APPENDIX A -- RESULTS OF A LITERATURE REVIEW FOR THE LOXAHATCHEE RIVER AND ESTUARY

CONTENTS

One of the requirements for developing a minimum flow for a river is the use of "best available information" (Section 373.042(1), Florida Statutes). To assist in defining a flow/salinity relationship or recommended minimum flow for the Loxahatchee River, a literature review was conducted to review the results of studies of the river that were performed over the past three decades. The studies are summarized in this appendix. An additional section was written to summarize what is currently known about the effects of salinity on baldcypress. Topics that were covered include the response of baldcypress to acute and chronic exposure of saline waters, age sensitivity, intraspecific variation, symptoms of salinity stress, and the potential mechanisms used by baldcypress to minimize the concentration of chloride and sodium ions in plant tissue. Also included at the end of this appendix is the list of all documents that were reviewed by South Florida Water Management District (SFWMD or District) staff.

STUDIES RELATED TO THE PROBLEM OF SALTWATER INTRUSION

The studies related to the problem of saltwater intrusion are organized chronologically beginning in the early 1970s when the problem of saltwater intrusion within the Northwest Fork became a major public concern. Several portions were obtained from Law Environmental (1991).

- **Land et al. (1972)** discussed saltwater intrusion in the Loxahatchee River and area ground water. The report states that reduced flows to the Loxahatchee River have permitted seawater to advance several miles upriver where it had previously been held back near the mouth of the inlet. This reduction in flow was thought to be primarily due to the diversion of freshwater flow from the Loxahatchee Slough into the Southwest Fork and to irrigation operations. The report comments that it was necessary to discontinue pumping at several wells during the drought of 1970-71 because of increasing chloride levels in Tequesta and Juno Beach. The report also states that the old Jupiter municipal wellfield and wells near the Loxahatchee River Estuary, the Intracostal Waterway, and the ocean had to be shut down several previous years because of saltwater intrusion.

- **Rodis (1973a,b)** In 1973, the United States Geological Survey (USGS) published a report entitled: *The Loxahatchee - A River in Distress, Southeast Florida* (Rodis 1973b). The study concluded that the primary cause of environmental problems facing the river was the upstream movement of salt water. The study attributed changes in the flora and fauna in Jonathan Dickinson State Park and other portions of the river to this cause. Rodis (1973) prepared an atlas for the USGS describing these problems and outlined some possible solutions.

  Before the area was settled in the early 1900s, stream flow and the water table were high enough to hold seawater at the coast. Coastal springs seeped into the ocean from the shallow aquifer and streams carried fresh water seaward to Jupiter Inlet. The Everglades and area lakes stored most of the rain that fell. This stored water recharged the shallow aquifer and provided a nearly constant wet season flow to the sea. Early settlers began to drain the Everglades to make additional land available for farms and homes and lakes and streams were connected to the sea. As a result, the flow of fresh water into the estuary and shallow aquifer gradually diminished and salt water moved inland to compensate for the reduction of fresh water. In 1972, after the 1971 drought, wedges of saline ground water threatened municipal wellfields in Tequesta and Juno Beach and saltwater ocean tides reached the upper portion of the Loxahatchee River.

  Rodis (1973) also noted that by 2000, freshwater needs for coastal communities may increase eight to ten fold. He made numerous suggestions for meeting these demands:

  - Freshwater sources were available west of the present wellfields.

  - Use of the present wells could be prolonged by reduced pumping rates, wider well spacing, improved well design, and water reuse.

  - Treated sewage effluent and storm water runoff could be reused to irrigate golf courses and maintain a freshwater head at the freshwater-saltwater interface.

- The remaining freshwater environment of the Loxahatchee River can be maintained by diverting enough fresh water from inland canals and water storage areas to the river to retard the advance of salt water.

- Preventing upstream movement of saltwater tides by constructing a salinity barrier, dam, or lock downstream would also aid in maintaining the freshwater environment.

Rodis (1973) also reviewed existing flow and salinity data for the Northwest Fork of the Loxahatchee River and concluded that a minimum continuous flow of 50 cubic feet per second (cfs) (23,000 gallons per minute) across the Lainhart Dam, was required to retard further upstream movement of salt water in the river under the drainage and development conditions that existed at the time of the study. This assumed that flows from other contributing tributaries would provide another 90 cfs such that the total Northwest Fork flow would be 130 cfs below Kitching Creek.

- **Birnhak (1974)** conducted an early study on the effect of freshwater discharges from canals in six southeastern coastal estuaries with the Loxahatchee River Estuary. The report briefly discusses the problem of saltwater intrusion into the upper reach of the Northwest Fork and the replacement of the cypress forest in the lower reaches of the river by salt tolerant species.

  Freshwater flows to the lower three stations (Stations 7, 8, and 9) were reported to have a negligible effect in diluting the salinity of these areas during the period of the study. The uppermost station (Station 1), at the confluence of Kitching Creek and the River, remained essentially fresh throughout the twelve month period. A saltwater wedge intruded up river to Station 2 during the low flow period (April and May). The higher freshwater flows flushed out the saltwater wedge by August. Station 4 showed a good correlation between freshwater flow and salinity in that part of the river. Farther downstream at Station 6, the bottom salinity remained high and fairly constant throughout the study period.

  Birnhak (1974) recommended that the freshwater flow to the Loxahatchee River be maintained. He suggested that 60 cfs would be sufficient to keep significant saltwater intrusion below Station 5. He suggested realigning existing canals and directing good quality stormwater runoff from the Florida Turnpike and the then yet to be constructed I-95 Highway into the Loxahatchee River. The report also listed redirecting discharge waters from the Loxahatchee Slough to the Loxahatchee River instead of to the C-18 canal. The SFWMD accomplished this redirection by installing a culvert (G-92) in the C-18 canal that diverted excess flows to the main stem of the Loxahatchee River in the mid-1970s (Dames and Moore 1989). Finally, Birnhak suggested the construction of a low head dam to act as a salinity control barrier immediately downstream of Jonathan Dickinson State Park. While this would prevent the saltwater wedge from moving up the river, it would also eliminate the flowing character of the lower river and interfere with navigation.

- **Christensen (1973)** made a preliminary investigation of the oyster bars that used to exist in the vicinity of the FEC railroad trestle prior to their removal in 1976-77. These bars occupied a significant portion of the narrowest part of the Loxahatchee River Estuary. Freshwater flow from the area (about 330 square miles) and tidal flow into the estuary must pass through this opening. Previous filling of this area further restricted this opening to about 510 feet wide. Christensen (1973) calculated that the oyster bars and bridge piling limited the area of free flow through the narrows to one-fifth of the existing width. Christensen's (1973) preliminary report recommended removing the living oysters to another location and dredging the remaining bars to a depth not greater than -6 feet mean seal level. His calculations indicated that this removal would not greatly increase the upstream encroachment of seawater to the Northwest Fork and would improve circulation in the estuary particularly along the south side of the river.

- **Alexander and Crook (1975)** produced a comprehensive study of the major changes in vegetation that have occurred in South Florida over the last 30 or more years. This study utilized aerial photographs and ground truthing to examine plant communities along the Northwest Fork of the Loxahatchee River and Kitching Creek. Plant species lists were compiled for Sites 13 (RMs 7-8), Site 14 (RMs 7.0-7.5), and Site 15 (RMs 6.0-6.5) on the Northwest Fork and Site 10 on Kitching Creek. Upon identifying the signature of the most abundant community types, they were able to use photointerpretation to identify major vegetative communities from a 1940 aerial photograph. Areas of dead and living cypress canopy with a mangrove understory were noted in 1970. They concluded that since 1940, prairie and swamp hardwoods had been displaced by pineland and mangrove communities due to a lowering of the groundwater table and invasion of salt water between RMs 6 and 8. They were able to identify areas of active logging in the aerial photographs, which could explain the loss of mature trees within portions of the watershed. Also, they mentioned the impact of fire, hurricanes, and heavy frost on the major plant communities. At RM 6.5, they collected freshwater peat at a depth of 24 inches below the surface. Based on this information, they further concluded that there was no evidence that cypress forest had extended much further downstream than about RM 6. Wanless (written communication, 1982) suggested that RM 6 has experienced brackish conditions for at least the last 4,500 years. Finally, Alexander and Crook (1975) predicted that the mangrove invasion would accelerate, if anthropogenic activities in the upper floodplain of the river further reduced the freshwater head.

- **FDEP 1985**. Ten years after publication of Alexander and Crook's (1975) study, the Florida Department of Natural Resources (FDNR 1985) produced a follow up report indicating that many mature cypress trees from river mile 7.0 to 9.0 were dead and the number of trees stressed near river mile 9.0 had increased substantially from 1979 to 1982 as compared to the 1975 study. By 1984, the majority of cypress trees downstream of Kitching Creek (RM 7.8) were observed to be dead (FDNR 1985).

- **<u>Chiu (1975)</u>** conducted a saltwater intrusion study to determine the effect of removing the oyster bars that had formed in the vicinity of the FEC railroad trestle over the mouth of the estuary. The oyster bars were considered by local government and citizens to be a major cause of the deteriorating condition of the river. This was due to their restrictive effects on tidal and freshwater flow that are vital to the self cleaning capacity of the river. The oyster bars were also considered to inhibit boating by local residents and tourists. Chiu's (1975) study was conducted to determine the effect of removing the oyster bars on the tides, tidal currents, and saltwater intrusion into the Loxahatchee River. The study consisted of field studies to determine the existing river hydraulics and salinity distribution. Salinity was measured at 43 stations, seven tide recorders were installed, and current measurements were taken at seven locations. Chiu relied on published soundings for river bathymetry. These data were used to set up and calibrate a two stage numerical model to predict the effect on the river system of removing the oyster bars.

  The study concluded that dredging the oyster bars to a depth of -6 feet MSL under and adjacent to the FECRR trestle and AlA bridges will decrease the tidal range on the east side of the bridges about three percent and the time phase will be delayed about five minutes. The tide range on the west side of the bridges will increase about three percent and the tidal time phase will advance about five minutes. The model predicted an increase peak flood tidal flow of 320 feet/second (ft') and the peak volume will increase by 4 x 106 ft. The model also predicted that the high water slack salinity profiles would move 260 feet to 600 feet further inland. This model was also used to predict the effect of removing the sandbars adjacent to the FECRR trestle and AlA Bridge along with the oyster bars. This modification resulted in a predicted further inland movement of the high slack salinity profiles by 350 feet to 900 feet.

- **<u>Hill (1977)</u>** conducted a salinity-monitoring project during the removal of the oyster bars in the vicinity of the FECRR trestle from August 5, 1976, to August 29, 1977. The objective was to determine the extent of saltwater intrusion in the Loxahatchee River estuary at high slack tide before, during and after the removal of the bars. Twelve permanent sampling stations were selected along the estuary from 1.44 to 9.24 river miles above Jupiter Inlet. Measurements were taken at the deepest location at each of the sites and intermediate sites were sampled to determine the exact location of the saltwater wedge for that tide. The leading edge of saltwater intrusion in this study was defined as the location where the salinity equaled 1 ppt at high slack water, one foot above the streambed. Measurements were taken at one foot above the streambed and one foot below the surface at each location. Salinity data were taken once a month for one year at the highest slack water tide each month. Hill (1977) presented no conclusions that related the tide and salinity changes to the oyster bar removal project. The report instead presents the data collection methodology and their findings on tables, maps, and graphs. The study estimates that the inflow measured at this gauge represents roughly one-third of the daily freshwater inflow to the river. The extent of the saltwater wedge appears to correlate more closely to the level of freshwater inflow than it does to the tide height data. The effect of the oyster bar removal on the salinity wedge is not apparent from these data.

- **McPherson (unpublished)** During 1980-81, McPherson studied the transitional area between the cypress forest community and the mangrove community on the Northwest Fork. In May of 1981, he observed surface salinities of 20 to 30 ppt in an area of dead and stressed cypress. In another area of intermediately stressed cypress, surface salinities ranged from 15 to 20 ppt. Shallow groundwater salinities decreased with depth below the land surface and distance from the river with the exception of areas where seepage of fresh water was observed from nearby higher pinelands. McPherson concluded that there was no evidence that cypress forest ever extended much further than his Site 7E (approximately river mile 5.5, RM) on the Northwest Fork. Site 7E was characterized as an area of dead cypress snags now populated by mangrove forest in the middle of the river. It was assumed that cypress were unable to survive due to high surface and groundwater salinities.

- **McPherson and Sabanskas (1980)** reviewed the history and environmental concerns of the Loxahatchee River basin identifying those areas that need further study. For most of the areas identified, establishment of a baseline for the estuary and basin was recommended. Specific needs included saltwater encroachment, sedimentation, and pollution in the estuary. Specific objectives of their study included defining: (a) basin characteristics (e.g., basin divides, land cover, land use, and soil type; (b) major input and output patterns of water, sediment, and selected chemical constituents to and from the estuary, and the transport of these items within the estuary; (c) baseline information on the bottom sediment, seagrass beds, and wetlands, and on areal, tidal, and seasonal patterns of water quality within the estuary; and (d) selected functions and interrelationships within the estuary in terms of water, sediment, chemical input and output, basin characteristics, circulation, water quality and biology. The balance of this report concerns itself with the first objective of the investigation; it presents the major physical features of the basin, divides the basin into sub-basins, identifies the direction of surface water flow, and locates selected USGS stations on a photomosaic map.

- **McPherson et al. (1982)** conducted a study (1980-81) to provide baseline information on the estuary. The report was presented in the form of a large one page atlas providing information on bathymetry, hydrology, and benthic sediment and biota. The base map provides information on the location of seagrass, sand bars and oyster bars in the estuary. Other maps and tables show the evolution of the sand bars over the previous forty years, the bottom sediment characteristics, and the biomass of seagrass. The report also gives a history of the estuary to aid in understanding the physical and biological characteristics of the present system. The Loxahatchee River estuary was originally formed by a gradual rise in the sea level and the level of rainfall in this area. The estuary was shaped and modified by natural processes until the early 1900s when early settlers made alterations to the upstream watershed. Due to the opening of additional inlets and changes to area water flow, the inlet closed up and remained closed most of the time except when opened by dredging until 1947. The estuary has been maintained open by dredging since that time.

- **<u>Duever (unpublished data)</u>** The principal problem affecting the plant communities located along the NW Fork of the Loxahatchee River has been the gradual reduction in the number and geographic extent of healthy bald cypress in the floodplain and their replacement by mangroves. Virtually all of the cypress in the lowermost area of the wild and scenic river segment are now dead, as are the majority of cypress below Kitching Creek. Above Kitching Creek, the number of live trees increases with increasing distance up the river. An analysis conducted by the U.S. Geological Survey between 1979 and 1982 documented the extent of environmental stress in the bald cypress community along the Loxahatchee River corridor (Duever, unpublished data). The study examined core samples collected from cypress trees at 21 sites (69 trees in total) located up and down the river to identify changes in tree ring width and quality over time. The results of the study indicated that although all of the trees sampled had experienced stress at periodic intervals over their life histories, the proportion of stressed trees in the downstream section (below river mile 9.0) increased from 30 percent in 1940 to 80 percent in 1982. Stressed trees above River Mile 9.0 decreased from 11 percent to 3 percent during the same period. Further, the study found a high correlation between the incidence of growth stress and high salinity in surface water and soils**. Figures A-1 and A-2,** show the results of this study for the percent of trees with poor quality tree rings, percent of trees with small rings, and percent of trees with large rings from year 1760 to 1982.

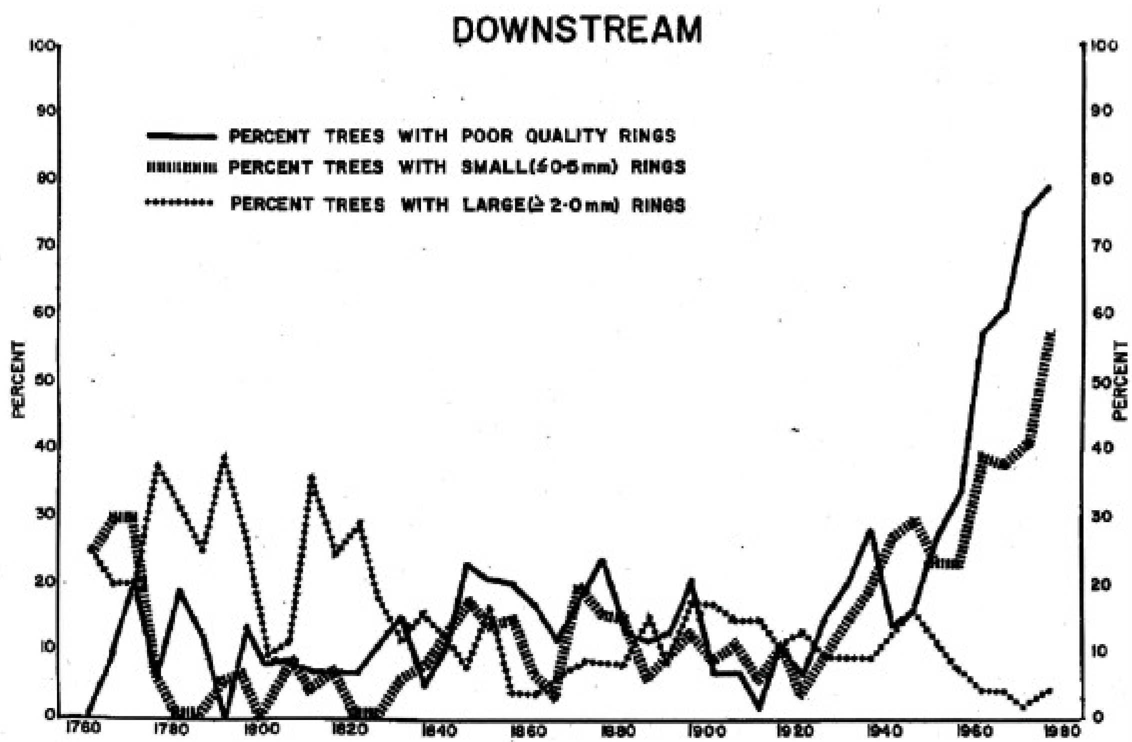


Figure A-1. Changes in cypress tree ring size and quality through time downstream of river mile 9, NW Fork of the Loxahatchee River (from: Duever, unpublished, USGS data)

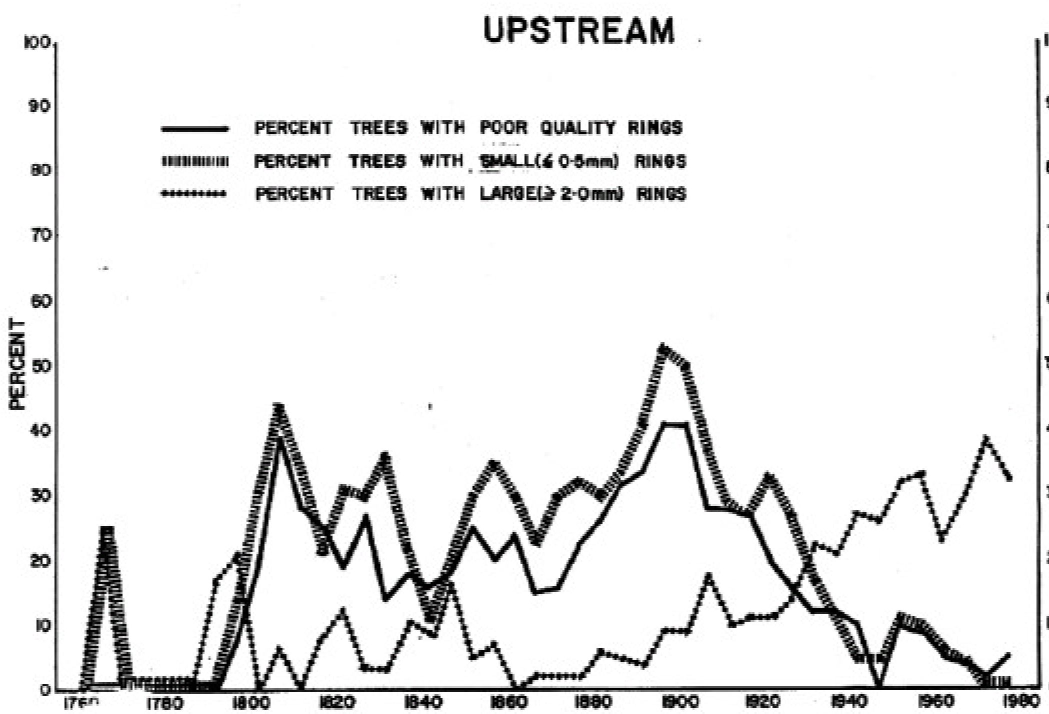


Figure A-2. Changes in cypress tree ring size and quality through time upstream of river mile 9.0, NW Fork of the Loxahatchee Rover (from: Duever unpublished data (USGS data).

- **<u>Russell and McPherson (1984)</u>** conducted an intensive study of the relationship of salinity distribution and freshwater inflow in the Loxahatchee River estuary from 1980-1982. The report presents baseline information on the areal and seasonal variations of salinity in the Loxahatchee River estuary and evaluated the effects of freshwater inflow on that salinity regime. The report contains information on areal and vertical salinity distribution, freshwater inflow, tidal fluctuations, and rainfall. The study had the benefit of both extreme high and low freshwater flow periods during their study. Characteristic low flows were measured in the dry season (November to May) and extremely high freshwater flows occurred for several days following Tropical Storm Dennis (August 18, 1981).

  Freshwater inflows to the major tributaries were measured at six continuous gauging stations including the Northwest Fork of the Loxahatchee River, Cypress Creek, Hobe Grove Ditch, and Kitching Creek. Information on freshwater inflow to the Southwest Fork was provided by the SFWMD at S-46. Key results of this study showed that in the NW Fork, a gradient of fresh water mixing with seawater occurs over a distance of 5 to 10 miles. The saltwater wedge (identified in this study as a bottom salinity > 2 ppt) moved daily over 0.5 to 1. 5 river miles as a result of change in freshwater inflow. The estimates of the total amount of fresh water [from all sources] needed to restrict brackish water (>2 ppt) from the upstream reaches of the NW Fork at mean high tide if tidal discharges are not altered are presented in **Table A-1**.

Table A-1. Estimates of the Total Amount Fresh Water Needed to Restrict Brackish Water at Mean High Tide

Total* Mean Daily Freshwater Discharge (cfs)	Upstream Extent of Saltwater Wedge in River Miles
220	7.0
130	8.0
120	8.2
75	9.0
43	10.0
26	11.0

* includes NW Fork + all upstream tributaries

For comparison, average inflow of fresh water to the NW Fork during the 1980-81 extended dry season was 57 cfs. Large volume freshwater discharges from the C-18 canal to the SW Fork can cause extreme vertical stratification of the estuary with a freshwater layer on the surface overlying denser seawater. However, most of the time, no fresh water is discharged from C-18, and tidal flows of high salinity water (>25 ppt) predominate the SW Fork. **Appendix F** provides a summary of salinities developed by Russell and McPherson (1984) for the Loxahatchee River and estuary under various flow discharge rates.

Based on the flow/salinity relationships provided in this study, the total amount of fresh water (from all sources) needed to restrict the saltwater wedge from the upstream reaches of the river was determined to be 120 cfs at river mile 8.2 (located at the confluence of Kitching Creek and the NW Fork of the river). Of this total flow, 57% (or about 68 cfs) is derived from the NW Fork, 32% (38 cfs) from Cypress Creek, 7% (8 cfs) from Hobe Grove Ditch, and 4% (5 cfs) from Kitching Creek (Russell and McPherson, 1984)

- **Russell and Goodwin (1987)** describe the development of a two-dimensional estuarine simulation model (SIMSYS 2D) to simulate tidal flows and circulation patterns in the Loxahatchee River Estuary system (Jupiter Inlet, the North and South Intracoastal Waterways, the central embayment, and three tributary streams). The model was calibrated using new and existing tidal stage data, tidal velocity data, and new information relating to the distribution of tidal flow volumes. The model was used to predict water levels, water-velocities, and water-transport and could simulate tidal flow and circulation in the estuary. The report acknowledges that the 250 foot grid size of the model, the narrow channel widths of connecting waterways, and the central embayment channel to the inlet makes detection of circulation features within them difficult.

- **Dames and Moore (1989)** submitted a preliminary plan to the SFWMD for conceptual approval that would supply additional fresh water for the NW Fork of the Loxahatchee River and groundwater recharge to areas east of the Loxahatchee Slough. The plan called for restoration of the Loxahatchee Slough to predevelopment conditions and the construction of above ground reservoirs to retain wet season rainfall until the dry season when it could be used to supply the Loxahatchee River and groundwater recharge.

Specific objectives of the plan were:

- To restore the predevelopment conditions in the Slough by raising and maintaining water levels to closely reflect those present prior to development.

- To provide an additional base flow of fresh water to the headwaters of the Loxahatchee River in order to prevent further saltwater intrusion and impacts to wildlife habitat.

- To restore and maintain groundwater and surface water levels in areas east of the Loxahatchee Slough which are currently experiencing depressed groundwater levels due to withdrawals from municipal well fields and other large users.

- The planned reservoirs encompassed approximately 4,800 acres with a total storage capacity of 26,000 acre-feet. The plan also used the existing canal network so that the further excavation of canals will be kept to a minimum. A probabilistic computer modeling analysis was conducted on the proposed design (Dames and Moore 1989). The results of the probabilistic model predicted that the following objectives could be achieved:

- An increase in the duration of Loxahatchee Slough water levels at or above elevation 17.5 feet MSL

- An increase in the duration of 50 cfs or higher flows to the Loxahatchee River from 75 percent of the time to 97 percent, and;

- The plan provided an average flow of 20 cfs for ground water recharge to areas east of the Slough every year.

The plan also called for a canal connection to the Loxahatchee River via Cypress Creek to provide direct discharge from a reservoir located to the west of the creek in Martin County. The plan would create an additional 650 acres of shallow wetland habitat, and 3,965 acres of deepwater aquatic habitat, restore and enhance 4,200 acres of freshwater wetland habitat, provide flood control benefits for the South Indian River Water Control District, reduce the amount of excess water in the canal systems during the wet season, reduce amounts of flood waters discharged into the southern part of the estuary through the Southwest Fork, and maintain residential lake levels east of the Slough and additional areas available for recreation to local citizens.

- **Law Environmental (1991)** developed the *West Loxahatchee River Management Plan* for the Jupiter Inlet District. A portion of the report discussed the analysis of unpublished flow, salinity and rainfall data collected from the NW Fork by the SFWMD (Dewey Worth, personnel communication, 1991). The data set (January 1985-January 1988) included *in situ* water column measurements of salinity collected on a monthly basis at high tide from 18 sites located within the three forks of the river and estuary. This period of record encompassed years of above and below normal rainfall, including extreme high flow and prolonged periods of zero from both G-92 and S-46. Flows from G-92 were used as a surrogate parameter for estimating freshwater discharges to the NW Fork.

  Average and median flows discharged to the NW Fork of the river through G-92 were recorded as 50 and 56 cfs, respectively over the three year study. Average bottom salinity recorded at river miles 9.2, 8.0, 6.9, and 5.7 were 0.4, 2, 8, and 17 ppt, respectively. Vertical stratification of the water column was most prominent at river miles 2.6 and 8.0. A shallow sill in the river bend at RM 4.0 acted to restrict the saltwater wedge from penetrating upstream. Under extreme low flow conditions (G-92 flows < 8 ppt) the salinity profile of the NW Fork was transported upstream by slightly more than one river mile. Under these low conditions average bottom salinity values recorded at river miles 9.2, 8.0, 6.9, and 5.7 were 3, 13, 17, and 25 ppt. Surface and botton salinity at river mile 8, located within the area of cypress die-off, was less than 0.2 ppt and 0.4 ppt for 50% of the 1985-1988 data set.

  The study suggested that releases from S-46 could be used to form a freshwater "plug" in the central embayment which can be transported upstream within the NW Fork on a rising high tide. In this sense these releases would act as a salinity barrier to prevent saltwater intrusion of the NW Fork. In addition, discharges from S-46 were reported to have substantial effects upon salinity regimes many miles upstream of the NW Fork. Possible management options for the river may include maintaining discharges from S-46 and G-92 in order to maximize the effectiveness of limited volumes of fresh water.

  Although the flows from S-46 and G-92 were shown to be independent from each other, the lower portion of the estuary demonstrated a significant relationship with flows from S-46. Flows from S-46 were also strongly associated with the bottom salinity at river mile 5. In order to maximize the amount of fresh water available to the Loxahatchee River, management options could include maintaining designated discharges from both G-92 and S-46 that are linked to the daily tidal cycle.

  Based on the SFWMD 1985-1988 data set, the report divided the tidal Loxahatchee into five zones. Zone I extends down river to a point below Kitching Creek and is tidal fresh water **(Table A-2).** From Hobe Grove Ditch to Kitching Creek it overlaps Zone II, which extends downstream to river mile five. Zone III begins near river mile seven and includes much of Zone II, but also includes the upper embayment area down to river mile four. Zone IV covers the river between miles five and three, and Zone V runs from river mile four to the inlet.

Table A-2 Proposed Salinity Zones for the Loxahatchee River and Estuary*

Zones	Minimum Salinity (ppt)	Maximum Salinity (ppt)
I	Fresh	4.0
II	2	15
III	11	19
IV	15	28
V	23	Marine

* As proposed by Law Environmental (1991) using the estuarine classification system of Bulger et al. (1990) which is based on species salinity ranges

The report concluded that salinity control within the river would be better served if implemented as a program of freshwater discharge management. Salinity control by a regulated freshwater discharge at average flow conditions of 40 to 50 cfs could benefit the region by establishing a stable salinity wedge location for the estuary system.

- **Ward and Roberts (unpublished)** Between October 1993 and January 1994, Ward and Roberts examined six vegetative transects on the Northwest Fork of the Loxahatchee River between Indiantown Road (State Road #706) and the mouth of Kitching Creek (RM 8.0). Generally the density (tree density stems/hectare) of bald cypress (*Taxodium distichum*) increased from downstream (Transect #6, RM 8.5) near Kitching Creek to upstream (Transect #1, upstream of RM 10 just north of State Road #706). A noticeable drop in cypress occurred at Transect #3 (upstream of RM 10 and just north of Interstate 95), which was heavily populated with pop ash (*Fraxinus caroliniana*), red maple (*Acer rubrum*) and cabbage palms (*Sabal palmetto*). They did not examine the density of mangrove during their study.

- **McPherson and Halley (1996)** in their publication, *The South Florida Environment: A Region Under Stress*, documented the encroachment of mangroves, along with the overall reductions in freshwater flows, maintenance of lower groundwater levels, short duration high volume freshwater flows for flood protection, and changes in the quality of runoff.

- **Hohner (1994)** used aerial photography and satellite imagery to examine vegetative changes in the Loxahatchee Slough between 1940 and 1989. The Loxahatchee Slough is part of the headwaters of the Loxahatchee River. In a comparison of the vegetative classes forest land (hammock), nonforested wetland (wet prairie), forested wetland (cypress), and nonforested wetland (marsh), she concluded that with GIS analysis there was a general trend toward dryer hydroperiod vegetation land cover. A portion of the study area, in which water levels were raised to pre-channelization levels in 1979, exhibited a recovery to longer hydroperiod vegetation.

- **Dent (1997).** Water quality studies were performed by the Loxahatchee Environmental Control District to assess the effects of constructing two rock and earthen dams to close off channels that had been providing a "short cut" for water flow up and down the NW Fork of the River (Dent 1997). The construction of these two dams helped to restore more natural river flow to the historic meandering oxbow sections of the river. This added approximately 0.7 river miles distance that salt water must now travel upstream to impact the freshwater cypress swamp communities of the NW Fork. Salinity studies were conducted for two, nine month periods prior to, and after construction of the project. Maximum daily bottom salinity from two water quality stations located above and below the construction sites were used for comparison. Results of the study showed that closure of these short cuts resulted in lower salinity concentrations after construction, and longer response times for the upstream station to experience an increase in salinity as compared to pre-construction values.

- **Dent and Ridler (1997).** The Loxahatchee River District completed a 12-month salinity monitoring study of the NW Fork (March 1996-February 1997), to establish a flow/salinity relationship using three water quality monitoring stations 63, 64 and 65 (see **Figure 11** of this report). Water quality station #63 is located near the Jonathan Dickinson boat ramp; water quality station #64 is located downstream of Kitching Creek; water quality station #65 is located upstream of Kitching Creek. Although the monitoring period was slightly wetter than normal, the following observations were made.

    - Flow rates, decreasing from 150 cfs to below 60 cfs over five days, resulted in the almost immediate movement of salt water into the monitoring area. As flow increased to near previous levels, the saline water was rapidly pushed downstream out of the monitoring area.

    - During the study period, salinity was recorded on 294 days. On the average, 50 cfs was met on 33% of the 294 monitoring days. When flow was equal to or less than 50 cfs, the salinity was greater than 2 ppt at the station 65 95% of the time and the salinity was greater than 2 ppt at station 64 100% of the time. Therefore, 50 cfs was insufficient to maintain freshwater conditions at either of the two sampling stations. It was determined that if flows of 100 cfs or higher were achieved, for 41% of the sampling days, salinity at Station 65 would not be greater than 2 ppt and the salinity at Station 64 would be greater than 2 ppt only 9% of the time.

    - Daily tidal fluctuations through the Jupiter Inlet influence the salinity of the NW Fork in a short-term cyclical process and salinity at a specific location may increase by 5-10 parts per thousand (ppt) in the few hours between low and high tides. Tides in the Loxahatchee River typically range from 2-3 feet in height and move at approximately 5-10 mph and influence the river over a distance of 10 river miles. Winds also have a significant effect on the height of the tide; for example, strong northeast winds that occur during autumn and winter months tend to push additional amounts of saline water upstream into the River, resulting in higher than average tides. (Russell and McPherson 1984).

- Based on their analysis of data they concluded that during dry periods a minimum flow of 50 cfs was insufficient to maintain the saltwater wedge downstream of water quality stations #64 and #65. The study suggested both a minimum and a maximum flow range for the NW Fork of the Loxahatchee River. Their proposed minimum flow rate for the delivery of water to the NW Fork was 75 cfs (as measured at the SR 706 bridge) for the end of the dry season (May), and 130 cfs for the wet season (July-November). They also recommended a maximum flow target, i.e., discharges to the river should not exceed 150 cfs during the dry season (months of February-May), (dry season), and no greater than 300 cfs during the wet season (June-November).

• **SFWMD (1999)** As late as 1998, the original USGS flow target of 50 cfs established by Rodis (1973) was still identified as the recommended minimum flow target for the NW Fork. The origin of this target was based on water flowing over the Lainhart Dam; a broad crested weir located 0.1 mile north of SR 706. The dam consists of a combination of steel sheet pile and cypress logs constructed at elevation 10.5 ft. NGVD. Previous flow rating curves developed for the dam in 1984 tended to under estimate flow over the dam. The dam was reconstructed in 1998 and flow-rating curves developed for the dam tended to significantly over estimate discharge. For this reason District staff conducted a recalibration of the rating curve for the Lainhart dam in 1998 which provided a more realistic estimate of river flow over the dam. These data were compared to earlier U.S.G.S. data generated for the river ten and twenty years earlier and suggested that the 50 cfs minimum flow requirement for the river should be modified based on the newer information.

  This new calibration information was then used generate a more accurate picture of the relationship between discharges over the dam and maintaining bottom salinity values at key points along the river. Results of the analyses indicated that a minimum flow target of 64 cfs was needed to maintain the saltwater wedge (as 2 ppt bottom salinity) just downstream of the point at which Kitching Creek flows into the NW Fork of the river (SFWMD memorandum dated August 20, 1999).

A LITERATURE REVIEW OF THE EFFECTS OF SALINITY ON BALDCYPRESS

The previous section provided a comprehensive summary of the various studies that have been conducted on the Northwest Fork of the Loxahatchee River within the past thirty years and documented the changes that have occurred. Historically the Loxahatchee River supported a freshwater cypress community, which extended downstream to approximately river mile 5.5 (McPherson unpublished data). Due to hydrological alterations in the region caused by the building of canals and levees, the permanent stabilization of the Jupiter Inlet, and removal of oyster beds at FECRR Bridge the historic freshwater communities within and along the Loxahatchee River were exposed to higher salinity regimes. The saltwater intrusion and higher salinity levels allowed for salt-tolerant red mangroves (*Rhizophora mangle*) to extend upstream into areas historically dominated by baldcypress (*Taxodium distichum*). Increased levels of salinity are believed to adversely affect vegetation by three primary mechanisms: 1) direct effects such as specific toxicity and disruption of metabolic pathways 2) indirect effects such as declines in the levels of water and nutrient uptake in plants unable to adjust their internal osmotic potentials to compensate for reduced soil osmotic potentials and 3) alterations of the plant's energy relations (Greenway and Munns 1980, Allen 1994). The objectives of this section are to summarize what is currently known about the effects of salinity on baldcypress. Topics that will be discussed include the response of baldcypress to acute and chronic exposure of saline waters, age sensitivity, intraspecific variation among baldcypress individuals, symptoms of salinity stress, and potential mechanisms used by bald cypress to minimize the concentration of chloride and sodium ions in plant tissue.

According to Conner and Askew (1992) very little research has been conducted on salt tolerance in baldcypress. The studies that have been conducted to date focus primarily on areas in southeastern Louisiana, Georgia, South Carolina, and North Carolina. It is extremely important to note that although these studies can aid District staff in understanding the effects of salinity on baldcypress, the salinity thresholds cannot automatically be applied to populations in Southeast Florida. Florida's rivers and baldcypress communities have not been historically subjected to saltwater intrusion as other populations in the southeastern United States. The natural selective pressure of saltwater intrusion in other southeast populations favored the survival of more salt-tolerant individuals and the establishment of their offspring in brackish environments over a time span of many generations (Allen et al. 1997, Yanosky et al. 1995). The selective pressures in these areas began long before the early twentieth century, the timeframe that Florida's populations have been under selective pressure. Therefore, it is hypothesized that baldcypress populations in brackish environments in Louisiana, Georgia, South Carolina and North Carolina can tolerate higher salinity levels than individuals living in brackish environments in southeast Florida.

Acute and Chronic Effects of Saltwater Intrusion

A study was conducted in Georgetown, South Carolina to determine the impact that short-term saltwater flooding would have on six-month and eighteen-month baldcypress seedlings (Conner and Askew, 1992). The water had an initial salinity of 30 ppt and the water level was maintained at approximately five centimeters above soil surface. The seedlings exposure to saline waters ranged from zero to five days, and upon removal from the pool they were flushed with freshwater, and allowed to grow for an additional nine weeks. Only 30% of the six-month seedlings exposed to saline waters for one day survived to the end of the study and 0% survived flooding for two or more days. In contrast, 90% of the eighteen-month seedlings survived two days of flooding and 30% survived up to four days of flooding. The results of the experiment suggest that younger seedlings are much more sensitive and susceptible to saltwater flooding than older ones. Krauss, Chambers, and Allen (1998) found an indirect relationship between soil salinity levels and germination capacity of baldcypress seeds. The seeds used in the study were collected from eight open-pollinated half-sib families in Louisiana and Alabama and were exposed to varying levels of salinity (0 ppt, 2 ppt, 4 ppt, and 6 ppt). The mean germination under the four salinity regimes was 26.3, 22.9, 15.4, and 10.2%, respectively.

A study conducted by Krauss et. al (2000) compared survival of baldcypress seedlings planted on three sites in Louisiana characterized by coastal swamp forest degradation. The most saline site had an average salinity level of 2 ppt throughout the 1996 growing season, but the levels did rise to 4.2 ppt in August 1996 and as high as 15 ppt in October 1997. The average salinity values for the other two sites were 1.2 ppt and 0.5 ppt in 1996, with only slight modifications in 1997. Survival at the end of the 1996 growing season was 86.4%, 93.0%, and 99.5%, respectively, and 17.7%, 92.7%, and 98.3% at the completion of the 1997 growing season.

Researchers at Clemson University flooded baldcypress seedlings with water having salinities of 0 ppt, 2 ppt, and 10 ppt. Those exposed to zero ppt and 2 ppt survived until the end of the three-month experiment while those exposed to 10 ppt died within two weeks (USGS 1997). In contrast, Conner (1994) had a 100% survival rate for seedlings regularly watered for three months with a saline solution of 10 ppt. The difference between these experiments is most likely due to the fact that the former baldcypress were constantly inundated with saline water whereas the latter were only watered with it. Other studies suggest that baldcypress is more sensitive to the combined stress of flooding and salinity than either factor alone (Allen *et. al* 1996, Javanshir and Ewel 1993, Conner 1994).

Based on the results of these studies it can be concluded that the acute effects of saltwater intrusion on baldcypress seedlings are dependent on the salinity levels of the water, the age of the individuals, intraspecific variation among individuals, and the amount of time the seedlings remain flooded. At this time, very little is known about the response of mature bald cypress to acute doses of salinity and the chronic effects of long-term, low saline exposure on seedlings, saplings, and adult baldcypress. Adult intraspecific variation to salt-tolerance was discussed in a paper prepared by Yanosky and Hupp in 1995. Their study identified three mature individuals of baldcypress in Cape Fear River estuary, North Carolina that were living in highly saline areas (soil sodium concentrations ranging from 44.9 to 77.8 mg/g) where all of the other individuals had died and attributed their presence to higher salt-tolerance. The estimates of baldcypress salinity tolerance reported in the literature range from 0.1 ppt (Beal 1977) to 8.9 ppt (Penfound and Hathaway 1938). According to (1994) the most accurate estimates on the mean level of salt tolerance in Louisiana were derived from Chabreck (1972) and Wicker et al. (1981). Chabreck analyzed the average soil pore water salinity level for five baldcypress transect’s located in close proximity to the swamp-marsh boundary, and estimated the average salinity tolerance to be 1.9 ppt with a standard deviation of 1.4 ppt. Wicker et al. graphed the relative rate of decline in baldcypress trees per acre versus salinity levels, and found that the rate of decline began to substantially increase between salinity levels of 1.8 and 2.1 ppt. From these findings Wicker concluded that baldcypress swamps would be confined to regions where the salinity level does not rise above 2 ppt for more than fifty percent of the time the baldcypress are exposed to flooding or soil saturation.

Symptoms of Salinity Stress in Baldcypress

There are many symptoms of salinity stress in baldcypress. These include reductions in diameter and height growth, leaf damage and biomass reductions, declines in stomatal conductance and net photosynthesis, and increases in chlorine and sodium ionic concentrations in leaf, stem, and root tissues. An indirect relationship between diameter growth and the number of days seedlings were flooded with saline water was noted in the study conducted by Conner and Askew in 1992. The six-month and eighteen-month seedlings experienced steady declines in diameter growth with the latter exhibiting shrinkage after the third day of flooding. Krauss et al. (1999) found the diameter growth of baldcypress seedlings flooded with water containing 6 ppt of sodium chloride significantly less than the control seedlings flooded with freshwater. A study was conducted by the U.S. Geological Survey from 1979 to 1982 to document the extent of salinity stress in baldcypress located along the Loxahatchee River (Duever – unpublished data). Core samples were collected from sixty-nine trees, all located along different portions of the river, to assess if the width of tree rings and their overall quality had changed overtime. It was found that although each tree sampled had endured stress at intermittent intervals throughout their life span, the percentage of individuals experiencing stress down-gradient of river mile nine increased substantially. In 1940, the percentage of stressed trees downstream of river mile nine was 30% whereas in 1982 it was 80%. The pattern of reduced radial growth discussed above has also been observed in populations subjected to permanent freshwater flooding (Young *et al*. 1993).

Conner and Askew also discovered that the height growth of the six and eighteen month cohorts was negative due to die-back of the main stem and resprouting of seedlings. A direct relationship was identified between the amount of die-back and the number of days of saltwater flooding for the older seedlings. Baldcypress seedlings exposed to 6 ppt and 8 ppt saline waters showed large declines in height growth in comparison to seedlings exposed to zero and 2 ppt (Allen, 1994). Similar results were noted in Krauss et. al (1999) in which the height increments for the 4 ppt and 6 ppt salinty treatments were fifty and twenty percent, respectively, of the control treatments. Baldcypress seedlings planted at sites with mean salinity levels of 2 ppt, 1.2 ppt, and 0.5 ppt in the 1996 growing season had average seedling heights of 121.6 cm, 165.9 cm, and 196.4 cm, respectively, at the end of the 1997 growing season (Krauss et al. 2000). Pezeshki (1990) did not find significant effects on height growth in seedlings watered with 3 ppt saltwater for sixty days, but did find the results significant when the seedlings were flooded. As in the case of ring diameter, many studies have also reported reductions in overall height of baldcypress exposed to permanent freshwater inundation (Conner and Day 1976, Duever and McCollom 1987, Keeland 1994, Mitsch *et. al* 1979 and Stahle *et. al* 1992).

Leaf injury and death both serve as good indicators of baldcypress experiencing salinity stress. A study conducted by Allen, Chambers, and Pezeshki in 1997, which exposed first-year seedlings to varying salinity conditions (0 ppt, 2 ppt, 4 ppt, 6 ppt, and 8ppt), determined that overall increases in salinity cause the highest reductions in leaf biomass followed by root biomass and then stem biomass. A significant decline in mean leaf area was noted between seedlings exposed to water containing 0 ppt and 2 ppt of sodium chloride although the individual responses varied. The more tolerant individuals did not experience die-back at the top of the plant and gradually lost their older basal leaves while maintaining and/or producing healthy, younger leaves. The less tolerant individuals experienced partial stem die-back and limited refoliation along the lower section of the stem. As salinity levels rose from 0 ppt to 4 ppt, a larger percentage of total seedling biomass was partitioned to the roots. It was suggested that this increase might be an adaptation to increase the overall surface area thereby increasing the probability that roots may encounter zones of lower salinity. The biomass partitioning to the roots was observed to decline at salinity levels above 4 ppt. The authors attributed this to the large increases in Na/K and Na/Ca ratios, which can cause significant disruption of root metabolic functions. Similar reductions in leaf, shoot, and root biomass were noted in the six-month and eighteen-month seedlings exposed to saltwater. The six-month seedlings biomass declined following one day of exposure while the eighteen month seedlings exhibited declines following two days, but showed signs of stabilization after four days (Conner and Askew, 1992). Krauss et al. (1999) evaluated the differences in root elongation among five half-sib families of baldcypress exposed to varying salinity conditions (0 ppt, 4 ppt, and 6 ppt). Root elongation was significantly greater for the control treatment than the other two treatments, which had values only 60% and 24% of the control, respectively.

Stomatal conductance[1] and net photosynthesis were reduced when salinity levels exceeded 3 ppt (Pezeshki et. al 1987, Pezeshki 1990, and Pezeshki 1992). The mean values of photosynthesis and stomatal conductance at 8 ppt were less than 30% of the mean values recorded at 0 ppt (Allen *et. al* 1997). A study conducted at the University of Georgia in which baldcypress seedlings were flooded with 32 ppt of saline water for forty-eight hours also found decreased levels of photosynthesis (University of Georgia Savannah River Ecology Laboratory News Release, 1996). A negative relationship between leaf ionic content and photosynthesis was noted in studies conducted by Pezeshki *et. al* (1988, 1990) and Allen (1994). Pezeshki's 1988 study found that internal leaf carbon dioxide concentrations remained constant as leaf ionic concentrations rose suggesting that the increased ion levels may interfere with normal photosynthetic processes by inhibiting RUBISCO or other enzyme activity.

[1] A numerical measurement which indicates either the rate of water vapor or carbon dioxide passage through the stomates or stomatal diameter.

The study conducted by Allen *et. al* in 1997 found that as overall salinity levels rose, greater amounts of chloride and sodium were detected in leaf, stem, and root tissue. The highest chloride concentrations were found in the leaves while sodium concentrations were virtually equal in leaf and root tissue. Failure to exclude sodium and chloride from leaf tissue may result in increased water stress, ion imbalances or toxicity, and hormonal imbalances (Flowers *et. al* 1977, Greenway and Munns 1980, Poljakoff-Mayber 1988). In Allen's experiment, the three seedlings exhibiting the highest levels of salt-tolerance had sodium concentrations 34% lower than the mean value. In addition, the most tolerant individuals to 6 ppt had 20% and 25% lower chloride values in their leaves and roots, respectively, in comparison to the mean levels. The study found a significant negative linear correlation between sodium and chloride concentrations in the leaves and the Potential Survival Index suggesting that elevated ion concentrations can be associated to low salinity tolerance (Allen 1994). Varying abilities of baldcypress individuals to expel sodium and chloride are often the reasoning used to account for intraspecific variation (Thomson 1988 and Ashraf and Fatima 1995).

Allen's findings were strengthened by the Krauss et al. (2000) study, which found a linear relationship between the free soil water salinity at the time of collection and foliar concentrations of sodium and chloride. The seedlings planted at sites with mean salinity levels of 2 ppt, 1.2 ppt, and 0.5 ppt had foliar sodium concentrations of 0.54, 0.26, and 0.11%, respectively, while foliar chloride concentrations at the most saline location were approximately 1.8 times greater than the other locations. In addition, significant site-level differences in Na/K and Na/Ca tissue ratios were documented. Wyn Jones et al. (1979) proposed that Na/K ratios must be maintained at levels less than one to maintain normal cellular functions. Flowers and Lauchli (1983) hypothesize that the cells are damaged when the Na/K ratio increases because sodium can only partially substitute for potassium in the cell. The Na/K ratio on the most saline plot in Krauss' study exceeded 1.0, which may account for the higher levels of stress observed. Allen et al. (1997) and Pezeshki et al. (1988) also reported Na/K foliar ratios that exceeded one when baldcypress seedlings were exposed to salinity levels above 2 ppt and 8 ppt, respectively.

Potential Mechanisms Used by Baldcypress to Minimize Salinity Impacts

Research has been conducted to explore the possible mechanisms of ion exclusion in baldcypress. Noble and Rogers (1992) outlined the following physiological responses as potential routes of ion removal: (1) control of uptake at the root plasmalemma and tonoplasts of the cortex (2) accumulation and release of ions from stele to xylem, (3) reabsorption of ions by xylem parenchyma cells (4) phloem translocation, and (5) compartmentation in older leaves. Another tactic that baldcypress may use when overburdened by large amounts of chloride in the soil is translocation of the ions from living, outer sapwood rings to non-living, inner heartwood rings. An experiment conducted by Yanosky and Hupp in 1995, used proton induced X-ray emission spectroscopy to assess chloride concentrations in increment corings gathered from baldcypress in North Carolina. The study found that four of the five trees, which had the highest chlorine concentrations in the outer sapwood, exhibited the similar pattern of an abrupt increase in chloride within the outermost heartwood ring in comparison to the innermost sapwood ring. The authors believe that the shunting of chloride ions from younger to older rings may be a mechanism to sustain physiologically tolerable levels of ions within the living ray parenchyma, especially the parenchyma adjacent to the cambium.

Conclusions

The information gathered in this literature search can be used to help understand potentially dangerous salinity levels in regard to successful cypress recruitment and survival, the extent of intraspecific variation, the various symptoms of salinity stress, and the mechanisms used by baldcypress to minimize salinity exposure. The specific salinity levels tested in the various experiments on baldcypress seedlings, which are summarized in **Table A-3** and **Figure A-3** can only serve as initial guides to the salinity values necessary to retard further baldcypress mortality in upper reaches of the Loxahatchee River. As exemplified in the literature search, the majority of the research conducted to date has concentrated on the seedlings response to acute dosages of salinity. Although salinity tolerance appears to increase with age, it is extremely important to note that salinity levels must be maintained at levels which protect baldcypress seedlings because levels that protect only mature adults will not ensure a sustainable population. As shown on **Figure A-3,** at 2 ppt there are major declines in the seedlings net photosynthesis, stomatal conductance, and mean height, and by 4 ppt significant declines in leaf biomass and germination capacity. Although these studies demonstrate that some individuals can withstand higher levels of exposure, one may argue from established ecological principles that sodium chloride concentrations of 2 ppt and higher could have greater adverse effects on the Loxahatchee's baldcypress population than coastal Louisiana populations, as the former has had less opportunity to select more tolerant strains. It is essential that site specific studies be conducted to verify salinity levels that negatively impact survival and recruitment for freshwater baldcypress in the Loxahatchee River because they have not evolved under the same saltwater selective pressures characteristic of other populations in the southeastern United States.

Table A-3 Summary of the Physiological Responses of *Taxodium distichum* to Varying Levels of Salinity

Salinity Levels	Germination Capacity	Survival	Height & Diameter	Root & Shoot Biomass (g dry wt) Leaf size (cm^2)	Stomatal Conductance (g_w) Photosynthesis(A)	Foliar ionic concentrations
0 ppt	26.3% [a]	100% @ end of 3 months when flooded [b]		Mean leaf biomass 2.14**(1**[1]**)** [j] Mean leaf area 415 [d] Mean root biomass 2.39**(2)** [j]	g_w = 91.8 mmol m^2/s **(1)** [j] A=3.88 μmol(CO_2) m^2/s **(1)** [j]	Na^+ 0.05%* [j] Cl^- 0.38% * [j]
0.5 ppt		99.5% (1996) [c] 98.3% (1997) [c]	Average seedling ht. in 1997 was 196.4 cm [c]	Mean leaf biomass 15.4 [c]		Na^+ 0.11% [c] Cl^- 0.64% [c]
1.2 ppt		93.0% (1996) [c] 92.7% (1997) [c]	Average seedling ht. in 1997 was 165.9 cm [c]	Mean leaf biomass 7.1 [c]		Na^+ 0.26% [c] Cl^- 0.66% [c]
2 ppt	22.9% [a] (94% of control)	86.4% (1996) [c] 17.7% (1997) [c] 100% @ end of 3 months when flooded [b] 99% [j]	Average seedling ht. in 1997 was 121.6 cm [c]	Mean leaf biomass 1.99**(1)** [j] Mean leaf biomass 4.6 [c] Mean leaf area 366 [d] Mean root biomass 2.56**(1)** [j]	g_w = 74.0 mmol m^2/s **(2)** [j] A=3.18 μmol(CO_2) m^2/s **(2)** [j]	Na^+ 0.54% [c] Cl^- 0.77% [c] Na^+ 0.4% *[j] Cl^- 1.6 % *[j]
3 ppt			Significant reduction in height growth when flooded (~50%) vs. control, but not significant when only watered. [g]		Both g_w and A were reduced [g]	
4 ppt	15.4% [a] (57.5% of control)	95% [j]	-Height increment 50% of control [h]	Mean leaf biomass 1.44**(2)** [j] Mean leaf area 253 [d] Mean root biomass 2.31**(3)** [j]	g_w = 70.2 mmol m^2/s **(2)** [j] A=3.30 μmol(CO_2) m^2/s **(1,2)** [j]	Na^+ 0.6% *[j] Cl^- 1.9% *[j]

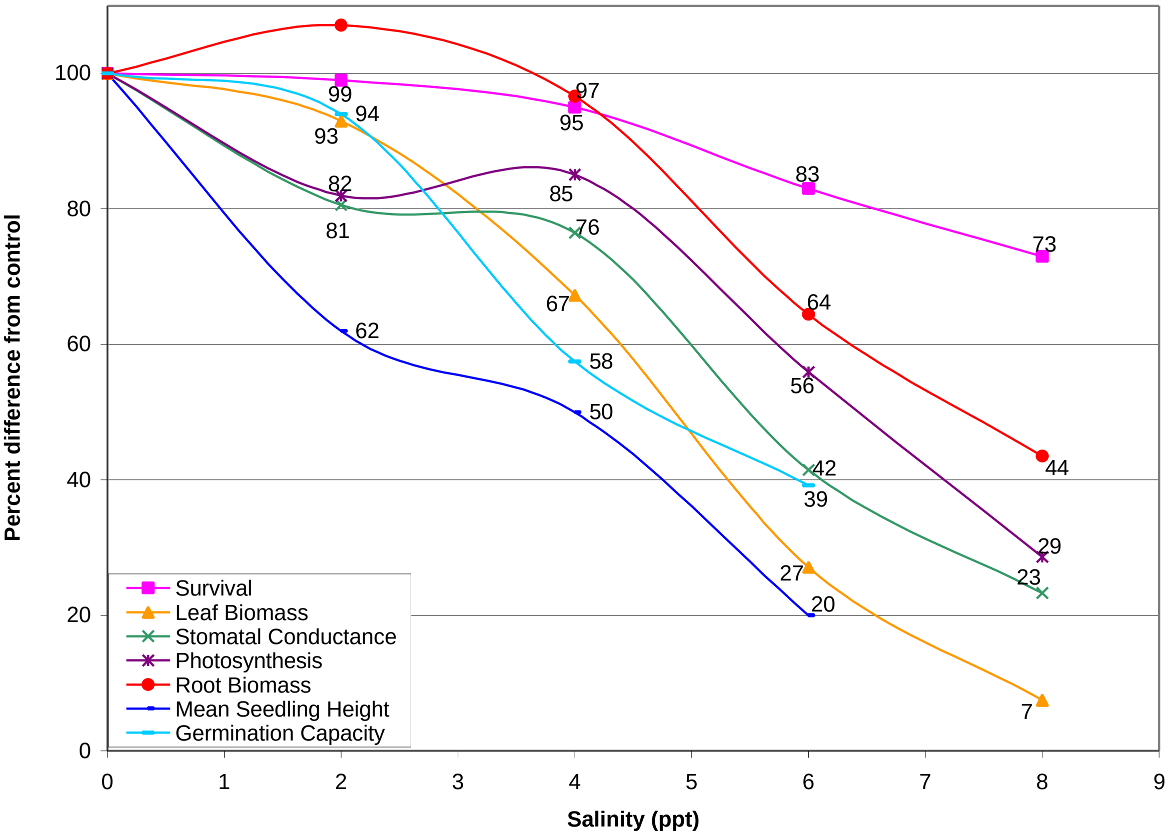
[a] Krauss et al. (1998) [b] Clemson University [c] Krauss et al. (2000) [d] Allen, Chambers, and McKinney (1994) [e] Conner (1994) [f] Conner and Askew (1992) [g] Pezeshki (1987) [h] Krauss et al. (1999) [i] Allen, Chambers, and Pezeshki (1997) [j] James Allen L.S.U. Ph.D. Dissertation (1994)

[1] Mean values within a column followed by the same number are not significantly different (P > 0.05) Allen, 1994 * Values estimated from graphs in Allen 1994.

Salinity Levels	Germination Capacity	Survival	Height & Diameter	Root & Shoot Biomass (g dry wt) Leaf size (cm^2)	Stomatal Conductance (g_w) Photosynthesis(A)	Foliar ionic concentrations
				Root elongation 60% of control [h]		
6 ppt	10.2% [a] (39.2% of control)	83% [j]	-Height increment 20% of control [h] -Diameter growth significantly less then control [c]	Mean leaf biomass 0.58**(3)** [j] Mean leaf area 69 [d] Mean root biomass 1.54**(4)** [j] Root elongation 24% of control [h]	g_w = 38.1 mmol m^2/s **(3)** [j] A=2.17 µmol(CO_2) m^2/s **(3)** [j]	Na^+ 0.62% *[j] Cl^- 2.33% *[j]
8 ppt		Survival of seedlings from 15 open-pollinated families ranged from 42% to 97% [d] 73% [j]	Large declines in height growth [d]	Mean leaf biomass 0.16**(4)** [j] Mean leaf area 24 cm^2 [d] Mean root biomass 1.04**(5)** [j]	g_w = 21.4 mmol m^2/s **(4)** [j] A=1.11 µmol(CO_2) m^2/s **(4)** [j] Mean g_w and A <30% of control [i]	Na^+1.2% *[j] Cl^- 2.63% *[j]
10 ppt		100% mortality within 2 weeks when flooded [b] 100% survival @ end of 3 months when watered [e]				
30 ppt		<u>Six month seedlings</u> [f] -30% 1d. of flooding - 0 % 2-5d. of flooding <u>Eighteen month seedlings</u>[f] -90% 2d. of flooding -30% up to 4d. of flooding	Six & 18 mo. seedlings experienced steady declines in diameter growth and negative height growth [f]	6 mo. seedlings biomass declined following 1 d. of exposure. 18 mo. seedlings biomass declined after 2 d. [f]		

[a] Krauss et al. (1998) [b] Clemson University [c] Krauss et al. (2000) [d] Allen, Chambers, and McKinney (1994) [e] Conner (1994) [f] Conner and Askew (1992)
[g] Pezeshki (1987) [h] Krauss et al. (1999) [i] Allen, Chambers, and Pezeshki (1997) [j] James Allen L.S.U. Ph.D. Dissertation (1994)
[1] Mean values within a column followed by the same number are not significantly different (P > 0.05) Allen, 1994
*Values estimated from graphs in Allen 1994.

Figure A-3 The Response of Baldcypress Seedlings to Increasing Salinity Levels (Measured as a Percentage of the Freshwater Control)



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APPENDIX B -- HISTORICAL VEGETATION DISTRIBUTION ALONG THE NORTHWEST FORK OF THE LOXAHATCHEE RIVER

Aerial Photography/GIS Study Methodology

Existing historical aerial photography was used to compare spatial and temporal changes in the distribution and abundance of vegetation communities along the floodplain of the Northwest Fork of the Loxahatchee River, document changes in vegetation cover, and correlate those changes to major events in the watershed. This study examined 1940, 1953, 1964, 1979, 1985, and 1995 aerial photographs to determine the vegetative distribution during each decade. The 1940, 1979, 1985, and 1995 aerial photographs were specifically chosen because those dates correspond to a time prior to the permanent opening of the Jupiter Inlet, times before and after enactment of Minimum Flows and Levels legislature, and the Federal Wild and Scenic designation, and the most recent photograph available, respectively. The black and white aerial photographs taken in 1940 were compared to color infrared photographs taken in 1985 and 1995 to quantify changes in the distribution and abundance of freshwater hardwood, cypress and mangrove communities between river miles 4.5 and 11.2. For comparison purposes, total acreage of vegetation types was analyzed within six segments of the 1940 and 1995 coverages. The 1953, 1964, and 1979 aerial photographs were also digitized and compared with photography from 1940, 1985 and 1995 between river miles 6.6 and 8.9.

The 1940 aerial black and white photographs (Accession Numbers CJF 3-51, 17-53, 17-54), which were taken on August 21, 1940 at a scale of 1:40,000 were obtained from the National Archives (College Park, Md.). The 1953, 1964, and 1979 photographs were obtained from the U.S. Department of Agriculture, Consolidated Farms Service Agency in Salt Lake City, Utah. The 1985 color infrared photographs were obtained from a special flight conducted for the SFWMD by Abrams Aerial Survey Corporation on April 27, 1985, at a scale of 1:400 over Lake Okeechobee and portions of the Loxahatchee River Watershed. Eight photographs from the 1985 survey were scanned to produce the floodplain coverage. The 1995 aerial photographs (Accession Number NAPP 6966-089) were taken on January 26, 1995, at a scale of 1:40,000 and the Digital Ortho Quads (DOQs) were obtained from the National Aerial Photography Program. The 1940 photographs were scanned at a scale of 3' per pixel and georeferenced to the 1995 DOQQ's. The 1995 aerials for the DOQQ's were scanned at a 1 meter-pixel resolution and rectified to meet a 1:12,000 scale accuracy for the quarter quadrangles. All imagery was produced in the State Plane Coordinate System, Florida East Zone, 1983 Datum. The floodplain areas between RMs 6.6 and 8.9 were digitized for the 1979 photograph. The total vegetative community coverage by type and by year was compared over time to quantify changes in vegetative types over this 55-year period.

Plant community signatures utilized in this study were adopted from the Florida Land Use, Cover and Forms Classification System (FLUCCS), Florida Department of Transportation, 1985 (**Table B-1**). Color and texture descriptions listed in the reference document were compared with known vegetation from the 1995 aerial to establish the following list of observed classifications:

<u>Vegetative Coverages</u>

428 Cabbage Palm
500 Water
510 Streams and Waterways
612 Mangrove Swamp
615 Stream Swamp
617 Mixed Hardwoods
621 Cypress
641 Freshwater Marshes
700 Barren Land
740 Disturbed Land

Using these categories, major plant communities were delineated into distinct aerial units characterized by specific tones and textures. Image tones refer to the brightness of an area of background as portrayed by the film in a given spectral region (or in three spectral regions for color or color infrared). Image texture refers to the apparent roughness or smoothness of an image region. Texture is produced by the pattern of highlighted and shadowed areas as an irregular surface is illuminated from an oblique angle. Mature forest appears as rough texture, while agricultural fields appear as smooth texture. Categories such as cypress may be recognized by the distinctive shape of the pin-like crowns of some trees (Campbell, 1987).

To validate the images produced by the major plant community-types in the floodplains and associated upland communities, groundtruthing and field observations were conducted from a helicopter in October and November 2000 and from ground surveys in November and December 2000 and April 2002.

Table B-1. Major Plant Communities and Signatures for Color Infrared Photos

Major Plant Communities	Signature	Vegetation	Hydrology/Soils
300 Rangeland 321 Palmetto Prairies	Bright pink, stippled appearance	Saw palmetto (*Serenoa repens)* is the dominant species. Other potential species: bluestems (*Andropogon spp.)*, panic grasses (*Panicium spp.*), fetterbush (*Lyonia sp.*), gallberry (*Ilex glabra*), and wax myrtle (*Myrica cerifera*)	Good drainage, seldom inundated
400 Upland Forest 428 Cabbage Palm	Dull, medium red color return with a predominantly fluffy and irregular crown texture with individual crowns discernable	cabbage palms with live oaks and vines	Rarely inundated/ fine sands well to somewhat poorly drained
500 Water 510 Streams and Waterways	black color for rivers streams, creeks, canals and other water bodies		
600 Wetlands 612 Mangrove Swamp	Smooth "cottony" red with generally even height* Areas of stress may appear as bright greenish color with a rough or stipple texture	Dominated by red, white or black mangroves (red towards the water's edge, blacks toward the landward side, whites more landward Other species Buttonwood, seagrape, palms, brazilian pepper, cocoplum	Permanently to tidally flooded/ very poorly drained organics or saline sands
615 Stream & Lake Swamps	Varying size canopies of irregularly shaped crowns from very pin-like (cypress) to mid-size fluffy and cottony overlapping crowns of broad leaf deciduous hardwoods. Cypress greyish green other hardwoods red color returns	Dominated by a mixture of water tolerant hardwoods including red maple, water oak, sweetgum, willows, water hickory, bays Cypress present but not dominant	Seasonal inundation depending upon weather cycles/ Soils mixture of sand, organics, and alluvial materials
616 Inland Ponds & Sloughs	Similar return as 615; however, these areas are found in depressions (ponds) and poorly drained defined drainages (sloughs) not associated with rivers or creeks	Dominated by cypress, red maples, willows with no single species dominating	Semi-permanent or permanent hydroperiods with a few inches of slowly moving water/ Soils highly organic sands or layered
621 Cypress	gray or gray-green color, narrow, densely packed crowns Tallest trees near the center with younger smaller trees along the edges	Dominated by cypress bald or pond Other species: red maple, pond apple, pop ash, water hickory In drier sites laurel oaks, sweet gum and bays	Semi-permanent or permanent hydroperiods/Poorly or very poorly drained, high in organics with peat layer of varying thickness on the surface
641 Freshwater Marshes	Variable, black open water, areas of faint pink to white return (floating aquatic vegetation), other vegetation pink to red range producing a smooth to stippled texture Sawgrass and cattail greenish to greenish-white return	Dominated by herbaceous vegetation including maidencane, common reed, cordgrass, bullrush, sawgrass and cattails with some pickerelweed and arrowhead	Seasonally to permanently flooded, may dry out during droughts/ Very poorly drained, mineral or organic

*We noted that darker tones of red within the mangrove community appeared to be taller/older trees that had not been as impacted by past freezes. These areas could be found generally in the interior of the communities and had perhaps been shielded from the colder temperatures and stronger wind.

Results & Discussion

1940 Vegetative Cover

Figure B-1 and Table B-2 (column 2) provide summaries of the major vegetation communities found along the Northwest Fork and adjacent areas (including the floodplain, wetlands in Jonathan Dickinson State Park [Wilson Creek] and some uplands) in 1940, based on a review of historical black and white aerial photographs. **Table B-2** summarizes the coverage (in acres) and changes in coverage of each community type for 1940, 1985 and 1995.

Figure B-1. 1940 Loxahatchee River Watershed (c. 1940)

Table B-2. Interpreted vegetation coverages (acres) for 1940, 1985 and 1995 for the Northwest Fork and adjacent areas, from river miles 4.5 to 11.2, based on aerial photography.

VEGETATION	1940 Coverage	1985 Coverage	1995 Coverage	Acres Difference 1940-1985	Acres Difference 1940-1995	Acres Difference 1985-1995
Freshwater Plant Communities						
Swamp Hardwood Cypress Stream Swamp**	467	338	326	-129	-141	-12
Inland Ponds and Sloughs	59	39	39	-20	-20	0
Freshwater Marsh	NA	5	2	NA	NA	-3
Cabbage Palm	3	7	4	+4	+1	-3
Category Total	***529***	***389***	***371***	***-145***	***-160***	***-18***
Saltwater Tolerant Plant Communities						
Mangrove	163	161	152	-2	-11	-9
Other						
Disturbed or Cleared Lands	27	84	84	+57	+57	-0
TOTAL	**719**	**635**	**607**	**-90**	**-114**	**-27**

*Coverage in acres

** Since swamp hardwood, stream swamp and cypress communities could not be accurately distinguished in the 1940's photographs, these subcategories were combined to provide a basis for comparison.

Results show that the watershed was relatively undeveloped in 1940. The most obvious features are the extensive freshwater swamp, the mangrove swamp located primarily downstream of river mile 7.8, the abundance of wetlands associated with sloughs and ponds, and the overall lack of urban development throughout most of the watershed.

Table B-3. Population as Reported in the U.S. Census in the Loxahatchee River Watershed

Municipality (Incorporation dates)	**Year**						
	1940	**1950**	**1960**	**1970**	**1980**	**1990**	**1999***
Juno Beach (1953)	-	-	249	747	1,142	2,172	2,903
Jupiter (1925)	215	313	1,058	3,136	9,868	24,907	33,925
Jupiter Inlet Colony(1959)	-	-	242	396	378	405	416
Jupiter Island (1953)	-	-	114	295	364	549	561
Palm Beach Gardens (1959)	-	-	-	6,102	14,407	22,990	34,557
Tequesta (1957)	-	-	199	2,642	3,685	4,499	5,122
Total	**215**	**313**	**1,862**	**13,318**	**29,844**	**55,522**	**77,484**

*Estimated by Bureau of Economic and Business Research, University of Florida

According to the 1940 U.S. Census, the Town of Jupiter contained 215 residents (**Table B-3**). Interstate 95 and the Florida Turnpike had not yet been constructed. The major roads at that time were Center Street, State Road 706 (Indiantown Road), State Road 710 (Beeline Highway), U.S. Highway 1, State Road 708 (Bridge Road) and Northlake Boulevard. Although the C-18 Canal had not yet been constructed, there was evidence of ditching from the Loxahatchee and Hungryland Sloughs to the River. The Jupiter Inlet was open in the 1940 photograph, but the presence of sandbars probably reduced the amount of saltwater coming in during high tides. The inlet was not permanently stabilized for navigation until 1947. On the Northwest Fork, tides, winds and periodic storm events may have had sufficient effects upstream past the mouth of Kitching Creek to promote growth of what appear on the photographs to be mangroves along the northern river bank, extending upstream to river mile 7.8. In **Figure B-2**, the 1940's distribution of the swamp hardwood (dominated by cypress) community is color-coded green, while mangroves are color-coded orange. This coverage represents our earliest photographic record of the distribution of mangroves and freshwater communities. Freshwater communities begin to disappear downstream of river mile 7.8 as mangrove became more common. The last remnant of freshwater swamp vegetation occurs at river mile 5.8.

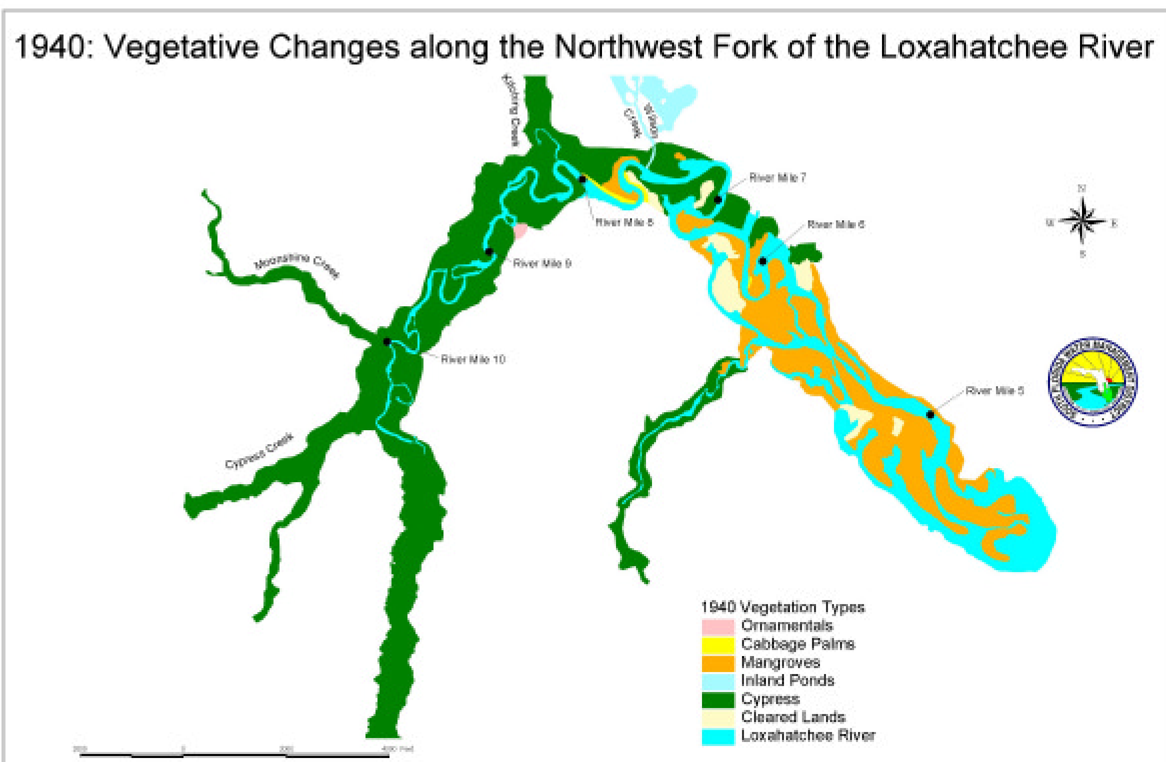

Figure B-2. 1940 Vegetation

Flow from the three main tributaries of the river and runoff from the surrounding lands feed into the northern loop of the river. The uplands and sloughs provide a network of interconnecting lakes, ponds and wetlands (**Figure B-1**) that feed into these tributaries. There are extensive wetlands (prairies and four major sloughs) between Kitching Creek, the North Fork, and Bridge Road at the north end of Jonathan Dickinson State Park in Martin County. Two of the sloughs appear to connect the North and Northwest Forks. These four areas historically may have provided sources of surface water flows to the river, but only Wilson Creek is still connected to the river today. Other visible hydrologic characteristics identified in the 1940 photographs included the following (refer to **Figure B-1** for location of features):

- On the Northwest Fork, Hobe Grove Ditch was not present in 1940, but Moonshine Creek was apparent and drained a wetland slough to the north
- No citrus was grown near the river as it is today, but there was extensive land clearing north of SR 706 on the east side of the Northwest Fork perhaps for agriculture
- A wetland slough connected Jones Creek to Lake Worth Creek (in the vicinity of what is today Frenchmen's Creek)
- Jones and Sims Creeks were lined with mangroves south of SR#706
- The Southwest Fork was a meandering creek that appeared to be dominated by mangroves
- The Southwest Fork/Limestone Creek had been ditched but not channelized
- Mangroves bordered the North Fork and transitioned into freshwater vegetation in the vicinity of today's park. The floodplain was very narrow in the mangrove areas
- There were very few mangrove islands in the embayment area
- Spoil mounds were evident along the Lake Worth Creek and the lower Indian River Lagoon from the dredging of the Atlantic Intracoastal Waterway channel

An estimate of the location of Interstate 95 and the Florida Turnpike was made to define the southern boundary of the study area in the 1940 photo. Unlike the clarity of later black and white infrared photography that was taken in the 1950s and 1960s, it was difficult to identify plant species other than cypress and cabbage palm within the freshwater communities. In addition, the 1940 photographs were taken during August, when all trees would have full canopies. Most subsequent aerial photographs were taken during the winter months when trees, like cypress, are dormant and very distinguishable. Thus in **Table B-2,** total acreage of cypress was combined with other freshwater vegetation to compare 1940 with 1985 and 1995 coverages.

In this study, the category of cypress represents a community dominated by cypress (more than 50% coverage) but that also may contain red maple, pond apple, pop ash, water hickory, laurel oak, and bay trees. The category of stream swamp represents a freshwater community of primarily mixed hardwoods with cypress (present but not dominant). Cabbage palms, which are normally associated with upland communities, are found within tidally inundated to seldomly inundated areas of the floodplain along the Northwest Fork of the Loxahatchee River. During the 2000 field observations, it was noted that those cabbage palms still surviving in inundated areas did not appear as healthy as those did at higher elevations.

Table B-2 and **Figure B-2** show that in 1940, there were about 163 acres of mangroves and 467 acres of cypress and stream swamp within the floodplain. Of the total 720 acres of floodplain vegetation identified in the 1940 aerial photography, 65% was represented by the stream swamp and cypress community while mangroves represented about 23%. Disturbed or cleared land represented 27 acres or about 4% of this coverage. Mangroves dominated the floodplain between river miles 4.5 and 6.0 and were present up to river mile 7.8. Stream swamp and cypress were present upstream from about river mile 6.5 and were dominant above river mile 8.0.

1985 and 1995 Vegetation Communities

Beyond the obvious publicly owned lands and agricultural fields, the eastern portions of the Loxahatchee River Watershed were highly urbanized by 1985 and 1995 (see **Figure 8 – Main Document**). A 1999 census estimate showed that the Town of Jupiter had a population of 33,925 residents within the city limits. Jupiter residents plus neighboring municipalities accounted for a total of 77,484 residents (**Table B-3**). This number, however, does not include the residents of unincorporated Palm Beach County in the western portion of the watershed (e.g. Jupiter Farms). According to the Palm Beach County Planning and Zoning Department records, the 1999 census estimated an additional 10,506 residents in Jupiter Farms and 3,536 in Palm Beach Country Estates. Interstate 95 and the Florida Turnpike stand out as major features that bisect the landscape along with extensive areas of agriculture (primarily citrus and cattle grazing), and the 11,471 acres of Jonathan Dickinson State Park.

Whereas in the 1940 black and white photographs the canopy appeared to be very uniform among swamp hardwood areas, in the 1995 photographs, the canopy seemed to have varying heights, colors and textures. Field observations showed that while some remaining areas maintained more than 50% cypress coverage, other freshwater communities consisted of mixed hardwoods including red maple (*Acer rubrum*), water hickory (*Carya aquatica*), laurel oak (*Quercus laurifolia*), pond apple (*Annona glabra*), pop ash (*Fraxinus caroliniana*), dahoon holly (*Ilex cassine*), and bay (*Persea* spp.) that are characteristic of a freshwater hardwood swamp. These areas were designated as “stream swamp” in the 1985 and 1995 coverages.

The most striking features noted in the comparison between the 1940 photos and those taken in 1985 and 1995 were as follows: a) the dredging and filling of former mangrove islands between river miles 4.5 and 5.5; b) the loss of floodplain and wetlands due to apparent flow diversions, invasion of upland species and development; and c) the effects of the placement of bulkheads along both shorelines of the estuary and lower Northwest Fork. Also, the islands and oxbows appear to have been heavily scoured over the years. These changes are reflected in total acreage differences between the 1940, 1985 and 1995 coverages. There is an overall loss of approximately 114 acres (17%) of wetland/floodplain area during this 55-year period (**Table B-2**).

Figures B-3 and B-4 illustrate the 1985 and 1995 distributions of vegetation within the floodplain. Color infrared photography allowed for the identification of a greater number of plant categories and better observation of vegetative changes. The 1985 photo represents the distribution of vegetation at the time that the Loxahatchee was designated as Florida's first Wild and Scenic River.

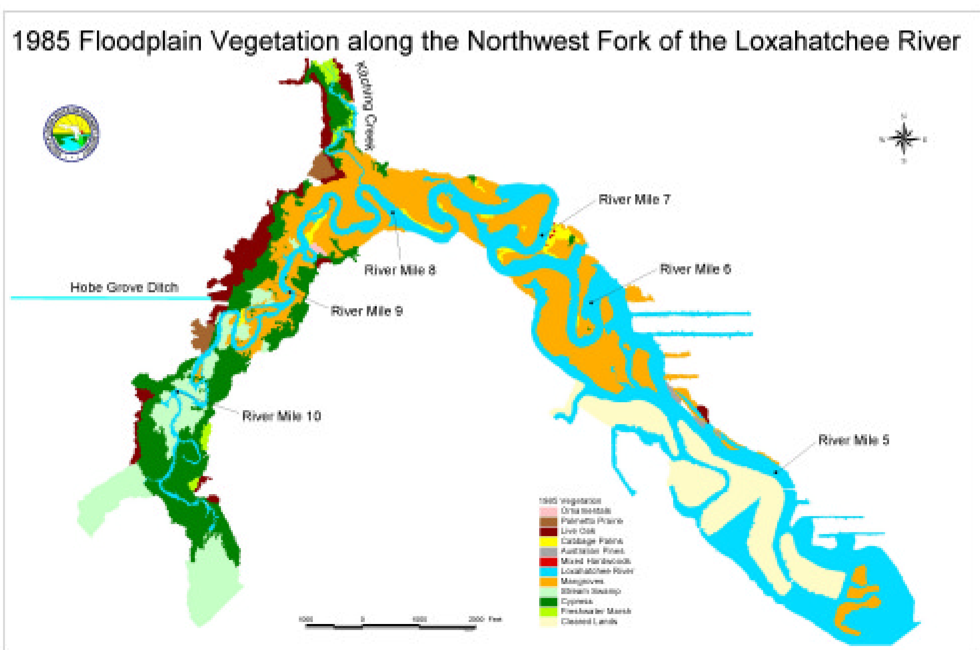

Figure B-3. 1985 Vegetation

Whereas in 1940, mangroves were dominant between river miles 4.5 and 6.5 and were present up to RM 7.8, mangroves became dominant between river miles 5.5 and 8.7 and extended upstream to RM 10.4 by 1985. The floodplain in 1985 included 163 acres of mangroves, which represented 25% of the vegetation coverage in the Northwest Fork, and 390 acres of freshwater vegetation, representing approximately 61% of the coverage (**Table B-2**). Therefore, between 1940 and 1985, there was about a 10% loss of freshwater vegetation and a 4% increase in mangroves within the floodplain area. One would suspect that mangrove encroachment should be higher; however, between 1940 and 1985, there was a loss of mangroves reflected in the category Disturbed and Cleared Land, which increased from 4% in 1940 to 13% in 1985. Also, the floodplain decreased in acreage from 720 acres to 635 acres.

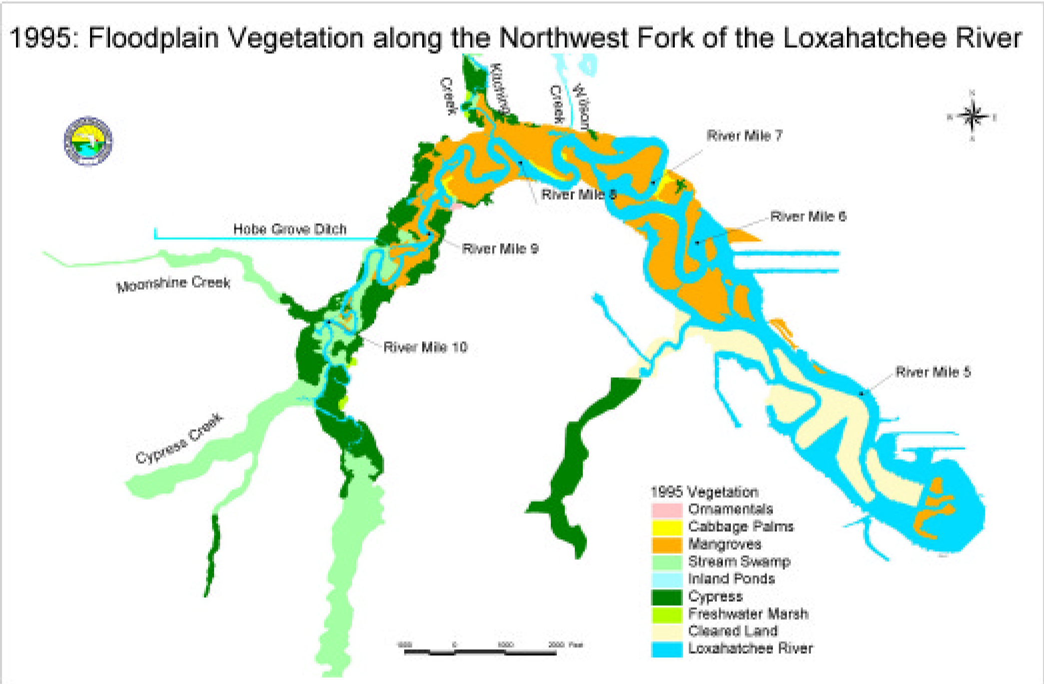

Figure B-4. 1995 Vegetation

There were no major changes in coverage between 1985 and 1995 (**Table B-2**). This relative stability of plant communities may be attributed to two factors. First, in 1987 additional culverts and operational criteria were added to G-92 to reconnect the Loxahatchee Slough with the NW Fork resulting in more water being added to the NW Fork (see section on *Hydrologic and Salinity Conditions* at the beginning of **Chapter 5**). Second, there was above normal rainfall and flow to the river during the 1990s. As a result of these changes, on average, an increase of 30 cfs subsequently delivered through G-92 may have helped to stabilize the distribution of fresh and saltwater communities.

Both the 1985 and 1995 photographs show apparent changes in the distribution of mangroves and freshwater plant community coverages in the Hobe Grove Ditch and Cypress Creek areas. In 1985 and 1995, mangroves were present within the lower portion of Kitching Creek. Near the mouth of the creek, mangroves appear as forests whereas further upstream they appear as understory vegetation with a cypress/cabbage palm canopy. By 1995, there were 152 acres of mangroves (25%) and 371 acres of freshwater vegetation (60%) (see **Table B-2)** along the Northwest Fork (east of Interstate 95 and the Turnpike). Although the total coverage of freshwater vegetation decreased by 144 acres (27%) between 1940 and 1985, only 19 additional acres were lost from this community between 1985 and 1995.

To obtain a more detailed look at changes in freshwater and saltwater communities between 1940 and 1995, District staff divided the River into six segments (Lower NW, Mid NW, Upper NW, Wilson Creek, Kitching Creek, and Island Way Creek (**Figure B-5**).

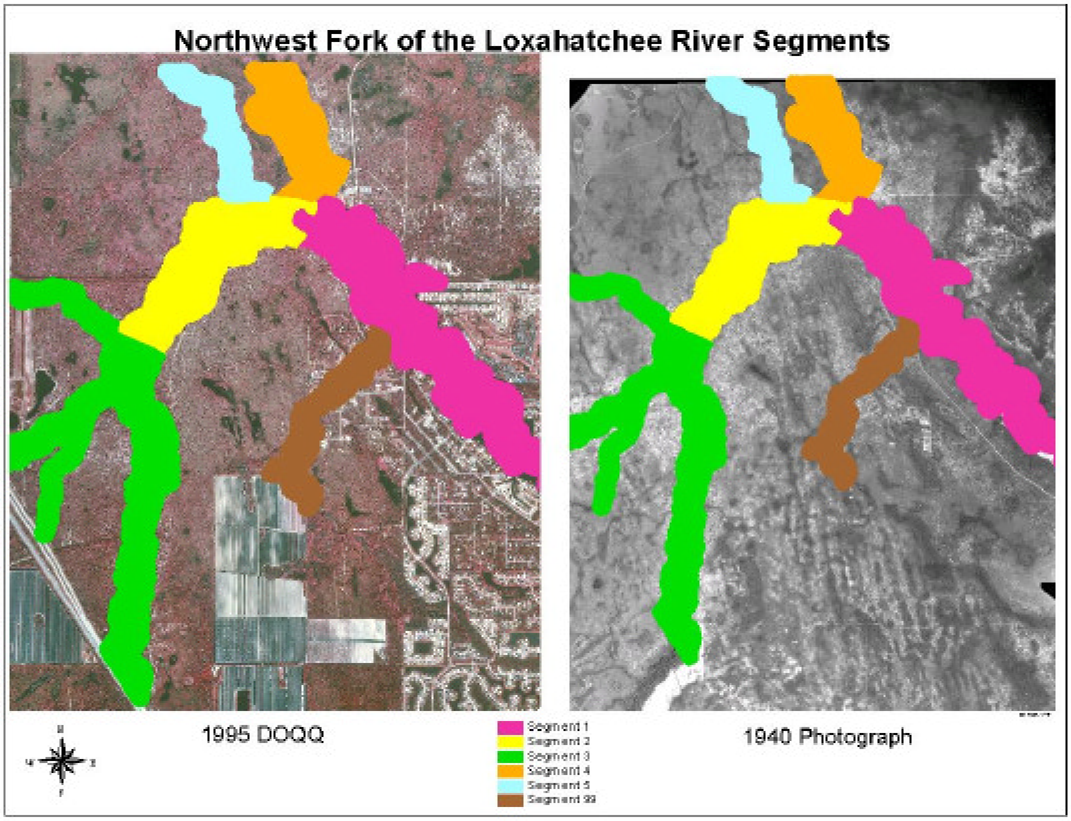

Figure B-5. Location of River Segments

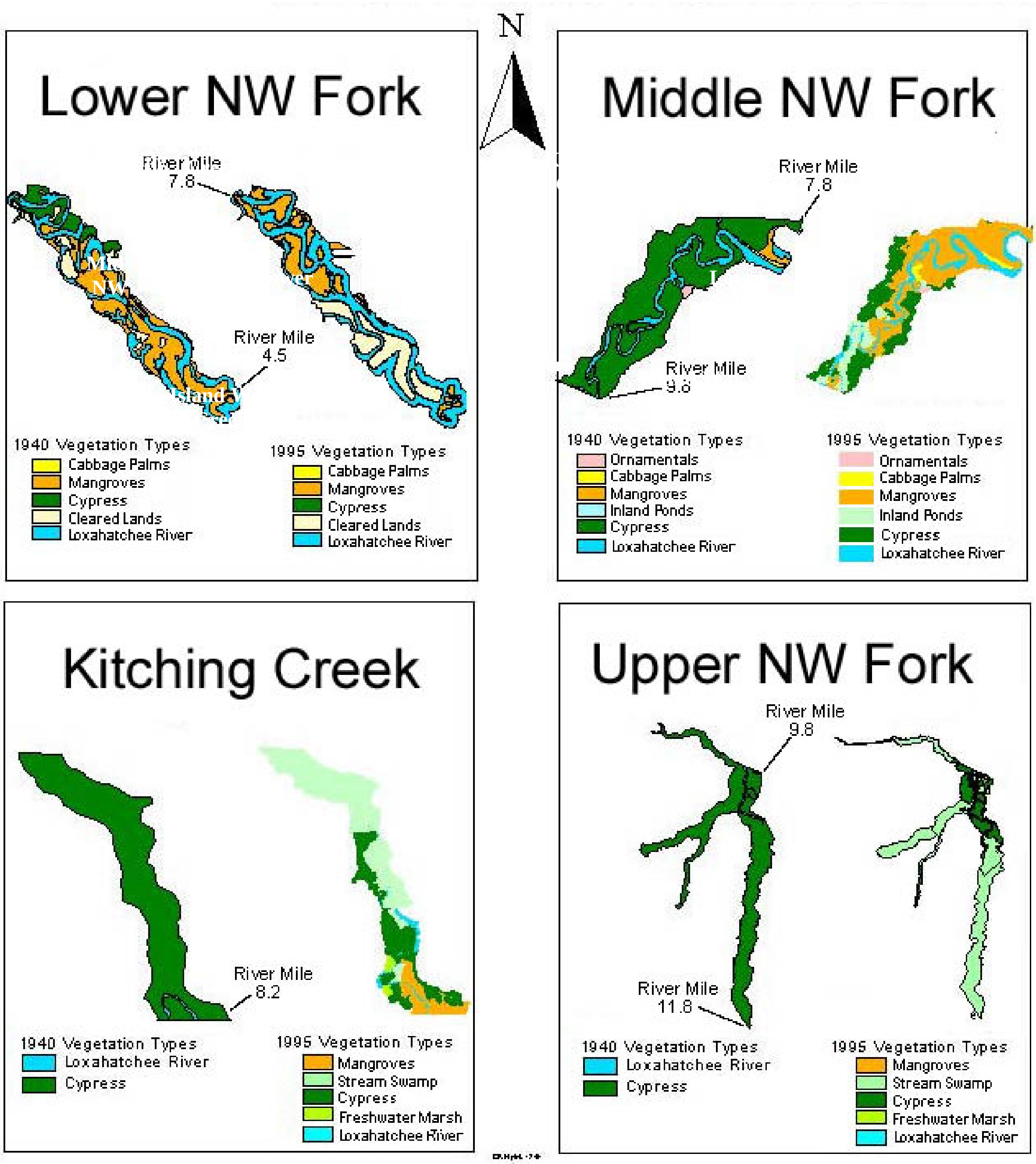

Figure B-6. Comparisons between 1940 and 1995 Coverages by River Segment

Figures B-6, B-7 and **B-8** illustrate the changes in freshwater and saltwater communities and disturbed lands between 1940 and 1995 by river segment. Most of the changes were observed within the Lower and Middle Northwest Fork segments. Between 1940 and 1995, mangroves exhibited both losses and gains (**Table B-2** and **Figures B-6, B-7** and **B-8**) so that the total coverage remained essentially unchanged. Mangroves were lost due to development of islands between river miles 4.5 and 5.5 in the lower segment of the river, including 84 acres in the vicinity of Island Way Bridge. Mangroves increased in coverage upstream, primarily between river miles 6.0 and 8.5 in the middle segment, by invasion into freshwater communities.

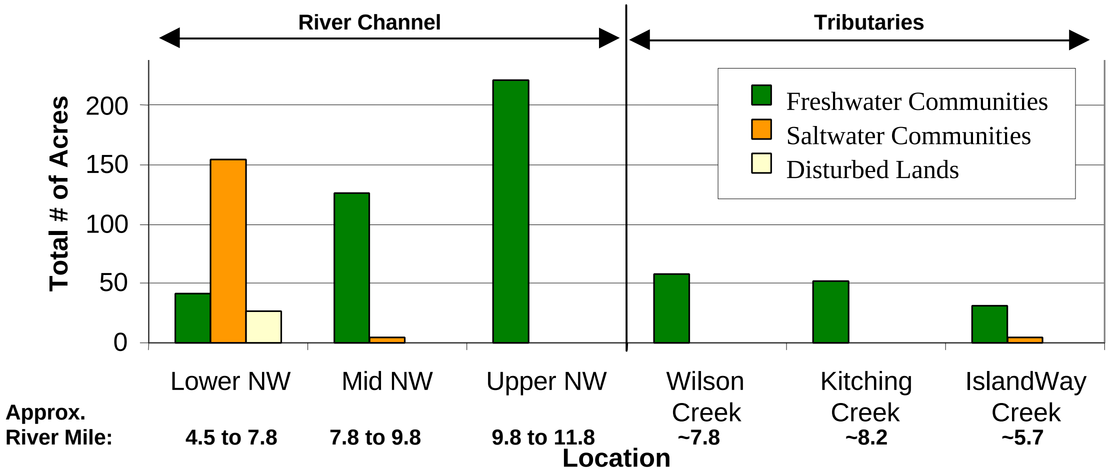

Figure B-7. 1940 Vegetation Coverage along the Loxahatchee River, by Segment

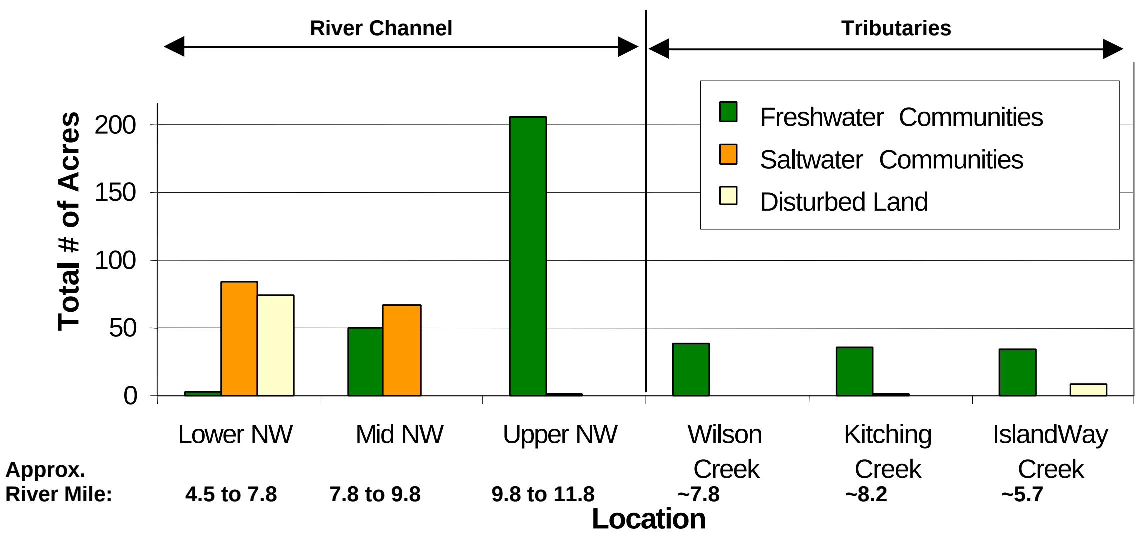

Figure B-8. 1995 Vegetation Coverage along the Loxahatchee River, by Segment.

Freshwater communities were present in all segments, but primarily in the Upper NW segment. Disturbed and/or Cleared Lands were present primarily in the Lower NW segment. Those Disturbed Lands that were not developed reverted to mangrove communities. Brackish water marsh plants were observed as understory within these communities. As a side note, family photographs taken of plant communities in 1964 and 1966 (personal communication, Richard Roberts, Jonathan Dickinson State Park) provided clear evidence that large areas in the vicinity of the power lines (approximately river mile 6.5) that were brackish water marshes in 1964-66 were taken over by mangroves by 1985.

Six Decade Analysis

In order to provide a more detailed analysis of observed vegetation changes over time, District staff analyzed black and white aerial photographs taken of the Northwest Fork and floodplain, between river miles 6.6 and 8.9, during the years 1940, 1953, 1964 and 1979. These early vegetation coverages were also compared to more recent infrared Digital Ortho Quad photographs that were taken from the watershed during 1979, 1985 and 1995. Results of the six-decade analysis of vegetative changes are summarized in **Figures B-9** and **B-10**. River miles 6.6 to 8.9 represent that area of the river where the majority of the vegetation changes have occurred during the past 55 years. These figures clearly represent the progressive encroachment of mangroves and displacement of freshwater swamp communities that occurred between river miles 6.6 and 8.9.

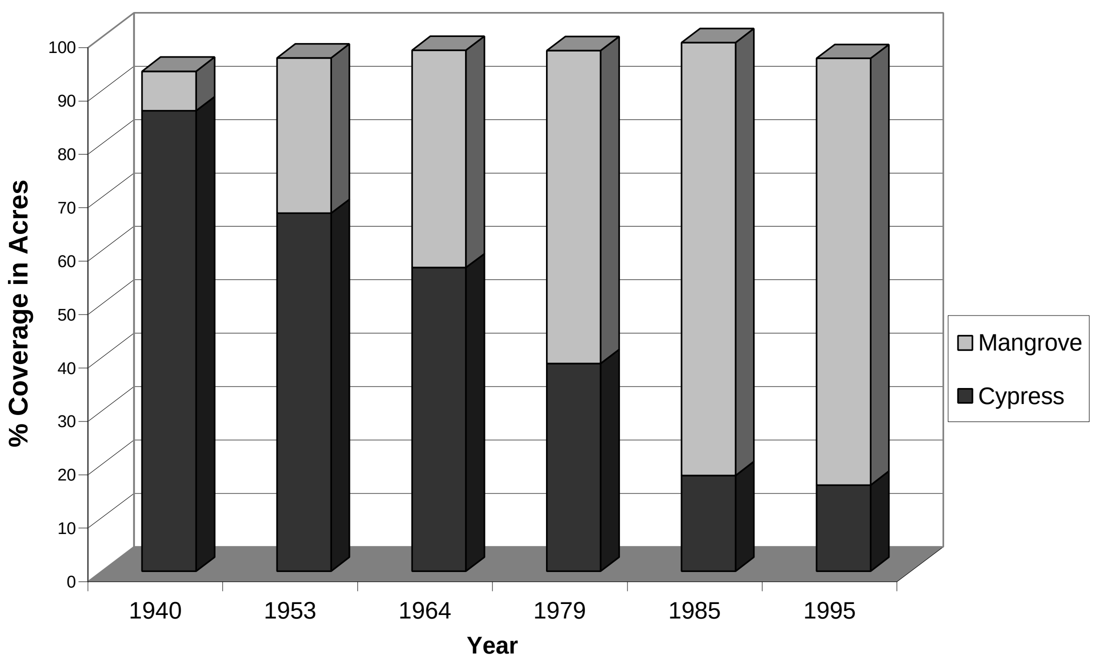

Figure B-9. Mangrove Encroachment between River Miles 6.6 and 8.9.

1953 to 1979 Vegetation Coverages

Details of the 1940, 1985 and 1995 aerial photos were discussed earlier. Aerial photos from 1953 to 1979 were obtained, but were studied in less detail due to limited time and resources. Several overall trends and changes were nevertheless identified from this brief examination (**Figure B-9**). In 1953, mangrove coverage increases substantially in comparison to the 1940 photography. Mangroves represented about 29% of the total area, but still appear to be absent upstream of river mile 7.8. The coverage of the stream swamp and cypress community has decreased although it is still the largest (67%) category of coverage in the floodplain.

By 1964, the aerial photography shows additional replacement of the freshwater communities by mangroves. Mangroves had colonized the Northwest Fork as far as river mile 8.7 and were present at the mouth of Kitching Creek.

The 1979 photograph shows the continued decline of the freshwater communities and increase in mangrove coverage. Freshwater communities represented only 38% of the coverage. Mangroves had increased to 60% and had advanced to areas above river mile 9, which are located outside (upstream) of the regions shown in **Figure B-10**.

Factors that Influenced Changes in Vegetation

Several field trips to the Loxahatchee River were made during 2000 and 2001 to gain general familiarity with the terrain and to groundtruth plant community signatures. During these trips it was noted that many of the remaining freshwater marsh areas, and Wilson and Moonshine Creeks have been heavily invaded by the exotic Old-World climbing fern, *Lygodium microphyllum*. The *Lygodium* appears to smother existing vegetation. Also, there was apparently a net loss of brackish water marsh habitat, primarily between river miles 6.5 and 7.8 associated with an invasion by mangroves during the 1990s.

The presence of mangroves along the lower NW Fork of the river shown in the 1940 photograph may be the result of several factors. Prior to 1947, the inlet opened and closed periodically. During periods when the inlet was open, saltwater may have had the opportunity to penetrate the lower portion of the river allowing mangroves to become established. Other factors that may have contributed to increased salinity levels within the estuary and lower Northwest Fork prior to 1940 include: (a) construction of the Intracoastal Waterway in 1928 that linked the St. Lucie inlet with the Lake Worth inlet, (b) USACE dredging of the inlet and lower estuary; (c) construction of the Lainhart and Masten dams; (d) construction of Bridge Road, which reduced inflow from Kitching Creek; and (e) construction of a small agricultural ditch that diverted water from the Loxahatchee Slough marsh to the SW Fork of the river.

Several additional changes had occurred in river vegetation by 1953. These changes correspond to the opening of the Jupiter Inlet in 1947, which permanently changed the lower estuary from a freshwater/brackish water system to a salinity regime more characteristic of estuarine conditions (USACE 1966). In addition, back-to-back hurricanes of the late 1940’s and their associated high winds and storm surges may have transported mangroves propagules far up river, accounting for some of the mangrove colonization shown in the 1953 photography.

Vegetation changes observed after 1953 are probably related to physical and hydrological changes that occurred in the late 1950’s. Between 1957 and 1958, the USACE constructed the C-18 Canal, channelized the Southwest Fork, and constructed the S-46 structure for flood control purposes. These flood control improvements however diverted water away from the Northwest Fork to the Southwest Fork (McPherson et al. 1982). High (spring or wind-driven) tide events, occurring during periods when river flow was reduced, could have transported mangrove propagules upstream. In addition, during the 1960’s a developer dredged and filled a

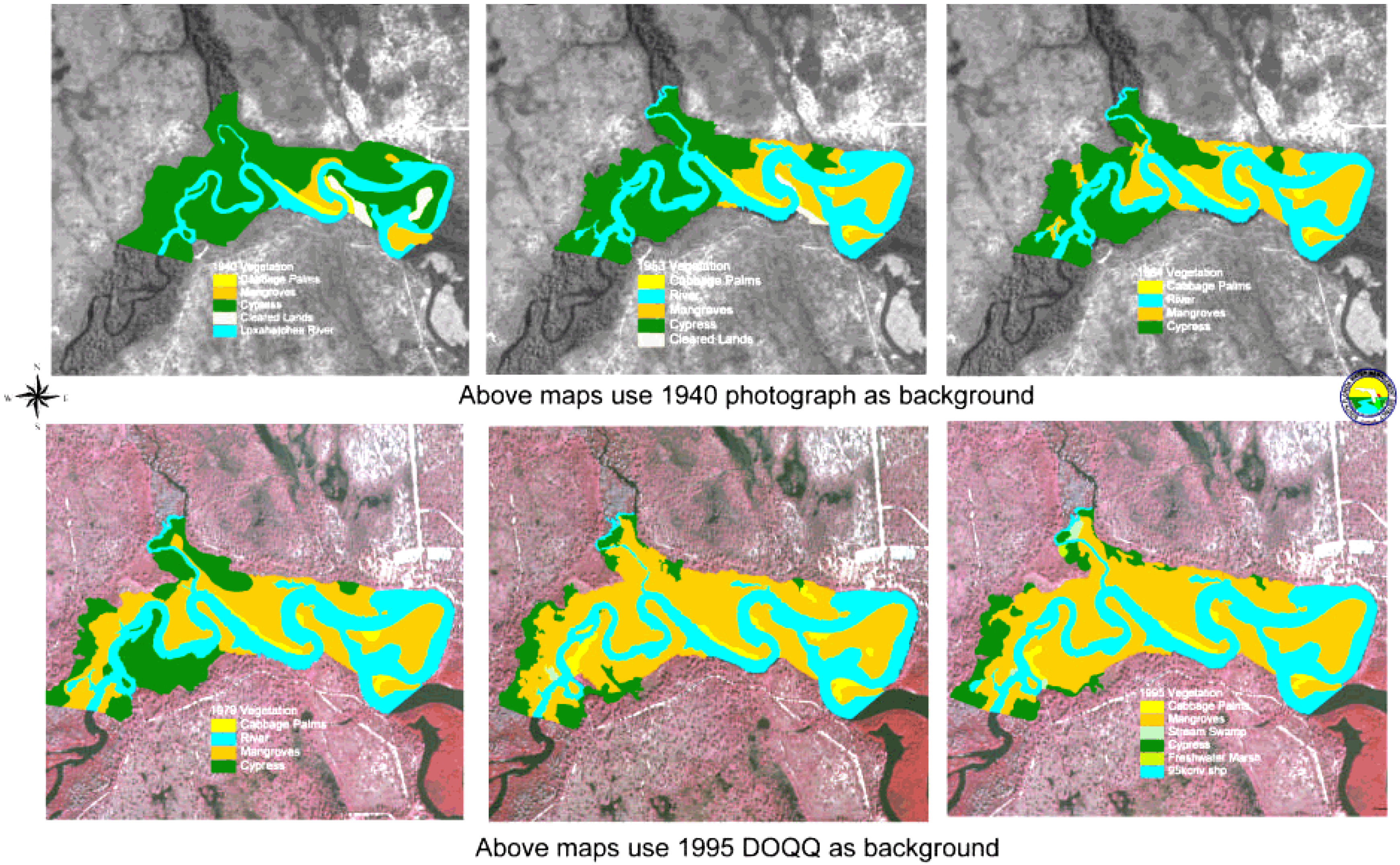

Figure B-10. Vegetation Changes Along the Loxahatchee River between River Miles 6.6 and 8.9, 1940 to 1995

number of mangrove islands within lower portion of the river and cut a channel through the sandbar (“S-bar”) that historically provided a natural saltwater barrier between the estuary and the upper reaches of the river. As a result of these projects, saltwater could now more freely penetrate the Northwest Fork of the river during low flow and high tide periods.

Observed vegetation changes that occurred by 1979 correspond with the continued operation of the C-18 canal which essentially eliminated freshwater flow from the Loxahatchee Slough to the Northwest Fork from the time the C-18 canal project became operational (early 1960’s) until the construction of the G-92 structure in 1974. In addition, dredging of the central embayment area (McPherson et al. 1982), combined with oyster bar removal projects (Chiu 1975), and replacement of the Alternate A1A bridge over the Loxahatchee River are thought to have improved tidal flushing of the estuary. These projects may have also played a role in allowing saltwater and mangrove propagules to further penetrate the lower portion of the river during dry periods. Review of long-term rainfall records also show that during the 1970’s, the region experienced a number of sequential below normal rainfall years that also contributed to the river’s saltwater intrusion problems. This timeframe also correlates to the period when small and poor quality rings were formed in cypress trees in the River floodplain (Duever and McCollum, 1982)

The apparent lack of change in the distribution of plant communities between 1985 and 1995 (**Figures B-3** and **B-4)** can be attributed to two major factors: (a) increased flows delivered to the Northwest Fork as a result of conveyance and telemetry improvements made to the G-92 structure in 1987, and (b) increased rainfall experienced within the basin over the past decade **(Figure 4).** These two factors resulted in significantly more water being discharged downstream to the Northwest Fork via G-92 and the Lainhart Dam during the 1990’s (**see Figure 19**). Other visible hydrologic or structural changes noted in the 1995 photographs included the following:

- Over 3,000 acres of citrus groves have been planted west of the NW Fork
- Hobe Grove Ditch was dug through uplands to provide flood control for citrus groves during the 1960s. Surface water flowing from this area during dry periods is now being retained to maintain the water table for these irrigation wells.
- Most of the remaining inland ponds and sloughs appear to be much smaller in size in comparison to the 1940 photographs

Impacts of Hydrological Alterations and Meterological Events on Vegetative Changes

Odum et. al. (1982) noted that one generally unrecognized side effect of lowered freshwater flow and saltwater intrusion has been the inland expansion of mangrove forest. The examples that were given included the mangrove borders of Biscayne Bay and much of the Everglades. These forests have expanded inland since the 1940s in conjunction with man's alteration of surface and groundwater flows.

The permanent opening of Jupiter Inlet, the alteration inflows of surface water, the drop in the groundwater table, and an increase in sea level have promoted the distribution of mangroves and taken their toll on the freshwater habitat of the Northwest Fork of the Loxahatchee River. The altered location of the saltwater interface has produced major changes in vegetative communities. In many areas, mangroves now dominate habitat that was formerly dominated by freshwater cypress and additional changes have occurred within remaining freshwater communities. Urban development within the headwaters and the major tributaries will continue to alter freshwater inflows and make any efforts towards preserving this historical flora more difficult.

Hurricanes have affected the watershed by producing extreme high water levels, opening and closing of inlets, changes in topographical and land contour and by producing severe physical damage to vegetation. Hurricanes have also been known to spread plant propagules over long distances with their waves and high tides. Major hurricanes and tropical storms occurred in the vicinity of the Loxahatchee in 1898, 1903, 1924, 1926,1928, 1933, 1948, 1949, 1964, and 1979. The 1903 storm created an 8-foot storm surge in Jupiter, while Hurricane David in 1979 created a 5-foot surge with winds gusting at 85 miles per hour (mph). Winds of 153 mph were recorded at the Jupiter Lighthouse during the 1949 storm, which passed through Delray Beach (Barnes, 1998).

Historical heavy frost winters were reported in 1939-40, 1957-58, 1962-63 and 1964-65 (Alexander and Crook, 1975) and in 1977, 1983, 1985 and 1989 (Florida Department of Environmental Protection, 2000). Evidence of a major meterological event was apparent from infrared aerial photographs taken during a special flight for South Florida Water Management District in April 1985. Mangroves along the Northwest Fork were defoliated and trees that were 30 feet tall or more exhibited broken branches and trunks. The average monthly air temperatures for January and February 1985 had fallen to 46º and 52º F, respectively with temperatures ranging as low as 25°F (U.S. Department of Commerce, Climatological Data: Florida). Mangroves do not tolerate temperature fluctuations exceeding 18° F or temperatures below freezing for any length of time (Odum et. al, 1982). They may defoliate after exposure to 45°F or less. This may explain why mangroves along the Northwest Fork of the Loxahatchee River are not reaching the height of mangroves in warmer climates, which can range between 60 and 80 feet.

Although mangroves have taken over a considerable amount of the downstream historical coverage of freshwater vegetation along the Northwest Fork of the Loxahatchee River, the Wild and Scenic River segments of the waterway continue to be a valuable natural resource and tourist attraction with both mangrove and cypress habitats. As in coastal areas, mangroves still provide shoreline stabilization, wildlife habitat, and aesthetic values.

Summary

Results of the comparisons of aerial photographs from 1940, 1985, 1995 and other years showed the following:

- Aerial photography of the watershed from 1940 revealed an abundance of swamps, wet prairies, inland ponds, and sloughs. Mangroves were present from river mile 4.5 to river mile 6.0 and extended upstream to river mile 7.8. Freshwater stream swamp and cypress communities were present upstream from river mile 6.5 and were dominant within the floodplain portion of the study area above river mile 8.0, comprising about 73% of the vegetative coverage of the Northwest Fork, while mangroves represented 22%.
- An apparent reduction in total acreage of the river floodplain between 1940 and 1995 can be attributed to several causes, including scouring of the riverbed, bulkheading, development, and loss of wetland vegetation to transitional and upland species due to flow diversion and lowering of water levels in the watershed. Most of the vegetative changes occurred in the lower and middle segments of the Northwest Fork and were documented by more detailed examination of the area between river miles 6.6 and 8.9
- By 1985, much of the watershed had been developed with the exception of Jonathan Dickinson State Park. Freshwater communities represented 61% of the total coverage. Mangroves represented 25% of the coverage and had become dominant along the shoreline upstream to river mile 8.7. In spite of the increased encroachment of mangroves upstream in the floodplain, mangroves increased only 4% in overall extent due to losses of these plants from urbanization. Freshwater communities decreased by 10%.
- Freshwater flows to the Northwest Fork increased during the period between 1985 and 1995, due to construction and improved operation of the G-92 Structure and increased rainfall. These changes may account for the fact that only minor differences in vegetative coverage occurred during this ten year period.
- Improved aerial photography that was used during 1985 and 1995 made it possible to distinguish differences in structure and composition of the freshwater communities. This improved resolution may account for the apparent increase in number of species and apparent loss of cypress dominance along the immediate river corridor upstream of river mile 9. Such changes could also be explained by the impact of saltwater intrusion and decreased surface and ground water inflow.
- An analysis of six decades of change based on aerial photographs and review of other research studies, indicates that most of the mangrove encroachment seemed to occur between 1953 and 1979. Also during this period, the inlet was stabilized and freshwater flow was redirected from the Northwest Fork to the Southwest Fork of the river for flood control.

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APPENDIX C -- VEGETATION SURVEYS ALONG THE NORTHWEST FORK OF THE LOXAHATCHEE RIVER

CONTENTS

INTRODUCTION

Floodplain vegetation along downstream segments of the Northwest Fork of the Loxahatchee River has changed over the past century from freshwater swamp dominated by bald cypress to salt-tolerant red mangrove swamp. Protection of upstream segments of this community requires that sufficient quantities of freshwater be provided that will protect the resource against significant harm and meet proposed minimum flow requirements. In order to derive the required minimum flow criteria, a relationship between salinity magnitude, duration and frequency and vegetation community changes (significant harm) must be established. To begin the process of understanding and documenting these relationships, field vegetation surveys were conducted along the Northwest Fork between 2000 and 2002. From these data, a relationship between measurable vegetation parameters at specific river locations, and long-term salinity conditions were established.

METHODS

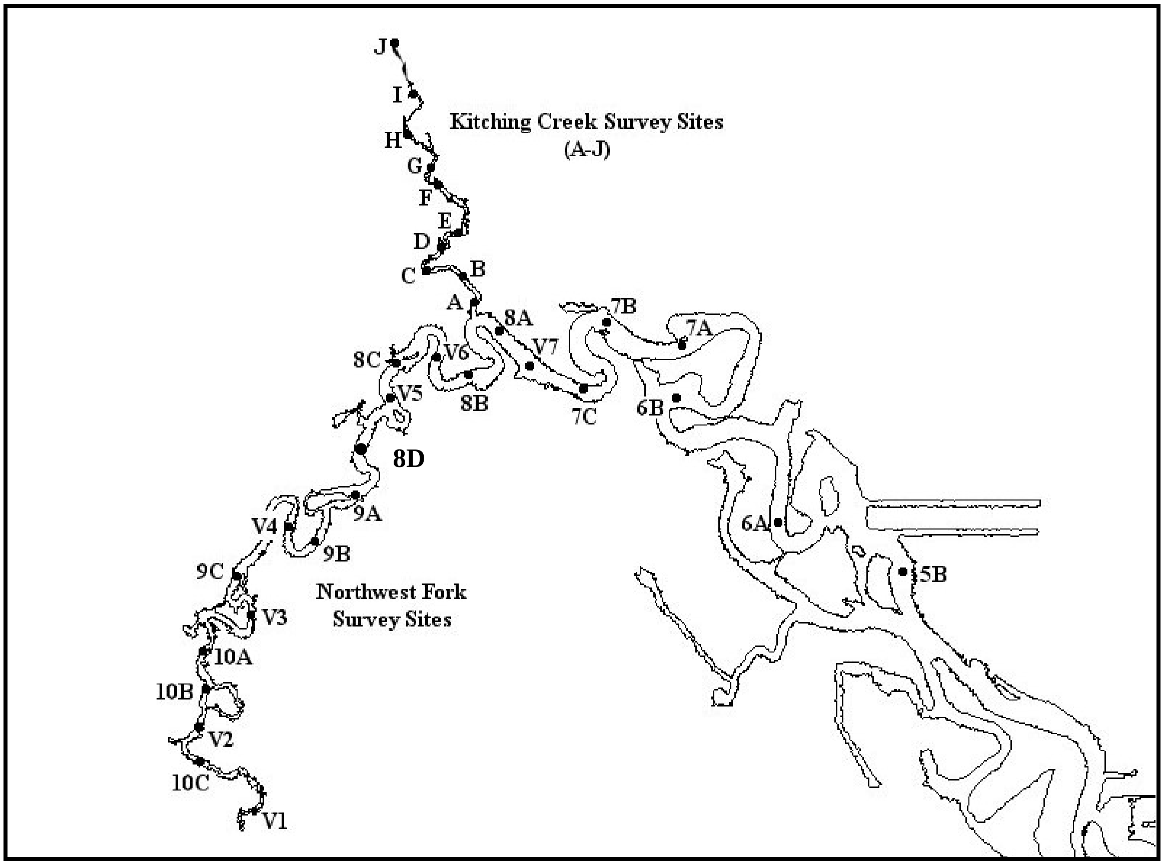
Field Vegetation Survey

Surveys of the floodplain swamp vegetation (vascular macrophytes) along the Northwest Fork (NW Fork) of the Loxahatchee River were conducted to characterize the species and community changes that occur along the salinity gradient upstream from the Jupiter Inlet and central embayment. These surveys provided both community-based (i.e., canopy structure analysis, total number of observed species, community composition) and species-based (i.e., abundance, number of individuals, height, trunk diameter, age class) information. Two methods of vegetation surveys were used; a semiquantitative method provided a more generalized view of the local community and a quantitative method gave more specific information about the site.

Semiquantitative Vegetation Survey

A semiquantitative vegetation survey method, suitable for statistical analysis, was used by SFWMD biologists to examine community-wide changes along the NW Fork of the Loxahatchee River. This method was used primarily because: 1) it could be conducted in a short period of time, allowing more sites to be surveyed in the time available; 2) was not labor intensive; 3) provided a reliable and generalized perspective of the distribution of species; 4) and was more comprehensive in scope, as it allowed the entire plant assemblage to be accounted for rather than just selected species. Sixteen sites (labeled 5B through 10C) were selected and surveyed in November 2000 and seven additional verification sites (labeled V1 through V7) were surveyed in December 2001 (**Figure C-1**).

Figure C-1. Location of Semiquantitative Vegetation Survey Sites along the Northwest Fork of the Loxahatchee River and Kitching Creek



The locations of these sites were not random, but instead were based upon the following criteria:

- Vegetation survey sites were located more than 100 ft. from a river bend or oxbow. This was done to reduce the potential effects of shifting currents, riverbank dynamics, and river flow energy on vegetation community composition.
- Vegetation survey sites were located at or near the center of the River's floodplain and at least 100 ft. away from the floodplain-upland transitional zone. This was done to reduce the possible influence of freshwater seeps on vegetation community composition.

During the survey, vegetation was examined within an area of approximately 400 ft (122 m) by 50 ft (7.5 m) along each river bank at a site. All vascular plant (macrophyte) species present were recorded and an estimated abundance index for floodplain species was recorded. An abundance index was determined from a dichotomous key that categorized a species' abundance or cover into classes. This method is based upon a modified version of the Braun-Blanquet cover-abundance scale (Braun-Blanquet 1932, 1965; also see Mueller-Dombois & Ellenberg 1974, Bonham 1989) and was conducted as follows:

Description of Species Population Density	**Abundance Index**
1a. Species not present	0
1b. Species present:	
2a. Two or less individuals or less than 1% total coverage of area; rare	1
2b. More than two individuals or more than 1% total coverage of area:	
3a. Highly abundant or dense population (>75% cover), a dominant component of the plant community	4
3b. Species not a dominant component of the plant community.	
4a. Sparse; widespread and of low density or restricted to localized populations	2
4b. Common; widespread and of moderate density but not a dominant component of the plant community (<50% cover)	3

This information was used to provide ground truthing to companion aerial photography studies of the River and to investigate general vegetation trends along the River that may be associated with different salinity conditions. It also was used to indicate potential "key" species of interest, to indicate where future quantitative survey methods should be concentrated, and to support the development of a vegetation-salinity model for the NW Fork. This semiquantitative method was also used to survey the lower Kitching Creek area in November 2000 (**Figure C-1**).

Quantitative Vegetation Survey

A quantitative vegetation survey was conducted along the NW Fork of the Loxahatchee River in January 2002. Nine sites (V7, 8B, 8D, 9A, 9B, 9C, V3, 10B, and V1) that were previously surveyed by the semiquantitative method were re-surveyed (**Figure C-1**). Due to time constraints, site V3 was only partially surveyed, so the data collected there was limited. The data from these sites were compared with the results of the semiquantitative method and to correlate results with the calculated long-term salinity (see **Appendix H**). At each sampling site, two strip quadrats (belt transects) were established, one along each opposite shoreline. Each strip quadrat was 200 ft (60 m) by 25 ft (7.5 m), covering an area of 5000 ft^2 (465 m^2). The selected area of each strip quadrat was larger than that typically used to estimate density in tree communities (see Bonham 1989).

At each of the nine sites, the parameters listed in **Table C-1** were measured and recorded for "key" species within a sampling plot. Age classes were defined as adults (mature), saplings (juvenile taller than breast height but shorter than the canopy height), seedlings (juveniles shorter than breast height), and stump sprouts (damaged adults that resprouted from a trunk). Tree height was estimated using the hypsometer method (BSA 1967, Bonham 1989); the estimator was located at a fixed distance from the tree and used a hypsometer tree scale to estimate the tree height. Mean tree canopy diameter (average of shortest and longest) and trunk circumference at breast height were measured with a tape measure. Tree canopy diameter was used to calculate tree cover area as follows:

$$\text{Cover} = [(\text{canopy diameter})/2)^2]\pi$$

Total (cumulative) tree canopy cover could, in some cases, exceed 100% of the survey area since multiple strata of leaf cover at different heights above the forest floor are possible within the forest structure. The cumulative tree canopy cover for tree height classes was used to examine vertical distribution of the canopy cover and its changes associated with salinity conditions. The tree diameter at breast height (DBH) was calculated from the measured trunk circumference as follows:

$$\text{DBH} = (\text{tree circumference at breast height})/\ \pi$$

Due to time limitations, counts of red mangrove (*Rhizophora mangle*) were not conducted at sites where it was the dominant vegetation species. An estimate of the number of adults (approx. 200) was used, based upon the average canopy cover (25 ft^2) of measured adults at other sites and plot size (5000 ft^2 total/ 25 ft^2 per adult =200 adults).

Table C-1. Measured Parameters* for Key Species.

	Adults	**Saplings**	**Seedlings**	**Stump Sprouts**
Number of Individuals	X	X	X	X
Mean Canopy Diameter (used to calculate tree cover)	X	X		X
Tree Height	X	X		X
Trunk Circumference (used to calculate DBH)	X	X		X (cumulative)

DBH= trunk diameter at breast height
*a discussion of the methods and importance of these parameters in forest studies can be found in Mueller-Dombois & Ellenberg 1974, Bonham 1989

"Key" species were selected from the results of the semiquantitative survey and a corresponding literature review to represent different salinity tolerances, have physiological characteristics that play important functional roles in the forest ecology and that make them useful as indicators of long-term salinity conditions. The criteria for selection of key species were as follows:

1. Species that are widely distributed in South Florida freshwater swamps (i.e. not found only in localized populations). This criteria was used to ensure that observed trends are most likely not due to uneven distribution of populations.
2. Species that are locally abundance and significant components of the physical forest structure. This criteria excludes minor (rare) species and to select those that were primary constituents of forest structure, which allows changes to be more reliably measured by survey sample sizes.
3. Terrestrial species that are rooted in the soil substrate (i.e. not floating or epiphytic). This excludes aquatics, which may reflect only short-term (transient) salinity conditions.
4. Species that are relatively long lived (more than 10 years, i.e. generally woody or tree species), which are more reliable indicators of long-term conditions. Herbaceous species were excluded, as they typically have shorter life spans (less than 10 years).
5. Species that occupy different ecological niches and have different functional roles in the freshwater swamp (i.e. canopy, sub-canopy, shrubby). A decline

in one or more of these functional roles can have ecological consequences, such as impacts to wildlife.

6. Species that are copious producers of differing seed types (e.g. berries, samaras, etc.) that are readily spread (e.g. air-borne, water-borne, bird-dispersed) throughout the area. This helps to ensure that an observed decline in seedling or sapling numbers is not related to species-specific dispersal characteristics.
7. Species that represent a range of saltwater tolerance and sensitivities (i.e. obligate freshwater species, saltwater tolerant species, and transitional species). This characteristic will help to document the range of salinity conditions and changes along the NW Fork.

Information gathered from the semiquantitative vegetation survey indicated that a group of ten species would fit the criteria described above. These species are listed in **Table C-2** along with their relative salinity tolerances obtained from a review of the available literature.

Table C-2. Key Species Identified along the NW of the Loxahatchee River

Species	Saltwater Tolerance
Bald cypress (*Taxodium distichum*)	Freshwater to slight salt tolerance[a]
Cabbage palm (*Sabal palmetto*)	Freshwater to slight salt tolerance[b]
Laurel Oak (*Quercus laurifolia*)	Freshwater[c]
Virginia willow (*Itea virginica*)	Freshwater[c]
Dahoon holly (*Ilex cassine*)	Freshwater[c]
Pop ash (*Fraxinus caroliniana*)	Freshwater[c]
Pond apple (*Annona glabra*)	Freshwater[c]
Red Bay (*Persea borbonia*)	Freshwater[c]
Red mangrove (*Rhizophora mangle*)	Salt tolerant[c]
Red maple (*Acer rubrum*)	Freshwater[c]

[a]see Allen 1994; Allen et al. 1994, 1997; Conner 1992; Javanshir & Ewel 1993, Pezeshki et al. 1986, 1987, 1990, 1995.

[b]Cabbage palm is generally associated with freshwater and coastal habitats, see Johnson and Barbour 1990.

[c]no salinity tolerance data could be found for these species. However, field books indicate the community that this species is typically found, such as freshwater or saltwater (see Tobe, et al. 1998).

Results from the quantitative vegetation survey were examined for trends by calculating means, standard deviations, medians, modes, as well as regression analysis correlating measured parameters (**Table C-1**) with estimated long-term salinity conditions at each site.

Vegetation Survey Results

Field data from the vegetation surveys are presented in tables at the end of this appendix. Analysis of the vegetation data revealed a strong relationship between number of species observed at each site and proximity to the Jupiter Inlet (expressed as river mile), the source of salinity within the River (**Figures C-2a and C-2b**). This relationship was consistent and comparable between both the semiquantitative and quantitative vegetation survey methods. Result from the November 2000 semiquantitative vegetation survey (**Figure C-2a**) shows that the number of plant species (vascular macrophytes) decreases dramatically from upstream (freshwater) areas to downstream (more saltwater-dominated) areas. A similar trend was observed along Kitching Creek (**Figure C-2a**) for data collected during the same period.

A second semiquantitative vegetation survey using the same method but at intermediate sites was conducted during the following year (2001) and revealed a similar trend (**Figure C-2b**), but with a higher total number of species. The differences in number of observed species could be accounted for by differences in weather patterns between the two years. The previous growing season (1998-2000) represented a drought period, whereas 2001 was a normal rainfall year that had relatively warm weather up until December. Although the total number of species differed, and perhaps would be expected to vary from year to year, the significant positive trend indicates that the number of floodplain plant species increases with distance from the inlet and hence is reduced as salinity increases.

Figure C-2a. Number of Observed Vascular Plant Species along the Northwest Fork of the Loxahatchee River and Kitching Creek (November 2000 Semiquantitative Vegetation Survey)

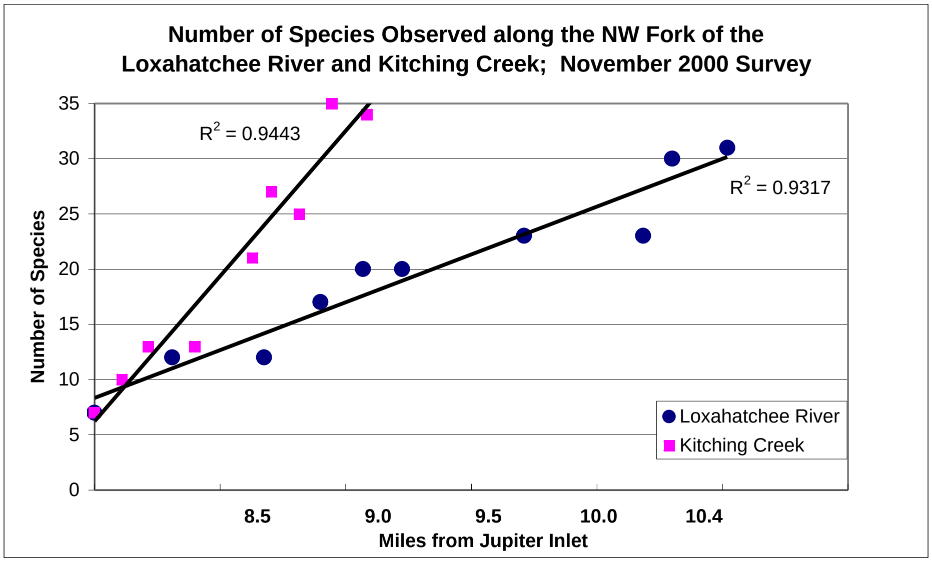
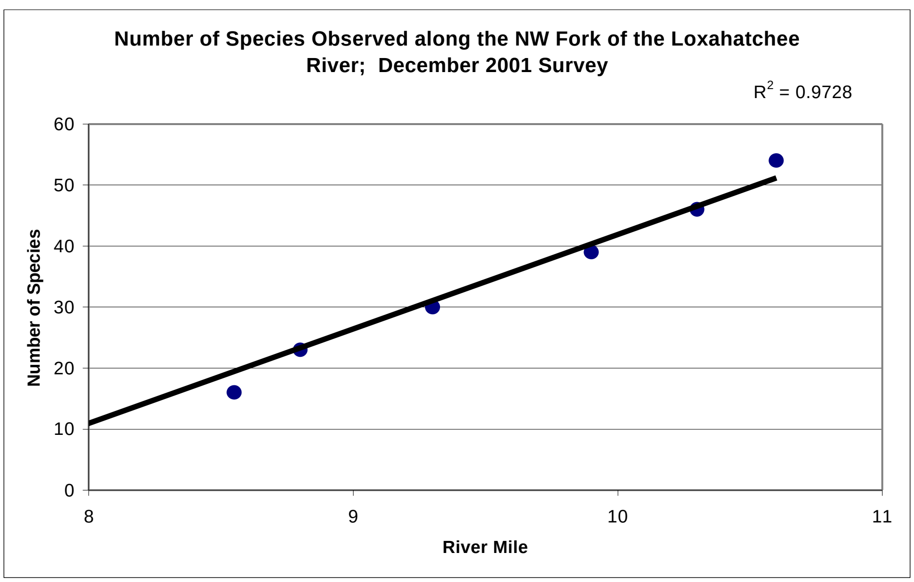


Figure C-2b. Number of Observed Vascular Plant Species along the Northwest Fork of the Loxahatchee River (December 2001 Semiquantitative Vegetation Survey)



The abundance of freshwater swamp trees, which form the basic structure of the upstream floodplain forest, declined with decreasing distance to the Jupiter Inlet (increasing salinity conditions). **Table C-3** shows the change in abundance of several important swamp canopy tree species along the NW Fork. Tree species associated with mixed freshwater swamps (bald cypress, dahoon, pop ash, and red maple) all declined in abundance at sites closer to the Inlet. Virginia willow, a woody shrub found in freshwater swamps, also exhibited the same decline. In contrast, red mangrove dominated areas more closer to the Inlet, but rapidly declined in abundance and was absent in the most upstream (freshwater) sites (**Table C-3**).

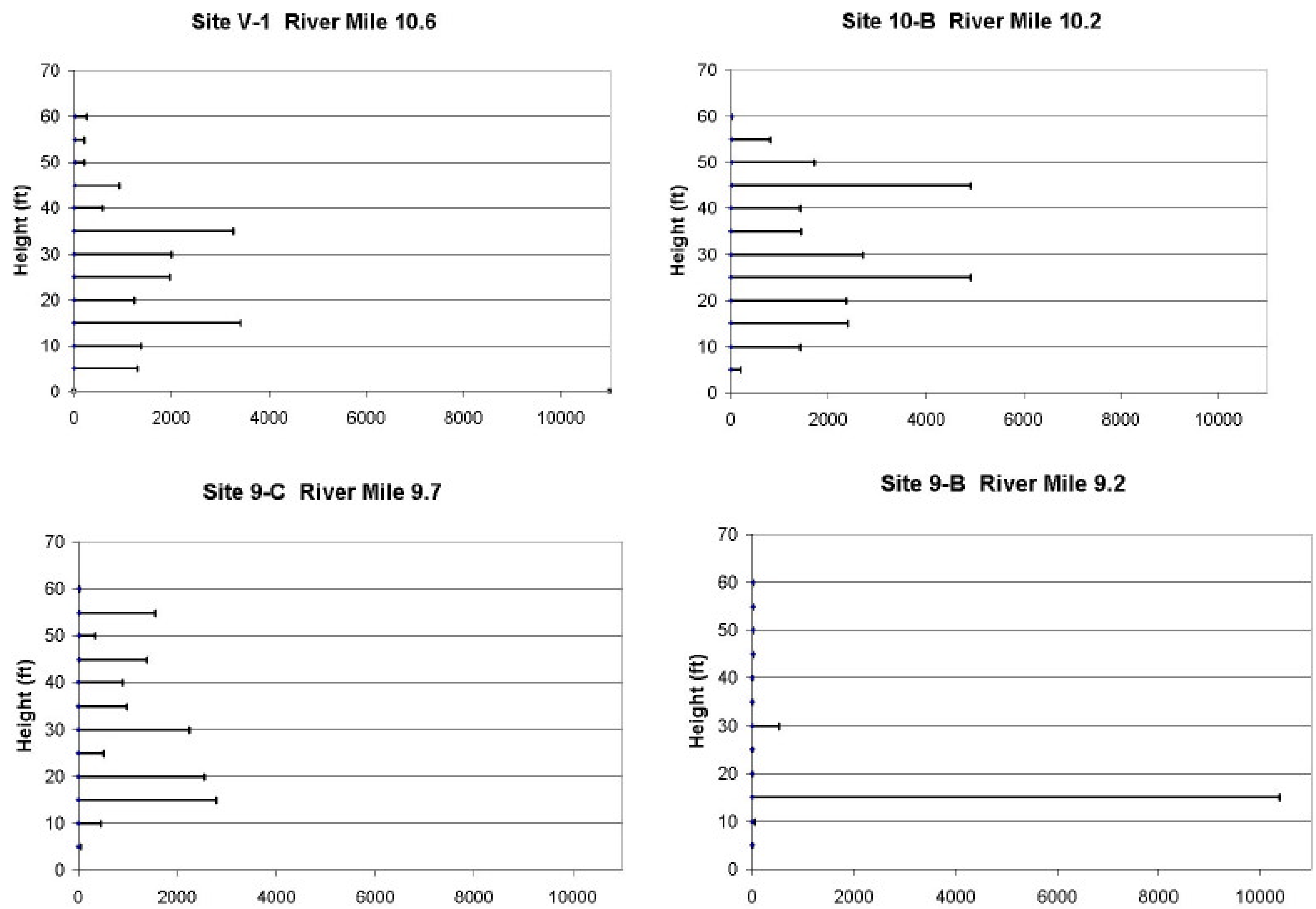
To examine canopy density and height changes between sites, the estimated canopy area and height of each tree were used. All tree heights at a site were sorted into incremental (5-ft) height classes between 0 and 60 ft. The canopy area for an individual tree, which was calculated from the estimated canopy diameter, was summed for each height class and graphed. This analysis revealed possible changes in the forest structure by river mile 9.7 and striking changes by river mile 9.2 (**Figures C-3a through C-3d**). The forest at river miles 10.6 and 10.2 appears as a complex structure with a high canopy (between 35-60 ft, dominated by bald cypress and swamp hardwoods) and a secondary canopy (between 15-30 ft, dominated by mixed hardwoods, bald cypress and pond apple) (**Figure C-3a** and **C-3b**). Some shrubby species are found below the secondary canopy, at or less than 10 ft. The forest structure at river mile 9.7 shows a decrease in the area of the high canopy strata (**Figure C-3c**). At river mile 9.2 the high canopy has been virtually eliminated and replaced by a low canopy (red mangrove dominated) approximately 15 ft above the ground surface (**Figure C-3d**). These changes in forest structure can have profound effects on microclimate, ecological function, and species composition (both flora and fauna) of the swamp forest.

Table C-3. Tree Abundance Index* at points along the NW Fork of the Loxahatchee River

	River Mile (from the Jupiter Inlet)																			
	10.6	**10.4**	**10.3**	**10.2**	**10.1**	**9.9**	**9.7**	**9.3**	**9.2**	**9.1**	**8.9**	**8.8**	**8.7**	**8.6**	**8.4**	**8.1**	**8.0**	**7.8**	**7.5**	**7.3**
Cabbage Palm	3	2	2.5	3	3	3	3	3	3	4	3.5	3.5	3.5	2	3	4	2	3.5	3	2.5
Bald Cypress	4	4	4	4	4	4	4	2	3	3	3.5	2	2	1	2	1	1	1	0	0
Red Maple	3.5	3.5	3	3	3	1	2	0	1	1	1	0	0	0	0	0	0	0	0	0
Dahoon	2	3	3.5	2	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Pond Apple	3.5	3.5	3	3	3.5	3.5	3	1	3	3	3	2	3	0	0	0	1	0	0	0
Red Bay	1.5	0	1	1.5	0	0	0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
Pop Ash	2.5	2	2	2	2	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0
Red Mangrove	0	0	1	0	0	2	2.5	3	4	4	4	4	4	4	4	4	4	4	4	4
Virginia Willow**	3.5	2	2.5	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*see section entitled "**Semiquantitative Vegetation Survey**"

**Virginia willow is a woody shrub, not a tree, but was included as it is an important component of the dominant woody vegetation in the freshwater communty.



Figures C-3a-d. Total Forest Canopy Area Within Height Classes for three sites along the Northwest Fork of the Loxahatchee River

Results from the 2002 quantitative vegetation survey showed changes in numbers of individuals and other measured parameters of bald cypress, dahoon, pop ash, pond apple, red maple, and Virginia willow associated with distance from the Jupiter Inlet.

Table H-2 shows the estimated long-term average salinity conditions at selected sites. When the average salinity event duration and time between events is expressed as a single value (**Figure H-4**), it can be used to statistically relate vegetation and salinity conditions at a site. The salinity ratio *Ds/Db* (see **Appendix H** for a discussion of the salinity ratio) is highly correlated with distance from the Jupiter Inlet (expressed as river mile, $r^2 = 0.9785$). **Table C-4** shows the relationship between between the salinity ratio *Ds/Db* and a decline in number of individuals, DBH, canopy area, and tree height.

Table C-4. Decline of Measured Freshwater Vegetation Parameters associated with ratio (*Ds/Db*) of mean duration of a salinity event (*Ds*) and mean time between salinity events (*Db*) from the modeled long-term period of record

	Abundance Index		No. of Adults Per Site[4]		Canopy Coverage (Adults)		Mean Height (Adults)		Mean DBH (Adults)		No. of Juveniles Per Site[4]	
	Dec[1]	NP[2]	Dec	NP	Dec	<5%	Dec	NP	Dec	NP	Dec	NP
Bald Cypress	0.28	5.00[5]	0.13	5.00[5]	0.13	0.38	N/A[3]	5.00[5]	N/A	5.00[5]	0.13	0.52
V. Willow	0.13	0.13	0.13	0.28	N/A	N/A	N/A	0.28	N/A	N/A	0.13	0.28
Dahoon	0.13	0.52	0.13	0.33	N/A	N/A	0.13	0.33	0.13	0.33	0.13	0.28
Pop Ash	0.28	0.52	0.28	0.52	0.13	0.28	0.28	0.52	0.13	0.52	0.28	0.28
Pond Apple	1.26	1.26	0.28	1.22	0.13	0.60	0.28	1.22	0.28	0.60	0.28	0.28
Red Maple	0.13	0.75	0.28	0.28	0.13	0.28	0.28	0.28	0.13	0.28	0.13	0.13

[1]Dec= declined; where a consistent drop in the value was first noted (moving from upstream to downstream)

[2]NP= not present, where the value first reached 0 or where there were no individuals found (moving from upstream to downstream)

[3]N/A= not able to be determined from the data

[4]Based upon combined totals from both plots surveyed at a site

[5]indicates an estimated value

Historical Vegetation along the Northwest Fork

Historically, downstream segments of the Loxahatchee River were dominated by freshwater vegetation. A review of the 1855 General Land Office Township Plats & Field Survey Notes (GLO 1855) from the Loxahatchee River area (Township 40 S, Range 42 E) indicate that mangroves were only present near the confluence of the North, Northwest, and Southwest Forks of the River near the Jupiter Inlet. Upstream areas of the riverine swamp are described as containing bald cypress, cabbage palms, wax myrtle, pop ash, and bay. A USGS Quadrangle/Topographic Map of the Jupiter Area (see 1950 USGS Topo map of the Rood Quadrangle for Florida) indicates that by the late 1940's, mangroves were present up to near the mouth of Kitching Creek. Currently (2002), red mangrove communities are found up to river mile 9.2, with scattered individuals found upstream to river mile 10 (see **Table C-3**). Interpretation of aerial photography flown over the River corredor approximately every decade since 1940 indicate a progressive invasion of red mangrove upstream of Kitching Creek along with accompanying loss of freshwater swamp vegetation (see **Appendix B**).

Reasons cited for the decline of freshwater habitat along the NW Fork include dredging of the Intracoastal Waterway (early 1900's), dredging of downstream segments of the Loxahatchee River (1930's), permanent opening of the Jupiter Inlet (1947), lowering of the local freshwater table, and diversion of freshwater from the NW Fork (1950's). All of these projects had a potential to allow further upstream encroachment of salt water during the daily tidal cycles.

Review of 1979 aerial photography (**Appendix B**) indicates that freshwater swamp vegetation was present upstream of river mile 8.4 (vegetation site 8B, see **Figure C-1** for approximate location), however since then red mangrove have become established upstream from there. Because the simulated salinity time series represented the same period of time (since 1970) as some vegetation changes in the most upstream segments of the NW Fork (particularly from river mile 9.0 through 10.0), it can be useful in determining salinity concentrations that have led to the decline in freshwater vegetation noted since 1979.

Current Freshwater Vegetation Trends along the NW Fork

The vegetation survey data collected along the NW Fork documents a gradient of change from a cypress and hardwood dominated freshwater swamp community to a red mangrove swamp. These observed changes are highly correlated to the magnitude of exposure to salinity from tidal fluxes. The results from our soil survey (see **Appendix G**), which was of limited scope, suggest that soil salinity is not a good predictor of long-term salinity conditions and was not useful in defining salinity conditions that lead to a decline in freshwater vegetation associated with salinity exposure. However, chloride concentrations may be a better and more sensitive indicator. More frequent and more extensive long-term soil salinity monitoring may provide data needed to determine spatial and temporal changes, and the extent of salinity concentrations that may affect the ecological community at a site. We have also considered other factors as possible explanations for the distribution of species found along the NW Fork and for the decline of freshwater swamp species. These include fire frequency, excessive flooding, and drought. A review of the literature relative to bald cypress (see below) and our studies of long-term changes in the basin indicate that none of these factors can account for the overall pattern of vegetation change observed the past half-century.

Fire frequency in river floodplains is generally low, primarily because the soils are saturated most of the year, which retards the spread of fire. Furthermore, dry fuel in the floodplain swamp is sparse, and rapid decomposition rates and frequent flood events tend to clear away fuel. Bald cypress forests thrive in both fire free habitats and in occasionally burned areas (see Gunderson 1984, Ewel 1990). Bald cypress have been found to recolonize after fire, if a local seed source is available (Gunderson 1984).

Excessive prolonged flooding of the floodplain along the NW Fork is unlikely, especially since water tables have been reduced and hydroperiods shortened over the past century. In spite of this, flooding may be more frequent along downstream segments where tidal action is a dominant hydrological force. Bald cypress have been found to grow naturally in flooded swamps and lakes 90-100 m from the shoreline, some in water 1-3 m or more deep and at time of floods, the depth may be greater for short intervals (Brown 1984, Lugo & Brown 1984). Conversely, bald cypress are successfully grown in moist soils as well as in much drier upland landscape situations where flooding never or rarely occurs. Drought would induce short-term restrictions on growth of bald cypress, but would not explain the pattern of loss we have observed along the River. If either of these factors (prolonged flooding or drought) were a primary influencing factor of loss of bald cypress along the NW Fork, it would be expected to cause widespread loss across the landscape, rather than only along a front that is closely associated with distance from the inlet.

Salinity Toxicity and Thresholds

Although we have shown strong and predictable relationships between long-term salinity event duration, frequency, and magnitude, and species composition of a site, we have not addressed short-term effects of salinity exposure. Furthermore, long-lived species, such as trees and other woody vegetation, can exhibit two types of stress from exposure to a toxic substance. They are *acute stress*, associated with short-duration high-concentration exposures, and *chronic stress*, associated with long-duration low-level concentration exposure (see Brown & Montz 1986; Pezeshki et al. 1986, 1987, 1990, 1995; Conner & Askew 1992; Javanshir & Ewel 1993; Allen 1994; Allen et al. 1994, 1997; Yanosky et al. 1995). Acute stress is generally visible at the time of or relatively soon after exposure to the toxin. Chronic stress may not be expressed for years after the initiation of long-term exposure. Salinity is known to be toxic to freshwater vegetation, however the concentrations and exposure duration that lead to either acute or chronic stress in a particular species are not well documented. Furthermore, different species can exhibit different tolerances to salinity, as indicated in **Tables C-2, C-3, and C-4**. In this study, we provided data that identifies long-term salinity conditions that are associated with the more recent changes in vegetation seen in the upstream portions of the NW Fork in order to begin to understand the effects of chronic low-level exposure.

The concept of a “threshold value” is often used to indicate a cutoff between a concentration of exposure above which damage (acute effect) or stress (chronic effect) will occur. In the analysis of water quality data (**Appendix H**), we have viewed salinity in terms of a salinity event defined at threshold value. It is important to remember that the simulated salinity value from the hydrodynamic model (see **Appendix E** for methods) is based upon a daily average of the water column salinity at a point along the River.

Salinity within the river channel at a site is not homogeneous, but rather is stratified so that when the "average" salinity is 1 ppt, river bottom salinity may be 2-3 ppt, while river surface salinity may be near 0. Model output will read as 1 ppt average salinity for that location, so selection of a 1 ppt threshold will encompass the range of salinity from freshwater at the surface to more saline water that can cause potential impacts to freshwater organisms (2-3 ppt) at the river bottom.

Two community-level mechanisms that contribute to the degradation of forest composition include mortality of existing adults (causing a reduction of canopy structure) and reduction or loss of recruitment of new adults to replace those lost by natural processes. Elevated salt concentrations in soils and surface water can stress or kill adult trees, reduce production of viable seeds, or kill germinating seedlings (see Pezeshki et al. 1986, 1987, 1990, 1995; Conner & Askew 1992; Allen 1994; Allen et al. 1994, 1997). When mature trees in an area are no longer capable of producing a sufficient number of viable seeds or seedling mortality is high because of high salinity conditions, recruitment of new trees to replace dead adults cannot occur. Although some mature trees may be able to survive (perhaps in a stressed state), the forest structure begins to degrade through time as adults begin to die off with no replacement by saplings. This mechanism is important to consider, especially along the upstream segments of the NW Fork where increases in salinity have most recently occurred. In these areas, the mature forest vegetation may still retain some characteristics of a "healthy" community, but if replacement of mature trees does not occur, the forest will die out over time. For this reason, examination of seedling and saplings at sites is a critical indicator of the sustainability of the freshwater floodplain community.

Maintenance of the freshwater swamp forest is ecologically important for many reasons. Cypress swamps have been found to provide habitat to a great diversity of invertebrates (see Brightman 1984, McMahan & Davis 1984). McMahan & Davis (1984) found that microarthropod diversity in cypress swamps is large when compared with that of most other ecosystems. Harris & Vickers (1984) studied vertebrate faunal communities in cypress domes and found that reptile and amphibian species dominate the cypress fauna during the summer and the winter vertebrate fauna is dominated by birds (year-round residents plus large numbers of northern migrants). They conclude that both the abundance of broad-leaved evergreen plants (e.g. dahoon, red bay) that bear fruit and the swamp's ability to support active arthropod populations throughout the winter are the probable explanations for this high abundance of birds. In addition, they note that mammals use cypress swamps for refuge sites and many wading birds use them as rookery and roosting sites. Other vertebrates that inhabit cypress swamps include salamanders, frogs, toads, turtles, anoles, glass lizards, skinks, snakes, opossum, shrew, raccoon, river otters, red wolf, bobcat, squirrels, deer, rabbits, rats and mice. Birds found in cypress swamps include kestrel, herons, ibis, yellow-billed cuckoo, owls, woodpeckers, flycatchers, blue jay, wrens, catbirds, gnatcatchers, vireos, warblers, cardinal, and sparrows (Harris & Vickers 1984).

A primary aspect of forest structure that is known to play an important role in local ecology is the canopy. Bald cypress' tendency to dominate wetland forests is largely due to their ability to form a high closed canopy, which is particularly evident during the growing season. The canopy can support a large array of air plants, bromeliads, and orchids, many of which are federally threatened or endangered species (FDEP & SFWMD 2000) and also plays a critical role in the life cycles of many birds, reptiles, and insects. In all closed forests in general and freshwater swamps in particular, the canopy regulates light reaching the forest floor below, which has important ecological consequences. A fully developed forest canopy blocks most light from reaching the forest floor (see Sklar 1983, Conner et al. 1986), which suppresses seed germination (photodormancy), reduces growth of seedlings and saplings (photomorphogenic effects and reduction in photosynthesis), and exerts very significant competitive pressure against shade-intolerant species (Salisbury & Ross 1992). The canopy also regulates the microclimate of the forest, controlling humidity, light quality, rainfall distribution and other physical parameters that can have profound influences on plant growth. A listing of species found on the forest floor of cypress swamps reveals an array of shade-tolerant herbs, ferns, shrubs, and few swamp hardwoods (see Duever et al. 1984, Ewel 1990, Mitch & Gosselink 2000, Roberts & Woodbury *in review*). Shade-intolerant species generally persist only in areas of the forest that have a gap in the canopy (e.g. from a tree fall) or along an ecotone (such as along a riverbank where the canopy edge is found).

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Field Data from the Vegetation Surveys along the NW Fork of the Loxahatchee River and Kitching Creek

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-1

(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Acer rubrum	Red maple	1.3	11	24	1				west
Acer rubrum	Red maple	1.3	23		1				west
Acer rubrum	Red maple	1.9	19			1			west
Acer rubrum	Red maple						2		west
Acer rubrum	Red maple	1.6		16	1				west
Acer rubrum	Red maple						12		west
Acer rubrum	Red maple	2.5		24	1				west
Acer rubrum	Red maple	1.3		24	1				west
Acer rubrum	Red maple						24		west
Acer rubrum	Red maple	3.8	19	24				1	west
Acer rubrum	Red maple	1.3	8	16	1				west
Acer rubrum	Red maple	1.6	8	20	1				west
Acer rubrum	Red maple	1.3	8	16	1				west
Acer rubrum	Red maple	1.3	8	16	1				west
Annona glabra	Pond apple		60	0.5				1	west
Annona glabra	Pond apple	1.0		18	1				west
Annona glabra	Pond apple	0.2	19	10				1	west
Annona glabra	Pond apple	3.8		16	1				west
Annona glabra	Pond apple	2.5	32	10	1				west
Annona glabra	Pond apple	1.9	32	20	1				west
Annona glabra	Pond apple	2.2	32	8	1				west
Annona glabra	Pond apple	2.9	32	16	1				west
Annona glabra	Pond apple	0.3	13	12	1				west
Fraxinus caroliniana	Pop ash	2.5	40			1			west
Fraxinus caroliniana	Pop ash						9		west
Fraxinus caroliniana	Pop ash	0.3	19			1			west

Quantitative Vegetation Survey of NW Fork Loxahatchee River: Site V-1 (continued)

(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Fraxinus caroliniana	Pop ash	1.6	22	12				1	west
Fraxinus caroliniana	Pop ash						2		west
Fraxinus caroliniana	Pop ash	1.3	15	20	1				west
Fraxinus caroliniana	Pop ash	1.9	13	8				1	west
Fraxinus caroliniana	Pop ash	0.3	10	6	1				west
Fraxinus caroliniana	Pop ash	0.2	6	6	1				west
Fraxinus caroliniana	Pop ash	1.3	6	16	1				west
Fraxinus caroliniana	Pop ash	1.0	13	16	1				west
Fraxinus caroliniana	Pop ash	2.2		16	1				west
Fraxinus caroliniana	Pop ash	0.6	4	12	1				west
Fraxinus caroliniana	Pop ash	1.3	20	24				1	west
Fraxinus caroliniana	Pop ash	1.0	14	16				1	west
Fraxinus caroliniana	Pop ash	1.0	7	16	1				west
Fraxinus caroliniana	Pop ash	1.9	5	20	1				west
Fraxinus caroliniana	Pop ash	1.0	5	8	1				west
Fraxinus caroliniana	Pop ash	0.6	28	8	1				west
Fraxinus caroliniana	Pop ash	0.3	26	6	1				west
Fraxinus caroliniana	Pop ash	0.6		6	1				west
Fraxinus caroliniana	Pop ash	0.2	21	6	1				west
Fraxinus caroliniana	Pop ash	0.2	32	6	1				west
Fraxinus caroliniana	Pop ash	0.3	26	8	1				west
Fraxinus caroliniana	Pop ash	0.3		6	1				west
Fraxinus caroliniana	Pop ash	0.1				1			west
Fraxinus caroliniana	Pop ash	0.1	26	6		1			west
Fraxinus caroliniana	Pop ash	0.6	35	8	1				west
Fraxinus caroliniana	Pop ash	0.2		6	1				west
Itea virginica	Virginia willow		8		1				west
Itea virginica	Virginia willow		12		1				west
Itea virginica	Virginia willow						1		west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-1 (continued)
(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow						8		west
Itea virginica	Virginia willow		24						west
Itea virginica	Virginia willow		15						west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow						2		west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow		42		1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow		36		1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow		19		1				west
Itea virginica	Virginia willow		32		1				west
Itea virginica	Virginia willow		23		1				west
Itea virginica	Virginia willow				3				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow						13		west
Itea virginica	Virginia willow		16		1				west
Itea virginica	Virginia willow		12		1				west
Itea virginica	Virginia willow		11		1				west
Itea virginica	Virginia willow		35		1				west
Itea virginica	Virginia willow		45		1				west
Itea virginica	Virginia willow		11		1				west
Itea virginica	Virginia willow		10		1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow		15		1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-1 (continued)

(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow		28		4				west
Itea virginica	Virginia willow		40		6				west
Persea borbonia	Red bay	0.1					1		west
Taxodium distichum	Bald cypress	5.1	3	24	1				west
Taxodium distichum	Bald cypress	1.3	3	22	1				west
Taxodium distichum	Bald cypress	1.3	27	16	1				west
Taxodium distichum	Bald cypress	2.5	40	20	1				west
Taxodium distichum	Bald cypress	0.3	24	8		1			west
Taxodium distichum	Bald cypress	3.8	30	32	1				west
Taxodium distichum	Bald cypress	1.6	16	16	1				west
Taxodium distichum	Bald cypress	7.6	22	36	1				west
Acer rubrum	Red maple	0.6	25	16	1				east
Acer rubrum	Red maple						6		east
Acer rubrum	Red maple	1.1		24	1				east
Acer rubrum	Red maple	0.6	60	18	1				east
Acer rubrum	Red maple	0.6	32	6				1	east
Acer rubrum	Red maple	1.6	18	20	1				east
Acer rubrum	Red maple	1.3	22	16	1				east
Acer rubrum	Red maple	1.3		24	1				east
Acer rubrum	Red maple	0.6	15	16	1				east
Acer rubrum	Red maple	1.9	35	20	1				east
Acer rubrum	Red maple	0.6	38	16	1				east
Acer rubrum	Red maple	0.3		8	1				east
Annona glabra	Pond apple	0.3	30	6	1				east
Annona glabra	Pond apple	2.2	18	10	1				east
Annona glabra	Pond apple	2.2	4	12				1	east
Annona glabra	Pond apple	1.6		20	1				east
Annona glabra	Pond apple						1		east
Annona glabra	Pond apple	3.2	55	16	1				east

Quantitative Vegetation Survey of NW Fork Loxahatchee River: Site V-1 (continued)

(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	2.5	26	12	1				east
Annona glabra	Pond apple	1.0	15	14	1				east
Annona glabra	Pond apple	1.0	30	12	1				east
Carya aquatica	Water hickory	0.6	45	28	1				east
Fraxinus caroliniana	Pop ash	0.2	28	6	1				east
Fraxinus caroliniana	Pop ash	3.8	28	16	1				east
Fraxinus caroliniana	Pop ash	0.6		6				1	east
Fraxinus caroliniana	Pop ash	0.6		4				1	east
Fraxinus caroliniana	Pop ash	0.6		4		1			east
Fraxinus caroliniana	Pop ash	0.6		8				1	east
Fraxinus caroliniana	Pop ash	0.3	38	8	1				east
Fraxinus caroliniana	Pop ash	0.3	36	4	1				east
Fraxinus caroliniana	Pop ash	1.3	15	8				1	east
Fraxinus caroliniana	Pop ash	0.2		6		1			east
Fraxinus caroliniana	Pop ash	1.3	12	24	1				east
Fraxinus caroliniana	Pop ash	0.5	27	6	1				east
Fraxinus caroliniana	Pop ash						2		east
Ilex cassine	Dahoon	0.6	50	16	1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow		40		1				east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow		18		1				east
Itea virginica	Virginia willow		18		1				east
Itea virginica	Virginia willow		18		1				east
Itea virginica	Virginia willow		18		1				east
Itea virginica	Virginia willow				7				east
Itea virginica	Virginia willow						6		east
Itea virginica	Virginia willow		12		4				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-1 (continued)
(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow						3		east
Itea virginica	Virginia willow		23		4				east
Itea virginica	Virginia willow		23		6				east
Itea virginica	Virginia willow		17		5				east
Itea virginica	Virginia willow		25		5				east
Itea virginica	Virginia willow				7				east
Itea virginica	Virginia willow				6				east
Itea virginica	Virginia willow		12		1				east
Itea virginica	Virginia willow				6				east
Itea virginica	Virginia willow						4		east
Itea virginica	Virginia willow		25		3				east
Itea virginica	Virginia willow						8		east
Itea virginica	Virginia willow				3				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow		32		4				east
Itea virginica	Virginia willow		25		6				east
Itea virginica	Virginia willow		10		3				east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow						6		east
Itea virginica	Virginia willow		40		5				east
Itea virginica	Virginia willow						6		east
Itea virginica	Virginia willow		22		6				east
Persea borbonia	Red bay	0.2		8				1	east
Persea borbonia	Red bay	0.2		4				1	east
Persea borbonia	Red bay	0.2	36	4	1				east
Persea borbonia	Red bay	0.1				1			east
Sabal palmetto	Cabbage palm		55		1				east
Sabal palmetto	Cabbage palm				1				east
Sabal palmetto	Cabbage palm		20		1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-1 (continued)

(river mile 10.6, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		18		1				east
Sabal palmetto	Cabbage palm		25		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		18		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		7		1				east
Sabal palmetto	Cabbage palm		55		1				east
Sabal palmetto	Cabbage palm				1				east
Sabal palmetto	Cabbage palm		40		1				east
Sabal palmetto	Cabbage palm		38		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm				1				east
Sabal palmetto	Cabbage palm				1				east
Sabal palmetto	Cabbage palm				1				east
Sabal palmetto	Cabbage palm		50		1				east
Sabal palmetto	Cabbage palm		28		1				east
Taxodium distichum	Bald cypress	4.8		24	1				east
Taxodium distichum	Bald cypress	2.5	12	24	1				east
Taxodium distichum	Bald cypress	1.9	45	20	1				east
Taxodium distichum	Bald cypress	3.2		32	1				east
Taxodium distichum	Bald cypress	1.3		16	1				east
Taxodium distichum	Bald cypress	3.8	30	20	1				east
Taxodium distichum	Bald cypress	1.3	12	8	1				east
Taxodium distichum	Bald cypress	3.8		32	1				east
Taxodium distichum	Bald cypress	7.6	32	40	1				east
Taxodium distichum	Bald cypress	2.2	17	10	1				east
Taxodium distichum	Bald cypress	4.5	33	28	1				east
Taxodium distichum	Bald cypress	3.2		20	1				east
Taxodium distichum	Bald cypress	3.8	35	20	1				east
Taxodium distichum	Bald cypress	3.2	15	36	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Acer rubrum	Red maple	1.0	35	16	1				west
Acer rubrum	Red maple						1		west
Acer rubrum	Red maple	0.2	20	6		1			west
Acer rubrum	Red maple						3		west
Acer rubrum	Red maple	0.6	35	14	1				west
Acer rubrum	Red maple						7		west
Acer rubrum	Red maple						8		west
Acer rubrum	Red maple	0.3	18	6		1			west
Acer rubrum	Red maple	0.2	8	4		1			west
Acer rubrum	Red maple						17		west
Acer rubrum	Red maple	1.3	33	20	1				west
Acer rubrum	Red maple	0.2	8	2		1			west
Acer rubrum	Red maple	0.8	28	8	1				west
Annona glabra	Pond apple	0.2	13	6	1				west
Annona glabra	Pond apple	0.1	12	3	1				west
Annona glabra	Pond apple	1.3	14	6	1				west
Annona glabra	Pond apple	0.6	21	8	1				west
Annona glabra	Pond apple	1.0	25	8	1				west
Annona glabra	Pond apple	0.1	23						west
Annona glabra	Pond apple		8						west
Annona glabra	Pond apple	1.0		10	1				west
Annona glabra	Pond apple	0.6	23	16	1				west
Annona glabra	Pond apple	0.3	10	8	1				west
Annona glabra	Pond apple	0.3	8	4	1				west
Annona glabra	Pond apple						2		west
Annona glabra	Pond apple						1		west
Annona glabra	Pond apple						1		west
Annona glabra	Pond apple						1		west
Annona glabra	Pond apple	1.0	20	10	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	0.8	14	6	1				west
Annona glabra	Pond apple	1.3	24	12	1				west
Annona glabra	Pond apple	1.3	25	16	1				west
Annona glabra	Pond apple	1.3	25	14	1				west
Annona glabra	Pond apple						1		west
Annona glabra	Pond apple	1.3	24	10	1				west
Annona glabra	Pond apple	1.3	33	12	1				west
Annona glabra	Pond apple	0.3	30	14	1				west
Annona glabra	Pond apple	1.0	25	8	1				west
Annona glabra	Pond apple	1.0	25	8	1				west
Annona glabra	Pond apple	0.6	25	10	1				west
Annona glabra	Pond apple	0.3	20	6	1				west
Annona glabra	Pond apple	0.6	15	16	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	0.5	11	8	1				west
Annona glabra	Pond apple	1.0	15	12	1				west
Annona glabra	Pond apple	1.3	15	20	1				west
Annona glabra	Pond apple	0.8	23					1	west
Fraxinus caroliniana	Pop ash	1.0	30	10	1				west
Fraxinus caroliniana	Pop ash						1		west
Fraxinus caroliniana	Pop ash	0.6	23	10	1				west
Fraxinus caroliniana	Pop ash	0.5	23	6	1				west
Fraxinus caroliniana	Pop ash	1.0	28	12	1				west
Fraxinus caroliniana	Pop ash	0.1	20	6	1				west
Fraxinus caroliniana	Pop ash	0.1	20	6	1				west
Fraxinus caroliniana	Pop ash	0.3	14	8	1				west
Fraxinus caroliniana	Pop ash	0.3	28	6	1				west
Fraxinus caroliniana	Pop ash	0.6	18	10	1				west
Fraxinus caroliniana	Pop ash	0.2	7	4		1			west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Fraxinus caroliniana	Pop ash	0.2	10	2		1			west
Fraxinus caroliniana	Pop ash	0.5	28	14	1				west
Fraxinus caroliniana	Pop ash	1.0	24	12	1				west
Fraxinus caroliniana	Pop ash	0.5	13	4	1				west
Fraxinus caroliniana	Pop ash	0.2	10	4	1				west
Ilex cassine	Dahoon		10	4		1			west
Ilex cassine	Dahoon	0.2	32	4	1				west
Ilex cassine	Dahoon	0.2	32	6	1				west
Ilex cassine	Dahoon	0.2	33	4	1				west
Ilex cassine	Dahoon	0.6	21	8				1	west
Ilex cassine	Dahoon	0.2	11	4		1			west
Ilex cassine	Dahoon	0.3	12	6	1				west
Ilex cassine	Dahoon	0.2	6	6		1			west
Ilex cassine	Dahoon	0.3	22	6		1			west
Ilex cassine	Dahoon	0.3	25	4	1				west
Ilex cassine	Dahoon	0.3	18	4	1				west
Ilex cassine	Dahoon	0.1	5.5	2		1			west
Ilex cassine	Dahoon	0.2	18	6	1				west
Ilex cassine	Dahoon	0.1	9	2		1			west
Ilex cassine	Dahoon	0.3	13	8	1				west
Ilex cassine	Dahoon	0.5	18	6					west
Ilex cassine	Dahoon	0.6	13	8	1				west
Ilex cassine	Dahoon	0.1	8	4		1			west
Ilex cassine	Dahoon	0.3	20	12	1				west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				2				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)
(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow				2				west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow						2		west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow				3				west
Persea borbonia	Red bay	0.2	17	4		1			west
Persea borbonia	Red bay	0.3	28	8	1				west
Persea borbonia	Red bay						1		west
Persea borbonia	Red bay						2		west
Persea borbonia	Red bay						5		west
Persea borbonia	Red bay	0.1	12	4		1			west
Persea borbonia	Red bay	0.3	28	8	1				west
Persea borbonia	Red bay	0.2	26	6		1			west
Persea borbonia	Red bay	0.3	16	4	1				west
Persea borbonia	Red bay						1		west
Persea borbonia	Red bay						2		west
Quercus laurifolia	Laurel oak						1		west
Sabal palmetto	Cabbage palm		28		1				west
Sabal palmetto	Cabbage palm		35		1				west
Sabal palmetto	Cabbage palm		28		1				west
Sabal palmetto	Cabbage palm		50		1				west
Sabal palmetto	Cabbage palm		45		1				west
Sabal palmetto	Cabbage palm		32		1				west
Sabal palmetto	Cabbage palm		45		1				west
Sabal palmetto	Cabbage palm		45		1				west
Sabal palmetto	Cabbage palm		17		1				west
Sabal palmetto	Cabbage palm		17		1				west
Sabal palmetto	Cabbage palm		45		1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)
(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		45		1				west
Sabal palmetto	Cabbage palm		45		1				west
Sabal palmetto	Cabbage palm		32		1				west
Sabal palmetto	Cabbage palm		35		1				west
Taxodium distichum	Bald cypress	1.0	38	16	1				west
Taxodium distichum	Bald cypress	1.0	45	24	1				west
Taxodium distichum	Bald cypress	3.2	55	32	1				west
Taxodium distichum	Bald cypress	0.2	10	12		1			west
Taxodium distichum	Bald cypress	0.2	18	14		1			west
Taxodium distichum	Bald cypress						6		west
Taxodium distichum	Bald cypress	2.5	6	30	1				west
Taxodium distichum	Bald cypress	2.5	45	32	1				west
Taxodium distichum	Bald cypress						1		west
Taxodium distichum	Bald cypress	1.3	50	24	1				west
Taxodium distichum	Bald cypress	0.1	7	6		1			west
Taxodium distichum	Bald cypress	0.3	22	8	1				west
Taxodium distichum	Bald cypress	1.3	35	18	1				west
Taxodium distichum	Bald cypress	4.5	45	56	1				west
Acer rubrum	Red maple						2		east
Acer rubrum	Red maple	1.0	20	16	1				east
Acer rubrum	Red maple	0.3	33	10	1				east
Acer rubrum	Red maple	0.1	6	2		1			east
Acer rubrum	Red maple	1.0	18	22	1				east
Acer rubrum	Red maple	2.9	30	12	1				east
Acer rubrum	Red maple	0.3	23	6	1				east
Acer rubrum	Red maple	0.3	30	10	1				east
Acer rubrum	Red maple		10	10	1				east
Annona glabra	Pond apple	0.5	14	12	1				east
Annona glabra	Pond apple	1.0	22	10	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)
(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	1.0	21	10	1				east
Annona glabra	Pond apple	1.0	22	12	1				east
Annona glabra	Pond apple	0.3	22	14	1				east
Annona glabra	Pond apple						1		east
Annona glabra	Pond apple						3		east
Annona glabra	Pond apple	1.0	20	8	1				east
Annona glabra	Pond apple	0.5	23	8	1				east
Annona glabra	Pond apple	1.0	28	12	1				east
Annona glabra	Pond apple	0.3	22	6	1				east
Annona glabra	Pond apple	0.3	18	4	1				east
Annona glabra	Pond apple	1.0	15	12	1				east
Annona glabra	Pond apple	3.2	22	20	1				east
Annona glabra	Pond apple	1.0	20	18	1				east
Annona glabra	Pond apple	2.9	25	18	1				east
Annona glabra	Pond apple	3.2	24	14	1				east
Annona glabra	Pond apple	3.2	24	18	1				east
Annona glabra	Pond apple	2.9	38	18	1				east
Annona glabra	Pond apple	2.5	25	10	1				east
Annona glabra	Pond apple	0.5	13	12	1				east
Annona glabra	Pond apple	0.6	13	4	1				east
Annona glabra	Pond apple	1.0	24	12	1				east
Annona glabra	Pond apple	1.9	5	16	1				east
Annona glabra	Pond apple	0.6	14	6	1				east
Annona glabra	Pond apple	0.5	10	12	1				east
Fraxinus caroliniana	Pop ash	1.0	22	14	1				east
Fraxinus caroliniana	Pop ash	1.0	22	14	1				east
Fraxinus caroliniana	Pop ash	0.3	15	6		1			east
Fraxinus caroliniana	Pop ash	1.0	24	16	1				east
Fraxinus caroliniana	Pop ash	1.6	21	16	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Fraxinus caroliniana	Pop ash	0.6	25	14	1				east
Fraxinus caroliniana	Pop ash	0.6	20	6	1				east
Fraxinus caroliniana	Pop ash	0.1	7			1			east
Fraxinus caroliniana	Pop ash	1.0	13	8				1	east
Fraxinus caroliniana	Pop ash	0.8	13	8	1				east
Fraxinus caroliniana	Pop ash	0.8	15	12	1				east
Fraxinus caroliniana	Pop ash	0.1	10	4				1	east
Fraxinus caroliniana	Pop ash	0.8	18	6	1				east
Fraxinus caroliniana	Pop ash	0.1	18	4				1	east
Fraxinus caroliniana	Pop ash	0.6	15	6	1				east
Fraxinus caroliniana	Pop ash	0.6	16	8	1				east
Fraxinus caroliniana	Pop ash						1		east
Fraxinus caroliniana	Pop ash	0.2	22	6	1				east
Fraxinus caroliniana	Pop ash	0.2	15	10	1				east
Fraxinus caroliniana	Pop ash	0.2	22	4	1				east
Fraxinus caroliniana	Pop ash	0.3	25	10	1				east
Fraxinus caroliniana	Pop ash	0.6	30	8	1				east
Fraxinus caroliniana	Pop ash	0.3	18	6	1				east
Fraxinus caroliniana	Pop ash	0.2	10	6	1				east
Fraxinus caroliniana	Pop ash	0.2	18	8		1			east
Fraxinus caroliniana	Pop ash	0.3	24	6	1				east
Fraxinus caroliniana	Pop ash						1		east
Fraxinus caroliniana	Red bay	0.3	15	6	1				east
Ilex cassine	Dahoon	0.3	13	6	1				east
Ilex cassine	Dahoon	0.1	15	6	1				east
Itea virginica	Virginia willow						2		east
Itea virginica	Virginia willow						2		east
Itea virginica	Virginia willow				2				east
Itea virginica	Virginia willow						1		east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				3				east
Itea virginica	Virginia willow				3				east
Itea virginica	Virginia willow				3				east
Itea virginica	Virginia willow						2		east
Itea virginica	Virginia willow				2				east
Itea virginica	Virginia willow						3		east
Itea virginica	Virginia willow				2				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow						2		east
Itea virginica	Virginia willow				2				east
Itea virginica	Virginia willow				4				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				3				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow						2		east
Itea virginica	Virginia willow				3				east
Itea virginica	Virginia willow				1				east
Rhizophora mangle	Red mangrove		12	14	1				east
Sabal palmetto	Cabbage palm		30		1				east
Sabal palmetto	Cabbage palm		10		1				east
Sabal palmetto	Cabbage palm		25		1				east
Sabal palmetto	Cabbage palm		45						east
Sabal palmetto	Cabbage palm		30		1				east
Sabal palmetto	Cabbage palm		25		1				east
Sabal palmetto	Cabbage palm		15		1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		20		1				east
Sabal palmetto	Cabbage palm		21		1				east
Sabal palmetto	Cabbage palm		20		2				east
Sabal palmetto	Cabbage palm		42		1				east
Sabal palmetto	Cabbage palm		35		1				east
Sabal palmetto	Cabbage palm		18		1				east
Sabal palmetto	Cabbage palm		19		1				east
Sabal palmetto	Cabbage palm		6			1			east
Taxodium distichum	Bald cypress	1.6	38	32	1				east
Taxodium distichum	Bald cypress	0.6	21	18	1				east
Taxodium distichum	Bald cypress	1.9	45	22	1				east
Taxodium distichum	Bald cypress	1.3	30	22	1				east
Taxodium distichum	Bald cypress	1.0	28	20	1				east
Taxodium distichum	Bald cypress	1.3	45	32	1				east
Taxodium distichum	Bald cypress	0.1	13	8		1			east
Taxodium distichum	Bald cypress	0.2	13	8		1			east
Taxodium distichum	Bald cypress	0.2	14	12		1			east
Taxodium distichum	Bald cypress	0.1	11	4		1			east
Taxodium distichum	Bald cypress	0.2	14	10		1			east
Taxodium distichum	Bald cypress	0.1	7	6		1			east
Taxodium distichum	Bald cypress	0.3	18	12	1				east
Taxodium distichum	Bald cypress	0.4	21	10	1				east
Taxodium distichum	Bald cypress	0.5	30	16	1				east
Taxodium distichum	Bald cypress	0.5	28	16	1				east
Taxodium distichum	Bald cypress	0.2	18	8		1			east
Taxodium distichum	Bald cypress	0.1	12	4		1			east
Taxodium distichum	Bald cypress	0.3	20	16	1				east
Taxodium distichum	Bald cypress	0.6	29	20	1				east
Taxodium distichum	Bald cypress	0.6	40	14	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 10-B (continued)

(lat –80.164987106/lon 26.978938944; river mile 10.2, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Taxodium distichum	Bald cypress	2.9	50	40	1				east
Taxodium distichum	Bald cypress	0.5	18	12	1				east
Taxodium distichum	Bald cypress	0.2	15	6		1			east
Taxodium distichum	Bald cypress	0.6	22	12	1				east
Taxodium distichum	Bald cypress	0.5	20	10	1				east
Taxodium distichum	Bald cypress	0.3	23	12	1				east
Taxodium distichum	Bald cypress	0.2	20	6		1			east
Taxodium distichum	Bald cypress	0.5	21	10	1				east
Taxodium distichum	Bald cypress	0.1	10	6		1			east
Taxodium distichum	Bald cypress	0.6	26	14	1				east
Taxodium distichum	Bald cypress	0.2	22	8		1			east
Taxodium distichum	Bald cypress	0.1	9	6	1				east
Taxodium distichum	Bald cypress	0.1	12	6		1			east
Taxodium distichum	Bald cypress	0.2	14	6		1			east
Taxodium distichum	Bald cypress	0.1	8	4		1			east
Taxodium distichum	Bald cypress	0.2	22	8	1				east
Taxodium distichum	Bald cypress	0.1	9	4		1			east
Taxodium distichum	Bald cypress	0.1	7	4		1			east
Taxodium distichum	Bald cypress	0.5	30	10	1				east
Taxodium distichum	Bald cypress	0.2	18	6		1			east
Taxodium distichum	Bald cypress	0.2	15	4		1			east
Taxodium distichum	Bald cypress	0.5	25	10	1				east
Taxodium distichum	Bald cypress	0.2	13	8		1			east
Taxodium distichum	Bald cypress	0.1	8	8		1			east
Taxodium distichum	Bald cypress	1.9	35	18	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-3

(river mile 9.9, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	1.9	15	16	1				west
Annona glabra	Pond apple	1.3	15	14	1				west
Annona glabra	Pond apple	1.0	15	12	1				west
Annona glabra	Pond apple	1.0	15	12	1				west
Annona glabra	Pond apple	1.0	15	16	1				west
Annona glabra	Pond apple	0.1	13	16	1				west
Annona glabra	Pond apple	1.6	14	8	1				west
Annona glabra	Pond apple	0.6	15	8	1				west
Annona glabra	Pond apple	1.3	15	8	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	0.6	15	6	1				west
Annona glabra	Pond apple	1.0	15	12	1				west
Annona glabra	Pond apple	0.6	15	6	1				west
Annona glabra	Pond apple	0.8	15	8	1				west
Annona glabra	Pond apple	0.8	15	8	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	0.6	15	6	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	0.8	15	6	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	0.5	15	4	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	1.9	15	8	1				west
Annona glabra	Pond apple	1.0	15	5	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	1.3	15	10	1				west
Annona glabra	Pond apple	0.8	15	4	1				west
Annona glabra	Pond apple	1.0	15	8	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-3 (continued)

(river mile 9.9, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	1.3	15	6	1				west
Annona glabra	Pond apple	2.2	12	8	1				west
Annona glabra	Pond apple	0.5	13	6	1				west
Annona glabra	Pond apple	1.0	15	12	1				west
Annona glabra	Pond apple	1.0	15	8	1				west
Annona glabra	Pond apple	0.8	15	8	1				west
Annona glabra	Pond apple	0.8	15	4	1				west
Annona glabra	Pond apple	1.6	15	10	1				west
Annona glabra	Pond apple	1.4	15	8	1				west
Annona glabra	Pond apple	1.8	15	12	1				west
Annona glabra	Pond apple	1.0	15	12	1				west
Annona glabra	Pond apple	0.6		8	1				west
Annona glabra	Pond apple	1.0	15	8	1				west
Annona glabra	Pond apple	0.8	15	6	1				west
Annona glabra	Pond apple	2.5	15	10	1				west
Annona glabra	Pond apple	1.9	15	12	1				west
Annona glabra	Pond apple	1.3	15	10	1				west
Annona glabra	Pond apple	1.3		12	1				west
Annona glabra	Pond apple	1.0	15	8	1				west
Annona glabra	Pond apple	0.5	15	6	1				west
Annona glabra	Pond apple	0.5	15	6	1				west
Annona glabra	Pond apple	2.2	15	14	1				west
Annona glabra	Pond apple	1.3	15	8	1				west
Annona glabra	Pond apple	0.2	15	4	1				west
Annona glabra	Pond apple	1.0	14	10	1				west
Annona glabra	Pond apple	0.1	14	8	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	1.0		8	1				west
Annona glabra	Pond apple	0.5	14	8	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-3 (continued)

(river mile 9.9, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	0.3	10	6	1				west
Annona glabra	Pond apple	0.6	15	12	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	0.3	14	2	1				west
Annona glabra	Pond apple	1.0	15	8	1				west
Annona glabra	Pond apple	0.3		8	1				west
Annona glabra	Pond apple	1.3	15	14	1				west
Annona glabra	Pond apple	1.4	15	14	1				west
Annona glabra	Pond apple	0.6	12	14	1				west
Annona glabra	Pond apple	1.3	15	14	1				west
Annona glabra	Pond apple	0.6	15	10	1				west
Annona glabra	Pond apple	0.3	15	4	1				west
Annona glabra	Pond apple	1.3	15	10	1				west
Annona glabra	Pond apple	1.3	15	10	1				west
Annona glabra	Pond apple	1.3	15	16	1				west
Annona glabra	Pond apple	0.5	15	12	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	1.6	15	14	1				west
Fraxinus caroliniana	Pop ash	0.5	12	20	1				west
Fraxinus caroliniana	Pop ash	0.6	15	14	1				west
Fraxinus caroliniana	Pop ash	0.5	8	4				1	west
Fraxinus caroliniana	Pop ash	0.6	14			1			west
Fraxinus caroliniana	Pop ash	0.1	13		1				west
Fraxinus caroliniana	Pop ash	0.1	13		1				west
Fraxinus caroliniana	Pop ash	0.1	13		1				west
Fraxinus caroliniana	Pop ash	0.1	8		1				west
Fraxinus caroliniana	Pop ash	0.5	15	6	1				west
Fraxinus caroliniana	Pop ash	0.1	10	2		1			west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-3 (continued)

(river mile 9.9, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Fraxinus caroliniana	Pop ash	0.3	13	4	1				west
Fraxinus caroliniana	Pop ash	1.3	15	16	1				west
Fraxinus caroliniana	Pop ash	0.2	15	6	1				west
Fraxinus caroliniana	Pop ash	0.6	16	8	1				west
Ilex cassine	Dahoon	0.2	13			1			west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Rhizophora mangle	Red mangrove	0.1	11	4	1				west
Rhizophora mangle	Red mangrove		14	10	1				west
Rhizophora mangle	Red mangrove		15	14	1				west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove		15	10	1				west
Rhizophora mangle	Red mangrove		15	12	1				west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove		15	4	1				west
Rhizophora mangle	Red mangrove		15	4	1				west
Rhizophora mangle	Red mangrove		6			1			west
Rhizophora mangle	Red mangrove		10			1			west
Rhizophora mangle	Red mangrove		10			1			west
Rhizophora mangle	Red mangrove		9			1			west
Rhizophora mangle	Red mangrove		15		1				west
Rhizophora mangle	Red mangrove		15	14	1				west
Rhizophora mangle	Red mangrove		15	14	1				west
Rhizophora mangle	Red mangrove		15	14	1				west
Rhizophora mangle	Red mangrove		15	14	1				west
Rhizophora mangle	Red mangrove		15	14	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-3 (continued)

(river mile 9.9, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Rhizophora mangle	Red mangrove		10			1			west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove						1		west
Rhizophora mangle	Red mangrove		14	10	1				west
Rhizophora mangle	Red mangrove		17	14	1				west
Rhizophora mangle	Red mangrove		15	8	1				west
Rhizophora mangle	Red mangrove		16	8	1				west
Rhizophora mangle	Red mangrove		15	16	1				west
Rhizophora mangle	Red mangrove						4		west
Rhizophora mangle	Red mangrove						10		west
Rhizophora mangle	Red mangrove			6	1				west
Rhizophora mangle	Red mangrove		15	10	1				west
Rhizophora mangle	Red mangrove		15	12	1				west
Rhizophora mangle	Red mangrove		15	16	1				west
Rhizophora mangle	Red mangrove		15	8	1				west
Rhizophora mangle	Red mangrove		14	14	1				west
Rhizophora mangle	Red mangrove		14	14	1				west
Rhizophora mangle	Red mangrove		14	12	1				west
Rhizophora mangle	Red mangrove		13	12	1				west
Rhizophora mangle	Red mangrove		11	8	1				west
Rhizophora mangle	Red mangrove		15	14	1				west
Rhizophora mangle	Red mangrove		15	8	1				west
Rhizophora mangle	Red mangrove		15	12	1				west
Rhizophora mangle	Red mangrove		15	10	1				west
Rhizophora mangle	Red mangrove		15	8	1				west
Rhizophora mangle	Red mangrove		15	8	1				west
Rhizophora mangle	Red mangrove		10	4		1			west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site V-3 (continued)

(river mile 9.9, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Rhizophora mangle	Red mangrove		10	4		1			west
Rhizophora mangle	Red mangrove		12	8	1				west
Rhizophora mangle	Red mangrove		10	8	1				west
Rhizophora mangle	Red mangrove		15	12	1				west
Sabal palmetto	Cabbage palm		12		1				west
Taxodium distichum	Bald cypress	0.6	30	24	1				west
Taxodium distichum	Bald cypress	1.6	35	28	1				west
Taxodium distichum	Bald cypress	3.5	45	40	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Acer rubrum	Red maple	0.3	20	8	1				west
Acer rubrum	Red maple	0.1	15	2	1				west
Acer rubrum	Red maple	0.2	17	12	1				west
Acer rubrum	Red maple	0.3	22	4	1				west
Acer rubrum	Red maple	0.3	18	4	1				west
Acer rubrum	Red maple	0.5	42	12	1				west
Acer rubrum	Red maple	0.5	32	12	1				west
Acer rubrum	Red maple	0.6	22	12	1				west
Acer rubrum	Red maple	0.8	33	14	1				west
Annona glabra	Pond apple	0.3	17	6	1				west
Annona glabra	Pond apple	0.3	15	12	1				west
Annona glabra	Pond apple	0.1	16	4	1				west
Annona glabra	Pond apple	0.3	14	6	1				west
Annona glabra	Pond apple	0.3	14	6	1				west
Annona glabra	Pond apple	0.3	13	6	1				west
Annona glabra	Pond apple						1		west
Annona glabra	Pond apple	0.3	14	6				1	west
Annona glabra	Pond apple	0.6	15	6	1				west
Annona glabra	Pond apple	1.0	15	8	1				west
Annona glabra	Pond apple	0.6	18	8	1				west
Annona glabra	Pond apple	0.6	18	8	1				west
Annona glabra	Pond apple	0.6	18	8	1				west
Annona glabra	Pond apple	0.6	18	8	1				west
Annona glabra	Pond apple	0.6	18	14	1				west
Annona glabra	Pond apple	0.3	12	4	1				west
Annona glabra	Pond apple	0.6	18	8	1				west
Annona glabra	Pond apple	0.6	12	12	1				west
Annona glabra	Pond apple	0.6	16	12	1				west
Annona glabra	Pond apple	1.0	12	12	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)
(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	0.6	14	12	1				west
Annona glabra	Pond apple	0.6	14	14	1				west
Annona glabra	Pond apple	0.6	15	16	1				west
Annona glabra	Pond apple	0.6	15	8	1				west
Annona glabra	Pond apple	0.6	18	12	1				west
Annona glabra	Pond apple	0.6	18	4	1				west
Annona glabra	Pond apple	1.0	18	12	1				west
Annona glabra	Pond apple	0.6	15	12	1				west
Annona glabra	Pond apple	0.3	14	8	1				west
Annona glabra	Pond apple	0.3	15	8	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	0.3	18	6	1				west
Annona glabra	Pond apple	0.3	14	4	1				west
Annona glabra	Pond apple	0.5	15	12	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Annona glabra	Pond apple	0.3	15	6	1				west
Fraxinus caroliniana	Pop ash	0.2	17	4	1				west
Fraxinus caroliniana	Pop ash	0.3	12	4	1				west
Fraxinus caroliniana	Pop ash	0.3	7	4	1				west
Fraxinus caroliniana	Pop ash	0.2	10	4	1				west
Fraxinus caroliniana	Pop ash	0.1	6	2		1			west
Fraxinus caroliniana	Pop ash	0.1	16	4		1			west
Fraxinus caroliniana	Pop ash	0.1	14	2	1				west
Fraxinus caroliniana	Pop ash	0.2	12	2	1				west
Fraxinus caroliniana	Pop ash	0.2	12	2	1				west
Fraxinus caroliniana	Pop ash	0.3	13	6	1				west
Fraxinus caroliniana	Pop ash	0.3	20	8	1				west
Fraxinus caroliniana	Pop ash	0.3	18	6	1				west
Fraxinus caroliniana	Pop ash	0.5	15	8	1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Fraxinus caroliniana	Pop ash	0.3	13	6	1				west
Fraxinus caroliniana	Pop ash	0.2	13	4	1				west
Fraxinus caroliniana	Pop ash	0.2	9	4	1				west
Fraxinus caroliniana	Pop ash	0.3	14	8	1				west
Fraxinus caroliniana	Pop ash	0.1	7	2	1				west
Fraxinus caroliniana	Pop ash	0.1	13	2	1				west
Fraxinus caroliniana	Pop ash	0.5	12	8	1				west
Fraxinus caroliniana	Pop ash	0.2	12	8	1				west
Ilex cassine	Dahoon	0.2	23	4	1				west
Ilex cassine	Dahoon	0.1	10	4		1			west
Ilex cassine	Dahoon	0.0	4	2	1				west
Ilex cassine	Dahoon	0.1	16	6	1				west
Ilex cassine	Dahoon	0.3	13	8	1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow						1		west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow						1		west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow				1				west
Persea borbonia	Red bay	0.1	5	2	1	1			west
Persea borbonia	Red bay	0.0	6	2		1			west
Persea borbonia	Red bay	0.0	7	2		1			west
Persea borbonia	Red bay	0.0	7	2		1			west
Persea borbonia	Red bay	0.1	11	4	1				west
Persea borbonia	Red bay						1		west
Persea borbonia	Red bay	0.1	12	2	1				west
Rhizophora mangle	Red mangrove		10	8	1				west
Sabal palmetto	Cabbage palm		18		1				west
Sabal palmetto	Cabbage palm		13		1				west
Sabal palmetto	Cabbage palm		30		1				west
Sabal palmetto	Cabbage palm		15		1				west
Sabal palmetto	Cabbage palm		8		1				west
Sabal palmetto	Cabbage palm								west
Sabal palmetto	Cabbage palm		9		1				west
Sabal palmetto	Cabbage palm		22		1				west
Sabal palmetto	Cabbage palm		20		1				west
Sabal palmetto	Cabbage palm		30		1				west

Quantitative Vegetativon Survey of the NW Fork Loxahatchee River: Site 9-C (continued)

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		25		1				west
Sabal palmetto	Cabbage palm		10		1				west
Sabal palmetto	Cabbage palm		21		1				west
Sabal palmetto	Cabbage palm		40		1				west
Taxodium distichum	Bald cypress	1.9	55	24	1				west
Taxodium distichum	Bald cypress	1.0	55	20	1				west
Taxodium distichum	Bald cypress	1.3	50	20	1				west
Taxodium distichum	Bald cypress	0.6	45	14	1				west
Taxodium distichum	Bald cypress	1.0	55	20	1				west
Taxodium distichum	Bald cypress	1.3	55	24	1				west
Taxodium distichum	Bald cypress	1.3	45	24	1				west
Taxodium distichum	Bald cypress	0.3	30	12	1				west
Taxodium distichum	Bald cypress	0.1	30	24	1				west
Taxodium distichum	Bald cypress	1.0	45	20	1				west
Taxodium distichum	Bald cypress	0.8	30	16	1				west
Taxodium distichum	Bald cypress	1.3	35	22	1				west
Taxodium distichum	Bald cypress	1.3	38	20	1				west
Taxodium distichum	Bald cypress	1.9	40	24	1				west
Taxodium distichum	Bald cypress	1.0	25	20	1				west
Acer rubrum	Red maple	0.1	15	12	1				east
Annona glabra	Pond apple	0.2	18	8	1				east
Annona glabra	Pond apple	0.1	7	3		1			east
Annona glabra	Pond apple	0.2	30	6	1				east
Annona glabra	Pond apple						1		east
Annona glabra	Pond apple						1		east
Annona glabra	Pond apple	0.1	6	2	1				east
Annona glabra	Pond apple	0.1	11	2	1				east
Annona glabra	Pond apple	0.1	12	6	1				east
Annona glabra	Pond apple	0.1	23	8	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)
(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Fraxinus caroliniana	Pop ash	0.6	20	12	1				east
Fraxinus caroliniana	Pop ash	0.2	20	6	1				east
Fraxinus caroliniana	Pop ash	0.1	15	5	1				east
Fraxinus caroliniana	Pop ash	0.3	18	8	1				east
Fraxinus caroliniana	Pop ash	0.1	15	2	1				east
Fraxinus caroliniana	Pop ash	0.1	13	4	1				east
Fraxinus caroliniana	Pop ash	0.1	6	2				1	east
Fraxinus caroliniana	Pop ash	0.2	10	4				1	east
Fraxinus caroliniana	Pop ash	0.2	6	2				1	east
Fraxinus caroliniana	Pop ash	0.3	13	6	1				east
Fraxinus caroliniana	Pop ash	0.1	5	4	1				east
Fraxinus caroliniana	Pop ash	0.3	19	12	1				east
Fraxinus caroliniana	Pop ash	0.3	20	12	1				east
Fraxinus caroliniana	Pop ash	0.1	13	12		1			east
Ilex cassine	Dahoon	0.1	6	2	1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow				1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow				1				east
Itea virginica	Virginia willow						1		east
Itea virginica	Virginia willow				1				east
Rhizophora mangle	Red mangrove		1	4		1			east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove		12	4	1				east
Rhizophora mangle	Red mangrove		7	6	1				east
Rhizophora mangle	Red mangrove		4	2		1			east
Rhizophora mangle	Red mangrove		18	8	1				east
Rhizophora mangle	Red mangrove		5	4	1				east
Rhizophora mangle	Red mangrove		7	4	1				east
Rhizophora mangle	Red mangrove		15	8	1				east
Rhizophora mangle	Red mangrove		7	4	1				east
Rhizophora mangle	Red mangrove		8	4	1				east
Rhizophora mangle	Red mangrove		7	4	1				east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove		10	8	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Rhizophora mangle	Red mangrove		12	4	1				east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove		14	8	1				east
Rhizophora mangle	Red mangrove		7	6	1				east
Rhizophora mangle	Red mangrove		7	6	1				east
Rhizophora mangle	Red mangrove		6	8	1				east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Rhizophora mangle	Red mangrove						1		east
Sabal palmetto	Cabbage palm		21		1				east
Sabal palmetto	Cabbage palm		30		1				east
Sabal palmetto	Cabbage palm		25		1				east
Sabal palmetto	Cabbage palm		25		1				east
Sabal palmetto	Cabbage palm		18		1				east
Sabal palmetto	Cabbage palm		40		1				east
Sabal palmetto	Cabbage palm		45		1				east
Sabal palmetto	Cabbage palm		20		1				east
Sabal palmetto	Cabbage palm		40		1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)
(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		40		1				east
Sabal palmetto	Cabbage palm		10		1				east
Sabal palmetto	Cabbage palm		12		1				east
Sabal palmetto	Cabbage palm		19		1				east
Sabal palmetto	Cabbage palm		35		1				east
Sabal palmetto	Cabbage palm		35		1				east
Sabal palmetto	Cabbage palm		40		1				east
Sabal palmetto	Cabbage palm		25		1				east
Sabal palmetto	Cabbage palm		12		1				east
Sabal palmetto	Cabbage palm		5		1				east
Sabal palmetto	Cabbage palm		30		1				east
Sabal palmetto	Cabbage palm		15		1				east
Sabal palmetto	Cabbage palm		15		1				east
Sabal palmetto	Cabbage palm		30		1				east
Sabal palmetto	Cabbage palm		40		1				east
Sabal palmetto	Cabbage palm		21		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		35		1				east
Sabal palmetto	Cabbage palm		40		1				east
Sabal palmetto	Cabbage palm		28		1				east
Taxodium distichum	Bald cypress	0.6	40	12	1				east
Taxodium distichum	Bald cypress	0.5	28	10	1				east
Taxodium distichum	Bald cypress	0.2	15	10	1				east
Taxodium distichum	Bald cypress	0.2	18	12	1				east
Taxodium distichum	Bald cypress	0.5	28	13	1				east
Taxodium distichum	Bald cypress	0.5	18	12	1				east
Taxodium distichum	Bald cypress	0.2	15	10		1			east
Taxodium distichum	Bald cypress	0.6	18	20	1				east
Taxodium distichum	Bald cypress	1.3	35	20	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-C (continued)

(lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 1/17/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Taxodium distichum	Bald cypress	1.3	45	24	1				east
Taxodium distichum	Bald cypress	1.0	14	16	1				east
Taxodium distichum	Bald cypress	1.0	30	28	1				east
Taxodium distichum	Bald cypress	0.2	15	10		1			east
Taxodium distichum	Bald cypress	0.3	16	14	1				east
Taxodium distichum	Bald cypress	0.3	20	16		1			east
Taxodium distichum	Bald cypress	0.1	10	10		1			east
Taxodium distichum	Bald cypress	0.1	14	10		1			east
Taxodium distichum	Bald cypress	3.5	28	28	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-B

(lat –80.160870447/lon 26.983861002; river mile 9.2, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Rhizophora mangle	Red mangrove		14	200*	100*				west
Sabal palmetto	Cabbage palm		22		1				west
Sabal palmetto	Cabbage palm		24		1				west
Sabal palmetto	Cabbage palm		32		1				west
Sabal palmetto	Cabbage palm		18		1				west
Sabal palmetto	Cabbage palm		15		1				west
Sabal palmetto	Cabbage palm		15		1				west
Sabal palmetto	Cabbage palm		10		1				west
Sabal palmetto	Cabbage palm		12		1				west
Sabal palmetto	Cabbage palm		14		1				west
Sabal palmetto	Cabbage palm		8		1				west
Sabal palmetto	Cabbage palm		8		1				west
Sabal palmetto	Cabbage palm		12		1				west
Taxodium distichum	Bald cypress		26	10	1				west
Taxodium distichum	Bald cypress		26	15	1				west
Taxodium distichum	Bald cypress		26	15	1				west
Annona glabra	Pond apple		13	8				1	east
Annona glabra	Pond apple		15					1	east
Annona glabra	Pond apple	0.3	14	6	1				east
Annona glabra	Pond apple	0.3	14	6	1				east
Annona glabra	Pond apple	0.3	14	6	1				east
Annona glabra	Pond apple	0.3	14	6	1				east
Annona glabra	Pond apple	0.3	14	6	1				east
Annona glabra	Pond apple	0.3	14	6	1				east
Annona glabra	Pond apple	0.3	14	12	1				east
Annona glabra	Pond apple	0.3	14	3	1				east
Annona glabra	Pond apple	0.3	14	3	1				east
Annona glabra	Pond apple	0.3	14	3	1				east

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-B (continued)

(lat –80.160870447/lon 26.983861002; river mile 9.2, surveyed 1/15/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	0.0	8	8	1				east
Fraxinus caroliniana	Pop ash	0.2	16		1				east
Fraxinus caroliniana	Pop ash	0.5	12	8				1	east
Ilex cassine	Dahoon		14	3	1				east
Ilex cassine	Dahoon	0.2	12	4	1				east
Rhizophora mangle	Red mangrove		14	200*	100*				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		20		1				east
Sabal palmetto	Cabbage palm		14		1				east
Sabal palmetto	Cabbage palm		6		1				east
Sabal palmetto	Cabbage palm		19		1				east
Sabal palmetto	Cabbage palm		14		1				east
Sabal palmetto	Cabbage palm		16		1				east
Sabal palmetto	Cabbage palm		24		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		20		1				east
Sabal palmetto	Cabbage palm		16		1				east
Sabal palmetto	Cabbage palm		20		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		26		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		22		1				east
Sabal palmetto	Cabbage palm		16		1				east
Sabal palmetto	Cabbage palm		26		1				east
Sabal palmetto	Cabbage palm		24		1				east
Sabal palmetto	Cabbage palm		30		1				east
Sabal palmetto	Cabbage palm		25		1				east
Taxodium distichum	Bald cypress		28	11	1				east

*indicates estimated value

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-A

(lat –80.159358557/lon 26.985374135; river mile 9.1, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Annona glabra	Pond apple	1.0	10	10	1				west
Annona glabra	Pond apple	0.5	10	5				1	west
Annona glabra	Pond apple	0.6	10	5				1	west
Annona glabra	Pond apple	0.6	10	5				1	west
Annona glabra	Pond apple	0.3	8	6	1				west
Annona glabra	Pond apple	0.5	10	5				1	west
Annona glabra	Pond apple	0.3	8	3				1	west
Annona glabra	Pond apple	0.3	12	7				1	west
Annona glabra	Pond apple	0.5	10	6				1	west
Annona glabra	Pond apple	0.5	12	10	1				west
Annona glabra	Pond apple	0.3	4	4	1				west
Annona glabra	Pond apple	0.3	11	3				1	west
Annona glabra	Pond apple	0.3	12	3	1				west
Fraxinus caroliniana	Pop ash	0.3	11	2		1			west
Itea virginica	Virginia willow				1				west
Itea virginica	Virginia willow						1		west
Rhizophora mangle	Red mangrove		9	200*	100*				west
Sabal palmetto	Cabbage palm		18		1				west
Sabal palmetto	Cabbage palm		13		1				west
Sabal palmetto	Cabbage palm		18		1				west
Sabal palmetto	Cabbage palm		16		1				west
Sabal palmetto	Cabbage palm		22		1				west
Sabal palmetto	Cabbage palm		15		1				west
Sabal palmetto	Cabbage palm		12		1				west
Sabal palmetto	Cabbage palm		15		1				west
Sabal palmetto	Cabbage palm		16		1				west
Sabal palmetto	Cabbage palm		16		1				west
Sabal palmetto	Cabbage palm		16		1				west
Sabal palmetto	Cabbage palm		4.5		1				west

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 9-A (continued)

(lat –80.159358557/lon 26.985374135; river mile 9.1, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		4		1				west
Annona glabra	Pond apple		11	8					east
Annona glabra	Pond apple	0.5	15	7				1	east
Annona glabra	Pond apple	0.6	12	10	1				east
Annona glabra	Pond apple	1.0	12	10	1				east
Annona glabra	Pond apple		5	3	1				east
Annona glabra	Pond apple	0.2	6	1		1			east
Annona glabra	Pond apple	0.2	6	1	1				east
Annona glabra	Pond apple	0.5	8	7	1				east
Annona glabra	Pond apple	0.6	9	6	1				east
Annona glabra	Pond apple	0.3	9	8	1				east
Annona glabra	Pond apple	0.5	6	8	1				east
Annona glabra	Pond apple	0.8	7	8	1				east
Rhizophora mangle	Red mangrove			200*	100*				east
Taxodium distichum	Bald cypress	0.3	15	4		1			east
Taxodium distichum	Bald cypress	0.3	14	4		1			east
Taxodium distichum	Bald cypress	0.3	14	4		1			east
Taxodium distichum	Bald cypress	0.3	14	4		1			east

*indicates estimated value

Quantitative Vegetation Survey of the NW Fork Loxahatchee River: Site 8-C

(lat –80.157838347/lon 26.989749400; river mile 8.7, surveyed 1/16/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		10		1				w
Sabal palmetto	Cabbage palm		10		1				w
Sabal palmetto	Cabbage palm		8		1				w
Sabal palmetto	Cabbage palm		8		1				w
Sabal palmetto	Cabbage palm		11		1				w
Sabal palmetto	Cabbage palm		13		1				w
Rhizophora mangle	Red mangrove		9	200*	100*				w
Taxodium distichum	Bald cypress	1.0	14	16	1				e
Taxodium distichum	Bald cypress		13	8	1				e
Taxodium distichum	Bald cypress		17	18	1				e
Taxodium distichum	Bald cypress	1.0	24	9	1				e
Sabal palmetto	Cabbage palm		13		1				e
Sabal palmetto	Cabbage palm		12		1				e
Sabal palmetto	Cabbage palm		12		1				e
Sabal palmetto	Cabbage palm		17		1				e
Sabal palmetto	Cabbage palm		8		1				e
Rhizophora mangle	Red mangrove		9	160*	80*				e

*indicates estimated value

Quantitative Vegetative Survey of NW Fork Loxahatchee River: Site 8-B

(lat –80.155118577/lon 26.989388511; river mile 8.4, surveyed 1/14/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Rhizophora mangle	Red mangrove		8	200*	100*				north
Sabal palmetto	Cabbage palm		18		1				north
Sabal palmetto	Cabbage palm		17		1				north
Sabal palmetto	Cabbage palm		9		1				north
Sabal palmetto	Cabbage palm		18		1				north
Sabal palmetto	Cabbage palm		12		1				north
Sabal palmetto	Cabbage palm		17		1				north
Sabal palmetto	Cabbage palm		20		1				north
Rhizophora mangle	Red mangrove		8	200*	100*				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		16		1				south
Sabal palmetto	Cabbage palm		16		1				south
Sabal palmetto	Cabbage palm		16		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		10		1				south
Sabal palmetto	Cabbage palm		20		1				south
Sabal palmetto	Cabbage palm		20		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		19		1				south
Sabal palmetto	Cabbage palm		19		1				south
Sabal palmetto	Cabbage palm		19		1				south
Sabal palmetto	Cabbage palm		19		1				south
Sabal palmetto	Cabbage palm		17		1				south

Quantitative Vegetative Survey of the NW Fork Loxahatchee River: Site 8-B (continued)
(lat –80.155118577/lon 26.989388511; river mile 8.4, surveyed 1/14/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		30		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		20		1				south
Sabal palmetto	Cabbage palm		20		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		22		1				south
Sabal palmetto	Cabbage palm		22		1				south
Sabal palmetto	Cabbage palm		22		1				south
Sabal palmetto	Cabbage palm		22		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		25		1				south
Sabal palmetto	Cabbage palm		25		1				south
Taxodium distichum	Bald cypress		25	12	1				south
Taxodium distichum	Bald cypress		25	12	1				south
Taxodium distichum	Bald cypress		25	12	1				south

*indicates estimated value

Quantitative Vegetative Survey of the NW Fork Loxahatchee River: Site V-7
(river mile 7.95, surveyed 1/14/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Rhizophora mangle	Red mangrove		7	200*	100*				north
Sabal palmetto	Cabbage palm		20		1				north
Sabal palmetto	Cabbage palm		8		1				north
Sabal palmetto	Cabbage palm		12		1				north
Sabal palmetto	Cabbage palm		18		1				north
Sabal palmetto	Cabbage palm		13		1				north
Sabal palmetto	Cabbage palm		13		1				north
Sabal palmetto	Cabbage palm		10		1				north
Sabal palmetto	Cabbage palm		20		1				north
Sabal palmetto	Cabbage palm		22		1				north
Sabal palmetto	Cabbage palm		16		1				north
Sabal palmetto	Cabbage palm		10		1				north
Sabal palmetto	Cabbage palm		23		1				north
Sabal palmetto	Cabbage palm		10		1				north
Sabal palmetto	Cabbage palm		13		1				north
Sabal palmetto	Cabbage palm		11		1				north
Sabal palmetto	Cabbage palm		15		1				north
Sabal palmetto	Cabbage palm		17		1				north
Sabal palmetto	Cabbage palm		15		1				north
Sabal palmetto	Cabbage palm		25		1				north
Sabal palmetto	Cabbage palm		17		1				north
Sabal palmetto	Cabbage palm		20		1				north
Sabal palmetto	Cabbage palm		8		1				north
Sabal palmetto	Cabbage palm		22		1				north
Sabal palmetto	Cabbage palm		10		1				north
Sabal palmetto	Cabbage palm		12		1				north
Sabal palmetto	Cabbage palm		16		1				north
Sabal palmetto	Cabbage palm		15		1				north
Rhizophora mangle	Red mangrove		8	200*	100*				south

Quantitative Vegetative Survey of the NW Fork Loxahatchee River: Site V-7 (continued)
(river mile 7.95, surveyed 1/14/02)

Scientific Name	Common Name	DBH (ft)	Height (ft)	Canopy diameter (ft)	No. of Adults	No. of Saplings	No. of Seedlings	No. of Stump sprouts	Bank
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		12		1				south
Sabal palmetto	Cabbage palm		12		1				south
Sabal palmetto	Cabbage palm		16		1				south
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		16		1				south
Sabal palmetto	Cabbage palm		10		1				south
Sabal palmetto	Cabbage palm		10		1				south
Sabal palmetto	Cabbage palm		18		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		12		1				south
Sabal palmetto	Cabbage palm		15		1				south
Sabal palmetto	Cabbage palm		17		1				south
Sabal palmetto	Cabbage palm		20		1				south
Sabal palmetto	Cabbage palm		18		1				south

*indicates estimated value

Semiquantitative Vegetation Survey of NW Fork Loxahatchee River

Site V-1 (river mile 10.6, surveyed 12/12/01)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	3.5
Acrostichum sp.	Leather fern	3.5
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	2.5
Baccaris sp.	Saltbush	2
Blechnum serrulatum	Swamp fern	1
Boehmeria cylindrica	False nettle	1
Carya aquatica	Water hickory	2
Crinum americanum	String lily	2.5
Ficus aurea	Golden fig	2
Fraxinus caroliniana	Pop ash	2
Hydrocotyl sp.	Water pennywort	present
Hyptis sp.		1
Ilex cassine	Dahoon	2
Ipomoea alba	Moon flower	2
Ipomoea sp.	Morning glory	1
Itea virginica	Virginia willow	3.5
Limnophila sp.		present
Ludwigia peruviana	Water primrose	1
Ludwigia repens	Creeping primrose willow	present
Lygodium microphylum	Japanese climbing fern	1
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	1
Nephrolepis sp.	Wild Boston fern	present
Osmunda regalis	Royal fern	1
Persea borbonia	Red bay	1.5
Phlebodium aureum	Golden polypody	present
Pleopeltis polypodioides	Resurrection fern	present
Poaceae spp.		1
Polygonum sp.	Swamp smartweed	present
Pontederia cordata	Pickerelweed	1
Quercus laurifolia	Laurel oak	2
Sabal palmetto	Cabbage palm	1.5
Salix caroliniana	Swamp willow	1
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	2
Smilax sp.	Greenbriar	1
Syzygium cumini	Java plum	3
Taxodium distichum	Baldcypress	4
Tillandsia balbisiana		present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae		present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2
Vitits munsoniana	Wild grape	1

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 10-C (lat –80.165192015/lon 26.976525692; river mile 10.4, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	3.5
Acrostichum sp.	Leather fern	3.5
Annona glabra	Pond apple	3.5
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	2
Bacopa monnieri	Water hyssop	present
Crinum americanum	String lily	2
Fraxinus caroliniana	Pop ash	2
Ilex cassine	Dahoon	3
Itea virginica	Virginia willow	2
Limnophila sp.		present
Ludwigia peruviana	Water primrose	2
Ludwigia repens	Creeping primrose willow	present
Lygodium microphylum	Japanese climbing fern	2.5
Mikania scandens	Climbing hempvine	2
Pandanus sp.		2
Phlebodium aureum	Golden polypody	present
Pleopeltis polypodioides	Resurrection fern	present
Polygonum sp.	Swamp smartweed	present
Quercus laurifolia	Laurel oak	2
Sabal palmetto	Cabbage palm	2
Salix caroliniana	Swamp willow	2
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	1
Syzygium cumini	Java plum	2
Taxodium distichum	Baldcypress	4
Tillandsia balbisiana		present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site V-3 (river mile 10.3, surveyed 12/12/01)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	3
Acrostichum sp.	Leather fern	3.5
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	2
Blechnum serrulatum	Swamp fern	2
Carya aquatica	Water hickory	2
Crinum americanum	String lily	2
Fraxinus caroliniana	Pop ash	2
Hydrocotyl sp.	Water pennywort	present
Ilex cassine	Dahoon	3.5
Ipomoea alba	Moon flower	1
Itea virginica	Virginia willow	2.5
Ludwigia peruviana	Water primrose	2
Ludwigia repens	Creeping primrose willow	present
Lygodium microphylum	Japanese climbing fern	2
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	2
Osmunda regalis	Royal fern	2
Persea borbonia	Red bay	1
Phlebodium aureum	Golden polypody	present
Pleopeltis polypodioides	Resurrection fern	present
Poaceae spp.		1
Quercus laurifolia	Laurel oak	2
Rhizophora mangle	Red mangrove	1
Sabal palmetto	Cabbage palm	2.5
Salix caroliniana	Swamp willow	2
Sarcostemma clausum	White vine	2.5
Schinus terebinthifolius	Brazilian pepper	2
Smilax sp.	Greenbriar	2
Syzygium cumini	Java plum	2.5
Taxodium distichum	Baldcypress	4
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae		present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2.5
Vitits munsoniana	Wild grape	1

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 10-B (lat –80.164987106/lon26.978938944; river mile 10.2, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	3
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	2
Blechnum serrulatum	Swamp fern	2
Carya aquatica	Water hickory	2
Crinum americanum	String lily	2.5
Ficus aurea	Golden fig	1
Fraxinus caroliniana	Pop ash	2
Ilex cassine	Dahoon	2
Ipomoea alba	Moon flower	present
Itea virginica	Virginia willow	2
Limnophila sp.		present
Ludwigia peruviana	Water primrose	2
Lygodium microphylum	Japanese climbing fern	2
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	1
Osmunda regalis	Royal fern	2
Phlebodium aureum	Golden polypody	present
Pleopeltis polypodioides	Resurrection fern	present
Sabal palmetto	Cabbage palm	3
Salix caroliniana	Swamp willow	2
Sarcostemma clausum	White vine	3
Smilax sp.	Greenbriar	1
Syzygium cumini	Java plum	2
Taxodium distichum	Baldcypress	4
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 10-A (lat –80.165062424/lon 26.980186754; river mile 10.1, surveyed 11/14/00)

Scientific Name	**Common Name**	**Abundance Index**
Acer rubrum	Red maple	3
Acrostichum sp.	Leather fern	3.5
Annona glabra	Pond apple	3.5
Aster caroliniana	Carolina aster	3
Crinum americanum	String lily	2.5
Fraxinus caroliniana	Pop ash	2
Ilex cassine	Dahoon	2
Itea virginica	Virginia willow	2
Limnophila sp.		present
Ludwigia peruviana	Water primrose	2
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	3
Osmunda regalis	Royal fern	2.5
Phlebodium aureum	Golden polypody	present
Pleopeltis polypodioides	Resurrection fern	present
Sabal palmetto	Cabbage palm	3
Salix caroliniana	Swamp willow	3
Sarcostemma clausum	White vine	3
Taxodium distichum	Baldcypress	4
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	3

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site V-3 (river mile 9.9, surveyed 12/12/01)

Scientific Name	**Common Name**	**Abundance Index**
Acer rubrum	Red maple	1
Acrostichum sp.	Leather fern	3.5
Annona glabra	Pond apple	3.5
Aster caroliniana	Carolina aster	2
Baccaris sp.	Saltbush	1
Blechnum serrulatum	Swamp fern	2
Crinum americanum	String lily	2
Dalbergia ecastaphyllum	Coin vine	1
Fraxinus caroliniana	Pop ash	2
Ilex cassine	Dahoon	2
Ipomoea alba	Moon flower	1
Ipomoea sp.	Morning glory	1
Ludwigia peruviana	Water primrose	2.5
Lygodium microphylum	Japanese climbing fern	2
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	2
Nephrolepis sp.	Wild Boston fern	present
Osmunda regalis	Royal fern	2
Phlebodium aureum	Golden polypody	present
Pleopeltis polypodioides	Resurrection fern	present
Poaceae spp.		1
Quercus laurifolia	Laurel oak	1.5
Rhabdadenia biflora	Rubber vine	2
Rhizophora mangle	Red mangrove	2
Sabal palmetto	Cabbage palm	3
Sagittaria lancifolia	Lance-leaf arrowhead	1
Salix caroliniana	Swamp willow	2
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	2
Smilax sp.	Greenbriar	2
Syzygium cumini	Java plum	1
Taxodium distichum	Baldcypress	4
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae		present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2

Semiquantitative Vegetation Survey of NW Fork Loxahatchee River

Site 9-C (lat –80.163800034/lon 26.982719318; river mile 9.7, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	2
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	2
Crinum americanum	String lily	1
Dalbergia ecastaphyllum	Coin vine	2
Fraxinus caroliniana	Pop ash	2
Ludwigia peruviana	Water primrose	1.5
Mikania scandens	Climbing hempvine	1.5
Myrica cerifera	Wax myrtle	2
Phlebodium aureum	Golden polypody	present
Polygonum sp.	Swamp smartweed	1
Rhizophora mangle	Red mangrove	2.5
Sabal palmetto	Cabbage palm	3
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	1
Syzygium cumini	Java plum	1
Taxodium distichum	Baldcypress	4
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site V-4 (river mile 9.3, surveyed 12/12/01)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	2
Annona glabra	Pond apple	1
Aster caroliniana	Carolina aster	2.5
Baccaris sp.	Saltbush	2
Blechnum serrulatum	Swamp fern	2
Carya aquatica	Water hickory	1
Dalbergia ecastaphyllum	Coin vine	2
Ilex cassine	Dahoon	1
Lygodium microphylum	Japanese climbing fern	2
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	2
Nephrolepis sp.	Wild Boston fern	present
Osmunda regalis	Royal fern	2
Persea borbonia	Red bay	1.5
Phlebodium aureum	Golden polypody	present
Quercus laurifolia	Laurel oak	2
Rhabdadenia biflora	Rubber vine	1
Rhizophora mangle	Red mangrove	3
Sabal palmetto	Cabbage palm	3
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	2
Smilax sp.	Greenbriar	1
Taxodium distichum	Baldcypress	2
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae		present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2

Semiquantitative Vegetation Survey of NW Fork Loxahatchee River

Site 9-B (lat –80.160870447/lon 26.983861002; river mile 9.2, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	1
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	2
Chrysobalanus icaco	Coco plum	1
Dalbergia ecastaphyllum	Coin vine	1
Eugenia uniflora	Surinam cherry	1
Fraxinus caroliniana	Pop ash	1
Ilex cassine	Dahoon	1
Myrica cerifera	Wax myrtle	1
Phlebodium aureum	Golden polypody	present
Rhizophora mangle	Red mangrove	4
Roystonea regia	Royal palm	1
Sabal palmetto	Cabbage palm	3
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	2
Syzygium cumini	Java plum	1
Taxodium distichum	Baldcypress	3
Toxicodendron radicans	Poison ivy	1

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 9-A (lat –80.159358557/lon 26.985374195; river mile 9.1, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	1
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	2
Dalbergia ecastaphyllum	Coin vine	2
Ilex cassine	Dahoon	1
Phlebodium aureum	Golden polypody	present
Rhabdadenia biflora	Rubber vine	2
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	4
Salix caroliniana	Swamp willow	2
Sarcostemma clausum	White vine	2.5
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	3
Toxicodendron radicans	Poison ivy	1.5
Typha domingensis	Cattail	2
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 8-D (river mile 8.9, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	1
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	1.5
Dalbergia ecastaphyllum	Coin vine	1
Ilex cassine	Dahoon	1
Rhabdadenia biflora	Rubber vine	2
Rhizophora mangle	Red mangrove	4
Roystonea regia	Royal palm	1
Sabal palmetto	Cabbage palm	3.5
Sarcostemma clausum	White vine	1
Schinus terebinthifolius	Brazilian pepper	1.5
Taxodium distichum	Baldcypress	3.5
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site V-5 (river mile 8.8, surveyed 12/12/01)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	1.5
Annona glabra	Pond apple	2
Aster caroliniana	Carolina aster	2.5
Bacopa monnieri	Water hyssop	1
Crinum americanum	String lily	1
Dalbergia ecastaphyllum	Coin vine	2.5
Laguncularia racemosa	White mangrove	1.5
Ludwigia peruviana	Water primrose	1
Mikania scandens	Climbing hempvine	1
Myrica cerifera	Wax myrtle	2
Osmunda regalis	Royal fern	2
Poaceae spp.		1
Rhabdadenia biflora	Rubber vine	2
Rhizophora mangle	Red mangrove	4
Roystonea regia	Royal palm	1
Sabal palmetto	Cabbage palm	3.5
Salix caroliniana	Swamp willow	1
Sarcostemma clausum	White vine	2
Schinus terebinthifolius	Brazilian pepper	2
Syzygium cumini	Java plum	1
Taxodium distichum	Baldcypress	2
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 8-C (lat –80.157838347/lon 26.989749400; river mile 8.7, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	2
Baccaris sp.	Saltbush	1
Laguncularia racemosa	White mangrove	1
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	3.5
Schinus terebinthifolius	Brazilian pepper	1
Taxodium distichum	Baldcypress	2
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site V-6 (river mile 8.55, surveyed 12/12/01)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	2
Aster caroliniana	Carolina aster	2.5
Baccaris sp.	Saltbush	1
Dalbergia ecastaphyllum	Coin vine	2.5
Mikania scandens	Climbing hempvine	2
Phlebodium aureum	Golden polypody	present
Rhabdadenia biflora	Rubber vine	2.5
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	3
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	1
Tillandsia balbisiana		present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae		present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 8-B (lat –80.155118577/lon 26.989388511; river mile 8.4, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	3
Aster caroliniana	Carolina aster	3
Laguncularia racemosa	White mangrove	1
Rhabdadenia biflora	Rubber vine	3
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	3
Sarcostemma clausum	White vine	1
Schinus terebinthifolius	Brazilian pepper	1
Taxodium distichum	Baldcypress	2
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 8-A (lat –80.153982377/lon 26.990833609; river mile 8.1, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Aster caroliniana	Carolina aster	1
Baccaris sp.	Saltbush	1
Phragmites australis	Giant reed	1.5
Rhabdadenia biflora	Rubber vine	2
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	4
Taxodium distichum	Baldcypress	1

Semiquantitative Vegetation Survey of NW Fork Loxahatchee River

Site V-7 (river mile 7.95, surveyed 12/12/01)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	1
Annona glabra	Pond apple	1
Aster caroliniana	Carolina aster	1
Crinum americanum	String lily	1
Dalbergia ecastaphyllum	Coin vine	1
Laguncularia racemosa	White mangrove	2
Rhabdadenia biflora	Rubber vine	3
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	3
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	1
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 7-C (lat –80.150862762/lon 26.988849080; river mile 7.8, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	2
Aster caroliniana	Carolina aster	2
Baccaris sp.	Saltbush	2
Blechnum serrulatum	Swamp fern	1
Chrysobalanus icaco	Coco plum	1
Crinum americanum	String lily	1
Dalbergia ecastaphyllum	Coin vine	3
Lygodium microphylum	Japanese climbing fern	2
Myrica cerifera	Wax myrtle	2
Rhabdadenia biflora	Rubber vine	3
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	3.5
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	1
Toxicodendron radicans	Poison ivy	1

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 7-B (-80.149975096/lon 26.99106662; river mile 7.5, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	3
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	3

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 6-B (lat –80.147410631/lon 26.988542914; river mile 6.8, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	1
Dalbergia ecastaphyllum	Coin vine	1
Juncus roemerianus	Black needlerush	2
Laguncularia racemosa	White mangrove	3
Myrica cerifera	Wax myrtle	1
Phragmites australis	Giant reed	1
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	2.5
Schinus terebinthifolius	Brazilian pepper	2

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 6-A (lat –80.143669519/lon 26.984342169; river mile 6.2, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Casuarina sp.	Australian pine	1
Dalbergia ecastaphyllum	Coin vine	1
Rhabdadenia biflora	Rubber vine	3
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	1.5
Schinus terebinthifolius	Brazilian pepper	1

Semiquantitative Vegetation Survey of the NW Fork Loxahatchee River

Site 5-B (lat –80.139039353/lon 26.982712901; river mile 5.6, surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Dalbergia ecastaphyllum	Coin vine	3
Rhizophora mangle	Red mangrove	4
Schinus terebinthifolius	Brazilian pepper	2

Semiquantitative Vegetative Survey of Kitching Creek

Site A (lat -80.154898869/lon 26.991771447; surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	2
Annona glabra	Pond apple	2
Baccaris sp.	Saltbush	2
Dalbergia ecastaphyllum	Coin vine	2
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	4
Taxodium distichum	Baldcypress	2
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetative Survey of Kitching Creek

Site B (lat -80.155330876/lon 26.992670262; surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Annona glabra	Pond apple	2
Aster caroliniana	Carolina aster	2
Baccaris sp.	Saltbush	1
Bacopa monnieri	Water hyssop	present
Laguncularia racemosa	White mangrove	1
Rhabdadenia biflora	Rubber vine	2
Rhizophora mangle	Red mangrove	4
Sabal palmetto	Cabbage palm	4
Schinus terebinthifolius	Brazilian pepper	1
Taxodium distichum	Baldcypress	2
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetative Survey of Kitching Creek

Site C (lat -80.156664449/lon 26.992851025; surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	2
Bacopa monnieri	Water hyssop	present
Blechnum serrulatum	Swamp fern	2.5
Dalbergia ecastaphyllum	Coin vine	2
Laguncularia racemosa	White mangrove	2
Mikania scandens	Climbing hempvine	2
Quercus laurifolia	Laurel oak	2
Rhabdadenia biflora	Rubber vine	1.5
Rhizophora mangle	Red mangrove	3
Sabal palmetto	Cabbage palm	3
Sarcostemma clausum	White vine	1
Taxodium distichum	Baldcypress	2.5
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Vitits munsoniana	Wild grape	1

Semiquantitative Vegetative Survey of Kitching Creek

Site D (lat -80.156095466/lon 26.993647772; surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	2.5
Aster caroliniana	Carolina aster	1
Baccaris sp.	Saltbush	1
Bacopa monnieri	Water hyssop	present
Rhizophora mangle	Red mangrove	3
Sabal palmetto	Cabbage palm	3
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	3
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Typha domingensis	Cattail	3

Semiquantitative Vegetative Survey of Kitching Creek

Site E (lat -80.155459331/lon 26.994103015; surveyed 11/14/00)

Scientific Name	Common Name	Abundance Index
Acrostichum sp.	Leather fern	3
Andropogon sp.	Broomsedge	2.5
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	2
Baccaris sp.	Saltbush	2
Bacopa monnieri	Water hyssop	present
Blechnum serrulatum	Swamp fern	2.5
Crinum americanum	String lily	2
Eupatorium sp.	Dog fennel	2
Laguncularia racemosa	White mangrove	2
Myrica cerifera	Wax myrtle	2
Nephrolepis sp.	Wild Boston fern	2
Phlebodium aureum	Golden polypody	1
Poaceae spp.		1.5
Rhizophora mangle	Red mangrove	2
Sabal palmetto	Cabbage palm	3.5
Schinus terebinthifolius	Brazilian pepper	2.5
Smilax sp.	Greenbriar	2
Taxodium distichum	Baldcypress	3
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetative Survey of Kitching Creek

Site F (lat-80.156193578/lon 26.995723248; surveyed 11/14/00)

Scientific Name	**Common Name**	**Abundance Index**
Acer rubrum	Red maple	2
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Aster caroliniana	Carolina aster	3
Bacopa monnieri	Water hyssop	present
Blechnum serrulatum	Swamp fern	2
Crinum americanum	String lily	3
Ipomoea sp.	Morning glory	3
Lygodium microphylum	Japanese climbing fern	2
Mikania scandens	Climbing hempvine	2
Myrica cerifera	Wax myrtle	2
Pontederia cordata	Pickerelweed	2
Quercus laurifolia	Laurel oak	2
Rhabdadenia biflora	Rubber vine	1.5
Rhizophora mangle	Red mangrove	3
Rhynchospora sp.	Beakrush	2
Sabal palmetto	Cabbage palm	3
Taxodium distichum	Baldcypress	4
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present

Semiquantitative Vegetative Survey of Kitching Creek

Site G (surveyed 11/28/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	2
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	4
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	1
Bacopa monnieri	Water hyssop	3
Cephalanthus occidentalis	Buttonbush	1
Crinum americanum	String lily	3
Fraxinus caroliniana	Pop ash	3
Laguncularia racemosa	White mangrove	2
Mikania scandens	Climbing hempvine	3
Myrica cerifera	Wax myrtle	2
Nephrolepis sp.	Wild Boston fern	2
Osmunda regalis	Royal fern	1
Phlebodium aureum	Golden polypody	2
Pontederia cordata	Pickerelweed	2
Rhizophora mangle	Red mangrove	2.5
Rhynchospora sp.	Beakrush	1
Sabal palmetto	Cabbage palm	3
Sarcostemma clausum	White vine	3
Schinus terebinthifolius	Brazilian pepper	3
Taxodium distichum	Baldcypress	3.5
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Typha domingensis	Cattail	3

Semiquantitative Vegetative Survey of Kitching Creek

Site H (surveyed 11/28/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	3
Acrostichum sp.	Leather fern	4
Annona glabra	Pond apple	4
Aster caroliniana	Carolina aster	3
Baccaris sp.	Saltbush	2.5
Cephalanthus occidentalis	Buttonbush	2
Crinum americanum	String lily	3
Fraxinus caroliniana	Pop ash	2
Laguncularia racemosa	White mangrove	2
Ludwigia peruviana	Water primrose	2
Ludwigia repens	Creeping primrose willow	2
Mikania scandens	Climbing hempvine	3
Polygonum sp.	Swamp smartweed	2.5
Pontederia cordata	Pickerelweed	2
Rhizophora mangle	Red mangrove	1
Sabal palmetto	Cabbage palm	1
Sarcostemma clausum	White vine	2
Saururus cernuus	Lizard's tail	3
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	3
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia usneoides	Spanish moss	present
Typha domingensis	Cattail	2

Semiquantitative Vegetative Survey of Kitching Creek

Site I (surveyed 11/28/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	2
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	4
Aster caroliniana	Carolina aster	2
Baccaris sp.	Saltbush	2
Bacopa monnieri	Water hyssop	2
Blechnum serrulatum	Swamp fern	3
Boehmeria cylindrica	False nettle	1
Crinum americanum	String lily	3.5
Fraxinus caroliniana	Pop ash	2
Hypericum sp.		1.5
Hyptis sp.		2
Ilex cassine	Dahoon	1
Laguncularia racemosa	White mangrove	1
Ludwigia repens	Creeping primrose willow	present
Mikania scandens	Climbing hempvine	3
Osmunda regalis	Royal fern	3
Phlebodium aureum	Golden polypody	present
Poaceae sp.		1
Polygonum sp.	Swamp smartweed	present
Pontederia cordata	Pickerelweed	2
Rapanea punctata	Myrsine	1
Rhizophora mangle	Red mangrove	1
Rhynchospora sp.	Beakrush	2
Sabal palmetto	Cabbage palm	2
Sarcostemma clausum	White vine	2
Saururus cernuus	Lizard's tail	2.5
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	3
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae	Air plant	present
Tillandsia usneoides	Spanish moss	present
Vitits munsoniana	Wild grape	1

Semiquantitative Vegetative Survey of Kitching Creek

Site J (surveyed 11/28/00)

Scientific Name	Common Name	Abundance Index
Acer rubrum	Red maple	3
Acrostichum sp.	Leather fern	3
Annona glabra	Pond apple	3
Apios americana	American groundnut	1
Ardisia escallonioides	Marl berry	2
Baccaris sp.	Saltbush	2
Blechnum serrulatum	Swamp fern	3.5
Boehmeria cylindrica	False nettle	2
Crinum americanum	String lily	1
Fraxinus caroliniana	Pop ash	3
Hydrocotyl sp.	Water pennywort	1.5
Hyptis sp.		2
Itea virginica	Virginia willow	3
Ludwigia repens	Creeping primrose willow	present
Lygodium microphylum	Japanese climbing fern	3
Mikania scandens	Climbing hempvine	2.5
Osmunda regalis	Royal fern	3
Panicum spp.		2.5
Pleopeltis polypodioides	Resurrection fern	present
Polygonum sp.	Swamp smartweed	present
Rhabdadenia biflora	Rubber vine	1
Sabal palmetto	Cabbage palm	3
Saururus cernuus	Lizard's tail	2
Schinus terebinthifolius	Brazilian pepper	2
Taxodium distichum	Baldcypress	3.5
Tillandsia balbisiana	Air plant	present
Tillandsia fasciculata	Stiff-leafed wild pine	present
Tillandsia recurvata	Ball moss	present
Tillandsia setaceae	Air plant	present
Tillandsia usneoides	Spanish moss	present
Toxicodendron radicans	Poison ivy	2
Vigna luteola	Cow pea	2
Vitits munsoniana	Wild grape	2
Woodwardia sp.	Chain fern	2

APPENDIX D – STATISTICAL ANALYSIS OF FLOW SALINITY DATA

CONTENTS

RELATIONSHIP BETWEEN FLOW AND STAGE AT LAINHART DAM

Stage records are available from Lainhart Dam (see **Figure 2** on **page 9** of the Technical Document for a map of the area), which is a sheetpile weir driven into the bedrock and capped with concrete and logs to make it blend into the landscape. Lainhart Dam was rebuilt in 1986. The addition of wing walls and other work was carried out in 1995. Additional maintenance was conducted in 1991 during the drought.

Flow data from the Lainhart Dam is calculated from a stage-discharge curve. This curve was calculated by plotting flow measurements over the dam with surface water stage measurements. The collected stage data were converted to flow (cubic feet per second) using a rating curve developed by the District (**Figure D-1**). This stage/flow curve represents a recalibration of this relationship since repairs were conducted on Lainhart Dam. Earlier versions of this curve were used to estimate flows over Lainhart Dam for earlier periods in the record.

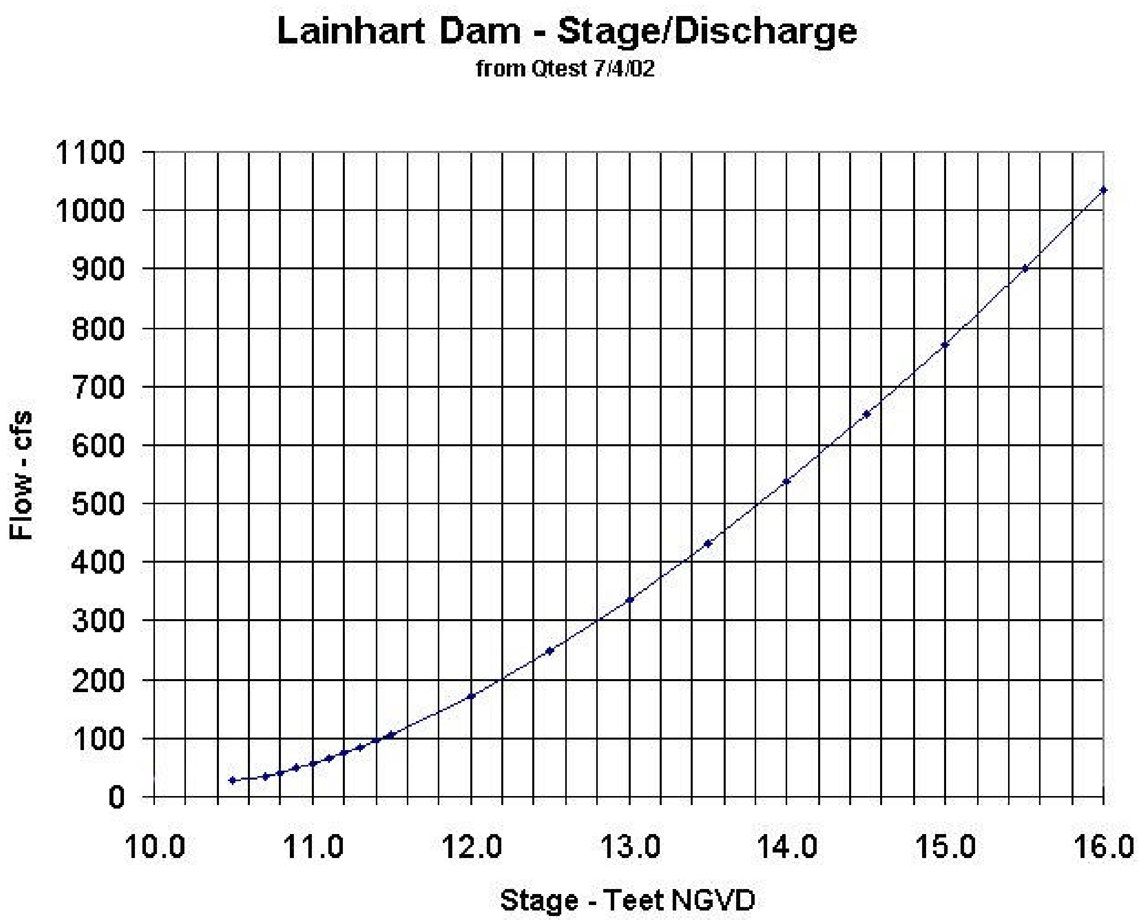


Figure D-1a. Stage-flow relationship used by the SFWMD to calculate flows over Lainhart Dam.

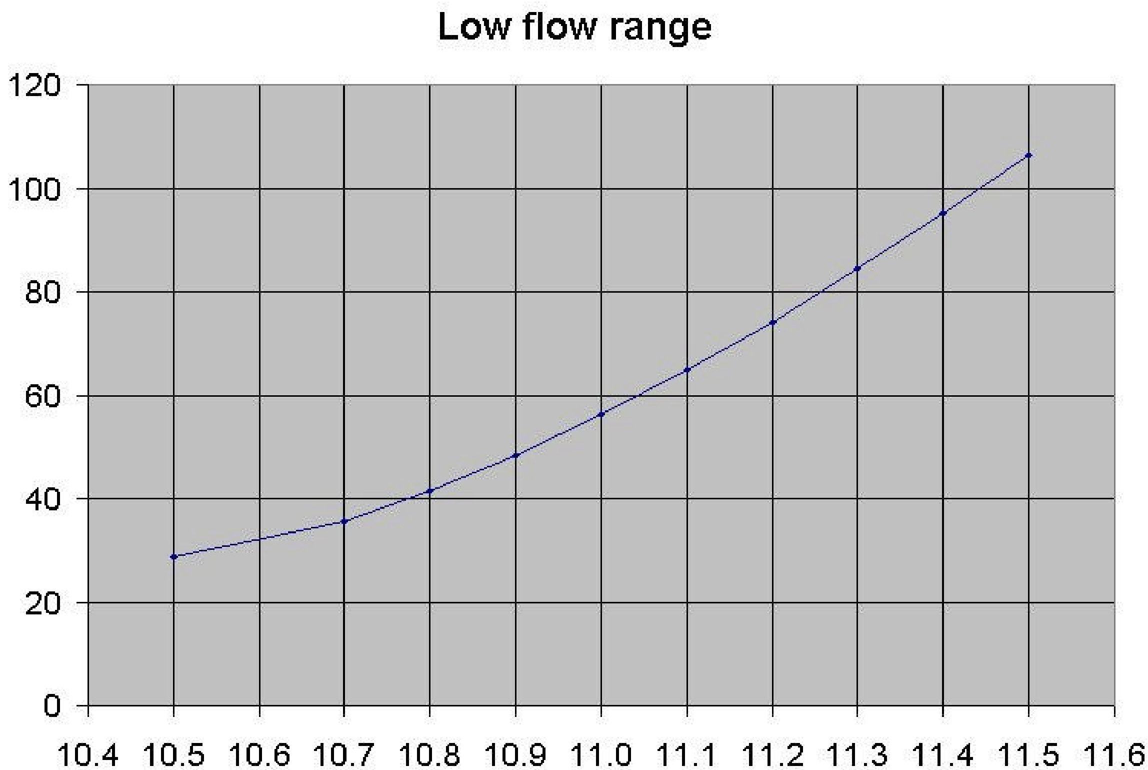


Figure D-1b. Low flow range of stage-flow relationship used by the SFWMD to calculate flows over Lainhart Dam.

RELATIONSHIP BETWEEN FLOW AND SALINITY IN THE NW FORK OF THE LOXAHATCHEE RIVER

Historical flow and salinity data have been periodically collected for the Loxahatchee River and estuary since the 1970's (e.g., Rodis 1973, Chiu 1975, Russell and McPherson 1984, Mote Marine Laboratory 1990b, Dent 1997). The January 1997 – July 2000 period of record was selected because it brackets the period when recent changes were made to the river channel. Several river channels (or gaps) were created over the past 25 years to provide shorter routes for boaters. Unfortunately, these "shortcuts" bypassed historic river meander flow patterns and provided a more direct path for the upstream migration of salt water. In 1997, the Jupiter Inlet District constructed a number of earth and rock dams to seal off these short cuts and reestablish historical flow routes for the river. Salinity studies conducted by the Loxahatchee River Environmental Control District demonstrated that these construction activities resulted in lower salinity levels upstream of the closures (Dent, 1997). The 1997-2000 period of record reflects these hydrologic improvements to the river as well as the 1994 re-calibration of flow data obtained from the Lainhart Dam. This time period also includes a wide range of both high, average, and low flow periods and also corresponds to the most recent set of salinity values collected for the river by the Loxahatchee River Environmental Control District.

Historical salinity data for five river sampling sites were obtained from water quality surveys conducted by the Loxahatchee River Environmental Control District for the period of record January 1997-July 2000. Water Quality Station # 63 is located at a depth of about 3.0 meters between mid-channel and the southern shore at approximately SFWMD river mile 6.5 in the vicinity of the south boat ramp for Jonathan Dickinson State Park. This station was used previously by the U.S. Geological Survey, the SFWMD, and the Loxahatchee River Environmental Control District to record Results of the regression analyses and their associated graphical plots are presented in figures at the end of this appendix.

Statistical analyses of the salinity-flow data were conduced using SAS at different ranges of salinity. The reason for this is that while a regression curve generated for all field salinity data points gives a decent fit on a very scattered data set, the curve does not fit the field data well in the low salinity range. In the area below a few ppt, all data dots may fall below the curve. It is difficult for a regression model to fit all the field data well over the entire data range and should be used only in the data range where the regression curve gives a good fit in the salinity range of interest.

In order to relate salinity measurements with Lainhart flows, daily flow data were obtained from the SFWMD's DBHYDRO data retrieval system for the Lainhart Dam for the period of record from January 1997 through July 2000 (see data tables at the end of this appendix). **Table D-1 and Figure D-2** provide summaries of the minimum dry season flow rates that are required to be delivered from the Lainhart Dam to the NW Fork of the Loxahatchee River to maintain a bottom salinity of 2 ppt for selected locations along the river. These results are reported in SFWMD river miles upstream from the Jupiter inlet.

Table D-1. Relationship between Dry Season Lainhart Dam Flow and estimated position of the saltwater wedge within the Northwest Fork of the Loxahatchee River.

Water Quality Station Number	Upstream Extent of 2 ppt salinity wedge (river miles)	Dry Season discharges from Lainhart Dam (cfs)	
		Total Data Set (Jan 1997-Jul/2000)	After closure of Gaps
WQ Station # 63	6.5	203	236
Avg. of WQ Stations # 63 &64	7.1	146*	161*
WQ Station # 64	7.7	90	87
Avg. of WQ Stations # 64 & 65	8.1	68*	68*
WQ Station # 65	8.6	47	49
Avg. of WQ Stations # 65 & 66	9.0	31*	32*
WQ Station # 66	9.4	15	15**
WQ Station # 67	10.5	<10	< 10**

- = Flows shown were estimated by interpolation of data between upstream and downstream water quality sampling stations;
- ** Represents upper limit for this value

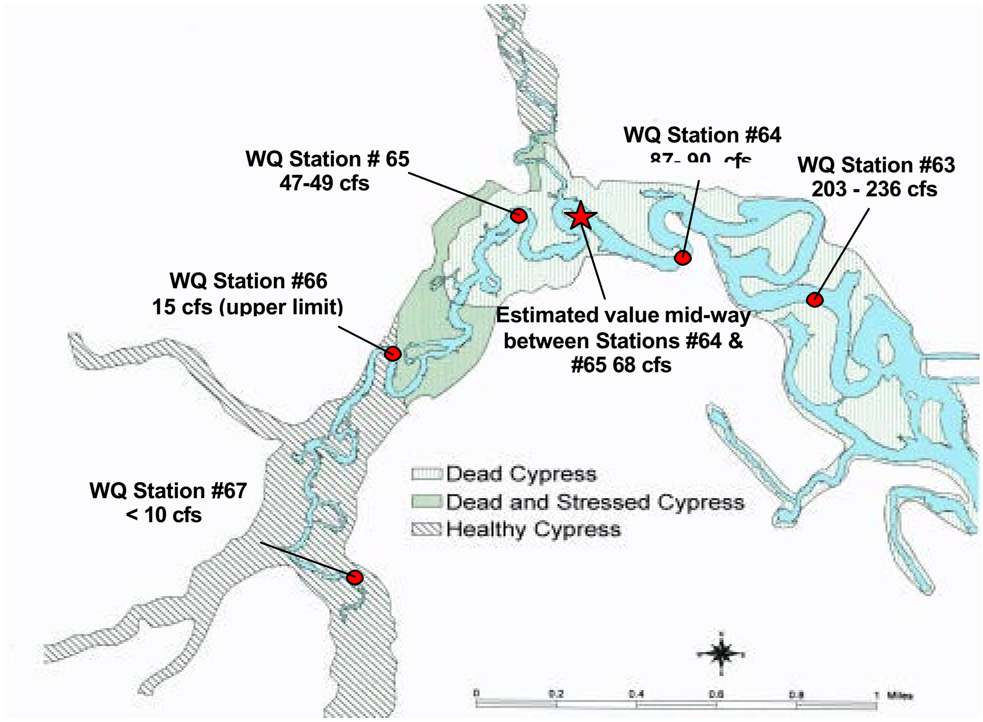


Figure D-2. Amount of flow required from Lainhart Dam to maintain river bottom salinity of 2ppt at selected sites, NW Fork, Loxahatchee River

WQ Station # 63 (River Mile 6.5)

Station # 63 **(Figure D-2)** is located just upstream from the south boat ramp in Jonathan Dickinson State Park at SFWMD river mile 6.5. This site generally represents the nearest river water quality station adjacent to the central embayment (estuary). This water quality monitoring site is directly influenced by the daily tidal cycle and upstream movement of saltwater. Over the three year period of record, daily salinity values ranged from less than 0.4 ppt during high discharge events, to a high of 20-25 ppt recorded during a number of low flow periods. Time series for flow and salinity for each of the five river water quality sampling stations are shown in figures at the end of this appendix.

Results of the regression analyses show that a flow of within the range of 203 - 236 cfs would be required from the Lainhart Dam to reduce river bottom salinity to less than 2 ppt at WQ Station # 63 (**Figure D-2**). Salinity data recorded from this site exhibited a wide degree of variability as compared to the other upstream monitoring sites. This low correlation occurs, in part, because this site is the most downstream monitoring station and is subject to greater daily tidal fluctuations, effects of wind, and major storm events due to its proximity to the ocean at the Jupiter Inlet. In addition, this area may also be subject to the cumulative effects of freshwater seepage from surrounding uplands and other inflows that are not fully accounted for in the estimated river flow.

WQ Station # 64 (River Miles 7.7)

This station is located approximately 1.2 miles upstream of Station # 63 or about 0.5 mile upstream of the Jonathan Dickinson State Park canoe concession area at river mile 7.7. Because this site is located further upstream within the NW Fork, it showed less variability among data points as compared to Site # 63 (see figures at the end of this appendix). Seasonal salinity values range from less than 0.1 ppt (essentially freshwater) to 15 – 24 ppt during low flow periods. Review of historical data shows that significantly less river flow is required to maintain the saltwater wedge (**Table D-1)** at this site as compared to WQ Station # 63**.** At this location, flows within the range of 87-90 cfs are needed from the Lainhart Dam, plus another estimated 10 cfs from other upstream sources, to maintain the salinity wedge at 2 ppt. The estimated dry season flow contributions for these other upstream tributaries were estimated as: Cypress Creek (7 cfs), Kitching Creek (2 cfs), and Hobe Grove Ditch (1 cfs) based on typical dry season flow values obtained from the USGS study (Russell and McPherson, 1984). Therefore, the total amount of water needed to maintain the salinity wedge at river mile 7.7 is approximately 100 cfs.

Confluence of NW Fork and Kitching Creek (River Mile 8.1)

River mile 8.1 is located just below the mouth of Kitching Creek about one mile downstream of the "stressed cypress zone" (**Figure D-2).** This area was selected as a point of interest because it lies just downstream of the remaining cypress river-swamp habitat that the proposed MFL is trying to protect, and it also lies just downstream of Kitching Creek, an area that still contains significant amounts of cypress swamp habitat. Because no water quality data exists for this site, an estimate was made of the amount flow that needed to delivered from the Lainhart Dam to maintain the salinity wedge at 2 ppt at river mile 8.1. Water quality and flow data from WQ Stations #64 (RM 7.7) and WQ Station #65 located further upstream at RM 8.6 were averaged together to arrive at 68 cfs as the amount of flow required to maintain the freshwater-saltwater interface at less than 2 ppt at river mile 8.1. (e.g., (49 cfs + 87 cfs)/2 = 68 cfs).

It is important to note that during the 1940's Kitching Creek and areas located just upstream from this point in the river supported significant amounts of swamp hardwood (cypress) habitat as documented **Figure B-6 Appendix B** of this report. Interpretation of the vegetation studies conducted by Alexander and Crook (1975) show that swamp hardwoods were still the predominate vegetation cover at this point in the river in the early 1970s. Review of 1995 infrared photos (**Figure B-6, Appendix B)** shows that this same area of the river is now dominated by mangroves, most likely a response to increased salinity levels at this point in the river over the past 30 years.

WQ Station # 65 (River Mile 8.6)

Station # 65 is located about 0.5 miles above the confluence of Kitching Creek and the NW Fork of the River, or about 0.9 mile upstream of Station # 64 at RM 8.6. Because this site is located further upstream within the NW Fork, the data shows less variability than what occurs at downstream water quality monitoring sites (see figures at the end of this appendix). Seasonal salinity values range from less than 0.1 ppt (freshwater) to 13 – 19 ppt during low flow periods.

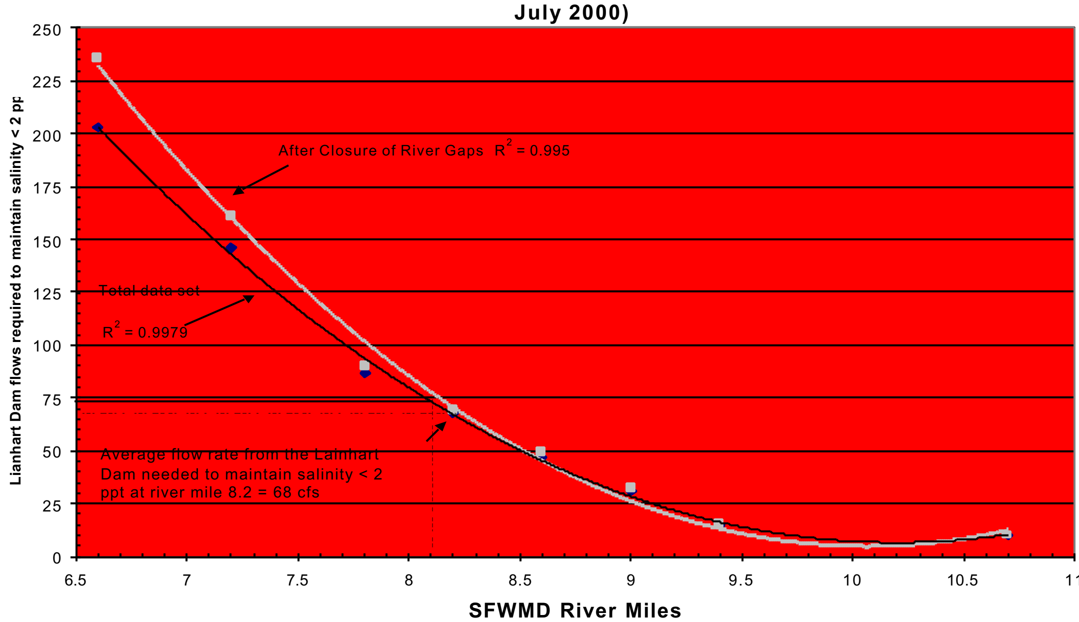
Results of the regression analyses indicate that flow rates within the range of 47-49 cfs are required from the Lainhart Dam to maintain salinity at or below 2 ppt at RM 8.6 (**Table D-1**). This is about 44% less flow required to maintain the salinity wedge at RM 8.6 as compared to WQ Station # 64 located 0.9 miles downstream. This is an important sampling location in that it represents the transition zone between downstream areas of the river that have been impacted by saltwater intrusion (i.e., historical bald cypress communities replaced by mangroves), and upstream areas of the river that are currently stressed by periodic exposure to saline water (**Figure D-2).**

WQ Stations # 66 & 67 (River Miles 9.4 & 10.5)

Review of water quality data collected from WQ Stations #66 (river mile 9.4) and #67 (river mile 10.5) show that during average and high flow conditions, these two sites are dominated primarily by freshwater. However during prolonged drought conditions, saltwater moves upstream to both of these sites within the river within relatively short time periods (days). For example, the flow/salinity relationship developed for Station # 67 (River Mile 10.5) in **Table D-1** shows that during prolonged low flow periods (flows less than 10 cfs) saltwater will penetrate upstream areas of the river as far as Trapper Nelson's. Although the number of data points collected from this upstream area of the river are significantly less than the downstream monitoring sites, these data correlate well with previous salinity studies conducted on the river (e.g., Russell and McPherson 1984). Similar results are shown for WQ Station # 66 where the upper limit of 15 cfs was estimated as the required flow delivered from the Lainhart dam to maintain a salinity of less than 2 ppt at river mile 9.4 **(Figure D-2).**

Based on the statistical analysis of the flow/salinity data discussed above, **Figure D-3** provides the general relationship between the volume of water need to be delivered from the Lainhart Dam during the dry season to maintain salinity near 2 ppt at various locations (river miles)along the NW Fork of the

Figure D-3. Lainhart Dam Flow Rates Required to Maintain Salinity at or below 2 ppt at Selected Points in the NW Fork of the Loxahatchee River (Jan. 1997-July 2000)



CALCULATION OF MEAN WET AND DRY SEASON FLOWS TO THE LOXAHATCHEE ESTUARY

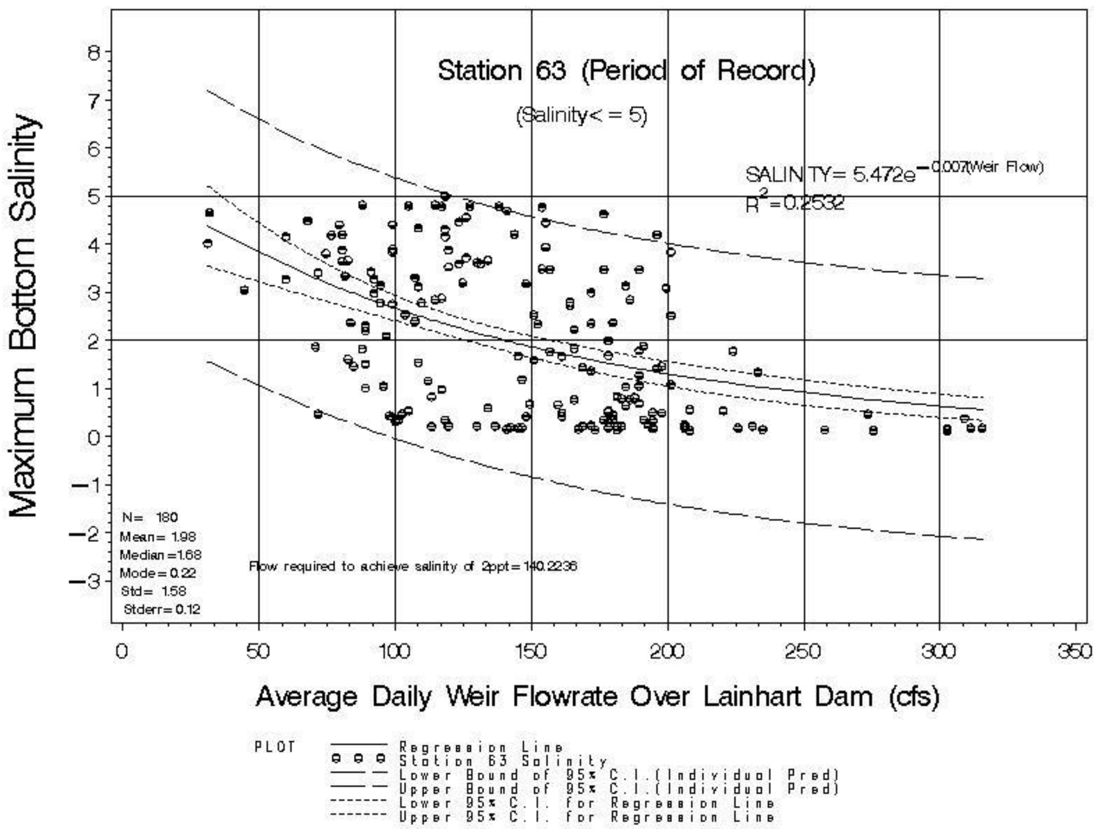
Table D-37 provides a summary of average freshwater flows delivered to the three forks of the Loxahatchee estuary during the wet and dry seasons as well as during selected drought events. Four major sources of water (G-92 and the Lainhart Dam, Cypress Creek, Hobe Grove Ditch and Kitching Creek) provide the majority of freshwater flow to the Northwest Fork of the Loxahatchee River. Other historical inputs such as Moonshine Creek and Wilson Creek have been highly altered by drainage and development, and today only provide a very small portion of flow to the Northwest Fork of the river and are not included in the table.

Table D-37. Summary of Average Wet and Dry Season Flows to the Loxahatchee Estuary.

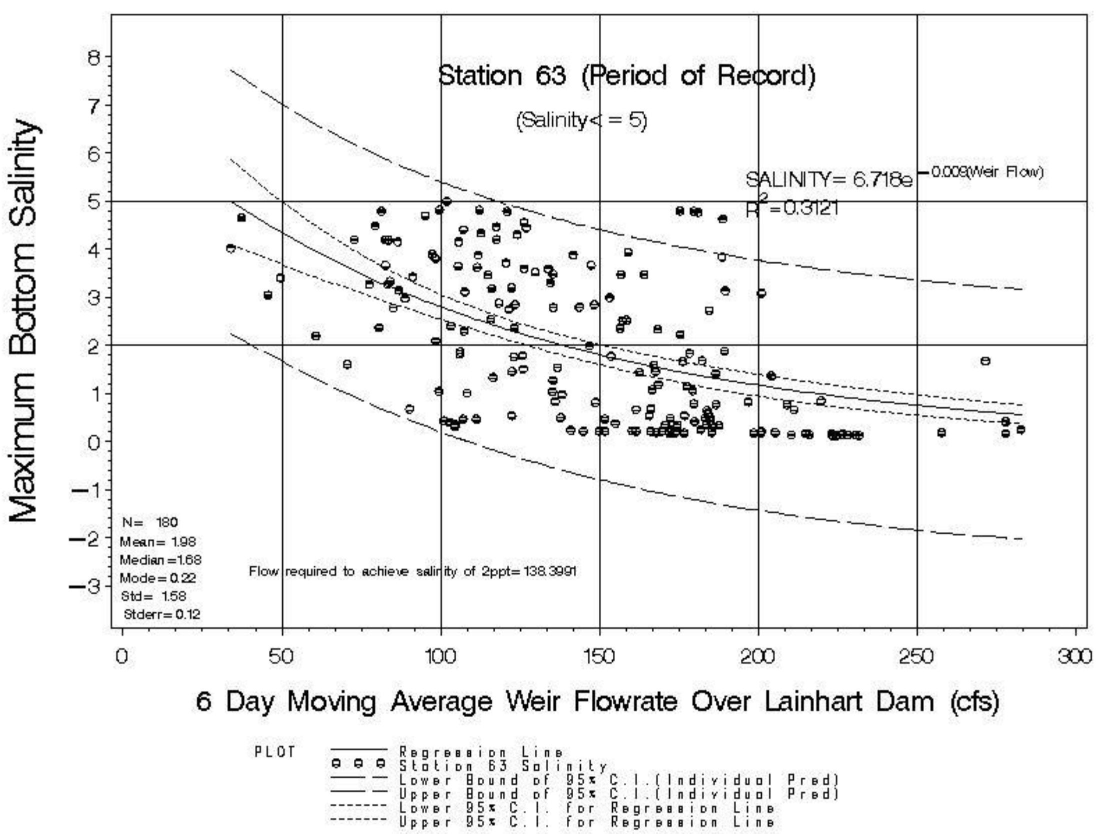
Tributary	Average Daily Flow (cfs)		1980-81 drought Avg. flow (cfs)		1989-90 drought Avg. Flow (cfs)		Period of Record
	Wet Season	Dry Season [1]	Wet Season (5/15/81-10/15/81)	Dry Season (10/14/80-5/14/81)	Wet Season (5/15/90-10/15/90)	Dry Season (10/14/89-5/14/90)	
Northwest Fork							
Lainhart Dam	95	70	65	35	68	26	1971-2001
Cypress Creek	60	32	57	30	41	30	1980-1991
Hobe Grove Ditch	9	7	11	7	9	7	1979-1991
Kitching Creek	21	16	8	5	3	1	1979-2001
Subtotal	*185*	*125*	*141*	*77*	*121*	*64*	
North Fork [2]							
USGS sites 28B & 28c	4	1	4	1	ND	ND	1980-1982
Southwest Fork							
C-18 Canal@S-46	94	61	61	20	8	8	1961-2001
Total	283	187	206	98	129	72	

[1] Wet season defined as May 15- Oct. 15; Dry season = Oct. 16- May 14
[2] From Russell and McPherson 1984 (POR 1980-1982)

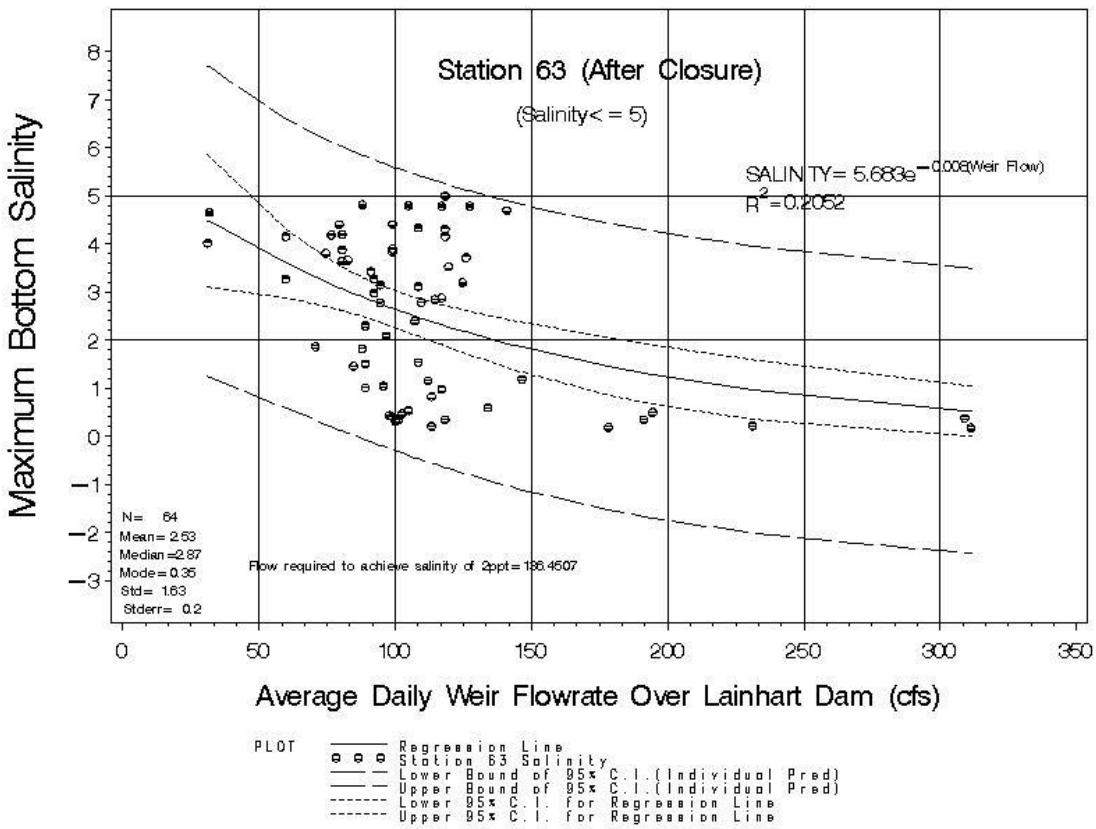
The average wet and dry season flows for Lainhart Dam, Cypress Creek, Hobe Grove Ditch, Kitching Creek, and the C-18 Canal @ S-46 were calculated by averaging the flows recorded from May 15 to October 15 over the period of record, and from October 16 to May 14 of the following year over the period of record, respectively. In cases where the data sets were discontinuous, the averages were calculated using the information that was available. The DBHYDRO data that was available for the tributary analysis are summarized on the following tables. The average wet and dry season flows for the North Fork were taken from Russell and McPherson (1984).

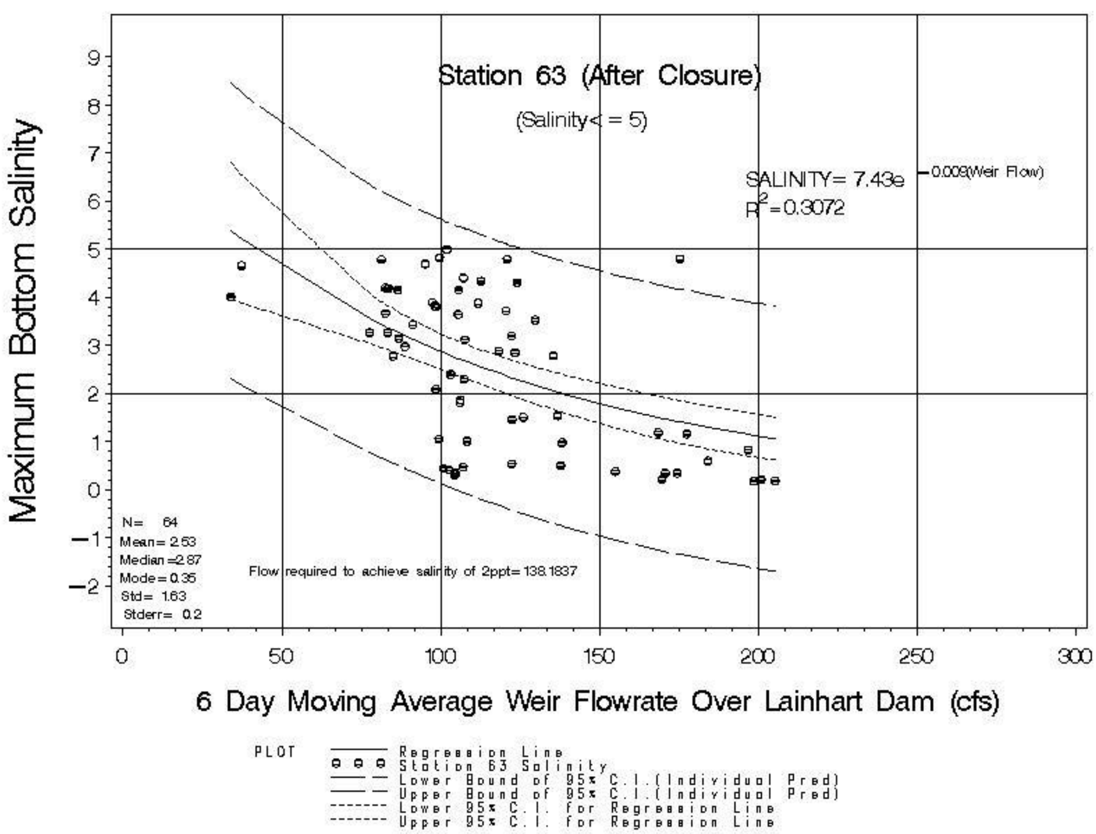


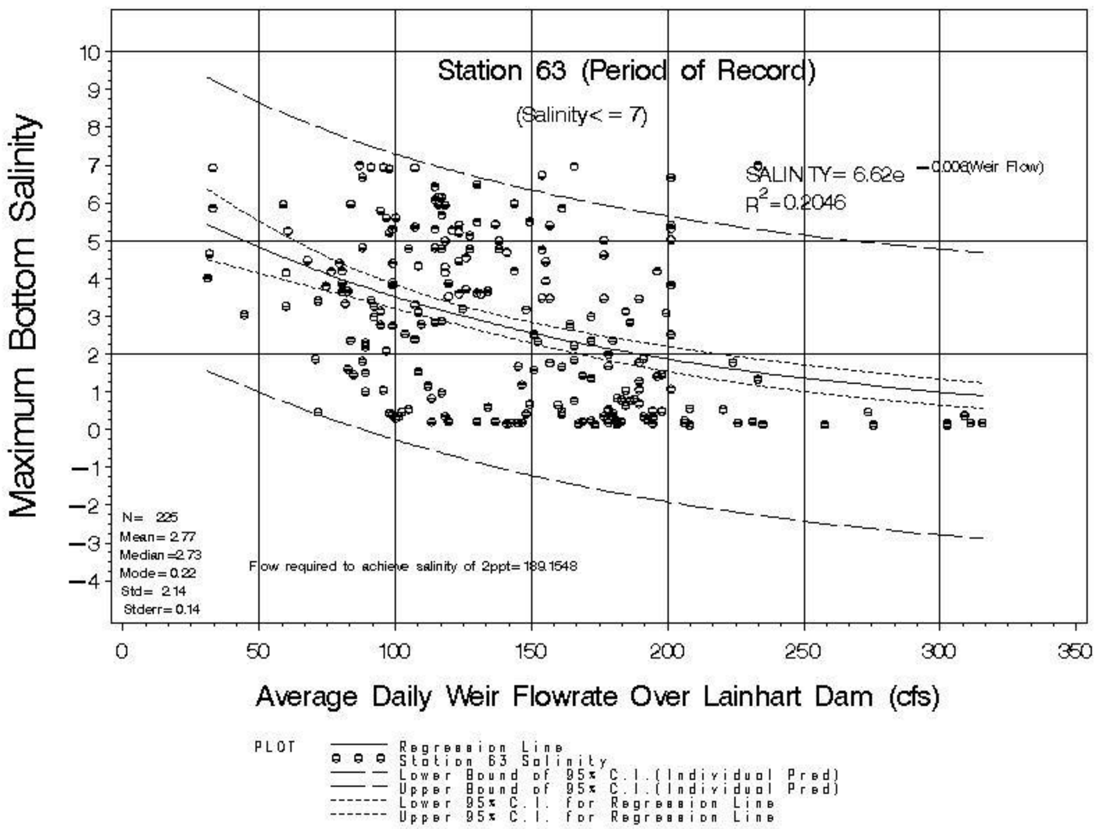
Station 63 (Period of Record)
(Salinity< = 5)
SALINITY= 5.472e^-0.007(Weir Flow)
R^2=0.2532
Maximum Bottom Salinity
N= 180
Mean= 1.98
Median =1.68
Mode= 0.22
Std= 1.58
Stderr= 0.12
Flow required to achieve salinity of 2ppt= 140.2236
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

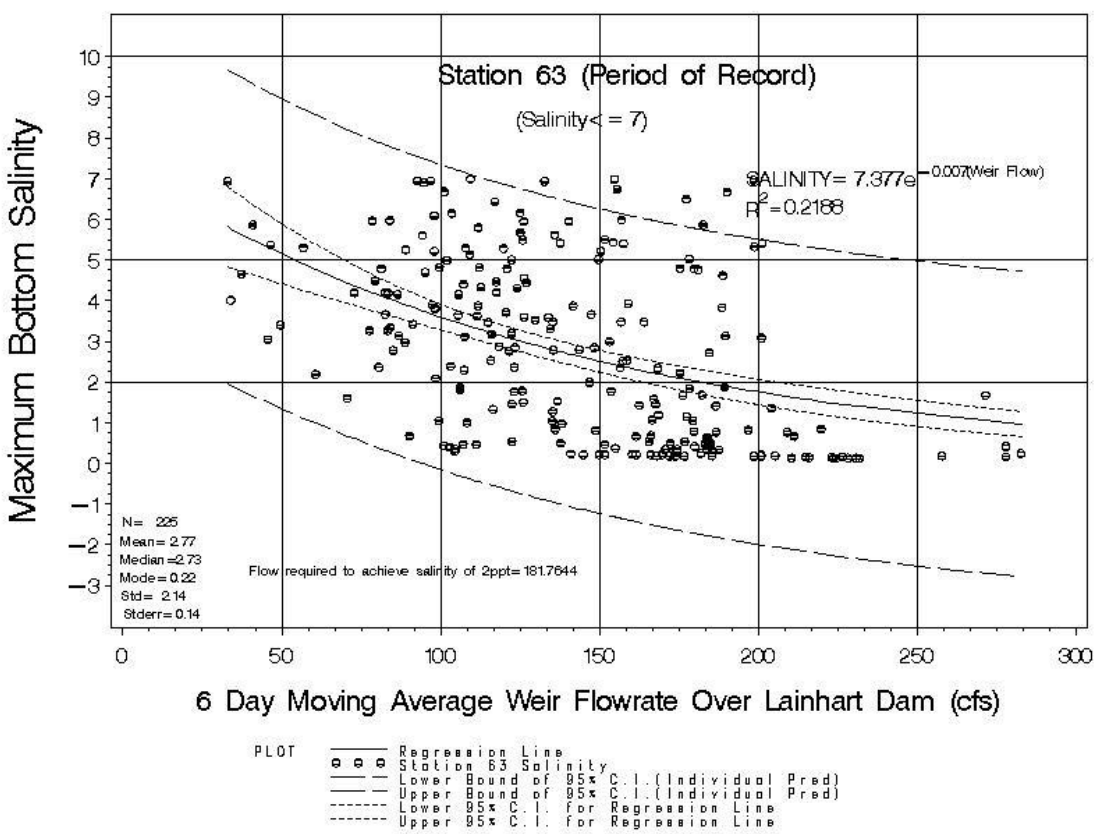


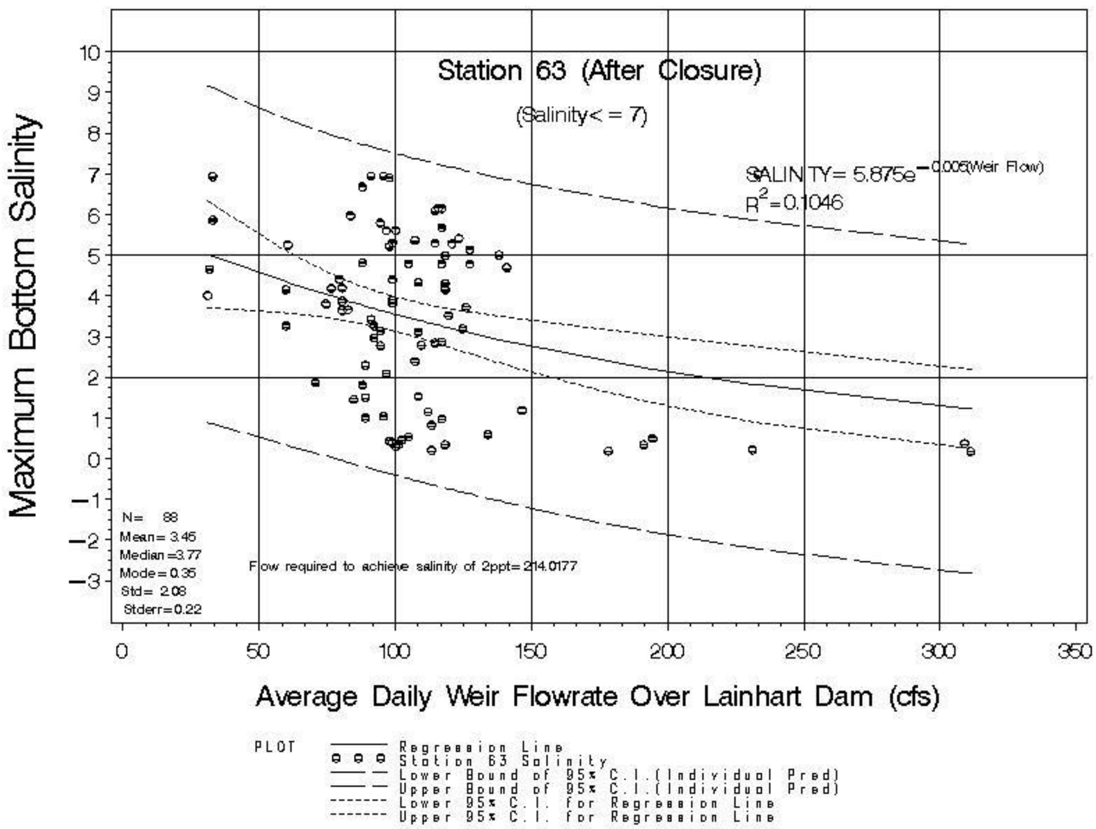
Station 63 (Period of Record)
(Salinity< = 5)
SALINITY= 6.718e^-0.009(Weir Flow)
R^2=0.3121
Maximum Bottom Salinity
N= 180
Mean= 1.98
Median =1.68
Mode= 0.22
Std= 1.58
Stderr= 0.12
Flow required to achieve salinity of 2ppt= 138.3991
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

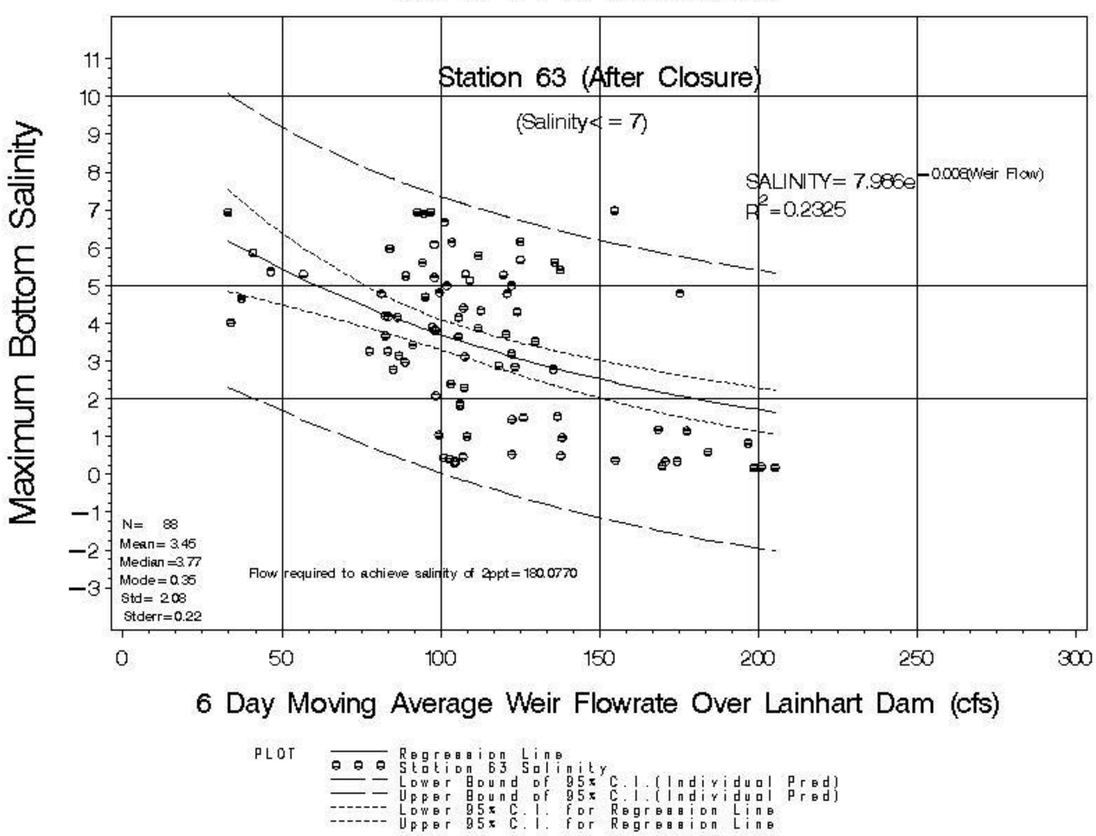

Station 63 (After Closure)
(Salinity< = 5)
SALINITY= 5.683e^-0.008(Weir Flow)
R^2=0.2052
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
N= 64
Mean= 2.53
Median =2.87
Mode= 0.35
Std= 1.63
Stderr= 0.2
Flow required to achieve salinity of 2ppt= 136.4507
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

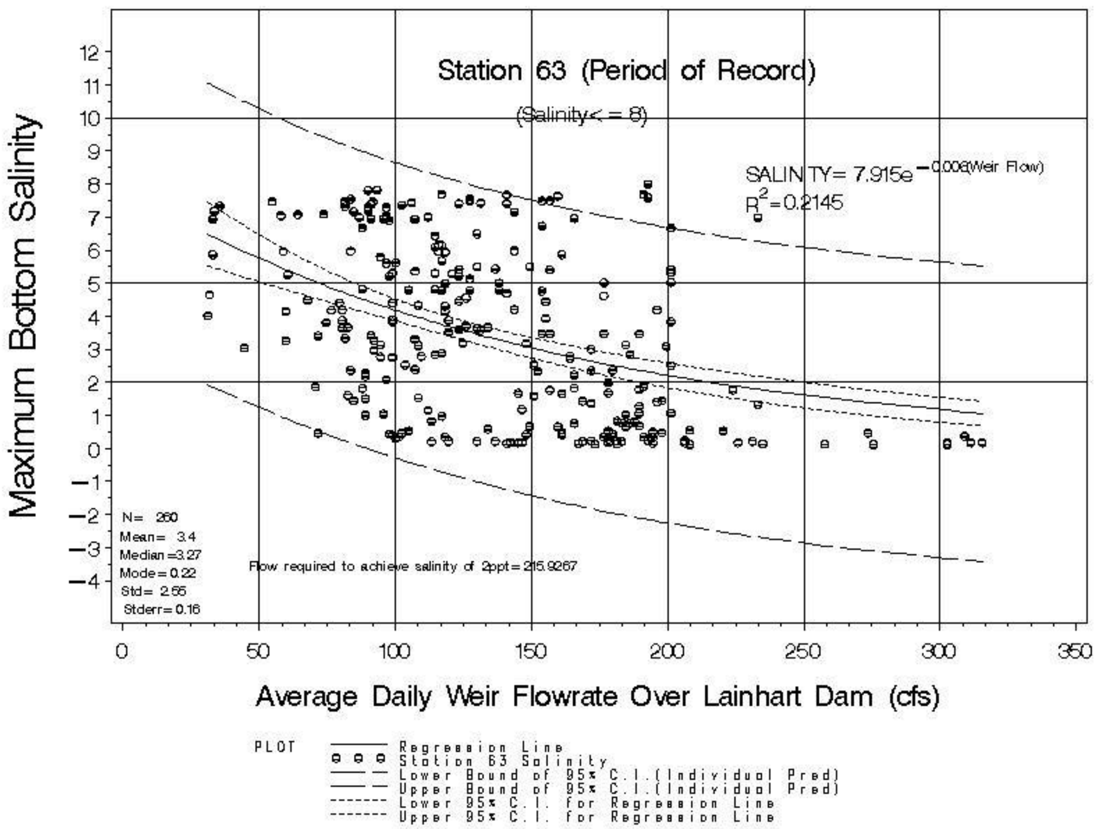

Station 63 (After Closure)
(Salinity< = 5)
SALINITY= 7.43e^-0.009(Weir Flow)
R^2=0.3072
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
N= 64
Mean= 2.53
Median =2.87
Mode= 0.35
Std= 1.63
Stderr= 0.2
Flow required to achieve salinity of 2ppt= 138.1837
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

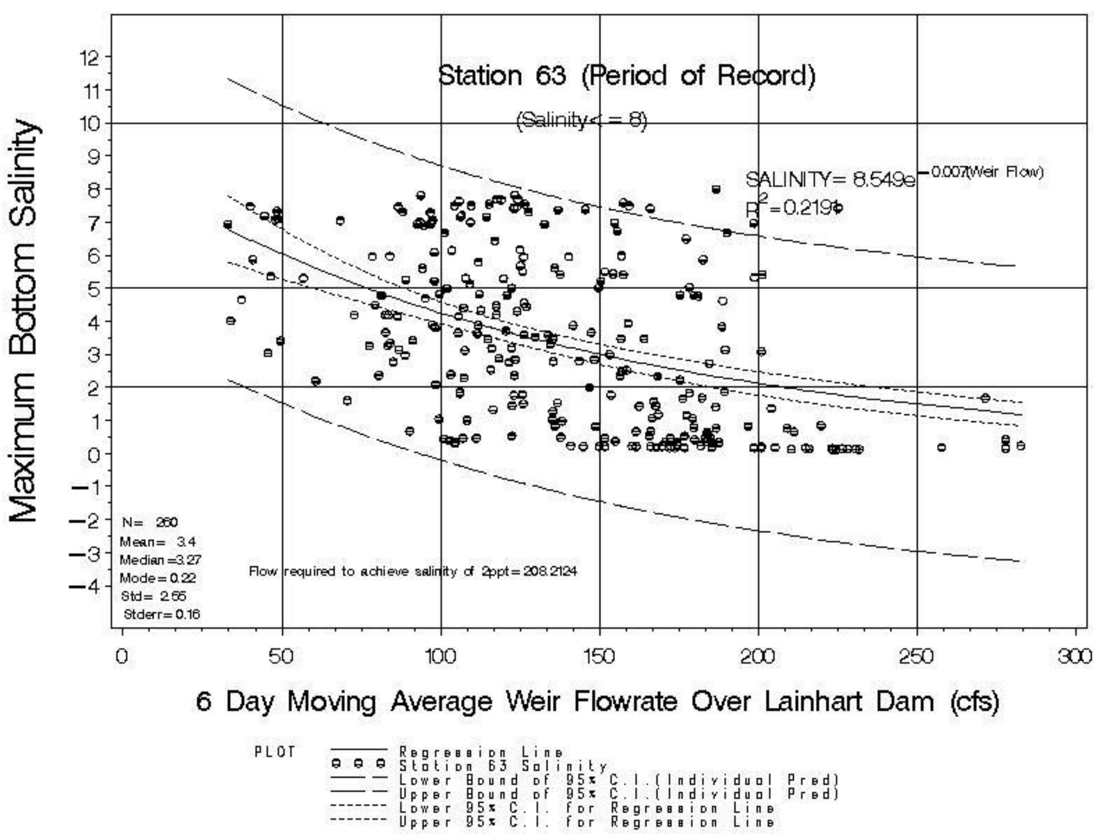

Station 63 (Period of Record)
(Salinity< = 7)
SALINITY= 6.62e^-0.006(Weir Flow)
R^2=0.2046
Maximum Bottom Salinity
N= 225
Mean= 2.77
Median =2.73
Mode= 0.22
Std= 2.14
Stderr= 0.14
Flow required to achieve salinity of 2ppt= 189.1548
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

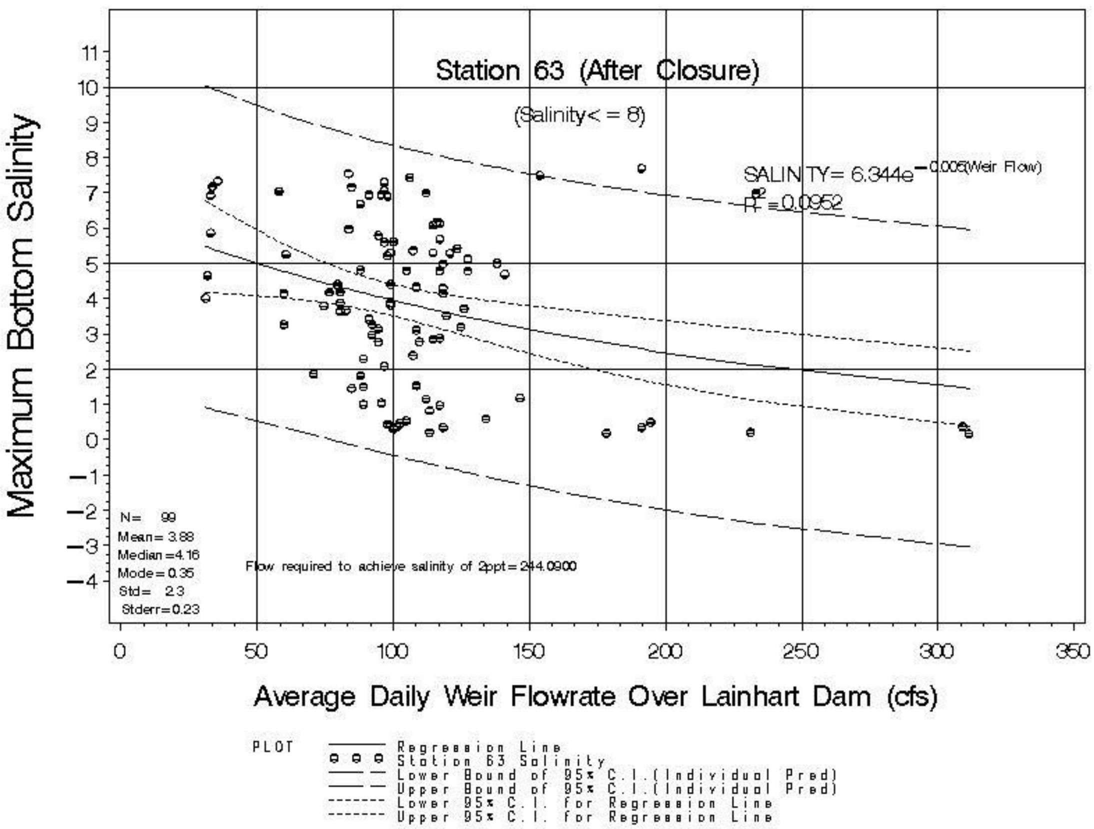

Station 63 (Period of Record)
(Salinity< = 7)
SALINITY= 7.377e^-0.007(Weir Flow)
R^2=0.2188
Maximum Bottom Salinity
N= 225
Mean= 2.77
Median =2.73
Mode= 0.22
Std= 2.14
Stderr= 0.14
Flow required to achieve salinity of 2ppt= 181.7644
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

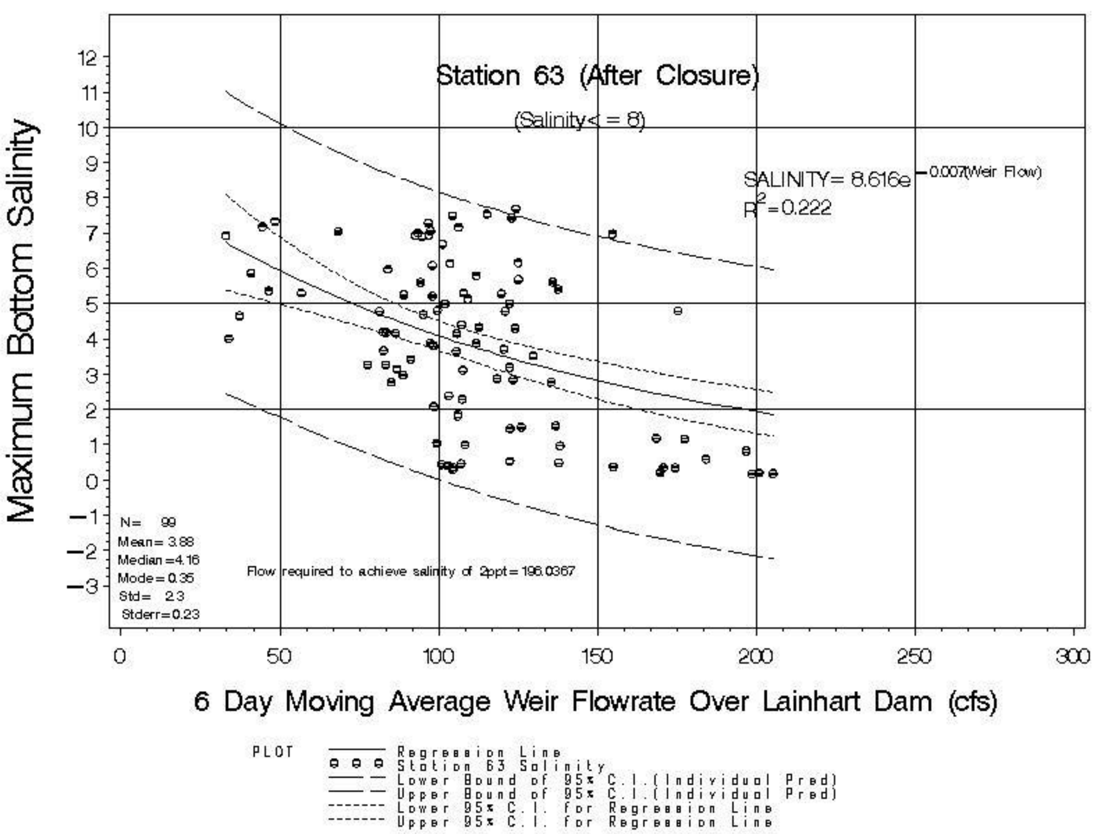

Station 63 (After Closure)
(Salinity< = 7)
SALINITY= 5.875e^-0.005(Weir Flow)
R^2=0.1046
N= 88
Mean= 3.45
Median =3.77
Mode= 0.35
Std= 2.08
Stderr=0.22
Flow required to achieve salinity of 2ppt= 214.0177
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

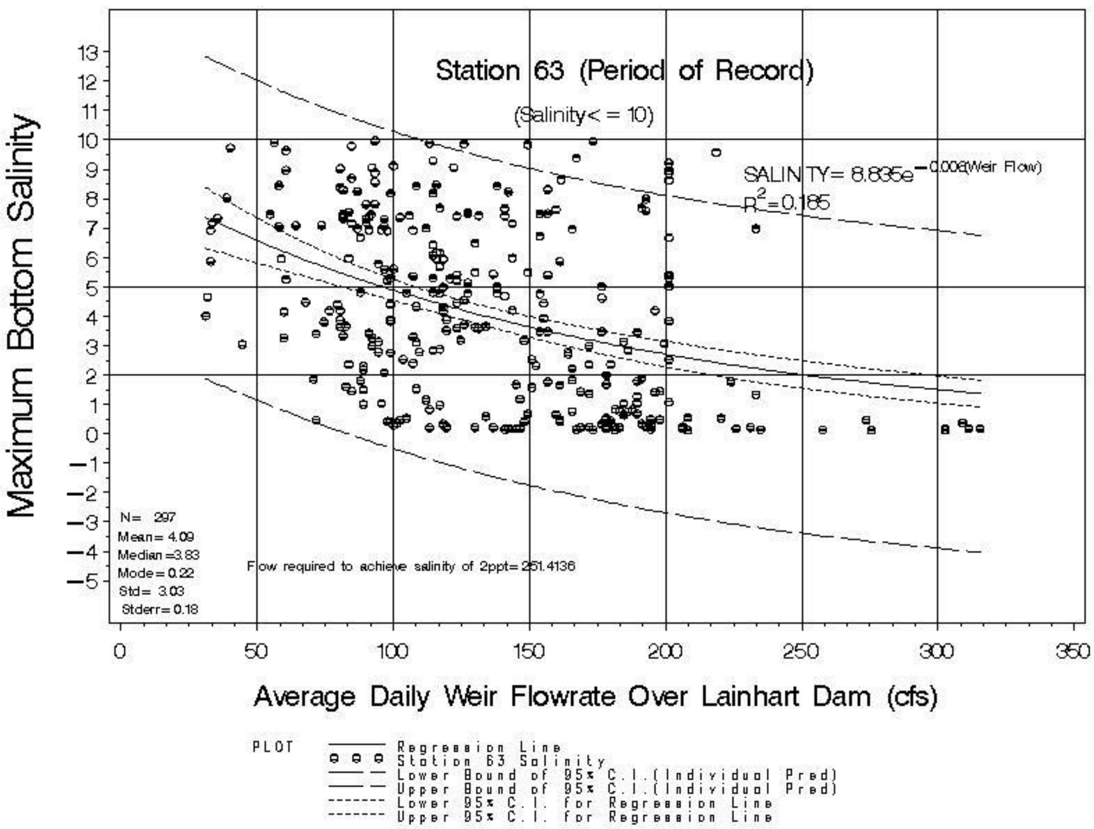

Station 63 (After Closure)
(Salinity< = 7)
SALINITY= 7.986e^-0.008(Weir Flow)
R^2=0.2325
N= 88
Mean= 3.45
Median =3.77
Mode= 0.35
Std= 2.08
Stderr=0.22
Flow required to achieve salinity of 2ppt= 180.0770
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

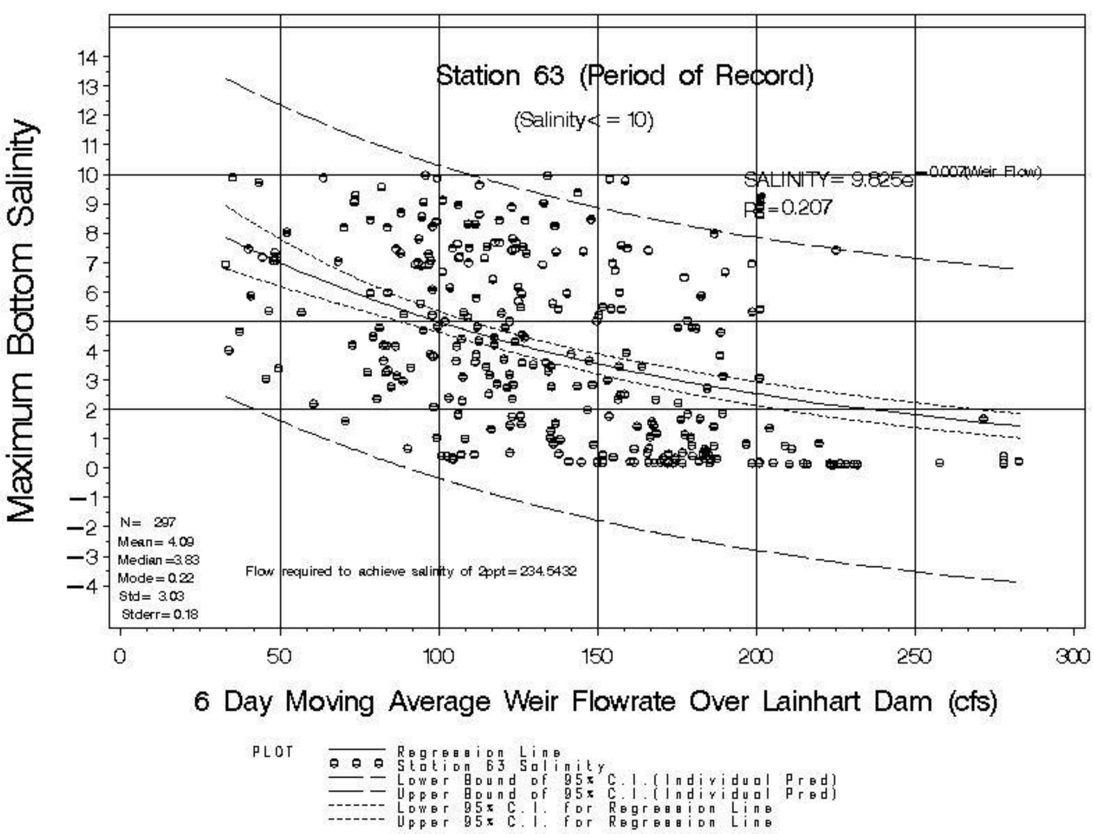

Station 63 (Period of Record)
(Salinity< = 8)
SALINITY= 7.915e^-0.006(Weir Flow)
R^2=0.2145
Maximum Bottom Salinity
N= 260
Mean= 3.4
Median =3.27
Mode= 0.22
Std= 2.65
Stderr= 0.16
Flow required to achieve salinity of 2ppt= 215.9267
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

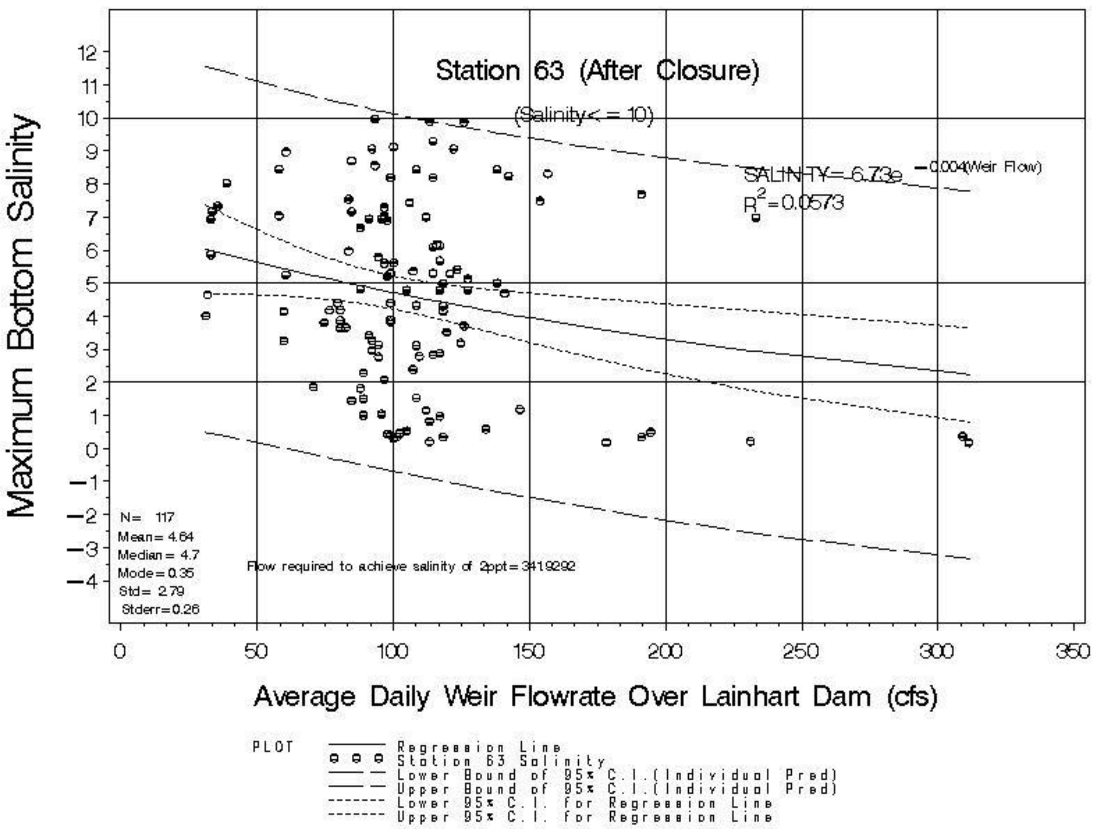

Station 63 (Period of Record)
(Salinity< = 8)
SALINITY= 8.549e^-0.007(Weir Flow)
R^2=0.2191
Maximum Bottom Salinity
N= 260
Mean= 3.4
Median =3.27
Mode= 0.22
Std= 2.65
Stderr= 0.16
Flow required to achieve salinity of 2ppt= 208.2124
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

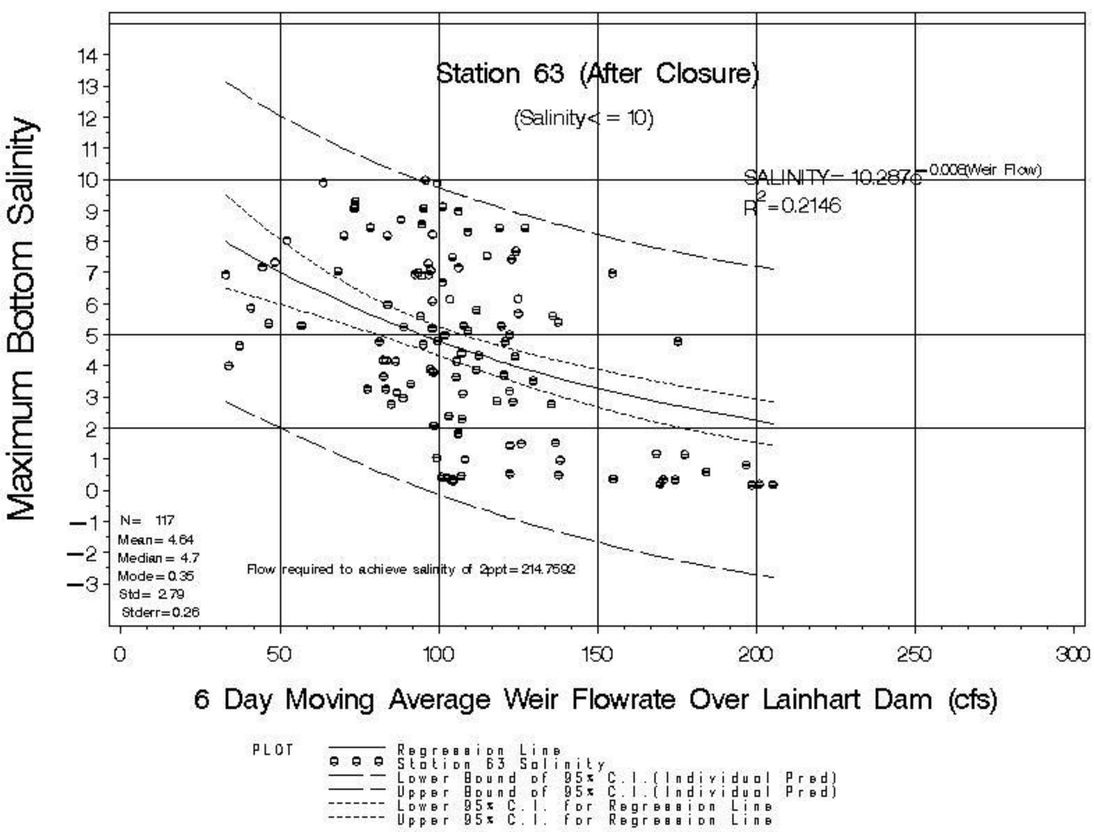

Station 63 (After Closure)
(Salinity< = 8)
SALINITY= 6.344e^-0.005(Weir Flow)
R^2 = 0.0952
Maximum Bottom Salinity
N= 99
Mean= 3.88
Median=4.16
Mode=0.35
Std= 2.3
Stderr=0.23
Flow required to achieve salinity of 2ppt=244.0900
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

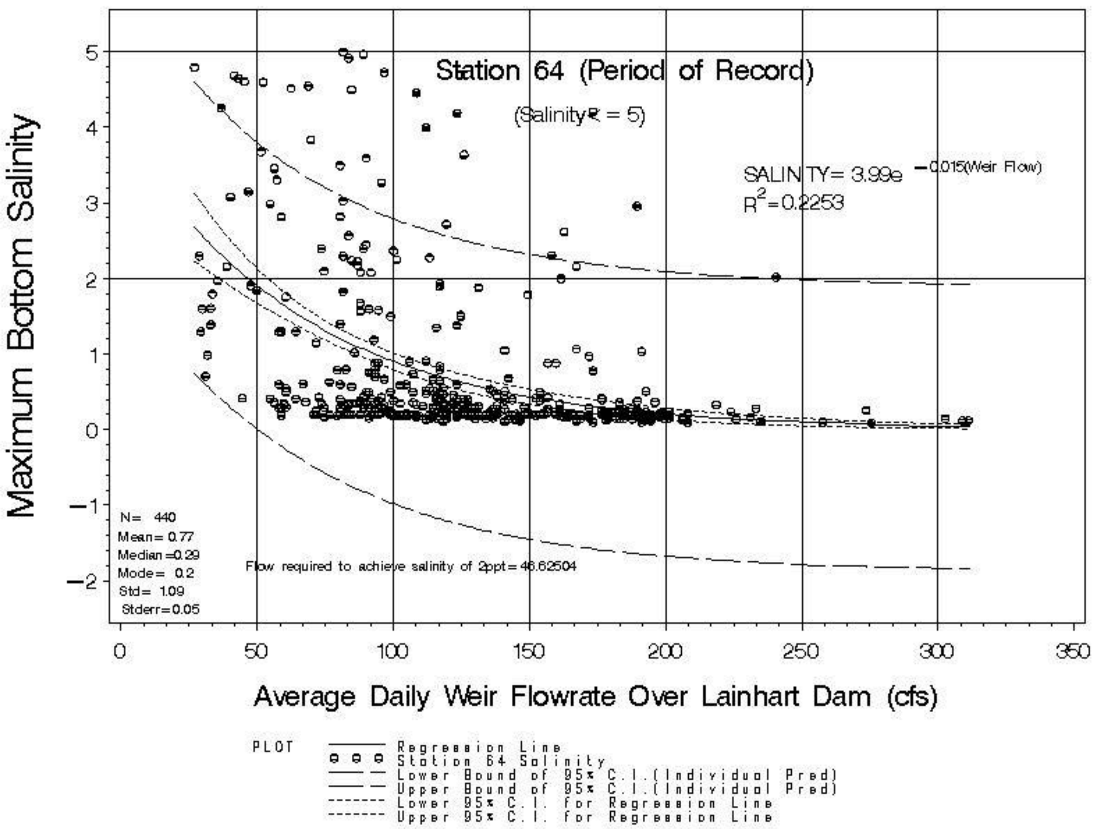

Station 63 (After Closure)
(Salinity< = 8)
SALINITY= 8.616e^-0.007(Weir Flow)
R^2 = 0.222
Maximum Bottom Salinity
N= 99
Mean= 3.88
Median=4.16
Mode=0.35
Std= 2.3
Stderr=0.23
Flow required to achieve salinity of 2ppt=196.0367
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

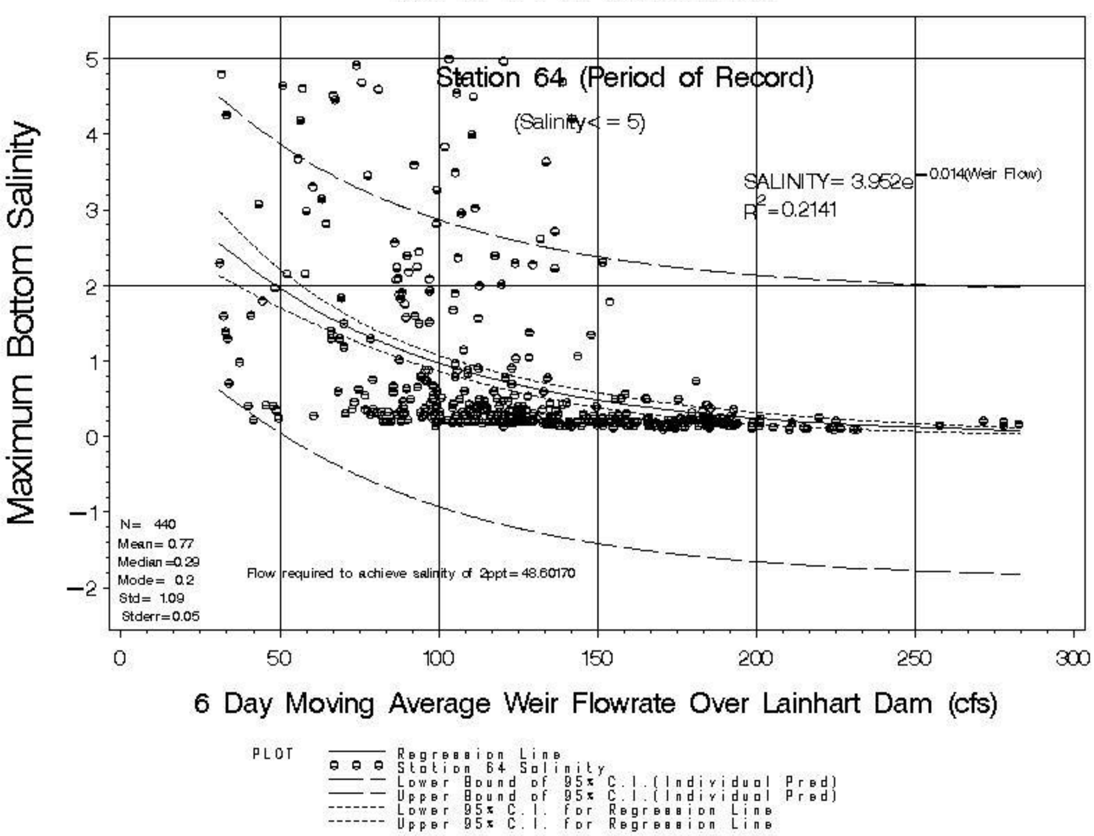

Station 63 (Period of Record)
(Salinity< = 10)
SALINITY= 8.835e-0.006(Weir Flow)
R2=0.185
Maximum Bottom Salinity
N= 297
Mean= 4.09
Median =3.83
Mode= 0.22
Std= 3.03
Stderr= 0.18
Flow required to achieve salinity of 2ppt= 251.4136
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

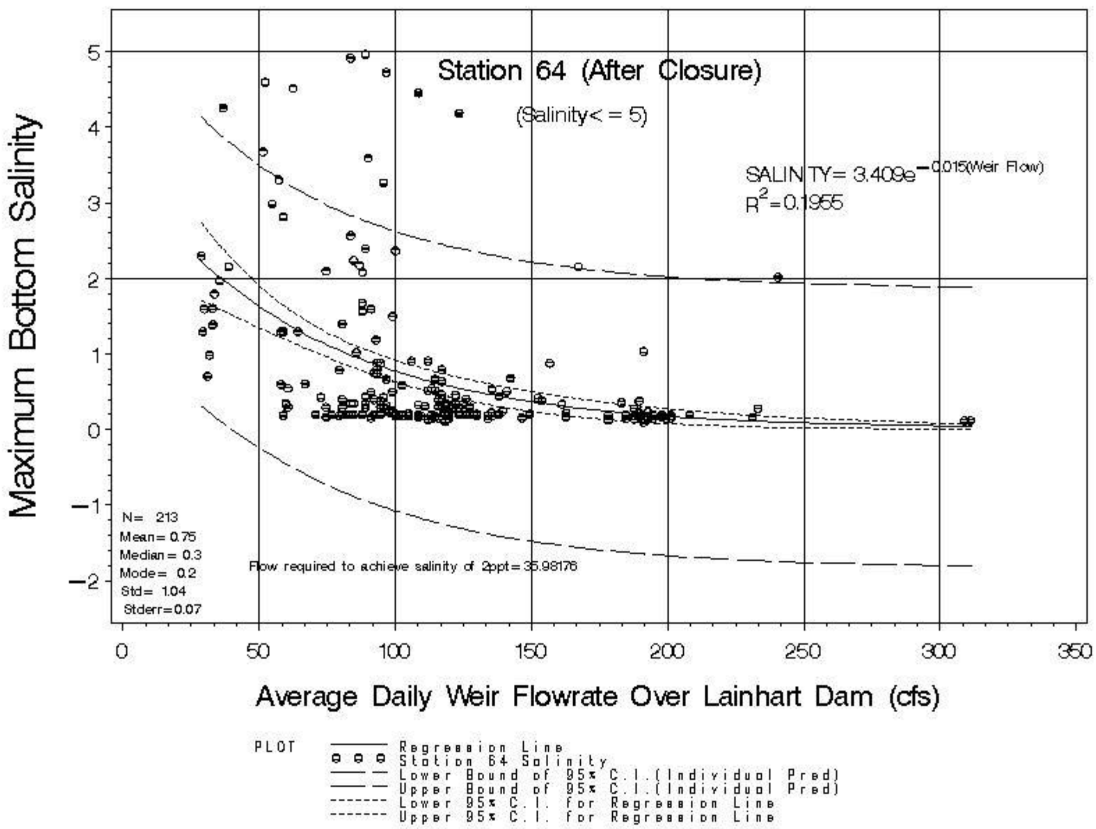

Station 63 (Period of Record)
(Salinity< = 10)
SALINITY= 9.825e-0.007(Weir Flow)
R2=0.207
Maximum Bottom Salinity
N= 297
Mean= 4.09
Median =3.83
Mode= 0.22
Std= 3.03
Stderr= 0.18
Flow required to achieve salinity of 2ppt= 234.5432
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

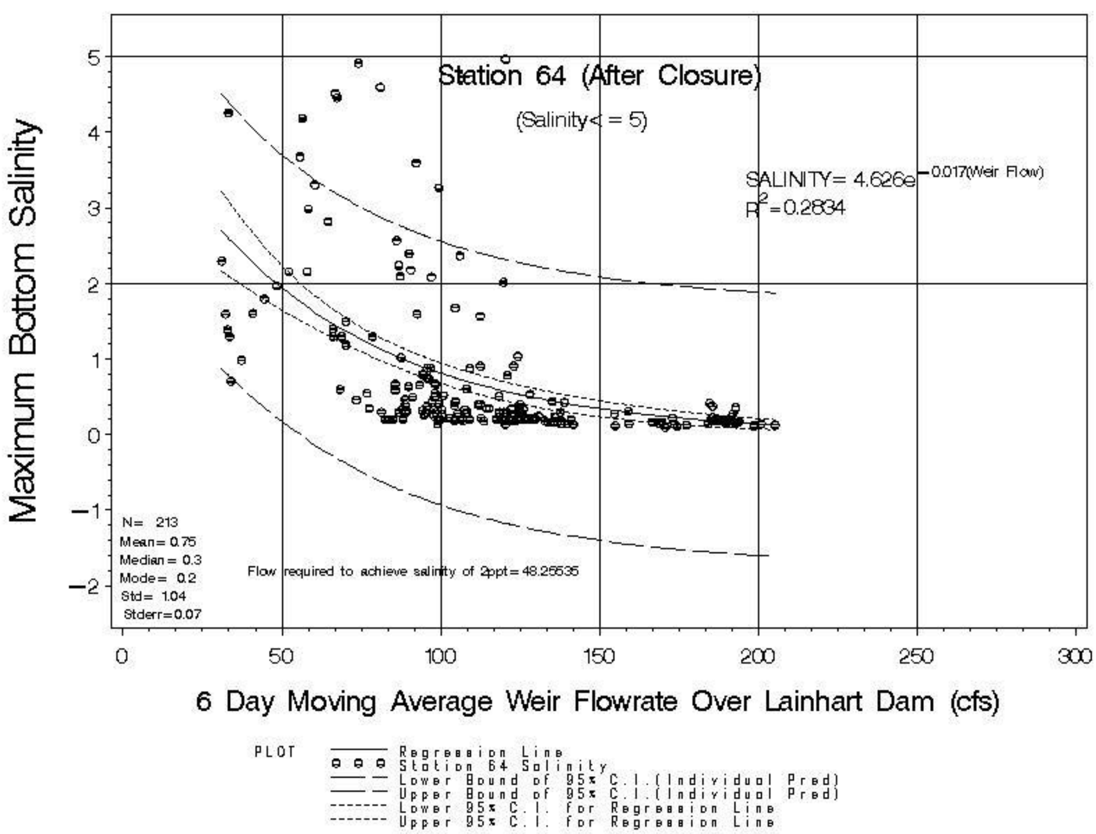

Station 63 (After Closure)
(Salinity< = 10)
SALINITY=6.73e −0.004(Weir Flow)
R2=0.0573
N= 117
Mean= 4.64
Median= 4.7
Mode= 0.35
Std= 2.79
Stderr= 0.26
Flow required to achieve salinity of 2ppt=3419292
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

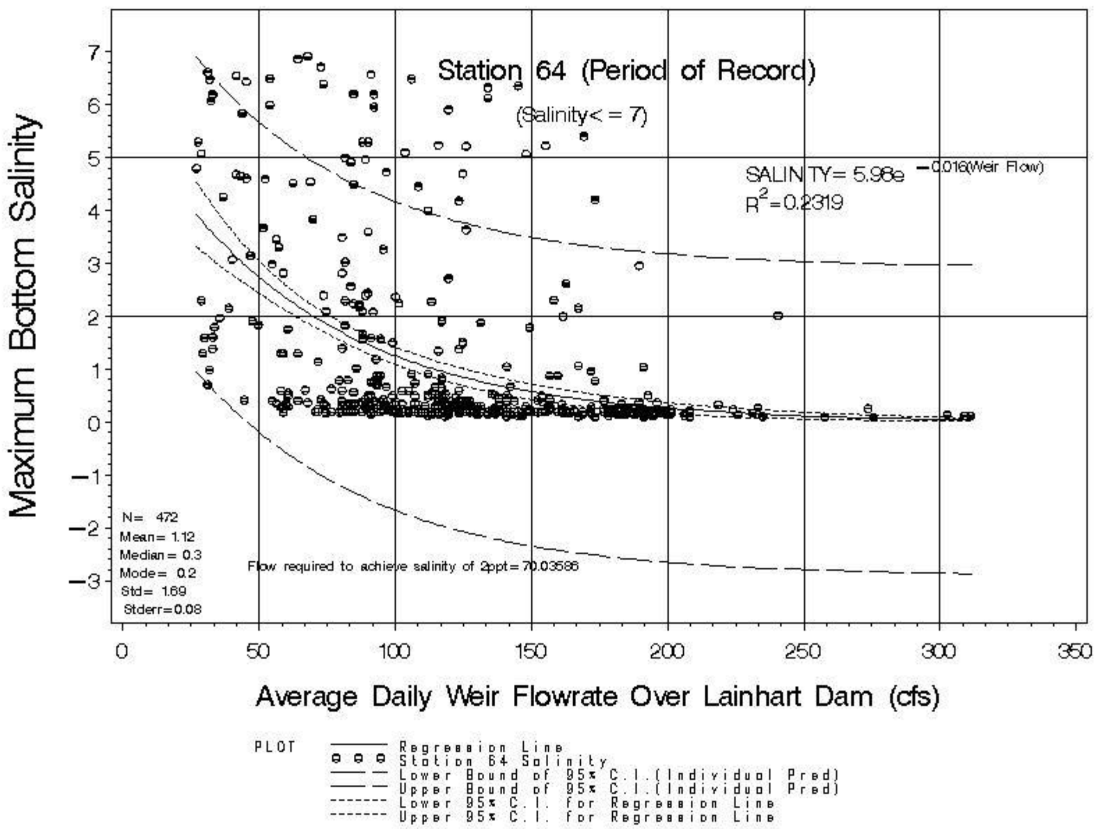

Station 63 (After Closure)
(Salinity< = 10)
SALINITY= 10.287e −0.008(Weir Flow)
R2=0.2146
N= 117
Mean= 4.64
Median= 4.7
Mode= 0.35
Std= 2.79
Stderr= 0.26
Flow required to achieve salinity of 2ppt=214.7592
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 63 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

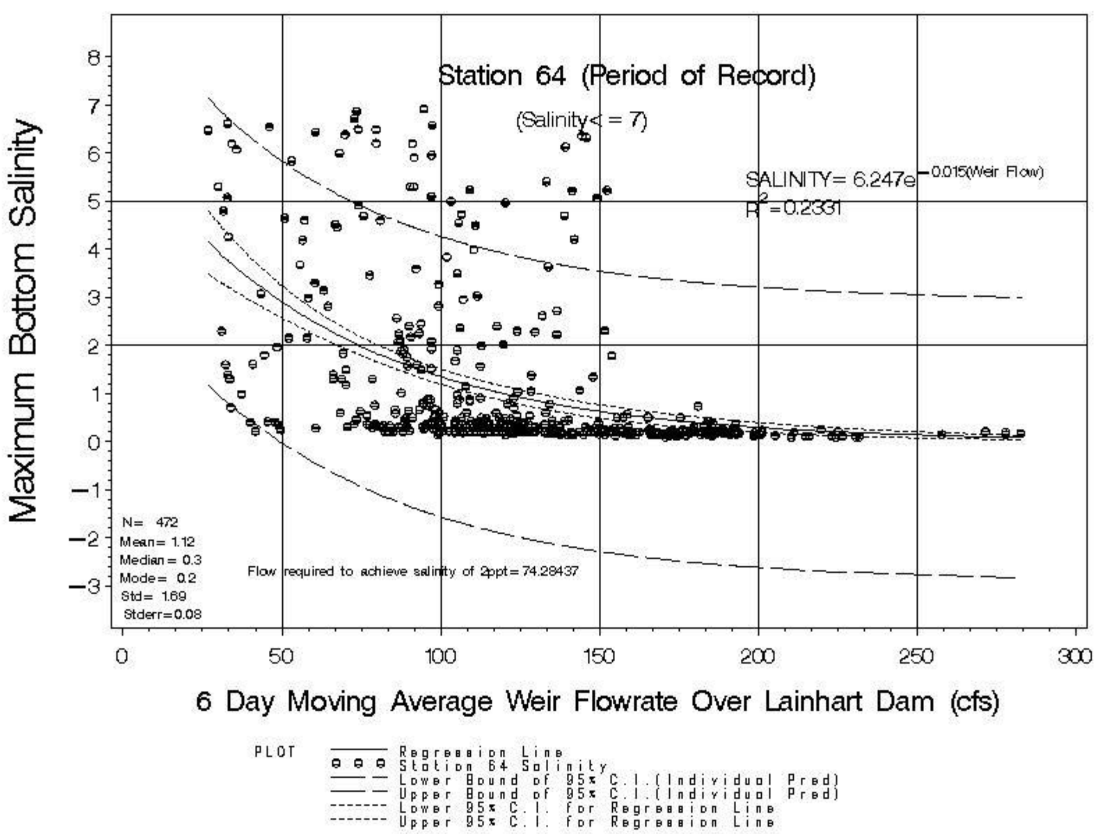

Station 64 (Period of Record)
(Salinity< = 5)
SALINITY= 3.99e -0.015(Weir Flow)
R2=0.2253
Maximum Bottom Salinity
N= 440
Mean= 0.77
Median =0.29
Mode= 0.2
Std= 1.09
Stderr=0.05
Flow required to achieve salinity of 2ppt= 46.62504
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

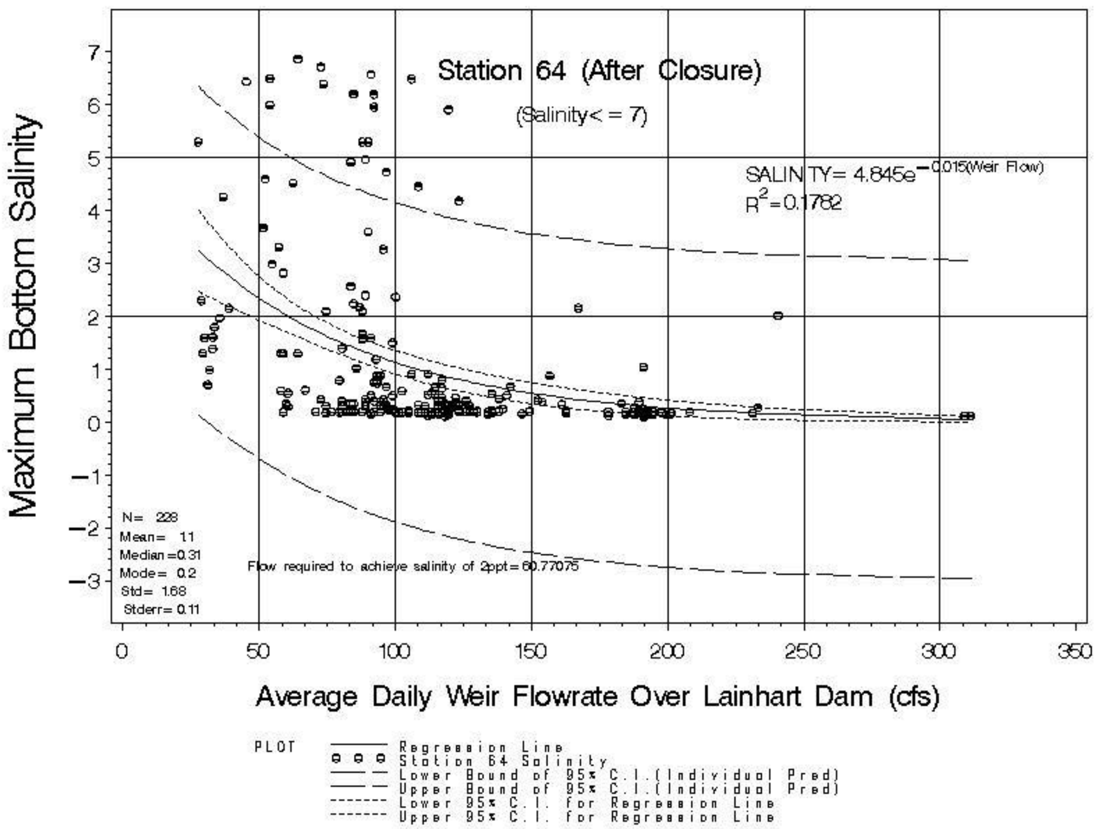

Station 64 (Period of Record)
(Salinity< = 5)
SALINITY= 3.952e -0.014(Weir Flow)
R2=0.2141
Maximum Bottom Salinity
N= 440
Mean= 0.77
Median =0.29
Mode= 0.2
Std= 1.09
Stderr=0.05
Flow required to achieve salinity of 2ppt= 48.60170
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

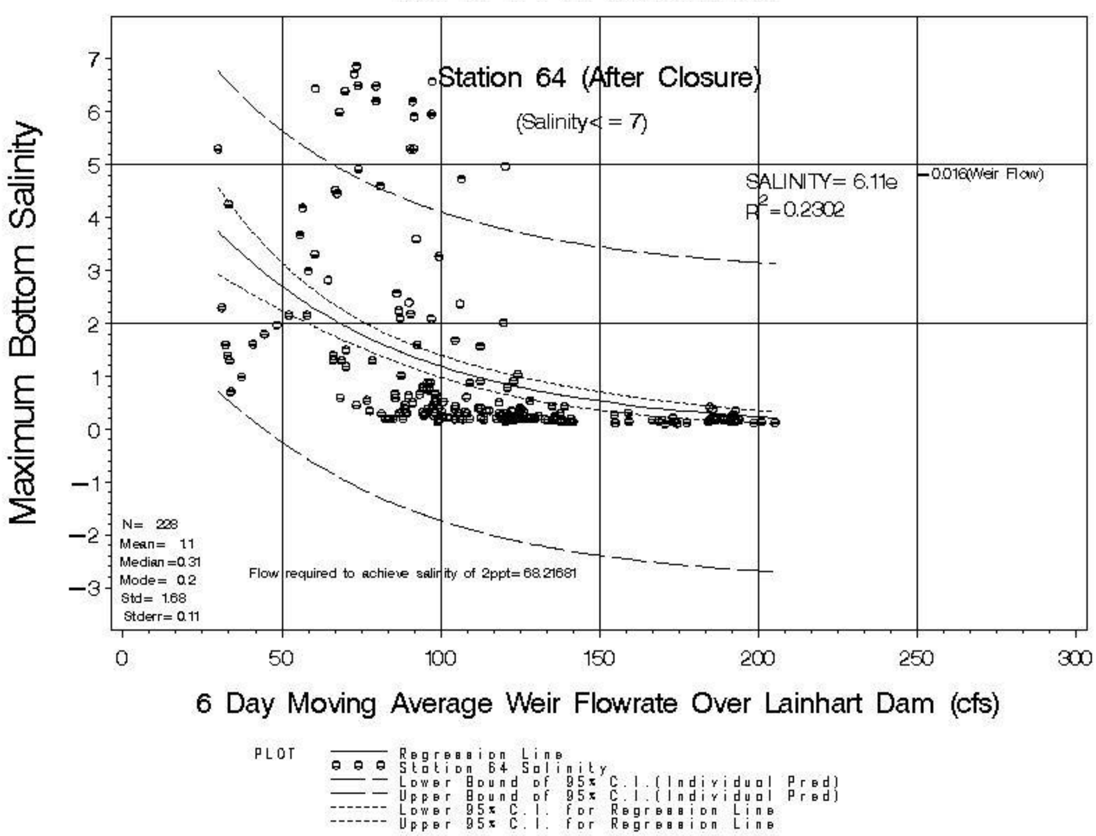

Station 64 (After Closure)
(Salinity< = 5)
SALINITY= 3.409e−0.015(Weir Flow)
R2=0.1955
Maximum Bottom Salinity
N= 213
Mean= 0.75
Median= 0.3
Mode= 0.2
Std= 1.04
Stderr=0.07
Flow required to achieve salinity of 2ppt=35.98176
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

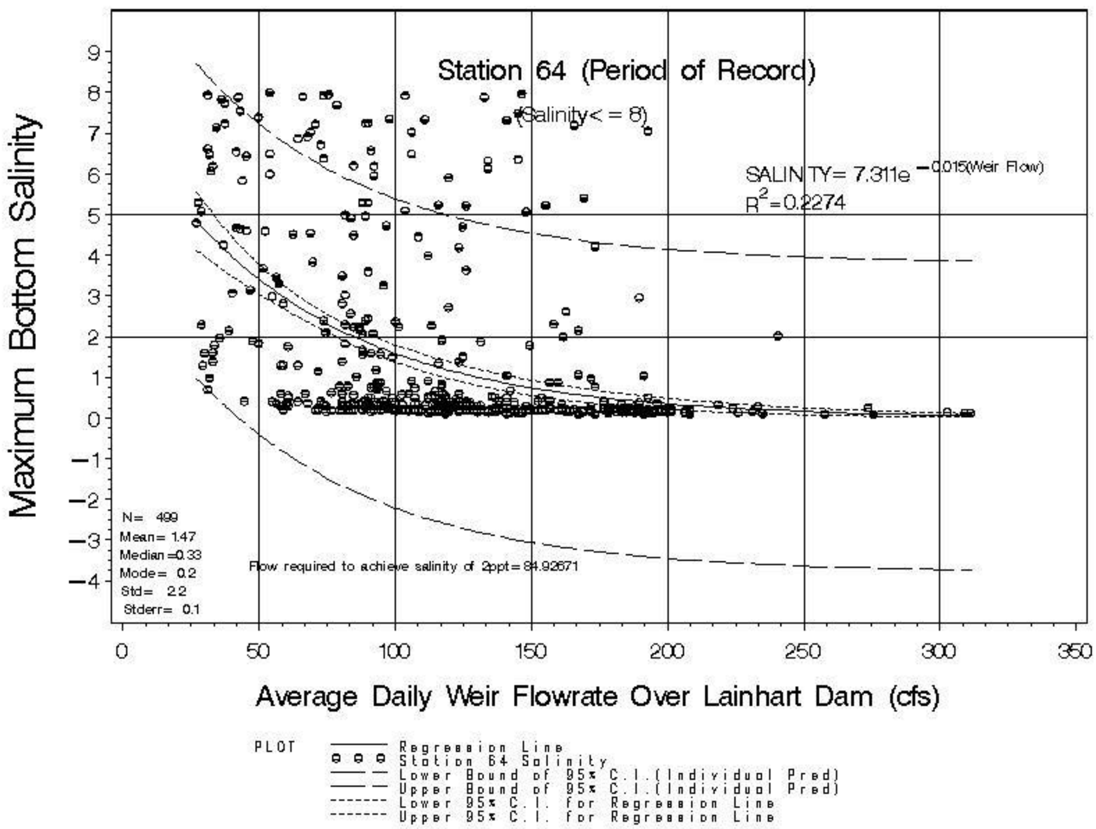

Station 64 (After Closure)
(Salinity< = 5)
SALINITY= 4.626e−0.017(Weir Flow)
R2=0.2834
Maximum Bottom Salinity
N= 213
Mean= 0.75
Median= 0.3
Mode= 0.2
Std= 1.04
Stderr=0.07
Flow required to achieve salinity of 2ppt=48.25535
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

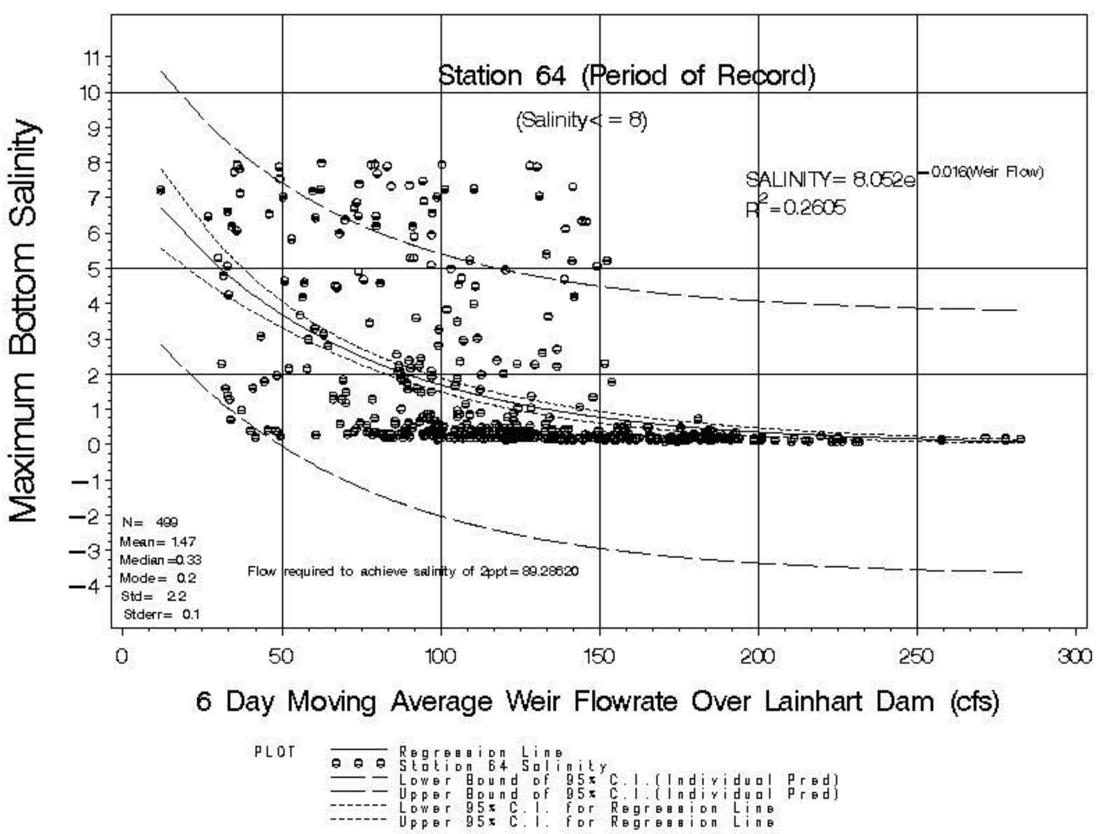

Station 64 (Period of Record)
(Salinity< = 7)
SALINITY= 5.98e −0.016(Weir Flow)
R2=0.2319
Maximum Bottom Salinity
N= 472
Mean= 1.12
Median= 0.3
Mode= 0.2
Std= 1.69
Stderr=0.08
Flow required to achieve salinity of 2ppt=70.03586
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

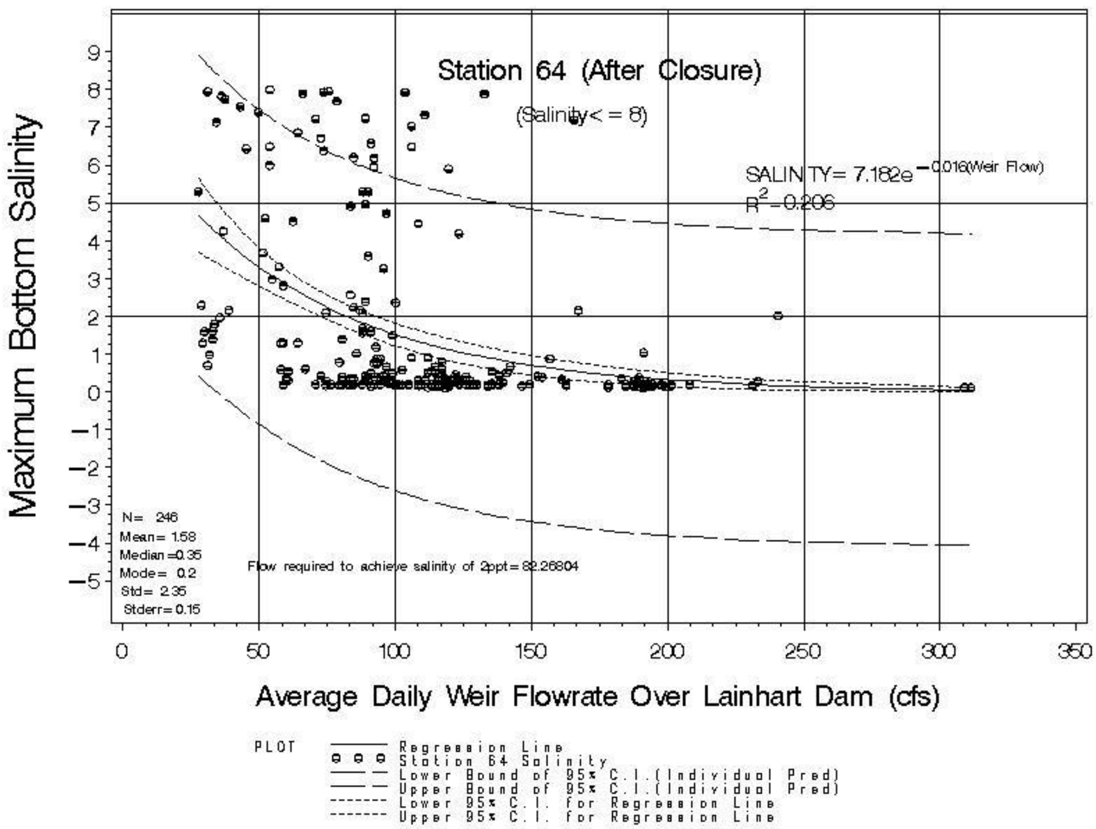

Station 64 (Period of Record)
(Salinity< = 7)
SALINITY= 6.247e −0.015(Weir Flow)
R2=0.2331
Maximum Bottom Salinity
N= 472
Mean= 1.12
Median= 0.3
Mode= 0.2
Std= 1.69
Stderr=0.08
Flow required to achieve salinity of 2ppt=74.28437
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

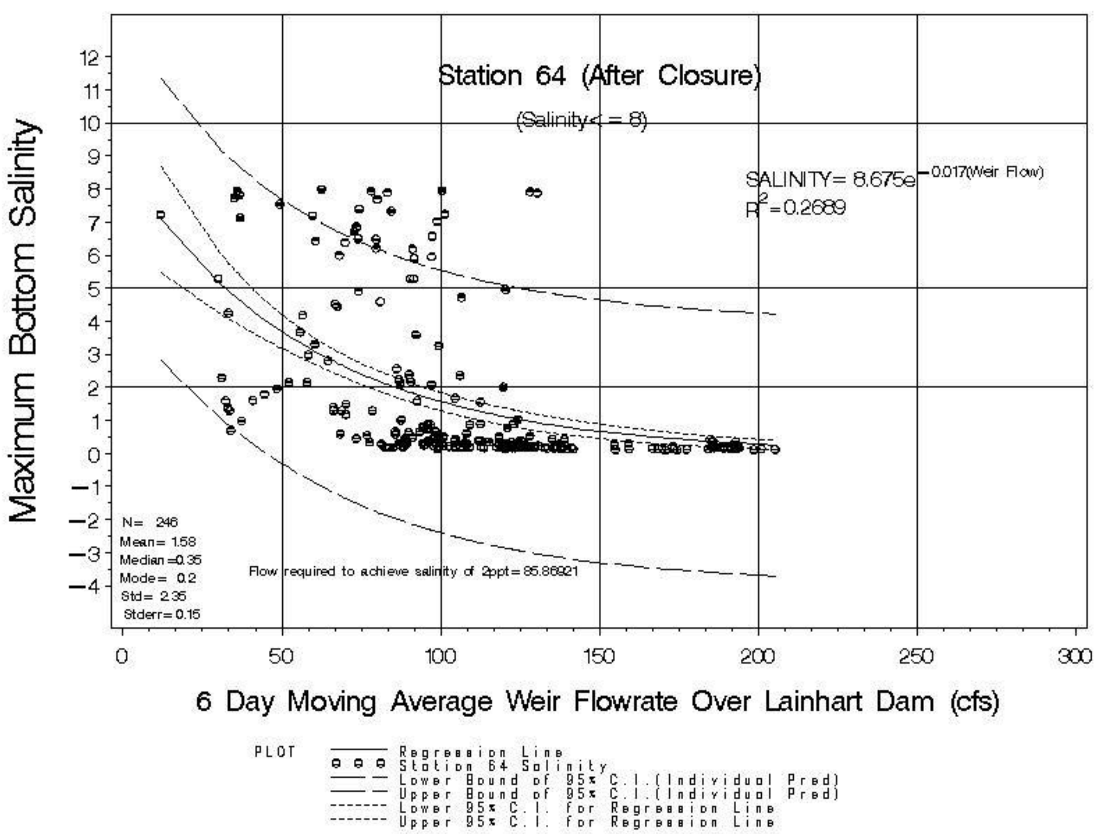

Station 64 (After Closure)
(Salinity< = 7)
SALINITY= 4.845e$^{-0.015(\text{Weir Flow})}$
R^2=0.1782
N= 228
Mean= 1.1
Median =0.31
Mode= 0.2
Std= 1.68
Stderr= 0.11
Flow required to achieve salinity of 2ppt=60.77075
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

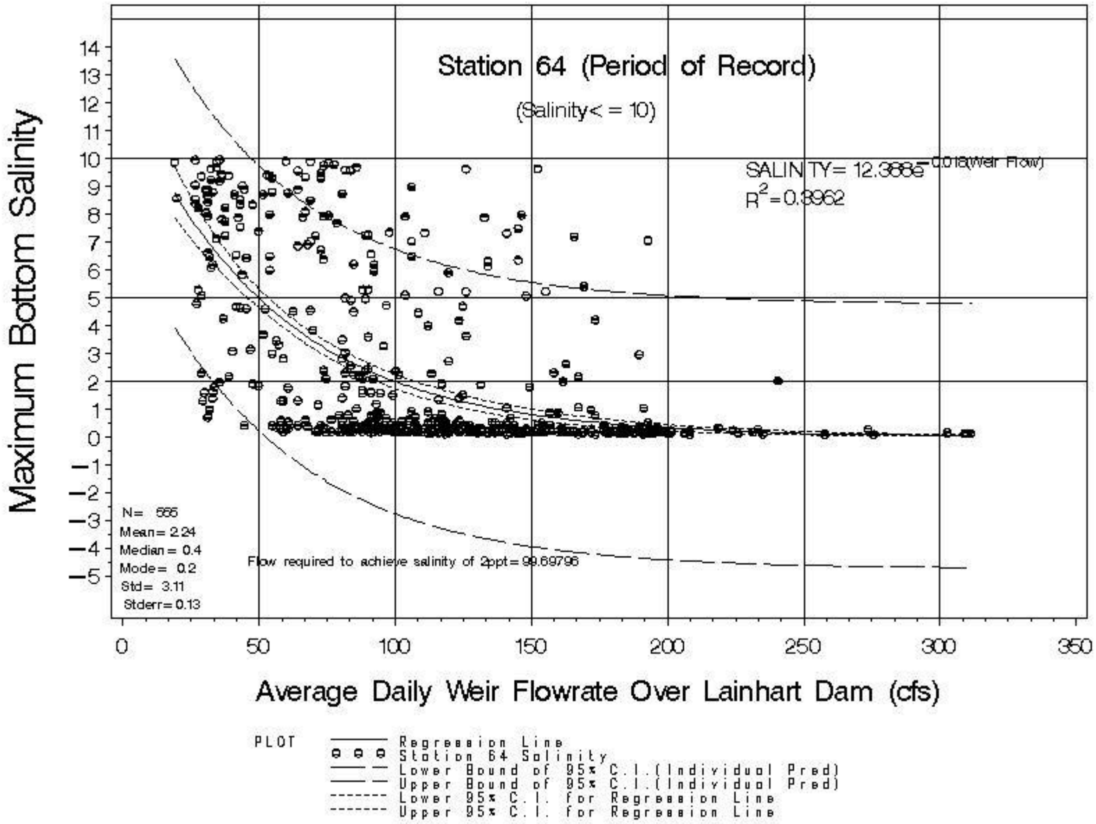

Station 64 (After Closure)
(Salinity< = 7)
SALINITY= 6.11e$^{-0.016(\text{Weir Flow})}$
R^2=0.2302
N= 228
Mean= 1.1
Median =0.31
Mode= 0.2
Std= 1.68
Stderr= 0.11
Flow required to achieve salinity of 2ppt=68.21681
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

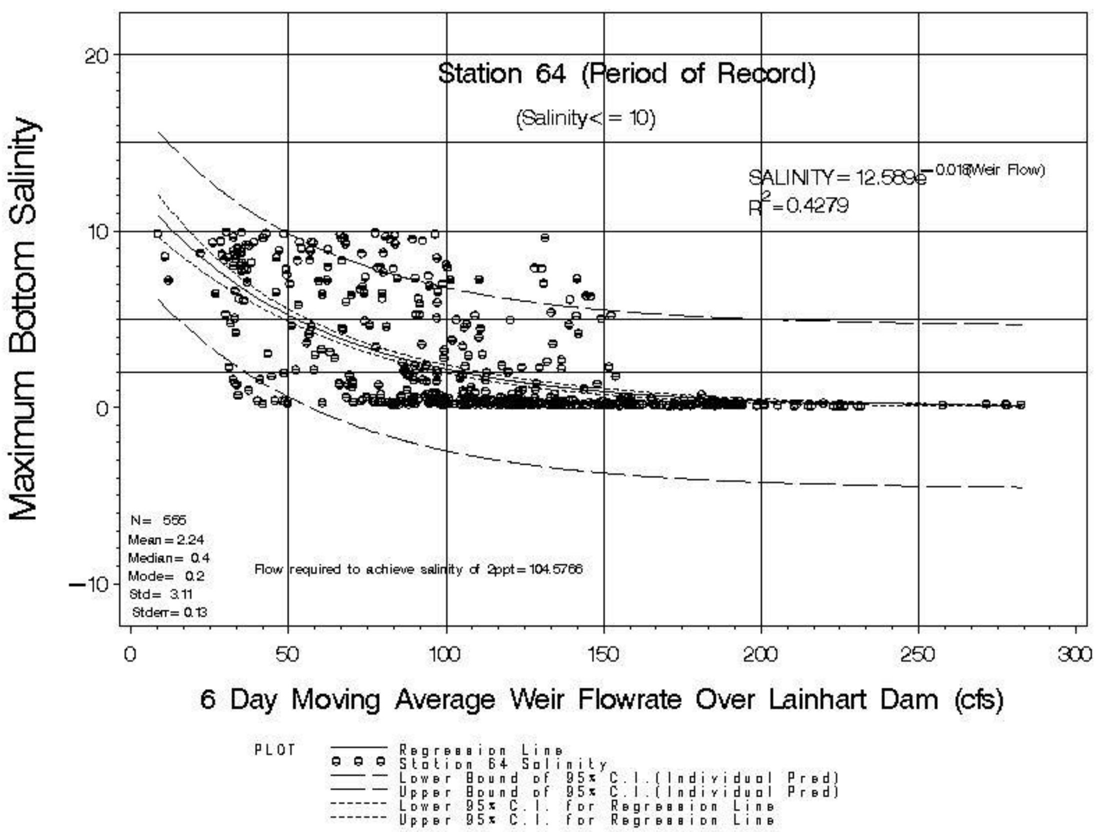

Station 64 (Period of Record)
(Salinity< = 8)
SALINITY= 7.311e −0.015(Weir Flow)
R2=0.2274
N= 499
Mean= 1.47
Median =0.33
Mode= 0.2
Std= 2.2
Stderr= 0.1
Flow required to achieve salinity of 2ppt= 84.92671
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

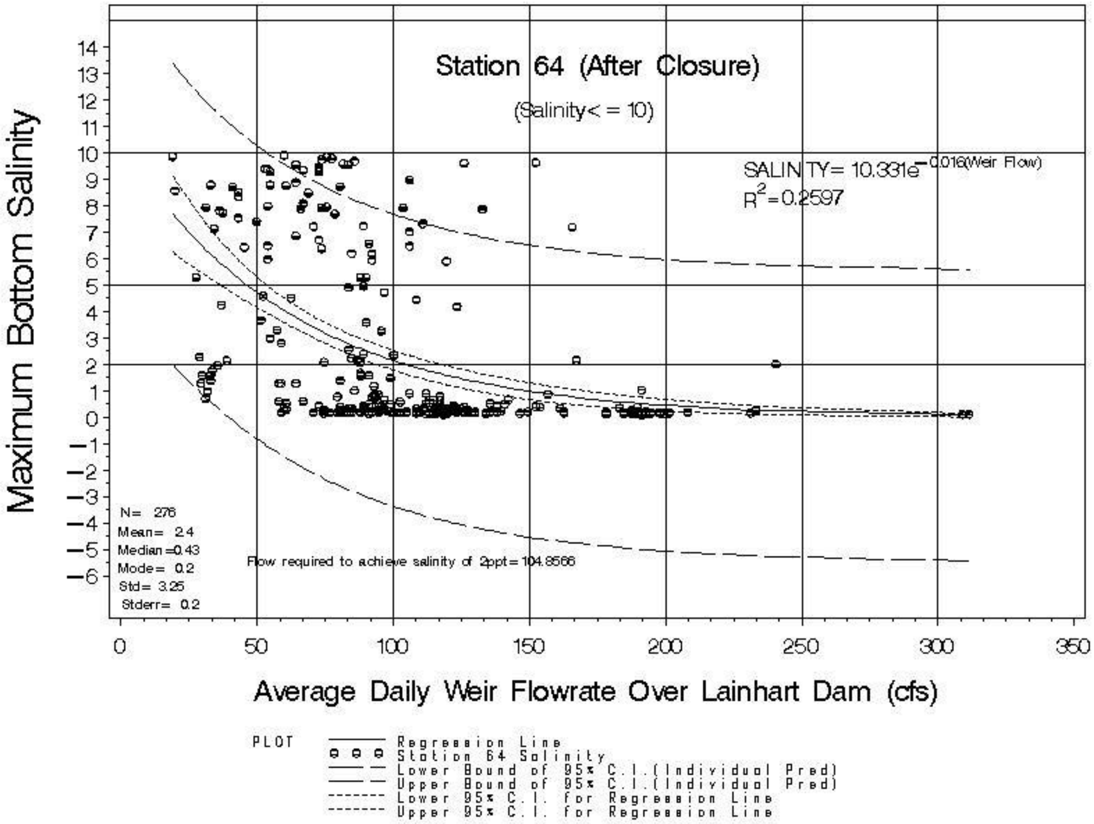

Station 64 (Period of Record)
(Salinity< = 8)
SALINITY= 8.052e −0.016(Weir Flow)
R2=0.2605
N= 499
Mean= 1.47
Median =0.33
Mode= 0.2
Std= 2.2
Stderr= 0.1
Flow required to achieve salinity of 2ppt= 89.28620
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

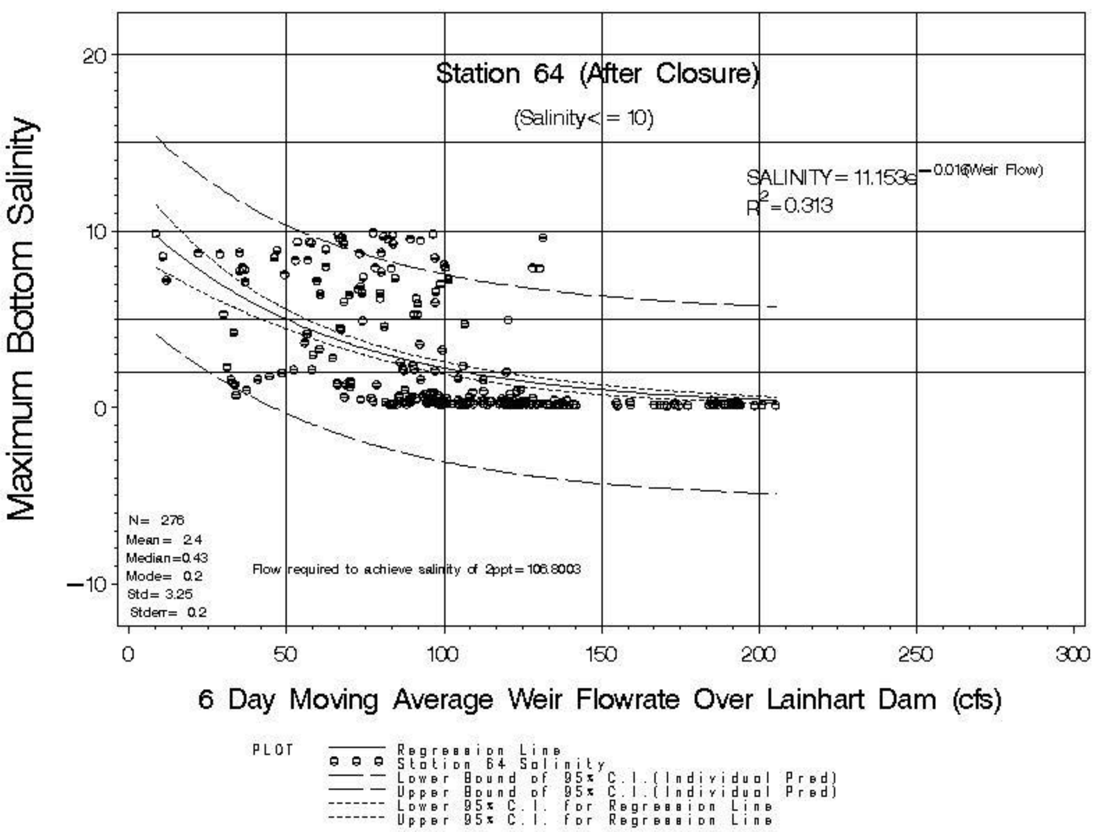

Station 64 (After Closure)
(Salinity< = 8)
SALINITY= 7.182e−0.016(Weir Flow)
R2=0.206
N= 246
Mean= 1.58
Median=0.35
Mode= 0.2
Std= 2.35
Stderr= 0.15
Flow required to achieve salinity of 2ppt= 82.26804
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

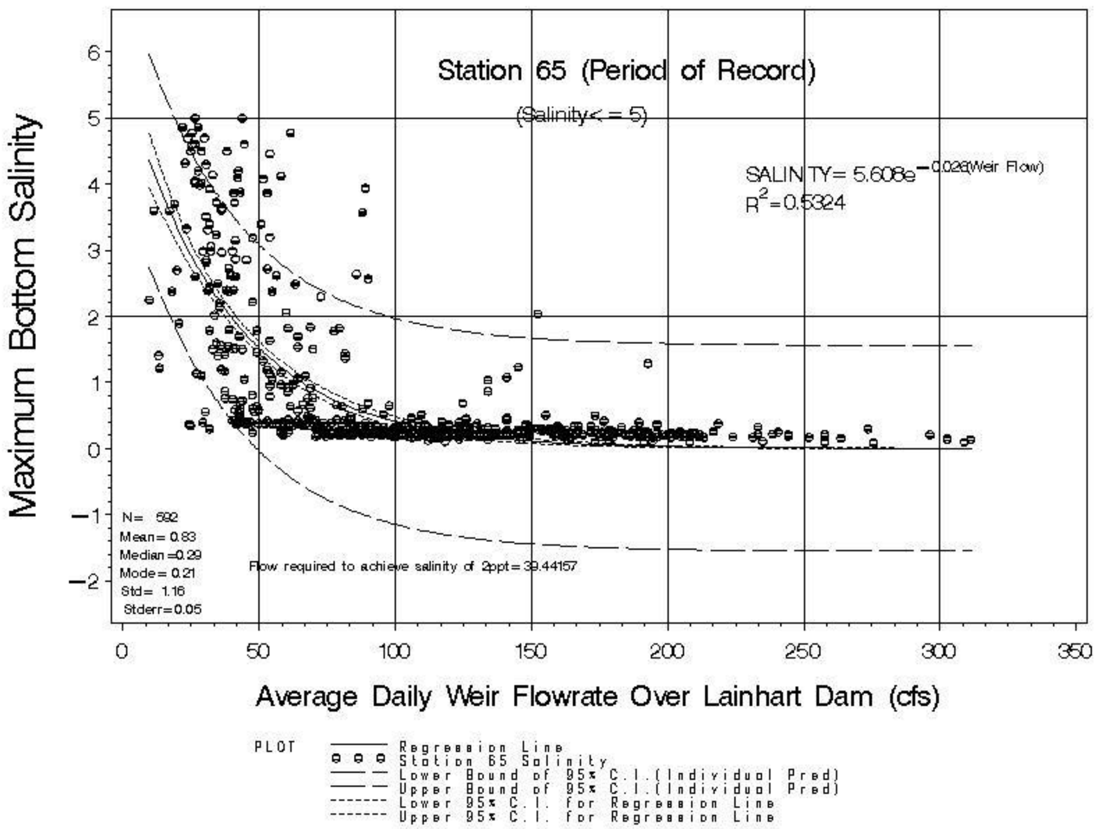

Station 64 (After Closure)
(Salinity< = 8)
SALINITY= 8.675e−0.017(Weir Flow)
R2=0.2689
N= 246
Mean= 1.58
Median=0.35
Mode= 0.2
Std= 2.35
Stderr= 0.15
Flow required to achieve salinity of 2ppt= 85.86921
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

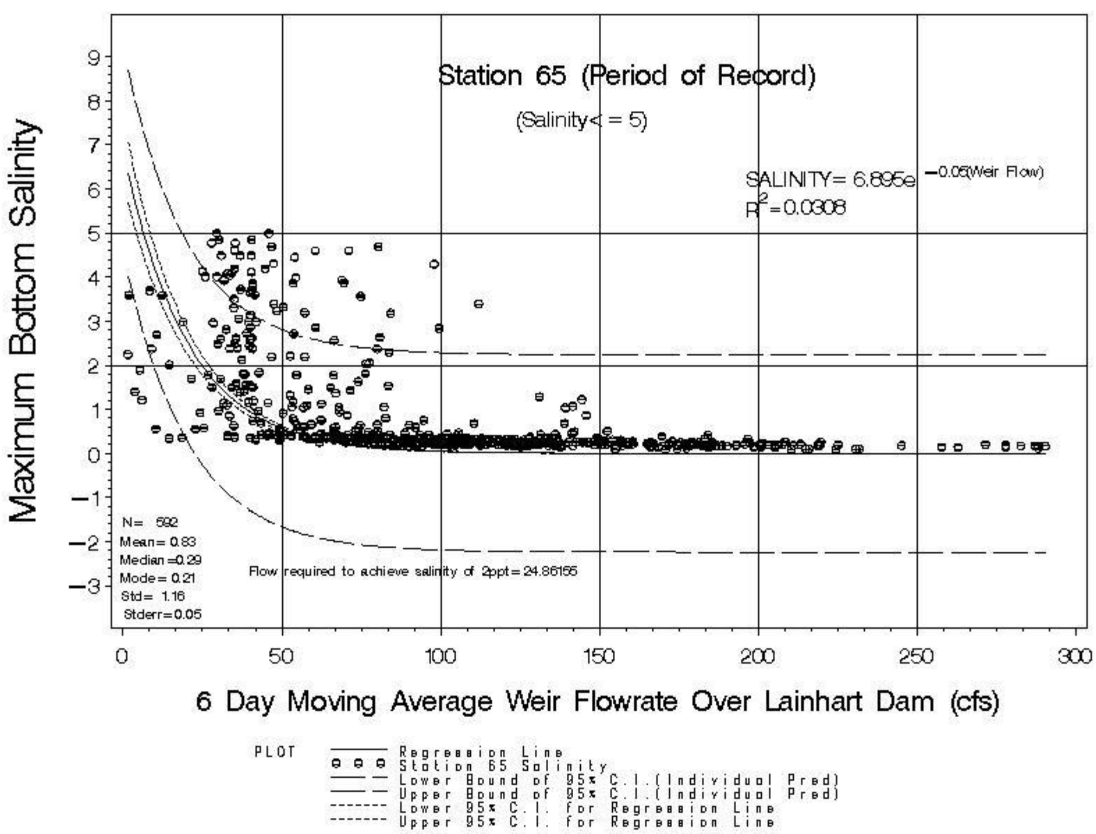

Station 64 (Period of Record)
(Salinity< = 10)
SALINITY= 12.388e^-0.018(Weir Flow)
R^2=0.3962
N= 565
Mean= 2.24
Median= 0.4
Mode= 0.2
Std= 3.11
Stderr= 0.13
Flow required to achieve salinity of 2ppt=99.69796
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

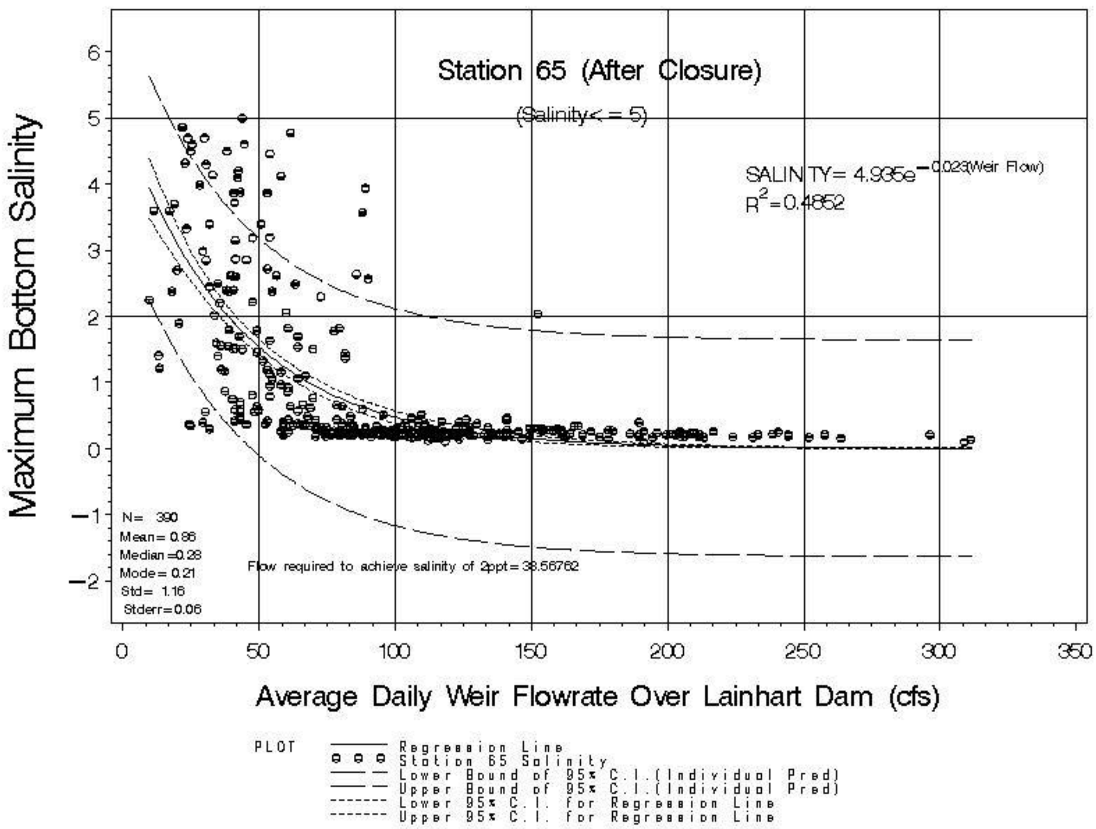

Station 64 (Period of Record)
(Salinity< = 10)
SALINITY= 12.589e^-0.018(Weir Flow)
R^2=0.4279
N= 565
Mean= 2.24
Median= 0.4
Mode= 0.2
Std= 3.11
Stderr= 0.13
Flow required to achieve salinity of 2ppt= 104.5766
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

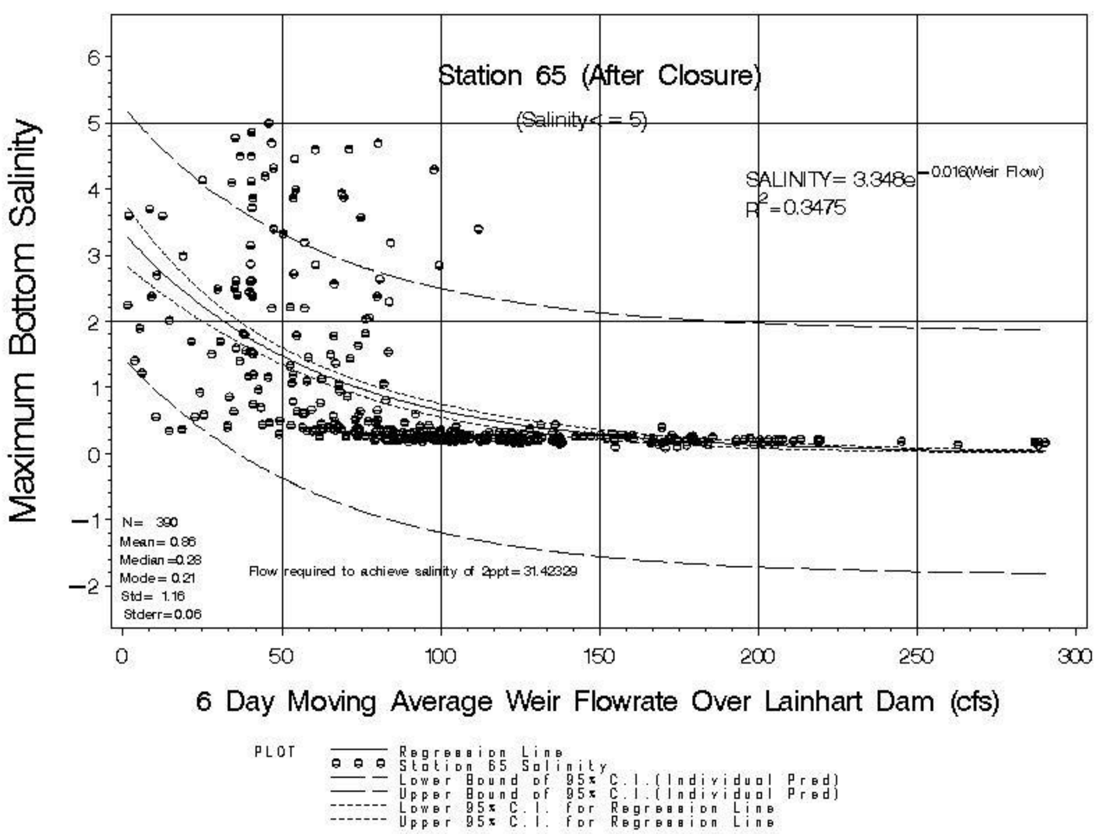

Station 64 (After Closure)
(Salinity< = 10)
SALINITY= 10.331e$^{-0.016(Weir\ Flow)}$
R^2=0.2597
N= 276
Mean= 2.4
Median=0.43
Mode= 0.2
Std= 3.25
Stderr= 0.2
Flow required to achieve salinity of 2ppt=104.8566
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

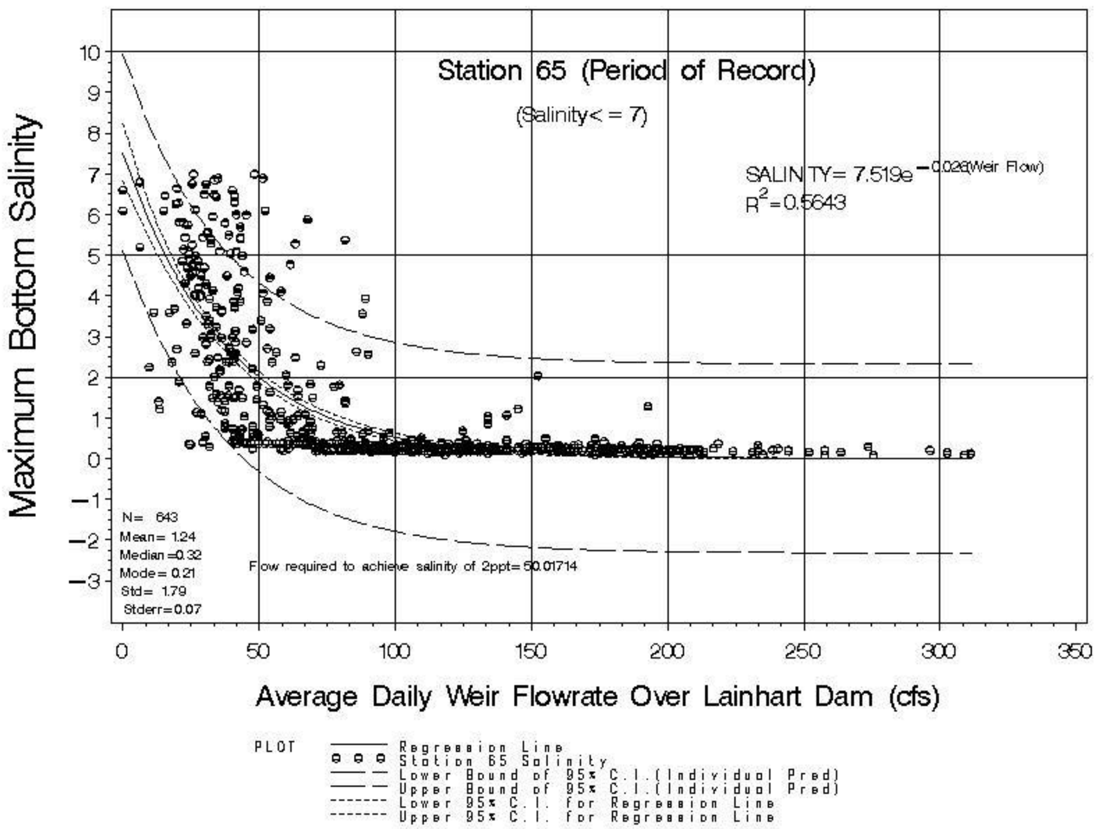

Station 64 (After Closure)
(Salinity< = 10)
SALINITY= 11.153e$^{-0.016(Weir\ Flow)}$
R^2=0.313
N= 276
Mean= 2.4
Median=0.43
Mode= 0.2
Std= 3.25
Stderr= 0.2
Flow required to achieve salinity of 2ppt=106.8003
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 64 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

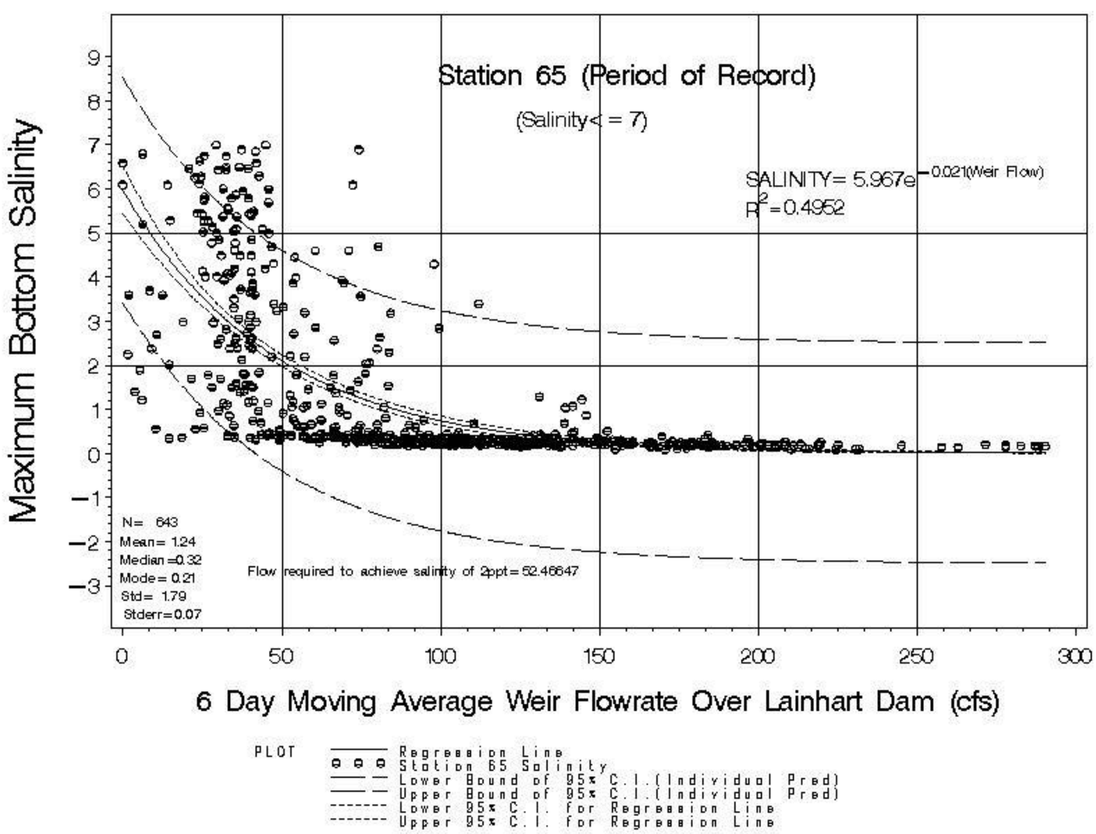

Station 65 (Period of Record)
(Salinity< = 5)
SALINITY= 5.608e −0.026(Weir Flow)
R2=0.5324
Maximum Bottom Salinity
N= 592
Mean= 0.83
Median =0.29
Mode= 0.21
Std= 1.16
Stderr=0.05
Flow required to achieve salinity of 2ppt= 39.44157
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

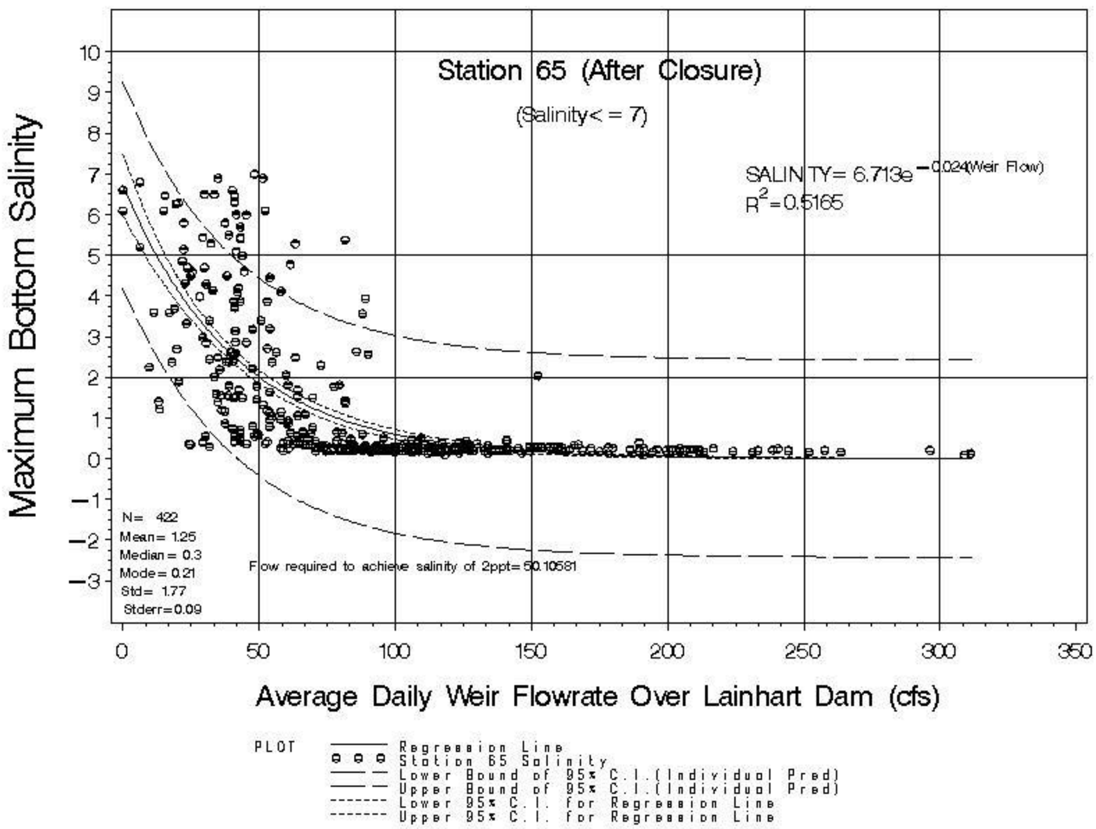

Station 65 (Period of Record)
(Salinity< = 5)
SALINITY= 6.895e −0.05(Weir Flow)
R2=0.0308
Maximum Bottom Salinity
N= 592
Mean= 0.83
Median =0.29
Mode= 0.21
Std= 1.16
Stderr=0.05
Flow required to achieve salinity of 2ppt= 24.86155
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

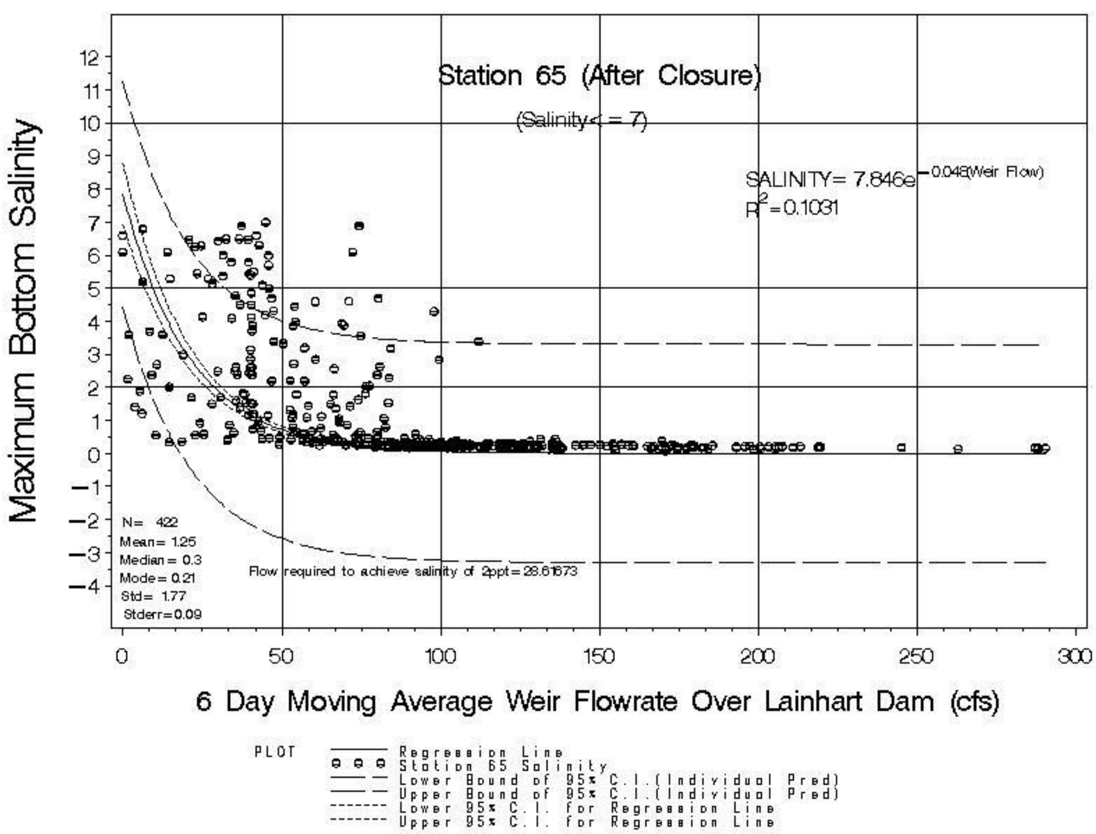

Station 65 (After Closure)
(Salinity< = 5)
SALINITY= 4.935e^-0.023(Weir Flow)
R^2=0.4852
N= 390
Mean= 0.86
Median =0.28
Mode= 0.21
Std= 1.16
Stderr=0.06
Flow required to achieve salinity of 2ppt= 38.56762
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

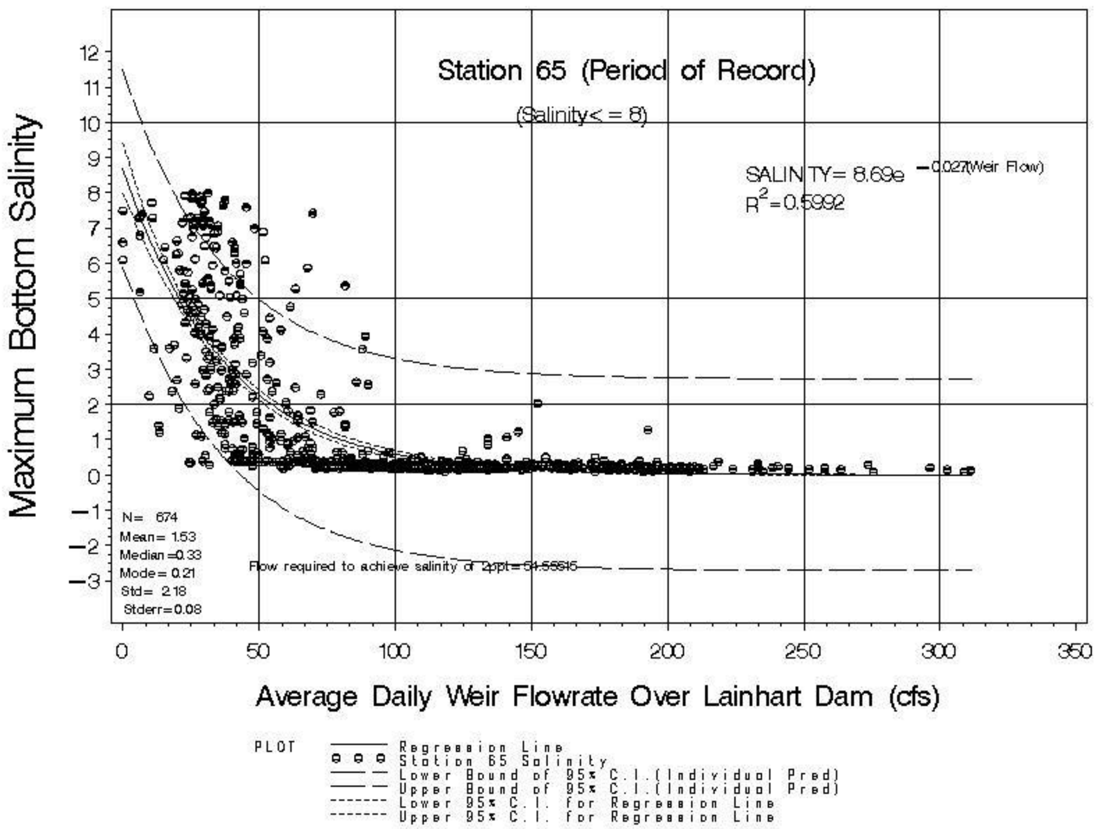

Station 65 (After Closure)
(Salinity< = 5)
SALINITY= 3.348e^-0.016(Weir Flow)
R^2=0.3475
N= 390
Mean= 0.86
Median =0.28
Mode= 0.21
Std= 1.16
Stderr=0.06
Flow required to achieve salinity of 2ppt= 31.42329
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (Period of Record)
(Salinity< = 7)
SALINITY= 7.519e −0.026(Weir Flow)
R2=0.5643
Maximum Bottom Salinity
N= 643
Mean= 1.24
Median =0.32
Mode= 0.21
Std= 1.79
Stderr=0.07
Flow required to achieve salinity of 2ppt= 50.01714
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

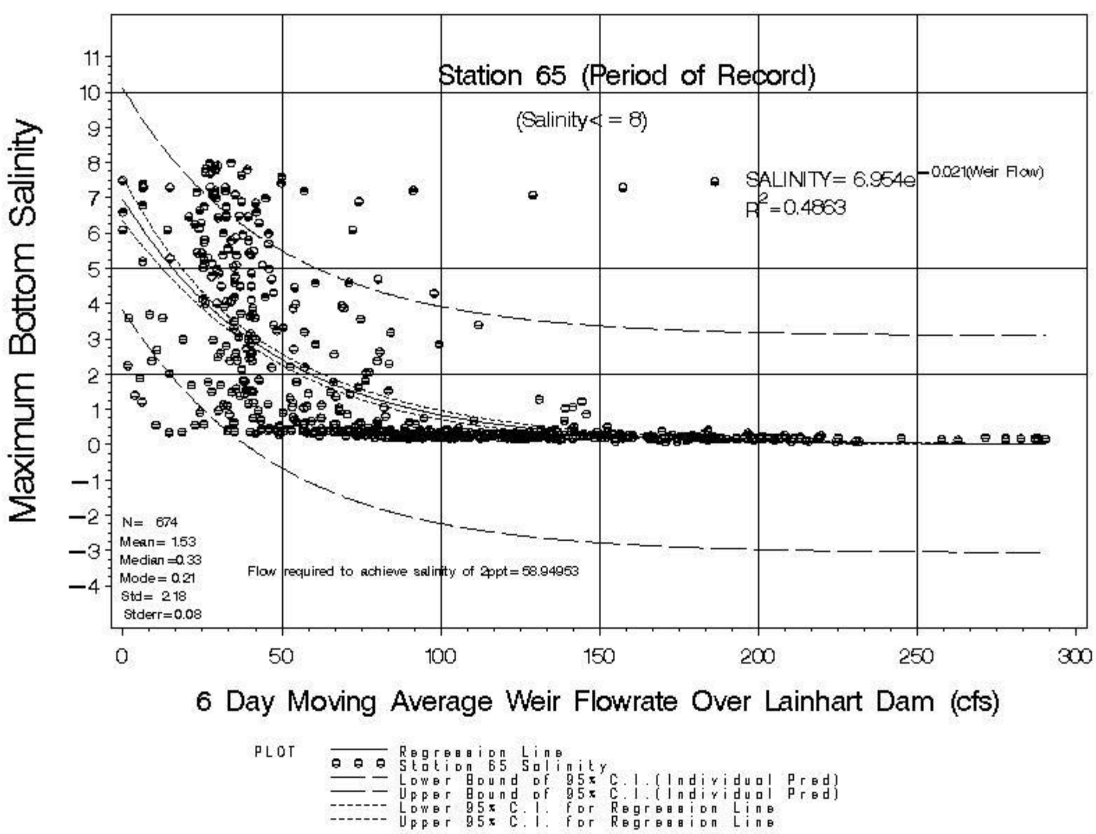

Station 65 (Period of Record)
(Salinity< = 7)
SALINITY= 5.967e −0.021(Weir Flow)
R2=0.4952
Maximum Bottom Salinity
N= 643
Mean= 1.24
Median =0.32
Mode= 0.21
Std= 1.79
Stderr=0.07
Flow required to achieve salinity of 2ppt= 52.46647
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (After Closure)
(Salinity< = 7)
SALINITY= 6.713e$^{-0.024(Weir Flow)}$
R^2=0.5165
Maximum Bottom Salinity
N= 422
Mean= 1.25
Median= 0.3
Mode= 0.21
Std= 1.77
Stderr=0.09
Flow required to achieve salinity of 2ppt=50.10581
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

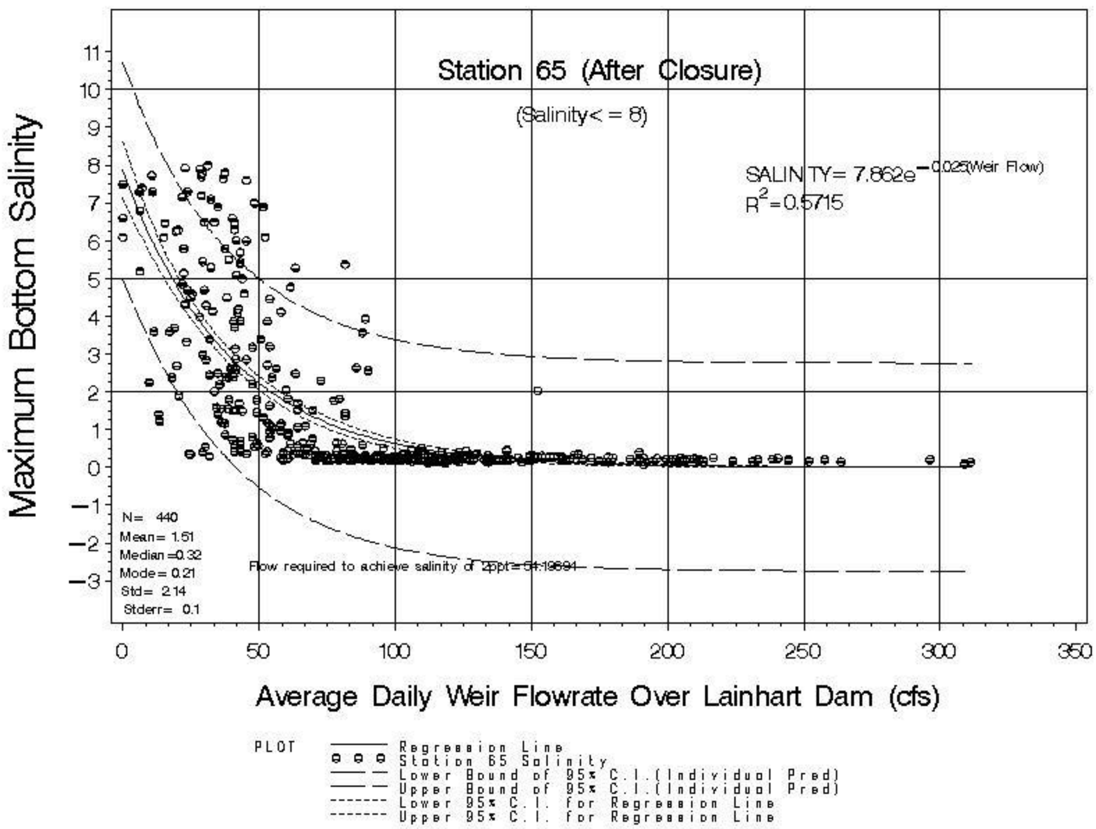

Station 65 (After Closure)
(Salinity< = 7)
SALINITY= 7.846e$^{-0.048(Weir Flow)}$
R^2=0.1031
Maximum Bottom Salinity
N= 422
Mean= 1.25
Median= 0.3
Mode= 0.21
Std= 1.77
Stderr=0.09
Flow required to achieve salinity of 2ppt=28.61673
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

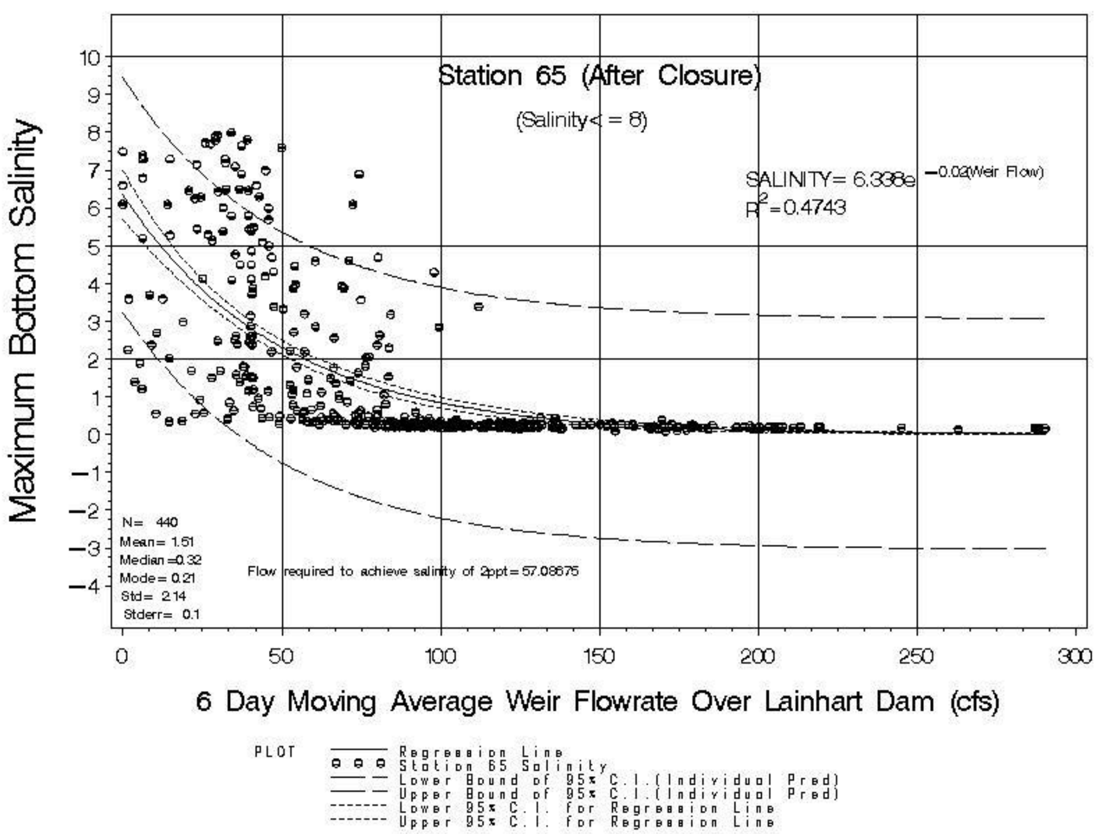


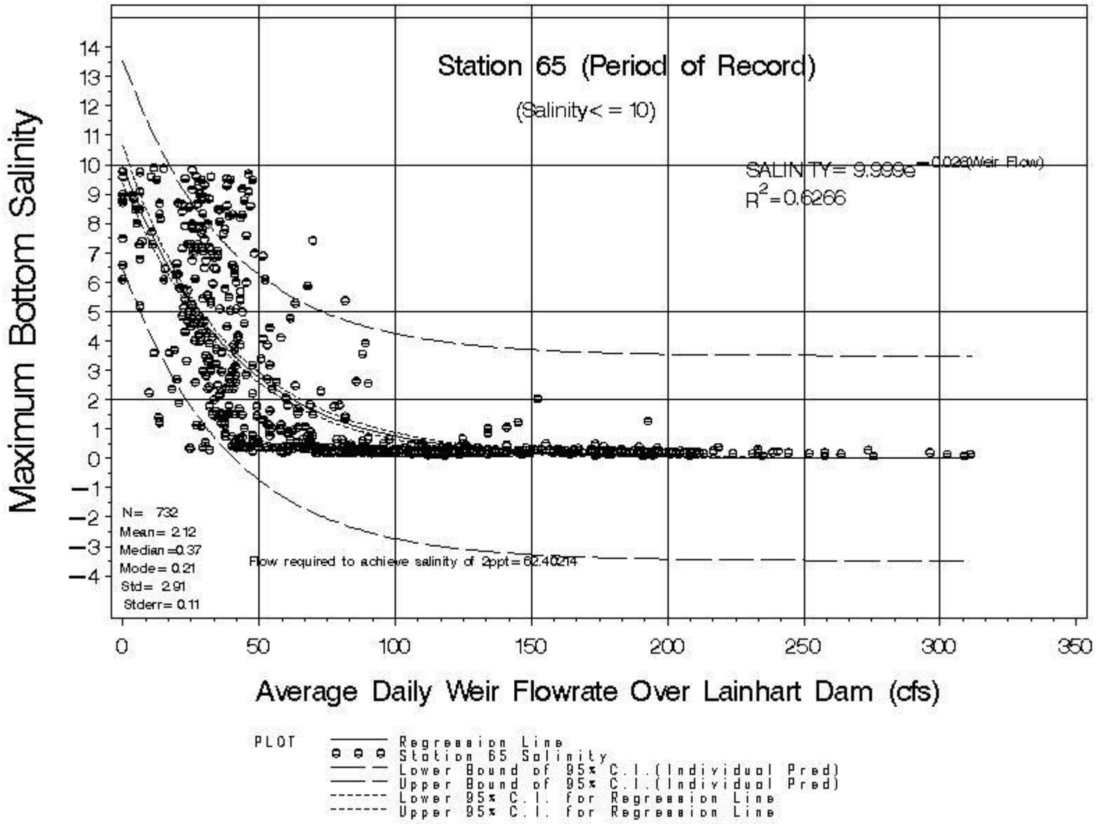
Station 65 (Period of Record)
(Salinity< = 8)
SALINITY= 8.69e −0.027(Weir Flow)
R2=0.5992
Maximum Bottom Salinity
N= 674
Mean= 1.53
Median=0.33
Mode= 0.21
Std= 2.18
Stderr=0.08
Flow required to achieve salinity of 2ppt=54.55615
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

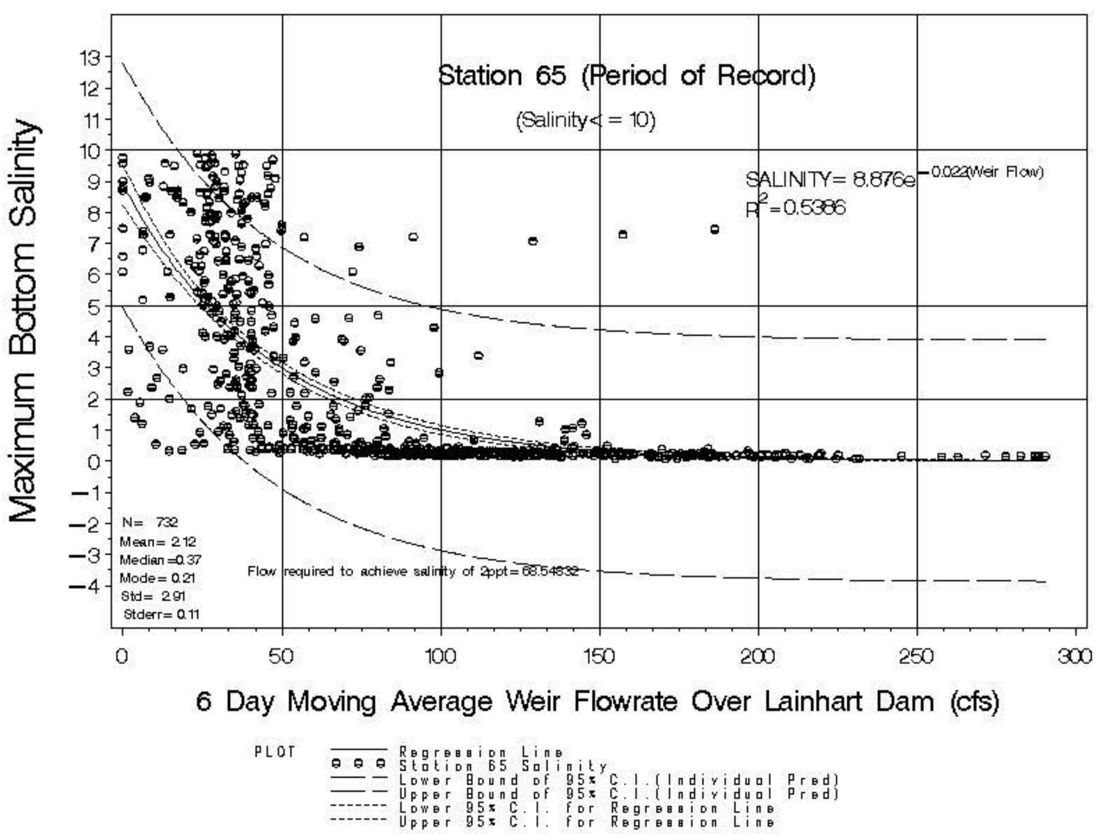


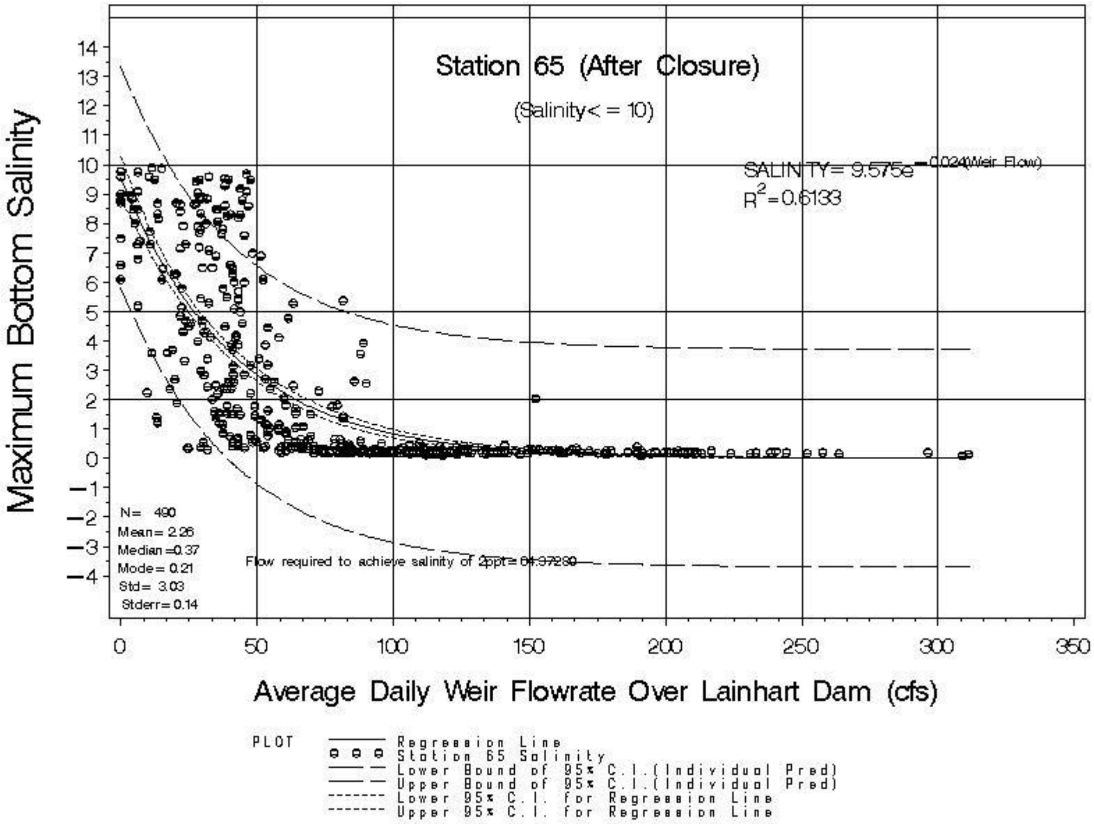
Station 65 (Period of Record)
(Salinity< = 8)
SALINITY= 6.954e −0.021(Weir Flow)
R2=0.4863
Maximum Bottom Salinity
N= 674
Mean= 1.53
Median=0.33
Mode= 0.21
Std= 2.18
Stderr=0.08
Flow required to achieve salinity of 2ppt=58.94953
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

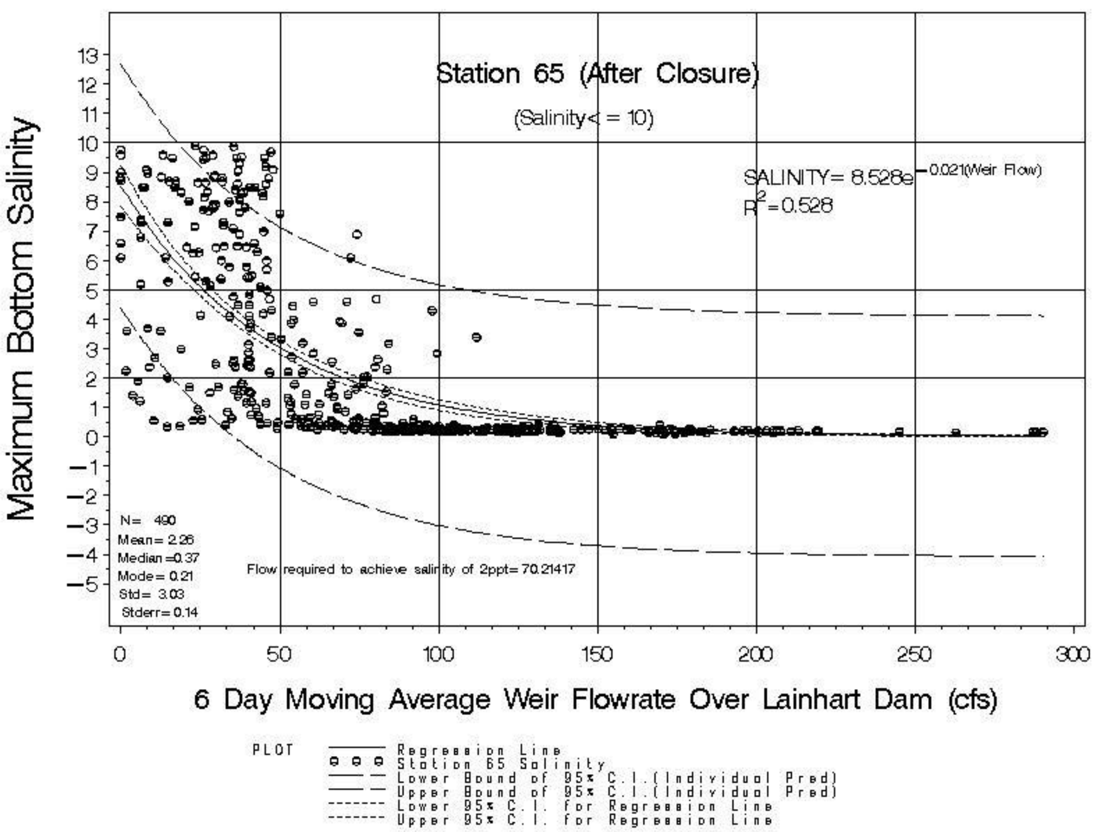

Station 65 (After Closure)
(Salinity< = 8)
SALINITY= 7.862e −0.025(Weir Flow)
R2=0.5715
Maximum Bottom Salinity
N= 440
Mean= 1.51
Median=0.32
Mode= 0.21
Std= 2.14
Stderr= 0.1
Flow required to achieve salinity of 2ppt=54.19694
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (After Closure)
(Salinity< = 8)
SALINITY= 6.338e −0.02(Weir Flow)
R2=0.4743
Maximum Bottom Salinity
N= 440
Mean= 1.51
Median=0.32
Mode= 0.21
Std= 2.14
Stderr= 0.1
Flow required to achieve salinity of 2ppt=57.08675
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (Period of Record)
(Salinity< = 10)
SALINITY= 9.999e^-0.026(Weir Flow)
R^2=0.6266
N= 732
Mean= 2.12
Median =0.37
Mode= 0.21
Std= 2.91
Stderr= 0.11
Flow required to achieve salinity of 2ppt=62.40214
Maximum Bottom Salinity
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (Period of Record)
(Salinity< = 10)
SALINITY= 8.876e^-0.022(Weir Flow)
R^2=0.5386
N= 732
Mean= 2.12
Median =0.37
Mode= 0.21
Std= 2.91
Stderr= 0.11
Flow required to achieve salinity of 2ppt=68.54832
Maximum Bottom Salinity
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (After Closure)
(Salinity< = 10)
SALINITY= 9.575e^-0.024(Weir Flow)
R^2=0.6133
Maximum Bottom Salinity
N= 490
Mean= 2.26
Median =0.37
Mode= 0.21
Std= 3.03
Stderr= 0.14
Flow required to achieve salinity of 2ppt= 64.97289
Average Daily Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line


Station 65 (After Closure)
(Salinity< = 10)
SALINITY= 8.528e^-0.021(Weir Flow)
R^2=0.528
Maximum Bottom Salinity
N= 490
Mean= 2.26
Median =0.37
Mode= 0.21
Std= 3.03
Stderr= 0.14
Flow required to achieve salinity of 2ppt= 70.21417
6 Day Moving Average Weir Flowrate Over Lainhart Dam (cfs)
PLOT
Regression Line
Station 65 Salinity
Lower Bound of 95% C.I.(Individual Pred)
Upper Bound of 95% C.I.(Individual Pred)
Lower 95% C.I. for Regression Line
Upper 95% C.I. for Regression Line

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
04/01/71	14	06/01/71	28	08/01/71	92	10/01/71	71	12/01/71	59
04/02/71	13	06/02/71	28	08/02/71	92	10/02/71	66	12/02/71	56
04/03/71	13	06/03/71	30	08/03/71	83	10/03/71	63	12/03/71	55
04/04/71	14	06/04/71	29	08/04/71	82	10/04/71	61	12/04/71	53
04/05/71	15	06/05/71	28	08/05/71	95	10/05/71	58	12/05/71	49
04/06/71	15	06/06/71	27	08/06/71	94	10/06/71	59	12/06/71	47
04/07/71	14	06/07/71	26	08/07/71	83	10/07/71	58	12/07/71	48
04/08/71	13	06/08/71	28	08/08/71	78	10/08/71	56	12/08/71	46
04/09/71	13	06/09/71	35	08/09/71	92	10/09/71	54	12/09/71	45
04/10/71	13	06/10/71	35	08/10/71	200	10/10/71	53	12/10/71	43
04/11/71	13	06/11/71	48	08/11/71	120	10/11/71	59	12/11/71	42
04/12/71	12	06/12/71	56	08/12/71	112	10/12/71	62	12/12/71	39
04/13/71	12	06/13/71	66	08/13/71	110	10/13/71	59	12/13/71	37
04/14/71	12	06/14/71	46	08/14/71	115	10/14/71	59	12/14/71	36
04/15/71	12	06/15/71	40	08/15/71	115	10/15/71	58	12/15/71	35
04/16/71	12	06/16/71	39	08/16/71	104	10/16/71	56	12/16/71	34
04/17/71	12	06/17/71	37	08/17/71	115	10/17/71	52	12/17/71	34
04/18/71	12	06/18/71	34	08/18/71	99	10/18/71	55	12/18/71	33
04/19/71	11	06/19/71	33	08/19/71	89	10/19/71	77	12/19/71	36
04/20/71	11	06/20/71	33	08/20/71	80	10/20/71	101	12/20/71	45
04/21/71	12	06/21/71	36	08/21/71	80	10/21/71	82	12/21/71	46
04/22/71	12	06/22/71	37	08/22/71	78	10/22/71	91	12/22/71	55
04/23/71	12	06/23/71	36	08/23/71	75	10/23/71	88	12/23/71	129
04/24/71	12	06/24/71	36	08/24/71	72	10/24/71	85	12/24/71	124
04/25/71	12	06/25/71	35	08/25/71	69	10/25/71	103	12/25/71	92
04/26/71	12	06/26/71	37	08/26/71	67	10/26/71	90	12/26/71	77
04/27/71	12	06/27/71	36	08/27/71	76	10/27/71	81	12/27/71	69
04/28/71	12	06/28/71	40	08/28/71	99	10/28/71	76	12/28/71	65
04/29/71	12	06/29/71	47	08/29/71	78	10/29/71	74	12/29/71	61
04/30/71	12	06/30/71	42	08/30/71	83	10/30/71	78	12/30/71	58
05/01/71	12	07/01/71	38	08/31/71	80	10/31/71	82	12/31/71	57
05/02/71	12	07/02/71	37	09/01/71	87	11/01/71	83		
05/03/71	12	07/03/71	45	09/02/71	133	11/02/71	119		
05/04/71	13	07/04/71	45	09/03/71	122	11/03/71	230		
05/05/71	12	07/05/71	37	09/04/71	94	11/04/71	553		
05/06/71	12	07/06/71	34	09/05/71	82	11/05/71	502		
05/07/71	13	07/07/71	33	09/06/71	109	11/06/71	491		
05/08/71	12	07/08/71	44	09/07/71	313	11/07/71	308		
05/09/71	12	07/09/71	46	09/08/71	198	11/08/71	210		
05/10/71	12	07/10/71	41	09/09/71	162	11/09/71	208		
05/11/71	12	07/11/71	40	09/10/71	184	11/10/71	170		
05/12/71	11	07/12/71	40	09/11/71	135	11/11/71	149		
05/13/71	11	07/13/71	40	09/12/71	128	11/12/71	138		
05/14/71	11	07/14/71	39	09/13/71	300	11/13/71	124		
05/15/71	13	07/15/71	43	09/14/71	402	11/14/71	117		
05/16/71	21	07/16/71	43	09/15/71	549	11/15/71	109		
05/17/71	34	07/17/71	45	09/16/71	352	11/16/71	103		
05/18/71	47	07/18/71	46	09/17/71	215	11/17/71	99		
05/19/71	44	07/19/71	47	09/18/71	159	11/18/71	93		
05/20/71	41	07/20/71	48	09/19/71	141	11/19/71	89		
05/21/71	40	07/21/71	59	09/20/71	123	11/20/71	85		
05/22/71	37	07/22/71	61	09/21/71	115	11/21/71	83		
05/23/71	36	07/23/71	62	09/22/71	110	11/22/71	76		
05/24/71	35	07/24/71	78	09/23/71	107	11/23/71	74		
05/25/71	36	07/25/71	69	09/24/71	104	11/24/71	94		
05/26/71	40	07/26/71	66	09/25/71	98	11/25/71	87		
05/27/71	37	07/27/71	62	09/26/71	89	11/26/71	80		
05/28/71	33	07/28/71	60	09/27/71	83	11/27/71	74		
05/29/71	32	07/29/71	67	09/28/71	79	11/28/71	70		
05/30/71	31	07/30/71	71	09/29/71	73	11/29/71	65		
05/31/71	29	07/31/71	78	09/30/71	71	11/30/71	64		

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/72	55	03/01/72	19	05/01/72	34	07/01/72	57	09/01/72	22	11/01/72	15
01/02/72	53	03/02/72	19	05/02/72	31	07/02/72	58	09/02/72	21	11/02/72	15
01/03/72	53	03/03/72	19	05/03/72	28	07/03/72	49	09/03/72	20	11/03/72	15
01/04/72	51	03/04/72	20	05/04/72	26	07/04/72	43	09/04/72	20	11/04/72	15
01/05/72	49	03/05/72	20	05/05/72	25	07/05/72	38	09/05/72	21	11/05/72	15
01/06/72	49	03/06/72	21	05/06/72	26	07/06/72	32	09/06/72	20	11/06/72	15
01/07/72	47	03/07/72	20	05/07/72	51	07/07/72	27	09/07/72	20	11/07/72	17
01/08/72	45	03/08/72	20	05/08/72	56	07/08/72	25	09/08/72	21	11/08/72	18
01/09/72	43	03/09/72	20	05/09/72	42	07/09/72	25	09/09/72	22	11/09/72	19
01/10/72	45	03/10/72	20	05/10/72	36	07/10/72	28	09/10/72	35	11/10/72	18
01/11/72	43	03/11/72	20	05/11/72	38	07/11/72	53	09/11/72	45	11/11/72	18
01/12/72	41	03/12/72	20	05/12/72	434	07/12/72	56	09/12/72	42	11/12/72	18
01/13/72	40	03/13/72	20	05/13/72	735	07/13/72	93	09/13/72	39	11/13/72	18
01/14/72	39	03/14/72	20	05/14/72	460	07/14/72	58	09/14/72	29	11/14/72	18
01/15/72	37	03/15/72	20	05/15/72	339	07/15/72	45	09/15/72	26	11/15/72	19
01/16/72	37	03/16/72	20	05/16/72	482	07/16/72	37	09/16/72	25	11/16/72	20
01/17/72	37	03/17/72	20	05/17/72	242	07/17/72	32	09/17/72	25	11/17/72	20
01/18/72	40	03/18/72	20	05/18/72	218	07/18/72	29	09/18/72	23	11/18/72	20
01/19/72	39	03/19/72	19	05/19/72	198	07/19/72	32	09/19/72	23	11/19/72	20
01/20/72	38	03/20/72	19	05/20/72	128	07/20/72	55	09/20/72	23	11/20/72	30
01/21/72	35	03/21/72	19	05/21/72	96	07/21/72	45	09/21/72	23	11/21/72	41
01/22/72	36	03/22/72	19	05/22/72	81	07/22/72	35	09/22/72	24	11/22/72	34
01/23/72	41	03/23/72	18	05/23/72	76	07/23/72	30	09/23/72	29	11/23/72	31
01/24/72	49	03/24/72	18	05/24/72	77	07/24/72	26	09/24/72	42	11/24/72	29
01/25/72	42	03/25/72	17	05/25/72	79	07/25/72	25	09/25/72	29	11/25/72	28
01/26/72	38	03/26/72	17	05/26/72	99	07/26/72	23	09/26/72	28	11/26/72	27
01/27/72	37	03/27/72	17	05/27/72	86	07/27/72	22	09/27/72	25	11/27/72	27
01/28/72	35	03/28/72	16	05/28/72	74	07/28/72	21	09/28/72	25	11/28/72	27
01/29/72	32	03/29/72	16	05/29/72	125	07/29/72	20	09/29/72	25	11/29/72	26
01/30/72	32	03/30/72	17	05/30/72	137	07/30/72	19	09/30/72	25	11/30/72	25
01/31/72	29	03/31/72	23	05/31/72	96	07/31/72	24	10/01/72	21	12/01/72	25
02/01/72	26	04/01/72	24	06/01/72	80	08/01/72	31	10/02/72	21	12/02/72	24
02/02/72	27	04/02/72	23	06/02/72	98	08/02/72	26	10/03/72	21	12/03/72	23
02/03/72	27	04/03/72	23	06/03/72	102	08/03/72	23	10/04/72	21	12/04/72	23
02/04/72	26	04/04/72	22	06/04/72	124	08/04/72	21	10/05/72	20	12/05/72	22
02/05/72	25	04/05/72	22	06/05/72	337	08/05/72	20	10/06/72	19	12/06/72	21
02/06/72	24	04/06/72	21	06/06/72	315	08/06/72	19	10/07/72	18	12/07/72	21
02/07/72	24	04/07/72	21	06/07/72	155	08/07/72	19	10/08/72	17	12/08/72	20
02/08/72	24	04/08/72	20	06/08/72	108	08/08/72	18	10/09/72	16	12/09/72	20
02/09/72	24	04/09/72	19	06/09/72	167	08/09/72	17	10/10/72	16	12/10/72	19
02/10/72	25	04/10/72	21	06/10/72	148	08/10/72	17	10/11/72	16	12/11/72	18
02/11/72	27	04/11/72	20	06/11/72	145	08/11/72	17	10/12/72	17	12/12/72	18
02/12/72	29	04/12/72	19	06/12/72	182	08/12/72	18	10/13/72	18	12/13/72	18
02/13/72	25	04/13/72	19	06/13/72	177	08/13/72	19	10/14/72	18	12/14/72	17
02/14/72	24	04/14/72	19	06/14/72	142	08/14/72	19	10/15/72	17	12/15/72	17
02/15/72	24	04/15/72	18	06/15/72	137	08/15/72	18	10/16/72	17	12/16/72	17
02/16/72	24	04/16/72	17	06/16/72	129	08/16/72	19	10/17/72	17	12/17/72	17
02/17/72	24	04/17/72	17	06/17/72	134	08/17/72	19	10/18/72	16	12/18/72	17
02/18/72	23	04/18/72	17	06/18/72	146	08/18/72	22	10/19/72	16	12/19/72	18
02/19/72	23	04/19/72	16	06/19/72	191	08/19/72	22	10/20/72	16	12/20/72	18
02/20/72	23	04/20/72	17	06/20/72	173	08/20/72	20	10/21/72	16	12/21/72	18
02/21/72	23	04/21/72	19	06/21/72	134	08/21/72	19	10/22/72	16	12/22/72	21
02/22/72	23	04/22/72	20	06/22/72	115	08/22/72	20	10/23/72	16	12/23/72	23
02/23/72	23	04/23/72	20	06/23/72	104	08/23/72	38	10/24/72	16	12/24/72	24
02/24/72	23	04/24/72	19	06/24/72	94	08/24/72	75	10/25/72	16	12/25/72	24
02/25/72	23	04/25/72	19	06/25/72	91	08/25/72	58	10/26/72	16	12/26/72	24
02/26/72	22	04/26/72	19	06/26/72	88	08/26/72	40	10/27/72	16	12/27/72	24
02/27/72	22	04/27/72	18	06/27/72	79	08/27/72	34	10/28/72	16	12/28/72	24
02/28/72	20	04/28/72	18	06/28/72	75	08/28/72	28	10/29/72	16	12/29/72	24
02/29/72	20	04/29/72	18	06/29/72	67	08/29/72	25	10/30/72	16	12/30/72	23
		04/30/72	25	06/30/72	60	08/30/72	23	10/31/72	15	12/31/72	23
						08/31/72	21				

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/73	21	03/01/73	16	05/01/73	5	07/01/73	29	09/01/73	317	11/01/73	34
01/02/73	20	03/02/73	16	05/02/73	5	07/02/73	26	09/02/73	357	11/02/73	33
01/03/73	20	03/03/73	16	05/03/73	5	07/03/73	27	09/03/73	341	11/03/73	31
01/04/73	20	03/04/73	15	05/04/73	5	07/04/73	29	09/04/73	308	11/04/73	30
01/05/73	19	03/05/73	15	05/05/73	5	07/05/73	29	09/05/73	273	11/05/73	29
01/06/73	19	03/06/73	15	05/06/73	5	07/06/73	27	09/06/73	232	11/06/73	27
01/07/73	19	03/07/73	15	05/07/73	5	07/07/73	26	09/07/73	180	11/07/73	27
01/08/73	18	03/08/73	14	05/08/73	4	07/08/73	27	09/08/73	136	11/08/73	26
01/09/73	17	03/09/73	14	05/09/73	5	07/09/73	35	09/09/73	107	11/09/73	25
01/10/73	16	03/10/73	14	05/10/73	8	07/10/73	65	09/10/73	86	11/10/73	24
01/11/73	18	03/11/73	14	05/11/73	8	07/11/73	76	09/11/73	106	11/11/73	24
01/12/73	19	03/12/73	13	05/12/73	8	07/12/73	56	09/12/73	299	11/12/73	23
01/13/73	20	03/13/73	12	05/13/73	8	07/13/73	46	09/13/73	273	11/13/73	23
01/14/73	20	03/14/73	12	05/14/73	8	07/14/73	58	09/14/73	207	11/14/73	23
01/15/73	19	03/15/73	11	05/15/73	9	07/15/73	178	09/15/73	151	11/15/73	22
01/16/73	18	03/16/73	11	05/16/73	11	07/16/73	144	09/16/73	142	11/16/73	22
01/17/73	17	03/17/73	10	05/17/73	11	07/17/73	94	09/17/73	161	11/17/73	21
01/18/73	17	03/18/73	10	05/18/73	11	07/18/73	68	09/18/73	143	11/18/73	23
01/19/73	16	03/19/73	9	05/19/73	10	07/19/73	54	09/19/73	139	11/19/73	25
01/20/73	15	03/20/73	9	05/20/73	10	07/20/73	48	09/20/73	218	11/20/73	25
01/21/73	15	03/21/73	9	05/21/73	10	07/21/73	53	09/21/73	145	11/21/73	24
01/22/73	14	03/22/73	8	05/22/73	9	07/22/73	96	09/22/73	116	11/22/73	24
01/23/73	15	03/23/73	8	05/23/73	9	07/23/73	175	09/23/73	106	11/23/73	26
01/24/73	25	03/24/73	8	05/24/73	10	07/24/73	152	09/24/73	103	11/24/73	25
01/25/73	26	03/25/73	8	05/25/73	15	07/25/73	108	09/25/73	96	11/25/73	24
01/26/73	26	03/26/73	10	05/26/73	15	07/26/73	80	09/26/73	88	11/26/73	22
01/27/73	25	03/27/73	11	05/27/73	17	07/27/73	63	09/27/73	83	11/27/73	22
01/28/73	25	03/28/73	10	05/28/73	18	07/28/73	81	09/28/73	77	11/28/73	21
01/29/73	25	03/29/73	10	05/29/73	18	07/29/73	90	09/29/73	74	11/29/73	21
01/30/73	25	03/30/73	10	05/30/73	16	07/30/73	108	09/30/73	73	11/30/73	20
01/31/73	26	03/31/73	9	05/31/73	16	07/31/73	88	10/01/73	67	12/01/73	20
02/01/73	26	04/01/73	9	06/01/73	15	08/01/73	84	10/02/73	61	12/02/73	20
02/02/73	28	04/02/73	9	06/02/73	14	08/02/73	74	10/03/73	58	12/03/73	20
02/03/73	29	04/03/73	8	06/03/73	13	08/03/73	70	10/04/73	58	12/04/73	21
02/04/73	28	04/04/73	7	06/04/73	12	08/04/73	82	10/05/73	57	12/05/73	22
02/05/73	28	04/05/73	7	06/05/73	12	08/05/73	100	10/06/73	54	12/06/73	22
02/06/73	28	04/06/73	7	06/06/73	12	08/06/73	81	10/07/73	52	12/07/73	21
02/07/73	28	04/07/73	7	06/07/73	13	08/07/73	68	10/08/73	851	12/08/73	21
02/08/73	27	04/08/73	7	06/08/73	57	08/08/73	62	10/09/73	975	12/09/73	22
02/09/73	25	04/09/73	7	06/09/73	58	08/09/73	84	10/10/73	807	12/10/73	22
02/10/73	24	04/10/73	7	06/10/73	46	08/10/73	88	10/11/73	605	12/11/73	22
02/11/73	23	04/11/73	6	06/11/73	38	08/11/73	76	10/12/73	409	12/12/73	21
02/12/73	22	04/12/73	6	06/12/73	34	08/12/73	61	10/13/73	266	12/13/73	20
02/13/73	21	04/13/73	6	06/13/73	31	08/13/73	52	10/14/73	193	12/14/73	19
02/14/73	21	04/14/73	6	06/14/73	30	08/14/73	46	10/15/73	154	12/15/73	18
02/15/73	21	04/15/73	9	06/15/73	51	08/15/73	42	10/16/73	129	12/16/73	18
02/16/73	20	04/16/73	8	06/16/73	63	08/16/73	71	10/17/73	116	12/17/73	18
02/17/73	19	04/17/73	8	06/17/73	66	08/17/73	189	10/18/73	105	12/18/73	19
02/18/73	19	04/18/73	7	06/18/73	51	08/18/73	187	10/19/73	91	12/19/73	19
02/19/73	20	04/19/73	7	06/19/73	43	08/19/73	144	10/20/73	93	12/20/73	19
02/20/73	21	04/20/73	7	06/20/73	44	08/20/73	113	10/21/73	97	12/21/73	22
02/21/73	20	04/21/73	6	06/21/73	54	08/21/73	103	10/22/73	105	12/22/73	23
02/22/73	19	04/22/73	6	06/22/73	60	08/22/73	99	10/23/73	106	12/23/73	23
02/23/73	18	04/23/73	6	06/23/73	53	08/23/73	82	10/24/73	96	12/24/73	23
02/24/73	17	04/24/73	6	06/24/73	54	08/24/73	98	10/25/73	82	12/25/73	23
02/25/73	17	04/25/73	5	06/25/73	49	08/25/73	193	10/26/73	73	12/26/73	23
02/26/73	18	04/26/73	5	06/26/73	45	08/26/73	171	10/27/73	64	12/27/73	23
02/27/73	17	04/27/73	6	06/27/73	45	08/27/73	131	10/28/73	54	12/28/73	23
02/28/73	16	04/28/73	6	06/28/73	42	08/28/73	107	10/29/73	46	12/29/73	22
		04/29/73	6	06/29/73	38	08/29/73	91	10/30/73	40	12/30/73	21
		04/30/73	5	06/30/73	34	08/30/73	85	10/31/73	37	12/31/73	21
						08/31/73	142				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/74	21	03/01/74	13	05/01/74	1	07/01/74	51	09/01/74	33	11/01/74	27
01/02/74	20	03/02/74	13	05/02/74	1	07/02/74	90	09/02/74	33	11/02/74	27
01/03/74	19	03/03/74	12	05/03/74	1	07/03/74	109	09/03/74	32	11/03/74	27
01/04/74	19	03/04/74	12	05/04/74	1	07/04/74	99	09/04/74	31	11/04/74	27
01/05/74	18	03/05/74	11	05/05/74	1	07/05/74	84	09/05/74	31	11/05/74	26
01/06/74	17	03/06/74	11	05/06/74	1	07/06/74	104	09/06/74	33	11/06/74	24
01/07/74	17	03/07/74	10	05/07/74	1	07/07/74	117	09/07/74	33	11/07/74	24
01/08/74	17	03/08/74	10	05/08/74	1	07/08/74	102	09/08/74	33	11/08/74	24
01/09/74	16	03/09/74	10	05/09/74	1	07/09/74	94	09/09/74	32	11/09/74	24
01/10/74	15	03/10/74	9	05/10/74	2	07/10/74	92	09/10/74	33	11/10/74	25
01/11/74	14	03/11/74	9	05/11/74	3	07/11/74	98	09/11/74	34	11/11/74	25
01/12/74	13	03/12/74	9	05/12/74	3	07/12/74	106	09/12/74	35	11/12/74	25
01/13/74	12	03/13/74	8	05/13/74	4	07/13/74	162	09/13/74	35	11/13/74	24
01/14/74	28	03/14/74	8	05/14/74	4	07/14/74	159	09/14/74	34	11/14/74	23
01/15/74	49	03/15/74	9	05/15/74	5	07/15/74	138	09/15/74	32	11/15/74	23
01/16/74	44	03/16/74	16	05/16/74	5	07/16/74	125	09/16/74	31	11/16/74	23
01/17/74	39	03/17/74	15	05/17/74	6	07/17/74	118	09/17/74	31	11/17/74	23
01/18/74	37	03/18/74	13	05/18/74	7	07/18/74	121	09/18/74	30	11/18/74	24
01/19/74	35	03/19/74	12	05/19/74	8	07/19/74	126	09/19/74	29	11/19/74	25
01/20/74	34	03/20/74	11	05/20/74	8	07/20/74	126	09/20/74	29	11/20/74	25
01/21/74	32	03/21/74	11	05/21/74	9	07/21/74	119	09/21/74	30	11/21/74	24
01/22/74	30	03/22/74	11	05/22/74	9	07/22/74	110	09/22/74	30	11/22/74	24
01/23/74	29	03/23/74	11	05/23/74	9	07/23/74	117	09/23/74	27	11/23/74	24
01/24/74	28	03/24/74	10	05/24/74	9	07/24/74	130	09/24/74	29	11/24/74	23
01/25/74	28	03/25/74	12	05/25/74	10	07/25/74	149	09/25/74	35	11/25/74	23
01/26/74	29	03/26/74	13	05/26/74	10	07/26/74	194	09/26/74	37	11/26/74	23
01/27/74	28	03/27/74	13	05/27/74	11	07/27/74	235	09/27/74	39	11/27/74	28
01/28/74	27	03/28/74	12	05/28/74	12	07/28/74	253	09/28/74	43	11/28/74	28
01/29/74	25	03/29/74	12	05/29/74	14	07/29/74	266	09/29/74	41	11/29/74	27
01/30/74	24	03/30/74	11	05/30/74	15	07/30/74	282	09/30/74	38	11/30/74	27
01/31/74	22	03/31/74	11	05/31/74	15	07/31/74	282	10/01/74	39	12/01/74	27
02/01/74	20	04/01/74	10	06/01/74	15	08/01/74	264	10/02/74	38	12/02/74	26
02/02/74	19	04/02/74	10	06/02/74	16	08/02/74	247	10/03/74	37	12/03/74	26
02/03/74	19	04/03/74	10	06/03/74	18	08/03/74	216	10/04/74	39	12/04/74	26
02/04/74	18	04/04/74	9	06/04/74	20	08/04/74	208	10/05/74	39	12/05/74	26
02/05/74	18	04/05/74	9	06/05/74	21	08/05/74	221	10/06/74	55	12/06/74	26
02/06/74	18	04/06/74	9	06/06/74	21	08/06/74	158	10/07/74	77	12/07/74	26
02/07/74	18	04/07/74	9	06/07/74	16	08/07/74	122	10/08/74	60	12/08/74	26
02/08/74	18	04/08/74	9	06/08/74	14	08/08/74	109	10/09/74	52	12/09/74	26
02/09/74	18	04/09/74	8	06/09/74	14	08/09/74	94	10/10/74	46	12/10/74	26
02/10/74	17	04/10/74	8	06/10/74	15	08/10/74	80	10/11/74	42	12/11/74	25
02/11/74	17	04/11/74	8	06/11/74	17	08/11/74	69	10/12/74	41	12/12/74	25
02/12/74	17	04/12/74	8	06/12/74	21	08/12/74	68	10/13/74	47	12/13/74	26
02/13/74	17	04/13/74	8	06/13/74	27	08/13/74	76	10/14/74	44	12/14/74	26
02/14/74	16	04/14/74	8	06/14/74	23	08/14/74	56	10/15/74	41	12/15/74	27
02/15/74	16	04/15/74	8	06/15/74	21	08/15/74	46	10/16/74	38	12/16/74	28
02/16/74	15	04/16/74	7	06/16/74	34	08/16/74	49	10/17/74	37	12/17/74	28
02/17/74	15	04/17/74	7	06/17/74	44	08/17/74	61	10/18/74	36	12/18/74	28
02/18/74	14	04/18/74	6	06/18/74	41	08/18/74	197	10/19/74	35	12/19/74	29
02/19/74	14	04/19/74	5	06/19/74	36	08/19/74	215	10/20/74	34	12/20/74	29
02/20/74	14	04/20/74	4	06/20/74	32	08/20/74	185	10/21/74	33	12/21/74	28
02/21/74	15	04/21/74	4	06/21/74	34	08/21/74	153	10/22/74	32	12/22/74	29
02/22/74	15	04/22/74	3	06/22/74	46	08/22/74	121	10/23/74	31	12/23/74	28
02/23/74	15	04/23/74	3	06/23/74	47	08/23/74	103	10/24/74	31	12/24/74	28
02/24/74	15	04/24/74	3	06/24/74	40	08/24/74	113	10/25/74	32	12/25/74	28
02/25/74	15	04/25/74	2	06/25/74	38	08/25/74	101	10/26/74	31	12/26/74	28
02/26/74	14	04/26/74	2	06/26/74	65	08/26/74	68	10/27/74	31	12/27/74	27
02/27/74	13	04/27/74	2	06/27/74	92	08/27/74	47	10/28/74	30	12/28/74	28
02/28/74	13	04/28/74	2	06/28/74	80	08/28/74	39	10/29/74	29	12/29/74	28
		04/29/74	1	06/29/74	63	08/29/74	36	10/30/74	28	12/30/74	28
		04/30/74	1	06/30/74	54	08/30/74	34	10/31/74	28	12/31/74	28
						08/31/74	33				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/75	28	03/01/75	13	05/01/75	6	07/01/75	44	09/01/75	21	11/01/75	42
01/02/75	27	03/02/75	13	05/02/75	6	07/02/75	45	09/02/75	23	11/02/75	41
01/03/75	26	03/03/75	13	05/03/75	6	07/03/75	44	09/03/75	31	11/03/75	41
01/04/75	25	03/04/75	13	05/04/75	5	07/04/75	39	09/04/75	31	11/04/75	41
01/05/75	24	03/05/75	13	05/05/75	5	07/05/75	35	09/05/75	30	11/05/75	40
01/06/75	24	03/06/75	13	05/06/75	7	07/06/75	34	09/06/75	29	11/06/75	40
01/07/75	23	03/07/75	13	05/07/75	7	07/07/75	36	09/07/75	29	11/07/75	40
01/08/75	22	03/08/75	13	05/08/75	8	07/08/75	34	09/08/75	29	11/08/75	40
01/09/75	21	03/09/75	13	05/09/75	8	07/09/75	34	09/09/75	29	11/09/75	39
01/10/75	20	03/10/75	12	05/10/75	8	07/10/75	38	09/10/75	29	11/10/75	40
01/11/75	20	03/11/75	12	05/11/75	8	07/11/75	38	09/11/75	29	11/11/75	41
01/12/75	20	03/12/75	11	05/12/75	8	07/12/75	38	09/12/75	29	11/12/75	40
01/13/75	19	03/13/75	11	05/13/75	9	07/13/75	44	09/13/75	28	11/13/75	41
01/14/75	18	03/14/75	11	05/14/75	10	07/14/75	42	09/14/75	28	11/14/75	40
01/15/75	17	03/15/75	10	05/15/75	11	07/15/75	39	09/15/75	29	11/15/75	41
01/16/75	17	03/16/75	10	05/16/75	13	07/16/75	35	09/16/75	30	11/16/75	41
01/17/75	16	03/17/75	10	05/17/75	14	07/17/75	32	09/17/75	30	11/17/75	42
01/18/75	16	03/18/75	9	05/18/75	15	07/18/75	48	09/18/75	31	11/18/75	43
01/19/75	15	03/19/75	10	05/19/75	16	07/19/75	39	09/19/75	37	11/19/75	49
01/20/75	14	03/20/75	11	05/20/75	17	07/20/75	35	09/20/75	38	11/20/75	51
01/21/75	14	03/21/75	11	05/21/75	17	07/21/75	32	09/21/75	36	11/21/75	52
01/22/75	14	03/22/75	10	05/22/75	17	07/22/75	31	09/22/75	35	11/22/75	51
01/23/75	14	03/23/75	10	05/23/75	17	07/23/75	30	09/23/75	34	11/23/75	50
01/24/75	15	03/24/75	9	05/24/75	17	07/24/75	30	09/24/75	34	11/24/75	50
01/25/75	15	03/25/75	9	05/25/75	17	07/25/75	29	09/25/75	35	11/25/75	49
01/26/75	14	03/26/75	8	05/26/75	16	07/26/75	28	09/26/75	35	11/26/75	48
01/27/75	14	03/27/75	8	05/27/75	16	07/27/75	28	09/27/75	35	11/27/75	47
01/28/75	14	03/28/75	8	05/28/75	18	07/28/75	28	09/28/75	34	11/28/75	46
01/29/75	14	03/29/75	7	05/29/75	27	07/29/75	28	09/29/75	41	11/29/75	46
01/30/75	13	03/30/75	7	05/30/75	29	07/30/75	27	09/30/75	50	11/30/75	45
01/31/75	13	03/31/75	7	05/31/75	32	07/31/75	28	10/01/75	80	12/01/75	45
02/01/75	12	04/01/75	6	06/01/75	32	08/01/75	28	10/02/75	176	12/02/75	44
02/02/75	12	04/02/75	6	06/02/75	32	08/02/75	33	10/03/75	186	12/03/75	43
02/03/75	12	04/03/75	7	06/03/75	35	08/03/75	35	10/04/75	178	12/04/75	42
02/04/75	12	04/04/75	6	06/04/75	37	08/04/75	30	10/05/75	127	12/05/75	42
02/05/75	11	04/05/75	6	06/05/75	36	08/05/75	28	10/06/75	101	12/06/75	41
02/06/75	11	04/06/75	6	06/06/75	36	08/06/75	27	10/07/75	89	12/07/75	39
02/07/75	11	04/07/75	6	06/07/75	35	08/07/75	26	10/08/75	78	12/08/75	39
02/08/75	12	04/08/75	6	06/08/75	35	08/08/75	26	10/09/75	75	12/09/75	39
02/09/75	12	04/09/75	6	06/09/75	54	08/09/75	25	10/10/75	84	12/10/75	39
02/10/75	12	04/10/75	6	06/10/75	52	08/10/75	24	10/11/75	81	12/11/75	36
02/11/75	12	04/11/75	6	06/11/75	44	08/11/75	23	10/12/75	72	12/12/75	32
02/12/75	12	04/12/75	6	06/12/75	46	08/12/75	23	10/13/75	68	12/13/75	30
02/13/75	12	04/13/75	7	06/13/75	45	08/13/75	23	10/14/75	66	12/14/75	29
02/14/75	12	04/14/75	7	06/14/75	44	08/14/75	25	10/15/75	64	12/15/75	29
02/15/75	12	04/15/75	7	06/15/75	44	08/15/75	25	10/16/75	60	12/16/75	28
02/16/75	12	04/16/75	8	06/16/75	44	08/16/75	25	10/17/75	57	12/17/75	28
02/17/75	11	04/17/75	7	06/17/75	54	08/17/75	25	10/18/75	56	12/18/75	27
02/18/75	11	04/18/75	7	06/18/75	71	08/18/75	25	10/19/75	54	12/19/75	26
02/19/75	11	04/19/75	7	06/19/75	75	08/19/75	24	10/20/75	53	12/20/75	25
02/20/75	11	04/20/75	6	06/20/75	72	08/20/75	24	10/21/75	51	12/21/75	25
02/21/75	11	04/21/75	6	06/21/75	60	08/21/75	24	10/22/75	51	12/22/75	25
02/22/75	12	04/22/75	8	06/22/75	51	08/22/75	24	10/23/75	50	12/23/75	24
02/23/75	13	04/23/75	8	06/23/75	48	08/23/75	23	10/24/75	48	12/24/75	23
02/24/75	13	04/24/75	8	06/24/75	52	08/24/75	23	10/25/75	45	12/25/75	23
02/25/75	14	04/25/75	7	06/25/75	45	08/25/75	23	10/26/75	44	12/26/75	25
02/26/75	14	04/26/75	7	06/26/75	42	08/26/75	22	10/27/75	43	12/27/75	25
02/27/75	14	04/27/75	7	06/27/75	38	08/27/75	23	10/28/75	44	12/28/75	25
02/28/75	13	04/28/75	7	06/28/75	34	08/28/75	24	10/29/75	47	12/29/75	24
		04/29/75	6	06/29/75	33	08/29/75	24	10/30/75	45	12/30/75	24
		04/30/75	6	06/30/75	38	08/30/75	23	10/31/75	43	12/31/75	24
						08/31/75	22				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/76	24	03/01/76	31	05/01/76	5	07/01/76	54	09/01/76	55	11/01/76	55
01/02/76	24	03/02/76	30	05/02/76	6	07/02/76	55	09/02/76	53	11/02/76	53
01/03/76	24	03/03/76	31	05/03/76	7	07/03/76	55	09/03/76	51	11/03/76	83
01/04/76	24	03/04/76	31	05/04/76	7	07/04/76	54	09/04/76	51	11/04/76	140
01/05/76	24	03/05/76	31	05/05/76	7	07/05/76	52	09/05/76	64	11/05/76	137
01/06/76	24	03/06/76	28	05/06/76	6	07/06/76	49	09/06/76	136	11/06/76	132
01/07/76	23	03/07/76	28	05/07/76	6	07/07/76	49	09/07/76	174	11/07/76	128
01/08/76	23	03/08/76	28	05/08/76	6	07/08/76	56	09/08/76	214	11/08/76	123
01/09/76	22	03/09/76	28	05/09/76	5	07/09/76	62	09/09/76	198	11/09/76	120
01/10/76	22	03/10/76	27	05/10/76	5	07/10/76	60	09/10/76	126	11/10/76	118
01/11/76	22	03/11/76	28	05/11/76	7	07/11/76	54	09/11/76	93	11/11/76	117
01/12/76	21	03/12/76	30	05/12/76	12	07/12/76	51	09/12/76	145	11/12/76	109
01/13/76	21	03/13/76	34	05/13/76	15	07/13/76	46	09/13/76	217	11/13/76	71
01/14/76	21	03/14/76	31	05/14/76	16	07/14/76	47	09/14/76	167	11/14/76	65
01/15/76	21	03/15/76	29	05/15/76	15	07/15/76	47	09/15/76	116	11/15/76	64
01/16/76	21	03/16/76	28	05/16/76	21	07/16/76	45	09/16/76	112	11/16/76	63
01/17/76	21	03/17/76	29	05/17/76	33	07/17/76	47	09/17/76	143	11/17/76	63
01/18/76	20	03/18/76	28	05/18/76	37	07/18/76	47	09/18/76	143	11/18/76	65
01/19/76	19	03/19/76	27	05/19/76	31	07/19/76	45	09/19/76	153	11/19/76	70
01/20/76	19	03/20/76	27	05/20/76	44	07/20/76	44	09/20/76	149	11/20/76	76
01/21/76	19	03/21/76	26	05/21/76	44	07/21/76	44	09/21/76	134	11/21/76	77
01/22/76	19	03/22/76	26	05/22/76	39	07/22/76	45	09/22/76	159	11/22/76	77
01/23/76	19	03/23/76	26	05/23/76	48	07/23/76	45	09/23/76	159	11/23/76	76
01/24/76	19	03/24/76	25	05/24/76	76	07/24/76	46	09/24/76	152	11/24/76	76
01/25/76	19	03/25/76	23	05/25/76	57	07/25/76	45	09/25/76	157	11/25/76	75
01/26/76	19	03/26/76	22	05/26/76	43	07/26/76	40	09/26/76	141	11/26/76	73
01/27/76	19	03/27/76	22	05/27/76	36	07/27/76	40	09/27/76	132	11/27/76	66
01/28/76	18	03/28/76	21	05/28/76	37	07/28/76	46	09/28/76	118	11/28/76	62
01/29/76	17	03/29/76	20	05/29/76	84	07/29/76	56	09/29/76	114	11/29/76	57
01/30/76	16	03/30/76	19	05/30/76	136	07/30/76	84	09/30/76	119	11/30/76	53
01/31/76	15	03/31/76	18	05/31/76	102	07/31/76	93	10/01/76	152	12/01/76	49
02/01/76	14	04/01/76	18	06/01/76	73	08/01/76	91	10/02/76	141	12/02/76	47
02/02/76	12	04/02/76	18	06/02/76	59	08/02/76	91	10/03/76	123	12/03/76	48
02/03/76	10	04/03/76	18	06/03/76	54	08/03/76	89	10/04/76	116	12/04/76	48
02/04/76	10	04/04/76	18	06/04/76	51	08/04/76	85	10/05/76	113	12/05/76	48
02/05/76	9	04/05/76	17	06/05/76	59	08/05/76	72	10/06/76	112	12/06/76	47
02/06/76	9	04/06/76	17	06/06/76	62	08/06/76	68	10/07/76	112	12/07/76	46
02/07/76	9	04/07/76	18	06/07/76	62	08/07/76	69	10/08/76	112	12/08/76	45
02/08/76	9	04/08/76	18	06/08/76	85	08/08/76	55	10/09/76	113	12/09/76	41
02/09/76	9	04/09/76	18	06/09/76	86	08/09/76	52	10/10/76	110	12/10/76	38
02/10/76	9	04/10/76	19	06/10/76	68	08/10/76	51	10/11/76	139	12/11/76	38
02/11/76	9	04/11/76	17	06/11/76	80	08/11/76	52	10/12/76	136	12/12/76	37
02/12/76	9	04/12/76	16	06/12/76	87	08/12/76	57	10/13/76	90	12/13/76	34
02/13/76	8	04/13/76	15	06/13/76	62	08/13/76	58	10/14/76	73	12/14/76	34
02/14/76	8	04/14/76	15	06/14/76	49	08/14/76	59	10/15/76	62	12/15/76	34
02/15/76	8	04/15/76	14	06/15/76	43	08/15/76	68	10/16/76	58	12/16/76	34
02/16/76	8	04/16/76	13	06/16/76	52	08/16/76	64	10/17/76	52	12/17/76	38
02/17/76	8	04/17/76	12	06/17/76	44	08/17/76	63	10/18/76	48	12/18/76	37
02/18/76	8	04/18/76	11	06/18/76	44	08/18/76	62	10/19/76	46	12/19/76	36
02/19/76	8	04/19/76	11	06/19/76	47	08/19/76	74	10/20/76	47	12/20/76	35
02/20/76	7	04/20/76	10	06/20/76	45	08/20/76	77	10/21/76	46	12/21/76	35
02/21/76	7	04/21/76	8	06/21/76	40	08/21/76	73	10/22/76	44	12/22/76	34
02/22/76	7	04/22/76	7	06/22/76	38	08/22/76	101	10/23/76	39	12/23/76	34
02/23/76	8	04/23/76	6	06/23/76	45	08/23/76	101	10/24/76	36	12/24/76	39
02/24/76	8	04/24/76	6	06/24/76	49	08/24/76	93	10/25/76	35	12/25/76	41
02/25/76	9	04/25/76	5	06/25/76	50	08/25/76	83	10/26/76	40	12/26/76	47
02/26/76	12	04/26/76	5	06/26/76	50	08/26/76	73	10/27/76	55	12/27/76	48
02/27/76	19	04/27/76	5	06/27/76	50	08/27/76	72	10/28/76	55	12/28/76	47
02/28/76	26	04/28/76	5	06/28/76	50	08/28/76	91	10/29/76	55	12/29/76	49
02/29/76	31	04/29/76	5	06/29/76	50	08/29/76	81	10/30/76	55	12/30/76	45
		04/30/76	5	06/30/76	51	08/30/76	67	10/31/76	55	12/31/76	40
						08/31/76	60				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/77	37	03/01/77	38	05/01/77	15	07/01/77	24	09/01/77	52	11/01/77	52
01/02/77	35	03/02/77	38	05/02/77	14	07/02/77	26	09/02/77	134	11/02/77	51
01/03/77	43	03/03/77	38	05/03/77	12	07/03/77	25	09/03/77	628	11/03/77	49
01/04/77	54	03/04/77	39	05/04/77	11	07/04/77	24	09/04/77	561	11/04/77	47
01/05/77	45	03/05/77	38	05/05/77	11	07/05/77	25	09/05/77	335	11/05/77	47
01/06/77	48	03/06/77	45	05/06/77	13	07/06/77	29	09/06/77	267	11/06/77	48
01/07/77	54	03/07/77	52	05/07/77	15	07/07/77	31	09/07/77	173	11/07/77	46
01/08/77	54	03/08/77	34	05/08/77	15	07/08/77	31	09/08/77	197	11/08/77	45
01/09/77	55	03/09/77	34	05/09/77	15	07/09/77	31	09/09/77	156	11/09/77	44
01/10/77	53	03/10/77	33	05/10/77	14	07/10/77	30	09/10/77	143	11/10/77	43
01/11/77	41	03/11/77	32	05/11/77	12	07/11/77	30	09/11/77	130	11/11/77	43
01/12/77	41	03/12/77	32	05/12/77	12	07/12/77	40	09/12/77	121	11/12/77	42
01/13/77	39	03/13/77	31	05/13/77	20	07/13/77	43	09/13/77	106	11/13/77	42
01/14/77	35	03/14/77	30	05/14/77	30	07/14/77	42	09/14/77	107	11/14/77	42
01/15/77	57	03/15/77	28	05/15/77	33	07/15/77	41	09/15/77	112	11/15/77	41
01/16/77	81	03/16/77	27	05/16/77	33	07/16/77	38	09/16/77	109	11/16/77	41
01/17/77	78	03/17/77	27	05/17/77	33	07/17/77	38	09/17/77	109	11/17/77	42
01/18/77	68	03/18/77	26	05/18/77	33	07/18/77	38	09/18/77	108	11/18/77	42
01/19/77	63	03/19/77	28	05/19/77	33	07/19/77	37	09/19/77	106	11/19/77	42
01/20/77	65	03/20/77	33	05/20/77	32	07/20/77	36	09/20/77	107	11/20/77	41
01/21/77	77	03/21/77	32	05/21/77	30	07/21/77	36	09/21/77	112	11/21/77	40
01/22/77	78	03/22/77	28	05/22/77	23	07/22/77	35	09/22/77	262	11/22/77	40
01/23/77	74	03/23/77	28	05/23/77	17	07/23/77	31	09/23/77	221	11/23/77	42
01/24/77	72	03/24/77	28	05/24/77	16	07/24/77	28	09/24/77	155	11/24/77	48
01/25/77	73	03/25/77	27	05/25/77	15	07/25/77	26	09/25/77	128	11/25/77	51
01/26/77	72	03/26/77	27	05/26/77	17	07/26/77	24	09/26/77	109	11/26/77	51
01/27/77	72	03/27/77	27	05/27/77	30	07/27/77	20	09/27/77	138	11/27/77	50
01/28/77	76	03/28/77	27	05/28/77	33	07/28/77	18	09/28/77	124	11/28/77	49
01/29/77	77	03/29/77	26	05/29/77	43	07/29/77	17	09/29/77	109	11/29/77	49
01/30/77	77	03/30/77	19	05/30/77	44	07/30/77	17	09/30/77	104	11/30/77	50
01/31/77	77	03/31/77	15	05/31/77	45	07/31/77	17	10/01/77	99	12/01/77	50
02/01/77	71	04/01/77	22	06/01/77	63	08/01/77	18	10/02/77	95	12/02/77	53
02/02/77	45	04/02/77	23	06/02/77	60	08/02/77	18	10/03/77	91	12/03/77	54
02/03/77	43	04/03/77	22	06/03/77	58	08/03/77	17	10/04/77	87	12/04/77	54
02/04/77	38	04/04/77	21	06/04/77	56	08/04/77	16	10/05/77	81	12/05/77	54
02/05/77	41	04/05/77	20	06/05/77	58	08/05/77	16	10/06/77	79	12/06/77	57
02/06/77	43	04/06/77	20	06/06/77	59	08/06/77	17	10/07/77	82	12/07/77	61
02/07/77	43	04/07/77	20	06/07/77	61	08/07/77	18	10/08/77	85	12/08/77	60
02/08/77	43	04/08/77	20	06/08/77	58	08/08/77	19	10/09/77	85	12/09/77	62
02/09/77	44	04/09/77	17	06/09/77	59	08/09/77	19	10/10/77	85	12/10/77	70
02/10/77	44	04/10/77	16	06/10/77	58	08/10/77	20	10/11/77	82	12/11/77	67
02/11/77	44	04/11/77	15	06/11/77	56	08/11/77	20	10/12/77	79	12/12/77	65
02/12/77	42	04/12/77	15	06/12/77	53	08/12/77	20	10/13/77	76	12/13/77	67
02/13/77	38	04/13/77	15	06/13/77	49	08/13/77	21	10/14/77	74	12/14/77	71
02/14/77	38	04/14/77	15	06/14/77	43	08/14/77	21	10/15/77	73	12/15/77	74
02/15/77	35	04/15/77	15	06/15/77	38	08/15/77	20	10/16/77	73	12/16/77	82
02/16/77	30	04/16/77	15	06/16/77	35	08/16/77	20	10/17/77	71	12/17/77	107
02/17/77	27	04/17/77	14	06/17/77	32	08/17/77	20	10/18/77	71	12/18/77	94
02/18/77	27	04/18/77	14	06/18/77	31	08/18/77	21	10/19/77	70	12/19/77	78
02/19/77	27	04/19/77	14	06/19/77	31	08/19/77	22	10/20/77	70	12/20/77	72
02/20/77	27	04/20/77	14	06/20/77	31	08/20/77	22	10/21/77	67	12/21/77	68
02/21/77	27	04/21/77	14	06/21/77	30	08/21/77	24	10/22/77	68	12/22/77	72
02/22/77	26	04/22/77	15	06/22/77	29	08/22/77	39	10/23/77	69	12/23/77	68
02/23/77	26	04/23/77	16	06/23/77	28	08/23/77	39	10/24/77	66	12/24/77	65
02/24/77	27	04/24/77	16	06/24/77	27	08/24/77	39	10/25/77	65	12/25/77	64
02/25/77	31	04/25/77	16	06/25/77	25	08/25/77	39	10/26/77	65	12/26/77	62
02/26/77	32	04/26/77	15	06/26/77	18	08/26/77	39	10/27/77	64	12/27/77	60
02/27/77	31	04/27/77	15	06/27/77	24	08/27/77	41	10/28/77	62	12/28/77	58
02/28/77	34	04/28/77	14	06/28/77	22	08/28/77	49	10/29/77	60	12/29/77	56
		04/29/77	16	06/29/77	20	08/29/77	50	10/30/77	59	12/30/77	56
		04/30/77	15	06/30/77	20	08/30/77	52	10/31/77	58	12/31/77	58
						08/31/77	51				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/78	64	03/01/78	85	05/01/78	24	07/01/78	52	09/01/78	81	11/01/78	136
01/02/78	66	03/02/78	81	05/02/78	24	07/02/78	44	09/02/78	89	11/02/78	163
01/03/78	65	03/03/78	84	05/03/78	26	07/03/78	38	09/03/78	98	11/03/78	136
01/04/78	67	03/04/78	89	05/04/78	25	07/04/78	34	09/04/78	104	11/04/78	123
01/05/78	67	03/05/78	89	05/05/78	25	07/05/78	31	09/05/78	123	11/05/78	118
01/06/78	67	03/06/78	88	05/06/78	25	07/06/78	31	09/06/78	120	11/06/78	115
01/07/78	69	03/07/78	87	05/07/78	24	07/07/78	48	09/07/78	104	11/07/78	118
01/08/78	71	03/08/78	86	05/08/78	23	07/08/78	132	09/08/78	95	11/08/78	142
01/09/78	87	03/09/78	98	05/09/78	21	07/09/78	102	09/09/78	95	11/09/78	117
01/10/78	113	03/10/78	112	05/10/78	20	07/10/78	91	09/10/78	92	11/10/78	101
01/11/78	107	03/11/78	112	05/11/78	19	07/11/78	66	09/11/78	92	11/11/78	240
01/12/78	79	03/12/78	107	05/12/78	18	07/12/78	60	09/12/78	91	11/12/78	730
01/13/78	78	03/13/78	104	05/13/78	9	07/13/78	56	09/13/78	89	11/13/78	590
01/14/78	78	03/14/78	104	05/14/78	3	07/14/78	72	09/14/78	87	11/14/78	460
01/15/78	74	03/15/78	104	05/15/78	1	07/15/78	75	09/15/78	86	11/15/78	270
01/16/78	73	03/16/78	99	05/16/78	1	07/16/78	99	09/16/78	89	11/16/78	160
01/17/78	76	03/17/78	98	05/17/78	1	07/17/78	112	09/17/78	91	11/17/78	112
01/18/78	76	03/18/78	94	05/18/78	1	07/18/78	165	09/18/78	101	11/18/78	92
01/19/78	91	03/19/78	88	05/19/78	5	07/19/78	235	09/19/78	98	11/19/78	78
01/20/78	157	03/20/78	85	05/20/78	8	07/20/78	197	09/20/78	91	11/20/78	67
01/21/78	123	03/21/78	82	05/21/78	10	07/21/78	130	09/21/78	88	11/21/78	62
01/22/78	105	03/22/78	80	05/22/78	24	07/22/78	86	09/22/78	89	11/22/78	68
01/23/78	99	03/23/78	76	05/23/78	28	07/23/78	75	09/23/78	91	11/23/78	69
01/24/78	99	03/24/78	60	05/24/78	21	07/24/78	67	09/24/78	89	11/24/78	60
01/25/78	96	03/25/78	56	05/25/78	16	07/25/78	54	09/25/78	95	11/25/78	56
01/26/78	107	03/26/78	58	05/26/78	16	07/26/78	48	09/26/78	102	11/26/78	49
01/27/78	105	03/27/78	67	05/27/78	16	07/27/78	56	09/27/78	94	11/27/78	46
01/28/78	104	03/28/78	68	05/28/78	17	07/28/78	60	09/28/78	89	11/28/78	44
01/29/78	105	03/29/78	68	05/29/78	19	07/29/78	110	09/29/78	86	11/29/78	43
01/30/78	105	03/30/78	67	05/30/78	20	07/30/78	183	09/30/78	86	11/30/78	42
01/31/78	105	03/31/78	62	05/31/78	24	07/31/78	149	10/01/78	98	12/01/78	44
02/01/78	105	04/01/78	47	06/01/78	26	08/01/78	216	10/02/78	99	12/02/78	56
02/02/78	107	04/02/78	43	06/02/78	26	08/02/78	237	10/03/78	98	12/03/78	55
02/03/78	107	04/03/78	42	06/03/78	27	08/03/78	157	10/04/78	104	12/04/78	53
02/04/78	107	04/04/78	42	06/04/78	30	08/04/78	99	10/05/78	117	12/05/78	51
02/05/78	104	04/05/78	41	06/05/78	43	08/05/78	77	10/06/78	112	12/06/78	48
02/06/78	102	04/06/78	40	06/06/78	72	08/06/78	107	10/07/78	108	12/07/78	46
02/07/78	102	04/07/78	38	06/07/78	104	08/07/78	98	10/08/78	104	12/08/78	47
02/08/78	99	04/08/78	28	06/08/78	108	08/08/78	98	10/09/78	102	12/09/78	46
02/09/78	99	04/09/78	25	06/09/78	105	08/09/78	80	10/10/78	101	12/10/78	44
02/10/78	101	04/10/78	24	06/10/78	99	08/10/78	60	10/11/78	104	12/11/78	84
02/11/78	96	04/11/78	24	06/11/78	92	08/11/78	51	10/12/78	110	12/12/78	116
02/12/78	96	04/12/78	31	06/12/78	86	08/12/78	46	10/13/78	109	12/13/78	84
02/13/78	96	04/13/78	34	06/13/78	95	08/13/78	44	10/14/78	132	12/14/78	69
02/14/78	95	04/14/78	34	06/14/78	96	08/14/78	44	10/15/78	136	12/15/78	62
02/15/78	91	04/15/78	33	06/15/78	91	08/15/78	48	10/16/78	122	12/16/78	57
02/16/78	89	04/16/78	32	06/16/78	84	08/16/78	77	10/17/78	115	12/17/78	52
02/17/78	92	04/17/78	31	06/17/78	79	08/17/78	86	10/18/78	110	12/18/78	49
02/18/78	94	04/18/78	31	06/18/78	74	08/18/78	82	10/19/78	112	12/19/78	47
02/19/78	92	04/19/78	31	06/19/78	71	08/19/78	85	10/20/78	154	12/20/78	45
02/20/78	92	04/20/78	30	06/20/78	71	08/20/78	87	10/21/78	130	12/21/78	44
02/21/78	94	04/21/78	28	06/21/78	47	08/21/78	84	10/22/78	127	12/22/78	46
02/22/78	96	04/22/78	24	06/22/78	46	08/22/78	87	10/23/78	127	12/23/78	49
02/23/78	98	04/23/78	19	06/23/78	69	08/23/78	84	10/24/78	122	12/24/78	51
02/24/78	95	04/24/78	16	06/24/78	105	08/24/78	91	10/25/78	104	12/25/78	51
02/25/78	94	04/25/78	14	06/25/78	154	08/25/78	98	10/26/78	94	12/26/78	50
02/26/78	92	04/26/78	13	06/26/78	163	08/26/78	91	10/27/78	115	12/27/78	48
02/27/78	89	04/27/78	10	06/27/78	206	08/27/78	86	10/28/78	119	12/28/78	89
02/28/78	87	04/28/78	7	06/28/78	142	08/28/78	85	10/29/78	120	12/29/78	250
		04/29/78	7	06/29/78	95	08/29/78	82	10/30/78	120	12/30/78	186
		04/30/78	23	06/30/78	42	08/30/78	81	10/31/78	119	12/31/78	122
						08/31/78	79				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/79	96	03/01/79	32	05/01/79	35	07/01/79	68	09/01/79	10	11/01/79	44
01/02/79	84	03/02/79	32	05/02/79	30	07/02/79	65	09/02/79	11	11/02/79	110
01/03/79	89	03/03/79	32	05/03/79	28	07/03/79	61	09/03/79	17	11/03/79	127
01/04/79	79	03/04/79	30	05/04/79	29	07/04/79	58	09/04/79	88	11/04/79	127
01/05/79	69	03/05/79	29	05/05/79	58	07/05/79	54	09/05/79	98	11/05/79	130
01/06/79	62	03/06/79	28	05/06/79	76	07/06/79	53	09/06/79	80	11/06/79	133
01/07/79	58	03/07/79	33	05/07/79	76	07/07/79	51	09/07/79	80	11/07/79	124
01/08/79	58	03/08/79	39	05/08/79	77	07/08/79	51	09/08/79	86	11/08/79	126
01/09/79	62	03/09/79	54	05/09/79	82	07/09/79	48	09/09/79	92	11/09/79	128
01/10/79	58	03/10/79	58	05/10/79	80	07/10/79	47	09/10/79	160	11/10/79	128
01/11/79	52	03/11/79	59	05/11/79	76	07/11/79	46	09/11/79	194	11/11/79	128
01/12/79	58	03/12/79	58	05/12/79	73	07/12/79	46	09/12/79	254	11/12/79	143
01/13/79	114	03/13/79	58	05/13/79	69	07/13/79	47	09/13/79	360	11/13/79	237
01/14/79	126	03/14/79	57	05/14/79	74	07/14/79	47	09/14/79	412	11/14/79	228
01/15/79	92	03/15/79	56	05/15/79	96	07/15/79	48	09/15/79	448	11/15/79	180
01/16/79	75	03/16/79	56	05/16/79	96	07/16/79	57	09/16/79	345	11/16/79	148
01/17/79	66	03/17/79	58	05/17/79	96	07/17/79	62	09/17/79	258	11/17/79	144
01/18/79	62	03/18/79	58	05/18/79	93	07/18/79	61	09/18/79	186	11/18/79	138
01/19/79	56	03/19/79	56	05/19/79	88	07/19/79	60	09/19/79	142	11/19/79	131
01/20/79	54	03/20/79	54	05/20/79	83	07/20/79	61	09/20/79	113	11/20/79	134
01/21/79	60	03/21/79	53	05/21/79	80	07/21/79	59	09/21/79	186	11/21/79	131
01/22/79	69	03/22/79	51	05/22/79	76	07/22/79	58	09/22/79	320	11/22/79	128
01/23/79	62	03/23/79	50	05/23/79	73	07/23/79	59	09/23/79	224	11/23/79	134
01/24/79	100	03/24/79	49	05/24/79	71	07/24/79	58	09/24/79	150	11/24/79	133
01/25/79	142	03/25/79	47	05/25/79	77	07/25/79	56	09/25/79	126	11/25/79	132
01/26/79	100	03/26/79	46	05/26/79	77	07/26/79	53	09/26/79	125	11/26/79	134
01/27/79	80	03/27/79	44	05/27/79	75	07/27/79	51	09/27/79	132	11/27/79	136
01/28/79	77	03/28/79	44	05/28/79	75	07/28/79	48	09/28/79	118	11/28/79	128
01/29/79	69	03/29/79	43	05/29/79	83	07/29/79	45	09/29/79	110	11/29/79	136
01/30/79	60	03/30/79	42	05/30/79	81	07/30/79	44	09/30/79	106	11/30/79	137
01/31/79	54	03/31/79	41	05/31/79	79	07/31/79	46	10/01/79	118	12/01/79	135
02/01/79	50	04/01/79	40	06/01/79	77	08/01/79	47	10/02/79	114	12/02/79	127
02/02/79	46	04/02/79	39	06/02/79	72	08/02/79	48	10/03/79	108	12/03/79	125
02/03/79	44	04/03/79	37	06/03/79	68	08/03/79	49	10/04/79	110	12/04/79	126
02/04/79	43	04/04/79	36	06/04/79	64	08/04/79	50	10/05/79	117	12/05/79	127
02/05/79	42	04/05/79	35	06/05/79	60	08/05/79	51	10/06/79	108	12/06/79	128
02/06/79	40	04/06/79	33	06/06/79	56	08/06/79	53	10/07/79	101	12/07/79	135
02/07/79	40	04/07/79	24	06/07/79	52	08/07/79	68	10/08/79	97	12/08/79	136
02/08/79	39	04/08/79	19	06/08/79	50	08/08/79	92	10/09/79	93	12/09/79	139
02/09/79	40	04/09/79	18	06/09/79	49	08/09/79	93	10/10/79	92	12/10/79	132
02/10/79	45	04/10/79	17	06/10/79	47	08/10/79	92	10/11/79	91	12/11/79	132
02/11/79	49	04/11/79	16	06/11/79	45	08/11/79	88	10/12/79	89	12/12/79	132
02/12/79	50	04/12/79	16	06/12/79	52	08/12/79	84	10/13/79	90	12/13/79	128
02/13/79	50	04/13/79	16	06/13/79	27	08/13/79	82	10/14/79	116	12/14/79	127
02/14/79	49	04/14/79	15	06/14/79	20	08/14/79	79	10/15/79	199	12/15/79	128
02/15/79	47	04/15/79	14	06/15/79	30	08/15/79	74	10/16/79	275	12/16/79	125
02/16/79	45	04/16/79	19	06/16/79	32	08/16/79	65	10/17/79	251	12/17/79	123
02/17/79	44	04/17/79	14	06/17/79	35	08/17/79	47	10/18/79	194	12/18/79	125
02/18/79	43	04/18/79	13	06/18/79	36	08/18/79	43	10/19/79	142	12/19/79	125
02/19/79	42	04/19/79	12	06/19/79	49	08/19/79	46	10/20/79	132	12/20/79	126
02/20/79	41	04/20/79	12	06/20/79	50	08/20/79	47	10/21/79	101	12/21/79	129
02/21/79	39	04/21/79	13	06/21/79	50	08/21/79	46	10/22/79	83	12/22/79	126
02/22/79	38	04/22/79	12	06/22/79	51	08/22/79	46	10/23/79	76	12/23/79	125
02/23/79	39	04/23/79	12	06/23/79	61	08/23/79	45	10/24/79	76	12/24/79	125
02/24/79	38	04/24/79	13	06/24/79	71	08/24/79	45	10/25/79	67	12/25/79	124
02/25/79	36	04/25/79	19	06/25/79	74	08/25/79	46	10/26/79	57	12/26/79	123
02/26/79	36	04/26/79	24	06/26/79	68	08/26/79	44	10/27/79	48	12/27/79	123
02/27/79	33	04/27/79	22	06/27/79	64	08/27/79	43	10/28/79	44	12/28/79	121
02/28/79	32	04/28/79	21	06/28/79	62	08/28/79	36	10/29/79	40	12/29/79	114
		04/29/79	21	06/29/79	64	08/29/79	18	10/30/79	38	12/30/79	68
		04/30/79	31	06/30/79	68	08/30/79	14	10/31/79	37	12/31/79	56
						08/31/79	11				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/80	53	03/01/80	108	05/01/80	53	07/01/80	110	09/01/80	35	11/01/80	45
01/02/80	52	03/02/80	135	05/02/80	53	07/02/80	108	09/02/80	41	11/02/80	56
01/03/80	50	03/03/80	125	05/03/80	51	07/03/80	122	09/03/80	62	11/03/80	66
01/04/80	49	03/04/80	118	05/04/80	50	07/04/80	125	09/04/80	81	11/04/80	66
01/05/80	49	03/05/80	118	05/05/80	38	07/05/80	115	09/05/80	72	11/05/80	65
01/06/80	49	03/06/80	117	05/06/80	23	07/06/80	115	09/06/80	57	11/06/80	63
01/07/80	49	03/07/80	111	05/07/80	12	07/07/80	105	09/07/80	45	11/07/80	59
01/08/80	49	03/08/80	113	05/08/80	11	07/08/80	105	09/08/80	39	11/08/80	42
01/09/80	59	03/09/80	117	05/09/80	11	07/09/80	111	09/09/80	35	11/09/80	38
01/10/80	68	03/10/80	116	05/10/80	11	07/10/80	108	09/10/80	33	11/10/80	42
01/11/80	39	03/11/80	115	05/11/80	11	07/11/80	95	09/11/80	32	11/11/80	44
01/12/80	64	03/12/80	114	05/12/80	11	07/12/80	92	09/12/80	31	11/12/80	44
01/13/80	70	03/13/80	112	05/13/80	11	07/13/80	90	09/13/80	30	11/13/80	45
01/14/80	70	03/14/80	109	05/14/80	11	07/14/80	86	09/14/80	30	11/14/80	44
01/15/80	69	03/15/80	107	05/15/80	11	07/15/80	86	09/15/80	32	11/15/80	45
01/16/80	68	03/16/80	104	05/16/80	11	07/16/80	86	09/16/80	32	11/16/80	46
01/17/80	68	03/17/80	101	05/17/80	21	07/17/80	89	09/17/80	31	11/17/80	53
01/18/80	68	03/18/80	95	05/18/80	26	07/18/80	94	09/18/80	30	11/18/80	56
01/19/80	67	03/19/80	86	05/19/80	27	07/19/80	96	09/19/80	28	11/19/80	53
01/20/80	65	03/20/80	81	05/20/80	27	07/20/80	110	09/20/80	27	11/20/80	53
01/21/80	64	03/21/80	78	05/21/80	28	07/21/80	125	09/21/80	26	11/21/80	52
01/22/80	63	03/22/80	73	05/22/80	34	07/22/80	90	09/22/80	26	11/22/80	51
01/23/80	63	03/23/80	70	05/23/80	60	07/23/80	70	09/23/80	25	11/23/80	50
01/24/80	64	03/24/80	62	05/24/80	72	07/24/80	102	09/24/80	25	11/24/80	51
01/25/80	63	03/25/80	45	05/25/80	80	07/25/80	144	09/25/80	24	11/25/80	61
01/26/80	61	03/26/80	40	05/26/80	89	07/26/80	128	09/26/80	24	11/26/80	64
01/27/80	114	03/27/80	38	05/27/80	116	07/27/80	106	09/27/80	23	11/27/80	62
01/28/80	120	03/28/80	37	05/28/80	113	07/28/80	86	09/28/80	25	11/28/80	63
01/29/80	111	03/29/80	37	05/29/80	116	07/29/80	72	09/29/80	23	11/29/80	64
01/30/80	109	03/30/80	37	05/30/80	110	07/30/80	59	09/30/80	22	11/30/80	62
01/31/80	103	03/31/80	34	05/31/80	111	07/31/80	62	10/01/80	30	12/01/80	60
02/01/80	104	04/01/80	25	06/01/80	112	08/01/80	94	10/02/80	50	12/02/80	59
02/02/80	104	04/02/80	25	06/02/80	112	08/02/80	80	10/03/80	54	12/03/80	58
02/03/80	101	04/03/80	25	06/03/80	110	08/03/80	73	10/04/80	56	12/04/80	56
02/04/80	97	04/04/80	26	06/04/80	108	08/04/80	76	10/05/80	56	12/05/80	54
02/05/80	80	04/05/80	40	06/05/80	106	08/05/80	70	10/06/80	54	12/06/80	54
02/06/80	39	04/06/80	43	06/06/80	100	08/06/80	91	10/07/80	54	12/07/80	53
02/07/80	30	04/07/80	45	06/07/80	94	08/07/80	93	10/08/80	53	12/08/80	52
02/08/80	27	04/08/80	50	06/08/80	86	08/08/80	93	10/09/80	66	12/09/80	51
02/09/80	26	04/09/80	66	06/09/80	74	08/09/80	91	10/10/80	109	12/10/80	51
02/10/80	26	04/10/80	72	06/10/80	45	08/10/80	94	10/11/80	90	12/11/80	50
02/11/80	26	04/11/80	70	06/11/80	40	08/11/80	97	10/12/80	65	12/12/80	49
02/12/80	26	04/12/80	68	06/12/80	38	08/12/80	102	10/13/80	49	12/13/80	48
02/13/80	25	04/13/80	66	06/13/80	42	08/13/80	98	10/14/80	42	12/14/80	47
02/14/80	25	04/14/80	65	06/14/80	66	08/14/80	63	10/15/80	39	12/15/80	46
02/15/80	26	04/15/80	66	06/15/80	67	08/15/80	46	10/16/80	39	12/16/80	46
02/16/80	27	04/16/80	64	06/16/80	62	08/16/80	42	10/17/80	38	12/17/80	47
02/17/80	28	04/17/80	60	06/17/80	45	08/17/80	40	10/18/80	39	12/18/80	47
02/18/80	30	04/18/80	44	06/18/80	40	08/18/80	52	10/19/80	37	12/19/80	46
02/19/80	86	04/19/80	37	06/19/80	39	08/19/80	98	10/20/80	36	12/20/80	45
02/20/80	76	04/20/80	38	06/20/80	38	08/20/80	72	10/21/80	42	12/21/80	45
02/21/80	82	04/21/80	37	06/21/80	40	08/21/80	57	10/22/80	84	12/22/80	50
02/22/80	80	04/22/80	35	06/22/80	68	08/22/80	50	10/23/80	90	12/23/80	56
02/23/80	77	04/23/80	35	06/23/80	86	08/23/80	52	10/24/80	97	12/24/80	56
02/24/80	75	04/24/80	35	06/24/80	91	08/24/80	72	10/25/80	94	12/25/80	53
02/25/80	78	04/25/80	40	06/25/80	105	08/25/80	75	10/26/80	91	12/26/80	51
02/26/80	109	04/26/80	53	06/26/80	106	08/26/80	72	10/27/80	87	12/27/80	50
02/27/80	110	04/27/80	55	06/27/80	102	08/27/80	64	10/28/80	85	12/28/80	49
02/28/80	109	04/28/80	56	06/28/80	103	08/28/80	44	10/29/80	82	12/29/80	48
02/29/80	106	04/29/80	55	06/29/80	99	08/29/80	37	10/30/80	80	12/30/80	48
		04/30/80	54	06/30/80	103	08/30/80	35	10/31/80	69	12/31/80	47
						08/31/80	34				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/81	46	03/01/81	31	05/01/81	8	07/01/81	12	09/01/81	62	11/01/81	69
01/02/81	47	03/02/81	31	05/02/81	8	07/02/81	13	09/02/81	56	11/02/81	67
01/03/81	47	03/03/81	30	05/03/81	8	07/03/81	20	09/03/81	75	11/03/81	63
01/04/81	45	03/04/81	30	05/04/81	8	07/04/81	22	09/04/81	100	11/04/81	63
01/05/81	44	03/05/81	30	05/05/81	8	07/05/81	23	09/05/81	84	11/05/81	69
01/06/81	43	03/06/81	30	05/06/81	8	07/06/81	23	09/06/81	69	11/06/81	83
01/07/81	42	03/07/81	29	05/07/81	8	07/07/81	20	09/07/81	89	11/07/81	91
01/08/81	42	03/08/81	28	05/08/81	9	07/08/81	19	09/08/81	107	11/08/81	90
01/09/81	41	03/09/81	27	05/09/81	10	07/09/81	19	09/09/81	126	11/09/81	90
01/10/81	41	03/10/81	18	05/10/81	10	07/10/81	18	09/10/81	104	11/10/81	90
01/11/81	40	03/11/81	16	05/11/81	9	07/11/81	18	09/11/81	92	11/11/81	90
01/12/81	39	03/12/81	15	05/12/81	9	07/12/81	17	09/12/81	84	11/12/81	87
01/13/81	39	03/13/81	15	05/13/81	9	07/13/81	17	09/13/81	76	11/13/81	85
01/14/81	39	03/14/81	15	05/14/81	9	07/14/81	16	09/14/81	72	11/14/81	84
01/15/81	38	03/15/81	15	05/15/81	9	07/15/81	11	09/15/81	71	11/15/81	83
01/16/81	38	03/16/81	15	05/16/81	8	07/16/81	10	09/16/81	65	11/16/81	82
01/17/81	37	03/17/81	14	05/17/81	8	07/17/81	10	09/17/81	129	11/17/81	82
01/18/81	36	03/18/81	14	05/18/81	8	07/18/81	10	09/18/81	113	11/18/81	80
01/19/81	36	03/19/81	14	05/19/81	8	07/19/81	11	09/19/81	101	11/19/81	79
01/20/81	36	03/20/81	14	05/20/81	8	07/20/81	16	09/20/81	90	11/20/81	78
01/21/81	36	03/21/81	14	05/21/81	10	07/21/81	31	09/21/81	203	11/21/81	76
01/22/81	36	03/22/81	14	05/22/81	10	07/22/81	65	09/22/81	181	11/22/81	75
01/23/81	37	03/23/81	14	05/23/81	10	07/23/81	67	09/23/81	153	11/23/81	69
01/24/81	37	03/24/81	13	05/24/81	10	07/24/81	68	09/24/81	146	11/24/81	51
01/25/81	37	03/25/81	13	05/25/81	10	07/25/81	70	09/25/81	130	11/25/81	48
01/26/81	37	03/26/81	13	05/26/81	9	07/26/81	68	09/26/81	260	11/26/81	47
01/27/81	35	03/27/81	14	05/27/81	10	07/27/81	59	09/27/81	160	11/27/81	47
01/28/81	26	03/28/81	17	05/28/81	10	07/28/81	43	09/28/81	104	11/28/81	46
01/29/81	23	03/29/81	17	05/29/81	9	07/29/81	39	09/29/81	74	11/29/81	46
01/30/81	22	03/30/81	17	05/30/81	9	07/30/81	39	09/30/81	56	11/30/81	45
01/31/81	22	03/31/81	17	05/31/81	10	07/31/81	41	10/01/81	48	12/01/81	45
02/01/81	22	04/01/81	17	06/01/81	9	08/01/81	41	10/02/81	51	12/02/81	45
02/02/81	21	04/02/81	15	06/02/81	9	08/02/81	41	10/03/81	83	12/03/81	45
02/03/81	22	04/03/81	12	06/03/81	9	08/03/81	48	10/04/81	90	12/04/81	45
02/04/81	21	04/04/81	11	06/04/81	9	08/04/81	79	10/05/81	90	12/05/81	44
02/05/81	21	04/05/81	11	06/05/81	10	08/05/81	84	10/06/81	96	12/06/81	43
02/06/81	20	04/06/81	10	06/06/81	11	08/06/81	63	10/07/81	100	12/07/81	42
02/07/81	21	04/07/81	10	06/07/81	12	08/07/81	55	10/08/81	105	12/08/81	41
02/08/81	21	04/08/81	10	06/08/81	16	08/08/81	53	10/09/81	106	12/09/81	35
02/09/81	21	04/09/81	9	06/09/81	21	08/09/81	53	10/10/81	106	12/10/81	34
02/10/81	20	04/10/81	9	06/10/81	18	08/10/81	54	10/11/81	103	12/11/81	33
02/11/81	21	04/11/81	9	06/11/81	17	08/11/81	40	10/12/81	106	12/12/81	33
02/12/81	23	04/12/81	9	06/12/81	17	08/12/81	37	10/13/81	106	12/13/81	32
02/13/81	26	04/13/81	8	06/13/81	16	08/13/81	37	10/14/81	107	12/14/81	32
02/14/81	39	04/14/81	8	06/14/81	16	08/14/81	38	10/15/81	103	12/15/81	32
02/15/81	43	04/15/81	8	06/15/81	16	08/15/81	40	10/16/81	101	12/16/81	32
02/16/81	44	04/16/81	8	06/16/81	11	08/16/81	44	10/17/81	95	12/17/81	32
02/17/81	43	04/17/81	8	06/17/81	9	08/17/81	107	10/18/81	90	12/18/81	32
02/18/81	44	04/18/81	8	06/18/81	9	08/18/81	215	10/19/81	84	12/19/81	32
02/19/81	45	04/19/81	8	06/19/81	9	08/19/81	395	10/20/81	96	12/20/81	31
02/20/81	42	04/20/81	8	06/20/81	9	08/20/81	244	10/21/81	109	12/21/81	30
02/21/81	40	04/21/81	8	06/21/81	9	08/21/81	190	10/22/81	105	12/22/81	31
02/22/81	39	04/22/81	8	06/22/81	10	08/22/81	166	10/23/81	104	12/23/81	31
02/23/81	38	04/23/81	8	06/23/81	11	08/23/81	144	10/24/81	103	12/24/81	31
02/24/81	37	04/24/81	8	06/24/81	11	08/24/81	125	10/25/81	98	12/25/81	31
02/25/81	34	04/25/81	8	06/25/81	11	08/25/81	163	10/26/81	98	12/26/81	31
02/26/81	33	04/26/81	8	06/26/81	11	08/26/81	187	10/27/81	95	12/27/81	31
02/27/81	32	04/27/81	8	06/27/81	11	08/27/81	140	10/28/81	68	12/28/81	30
02/28/81	32	04/28/81	8	06/28/81	11	08/28/81	119	10/29/81	64	12/29/81	30
		04/29/81	8	06/29/81	13	08/29/81	98	10/30/81	65	12/30/81	31
		04/30/81	8	06/30/81	13	08/30/81	82	10/31/81	69	12/31/81	36
						08/31/81	68				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/82	37	03/01/82	67	05/01/82	108	07/01/82	96	09/01/82	100	11/01/82	205
01/02/82	35	03/02/82	53	05/02/82	101	07/02/82	89	09/02/82	99	11/02/82	173
01/03/82	33	03/03/82	51	05/03/82	102	07/03/82	84	09/03/82	93	11/03/82	132
01/04/82	34	03/04/82	51	05/04/82	119	07/04/82	80	09/04/82	85	11/04/82	122
01/05/82	37	03/05/82	66	05/05/82	107	07/05/82	79	09/05/82	81	11/05/82	124
01/06/82	37	03/06/82	172	05/06/82	103	07/06/82	80	09/06/82	80	11/06/82	143
01/07/82	36	03/07/82	190	05/07/82	103	07/07/82	93	09/07/82	77	11/07/82	129
01/08/82	36	03/08/82	242	05/08/82	100	07/08/82	89	09/08/82	76	11/08/82	199
01/09/82	35	03/09/82	155	05/09/82	97	07/09/82	82	09/09/82	73	11/09/82	770
01/10/82	35	03/10/82	117	05/10/82	97	07/10/82	76	09/10/82	69	11/10/82	618
01/11/82	34	03/11/82	136	05/11/82	97	07/11/82	72	09/11/82	72	11/11/82	490
01/12/82	34	03/12/82	137	05/12/82	94	07/12/82	68	09/12/82	80	11/12/82	178
01/13/82	34	03/13/82	136	05/13/82	90	07/13/82	68	09/13/82	92	11/13/82	110
01/14/82	36	03/14/82	134	05/14/82	80	07/14/82	65	09/14/82	94	11/14/82	88
01/15/82	37	03/15/82	132	05/15/82	60	07/15/82	53	09/15/82	94	11/15/82	77
01/16/82	37	03/16/82	130	05/16/82	57	07/16/82	55	09/16/82	94	11/16/82	562
01/17/82	37	03/17/82	126	05/17/82	54	07/17/82	104	09/17/82	95	11/17/82	1,040
01/18/82	36	03/18/82	121	05/18/82	52	07/18/82	105	09/18/82	93	11/18/82	870
01/19/82	36	03/19/82	106	05/19/82	52	07/19/82	102	09/19/82	90	11/19/82	511
01/20/82	35	03/20/82	103	05/20/82	52	07/20/82	104	09/20/82	89	11/20/82	252
01/21/82	35	03/21/82	99	05/21/82	71	07/21/82	98	09/21/82	90	11/21/82	167
01/22/82	34	03/22/82	90	05/22/82	94	07/22/82	85	09/22/82	99	11/22/82	143
01/23/82	34	03/23/82	82	05/23/82	99	07/23/82	66	09/23/82	96	11/23/82	131
01/24/82	34	03/24/82	92	05/24/82	142	07/24/82	64	09/24/82	91	11/24/82	124
01/25/82	33	03/25/82	124	05/25/82	109	07/25/82	61	09/25/82	99	11/25/82	118
01/26/82	33	03/26/82	144	05/26/82	98	07/26/82	60	09/26/82	189	11/26/82	114
01/27/82	32	03/27/82	143	05/27/82	169	07/27/82	60	09/27/82	143	11/27/82	111
01/28/82	32	03/28/82	138	05/28/82	285	07/28/82	74	09/28/82	117	11/28/82	110
01/29/82	32	03/29/82	430	05/29/82	250	07/29/82	67	09/29/82	86	11/29/82	108
01/30/82	32	03/30/82	496	05/30/82	191	07/30/82	62	09/30/82	76	11/30/82	105
01/31/82	31	03/31/82	282	05/31/82	147	07/31/82	61	10/01/82	99	12/01/82	105
02/01/82	60	04/01/82	130	06/01/82	174	08/01/82	60	10/02/82	133	12/02/82	104
02/02/82	92	04/02/82	95	06/02/82	219	08/02/82	61	10/03/82	238	12/03/82	103
02/03/82	89	04/03/82	106	06/03/82	219	08/03/82	73	10/04/82	190	12/04/82	104
02/04/82	86	04/04/82	101	06/04/82	167	08/04/82	79	10/05/82	138	12/05/82	103
02/05/82	88	04/05/82	101	06/05/82	130	08/05/82	78	10/06/82	138	12/06/82	104
02/06/82	88	04/06/82	92	06/06/82	147	08/06/82	77	10/07/82	111	12/07/82	109
02/07/82	88	04/07/82	92	06/07/82	128	08/07/82	76	10/08/82	164	12/08/82	107
02/08/82	104	04/08/82	95	06/08/82	104	08/08/82	77	10/09/82	122	12/09/82	105
02/09/82	110	04/09/82	93	06/09/82	88	08/09/82	79	10/10/82	89	12/10/82	105
02/10/82	129	04/10/82	93	06/10/82	119	08/10/82	78	10/11/82	72	12/11/82	104
02/11/82	135	04/11/82	93	06/11/82	119	08/11/82	78	10/12/82	63	12/12/82	104
02/12/82	141	04/12/82	94	06/12/82	117	08/12/82	79	10/13/82	57	12/13/82	102
02/13/82	144	04/13/82	96	06/13/82	115	08/13/82	83	10/14/82	59	12/14/82	100
02/14/82	141	04/14/82	96	06/14/82	109	08/14/82	88	10/15/82	84	12/15/82	97
02/15/82	136	04/15/82	96	06/15/82	101	08/15/82	98	10/16/82	87	12/16/82	95
02/16/82	135	04/16/82	98	06/16/82	100	08/16/82	106	10/17/82	86	12/17/82	97
02/17/82	125	04/17/82	98	06/17/82	132	08/17/82	99	10/18/82	84	12/18/82	95
02/18/82	113	04/18/82	98	06/18/82	203	08/18/82	97	10/19/82	95	12/19/82	92
02/19/82	107	04/19/82	98	06/19/82	434	08/19/82	106	10/20/82	141	12/20/82	91
02/20/82	102	04/20/82	98	06/20/82	323	08/20/82	103	10/21/82	146	12/21/82	89
02/21/82	100	04/21/82	97	06/21/82	173	08/21/82	100	10/22/82	146	12/22/82	89
02/22/82	93	04/22/82	96	06/22/82	106	08/22/82	98	10/23/82	147	12/23/82	89
02/23/82	82	04/23/82	94	06/23/82	153	08/23/82	94	10/24/82	151	12/24/82	90
02/24/82	79	04/24/82	103	06/24/82	280	08/24/82	92	10/25/82	147	12/25/82	93
02/25/82	77	04/25/82	84	06/25/82	178	08/25/82	89	10/26/82	145	12/26/82	92
02/26/82	77	04/26/82	76	06/26/82	117	08/26/82	91	10/27/82	147	12/27/82	89
02/27/82	75	04/27/82	75	06/27/82	90	08/27/82	101	10/28/82	144	12/28/82	88
02/28/82	72	04/28/82	77	06/28/82	83	08/28/82	95	10/29/82	146	12/29/82	87
		04/29/82	101	06/29/82	100	08/29/82	91	10/30/82	147	12/30/82	86
		04/30/82	122	06/30/82	103	08/30/82	92	10/31/82	147	12/31/82	84
						08/31/82	100				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/83	86	03/01/83	232	05/01/83	74	07/01/83	94	09/01/83	176	11/01/83	81
01/02/83	91	03/02/83	143	05/02/83	72	07/02/83	98	09/02/83	200	11/02/83	84
01/03/83	89	03/03/83	118	05/03/83	69	07/03/83	99	09/03/83	150	11/03/83	125
01/04/83	87	03/04/83	110	05/04/83	70	07/04/83	97	09/04/83	131	11/04/83	140
01/05/83	88	03/05/83	105	05/05/83	82	07/05/83	95	09/05/83	120	11/05/83	110
01/06/83	89	03/06/83	101	05/06/83	69	07/06/83	95	09/06/83	114	11/06/83	96
01/07/83	88	03/07/83	102	05/07/83	66	07/07/83	94	09/07/83	112	11/07/83	90
01/08/83	86	03/08/83	179	05/08/83	65	07/08/83	92	09/08/83	107	11/08/83	105
01/09/83	84	03/09/83	141	05/09/83	64	07/09/83	92	09/09/83	106	11/09/83	103
01/10/83	88	03/10/83	112	05/10/83	63	07/10/83	91	09/10/83	109	11/10/83	92
01/11/83	96	03/11/83	104	05/11/83	62	07/11/83	95	09/11/83	107	11/11/83	85
01/12/83	89	03/12/83	99	05/12/83	61	07/12/83	93	09/12/83	105	11/12/83	81
01/13/83	84	03/13/83	96	05/13/83	59	07/13/83	92	09/13/83	114	11/13/83	77
01/14/83	84	03/14/83	95	05/14/83	58	07/14/83	89	09/14/83	143	11/14/83	75
01/15/83	84	03/15/83	95	05/15/83	56	07/15/83	89	09/15/83	150	11/15/83	74
01/16/83	81	03/16/83	108	05/16/83	55	07/16/83	89	09/16/83	211	11/16/83	74
01/17/83	79	03/17/83	131	05/17/83	54	07/17/83	87	09/17/83	178	11/17/83	74
01/18/83	79	03/18/83	116	05/18/83	54	07/18/83	89	09/18/83	150	11/18/83	71
01/19/83	79	03/19/83	104	05/19/83	52	07/19/83	90	09/19/83	147	11/19/83	69
01/20/83	88	03/20/83	99	05/20/83	51	07/20/83	89	09/20/83	159	11/20/83	70
01/21/83	110	03/21/83	96	05/21/83	50	07/21/83	89	09/21/83	147	11/21/83	84
01/22/83	105	03/22/83	93	05/22/83	48	07/22/83	91	09/22/83	140	11/22/83	92
01/23/83	120	03/23/83	90	05/23/83	48	07/23/83	91	09/23/83	206	11/23/83	90
01/24/83	118	03/24/83	126	05/24/83	38	07/24/83	91	09/24/83	870	11/24/83	90
01/25/83	105	03/25/83	143	05/25/83	23	07/25/83	89	09/25/83	970	11/25/83	90
01/26/83	100	03/26/83	110	05/26/83	22	07/26/83	89	09/26/83	874	11/26/83	90
01/27/83	96	03/27/83	103	05/27/83	21	07/27/83	92	09/27/83	714	11/27/83	89
01/28/83	99	03/28/83	103	05/28/83	21	07/28/83	104	09/28/83	415	11/28/83	89
01/29/83	96	03/29/83	101	05/29/83	35	07/29/83	104	09/29/83	193	11/29/83	88
01/30/83	92	03/30/83	99	05/30/83	65	07/30/83	104	09/30/83	130	11/30/83	88
01/31/83	90	03/31/83	145	05/31/83	70	07/31/83	104	10/01/83	93	12/01/83	103
02/01/83	89	04/01/83	147	06/01/83	70	08/01/83	103	10/02/83	78	12/02/83	126
02/02/83	92	04/02/83	119	06/02/83	68	08/02/83	102	10/03/83	80	12/03/83	109
02/03/83	100	04/03/83	120	06/03/83	57	08/03/83	100	10/04/83	97	12/04/83	100
02/04/83	94	04/04/83	109	06/04/83	31	08/04/83	100	10/05/83	94	12/05/83	96
02/05/83	91	04/05/83	104	06/05/83	29	08/05/83	99	10/06/83	95	12/06/83	95
02/06/83	90	04/06/83	101	06/06/83	30	08/06/83	104	10/07/83	91	12/07/83	93
02/07/83	120	04/07/83	100	06/07/83	29	08/07/83	105	10/08/83	88	12/08/83	92
02/08/83	112	04/08/83	96	06/08/83	36	08/08/83	107	10/09/83	85	12/09/83	90
02/09/83	100	04/09/83	95	06/09/83	74	08/09/83	109	10/10/83	86	12/10/83	88
02/10/83	100	04/10/83	101	06/10/83	118	08/10/83	109	10/11/83	98	12/11/83	88
02/11/83	121	04/11/83	104	06/11/83	74	08/11/83	109	10/12/83	102	12/12/83	102
02/12/83	107	04/12/83	99	06/12/83	56	08/12/83	119	10/13/83	95	12/13/83	102
02/13/83	209	04/13/83	96	06/13/83	51	08/13/83	118	10/14/83	90	12/14/83	97
02/14/83	181	04/14/83	95	06/14/83	50	08/14/83	125	10/15/83	86	12/15/83	96
02/15/83	126	04/15/83	95	06/15/83	46	08/15/83	170	10/16/83	91	12/16/83	102
02/16/83	130	04/16/83	182	06/16/83	42	08/16/83	145	10/17/83	94	12/17/83	116
02/17/83	209	04/17/83	131	06/17/83	40	08/17/83	136	10/18/83	131	12/18/83	110
02/18/83	147	04/18/83	111	06/18/83	38	08/18/83	147	10/19/83	132	12/19/83	103
02/19/83	119	04/19/83	104	06/19/83	36	08/19/83	142	10/20/83	107	12/20/83	101
02/20/83	109	04/20/83	102	06/20/83	44	08/20/83	145	10/21/83	95	12/21/83	99
02/21/83	104	04/21/83	97	06/21/83	81	08/21/83	131	10/22/83	89	12/22/83	97
02/22/83	104	04/22/83	93	06/22/83	92	08/22/83	122	10/23/83	293	12/23/83	96
02/23/83	101	04/23/83	90	06/23/83	100	08/23/83	136	10/24/83	404	12/24/83	95
02/24/83	99	04/24/83	93	06/24/83	104	08/24/83	170	10/25/83	185	12/25/83	93
02/25/83	96	04/25/83	88	06/25/83	114	08/25/83	153	10/26/83	122	12/26/83	92
02/26/83	95	04/26/83	84	06/26/83	106	08/26/83	135	10/27/83	103	12/27/83	92
02/27/83	125	04/27/83	81	06/27/83	102	08/27/83	120	10/28/83	96	12/28/83	91
02/28/83	370	04/28/83	79	06/28/83	97	08/28/83	119	10/29/83	91	12/29/83	94
		04/29/83	78	06/29/83	96	08/29/83	135	10/30/83	87	12/30/83	119
		04/30/83	76	06/30/83	94	08/30/83	176	10/31/83	83	12/31/83	174
						08/31/83	142				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/84	148	03/01/84	82	05/01/84	50	07/01/84	57	09/01/84	49	11/01/84	58
01/02/84	124	03/02/84	80	05/02/84	49	07/02/84	60	09/02/84	48	11/02/84	59
01/03/84	114	03/03/84	80	05/03/84	49	07/03/84	63	09/03/84	46	11/03/84	60
01/04/84	109	03/04/84	78	05/04/84	48	07/04/84	65	09/04/84	45	11/04/84	61
01/05/84	105	03/05/84	76	05/05/84	47	07/05/84	63	09/05/84	45	11/05/84	60
01/06/84	104	03/06/84	76	05/06/84	46	07/06/84	61	09/06/84	53	11/06/84	59
01/07/84	102	03/07/84	76	05/07/84	44	07/07/84	59	09/07/84	55	11/07/84	58
01/08/84	101	03/08/84	75	05/08/84	37	07/08/84	56	09/08/84	52	11/08/84	57
01/09/84	99	03/09/84	73	05/09/84	21	07/09/84	56	09/09/84	50	11/09/84	57
01/10/84	101	03/10/84	70	05/10/84	20	07/10/84	54	09/10/84	48	11/10/84	56
01/11/84	100	03/11/84	69	05/11/84	18	07/11/84	50	09/11/84	46	11/11/84	55
01/12/84	99	03/12/84	69	05/12/84	18	07/12/84	52	09/12/84	44	11/12/84	54
01/13/84	99	03/13/84	98	05/13/84	18	07/13/84	55	09/13/84	42	11/13/84	54
01/14/84	98	03/14/84	96	05/14/84	17	07/14/84	54	09/14/84	39	11/14/84	54
01/15/84	97	03/15/84	89	05/15/84	15	07/15/84	53	09/15/84	23	11/15/84	53
01/16/84	96	03/16/84	83	05/16/84	19	07/16/84	52	09/16/84	20	11/16/84	52
01/17/84	94	03/17/84	78	05/17/84	38	07/17/84	51	09/17/84	21	11/17/84	52
01/18/84	93	03/18/84	75	05/18/84	40	07/18/84	51	09/18/84	33	11/18/84	51
01/19/84	94	03/19/84	75	05/19/84	40	07/19/84	50	09/19/84	110	11/19/84	49
01/20/84	94	03/20/84	74	05/20/84	40	07/20/84	49	09/20/84	377	11/20/84	49
01/21/84	94	03/21/84	79	05/21/84	35	07/21/84	52	09/21/84	193	11/21/84	55
01/22/84	96	03/22/84	79	05/22/84	18	07/22/84	59	09/22/84	147	11/22/84	266
01/23/84	96	03/23/84	122	05/23/84	19	07/23/84	76	09/23/84	100	11/23/84	619
01/24/84	95	03/24/84	168	05/24/84	25	07/24/84	75	09/24/84	73	11/24/84	751
01/25/84	94	03/25/84	120	05/25/84	39	07/25/84	69	09/25/84	68	11/25/84	574
01/26/84	94	03/26/84	105	05/26/84	39	07/26/84	68	09/26/84	63	11/26/84	280
01/27/84	93	03/27/84	99	05/27/84	40	07/27/84	69	09/27/84	134	11/27/84	151
01/28/84	92	03/28/84	96	05/28/84	45	07/28/84	67	09/28/84	504	11/28/84	127
01/29/84	91	03/29/84	96	05/29/84	86	07/29/84	65	09/29/84	253	11/29/84	113
01/30/84	89	03/30/84	93	05/30/84	90	07/30/84	63	09/30/84	140	11/30/84	106
01/31/84	89	03/31/84	92	05/31/84	81	07/31/84	62	10/01/84	111	12/01/84	101
02/01/84	89	04/01/84	90	06/01/84	71	08/01/84	62	10/02/84	85	12/02/84	99
02/02/84	87	04/02/84	89	06/02/84	65	08/02/84	61	10/03/84	72	12/03/84	97
02/03/84	88	04/03/84	89	06/03/84	62	08/03/84	59	10/04/84	71	12/04/84	93
02/04/84	92	04/04/84	90	06/04/84	61	08/04/84	59	10/05/84	77	12/05/84	91
02/05/84	90	04/05/84	92	06/05/84	59	08/05/84	63	10/06/84	76	12/06/84	92
02/06/84	87	04/06/84	87	06/06/84	58	08/06/84	63	10/07/84	73	12/07/84	86
02/07/84	84	04/07/84	84	06/07/84	55	08/07/84	61	10/08/84	72	12/08/84	84
02/08/84	82	04/08/84	82	06/08/84	53	08/08/84	64	10/09/84	71	12/09/84	83
02/09/84	81	04/09/84	86	06/09/84	52	08/09/84	63	10/10/84	69	12/10/84	82
02/10/84	80	04/10/84	98	06/10/84	51	08/10/84	60	10/11/84	68	12/11/84	79
02/11/84	79	04/11/84	93	06/11/84	53	08/11/84	61	10/12/84	68	12/12/84	79
02/12/84	87	04/12/84	89	06/12/84	53	08/12/84	60	10/13/84	67	12/13/84	80
02/13/84	91	04/13/84	87	06/13/84	51	08/13/84	59	10/14/84	65	12/14/84	79
02/14/84	90	04/14/84	86	06/14/84	51	08/14/84	57	10/15/84	63	12/15/84	79
02/15/84	87	04/15/84	88	06/15/84	51	08/15/84	55	10/16/84	63	12/16/84	78
02/16/84	86	04/16/84	86	06/16/84	52	08/16/84	54	10/17/84	62	12/17/84	78
02/17/84	85	04/17/84	84	06/17/84	55	08/17/84	53	10/18/84	61	12/18/84	76
02/18/84	83	04/18/84	80	06/18/84	58	08/18/84	51	10/19/84	61	12/19/84	76
02/19/84	81	04/19/84	78	06/19/84	62	08/19/84	51	10/20/84	60	12/20/84	76
02/20/84	81	04/20/84	77	06/20/84	59	08/20/84	50	10/21/84	63	12/21/84	76
02/21/84	82	04/21/84	76	06/21/84	56	08/21/84	56	10/22/84	63	12/22/84	75
02/22/84	81	04/22/84	74	06/22/84	55	08/22/84	54	10/23/84	61	12/23/84	75
02/23/84	84	04/23/84	72	06/23/84	54	08/23/84	53	10/24/84	59	12/24/84	75
02/24/84	81	04/24/84	70	06/24/84	53	08/24/84	51	10/25/84	58	12/25/84	74
02/25/84	81	04/25/84	68	06/25/84	52	08/25/84	50	10/26/84	59	12/26/84	74
02/26/84	83	04/26/84	67	06/26/84	51	08/26/84	49	10/27/84	60	12/27/84	75
02/27/84	79	04/27/84	65	06/27/84	52	08/27/84	47	10/28/84	60	12/28/84	74
02/28/84	86	04/28/84	66	06/28/84	52	08/28/84	46	10/29/84	60	12/29/84	73
02/29/84	88	04/29/84	65	06/29/84	53	08/29/84	46	10/30/84	60	12/30/84	72
		04/30/84	61	06/30/84	54	08/30/84	48	10/31/84	59	12/31/84	71
						08/31/84	50				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/85	71	03/01/85	42	05/01/85	64	07/01/85	36	09/01/85	102	11/01/85	86
01/02/85	73	03/02/85	42	05/02/85	57	07/02/85	35	09/02/85	95	11/02/85	80
01/03/85	72	03/03/85	40	05/03/85	35	07/03/85	34	09/03/85	95	11/03/85	78
01/04/85	72	03/04/85	40	05/04/85	31	07/04/85	33	09/04/85	100	11/04/85	74
01/05/85	72	03/05/85	40	05/05/85	33	07/05/85	33	09/05/85	102	11/05/85	72
01/06/85	71	03/06/85	40	05/06/85	32	07/06/85	33	09/06/85	142	11/06/85	72
01/07/85	70	03/07/85	39	05/07/85	31	07/07/85	32	09/07/85	141	11/07/85	74
01/08/85	71	03/08/85	38	05/08/85	29	07/08/85	31	09/08/85	128	11/08/85	91
01/09/85	71	03/09/85	39	05/09/85	29	07/09/85	30	09/09/85	118	11/09/85	105
01/10/85	70	03/10/85	39	05/10/85	29	07/10/85	30	09/10/85	107	11/10/85	106
01/11/85	69	03/11/85	38	05/11/85	29	07/11/85	32	09/11/85	102	11/11/85	105
01/12/85	69	03/12/85	38	05/12/85	29	07/12/85	34	09/12/85	96	11/12/85	104
01/13/85	67	03/13/85	36	05/13/85	29	07/13/85	42	09/13/85	90	11/13/85	110
01/14/85	66	03/14/85	37	05/14/85	27	07/14/85	43	09/14/85	90	11/14/85	106
01/15/85	64	03/15/85	37	05/15/85	26	07/15/85	45	09/15/85	94	11/15/85	103
01/16/85	63	03/16/85	37	05/16/85	26	07/16/85	47	09/16/85	98	11/16/85	102
01/17/85	63	03/17/85	37	05/17/85	27	07/17/85	49	09/17/85	105	11/17/85	101
01/18/85	63	03/18/85	38	05/18/85	25	07/18/85	51	09/18/85	222	11/18/85	82
01/19/85	66	03/19/85	37	05/19/85	24	07/19/85	54	09/19/85	398	11/19/85	54
01/20/85	64	03/20/85	35	05/20/85	28	07/20/85	62	09/20/85	269	11/20/85	76
01/21/85	62	03/21/85	37	05/21/85	33	07/21/85	58	09/21/85	164	11/21/85	85
01/22/85	62	03/22/85	43	05/22/85	31	07/22/85	56	09/22/85	106	11/22/85	85
01/23/85	60	03/23/85	41	05/23/85	30	07/23/85	63	09/23/85	77	11/23/85	84
01/24/85	57	03/24/85	40	05/24/85	31	07/24/85	79	09/24/85	74	11/24/85	84
01/25/85	54	03/25/85	39	05/25/85	31	07/25/85	110	09/25/85	89	11/25/85	82
01/26/85	53	03/26/85	37	05/26/85	31	07/26/85	115	09/26/85	88	11/26/85	80
01/27/85	53	03/27/85	36	05/27/85	31	07/27/85	113	09/27/85	82	11/27/85	79
01/28/85	53	03/28/85	35	05/28/85	30	07/28/85	111	09/28/85	111	11/28/85	78
01/29/85	52	03/29/85	35	05/29/85	30	07/29/85	109	09/29/85	164	11/29/85	78
01/30/85	51	03/30/85	37	05/30/85	28	07/30/85	108	09/30/85	175	11/30/85	77
01/31/85	53	03/31/85	34	05/31/85	27	07/31/85	106	10/01/85	134	12/01/85	76
02/01/85	57	04/01/85	33	06/01/85	26	08/01/85	104	10/02/85	121	12/02/85	75
02/02/85	57	04/02/85	27	06/02/85	26	08/02/85	105	10/03/85	159	12/03/85	73
02/03/85	56	04/03/85	20	06/03/85	25	08/03/85	106	10/04/85	175	12/04/85	72
02/04/85	55	04/04/85	17	06/04/85	26	08/04/85	115	10/05/85	166	12/05/85	93
02/05/85	53	04/05/85	20	06/05/85	25	08/05/85	114	10/06/85	133	12/06/85	123
02/06/85	51	04/06/85	24	06/06/85	24	08/06/85	115	10/07/85	111	12/07/85	108
02/07/85	50	04/07/85	23	06/07/85	24	08/07/85	116	10/08/85	97	12/08/85	101
02/08/85	49	04/08/85	24	06/08/85	24	08/08/85	130	10/09/85	94	12/09/85	97
02/09/85	49	04/09/85	34	06/09/85	25	08/09/85	122	10/10/85	94	12/10/85	95
02/10/85	49	04/10/85	34	06/10/85	24	08/10/85	117	10/11/85	87	12/11/85	92
02/11/85	49	04/11/85	28	06/11/85	23	08/11/85	113	10/12/85	84	12/12/85	89
02/12/85	48	04/12/85	27	06/12/85	21	08/12/85	110	10/13/85	80	12/13/85	95
02/13/85	43	04/13/85	35	06/13/85	21	08/13/85	110	10/14/85	78	12/14/85	143
02/14/85	25	04/14/85	43	06/14/85	22	08/14/85	108	10/15/85	76	12/15/85	141
02/15/85	19	04/15/85	51	06/15/85	22	08/15/85	105	10/16/85	75	12/16/85	126
02/16/85	18	04/16/85	95	06/16/85	21	08/16/85	102	10/17/85	73	12/17/85	106
02/17/85	17	04/17/85	96	06/17/85	19	08/17/85	101	10/18/85	73	12/18/85	102
02/18/85	16	04/18/85	91	06/18/85	10	08/18/85	99	10/19/85	76	12/19/85	99
02/19/85	18	04/19/85	86	06/19/85	9	08/19/85	97	10/20/85	95	12/20/85	95
02/20/85	25	04/20/85	83	06/20/85	9	08/20/85	101	10/21/85	96	12/21/85	90
02/21/85	42	04/21/85	82	06/21/85	16	08/21/85	106	10/22/85	89	12/22/85	87
02/22/85	45	04/22/85	79	06/22/85	24	08/22/85	103	10/23/85	108	12/23/85	83
02/23/85	45	04/23/85	77	06/23/85	24	08/23/85	100	10/24/85	107	12/24/85	80
02/24/85	44	04/24/85	75	06/24/85	25	08/24/85	95	10/25/85	95	12/25/85	85
02/25/85	42	04/25/85	73	06/25/85	27	08/25/85	92	10/26/85	87	12/26/85	83
02/26/85	41	04/26/85	70	06/26/85	29	08/26/85	89	10/27/85	85	12/27/85	79
02/27/85	40	04/27/85	67	06/27/85	32	08/27/85	91	10/28/85	94	12/28/85	77
02/28/85	41	04/28/85	65	06/28/85	35	08/28/85	92	10/29/85	96	12/29/85	79
		04/29/85	65	06/29/85	38	08/29/85	81	10/30/85	113	12/30/85	79
		04/30/85	68	06/30/85	37	08/30/85	81	10/31/85	97	12/31/85	69
						08/31/85	106				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/86	49	03/01/86	69	05/01/86	59	07/01/86	145	09/01/86	110	11/01/86	76
01/02/86	52	03/02/86	66	05/02/86	34	07/02/86	132	09/02/86	111	11/02/86	78
01/03/86	67	03/03/86	65	05/03/86	31	07/03/86	126	09/03/86	111	11/03/86	81
01/04/86	69	03/04/86	60	05/04/86	31	07/04/86	129	09/04/86	110	11/04/86	77
01/05/86	69	03/05/86	50	05/05/86	30	07/05/86	131	09/05/86	112	11/05/86	73
01/06/86	69	03/06/86	49	05/06/86	31	07/06/86	127	09/06/86	114	11/06/86	69
01/07/86	67	03/07/86	46	05/07/86	31	07/07/86	131	09/07/86	125	11/07/86	68
01/08/86	68	03/08/86	42	05/08/86	32	07/08/86	128	09/08/86	129	11/08/86	67
01/09/86	116	03/09/86	41	05/09/86	31	07/09/86	122	09/09/86	162	11/09/86	66
01/10/86	183	03/10/86	49	05/10/86	31	07/10/86	118	09/10/86	160	11/10/86	65
01/11/86	129	03/11/86	68	05/11/86	31	07/11/86	118	09/11/86	150	11/11/86	75
01/12/86	97	03/12/86	98	05/12/86	32	07/12/86	130	09/12/86	140	11/12/86	88
01/13/86	93	03/13/86	95	05/13/86	44	07/13/86	126	09/13/86	130	11/13/86	83
01/14/86	134	03/14/86	95	05/14/86	46	07/14/86	137	09/14/86	120	11/14/86	82
01/15/86	138	03/15/86	119	05/15/86	45	07/15/86	126	09/15/86	110	11/15/86	96
01/16/86	137	03/16/86	152	05/16/86	44	07/16/86	114	09/16/86	100	11/16/86	132
01/17/86	139	03/17/86	120	05/17/86	43	07/17/86	111	09/17/86	90	11/17/86	107
01/18/86	139	03/18/86	106	05/18/86	42	07/18/86	111	09/18/86	80	11/18/86	92
01/19/86	139	03/19/86	101	05/19/86	43	07/19/86	110	09/19/86	70	11/19/86	84
01/20/86	135	03/20/86	97	05/20/86	41	07/20/86	114	09/20/86	80	11/20/86	78
01/21/86	134	03/21/86	110	05/21/86	41	07/21/86	112	09/21/86	90	11/21/86	74
01/22/86	132	03/22/86	133	05/22/86	40	07/22/86	115	09/22/86	100	11/22/86	72
01/23/86	131	03/23/86	130	05/23/86	41	07/23/86	139	09/23/86	100	11/23/86	70
01/24/86	125	03/24/86	127	05/24/86	41	07/24/86	187	09/24/86	100	11/24/86	74
01/25/86	104	03/25/86	123	05/25/86	39	07/25/86	169	09/25/86	90	11/25/86	92
01/26/86	105	03/26/86	152	05/26/86	38	07/26/86	158	09/26/86	90	11/26/86	88
01/27/86	103	03/27/86	422	05/27/86	36	07/27/86	147	09/27/86	80	11/27/86	80
01/28/86	99	03/28/86	244	05/28/86	36	07/28/86	169	09/28/86	80	11/28/86	75
01/29/86	96	03/29/86	250	05/29/86	32	07/29/86	165	09/29/86	70	11/29/86	72
01/30/86	96	03/30/86	303	05/30/86	24	07/30/86	148	09/30/86	70	11/30/86	70
01/31/86	96	03/31/86	171	05/31/86	23	07/31/86	136	10/01/86	109	12/01/86	70
02/01/86	95	04/01/86	99	06/01/86	23	08/01/86	129	10/02/86	108	12/02/86	68
02/02/86	94	04/02/86	103	06/02/86	25	08/02/86	124	10/03/86	106	12/03/86	66
02/03/86	91	04/03/86	146	06/03/86	23	08/03/86	122	10/04/86	105	12/04/86	65
02/04/86	89	04/04/86	141	06/04/86	23	08/04/86	122	10/05/86	104	12/05/86	68
02/05/86	86	04/05/86	140	06/05/86	23	08/05/86	128	10/06/86	103	12/06/86	74
02/06/86	84	04/06/86	135	06/06/86	23	08/06/86	125	10/07/86	98	12/07/86	73
02/07/86	84	04/07/86	131	06/07/86	23	08/07/86	120	10/08/86	95	12/08/86	70
02/08/86	89	04/08/86	127	06/08/86	24	08/08/86	119	10/09/86	72	12/09/86	68
02/09/86	88	04/09/86	125	06/09/86	24	08/09/86	115	10/10/86	62	12/10/86	67
02/10/86	86	04/10/86	122	06/10/86	24	08/10/86	112	10/11/86	61	12/11/86	66
02/11/86	85	04/11/86	122	06/11/86	23	08/11/86	115	10/12/86	58	12/12/86	70
02/12/86	81	04/12/86	121	06/12/86	24	08/12/86	121	10/13/86	56	12/13/86	70
02/13/86	78	04/13/86	120	06/13/86	25	08/13/86	123	10/14/86	55	12/14/86	67
02/14/86	77	04/14/86	120	06/14/86	24	08/14/86	144	10/15/86	56	12/15/86	66
02/15/86	75	04/15/86	120	06/15/86	29	08/15/86	130	10/16/86	58	12/16/86	65
02/16/86	70	04/16/86	118	06/16/86	35	08/16/86	124	10/17/86	60	12/17/86	64
02/17/86	69	04/17/86	115	06/17/86	49	08/17/86	122	10/18/86	58	12/18/86	63
02/18/86	71	04/18/86	111	06/18/86	82	08/18/86	120	10/19/86	78	12/19/86	62
02/19/86	73	04/19/86	104	06/19/86	88	08/19/86	120	10/20/86	110	12/20/86	61
02/20/86	72	04/20/86	102	06/20/86	112	08/20/86	122	10/21/86	158	12/21/86	60
02/21/86	70	04/21/86	102	06/21/86	145	08/21/86	125	10/22/86	130	12/22/86	60
02/22/86	70	04/22/86	100	06/22/86	124	08/22/86	120	10/23/86	111	12/23/86	60
02/23/86	70	04/23/86	96	06/23/86	130	08/23/86	118	10/24/86	102	12/24/86	65
02/24/86	69	04/24/86	88	06/24/86	132	08/24/86	116	10/25/86	98	12/25/86	70
02/25/86	67	04/25/86	83	06/25/86	132	08/25/86	113	10/26/86	95	12/26/86	70
02/26/86	65	04/26/86	81	06/26/86	121	08/26/86	109	10/27/86	92	12/27/86	116
02/27/86	64	04/27/86	78	06/27/86	117	08/27/86	110	10/28/86	90	12/28/86	126
02/28/86	67	04/28/86	76	06/28/86	126	08/28/86	111	10/29/86	78	12/29/86	107
		04/29/86	75	06/29/86	135	08/29/86	114	10/30/86	75	12/30/86	92
		04/30/86	71	06/30/86	173	08/30/86	113	10/31/86	75	12/31/86	91
						08/31/86	110				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/87	211	03/01/87	55	05/01/87	32	07/01/87	34	09/01/87	14	11/01/87	75
01/02/87	142	03/02/87	55	05/02/87	31	07/02/87	34	09/02/87	15	11/02/87	86
01/03/87	110	03/03/87	55	05/03/87	30	07/03/87	34	09/03/87	22	11/03/87	125
01/04/87	109	03/04/87	56	05/04/87	29	07/04/87	33	09/04/87	22	11/04/87	540
01/05/87	132	03/05/87	55	05/05/87	29	07/05/87	32	09/05/87	22	11/05/87	409
01/06/87	114	03/06/87	54	05/06/87	29	07/06/87	33	09/06/87	25	11/06/87	230
01/07/87	102	03/07/87	101	05/07/87	31	07/07/87	35	09/07/87	26	11/07/87	164
01/08/87	91	03/08/87	110	05/08/87	37	07/08/87	33	09/08/87	25	11/08/87	111
01/09/87	83	03/09/87	90	05/09/87	51	07/09/87	32	09/09/87	22	11/09/87	90
01/10/87	78	03/10/87	81	05/10/87	46	07/10/87	31	09/10/87	17	11/10/87	78
01/11/87	74	03/11/87	67	05/11/87	48	07/11/87	30	09/11/87	16	11/11/87	70
01/12/87	69	03/12/87	64	05/12/87	51	07/12/87	29	09/12/87	16	11/12/87	63
01/13/87	65	03/13/87	62	05/13/87	58	07/13/87	28	09/13/87	16	11/13/87	59
01/14/87	64	03/14/87	61	05/14/87	67	07/14/87	28	09/14/87	16	11/14/87	55
01/15/87	64	03/15/87	58	05/15/87	75	07/15/87	28	09/15/87	24	11/15/87	53
01/16/87	64	03/16/87	58	05/16/87	98	07/16/87	29	09/16/87	51	11/16/87	50
01/17/87	64	03/17/87	60	05/17/87	98	07/17/87	29	09/17/87	49	11/17/87	48
01/18/87	63	03/18/87	56	05/18/87	90	07/18/87	29	09/18/87	37	11/18/87	85
01/19/87	63	03/19/87	55	05/19/87	72	07/19/87	38	09/19/87	26	11/19/87	144
01/20/87	62	03/20/87	54	05/20/87	45	07/20/87	50	09/20/87	25	11/20/87	166
01/21/87	61	03/21/87	52	05/21/87	41	07/21/87	42	09/21/87	25	11/21/87	107
01/22/87	62	03/22/87	52	05/22/87	40	07/22/87	39	09/22/87	26	11/22/87	90
01/23/87	62	03/23/87	51	05/23/87	39	07/23/87	38	09/23/87	29	11/23/87	84
01/24/87	64	03/24/87	50	05/24/87	38	07/24/87	36	09/24/87	32	11/24/87	101
01/25/87	63	03/25/87	50	05/25/87	38	07/25/87	35	09/25/87	33	11/25/87	104
01/26/87	63	03/26/87	50	05/26/87	37	07/26/87	35	09/26/87	34	11/26/87	102
01/27/87	63	03/27/87	54	05/27/87	36	07/27/87	34	09/27/87	33	11/27/87	101
01/28/87	62	03/28/87	54	05/28/87	36	07/28/87	34	09/28/87	33	11/28/87	100
01/29/87	62	03/29/87	56	05/29/87	35	07/29/87	36	09/29/87	33	11/29/87	98
01/30/87	63	03/30/87	69	05/30/87	34	07/30/87	37	09/30/87	34	11/30/87	96
01/31/87	62	03/31/87	81	05/31/87	34	07/31/87	46	10/01/87	75	12/01/87	94
02/01/87	61	04/01/87	83	06/01/87	34	08/01/87	51	10/02/87	74	12/02/87	94
02/02/87	60	04/02/87	82	06/02/87	33	08/02/87	52	10/03/87	74	12/03/87	93
02/03/87	60	04/03/87	76	06/03/87	32	08/03/87	49	10/04/87	72	12/04/87	93
02/04/87	60	04/04/87	72	06/04/87	31	08/04/87	49	10/05/87	69	12/05/87	92
02/05/87	60	04/05/87	70	06/05/87	31	08/05/87	51	10/06/87	66	12/06/87	92
02/06/87	61	04/06/87	66	06/06/87	34	08/06/87	49	10/07/87	63	12/07/87	92
02/07/87	64	04/07/87	63	06/07/87	36	08/07/87	47	10/08/87	60	12/08/87	91
02/08/87	64	04/08/87	62	06/08/87	32	08/08/87	45	10/09/87	53	12/09/87	91
02/09/87	63	04/09/87	60	06/09/87	13	08/09/87	43	10/10/87	38	12/10/87	92
02/10/87	61	04/10/87	58	06/10/87	13	08/10/87	41	10/11/87	41	12/11/87	92
02/11/87	59	04/11/87	56	06/11/87	13	08/11/87	40	10/12/87	87	12/12/87	89
02/12/87	58	04/12/87	54	06/12/87	20	08/12/87	39	10/13/87	173	12/13/87	88
02/13/87	58	04/13/87	52	06/13/87	29	08/13/87	39	10/14/87	136	12/14/87	87
02/14/87	57	04/14/87	52	06/14/87	29	08/14/87	39	10/15/87	117	12/15/87	87
02/15/87	55	04/15/87	54	06/15/87	29	08/15/87	39	10/16/87	110	12/16/87	86
02/16/87	56	04/16/87	60	06/16/87	28	08/16/87	38	10/17/87	107	12/17/87	84
02/17/87	57	04/17/87	57	06/17/87	22	08/17/87	36	10/18/87	100	12/18/87	83
02/18/87	57	04/18/87	54	06/18/87	10	08/18/87	35	10/19/87	96	12/19/87	82
02/19/87	57	04/19/87	52	06/19/87	9	08/19/87	34	10/20/87	92	12/20/87	81
02/20/87	59	04/20/87	51	06/20/87	9	08/20/87	34	10/21/87	84	12/21/87	80
02/21/87	59	04/21/87	48	06/21/87	8	08/21/87	33	10/22/87	79	12/22/87	79
02/22/87	58	04/22/87	45	06/22/87	8	08/22/87	33	10/23/87	75	12/23/87	78
02/23/87	58	04/23/87	43	06/23/87	16	08/23/87	32	10/24/87	73	12/24/87	79
02/24/87	57	04/24/87	42	06/24/87	33	08/24/87	31	10/25/87	71	12/25/87	79
02/25/87	56	04/25/87	41	06/25/87	33	08/25/87	30	10/26/87	70	12/26/87	76
02/26/87	57	04/26/87	39	06/26/87	33	08/26/87	29	10/27/87	74	12/27/87	74
02/27/87	56	04/27/87	39	06/27/87	32	08/27/87	29	10/28/87	74	12/28/87	72
02/28/87	56	04/28/87	35	06/28/87	31	08/28/87	25	10/29/87	72	12/29/87	72
		04/29/87	33	06/29/87	36	08/29/87	15	10/30/87	70	12/30/87	71
		04/30/87	32	06/30/87	36	08/30/87	13	10/31/87	69	12/31/87	70
						08/31/87	13				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/88	70	03/01/88	88	05/01/88	13	07/01/88	89	09/01/88	91	11/01/88	35
01/02/88	70	03/02/88	84	05/02/88	22	07/02/88	88	09/02/88	96	11/02/88	34
01/03/88	74	03/03/88	85	05/03/88	21	07/03/88	86	09/03/88	90	11/03/88	34
01/04/88	75	03/04/88	78	05/04/88	20	07/04/88	84	09/04/88	86	11/04/88	37
01/05/88	74	03/05/88	76	05/05/88	17	07/05/88	82	09/05/88	83	11/05/88	38
01/06/88	73	03/06/88	78	05/06/88	16	07/06/88	83	09/06/88	83	11/06/88	38
01/07/88	72	03/07/88	77	05/07/88	15	07/07/88	92	09/07/88	83	11/07/88	37
01/08/88	73	03/08/88	76	05/08/88	14	07/08/88	113	09/08/88	83	11/08/88	36
01/09/88	75	03/09/88	76	05/09/88	14	07/09/88	180	09/09/88	81	11/09/88	35
01/10/88	87	03/10/88	76	05/10/88	12	07/10/88	178	09/10/88	80	11/10/88	34
01/11/88	93	03/11/88	78	05/11/88	11	07/11/88	130	09/11/88	79	11/11/88	34
01/12/88	94	03/12/88	76	05/12/88	13	07/12/88	110	09/12/88	78	11/12/88	33
01/13/88	93	03/13/88	74	05/13/88	40	07/13/88	134	09/13/88	76	11/13/88	33
01/14/88	91	03/14/88	78	05/14/88	53	07/14/88	262	09/14/88	75	11/14/88	30
01/15/88	89	03/15/88	78	05/15/88	43	07/15/88	271	09/15/88	74	11/15/88	25
01/16/88	86	03/16/88	75	05/16/88	41	07/16/88	183	09/16/88	73	11/16/88	24
01/17/88	83	03/17/88	72	05/17/88	34	07/17/88	136	09/17/88	72	11/17/88	23
01/18/88	82	03/18/88	71	05/18/88	21	07/18/88	119	09/18/88	72	11/18/88	23
01/19/88	76	03/19/88	92	05/19/88	15	07/19/88	113	09/19/88	71	11/19/88	24
01/20/88	63	03/20/88	97	05/20/88	17	07/20/88	123	09/20/88	71	11/20/88	23
01/21/88	59	03/21/88	90	05/21/88	44	07/21/88	118	09/21/88	71	11/21/88	23
01/22/88	59	03/22/88	86	05/22/88	23	07/22/88	110	09/22/88	70	11/22/88	23
01/23/88	57	03/23/88	67	05/23/88	30	07/23/88	109	09/23/88	69	11/23/88	21
01/24/88	58	03/24/88	28	05/24/88	48	07/24/88	114	09/24/88	68	11/24/88	21
01/25/88	59	03/25/88	25	05/25/88	43	07/25/88	108	09/25/88	68	11/25/88	21
01/26/88	59	03/26/88	24	05/26/88	30	07/26/88	105	09/26/88	67	11/26/88	20
01/27/88	56	03/27/88	22	05/27/88	52	07/27/88	107	09/27/88	65	11/27/88	22
01/28/88	55	03/28/88	22	05/28/88	57	07/28/88	120	09/28/88	65	11/28/88	23
01/29/88	55	03/29/88	23	05/29/88	56	07/29/88	112	09/29/88	64	11/29/88	23
01/30/88	54	03/30/88	22	05/30/88	62	07/30/88	106	09/30/88	63	11/30/88	22
01/31/88	53	03/31/88	21	05/31/88	77	07/31/88	102	10/01/88	56	12/01/88	21
02/01/88	56	04/01/88	21	06/01/88	108	08/01/88	99	10/02/88	56	12/02/88	21
02/02/88	57	04/02/88	20	06/02/88	92	08/02/88	98	10/03/88	53	12/03/88	20
02/03/88	53	04/03/88	25	06/03/88	94	08/03/88	98	10/04/88	41	12/04/88	20
02/04/88	51	04/04/88	17	06/04/88	90	08/04/88	94	10/05/88	60	12/05/88	19
02/05/88	50	04/05/88	13	06/05/88	113	08/05/88	90	10/06/88	62	12/06/88	19
02/06/88	50	04/06/88	15	06/06/88	224	08/06/88	89	10/07/88	62	12/07/88	19
02/07/88	49	04/07/88	13	06/07/88	178	08/07/88	96	10/08/88	59	12/08/88	19
02/08/88	60	04/08/88	9	06/08/88	164	08/08/88	123	10/09/88	57	12/09/88	18
02/09/88	65	04/09/88	6	06/09/88	125	08/09/88	113	10/10/88	55	12/10/88	17
02/10/88	62	04/10/88	10	06/10/88	106	08/10/88	107	10/11/88	52	12/11/88	16
02/11/88	60	04/11/88	27	06/11/88	110	08/11/88	106	10/12/88	50	12/12/88	18
02/12/88	63	04/12/88	30	06/12/88	104	08/12/88	103	10/13/88	49	12/13/88	18
02/13/88	70	04/13/88	21	06/13/88	98	08/13/88	101	10/14/88	48	12/14/88	17
02/14/88	72	04/14/88	14	06/14/88	98	08/14/88	133	10/15/88	45	12/15/88	16
02/15/88	73	04/15/88	19	06/15/88	96	08/15/88	268	10/16/88	44	12/16/88	14
02/16/88	79	04/16/88	43	06/16/88	92	08/16/88	223	10/17/88	44	12/17/88	11
02/17/88	78	04/17/88	46	06/17/88	91	08/17/88	177	10/18/88	41	12/18/88	10
02/18/88	77	04/18/88	40	06/18/88	91	08/18/88	170	10/19/88	29	12/19/88	9
02/19/88	82	04/19/88	43	06/19/88	87	08/19/88	139	10/20/88	29	12/20/88	8
02/20/88	82	04/20/88	28	06/20/88	86	08/20/88	264	10/21/88	37	12/21/88	11
02/21/88	83	04/21/88	24	06/21/88	99	08/21/88	253	10/22/88	38	12/22/88	17
02/22/88	85	04/22/88	40	06/22/88	123	08/22/88	180	10/23/88	37	12/23/88	16
02/23/88	86	04/23/88	40	06/23/88	119	08/23/88	151	10/24/88	36	12/24/88	15
02/24/88	98	04/24/88	36	06/24/88	99	08/24/88	119	10/25/88	36	12/25/88	14
02/25/88	98	04/25/88	15	06/25/88	92	08/25/88	88	10/26/88	36	12/26/88	13
02/26/88	97	04/26/88	6	06/26/88	88	08/26/88	81	10/27/88	36	12/27/88	13
02/27/88	95	04/27/88	28	06/27/88	85	08/27/88	75	10/28/88	36	12/28/88	13
02/28/88	93	04/28/88	40	06/28/88	85	08/28/88	71	10/29/88	35	12/29/88	13
02/29/88	92	04/29/88	41	06/29/88	89	08/29/88	76	10/30/88	35	12/30/88	13
		04/30/88	28	06/30/88	89	08/30/88	85	10/31/88	36	12/31/88	12
						08/31/88	80				

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/89	11	03/01/89	2	05/01/89	20	07/01/89	31	09/01/89	64	11/01/89	84
01/02/89	11	03/02/89	3	05/02/89	18	07/02/89	29	09/02/89	87	11/02/89	77
01/03/89	9	03/03/89	4	05/03/89	17	07/03/89	44	09/03/89	99	11/03/89	50
01/04/89	6	03/04/89	5	05/04/89	17	07/04/89	44	09/04/89	103	11/04/89	51
01/05/89	5	03/05/89	4	05/05/89	16	07/05/89	41	09/05/89	101	11/05/89	52
01/06/89	5	03/06/89	5	05/06/89	16	07/06/89	38	09/06/89	85	11/06/89	52
01/07/89	5	03/07/89	6	05/07/89	16	07/07/89	36	09/07/89	55	11/07/89	51
01/08/89	5	03/08/89	6	05/08/89	20	07/08/89	35	09/08/89	136	11/08/89	50
01/09/89	5	03/09/89	6	05/09/89	31	07/09/89	33	09/09/89	115	11/09/89	44
01/10/89	10	03/10/89	6	05/10/89	31	07/10/89	32	09/10/89	84	11/10/89	42
01/11/89	10	03/11/89	7	05/11/89	30	07/11/89	31	09/11/89	136	11/11/89	40
01/12/89	10	03/12/89	7	05/12/89	30	07/12/89	29	09/12/89	62	11/12/89	39
01/13/89	9	03/13/89	7	05/13/89	29	07/13/89	29	09/13/89	41	11/13/89	39
01/14/89	6	03/14/89	7	05/14/89	28	07/14/89	28	09/14/89	37	11/14/89	39
01/15/89	4	03/15/89	8	05/15/89	25	07/15/89	27	09/15/89	36	11/15/89	38
01/16/89	4	03/16/89	10	05/16/89	20	07/16/89	31	09/16/89	35	11/16/89	38
01/17/89	4	03/17/89	22	05/17/89	20	07/17/89	36	09/17/89	34	11/17/89	36
01/18/89	3	03/18/89	26	05/18/89	30	07/18/89	36	09/18/89	33	11/18/89	25
01/19/89	3	03/19/89	25	05/19/89	31	07/19/89	48	09/19/89	39	11/19/89	23
01/20/89	4	03/20/89	25	05/20/89	30	07/20/89	46	09/20/89	110	11/20/89	27
01/21/89	4	03/21/89	24	05/21/89	29	07/21/89	42	09/21/89	56	11/21/89	27
01/22/89	4	03/22/89	20	05/22/89	23	07/22/89	31	09/22/89	38	11/22/89	28
01/23/89	4	03/23/89	16	05/23/89	14	07/23/89	29	09/23/89	49	11/23/89	27
01/24/89	4	03/24/89	23	05/24/89	12	07/24/89	29	09/24/89	41	11/24/89	23
01/25/89	6	03/25/89	23	05/25/89	10	07/25/89	35	09/25/89	41	11/25/89	19
01/26/89	5	03/26/89	22	05/26/89	9	07/26/89	32	09/26/89	39	11/26/89	18
01/27/89	3	03/27/89	22	05/27/89	8	07/27/89	29	09/27/89	96	11/27/89	18
01/28/89	6	03/28/89	25	05/28/89	7	07/28/89	27	09/28/89	78	11/28/89	17
01/29/89	6	03/29/89	24	05/29/89	6	07/29/89	27	09/29/89	110	11/29/89	20
01/30/89	7	03/30/89	19	05/30/89	5	07/30/89	29	09/30/89	61	11/30/89	22
01/31/89	4	03/31/89	11	05/31/89	5	07/31/89	34	10/01/89	79	12/01/89	22
02/01/89	3	04/01/89	11	06/01/89	5	08/01/89	38	10/02/89	53	12/02/89	21
02/02/89	3	04/02/89	11	06/02/89	4	08/02/89	38	10/03/89	66	12/03/89	20
02/03/89	2	04/03/89	10	06/03/89	3	08/03/89	34	10/04/89	43	12/04/89	18
02/04/89	2	04/04/89	10	06/04/89	2	08/04/89	31	10/05/89	42	12/05/89	17
02/05/89	2	04/05/89	11	06/05/89	2	08/05/89	29	10/06/89	48	12/06/89	17
02/06/89	2	04/06/89	13	06/06/89	2	08/06/89	27	10/07/89	28	12/07/89	16
02/07/89	2	04/07/89	12	06/07/89	8	08/07/89	26	10/08/89	64	12/08/89	16
02/08/89	1	04/08/89	10	06/08/89	10	08/08/89	27	10/09/89	109	12/09/89	36
02/09/89	2	04/09/89	9	06/09/89	13	08/09/89	35	10/10/89	122	12/10/89	50
02/10/89	2	04/10/89	9	06/10/89	13	08/10/89	99	10/11/89	158	12/11/89	21
02/11/89	2	04/11/89	8	06/11/89	13	08/11/89	94	10/12/89	191	12/12/89	17
02/12/89	2	04/12/89	8	06/12/89	12	08/12/89	110	10/13/89	125	12/13/89	17
02/13/89	2	04/13/89	10	06/13/89	11	08/13/89	114	10/14/89	137	12/14/89	16
02/14/89	2	04/14/89	14	06/14/89	10	08/14/89	145	10/15/89	69	12/15/89	16
02/15/89	2	04/15/89	15	06/15/89	9	08/15/89	104	10/16/89	46	12/16/89	16
02/16/89	2	04/16/89	24	06/16/89	7	08/16/89	82	10/17/89	118	12/17/89	16
02/17/89	2	04/17/89	36	06/17/89	6	08/17/89	74	10/18/89	80	12/18/89	16
02/18/89	2	04/18/89	39	06/18/89	4	08/18/89	72	10/19/89	80	12/19/89	16
02/19/89	2	04/19/89	38	06/19/89	3	08/19/89	83	10/20/89	101	12/20/89	15
02/20/89	1	04/20/89	37	06/20/89	3	08/20/89	86	10/21/89	36	12/21/89	18
02/21/89	1	04/21/89	38	06/21/89	4	08/21/89	85	10/22/89	54	12/22/89	18
02/22/89	2	04/22/89	38	06/22/89	15	08/22/89	85	10/23/89	58	12/23/89	22
02/23/89	2	04/23/89	37	06/23/89	17	08/23/89	86	10/24/89	79	12/24/89	23
02/24/89	1	04/24/89	35	06/24/89	15	08/24/89	87	10/25/89	91	12/25/89	23
02/25/89	1	04/25/89	34	06/25/89	15	08/25/89	72	10/26/89	61	12/26/89	22
02/26/89	1	04/26/89	33	06/26/89	15	08/26/89	68	10/27/89	70	12/27/89	52
02/27/89	1	04/27/89	34	06/27/89	15	08/27/89	66	10/28/89	73	12/28/89	46
02/28/89	1	04/28/89	35	06/28/89	14	08/28/89	63	10/29/89	89	12/29/89	38
		04/29/89	35	06/29/89	20	08/29/89	61	10/30/89	75	12/30/89	47
		04/30/89	33	06/30/89	29	08/30/89	52	10/31/89	72	12/31/89	36
						08/31/89	62				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/90	25	03/01/90	20	05/01/90	15	07/01/90	14	09/01/90	225	11/01/90	54
01/02/90	44	03/02/90	20	05/02/90	13	07/02/90	16	09/02/90	225	11/02/90	72
01/03/90	26	03/03/90	22	05/03/90	12	07/03/90	16	09/03/90	229	11/03/90	42
01/04/90	20	03/04/90	26	05/04/90	11	07/04/90	21	09/04/90	247	11/04/90	45
01/05/90	57	03/05/90	23	05/05/90	10	07/05/90	19	09/05/90	240	11/05/90	72
01/06/90	42	03/06/90	22	05/06/90	10	07/06/90	18	09/06/90	194	11/06/90	40
01/07/90	27	03/07/90	22	05/07/90	13	07/07/90	17	09/07/90	156	11/07/90	31
01/08/90	26	03/08/90	22	05/08/90	12	07/08/90	17	09/08/90	92	11/08/90	29
01/09/90	25	03/09/90	21	05/09/90	11	07/09/90	16	09/09/90	81	11/09/90	30
01/10/90	20	03/10/90	20	05/10/90	12	07/10/90	15	09/10/90	58	11/10/90	41
01/11/90	50	03/11/90	19	05/11/90	13	07/11/90	14	09/11/90	25	11/11/90	56
01/12/90	22	03/12/90	18	05/12/90	13	07/12/90	14	09/12/90	77	11/12/90	31
01/13/90	19	03/13/90	18	05/13/90	12	07/13/90	14	09/13/90	38	11/13/90	28
01/14/90	18	03/14/90	17	05/14/90	11	07/14/90	16	09/14/90	56	11/14/90	27
01/15/90	18	03/15/90	16	05/15/90	14	07/15/90	16	09/15/90	37	11/15/90	27
01/16/90	18	03/16/90	15	05/16/90	11	07/16/90	15	09/16/90	37	11/16/90	26
01/17/90	18	03/17/90	15	05/17/90	10	07/17/90	16	09/17/90	54	11/17/90	26
01/18/90	17	03/18/90	15	05/18/90	9	07/18/90	16	09/18/90	35	11/18/90	26
01/19/90	17	03/19/90	16	05/19/90	8	07/19/90	16	09/19/90	89	11/19/90	53
01/20/90	17	03/20/90	21	05/20/90	8	07/20/90	15	09/20/90	263	11/20/90	34
01/21/90	17	03/21/90	21	05/21/90	7	07/21/90	15	09/21/90	293	11/21/90	29
01/22/90	17	03/22/90	19	05/22/90	7	07/22/90	15	09/22/90	295	11/22/90	28
01/23/90	17	03/23/90	18	05/23/90	6	07/23/90	25	09/23/90	306	11/23/90	27
01/24/90	16	03/24/90	17	05/24/90	6	07/24/90	21	09/24/90	227	11/24/90	26
01/25/90	16	03/25/90	17	05/25/90	7	07/25/90	16	09/25/90	175	11/25/90	26
01/26/90	15	03/26/90	16	05/26/90	8	07/26/90	15	09/26/90	154	11/26/90	24
01/27/90	15	03/27/90	15	05/27/90	9	07/27/90	15	09/27/90	113	11/27/90	27
01/28/90	15	03/28/90	14	05/28/90	13	07/28/90	15	09/28/90	261	11/28/90	59
01/29/90	16	03/29/90	14	05/29/90	12	07/29/90	15	09/29/90	409	11/29/90	29
01/30/90	36	03/30/90	13	05/30/90	11	07/30/90	14	09/30/90	371	11/30/90	25
01/31/90	19	03/31/90	16	05/31/90	24	07/31/90	14	10/01/90	362	12/01/90	24
02/01/90	16	04/01/90	17	06/01/90	23	08/01/90	13	10/02/90	350	12/02/90	23
02/02/90	15	04/02/90	15	06/02/90	21	08/02/90	14	10/03/90	342	12/03/90	27
02/03/90	15	04/03/90	14	06/03/90	20	08/03/90	13	10/04/90	330	12/04/90	63
02/04/90	14	04/04/90	13	06/04/90	18	08/04/90	13	10/05/90	335	12/05/90	41
02/05/90	14	04/05/90	13	06/05/90	17	08/05/90	13	10/06/90	328	12/06/90	26
02/06/90	14	04/06/90	12	06/06/90	16	08/06/90	30	10/07/90	288	12/07/90	25
02/07/90	14	04/07/90	12	06/07/90	16	08/07/90	56	10/08/90	232	12/08/90	25
02/08/90	14	04/08/90	12	06/08/90	15	08/08/90	76	10/09/90	278	12/09/90	24
02/09/90	14	04/09/90	13	06/09/90	15	08/09/90	33	10/10/90	253	12/10/90	23
02/10/90	14	04/10/90	17	06/10/90	14	08/10/90	72	10/11/90	310	12/11/90	23
02/11/90	15	04/11/90	17	06/11/90	13	08/11/90	66	10/12/90	321	12/12/90	22
02/12/90	16	04/12/90	16	06/12/90	13	08/12/90	86	10/13/90	327	12/13/90	23
02/13/90	16	04/13/90	15	06/13/90	12	08/13/90	55	10/14/90	293	12/14/90	22
02/14/90	16	04/14/90	14	06/14/90	12	08/14/90	110	10/15/90	216	12/15/90	21
02/15/90	16	04/15/90	14	06/15/90	11	08/15/90	99	10/16/90	179	12/16/90	20
02/16/90	16	04/16/90	15	06/16/90	11	08/16/90	110	10/17/90	131	12/17/90	20
02/17/90	16	04/17/90	16	06/17/90	10	08/17/90	118	10/18/90	166	12/18/90	21
02/18/90	16	04/18/90	15	06/18/90	10	08/18/90	141	10/19/90	128	12/19/90	21
02/19/90	16	04/19/90	14	06/19/90	10	08/19/90	186	10/20/90	123	12/20/90	21
02/20/90	16	04/20/90	14	06/20/90	9	08/20/90	196	10/21/90	121	12/21/90	21
02/21/90	21	04/21/90	13	06/21/90	9	08/21/90	158	10/22/90	90	12/22/90	21
02/22/90	21	04/22/90	13	06/22/90	9	08/22/90	141	10/23/90	141	12/23/90	21
02/23/90	20	04/23/90	12	06/23/90	9	08/23/90	110	10/24/90	136	12/24/90	21
02/24/90	20	04/24/90	12	06/24/90	10	08/24/90	110	10/25/90	96	12/25/90	22
02/25/90	20	04/25/90	12	06/25/90	11	08/25/90	125	10/26/90	91	12/26/90	34
02/26/90	20	04/26/90	11	06/26/90	13	08/26/90	141	10/27/90	85	12/27/90	22
02/27/90	20	04/27/90	11	06/27/90	20	08/27/90	141	10/28/90	80	12/28/90	21
02/28/90	20	04/28/90	11	06/28/90	20	08/28/90	133	10/29/90	75	12/29/90	20
		04/29/90	11	06/29/90	16	08/29/90	110	10/30/90	73	12/30/90	19
		04/30/90	14	06/30/90	15	08/30/90	140	10/31/90	72	12/31/90	18
						08/31/90	204				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/91	18	03/01/91	164	05/01/91	199	07/01/91	418	09/01/91	93	11/01/91	144
01/02/91	18	03/02/91	61	05/02/91	195	07/02/91	381	09/02/91	249	11/02/91	143
01/03/91	18	03/03/91	141	05/03/91	189	07/03/91	378	09/03/91	313	11/03/91	142
01/04/91	17	03/04/91	188	05/04/91	151	07/04/91	370	09/04/91	300	11/04/91	141
01/05/91	21	03/05/91	115	05/05/91	140	07/05/91	311	09/05/91	334	11/05/91	140
01/06/91	33	03/06/91	172	05/06/91	135	07/06/91	312	09/06/91	312	11/06/91	131
01/07/91	48	03/07/91	70	05/07/91	114	07/07/91	285	09/07/91	304	11/07/91	128
01/08/91	35	03/08/91	44	05/08/91	88	07/08/91	293	09/08/91	333	11/08/91	125
01/09/91	21	03/09/91	145	05/09/91	87	07/09/91	297	09/09/91	342	11/09/91	122
01/10/91	22	03/10/91	47	05/10/91	86	07/10/91	322	09/10/91	341	11/10/91	112
01/11/91	41	03/11/91	31	05/11/91	84	07/11/91	342	09/11/91	318	11/11/91	109
01/12/91	41	03/12/91	30	05/12/91	65	07/12/91	346	09/12/91	302	11/12/91	82
01/13/91	33	03/13/91	38	05/13/91	67	07/13/91	349	09/13/91	300	11/13/91	36
01/14/91	21	03/14/91	120	05/14/91	124	07/14/91	326	09/14/91	301	11/14/91	31
01/15/91	50	03/15/91	39	05/15/91	58	07/15/91	319	09/15/91	279	11/15/91	41
01/16/91	264	03/16/91	36	05/16/91	79	07/16/91	344	09/16/91	262	11/16/91	84
01/17/91	250	03/17/91	116	05/17/91	87	07/17/91	338	09/17/91	256	11/17/91	73
01/18/91	253	03/18/91	53	05/18/91	80	07/18/91	294	09/18/91	269	11/18/91	38
01/19/91	252	03/19/91	132	05/19/91	94	07/19/91	293	09/19/91	371	11/19/91	38
01/20/91	242	03/20/91	44	05/20/91	115	07/20/91	345	09/20/91	337	11/20/91	93
01/21/91	237	03/21/91	31	05/21/91	118	07/21/91	330	09/21/91	321	11/21/91	122
01/22/91	222	03/22/91	29	05/22/91	154	07/22/91	344	09/22/91	334	11/22/91	112
01/23/91	198	03/23/91	28	05/23/91	215	07/23/91	330	09/23/91	330	11/23/91	48
01/24/91	183	03/24/91	27	05/24/91	279	07/24/91	341	09/24/91	328	11/24/91	36
01/25/91	133	03/25/91	26	05/25/91	264	07/25/91	341	09/25/91	322	11/25/91	62
01/26/91	122	03/26/91	26	05/26/91	259	07/26/91	342	09/26/91	331	11/26/91	48
01/27/91	132	03/27/91	25	05/27/91	298	07/27/91	367	09/27/91	312	11/27/91	93
01/28/91	153	03/28/91	24	05/28/91	271	07/28/91	345	09/28/91	305	11/28/91	42
01/29/91	74	03/29/91	27	05/29/91	198	07/29/91	344	09/29/91	331	11/29/91	51
01/30/91	36	03/30/91	30	05/30/91	189	07/30/91	315	09/30/91	337	11/30/91	118
01/31/91	35	03/31/91	33	05/31/91	189	07/31/91	316	10/01/91	321	12/01/91	182
02/01/91	132	04/01/91	37	06/01/91	176	08/01/91	319	10/02/91	310	12/02/91	120
02/02/91	176	04/02/91	34	06/02/91	147	08/02/91	320	10/03/91	348	12/03/91	76
02/03/91	228	04/03/91	32	06/03/91	147	08/03/91	311	10/04/91	340	12/04/91	43
02/04/91	193	04/04/91	37	06/04/91	145	08/04/91	296	10/05/91	342	12/05/91	42
02/05/91	74	04/05/91	40	06/05/91	120	08/05/91	290	10/06/91	334	12/06/91	42
02/06/91	61	04/06/91	44	06/06/91	132	08/06/91	280	10/07/91	318	12/07/91	42
02/07/91	52	04/07/91	47	06/07/91	237	08/07/91	269	10/08/91	324	12/08/91	49
02/08/91	47	04/08/91	51	06/08/91	221	08/08/91	267	10/09/91	324	12/09/91	88
02/09/91	44	04/09/91	54	06/09/91	283	08/09/91	252	10/10/91	332	12/10/91	89
02/10/91	42	04/10/91	110	06/10/91	302	08/10/91	249	10/11/91	362	12/11/91	64
02/11/91	56	04/11/91	138	06/11/91	264	08/11/91	250	10/12/91	334	12/12/91	37
02/12/91	181	04/12/91	69	06/12/91	221	08/12/91	256	10/13/91	313	12/13/91	80
02/13/91	135	04/13/91	76	06/13/91	296	08/13/91	249	10/14/91	303	12/14/91	49
02/14/91	62	04/14/91	152	06/14/91	249	08/14/91	248	10/15/91	316	12/15/91	58
02/15/91	184	04/15/91	178	06/15/91	225	08/15/91	232	10/16/91	324	12/16/91	37
02/16/91	67	04/16/91	165	06/16/91	174	08/16/91	198	10/17/91	308	12/17/91	57
02/17/91	100	04/17/91	108	06/17/91	190	08/17/91	183	10/18/91	295	12/18/91	69
02/18/91	42	04/18/91	201	06/18/91	216	08/18/91	157	10/19/91	295	12/19/91	42
02/19/91	48	04/19/91	155	06/19/91	174	08/19/91	137	10/20/91	298	12/20/91	28
02/20/91	114	04/20/91	178	06/20/91	250	08/20/91	147	10/21/91	288	12/21/91	28
02/21/91	57	04/21/91	218	06/21/91	277	08/21/91	157	10/22/91	276	12/22/91	47
02/22/91	121	04/22/91	208	06/22/91	256	08/22/91	96	10/23/91	273	12/23/91	32
02/23/91	122	04/23/91	159	06/23/91	322	08/23/91	256	10/24/91	271	12/24/91	26
02/24/91	57	04/24/91	129	06/24/91	250	08/24/91	257	10/25/91	266	12/25/91	37
02/25/91	110	04/25/91	145	06/25/91	240	08/25/91	275	10/26/91	192	12/26/91	44
02/26/91	77	04/26/91	143	06/26/91	312	08/26/91	296	10/27/91	216	12/27/91	44
02/27/91	123	04/27/91	81	06/27/91	322	08/27/91	264	10/28/91	176	12/28/91	44
02/28/91	89	04/28/91	235	06/28/91	333	08/28/91	286	10/29/91	151	12/29/91	44
		04/29/91	245	06/29/91	306	08/29/91	306	10/30/91	150	12/30/91	42
		04/30/91	245	06/30/91	280	08/30/91	281	10/31/91	148	12/31/91	41
						08/31/91	193				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/92	27	03/01/92	24	05/01/92	14	07/01/92	223	09/01/92	173	11/01/92	47
01/02/92	24	03/02/92	22	05/02/92	17	07/02/92	158	09/02/92	144	11/02/92	70
01/03/92	37	03/03/92	21	05/03/92	31	07/03/92	125	09/03/92	156	11/03/92	73
01/04/92	29	03/04/92	27	05/04/92	24	07/04/92	121	09/04/92	182	11/04/92	77
01/05/92	21	03/05/92	20	05/05/92	23	07/05/92	158	09/05/92	167	11/05/92	67
01/06/92	20	03/06/92	61	05/06/92	23	07/06/92	161	09/06/92	149	11/06/92	106
01/07/92	20	03/07/92	56	05/07/92	23	07/07/92	164	09/07/92	139	11/07/92	103
01/08/92	19	03/08/92	23	05/08/92	22	07/08/92	168	09/08/92	134	11/08/92	97
01/09/92	18	03/09/92	21	05/09/92	21	07/09/92	171	09/09/92	131	11/09/92	187
01/10/92	18	03/10/92	20	05/10/92	21	07/10/92	174	09/10/92	136	11/10/92	263
01/11/92	17	03/11/92	20	05/11/92	20	07/11/92	178	09/11/92	137	11/11/92	254
01/12/92	16	03/12/92	19	05/12/92	20	07/12/92	180	09/12/92	134	11/12/92	239
01/13/92	16	03/13/92	39	05/13/92	19	07/13/92	142	09/13/92	131	11/13/92	263
01/14/92	16	03/14/92	36	05/14/92	19	07/14/92	114	09/14/92	144	11/14/92	262
01/15/92	16	03/15/92	21	05/15/92	22	07/15/92	116	09/15/92	156	11/15/92	256
01/16/92	15	03/16/92	19	05/16/92	21	07/16/92	116	09/16/92	151	11/16/92	254
01/17/92	15	03/17/92	18	05/17/92	20	07/17/92	107	09/17/92	155	11/17/92	254
01/18/92	14	03/18/92	17	05/18/92	19	07/18/92	83	09/18/92	153	11/18/92	263
01/19/92	14	03/19/92	17	05/19/92	19	07/19/92	88	09/19/92	148	11/19/92	265
01/20/92	14	03/20/92	18	05/20/92	14	07/20/92	90	09/20/92	144	11/20/92	260
01/21/92	14	03/21/92	25	05/21/92	12	07/21/92	90	09/21/92	144	11/21/92	257
01/22/92	14	03/22/92	18	05/22/92	20	07/22/92	81	09/22/92	198	11/22/92	265
01/23/92	14	03/23/92	20	05/23/92	19	07/23/92	75	09/23/92	187	11/23/92	262
01/24/92	14	03/24/92	23	05/24/92	19	07/24/92	74	09/24/92	191	11/24/92	256
01/25/92	14	03/25/92	54	05/25/92	18	07/25/92	74	09/25/92	203	11/25/92	254
01/26/92	14	03/26/92	36	05/26/92	17	07/26/92	73	09/26/92	204	11/26/92	252
01/27/92	14	03/27/92	21	05/27/92	17	07/27/92	47	09/27/92	204	11/27/92	250
01/28/92	14	03/28/92	20	05/28/92	16	07/28/92	42	09/28/92	258	11/28/92	248
01/29/92	14	03/29/92	18	05/29/92	16	07/29/92	59	09/29/92	305	11/29/92	246
01/30/92	14	03/30/92	17	05/30/92	16	07/30/92	82	09/30/92	239	11/30/92	244
01/31/92	14	03/31/92	18	05/31/92	16	07/31/92	91	10/01/92	202	12/01/92	242
02/01/92	14	04/01/92	18	06/01/92	16	08/01/92	93	10/02/92	177	12/02/92	240
02/02/92	13	04/02/92	17	06/02/92	16	08/02/92	93	10/03/92	195	12/03/92	238
02/03/92	13	04/03/92	19	06/03/92	16	08/03/92	93	10/04/92	207	12/04/92	235
02/04/92	13	04/04/92	25	06/04/92	16	08/04/92	120	10/05/92	255	12/05/92	232
02/05/92	26	04/05/92	21	06/05/92	15	08/05/92	184	10/06/92	255	12/06/92	230
02/06/92	21	04/06/92	22	06/06/92	15	08/06/92	193	10/07/92	259	12/07/92	230
02/07/92	59	04/07/92	22	06/07/92	15	08/07/92	200	10/08/92	261	12/08/92	229
02/08/92	33	04/08/92	42	06/08/92	15	08/08/92	222	10/09/92	262	12/09/92	221
02/09/92	19	04/09/92	27	06/09/92	15	08/09/92	221	10/10/92	259	12/10/92	214
02/10/92	19	04/10/92	19	06/10/92	16	08/10/92	217	10/11/92	260	12/11/92	194
02/11/92	19	04/11/92	19	06/11/92	18	08/11/92	212	10/12/92	259	12/12/92	109
02/12/92	18	04/12/92	59	06/12/92	17	08/12/92	210	10/13/92	255	12/13/92	86
02/13/92	34	04/13/92	35	06/13/92	17	08/13/92	207	10/14/92	232	12/14/92	141
02/14/92	19	04/14/92	44	06/14/92	18	08/14/92	203	10/15/92	231	12/15/92	134
02/15/92	17	04/15/92	32	06/15/92	21	08/15/92	202	10/16/92	229	12/16/92	107
02/16/92	17	04/16/92	20	06/16/92	53	08/16/92	202	10/17/92	228	12/17/92	125
02/17/92	16	04/17/92	18	06/17/92	41	08/17/92	204	10/18/92	226	12/18/92	94
02/18/92	16	04/18/92	18	06/18/92	29	08/18/92	194	10/19/92	227	12/19/92	109
02/19/92	16	04/19/92	17	06/19/92	26	08/19/92	190	10/20/92	226	12/20/92	111
02/20/92	15	04/20/92	17	06/20/92	24	08/20/92	192	10/21/92	218	12/21/92	91
02/21/92	20	04/21/92	19	06/21/92	23	08/21/92	192	10/22/92	206	12/22/92	92
02/22/92	98	04/22/92	17	06/22/92	23	08/22/92	190	10/23/92	186	12/23/92	90
02/23/92	48	04/23/92	16	06/23/92	40	08/23/92	171	10/24/92	120	12/24/92	76
02/24/92	53	04/24/92	15	06/24/92	98	08/24/92	155	10/25/92	120	12/25/92	91
02/25/92	38	04/25/92	17	06/25/92	94	08/25/92	164	10/26/92	122	12/26/92	94
02/26/92	72	04/26/92	16	06/26/92	173	08/26/92	183	10/27/92	124	12/27/92	86
02/27/92	53	04/27/92	15	06/27/92	221	08/27/92	182	10/28/92	125	12/28/92	79
02/28/92	56	04/28/92	14	06/28/92	229	08/28/92	179	10/29/92	127	12/29/92	89
02/29/92	33	04/29/92	14	06/29/92	239	08/29/92	192	10/30/92	96	12/30/92	105
		04/30/92	14	06/30/92	304	08/30/92	229	10/31/92	47	12/31/92	93
						08/31/92	205				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/93	125	03/01/93	170	05/01/93	67	07/01/93	109	09/01/93	102	11/01/93	161
01/02/93	215	03/02/93	157	05/02/93	62	07/02/93	104	09/02/93	103	11/02/93	156
01/03/93	228	03/03/93	134	05/03/93	58	07/03/93	99	09/03/93	105	11/03/93	137
01/04/93	206	03/04/93	132	05/04/93	54	07/04/93	94	09/04/93	107	11/04/93	129
01/05/93	148	03/05/93	135	05/05/93	53	07/05/93	89	09/05/93	109	11/05/93	126
01/06/93	213	03/06/93	134	05/06/93	53	07/06/93	84	09/06/93	111	11/06/93	124
01/07/93	262	03/07/93	132	05/07/93	52	07/07/93	82	09/07/93	113	11/07/93	121
01/08/93	256	03/08/93	129	05/08/93	59	07/08/93	75	09/08/93	116	11/08/93	119
01/09/93	267	03/09/93	124	05/09/93	65	07/09/93	70	09/09/93	118	11/09/93	100
01/10/93	278	03/10/93	102	05/10/93	66	07/10/93	70	09/10/93	120	11/10/93	55
01/11/93	275	03/11/93	99	05/11/93	66	07/11/93	69	09/11/93	122	11/11/93	76
01/12/93	299	03/12/93	100	05/12/93	63	07/12/93	67	09/12/93	124	11/12/93	163
01/13/93	292	03/13/93	128	05/13/93	61	07/13/93	66	09/13/93	126	11/13/93	135
01/14/93	292	03/14/93	117	05/14/93	65	07/14/93	66	09/14/93	128	11/14/93	92
01/15/93	294	03/15/93	99	05/15/93	66	07/15/93	66	09/15/93	131	11/15/93	75
01/16/93	307	03/16/93	98	05/16/93	65	07/16/93	65	09/16/93	133	11/16/93	50
01/17/93	303	03/17/93	99	05/17/93	63	07/17/93	65	09/17/93	135	11/17/93	52
01/18/93	292	03/18/93	111	05/18/93	61	07/18/93	62	09/18/93	138	11/18/93	85
01/19/93	292	03/19/93	127	05/19/93	53	07/19/93	59	09/19/93	140	11/19/93	88
01/20/93	292	03/20/93	130	05/20/93	50	07/20/93	59	09/20/93	142	11/20/93	84
01/21/93	278	03/21/93	186	05/21/93	49	07/21/93	58	09/21/93	145	11/21/93	93
01/22/93	223	03/22/93	403	05/22/93	49	07/22/93	56	09/22/93	147	11/22/93	95
01/23/93	226	03/23/93	223	05/23/93	47	07/23/93	57	09/23/93	149	11/23/93	87
01/24/93	241	03/24/93	160	05/24/93	44	07/24/93	58	09/24/93	152	11/24/93	94
01/25/93	355	03/25/93	285	05/25/93	41	07/25/93	58	09/25/93	154	11/25/93	175
01/26/93	386	03/26/93	217	05/26/93	35	07/26/93	56	09/26/93	157	11/26/93	198
01/27/93	268	03/27/93	231	05/27/93	34	07/27/93	55	09/27/93	159	11/27/93	189
01/28/93	239	03/28/93	267	05/28/93	44	07/28/93	54	09/28/93	162	11/28/93	164
01/29/93	237	03/29/93	263	05/29/93	50	07/29/93	54	09/29/93	164	11/29/93	137
01/30/93	228	03/30/93	265	05/30/93	49	07/30/93	53	09/30/93	167	11/30/93	125
01/31/93	243	03/31/93	268	05/31/93	56	07/31/93	54	10/01/93	169	12/01/93	83
02/01/93	298	04/01/93	276	06/01/93	58	08/01/93	66	10/02/93	172	12/02/93	81
02/02/93	303	04/02/93	269	06/02/93	75	08/02/93	69	10/03/93	174	12/03/93	80
02/03/93	260	04/03/93	263	06/03/93	167	08/03/93	74	10/04/93	177	12/04/93	79
02/04/93	262	04/04/93	260	06/04/93	169	08/04/93	88	10/05/93	180	12/05/93	78
02/05/93	265	04/05/93	269	06/05/93	132	08/05/93	96	10/06/93	183	12/06/93	77
02/06/93	259	04/06/93	269	06/06/93	76	08/06/93	95	10/07/93	185	12/07/93	77
02/07/93	243	04/07/93	259	06/07/93	122	08/07/93	92	10/08/93	188	12/08/93	76
02/08/93	239	04/08/93	249	06/08/93	118	08/08/93	87	10/09/93	191	12/09/93	75
02/09/93	245	04/09/93	238	06/09/93	77	08/09/93	84	10/10/93	194	12/10/93	74
02/10/93	249	04/10/93	228	06/10/93	72	08/10/93	83	10/11/93	196	12/11/93	73
02/11/93	247	04/11/93	218	06/11/93	70	08/11/93	82	10/12/93	199	12/12/93	72
02/12/93	258	04/12/93	208	06/12/93	69	08/12/93	69	10/13/93	202	12/13/93	70
02/13/93	259	04/13/93	198	06/13/93	69	08/13/93	47	10/14/93	223	12/14/93	56
02/14/93	255	04/14/93	189	06/14/93	70	08/14/93	61	10/15/93	227	12/15/93	50
02/15/93	249	04/15/93	180	06/15/93	71	08/15/93	69	10/16/93	263	12/16/93	48
02/16/93	246	04/16/93	171	06/16/93	72	08/16/93	105	10/17/93	234	12/17/93	42
02/17/93	242	04/17/93	162	06/17/93	72	08/17/93	53	10/18/93	227	12/18/93	38
02/18/93	237	04/18/93	154	06/18/93	73	08/18/93	41	10/19/93	201	12/19/93	61
02/19/93	167	04/19/93	146	06/19/93	74	08/19/93	34	10/20/93	187	12/20/93	60
02/20/93	126	04/20/93	138	06/20/93	75	08/20/93	31	10/21/93	183	12/21/93	61
02/21/93	149	04/21/93	131	06/21/93	76	08/21/93	45	10/22/93	180	12/22/93	33
02/22/93	147	04/22/93	123	06/22/93	73	08/22/93	82	10/23/93	178	12/23/93	37
02/23/93	160	04/23/93	116	06/23/93	49	08/23/93	85	10/24/93	176	12/24/93	79
02/24/93	189	04/24/93	109	06/24/93	45	08/24/93	87	10/25/93	174	12/25/93	76
02/25/93	172	04/25/93	103	06/25/93	46	08/25/93	88	10/26/93	172	12/26/93	75
02/26/93	172	04/26/93	96	06/26/93	57	08/26/93	90	10/27/93	170	12/27/93	71
02/27/93	207	04/27/93	90	06/27/93	83	08/27/93	92	10/28/93	168	12/28/93	38
02/28/93	202	04/28/93	84	06/28/93	98	08/28/93	94	10/29/93	167	12/29/93	32
		04/29/93	78	06/29/93	127	08/29/93	96	10/30/93	165	12/30/93	38
		04/30/93	73	06/30/93	103	08/30/93	98	10/31/93	163	12/31/93	45
						08/31/93	100				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/94	50	03/01/94	192	05/01/94	169	07/01/94	101	09/01/94	70	11/01/94	226
01/02/94	78	03/02/94	194	05/02/94	137	07/02/94	111	09/02/94	58	11/02/94	213
01/03/94	81	03/03/94	185	05/03/94	96	07/03/94	161	09/03/94	52	11/03/94	215
01/04/94	62	03/04/94	121	05/04/94	240	07/04/94	215	09/04/94	48	11/04/94	207
01/05/94	45	03/05/94	128	05/05/94	169	07/05/94	159	09/05/94	47	11/05/94	209
01/06/94	42	03/06/94	127	05/06/94	118	07/06/94	73	09/06/94	82	11/06/94	208
01/07/94	45	03/07/94	127	05/07/94	88	07/07/94	126	09/07/94	103	11/07/94	192
01/08/94	46	03/08/94	110	05/08/94	103	07/08/94	186	09/08/94	112	11/08/94	141
01/09/94	54	03/09/94	119	05/09/94	88	07/09/94	189	09/09/94	108	11/09/94	164
01/10/94	48	03/10/94	155	05/10/94	93	07/10/94	178	09/10/94	103	11/10/94	151
01/11/94	61	03/11/94	61	05/11/94	88	07/11/94	108	09/11/94	103	11/11/94	133
01/12/94	92	03/12/94	65	05/12/94	59	07/12/94	117	09/12/94	127	11/12/94	131
01/13/94	102	03/13/94	93	05/13/94	74	07/13/94	95	09/13/94	172	11/13/94	208
01/14/94	65	03/14/94	89	05/14/94	74	07/14/94	91	09/14/94	169	11/14/94	220
01/15/94	58	03/15/94	79	05/15/94	55	07/15/94	71	09/15/94	130	11/15/94	244
01/16/94	57	03/16/94	66	05/16/94	51	07/16/94	67	09/16/94	131	11/16/94	514
01/17/94	57	03/17/94	65	05/17/94	49	07/17/94	64	09/17/94	96	11/17/94	543
01/18/94	81	03/18/94	53	05/18/94	66	07/18/94	63	09/18/94	76	11/18/94	433
01/19/94	76	03/19/94	35	05/19/94	197	07/19/94	62	09/19/94	84	11/19/94	313
01/20/94	51	03/20/94	32	05/20/94	122	07/20/94	61	09/20/94	243	11/20/94	242
01/21/94	49	03/21/94	31	05/21/94	65	07/21/94	63	09/21/94	135	11/21/94	216
01/22/94	48	03/22/94	60	05/22/94	56	07/22/94	65	09/22/94	138	11/22/94	218
01/23/94	48	03/23/94	71	05/23/94	53	07/23/94	71	09/23/94	112	11/23/94	204
01/24/94	48	03/24/94	38	05/24/94	51	07/24/94	93	09/24/94	115	11/24/94	219
01/25/94	47	03/25/94	36	05/25/94	50	07/25/94	123	09/25/94	147	11/25/94	225
01/26/94	47	03/26/94	35	05/26/94	54	07/26/94	132	09/26/94	211	11/26/94	223
01/27/94	140	03/27/94	33	05/27/94	95	07/27/94	204	09/27/94	154	11/27/94	221
01/28/94	146	03/28/94	33	05/28/94	57	07/28/94	222	09/28/94	130	11/28/94	214
01/29/94	92	03/29/94	32	05/29/94	64	07/29/94	208	09/29/94	117	11/29/94	223
01/30/94	90	03/30/94	34	05/30/94	101	07/30/94	227	09/30/94	135	11/30/94	215
01/31/94	162	03/31/94	37	05/31/94	66	07/31/94	274	10/01/94	154	12/01/94	224
02/01/94	141	04/01/94	36	06/01/94	54	08/01/94	259	10/02/94	221	12/02/94	233
02/02/94	169	04/02/94	36	06/02/94	94	08/02/94	201	10/03/94	173	12/03/94	222
02/03/94	253	04/03/94	36	06/03/94	107	08/03/94	106	10/04/94	158	12/04/94	203
02/04/94	254	04/04/94	40	06/04/94	130	08/04/94	106	10/05/94	166	12/05/94	224
02/05/94	235	04/05/94	39	06/05/94	281	08/05/94	112	10/06/94	221	12/06/94	210
02/06/94	208	04/06/94	37	06/06/94	285	08/06/94	95	10/07/94	222	12/07/94	208
02/07/94	126	04/07/94	34	06/07/94	210	08/07/94	95	10/08/94	219	12/08/94	201
02/08/94	158	04/08/94	34	06/08/94	268	08/08/94	102	10/09/94	219	12/09/94	215
02/09/94	183	04/09/94	36	06/09/94	210	08/09/94	100	10/10/94	215	12/10/94	230
02/10/94	91	04/10/94	24	06/10/94	215	08/10/94	97	10/11/94	221	12/11/94	227
02/11/94	133	04/11/94	25	06/11/94	264	08/11/94	116	10/12/94	278	12/12/94	224
02/12/94	114	04/12/94	23	06/12/94	288	08/12/94	139	10/13/94	283	12/13/94	215
02/13/94	90	04/13/94	25	06/13/94	281	08/13/94	173	10/14/94	240	12/14/94	208
02/14/94	93	04/14/94	26	06/14/94	273	08/14/94	158	10/15/94	261	12/15/94	211
02/15/94	79	04/15/94	26	06/15/94	270	08/15/94	140	10/16/94	233	12/16/94	209
02/16/94	88	04/16/94	28	06/16/94	228	08/16/94	90	10/17/94	236	12/17/94	201
02/17/94	108	04/17/94	27	06/17/94	229	08/17/94	71	10/18/94	230	12/18/94	202
02/18/94	152	04/18/94	29	06/18/94	285	08/18/94	57	10/19/94	222	12/19/94	202
02/19/94	277	04/19/94	29	06/19/94	250	08/19/94	61	10/20/94	217	12/20/94	201
02/20/94	256	04/20/94	30	06/20/94	222	08/20/94	83	10/21/94	215	12/21/94	309
02/21/94	235	04/21/94	31	06/21/94	225	08/21/94	82	10/22/94	170	12/22/94	423
02/22/94	182	04/22/94	35	06/22/94	282	08/22/94	82	10/23/94	203	12/23/94	274
02/23/94	157	04/23/94	51	06/23/94	243	08/23/94	87	10/24/94	208	12/24/94	196
02/24/94	149	04/24/94	61	06/24/94	222	08/24/94	106	10/25/94	192	12/25/94	219
02/25/94	142	04/25/94	81	06/25/94	212	08/25/94	88	10/26/94	67	12/26/94	202
02/26/94	185	04/26/94	109	06/26/94	173	08/26/94	100	10/27/94	75	12/27/94	195
02/27/94	214	04/27/94	160	06/27/94	142	08/27/94	82	10/28/94	63	12/28/94	194
02/28/94	182	04/28/94	262	06/28/94	147	08/28/94	152	10/29/94	52	12/29/94	194
		04/29/94	246	06/29/94	72	08/29/94	208	10/30/94	49	12/30/94	192
		04/30/94	150	06/30/94	82	08/30/94	140	10/31/94	197	12/31/94	189
						08/31/94	89				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/95	188	03/01/95	92	05/01/95	33	07/01/95	193	09/01/95	166	11/01/95	165
01/02/95	191	03/02/95	67	05/02/95	32	07/02/95	163	09/02/95	171	11/02/95	166
01/03/95	200	03/03/95	62	05/03/95	30	07/03/95	174	09/03/95	166	11/03/95	162
01/04/95	198	03/04/95	61	05/04/95	28	07/04/95	107	09/04/95	154	11/04/95	179
01/05/95	200	03/05/95	61	05/05/95	30	07/05/95	116	09/05/95	151	11/05/95	221
01/06/95	199	03/06/95	61	05/06/95	29	07/06/95	194	09/06/95	198	11/06/95	227
01/07/95	187	03/07/95	60	05/07/95	28	07/07/95	158	09/07/95	221	11/07/95	225
01/08/95	202	03/08/95	49	05/08/95	26	07/08/95	148	09/08/95	316	11/08/95	225
01/09/95	205	03/09/95	60	05/09/95	26	07/09/95	126	09/09/95	303	11/09/95	228
01/10/95	136	03/10/95	79	05/10/95	25	07/10/95	133	09/10/95	182	11/10/95	226
01/11/95	173	03/11/95	69	05/11/95	25	07/11/95	156	09/11/95	128	11/11/95	223
01/12/95	195	03/12/95	65	05/12/95	25	07/12/95	145	09/12/95	117	11/12/95	219
01/13/95	174	03/13/95	67	05/13/95	23	07/13/95	140	09/13/95	131	11/13/95	221
01/14/95	218	03/14/95	80	05/14/95	23	07/14/95	134	09/14/95	120	11/14/95	222
01/15/95	248	03/15/95	75	05/15/95	21	07/15/95	125	09/15/95	115	11/15/95	220
01/16/95	232	03/16/95	72	05/16/95	21	07/16/95	120	09/16/95	112	11/16/95	218
01/17/95	215	03/17/95	77	05/17/95	22	07/17/95	113	09/17/95	108	11/17/95	211
01/18/95	210	03/18/95	125	05/18/95	21	07/18/95	74	09/18/95	101	11/18/95	201
01/19/95	229	03/19/95	130	05/19/95	19	07/19/95	69	09/19/95	99	11/19/95	191
01/20/95	236	03/20/95	123	05/20/95	21	07/20/95	68	09/20/95	74	11/20/95	111
01/21/95	229	03/21/95	89	05/21/95	25	07/21/95	98	09/21/95	40	11/21/95	32
01/22/95	227	03/22/95	80	05/22/95	24	07/22/95	145	09/22/95	37	11/22/95	37
01/23/95	220	03/23/95	75	05/23/95	22	07/23/95	190	09/23/95	36	11/23/95	63
01/24/95	193	03/24/95	74	05/24/95	20	07/24/95	177	09/24/95	34	11/24/95	107
01/25/95	176	03/25/95	74	05/25/95	17	07/25/95	161	09/25/95	34	11/25/95	117
01/26/95	130	03/26/95	72	05/26/95	16	07/26/95	159	09/26/95	35	11/26/95	116
01/27/95	124	03/27/95	65	05/27/95	14	07/27/95	182	09/27/95	35	11/27/95	81
01/28/95	122	03/28/95	60	05/28/95	12	07/28/95	189	09/28/95	58	11/28/95	39
01/29/95	121	03/29/95	43	05/29/95	10	07/29/95	190	09/29/95	124	11/29/95	64
01/30/95	129	03/30/95	40	05/30/95	9	07/30/95	181	09/30/95	129	11/30/95	81
01/31/95	170	03/31/95	40	05/31/95	8	07/31/95	178	10/01/95	129	12/01/95	73
02/01/95	137	04/01/95	40	06/01/95	7	08/01/95	176	10/02/95	127	12/02/95	65
02/02/95	89	04/02/95	39	06/02/95	7	08/02/95	183	10/03/95	127	12/03/95	61
02/03/95	90	04/03/95	39	06/03/95	9	08/03/95	409	10/04/95	128	12/04/95	61
02/04/95	95	04/04/95	38	06/04/95	13	08/04/95	416	10/05/95	131	12/05/95	62
02/05/95	91	04/05/95	38	06/05/95	15	08/05/95	302	10/06/95	141	12/06/95	62
02/06/95	90	04/06/95	39	06/06/95	12	08/06/95	207	10/07/95	147	12/07/95	59
02/07/95	88	04/07/95	39	06/07/95	11	08/07/95	149	10/08/95	173	12/08/95	42
02/08/95	67	04/08/95	39	06/08/95	10	08/08/95	145	10/09/95	181	12/09/95	37
02/09/95	67	04/09/95	40	06/09/95	9	08/09/95	132	10/10/95	166	12/10/95	38
02/10/95	66	04/10/95	36	06/10/95	7	08/10/95	130	10/11/95	155	12/11/95	40
02/11/95	65	04/11/95	31	06/11/95	6	08/11/95	149	10/12/95	150	12/12/95	40
02/12/95	65	04/12/95	40	06/12/95	6	08/12/95	187	10/13/95	144	12/13/95	52
02/13/95	59	04/13/95	44	06/13/95	8	08/13/95	201	10/14/95	149	12/14/95	60
02/14/95	110	04/14/95	45	06/14/95	9	08/14/95	201	10/15/95	189	12/15/95	58
02/15/95	69	04/15/95	44	06/15/95	7	08/15/95	201	10/16/95	228	12/16/95	58
02/16/95	62	04/16/95	42	06/16/95	10	08/16/95	201	10/17/95	858	12/17/95	58
02/17/95	60	04/17/95	39	06/17/95	12	08/17/95	201	10/18/95	1,230	12/18/95	56
02/18/95	60	04/18/95	38	06/18/95	11	08/18/95	201	10/19/95	1,022	12/19/95	53
02/19/95	109	04/19/95	39	06/19/95	12	08/19/95	201	10/20/95	771	12/20/95	51
02/20/95	90	04/20/95	39	06/20/95	14	08/20/95	201	10/21/95	520	12/21/95	48
02/21/95	103	04/21/95	36	06/21/95	27	08/21/95	201	10/22/95	364	12/22/95	46
02/22/95	90	04/22/95	32	06/22/95	37	08/22/95	201	10/23/95	274	12/23/95	48
02/23/95	85	04/23/95	31	06/23/95	41	08/23/95	201	10/24/95	161	12/24/95	47
02/24/95	85	04/24/95	31	06/24/95	39	08/24/95	200	10/25/95	111	12/25/95	57
02/25/95	84	04/25/95	29	06/25/95	69	08/25/95	257	10/26/95	97	12/26/95	57
02/26/95	89	04/26/95	35	06/26/95	156	08/26/95	235	10/27/95	88	12/27/95	49
02/27/95	84	04/27/95	40	06/27/95	160	08/27/95	194	10/28/95	97	12/28/95	42
02/28/95	84	04/28/95	39	06/28/95	117	08/28/95	158	10/29/95	91	12/29/95	38
		04/29/95	38	06/29/95	70	08/29/95	124	10/30/95	85	12/30/95	37
		04/30/95	35	06/30/95	91	08/30/95	122	10/31/95	137	12/31/95	38
						08/31/95	147				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/96	40	03/01/96	25	05/01/96	36	07/01/96	167	09/01/96	85	11/01/96	104
01/02/96	49	03/02/96	26	05/02/96	36	07/02/96	149	09/02/96	86	11/02/96	86
01/03/96	68	03/03/96	26	05/03/96	36	07/03/96	177	09/03/96	134	11/03/96	84
01/04/96	57	03/04/96	25	05/04/96	40	07/04/96	193	09/04/96	98	11/04/96	83
01/05/96	48	03/05/96	25	05/05/96	39	07/05/96	162	09/05/96	112	11/05/96	135
01/06/96	48	03/06/96	25	05/06/96	37	07/06/96	373	09/06/96	113	11/06/96	173
01/07/96	49	03/07/96	24	05/07/96	36	07/07/96	277	09/07/96	116	11/07/96	104
01/08/96	47	03/08/96	23	05/08/96	34	07/08/96	209	09/08/96	116	11/08/96	72
01/09/96	46	03/09/96	23	05/09/96	32	07/09/96	174	09/09/96	124	11/09/96	58
01/10/96	46	03/10/96	24	05/10/96	32	07/10/96	168	09/10/96	157	11/10/96	47
01/11/96	46	03/11/96	61	05/11/96	31	07/11/96	140	09/11/96	184	11/11/96	42
01/12/96	46	03/12/96	96	05/12/96	31	07/12/96	147	09/12/96	224	11/12/96	38
01/13/96	46	03/13/96	72	05/13/96	32	07/13/96	206	09/13/96	170	11/13/96	34
01/14/96	46	03/14/96	89	05/14/96	29	07/14/96	226	09/14/96	152	11/14/96	33
01/15/96	45	03/15/96	82	05/15/96	27	07/15/96	145	09/15/96	166	11/15/96	33
01/16/96	44	03/16/96	84	05/16/96	26	07/16/96	143	09/16/96	161	11/16/96	35
01/17/96	44	03/17/96	82	05/17/96	26	07/17/96	130	09/17/96	161	11/17/96	33
01/18/96	45	03/18/96	68	05/18/96	25	07/18/96	120	09/18/96	160	11/18/96	29
01/19/96	45	03/19/96	56	05/19/96	21	07/19/96	137	09/19/96	151	11/19/96	27
01/20/96	44	03/20/96	77	05/20/96	20	07/20/96	173	09/20/96	155	11/20/96	27
01/21/96	44	03/21/96	50	05/21/96	26	07/21/96	169	09/21/96	157	11/21/96	27
01/22/96	42	03/22/96	46	05/22/96	62	07/22/96	183	09/22/96	156	11/22/96	26
01/23/96	41	03/23/96	45	05/23/96	56	07/23/96	181	09/23/96	154	11/23/96	24
01/24/96	39	03/24/96	44	05/24/96	55	07/24/96	193	09/24/96	150	11/24/96	24
01/25/96	40	03/25/96	43	05/25/96	74	07/25/96	193	09/25/96	116	11/25/96	29
01/26/96	40	03/26/96	42	05/26/96	219	07/26/96	195	09/26/96	87	11/26/96	32
01/27/96	41	03/27/96	42	05/27/96	233	07/27/96	192	09/27/96	82	11/27/96	36
01/28/96	41	03/28/96	42	05/28/96	274	07/28/96	185	09/28/96	82	11/28/96	68
01/29/96	41	03/29/96	45	05/29/96	223	07/29/96	177	09/29/96	81	11/29/96	69
01/30/96	40	03/30/96	64	05/30/96	163	07/30/96	138	09/30/96	82	11/30/96	68
01/31/96	40	03/31/96	197	05/31/96	128	07/31/96	89	10/01/96	98	12/01/96	63
02/01/96	40	04/01/96	149	06/01/96	111	08/01/96	111	10/02/96	109	12/02/96	30
02/02/96	39	04/02/96	137	06/02/96	112	08/02/96	99	10/03/96	59	12/03/96	24
02/03/96	39	04/03/96	100	06/03/96	182	08/03/96	107	10/04/96	91	12/04/96	20
02/04/96	39	04/04/96	93	06/04/96	202	08/04/96	143	10/05/96	132	12/05/96	21
02/05/96	39	04/05/96	91	06/05/96	136	08/05/96	134	10/06/96	95	12/06/96	27
02/06/96	38	04/06/96	87	06/06/96	117	08/06/96	108	10/07/96	125	12/07/96	32
02/07/96	38	04/07/96	87	06/07/96	107	08/07/96	100	10/08/96	156	12/08/96	34
02/08/96	37	04/08/96	101	06/08/96	85	08/08/96	103	10/09/96	142	12/09/96	33
02/09/96	36	04/09/96	172	06/09/96	102	08/09/96	115	10/10/96	131	12/10/96	36
02/10/96	35	04/10/96	126	06/10/96	148	08/10/96	115	10/11/96	124	12/11/96	34
02/11/96	34	04/11/96	113	06/11/96	181	08/11/96	130	10/12/96	126	12/12/96	32
02/12/96	33	04/12/96	105	06/12/96	189	08/12/96	144	10/13/96	173	12/13/96	32
02/13/96	33	04/13/96	61	06/13/96	188	08/13/96	155	10/14/96	167	12/14/96	31
02/14/96	33	04/14/96	72	06/14/96	190	08/14/96	154	10/15/96	176	12/15/96	30
02/15/96	32	04/15/96	61	06/15/96	183	08/15/96	165	10/16/96	172	12/16/96	29
02/16/96	32	04/16/96	57	06/16/96	180	08/16/96	172	10/17/96	178	12/17/96	28
02/17/96	32	04/17/96	48	06/17/96	179	08/17/96	137	10/18/96	179	12/18/96	29
02/18/96	29	04/18/96	45	06/18/96	184	08/18/96	91	10/19/96	123	12/19/96	28
02/19/96	28	04/19/96	44	06/19/96	178	08/19/96	81	10/20/96	127	12/20/96	28
02/20/96	27	04/20/96	43	06/20/96	166	08/20/96	94	10/21/96	124	12/21/96	29
02/21/96	30	04/21/96	42	06/21/96	189	08/21/96	141	10/22/96	120	12/22/96	26
02/22/96	33	04/22/96	40	06/22/96	208	08/22/96	144	10/23/96	131	12/23/96	27
02/23/96	31	04/23/96	39	06/23/96	177	08/23/96	91	10/24/96	130	12/24/96	35
02/24/96	30	04/24/96	38	06/24/96	161	08/24/96	82	10/25/96	127	12/25/96	52
02/25/96	28	04/25/96	37	06/25/96	198	08/25/96	81	10/26/96	126	12/26/96	39
02/26/96	29	04/26/96	33	06/26/96	187	08/26/96	81	10/27/96	123	12/27/96	30
02/27/96	32	04/27/96	32	06/27/96	201	08/27/96	104	10/28/96	118	12/28/96	28
02/28/96	29	04/28/96	30	06/28/96	196	08/28/96	125	10/29/96	118	12/29/96	27
02/29/96	27	04/29/96	29	06/29/96	164	08/29/96	123	10/30/96	118	12/30/96	27
		04/30/96	34	06/30/96	180	08/30/96	118	10/31/96	117	12/31/96	27
						08/31/96	112				

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/97	26	03/01/97	92	05/01/97	43	07/01/97	114	09/01/97	124	11/01/97	87
01/02/97	25	03/02/97	57	05/02/97	39	07/02/97	112	09/02/97	151	11/02/97	89
01/03/97	25	03/03/97	80	05/03/97	44	07/03/97	112	09/03/97	75	11/03/97	75
01/04/97	24	03/04/97	73	05/04/97	59	07/04/97	113	09/04/97	59	11/04/97	52
01/05/97	23	03/05/97	46	05/05/97	58	07/05/97	114	09/05/97	208	11/05/97	50
01/06/97	23	03/06/97	52	05/06/97	56	07/06/97	117	09/06/97	221	11/06/97	55
01/07/97	22	03/07/97	66	05/07/97	52	07/07/97	116	09/07/97	151	11/07/97	78
01/08/97	28	03/08/97	55	05/08/97	41	07/08/97	113	09/08/97	84	11/08/97	90
01/09/97	29	03/09/97	34	05/09/97	48	07/09/97	113	09/09/97	79	11/09/97	90
01/10/97	29	03/10/97	33	05/10/97	38	07/10/97	113	09/10/97	103	11/10/97	87
01/11/97	30	03/11/97	32	05/11/97	33	07/11/97	123	09/11/97	102	11/11/97	85
01/12/97	29	03/12/97	32	05/12/97	36	07/12/97	131	09/12/97	97	11/12/97	72
01/13/97	32	03/13/97	31	05/13/97	71	07/13/97	124	09/13/97	107	11/13/97	55
01/14/97	42	03/14/97	44	05/14/97	73	07/14/97	127	09/14/97	115	11/14/97	54
01/15/97	49	03/15/97	80	05/15/97	46	07/15/97	124	09/15/97	115	11/15/97	54
01/16/97	167	03/16/97	72	05/16/97	41	07/16/97	126	09/16/97	84	11/16/97	54
01/17/97	122	03/17/97	50	05/17/97	42	07/17/97	116	09/17/97	84	11/17/97	54
01/18/97	102	03/18/97	46	05/18/97	43	07/18/97	110	09/18/97	107	11/18/97	54
01/19/97	73	03/19/97	45	05/19/97	52	07/19/97	111	09/19/97	103	11/19/97	53
01/20/97	69	03/20/97	45	05/20/97	72	07/20/97	104	09/20/97	103	11/20/97	53
01/21/97	67	03/21/97	47	05/21/97	57	07/21/97	93	09/21/97	100	11/21/97	53
01/22/97	66	03/22/97	58	05/22/97	65	07/22/97	96	09/22/97	98	11/22/97	54
01/23/97	65	03/23/97	81	05/23/97	101	07/23/97	94	09/23/97	98	11/23/97	62
01/24/97	62	03/24/97	60	05/24/97	91	07/24/97	90	09/24/97	98	11/24/97	69
01/25/97	59	03/25/97	57	05/25/97	68	07/25/97	88	09/25/97	98	11/25/97	66
01/26/97	45	03/26/97	53	05/26/97	44	07/26/97	88	09/26/97	108	11/26/97	70
01/27/97	43	03/27/97	46	05/27/97	41	07/27/97	84	09/27/97	104	11/27/97	82
01/28/97	43	03/28/97	47	05/28/97	39	07/28/97	84	09/28/97	116	11/28/97	82
01/29/97	43	03/29/97	47	05/29/97	60	07/29/97	85	09/29/97	145	11/29/97	81
01/30/97	43	03/30/97	45	05/30/97	57	07/30/97	89	09/30/97	95	11/30/97	84
01/31/97	43	03/31/97	33	05/31/97	42	07/31/97	92	10/01/97	71	12/01/97	97
02/01/97	42	04/01/97	30	06/01/97	59	08/01/97	113	10/02/97	88	12/02/97	95
02/02/97	41	04/02/97	27	06/02/97	234	08/02/97	158	10/03/97	88	12/03/97	93
02/03/97	40	04/03/97	24	06/03/97	111	08/03/97	135	10/04/97	84	12/04/97	97
02/04/97	41	04/04/97	23	06/04/97	81	08/04/97	85	10/05/97	83	12/05/97	102
02/05/97	117	04/05/97	22	06/05/97	54	08/05/97	70	10/06/97	81	12/06/97	99
02/06/97	145	04/06/97	21	06/06/97	86	08/06/97	84	10/07/97	77	12/07/97	97
02/07/97	123	04/07/97	19	06/07/97	109	08/07/97	110	10/08/97	82	12/08/97	103
02/08/97	108	04/08/97	15	06/08/97	103	08/08/97	137	10/09/97	93	12/09/97	114
02/09/97	84	04/09/97	13	06/09/97	89	08/09/97	177	10/10/97	95	12/10/97	115
02/10/97	79	04/10/97	18	06/10/97	124	08/10/97	114	10/11/97	95	12/11/97	115
02/11/97	64	04/11/97	17	06/11/97	123	08/11/97	82	10/12/97	93	12/12/97	113
02/12/97	48	04/12/97	21	06/12/97	100	08/12/97	76	10/13/97	91	12/13/97	100
02/13/97	45	04/13/97	29	06/13/97	92	08/13/97	78	10/14/97	91	12/14/97	192
02/14/97	46	04/14/97	70	06/14/97	111	08/14/97	119	10/15/97	90	12/15/97	195
02/15/97	67	04/15/97	216	06/15/97	307	08/15/97	97	10/16/97	90	12/16/97	117
02/16/97	106	04/16/97	122	06/16/97	177	08/16/97	70	10/17/97	92	12/17/97	100
02/17/97	127	04/17/97	138	06/17/97	98	08/17/97	109	10/18/97	97	12/18/97	110
02/18/97	152	04/18/97	97	06/18/97	150	08/18/97	157	10/19/97	95	12/19/97	108
02/19/97	156	04/19/97	101	06/19/97	327	08/19/97	89	10/20/97	93	12/20/97	105
02/20/97	124	04/20/97	118	06/20/97	187	08/20/97	79	10/21/97	88	12/21/97	103
02/21/97	89	04/21/97	125	06/21/97	119	08/21/97	72	10/22/97	89	12/22/97	101
02/22/97	85	04/22/97	121	06/22/97	120	08/22/97	73	10/23/97	90	12/23/97	100
02/23/97	84	04/23/97	78	06/23/97	128	08/23/97	96	10/24/97	90	12/24/97	99
02/24/97	89	04/24/97	106	06/24/97	152	08/24/97	108	10/25/97	90	12/25/97	98
02/25/97	126	04/25/97	125	06/25/97	129	08/25/97	110	10/26/97	89	12/26/97	95
02/26/97	154	04/26/97	94	06/26/97	116	08/26/97	108	10/27/97	89	12/27/97	97
02/27/97	109	04/27/97	78	06/27/97	104	08/27/97	103	10/28/97	90	12/28/97	99
02/28/97	89	04/28/97	88	06/28/97	103	08/28/97	98	10/29/97	90	12/29/97	97
		04/29/97	102	06/29/97	112	08/29/97	78	10/30/97	89	12/30/97	96
		04/30/97	79	06/30/97	113	08/30/97	89	10/31/97	88	12/31/97	97
						08/31/97	92				

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DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/98	97	03/01/98	120	05/01/98	156	07/01/98	14	09/01/98	63	11/01/98	89
01/02/98	97	03/02/98	122	05/02/98	113	07/02/98	12	09/02/98	73	11/02/98	75
01/03/98	96	03/03/98	120	05/03/98	106	07/03/98	4	09/03/98	75	11/03/98	76
01/04/98	96	03/04/98	117	05/04/98	103	07/04/98	5	09/04/98	72	11/04/98	84
01/05/98	96	03/05/98	115	05/05/98	106	07/05/98	3	09/05/98	75	11/05/98	512
01/06/98	95	03/06/98	109	05/06/98	113	07/06/98	1	09/06/98	81	11/06/98	512
01/07/98	95	03/07/98	110	05/07/98	108	07/07/98	13	09/07/98	80	11/07/98	354
01/08/98	96	03/08/98	113	05/08/98	99	07/08/98	63	09/08/98	76	11/08/98	260
01/09/98	102	03/09/98	111	05/09/98	82	07/09/98	61	09/09/98	76	11/09/98	207
01/10/98	100	03/10/98	129	05/10/98	72	07/10/98	60	09/10/98	75	11/10/98	201
01/11/98	96	03/11/98	137	05/11/98	59	07/11/98	59	09/11/98	73	11/11/98	194
01/12/98	95	03/12/98	135	05/12/98	56	07/12/98	64	09/12/98	71	11/12/98	204
01/13/98	93	03/13/98	134	05/13/98	55	07/13/98	153	09/13/98	63	11/13/98	196
01/14/98	92	03/14/98	128	05/14/98	54	07/14/98	111	09/14/98	62	11/14/98	193
01/15/98	94	03/15/98	127	05/15/98	53	07/15/98	142	09/15/98	62	11/15/98	192
01/16/98	97	03/16/98	126	05/16/98	53	07/16/98	128	09/16/98	76	11/16/98	191
01/17/98	97	03/17/98	124	05/17/98	51	07/17/98	126	09/17/98	92	11/17/98	190
01/18/98	97	03/18/98	127	05/18/98	50	07/18/98	119	09/18/98	114	11/18/98	197
01/19/98	96	03/19/98	136	05/19/98	48	07/19/98	118	09/19/98	172	11/19/98	193
01/20/98	94	03/20/98	208	05/20/98	37	07/20/98	117	09/20/98	215	11/20/98	191
01/21/98	93	03/21/98	120	05/21/98	30	07/21/98	117	09/21/98	350	11/21/98	186
01/22/98	241	03/22/98	115	05/22/98	25	07/22/98	121	09/22/98	255	11/22/98	185
01/23/98	309	03/23/98	109	05/23/98	20	07/23/98	118	09/23/98	149	11/23/98	180
01/24/98	192	03/24/98	115	05/24/98	26	07/24/98	115	09/24/98	136	11/24/98	178
01/25/98	118	03/25/98	130	05/25/98	35	07/25/98	112	09/25/98	153	11/25/98	200
01/26/98	112	03/26/98	130	05/26/98	34	07/26/98	107	09/26/98	161	11/26/98	190
01/27/98	133	03/27/98	130	05/27/98	33	07/27/98	99	09/27/98	112	11/27/98	189
01/28/98	147	03/28/98	124	05/28/98	32	07/28/98	83	09/28/98	104	11/28/98	195
01/29/98	124	03/29/98	121	05/29/98	36	07/29/98	80	09/29/98	124	11/29/98	198
01/30/98	116	03/30/98	122	05/30/98	38	07/30/98	80	09/30/98	122	11/30/98	189
01/31/98	106	03/31/98	122	05/31/98	38	07/31/98	75	10/01/98	116	12/01/98	141
02/01/98	104	04/01/98	120	06/01/98	38	08/01/98	61	10/02/98	122	12/02/98	133
02/02/98	101	04/02/98	118	06/02/98	36	08/02/98	58	10/03/98	160	12/03/98	120
02/03/98	149	04/03/98	116	06/03/98	35	08/03/98	59	10/04/98	182	12/04/98	117
02/04/98	122	04/04/98	114	06/04/98	33	08/04/98	65	10/05/98	184	12/05/98	162
02/05/98	121	04/05/98	105	06/05/98	32	08/05/98	80	10/06/98	183	12/06/98	163
02/06/98	115	04/06/98	67	06/06/98	31	08/06/98	100	10/07/98	182	12/07/98	149
02/07/98	109	04/07/98	61	06/07/98	30	08/07/98	128	10/08/98	185	12/08/98	104
02/08/98	119	04/08/98	60	06/08/98	44	08/08/98	142	10/09/98	183	12/09/98	119
02/09/98	112	04/09/98	59	06/09/98	32	08/09/98	107	10/10/98	187	12/10/98	120
02/10/98	116	04/10/98	58	06/10/98	29	08/10/98	89	10/11/98	187	12/11/98	120
02/11/98	141	04/11/98	57	06/11/98	30	08/11/98	80	10/12/98	186	12/12/98	123
02/12/98	138	04/12/98	55	06/12/98	29	08/12/98	100	10/13/98	186	12/13/98	136
02/13/98	138	04/13/98	53	06/13/98	28	08/13/98	118	10/14/98	186	12/14/98	136
02/14/98	140	04/14/98	52	06/14/98	30	08/14/98	118	10/15/98	185	12/15/98	135
02/15/98	138	04/15/98	39	06/15/98	29	08/15/98	116	10/16/98	179	12/16/98	133
02/16/98	233	04/16/98	35	06/16/98	29	08/16/98	114	10/17/98	134	12/17/98	126
02/17/98	232	04/17/98	34	06/17/98	28	08/17/98	108	10/18/98	56	12/18/98	104
02/18/98	310	04/18/98	33	06/18/98	29	08/18/98	94	10/19/98	74	12/19/98	89
02/19/98	178	04/19/98	32	06/19/98	28	08/19/98	85	10/20/98	116	12/20/98	88
02/20/98	114	04/20/98	31	06/20/98	10	08/20/98	88	10/21/98	133	12/21/98	88
02/21/98	91	04/21/98	33	06/21/98	11	08/21/98	98	10/22/98	157	12/22/98	87
02/22/98	75	04/22/98	37	06/22/98	7	08/22/98	115	10/23/98	157	12/23/98	87
02/23/98	59	04/23/98	39	06/23/98	6	08/23/98	110	10/24/98	170	12/24/98	86
02/24/98	79	04/24/98	38	06/24/98	4	08/24/98	93	10/25/98	167	12/25/98	85
02/25/98	119	04/25/98	38	06/25/98	8	08/25/98	82	10/26/98	160	12/26/98	83
02/26/98	117	04/26/98	37	06/26/98	7	08/26/98	77	10/27/98	128	12/27/98	64
02/27/98	117	04/27/98	34	06/27/98	5	08/27/98	72	10/28/98	83	12/28/98	59
02/28/98	114	04/28/98	31	06/28/98	11	08/28/98	69	10/29/98	118	12/29/98	79
		04/29/98	33	06/29/98	8	08/29/98	67	10/30/98	120	12/30/98	106
		04/30/98	50	06/30/98	7	08/30/98	63	10/31/98	93	12/31/98	85
						08/31/98	62				

Lainhart Dam (1971-2001) Agency: USGS & WMD
DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/99	63	03/01/99	38	05/01/99	1	07/01/99	313	09/01/99	508	11/01/99	120
01/02/99	199	03/02/99	51	05/02/99	1	07/02/99	464	09/02/99	425	11/02/99	117
01/03/99	300	03/03/99	53	05/03/99	1	07/03/99	363	09/03/99	264	11/03/99	150
01/04/99	194	03/04/99	43	05/04/99	1	07/04/99	252	09/04/99	189	11/04/99	146
01/05/99	149	03/05/99	26	05/05/99	1	07/05/99	224	09/05/99	149	11/05/99	140
01/06/99	199	03/06/99	24	05/06/99	1	07/06/99	214	09/06/99	138	11/06/99	138
01/07/99	193	03/07/99	25	05/07/99	1	07/07/99	212	09/07/99	137	11/07/99	138
01/08/99	188	03/08/99	24	05/08/99	1	07/08/99	206	09/08/99	168	11/08/99	137
01/09/99	186	03/09/99	32	05/09/99	1	07/09/99	205	09/09/99	296	11/09/99	134
01/10/99	192	03/10/99	45	05/10/99	1	07/10/99	206	09/10/99	175	11/10/99	134
01/11/99	192	03/11/99	46	05/11/99	1	07/11/99	202	09/11/99	116	11/11/99	135
01/12/99	201	03/12/99	45	05/12/99	1	07/12/99	199	09/12/99	97	11/12/99	140
01/13/99	197	03/13/99	43	05/13/99	1	07/13/99	200	09/13/99	65	11/13/99	138
01/14/99	192	03/14/99	40	05/14/99	4	07/14/99	189	09/14/99	55	11/14/99	138
01/15/99	189	03/15/99	35	05/15/99	7	07/15/99	118	09/15/99	61	11/15/99	143
01/16/99	194	03/16/99	35	05/16/99	9	07/16/99	125	09/16/99	113	11/16/99	140
01/17/99	163	03/17/99	36	05/17/99	10	07/17/99	125	09/17/99	156	11/17/99	141
01/18/99	189	03/18/99	36	05/18/99	9	07/18/99	122	09/18/99	133	11/18/99	142
01/19/99	192	03/19/99	37	05/19/99	10	07/19/99	108	09/19/99	141	11/19/99	127
01/20/99	190	03/20/99	40	05/20/99	9	07/20/99	77	09/20/99	107	11/20/99	125
01/21/99	189	03/21/99	39	05/21/99	7	07/21/99	73	09/21/99	177	11/21/99	141
01/22/99	189	03/22/99	37	05/22/99	8	07/22/99	72	09/22/99	145	11/22/99	141
01/23/99	186	03/23/99	36	05/23/99	8	07/23/99	74	09/23/99	130	11/23/99	142
01/24/99	177	03/24/99	35	05/24/99	7	07/24/99	73	09/24/99	119	11/24/99	141
01/25/99	201	03/25/99	34	05/25/99	6	07/25/99	74	09/25/99	116	11/25/99	138
01/26/99	198	03/26/99	33	05/26/99	5	07/26/99	92	09/26/99	176	11/26/99	126
01/27/99	195	03/27/99	31	05/27/99	5	07/27/99	151	09/27/99	253	11/27/99	94
01/28/99	193	03/28/99	30	05/28/99	6	07/28/99	111	09/28/99	202	11/28/99	95
01/29/99	188	03/29/99	29	05/29/99	2	07/29/99	100	09/29/99	145	11/29/99	102
01/30/99	182	03/30/99	23	05/30/99	1	07/30/99	93	09/30/99	132	11/30/99	91
01/31/99	152	03/31/99	11	05/31/99	1	07/31/99	74	10/01/99	137	12/01/99	86
02/01/99	126	04/01/99	7	06/01/99	1	08/01/99	72	10/02/99	131	12/02/99	83
02/02/99	160	04/02/99	5	06/02/99	1	08/02/99	68	10/03/99	132	12/03/99	76
02/03/99	173	04/03/99	5	06/03/99	1	08/03/99	73	10/04/99	132	12/04/99	65
02/04/99	149	04/04/99	4	06/04/99	10	08/04/99	49	10/05/99	139	12/05/99	63
02/05/99	127	04/05/99	4	06/05/99	13	08/05/99	48	10/06/99	140	12/06/99	60
02/06/99	111	04/06/99	3	06/06/99	14	08/06/99	96	10/07/99	141	12/07/99	59
02/07/99	73	04/07/99	3	06/07/99	18	08/07/99	65	10/08/99	196	12/08/99	59
02/08/99	80	04/08/99	2	06/08/99	34	08/08/99	53	10/09/99	207	12/09/99	59
02/09/99	97	04/09/99	3	06/09/99	48	08/09/99	68	10/10/99	160	12/10/99	58
02/10/99	106	04/10/99	3	06/10/99	70	08/10/99	110	10/11/99	154	12/11/99	54
02/11/99	106	04/11/99	2	06/11/99	79	08/11/99	142	10/12/99	185	12/12/99	40
02/12/99	105	04/12/99	2	06/12/99	130	08/12/99	140	10/13/99	182	12/13/99	33
02/13/99	91	04/13/99	2	06/13/99	149	08/13/99	117	10/14/99	381	12/14/99	31
02/14/99	61	04/14/99	2	06/14/99	160	08/14/99	135	10/15/99	596	12/15/99	32
02/15/99	65	04/15/99	2	06/15/99	152	08/15/99	179	10/16/99	891	12/16/99	42
02/16/99	74	04/16/99	1	06/16/99	99	08/16/99	159	10/17/99	754	12/17/99	79
02/17/99	74	04/17/99	1	06/17/99	95	08/17/99	153	10/18/99	558	12/18/99	134
02/18/99	73	04/18/99	1	06/18/99	105	08/18/99	158	10/19/99	377	12/19/99	136
02/19/99	74	04/19/99	1	06/19/99	141	08/19/99	178	10/20/99	261	12/20/99	123
02/20/99	81	04/20/99	1	06/20/99	204	08/20/99	190	10/21/99	196	12/21/99	120
02/21/99	70	04/21/99	1	06/21/99	209	08/21/99	164	10/22/99	135	12/22/99	120
02/22/99	55	04/22/99	1	06/22/99	210	08/22/99	186	10/23/99	101	12/23/99	117
02/23/99	41	04/23/99	1	06/23/99	209	08/23/99	197	10/24/99	83	12/24/99	115
02/24/99	39	04/24/99	1	06/24/99	202	08/24/99	244	10/25/99	73	12/25/99	112
02/25/99	39	04/25/99	1	06/25/99	211	08/25/99	257	10/26/99	92	12/26/99	109
02/26/99	38	04/26/99	1	06/26/99	238	08/26/99	135	10/27/99	156	12/27/99	103
02/27/99	38	04/27/99	1	06/27/99	244	08/27/99	94	10/28/99	187	12/28/99	63
02/28/99	37	04/28/99	1	06/28/99	212	08/28/99	145	10/29/99	189	12/29/99	78
		04/29/99	1	06/29/99	207	08/29/99	161	10/30/99	184	12/30/99	89
		04/30/99	1	06/30/99	230	08/30/99	162	10/31/99	178	12/31/99	75
						08/31/99	172				

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/00	45	03/01/00	15	05/01/00	59	07/01/00	1	09/01/00	5	11/01/00	175
01/02/00	57	03/02/00	13	05/02/00	57	07/02/00	1	09/02/00	4	11/02/00	121
01/03/00	73	03/03/00	12	05/03/00	55	07/03/00	1	09/03/00	3	11/03/00	77
01/04/00	72	03/04/00	10	05/04/00	53	07/04/00	1	09/04/00	4	11/04/00	72
01/05/00	71	03/05/00	10	05/05/00	46	07/05/00	2	09/05/00	4	11/05/00	70
01/06/00	61	03/06/00	9	05/06/00	29	07/06/00	1	09/06/00	3	11/06/00	78
01/07/00	41	03/07/00	8	05/07/00	25	07/07/00	1	09/07/00	2	11/07/00	77
01/08/00	38	03/08/00	7	05/08/00	25	07/08/00	12	09/08/00	2	11/08/00	68
01/09/00	36	03/09/00	6	05/09/00	29	07/09/00	21	09/09/00	3	11/09/00	65
01/10/00	36	03/10/00	6	05/10/00	29	07/10/00	30	09/10/00	2	11/10/00	62
01/11/00	37	03/11/00	6	05/11/00	31	07/11/00	25	09/11/00	2	11/11/00	62
01/12/00	35	03/12/00	6	05/12/00	37	07/12/00	25	09/12/00	2	11/12/00	61
01/13/00	34	03/13/00	6	05/13/00	38	07/13/00	41	09/13/00	2	11/13/00	60
01/14/00	35	03/14/00	6	05/14/00	37	07/14/00	43	09/14/00	2	11/14/00	60
01/15/00	39	03/15/00	6	05/15/00	36	07/15/00	42	09/15/00	2	11/15/00	59
01/16/00	40	03/16/00	6	05/16/00	35	07/16/00	41	09/16/00	2	11/16/00	59
01/17/00	39	03/17/00	6	05/17/00	34	07/17/00	39	09/17/00	2	11/17/00	57
01/18/00	38	03/18/00	6	05/18/00	32	07/18/00	38	09/18/00	2	11/18/00	55
01/19/00	39	03/19/00	7	05/19/00	32	07/19/00	38	09/19/00	2	11/19/00	54
01/20/00	38	03/20/00	19	05/20/00	32	07/20/00	42	09/20/00	2	11/20/00	53
01/21/00	28	03/21/00	20	05/21/00	31	07/21/00	40	09/21/00	2	11/21/00	52
01/22/00	8	03/22/00	17	05/22/00	31	07/22/00	41	09/22/00	2	11/22/00	51
01/23/00	6	03/23/00	15	05/23/00	30	07/23/00	41	09/23/00	3	11/23/00	50
01/24/00	27	03/24/00	14	05/24/00	30	07/24/00	41	09/24/00	3	11/24/00	49
01/25/00	81	03/25/00	13	05/25/00	30	07/25/00	41	09/25/00	2	11/25/00	51
01/26/00	62	03/26/00	11	05/26/00	29	07/26/00	40	09/26/00	41	11/26/00	55
01/27/00	59	03/27/00	10	05/27/00	29	07/27/00	40	09/27/00	53	11/27/00	56
01/28/00	51	03/28/00	18	05/28/00	28	07/28/00	41	09/28/00	52	11/28/00	56
01/29/00	49	03/29/00	33	05/29/00	28	07/29/00	40	09/29/00	53	11/29/00	59
01/30/00	49	03/30/00	62	05/30/00	28	07/30/00	39	09/30/00	53	11/30/00	57
01/31/00	48	03/31/00	64	05/31/00	27	07/31/00	38	10/01/00	52	12/01/00	54
02/01/00	46	04/01/00	64	06/01/00	26	08/01/00	36	10/02/00	52	12/02/00	52
02/02/00	46	04/02/00	60	06/02/00	25	08/02/00	38	10/03/00	66	12/03/00	52
02/03/00	46	04/03/00	58	06/03/00	21	08/03/00	43	10/04/00	330	12/04/00	46
02/04/00	46	04/04/00	52	06/04/00	16	08/04/00	41	10/05/00	298	12/05/00	43
02/05/00	45	04/05/00	28	06/05/00	1	08/05/00	39	10/06/00	154	12/06/00	41
02/06/00	44	04/06/00	23	06/06/00	1	08/06/00	37	10/07/00	175	12/07/00	40
02/07/00	43	04/07/00	22	06/07/00	1	08/07/00	41	10/08/00	174	12/08/00	39
02/08/00	44	04/08/00	22	06/08/00	1	08/08/00	42	10/09/00	175	12/09/00	38
02/09/00	48	04/09/00	22	06/09/00	1	08/09/00	41	10/10/00	176	12/10/00	38
02/10/00	48	04/10/00	22	06/10/00	1	08/10/00	41	10/11/00	177	12/11/00	46
02/11/00	46	04/11/00	30	06/11/00	1	08/11/00	39	10/12/00	177	12/12/00	52
02/12/00	45	04/12/00	33	06/12/00	1	08/12/00	37	10/13/00	173	12/13/00	51
02/13/00	44	04/13/00	32	06/13/00	1	08/13/00	37	10/14/00	172	12/14/00	51
02/14/00	43	04/14/00	41	06/14/00	1	08/14/00	36	10/15/00	178	12/15/00	51
02/15/00	42	04/15/00	57	06/15/00	1	08/15/00	32	10/16/00	177	12/16/00	51
02/16/00	42	04/16/00	167	06/16/00	1	08/16/00	26	10/17/00	158	12/17/00	50
02/17/00	41	04/17/00	208	06/17/00	1	08/17/00	23	10/18/00	107	12/18/00	50
02/18/00	40	04/18/00	201	06/18/00	1	08/18/00	22	10/19/00	148	12/19/00	49
02/19/00	39	04/19/00	158	06/19/00	1	08/19/00	24	10/20/00	122	12/20/00	48
02/20/00	38	04/20/00	93	06/20/00	1	08/20/00	25	10/21/00	104	12/21/00	48
02/21/00	38	04/21/00	87	06/21/00	1	08/21/00	17	10/22/00	124	12/22/00	48
02/22/00	37	04/22/00	73	06/22/00	1	08/22/00	6	10/23/00	115	12/23/00	48
02/23/00	41	04/23/00	71	06/23/00	1	08/23/00	2	10/24/00	101	12/24/00	46
02/24/00	43	04/24/00	69	06/24/00	1	08/24/00	1	10/25/00	84	12/25/00	46
02/25/00	43	04/25/00	68	06/25/00	1	08/25/00	1	10/26/00	81	12/26/00	44
02/26/00	41	04/26/00	66	06/26/00	1	08/26/00	1	10/27/00	79	12/27/00	44
02/27/00	39	04/27/00	63	06/27/00	1	08/27/00	1	10/28/00	78	12/28/00	44
02/28/00	32	04/28/00	63	06/28/00	1	08/28/00	1	10/29/00	76	12/29/00	45
02/29/00	19	04/29/00	61	06/29/00	1	08/29/00	4	10/30/00	66	12/30/00	44
		04/30/00	60	06/30/00	1	08/30/00	6	10/31/00	142	12/31/00	42
						08/31/00	6				

Lainhart Dam (1971-2001) Agency: USGS & WMD

DB KEY 295

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/01	41	03/01/01	1	05/01/01	7	07/01/01	105	09/01/01	171
01/02/01	31	03/02/01	1	05/02/01	6	07/02/01	109	09/02/01	150
01/03/01	14	03/03/01	1	05/03/01	3	07/03/01	115	09/03/01	130
01/04/01	11	03/04/01	1	05/04/01	2	07/04/01	98	09/04/01	132
01/05/01	9	03/05/01	1	05/05/01	1	07/05/01	93	09/05/01	115
01/06/01	8	03/06/01	1	05/06/01	1	07/06/01	93	09/06/01	120
01/07/01	5	03/07/01	1	05/07/01	1	07/07/01	92	09/07/01	256
01/08/01	1	03/08/01	1	05/08/01	1	07/08/01	91	09/08/01	269
01/09/01	1	03/09/01	1	05/09/01	1	07/09/01	92	09/09/01	152
01/10/01	1	03/10/01	1	05/10/01	1	07/10/01	104	09/10/01	154
01/11/01	1	03/11/01	1	05/11/01	1	07/11/01	126	09/11/01	131
01/12/01	1	03/12/01	1	05/12/01	1	07/12/01	126	09/12/01	287
01/13/01	1	03/13/01	1	05/13/01	1	07/13/01	124	09/13/01	559
01/14/01	1	03/14/01	1	05/14/01	1	07/14/01	127	09/14/01	500
01/15/01	1	03/15/01	1	05/15/01	1	07/15/01	142	09/15/01	294
01/16/01	1	03/16/01	1	05/16/01	1	07/16/01	141	09/16/01	218
01/17/01	1	03/17/01	1	05/17/01	1	07/17/01	158	09/17/01	237
01/18/01	1	03/18/01	1	05/18/01	1	07/18/01	172	09/18/01	267
01/19/01	1	03/19/01	1	05/19/01	1	07/19/01	149	09/19/01	266
01/20/01	1	03/20/01	4	05/20/01	1	07/20/01	129	09/20/01	270
01/21/01	1	03/21/01	3	05/21/01	1	07/21/01	128	09/21/01	272
01/22/01	2	03/22/01	2	05/22/01	1	07/22/01	125	09/22/01	270
01/23/01	4	03/23/01	1	05/23/01	1	07/23/01	159	09/23/01	272
01/24/01	3	03/24/01	1	05/24/01	1	07/24/01	285	09/24/01	277
01/25/01	2	03/25/01	1	05/25/01	1	07/25/01	158	09/25/01	279
01/26/01	1	03/26/01	1	05/26/01	9	07/26/01	170	09/26/01	277
01/27/01	1	03/27/01	1	05/27/01	63	07/27/01	160	09/27/01	279
01/28/01	1	03/28/01	1	05/28/01	63	07/28/01	144	09/28/01	259
01/29/01	1	03/29/01	1	05/29/01	50	07/29/01	177	09/29/01	351
01/30/01	1	03/30/01	5	05/30/01	48	07/30/01	167	09/30/01	412
01/31/01	1	03/31/01	10	05/31/01	48	07/31/01	166	10/01/01	320
02/01/01	1	04/01/01	13	06/01/01	48	08/01/01	168	10/02/01	238
02/02/01	1	04/02/01	18	06/02/01	50	08/02/01	420	10/03/01	278
02/03/01	1	04/03/01	21	06/03/01	47	08/03/01	467	10/04/01	283
02/04/01	1	04/04/01	25	06/04/01	45	08/04/01	312	10/05/01	279
02/05/01	1	04/05/01	28	06/05/01	44	08/05/01	398	10/06/01	278
02/06/01	1	04/06/01	33	06/06/01	43	08/06/01	237	10/07/01	276
02/07/01	1	04/07/01	38	06/07/01	42	08/07/01	196	10/08/01	278
02/08/01	1	04/08/01	43	06/08/01	41	08/08/01	193	10/09/01	282
02/09/01	1	04/09/01	40	06/09/01	41	08/09/01	152	10/10/01	276
02/10/01	1	04/10/01	33	06/10/01	38	08/10/01	91	10/11/01	278
02/11/01	1	04/11/01	28	06/11/01	45	08/11/01	89	10/12/01	280
02/12/01	1	04/12/01	25	06/12/01	44	08/12/01	119	10/13/01	279
02/13/01	1	04/13/01	21	06/13/01	42	08/13/01	147	10/14/01	274
02/14/01	1	04/14/01	19	06/14/01	41	08/14/01	148	10/15/01	276
02/15/01	1	04/15/01	16	06/15/01	41	08/15/01	129	10/16/01	279
02/16/01	1	04/16/01	15	06/16/01	41	08/16/01	125	10/17/01	278
02/17/01	1	04/17/01	16	06/17/01	42	08/17/01	134	10/18/01	248
02/18/01	1	04/18/01	17	06/18/01	42	08/18/01	150		
02/19/01	1	04/19/01	17	06/19/01	41	08/19/01	148		
02/20/01	1	04/20/01	16	06/20/01	41	08/20/01	159		
02/21/01	1	04/21/01	16	06/21/01	41	08/21/01	192		
02/22/01	1	04/22/01	16	06/22/01	47	08/22/01	215		
02/23/01	1	04/23/01	14	06/23/01	49	08/23/01	196		
02/24/01	1	04/24/01	12	06/24/01	48	08/24/01	210		
02/25/01	1	04/25/01	13	06/25/01	48	08/25/01	240		
02/26/01	1	04/26/01	13	06/26/01	48	08/26/01	230		
02/27/01	1	04/27/01	12	06/27/01	53	08/27/01	191		
02/28/01	1	04/28/01	11	06/28/01	99	08/28/01	221		
		04/29/01	9	06/29/01	109	08/29/01	234		
		04/30/01	8	06/30/01	114	08/30/01	231		
						08/31/01	199		

Cypress Creek (1980-1982; 1984-1991) **Agency: USGS & WMD**

DB KEYS 2968 & 5442

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
02/01/80	26	04/01/80	110	06/01/80	142	08/01/80	60	10/01/80	7.8	12/01/80	40
02/02/80	23	04/02/80	90	06/02/80	120	08/02/80	57	10/02/80	7.7	12/02/80	35
02/03/80	22	04/03/80	76	06/03/80	103	08/03/80	57	10/03/80	8.3	12/03/80	34
02/04/80	20	04/04/80	64	06/04/80	87	08/04/80	52	10/04/80	7.4	12/04/80	35
02/05/80	17	04/05/80	58	06/05/80	60	08/05/80	48	10/05/80	7.2	12/05/80	33
02/06/80	18	04/06/80	52	06/06/80	50	08/06/80	46	10/06/80	7.8	12/06/80	31
02/07/80	17	04/07/80	47	06/07/80	47	08/07/80	42	10/07/80	7.5	12/07/80	31
02/08/80	16	04/08/80	40	06/08/80	45	08/08/80	40	10/08/80	7.4	12/08/80	30
02/09/80	21	04/09/80	38	06/09/80	42	08/09/80	48	10/09/80	9.9	12/09/80	29
02/10/80	24	04/10/80	36	06/10/80	40	08/10/80	43	10/10/80	71	12/10/80	28
02/11/80	25	04/11/80	34	06/11/80	37	08/11/80	38	10/11/80	62	12/11/80	28
02/12/80	26	04/12/80	32	06/12/80	34	08/12/80	37	10/12/80	48	12/12/80	24
02/13/80	24	04/13/80	30	06/13/80	32	08/13/80	31	10/13/80	41	12/13/80	14
02/14/80	22	04/14/80	29	06/14/80	30	08/14/80	30	10/14/80	37	12/14/80	27
02/15/80	24	04/15/80	28	06/15/80	27	08/15/80	27	10/15/80	34	12/15/80	20
02/16/80	27	04/16/80	27	06/16/80	25	08/16/80	25	10/16/80	39	12/16/80	11
02/17/80	27	04/17/80	25	06/17/80	23	08/17/80	23	10/17/80	35	12/17/80	15
02/18/80	33	04/18/80	24	06/18/80	21	08/18/80	24	10/18/80	37	12/18/80	24
02/19/80	83	04/19/80	23	06/19/80	19	08/19/80	24	10/19/80	37	12/19/80	25
02/20/80	90	04/20/80	22	06/20/80	18	08/20/80	24	10/20/80	33	12/20/80	17
02/21/80	78	04/21/80	21	06/21/80	19	08/21/80	22	10/21/80	32	12/21/80	21
02/22/80	64	04/22/80	20	06/22/80	20	08/22/80	44	10/22/80	29	12/22/80	35
02/23/80	57	04/23/80	19	06/23/80	19	08/23/80	37	10/23/80	28	12/23/80	44
02/24/80	52	04/24/80	18	06/24/80	26	08/24/80	24	10/24/80	42	12/24/80	39
02/25/80	52	04/25/80	18	06/25/80	27	08/25/80	22	10/25/80	37	12/25/80	34
02/26/80	51	04/26/80	17	06/26/80	29	08/26/80	21	10/26/80	33	12/26/80	31
02/27/80	40	04/27/80	16	06/27/80	26	08/27/80	19	10/27/80	32	12/27/80	28
02/28/80	28	04/28/80	15	06/28/80	25	08/28/80	17	10/28/80	31	12/28/80	27
02/29/80	28	04/29/80	15	06/29/80	22	08/29/80	16	10/29/80	29	12/29/80	26
03/01/80	22	04/30/80	14	06/30/80	28	08/30/80	16	10/30/80	29	12/30/80	25
03/02/80	42	05/01/80	14	07/01/80	49	08/31/80	15	10/31/80	28	12/31/80	24
03/03/80	51	05/02/80	14	07/02/80	96	09/01/80	25	11/01/80	28		
03/04/80	62	05/03/80	12	07/03/80	119	09/02/80	48	11/02/80	27		
03/05/80	76	05/04/80	13	07/04/80	98	09/03/80	95	11/03/80	27		
03/06/80	58	05/05/80	13	07/05/80	80	09/04/80	98	11/04/80	29		
03/07/80	40	05/06/80	11	07/06/80	69	09/05/80	87	11/05/80	32		
03/08/80	38	05/07/80	11	07/07/80	59	09/06/80	73	11/06/80	31		
03/09/80	37	05/08/80	12	07/08/80	58	09/07/80	62	11/07/80	24		
03/10/80	45	05/09/80	16	07/09/80	69	09/08/80	56	11/08/80	17		
03/11/80	33	05/10/80	18	07/10/80	64	09/09/80	52	11/09/80	22		
03/12/80	30	05/11/80	19	07/11/80	54	09/10/80	52	11/10/80	27		
03/13/80	30	05/12/80	19	07/12/80	46	09/11/80	46	11/11/80	26		
03/14/80	28	05/13/80	16	07/13/80	39	09/12/80	44	11/12/80	25		
03/15/80	26	05/14/80	11	07/14/80	34	09/13/80	42	11/13/80	24		
03/16/80	26	05/15/80	13	07/15/80	30	09/14/80	41	11/14/80	24		
03/17/80	25	05/16/80	15	07/16/80	23	09/15/80	40	11/15/80	23		
03/18/80	23	05/17/80	30	07/17/80	25	09/16/80	40	11/16/80	34		
03/19/80	21	05/18/80	26	07/18/80	52	09/17/80	37	11/17/80	47		
03/20/80	16	05/19/80	28	07/19/80	66	09/18/80	36	11/18/80	57		
03/21/80	18	05/20/80	28	07/20/80	84	09/19/80	32	11/19/80	48		
03/22/80	15	05/21/80	31	07/21/80	78	09/20/80	31	11/20/80	43		
03/23/80	15	05/22/80	35	07/22/80	75	09/21/80	30	11/21/80	38		
03/24/80	17	05/23/80	52	07/23/80	67	09/22/80	28	11/22/80	34		
03/25/80	17	05/24/80	73	07/24/80	68	09/23/80	18	11/23/80	32		
03/26/80	14	05/25/80	128	07/25/80	68	09/24/80	18	11/24/80	38		
03/27/80	13	05/26/80	182	07/26/80	81	09/25/80	20	11/25/80	72		
03/28/80	15	05/27/80	254	07/27/80	92	09/26/80	20	11/26/80	58		
03/29/80	15	05/28/80	237	07/28/80	84	09/27/80	18	11/27/80	52		
03/30/80	74	05/29/80	212	07/29/80	74	09/28/80	17	11/28/80	51		
03/31/80	105	05/30/80	188	07/30/80	63	09/29/80	13	11/29/80	54		
		05/31/80	166	07/31/80	56	09/30/80	9.2	11/30/80	46		

Cypress Creek (1980-1982; 1984-1991) Agency: USGS & WMD

DB KEYS 2968 & 5442

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/81	24	03/01/81	19	05/01/81	1.2	07/01/81	2.4	09/01/81	154	11/01/81	24
01/02/81	24	03/02/81	18	05/02/81	1.2	07/02/81	2.4	09/02/81	141	11/02/81	23
01/03/81	24	03/03/81	12	05/03/81	1.1	07/03/81	2.7	09/03/81	127	11/03/81	23
01/04/81	23	03/04/81	5.5	05/04/81	2.5	07/04/81	2.7	09/04/81	115	11/04/81	30
01/05/81	23	03/05/81	4.9	05/05/81	1.5	07/05/81	2.7	09/05/81	110	11/05/81	35
01/06/81	23	03/06/81	4.3	05/06/81	1.3	07/06/81	6.2	09/06/81	102	11/06/81	35
01/07/81	25	03/07/81	4.3	05/07/81	1.3	07/07/81	4.1	09/07/81	98	11/07/81	33
01/08/81	28	03/08/81	4	05/08/81	1.7	07/08/81	3.5	09/08/81	108	11/08/81	32
01/09/81	31	03/09/81	4	05/09/81	3.5	07/09/81	3.5	09/09/81	110	11/09/81	31
01/10/81	34	03/10/81	6.2	05/10/81	2.3	07/10/81	3.8	09/10/81	108	11/10/81	30
01/11/81	36	03/11/81	11	05/11/81	6.9	07/11/81	7.2	09/11/81	112	11/11/81	29
01/12/81	39	03/12/81	15	05/12/81	3.7	07/12/81	12	09/12/81	117	11/12/81	28
01/13/81	36	03/13/81	16	05/13/81	1.7	07/13/81	9.6	09/13/81	115	11/13/81	28
01/14/81	33	03/14/81	14	05/14/81	1.3	07/14/81	3.7	09/14/81	120	11/14/81	27
01/15/81	30	03/15/81	12	05/15/81	1.2	07/15/81	3.1	09/15/81	108	11/15/81	25
01/16/81	28	03/16/81	12	05/16/81	1.3	07/16/81	2.9	09/16/81	104	11/16/81	24
01/17/81	27	03/17/81	6.4	05/17/81	2.3	07/17/81	3.1	09/17/81	111	11/17/81	23
01/18/81	27	03/18/81	4.8	05/18/81	2.9	07/18/81	8	09/18/81	141	11/18/81	22
01/19/81	28	03/19/81	5.5	05/19/81	2.2	07/19/81	9.8	09/19/81	136	11/19/81	20
01/20/81	35	03/20/81	7.8	05/20/81	1.4	07/20/81	12	09/20/81	126	11/20/81	17
01/21/81	64	03/21/81	17	05/21/81	4.5	07/21/81	17	09/21/81	152	11/21/81	18
01/22/81	38	03/22/81	21	05/22/81	14	07/22/81	19	09/22/81	161	11/22/81	21
01/23/81	8.3	03/23/81	23	05/23/81	12	07/23/81	25	09/23/81	193	11/23/81	18
01/24/81	15	03/24/81	33	05/24/81	12	07/24/81	50	09/24/81	183	11/24/81	16
01/25/81	37	03/25/81	31	05/25/81	9.2	07/25/81	44	09/25/81	181	11/25/81	14
01/26/81	33	03/26/81	28	05/26/81	2.5	07/26/81	41	09/26/81	262	11/26/81	12
01/27/81	32	03/27/81	26	05/27/81	3.4	07/27/81	37	09/27/81	211	11/27/81	12
01/28/81	31	03/28/81	24	05/28/81	9.4	07/28/81	34	09/28/81	183	11/28/81	11
01/29/81	31	03/29/81	25	05/29/81	9.4	07/29/81	31	09/29/81	164	11/29/81	11
01/30/81	31	03/30/81	27	05/30/81	9	07/30/81	29	09/30/81	151	11/30/81	10
01/31/81	31	03/31/81	27	05/31/81	9.8	07/31/81	19	10/01/81	96	12/01/81	10
02/01/81	30	04/01/81	26	06/01/81	7	08/01/81	16	10/02/81	91	12/02/81	10
02/02/81	26	04/02/81	24	06/02/81	4.5	08/02/81	15	10/03/81	80	12/03/81	10
02/03/81	17	04/03/81	21	06/03/81	3	08/03/81	15	10/04/81	74	12/04/81	9.7
02/04/81	15	04/04/81	19	06/04/81	4.1	08/04/81	15	10/05/81	69	12/05/81	9.3
02/05/81	14	04/05/81	17	06/05/81	11	08/05/81	15	10/06/81	64	12/06/81	9
02/06/81	43	04/06/81	15	06/06/81	6.6	08/06/81	16	10/07/81	60	12/07/81	8.7
02/07/81	67	04/07/81	12	06/07/81	9.6	08/07/81	17	10/08/81	56	12/08/81	8.5
02/08/81	65	04/08/81	11	06/08/81	23	08/08/81	17	10/09/81	52	12/09/81	8.4
02/09/81	63	04/09/81	8.6	06/09/81	31	08/09/81	17	10/10/81	57	12/10/81	10
02/10/81	63	04/10/81	7	06/10/81	28	08/10/81	16	10/11/81	61	12/11/81	10
02/11/81	61	04/11/81	5.8	06/11/81	38	08/11/81	12	10/12/81	66	12/12/81	10
02/12/81	51	04/12/81	4.8	06/12/81	28	08/12/81	9.8	10/13/81	70	12/13/81	11
02/13/81	43	04/13/81	4.1	06/13/81	22	08/13/81	19	10/14/81	70	12/14/81	11
02/14/81	48	04/14/81	3.6	06/14/81	20	08/14/81	20	10/15/81	70	12/15/81	9.4
02/15/81	48	04/15/81	3.1	06/15/81	19	08/15/81	20	10/16/81	66	12/16/81	8.6
02/16/81	41	04/16/81	2.8	06/16/81	16	08/16/81	25	10/17/81	61	12/17/81	11
02/17/81	36	04/17/81	2.9	06/17/81	14	08/17/81	58	10/18/81	56	12/18/81	12
02/18/81	37	04/18/81	2.4	06/18/81	12	08/18/81	131	10/19/81	52	12/19/81	11
02/19/81	38	04/19/81	2.4	06/19/81	11	08/19/81	243	10/20/81	48	12/20/81	9.9
02/20/81	27	04/20/81	3.6	06/20/81	9.2	08/20/81	226	10/21/81	44	12/21/81	10
02/21/81	14	04/21/81	2	06/21/81	8.2	08/21/81	308	10/22/81	36	12/22/81	9.8
02/22/81	10	04/22/81	1.9	06/22/81	7.2	08/22/81	415	10/23/81	33	12/23/81	10
02/23/81	8.2	04/23/81	2.1	06/23/81	6.2	08/23/81	357	10/24/81	33	12/24/81	9.9
02/24/81	6.6	04/24/81	2.2	06/24/81	5.3	08/24/81	305	10/25/81	37	12/25/81	10
02/25/81	11	04/25/81	1.8	06/25/81	4.5	08/25/81	279	10/26/81	33	12/26/81	11
02/26/81	12	04/26/81	1.3	06/26/81	4	08/26/81	253	10/27/81	26	12/27/81	15
02/27/81	15	04/27/81	1.3	06/27/81	3.5	08/27/81	232	10/28/81	24	12/28/81	15
02/28/81	18	04/28/81	1.4	06/28/81	3.1	08/28/81	213	10/29/81	23	12/29/81	16
		04/29/81	1.3	06/29/81	2.8	08/29/81	193	10/30/81	22	12/30/81	15
		04/30/81	1.3	06/30/81	2.6	08/30/81	180	10/31/81	23	12/31/81	20
						08/31/81	163				

Cypress Creek (1980-1982; 1984-1991) **Agency: USGS & WMD**

DB KEYS 2968 & 5442

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/82	26	03/01/82	12								
01/02/82	24	03/02/82	10								
01/03/82	22	03/03/82	10								
01/04/82	23	03/04/82	11								
01/05/82	25	03/05/82	21								
01/06/82	23	03/06/82	79								
01/07/82	20	03/07/82	111								
01/08/82	20	03/08/82	132								
01/09/82	20	03/09/82	109								
01/10/82	16	03/10/82	89								
01/11/82	12	03/11/82	75								
01/12/82	12	03/12/82	70								
01/13/82	15	03/13/82	65								
01/14/82	16	03/14/82	59								
01/15/82	18	03/15/82	45								
01/16/82	19	03/16/82	30								
01/17/82	19	03/17/82	27								
01/18/82	18	03/18/82	25								
01/19/82	15	03/19/82	23								
01/20/82	15	03/20/82	20								
01/21/82	15	03/21/82	20								
01/22/82	15	03/22/82	19								
01/23/82	14	03/23/82	20								
01/24/82	13	03/24/82	35								
01/25/82	13	03/25/82	63								
01/26/82	12	03/26/82	87								
01/27/82	11	03/27/82	80								
01/28/82	8.8	03/28/82	65								
01/29/82	9.9	03/29/82	382								
01/30/82	8.6	03/30/82	321								
01/31/82	9.3	03/31/82	237								
02/01/82	24	04/01/82	183								
02/02/82	30	04/02/82	154								
02/03/82	19	04/03/82	134								
02/04/82	36	04/04/82	119								
02/05/82	36	04/05/82	99								
02/06/82	24	04/06/82	79								
02/07/82	24	04/07/82	70								
02/08/82	48	04/08/82	65								
02/09/82	71	04/09/82	54								
02/10/82	65	04/10/82	46								
02/11/82	65	04/11/82	44								
02/12/82	54	04/12/82	40								
02/13/82	46	04/13/82	34								
02/14/82	39										
02/15/82	28										
02/16/82	16										
02/17/82	24										
02/18/82	54										
02/19/82	60										
02/20/82	28										
02/21/82	26										
02/22/82	24										
02/23/82	20										
02/24/82	15										
02/25/82	13										
02/26/82	12										
02/27/82	12										
02/28/82	14										

Cypress Creek (1980-1982; 1984-1991) Agency: USGS & WMD

DB KEYS 2968 & 5442

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
02/06/84	12	04/19/84	16	06/20/84	40	08/13/84	12	10/14/84	128	12/15/84	113
02/07/84	23	04/20/84	28	06/21/84	32	08/14/84	19	10/15/84	116	12/16/84	106
02/08/84	22	04/21/84	23	06/22/84	25	08/15/84	15	10/16/84	102	12/17/84	90
02/09/84	22	04/22/84	27	06/23/84	26	08/16/84	14	10/17/84	87	12/18/84	78
02/10/84	21	04/23/84	22	06/24/84	29	08/17/84	13	10/18/84	86	12/19/84	73
02/11/84	24	04/24/84	12	06/25/84	38	08/18/84	14	10/19/84	80	12/20/84	76
02/12/84	31	04/25/84	13	06/26/84	36	08/19/84	14	10/20/84	71	12/21/84	93
02/13/84	39	04/26/84	13	06/27/84	34	08/20/84	13	10/21/84	100	12/22/84	102
02/14/84	41	04/27/84	14	06/28/84	37	08/21/84	13	10/22/84	118	12/23/84	79
02/15/84	40	04/28/84	14	06/29/84	34	08/22/84	18	10/23/84	98	12/24/84	67
02/16/84	38	04/29/84	13	06/30/84	31	08/23/84	17	10/24/84	81	12/25/84	59
02/17/84	35	04/30/84	14	07/01/84	29	08/24/84	19	10/25/84	84	12/26/84	55
02/18/84	35	05/01/84	14	07/02/84	25	08/25/84	17	10/26/84	92	12/27/84	46
02/19/84	34	05/02/84	13	07/03/84	31	08/26/84	17	10/27/84	80	12/28/84	44
02/20/84	30	05/03/84	14	07/04/84	35	08/27/84	20	10/28/84	73	12/29/84	40
02/21/84	27	05/04/84	14	07/05/84	25	08/28/84	20	10/29/84	65	12/30/84	36
02/22/84	34	05/05/84	13	07/06/84	28	08/29/84	20	10/30/84	59	12/31/84	33
02/23/84	37	05/06/84	13	07/07/84	25	08/30/84	18	10/31/84	58		
02/24/84	38	05/07/84	12	07/08/84	23	08/31/84	15	11/01/84	61		
02/25/84	35	05/08/84	11	07/09/84	16	09/01/84	14	11/02/84	59		
02/26/84	31	05/09/84	12	07/10/84	5	09/02/84	17	11/03/84	58		
02/27/84	32	05/10/84	15			09/03/84	16	11/04/84	60		
02/28/84	37	05/11/84	16			09/04/84	12	11/05/84	57		
02/29/84	44	05/12/84	15			09/05/84	9	11/06/84	53		
03/01/84	41	05/13/84	15			09/06/84	13	11/07/84	52		
03/02/84	37	05/14/84	15			09/07/84	19	11/08/84	49		
03/03/84	34	05/15/84	15			09/08/84	27	11/09/84	46		
03/04/84	32	05/16/84	15			09/09/84	28	11/10/84	39		
03/05/84	30	05/17/84	16			09/10/84	23	11/11/84	43		
03/06/84	29	05/18/84	14			09/11/84	22	11/12/84	38		
03/07/84	30	05/19/84	11			09/12/84	21	11/13/84	35		
03/08/84	31	05/20/84	11			09/13/84	17	11/14/84	29		
03/09/84	32	05/21/84	7			09/14/84	14	11/15/84	27		
03/10/84	31	05/22/84	8			09/15/84	11	11/16/84	34		
03/11/84	31	05/23/84	9			09/16/84	10	11/17/84	29		
03/12/84	32	05/24/84	24			09/17/84	13	11/18/84	26		
03/13/84	87	05/25/84	50			09/18/84	44	11/19/84	25		
03/14/84	122	05/26/84	38			09/19/84	297	11/20/84	30		
03/15/84	102	05/27/84	35			09/20/84	409	11/21/84	42		
03/16/84	78	05/28/84	37			09/21/84	370	11/22/84	220		
03/17/84	63	05/29/84	105			09/22/84	361	11/23/84	476		
03/18/84	53	05/30/84	147			09/23/84	307	11/24/84	571		
03/19/84	47	05/31/84	147			09/24/84	271	11/25/84	497		
03/20/84	35	06/01/84	128			09/25/84	243	11/26/84	434		
03/21/84	35	06/02/84	114			09/26/84	231	11/27/84	379		
03/22/84	36	06/03/84	101			09/27/84	326	11/28/84	338		
03/23/84	79	06/04/84	86			09/28/84	474	11/29/84	300		
03/24/84	190	06/05/84	73			09/29/84	414	11/30/84	274		
03/25/84	164	06/06/84	58			09/30/84	370	12/01/84	256		
03/26/84	139	06/07/84	47			10/01/84	353	12/02/84	244		
03/27/84	127	06/08/84	41			10/02/84	332	12/03/84	226		
03/28/84	115	06/09/84	36			10/03/84	304	12/04/84	204		
03/29/84	97	06/10/84	35			10/04/84	275	12/05/84	185		
03/30/84	85	06/11/84	36			10/05/84	256	12/06/84	186		
03/31/84	77	06/12/84	31			10/06/84	236	12/07/84	180		
04/01/84	59	06/13/84	25			10/07/84	220	12/08/84	155		
04/02/84	49	06/14/84	19			10/08/84	204	12/09/84	139		
04/03/84	2	06/15/84	20			10/09/84	187	12/10/84	131		
		06/16/84	26			10/10/84	171	12/11/84	122		
		06/17/84	30			10/11/84	152	12/12/84	119		
		06/18/84	40			10/12/84	140	12/13/84	115		
		06/19/84	47			10/13/84	130	12/14/84	104		

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DB KEYS 2968 & 5442

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/85	31	03/01/85	9	05/01/85	52	06/27/85	23	08/28/85	35	10/29/85	99
01/02/85	43	03/02/85	10	05/02/85	42	06/28/85	35	08/29/85	39	10/30/85	100
01/03/85	48	03/03/85	13	05/03/85	32	06/29/85	32	08/30/85	63	10/31/85	90
01/04/85	41	03/04/85	14	05/04/85	28	06/30/85	32	08/31/85	94	11/01/85	78
01/05/85	41	03/05/85	11	05/05/85	30	07/01/85	30	09/01/85	79	11/02/85	70
01/06/85	39	03/06/85	13	05/06/85	28	07/02/85	26	09/02/85	65	11/03/85	65
01/07/85	38	03/07/85	19	05/07/85	25	07/03/85	25	09/03/85	58	11/04/85	65
01/08/85	34	03/08/85	16	05/08/85	20	07/04/85	24	09/04/85	56	11/05/85	65
01/09/85	37	03/09/85	14	05/09/85	16	07/05/85	23	09/05/85	61	11/06/85	58
01/10/85	39	03/10/85	14	05/10/85	12	07/06/85	21	09/06/85	84	11/07/85	53
01/11/85	35	03/11/85	14	05/11/85	20	07/07/85	18	09/07/85	87	11/08/85	51
01/12/85	33	03/12/85	13	05/12/85	20	07/08/85	14	09/08/85	79	11/09/85	53
01/13/85	36	03/13/85	14	05/13/85	18	07/09/85	14	09/09/85	72	11/10/85	36
01/14/85	34	03/14/85	13	05/14/85	17	07/10/85	14	09/10/85	65	11/11/85	34
01/15/85	32	03/15/85	11	05/15/85	16	07/11/85	12	09/11/85	57	11/12/85	32
01/16/85	31	03/16/85	16	05/16/85	16	07/12/85	20	09/12/85	52	11/13/85	32
01/17/85	29	03/17/85	18	05/17/85	16	07/13/85	34	09/13/85	52	11/14/85	27
01/18/85	25	03/18/85	27	05/18/85	17	07/14/85	47	09/14/85	63	11/15/85	28
01/19/85	31	03/19/85	32	05/19/85	17	07/15/85	36	09/15/85	82	11/16/85	28
01/20/85	27	03/20/85	31	05/20/85	14	07/16/85	31	09/16/85	86	11/17/85	26
01/21/85	21	03/21/85	31	05/21/85	11	07/17/85	27	09/17/85	81	11/18/85	25
01/22/85	20	03/22/85	52	05/22/85	11	07/18/85	27	09/18/85	146	11/19/85	27
01/23/85	25	03/23/85	50	05/23/85	12	07/19/85	48	09/19/85	345	11/20/85	24
01/24/85	23	03/24/85	36	05/24/85	13	07/20/85	49	09/20/85	400	11/21/85	17
01/25/85	22	03/25/85	27	05/25/85	13	07/21/85	48	09/21/85	382	11/22/85	14
01/26/85	23	03/26/85	18	05/26/85	15	07/22/85	45	09/22/85	345	11/23/85	19
01/27/85	23	03/27/85	17	05/27/85	22	07/23/85	49	09/23/85	311	11/24/85	21
01/28/85	28	03/28/85	15	05/28/85	33	07/24/85	49	09/24/85	279	11/25/85	21
01/29/85	37	03/29/85	10	05/29/85	53	07/25/85	44	09/25/85	250	11/26/85	19
01/30/85	32	03/30/85	10	05/30/85	33	07/26/85	42	09/26/85	226	11/27/85	13
01/31/85	21	03/31/85	11	05/31/85	22	07/27/85	41	09/27/85	201	11/28/85	11
02/01/85	16	04/01/85	11	06/01/85	16	07/28/85	39	09/28/85	218	11/29/85	12
02/02/85	19	04/02/85	14	06/02/85	14	07/29/85	35	09/29/85	277	11/30/85	14
02/03/85	39	04/03/85	21	06/03/85	11	07/30/85	35	09/30/85	266	12/01/85	12
02/04/85	32	04/04/85	23	06/04/85	12	07/31/85	35	10/01/85	228	12/02/85	12
02/05/85	31	04/05/85	15	06/05/85	13	08/01/85	35	10/02/85	211	12/03/85	15
02/06/85	28	04/06/85	11	06/06/85	9	08/02/85	35	10/03/85	208	12/04/85	18
02/07/85	24	04/07/85	12			08/03/85	35	10/04/85	205	12/05/85	55
02/08/85	22	04/08/85	12			08/04/85	51	10/05/85	194	12/06/85	128
02/09/85	25	04/09/85	11			08/05/85	59	10/06/85	165	12/07/85	112
02/10/85	27	04/10/85	12			08/06/85	63	10/07/85	144	12/08/85	80
02/11/85	25	04/11/85	11			08/07/85	63	10/08/85	130	12/09/85	64
02/12/85	16	04/12/85	11			08/08/85	69	10/09/85	121	12/10/85	52
02/13/85	15	04/13/85	12			08/09/85	64	10/10/85	113	12/11/85	47
02/14/85	14	04/14/85	30			08/10/85	55	10/11/85	107	12/12/85	42
02/15/85	18	04/15/85	75			08/11/85	53	10/12/85	99	12/13/85	41
02/16/85	17	04/16/85	104			08/12/85	53	10/13/85	93	12/14/85	40
02/17/85	17	04/17/85	75			08/13/85	58	10/14/85	89	12/15/85	42
02/18/85	13	04/18/85	55			08/14/85	58	10/15/85	83	12/16/85	36
02/19/85	13	04/19/85	45			08/15/85	51	10/16/85	80	12/17/85	34
02/20/85	13	04/20/85	42			08/16/85	47	10/17/85	76	12/18/85	43
02/21/85	14	04/21/85	35			08/17/85	48	10/18/85	74	12/19/85	36
02/22/85	13	04/22/85	31			08/18/85	47	10/19/85	77	12/20/85	33
02/23/85	8	04/23/85	25			08/19/85	56	10/20/85	95	12/21/85	29
02/24/85	6	04/24/85	29			08/20/85	56	10/21/85	112	12/22/85	28
02/25/85	8	04/25/85	25			08/21/85	60	10/22/85	122	12/23/85	26
02/26/85	6	04/26/85	18			08/22/85	67	10/23/85	102	12/24/85	26
02/27/85	4	04/27/85	11			08/23/85	59	10/24/85	88	12/25/85	30
02/28/85	5	04/28/85	11			08/24/85	47	10/25/85	82	12/26/85	32
		04/29/85	19			08/25/85	44	10/26/85	79	12/27/85	21
		04/30/85	46			08/26/85	37	10/27/85	78	12/28/85	20
						08/27/85	34	10/28/85	86	12/29/85	33
										12/30/85	49
										12/31/85	67

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/86	48	03/03/86	38	05/04/86	24	07/04/86	262	09/04/86	66	11/04/86	82
01/02/86	44	03/04/86	101	05/05/86	29	07/05/86	254	09/05/86	62	11/05/86	72
01/03/86	40	03/05/86	67	05/06/86	24	07/06/86	231	09/06/86	79	11/06/86	68
01/04/86	41	03/06/86	47	05/07/86	22	07/07/86	216	09/07/86	156	11/07/86	63
01/05/86	38	03/07/86	32	05/08/86	19	07/08/86	191	09/08/86	162	11/08/86	59
01/06/86	35	03/08/86	27	05/09/86	18	07/09/86	159	09/09/86	202	11/09/86	56
01/07/86	33	03/09/86	25	05/10/86	34	07/10/86	151	09/10/86	162	11/10/86	48
01/08/86	32	03/10/86	27	05/11/86	59	07/11/86	169	09/11/86	135	11/11/86	52
01/09/86	104	03/11/86	39	05/12/86	50	07/12/86	202	09/12/86	123	11/12/86	83
01/10/86	175	03/12/86	45	05/13/86	34	07/13/86	187	09/13/86	120	11/13/86	82
01/11/86	155	03/13/86	25	05/14/86	27	07/14/86	201	09/14/86	104	11/14/86	96
01/12/86	134	03/14/86	26	05/15/86	28	07/15/86	187	09/15/86	96	11/15/86	99
01/13/86	121	03/15/86	30	05/16/86	26	07/16/86	151	09/16/86	79	11/16/86	122
01/14/86	104	03/16/86	32	05/17/86	21	07/17/86	132	09/17/86	144	11/17/86	103
01/15/86	94	03/17/86	31	05/18/86	21	07/18/86	120	09/18/86	130	11/18/86	91
01/16/86	88	03/18/86	26	05/19/86	25	07/19/86	110	09/19/86	120	11/19/86	80
01/17/86	81	03/19/86	23	05/20/86	26	07/20/86	103	09/20/86	113	11/20/86	73
01/18/86	75	03/20/86	20	05/21/86	29	07/21/86	90	09/21/86	106	11/21/86	67
01/19/86	71	03/21/86	24	05/22/86	29	07/22/86	97	09/22/86	98	11/22/86	61
01/20/86	63	03/22/86	27	05/23/86	40	07/23/86	108	09/23/86	92	11/23/86	57
01/21/86	55	03/23/86	32	05/24/86	31	07/24/86	118	09/24/86	88	11/24/86	52
01/22/86	50	03/24/86	32	05/25/86	26	07/25/86	109	09/25/86	83	11/25/86	44
01/23/86	45	03/25/86	31	05/26/86	24	07/26/86	113	09/26/86	80	11/26/86	41
01/24/86	42	03/26/86	28	05/27/86	23	07/27/86	112	09/27/86	76	11/27/86	43
01/25/86	36	03/27/86	72	05/28/86	23	07/28/86	126	09/28/86	73	11/28/86	44
01/26/86	31	03/28/86	64	05/29/86	23	07/29/86	132	09/29/86	19	11/29/86	44
01/27/86	26	03/29/86	127	05/30/86	25	07/30/86	135	09/30/86	47	11/30/86	46
01/28/86	22	03/30/86	134	05/31/86	24	07/31/86	127	10/01/86	40	12/01/86	55
01/29/86	39	03/31/86	111	06/01/86	24	08/01/86	119	10/02/86	34	12/02/86	57
01/30/86	71	04/01/86	94	06/02/86	22	08/02/86	108	10/03/86	39	12/03/86	47
01/31/86	51	04/02/86	76	06/03/86	22	08/03/86	98	10/04/86	39	12/04/86	45
02/01/86	30	04/03/86	64	06/04/86	21	08/04/86	96	10/05/86	41	12/05/86	43
02/02/86	24	04/04/86	53	06/05/86	27	08/05/86	128	10/06/86	35	12/06/86	50
02/03/86	22	04/05/86	47	06/06/86	31	08/06/86	126	10/07/86	33	12/07/86	56
02/04/86	19	04/06/86	43	06/07/86	29	08/07/86	124	10/08/86	29	12/08/86	52
02/05/86	12	04/07/86	39	06/08/86	24	08/08/86	113	10/09/86	32	12/09/86	56
		04/08/86	35	06/09/86	18	08/09/86	109	10/10/86	31	12/10/86	43
		04/09/86	35	06/10/86	20	08/10/86	100	10/11/86	31	12/11/86	37
		04/10/86	32	06/11/86	19	08/11/86	96	10/12/86	34	12/12/86	44
		04/11/86	32	06/12/86	19	08/12/86	96	10/13/86	37	12/13/86	46
		04/12/86	36	06/13/86	33	08/13/86	92	10/14/86	32	12/14/86	44
		04/13/86	34	06/14/86	58	08/14/86	95	10/15/86	27	12/15/86	36
		04/14/86	35	06/15/86	56	08/15/86	91	10/16/86	32	12/16/86	35
		04/15/86	33	06/16/86	66	08/16/86	89	10/17/86	37	12/17/86	33
		04/16/86	31	06/17/86	130	08/17/86	85	10/18/86	37	12/18/86	29
		04/17/86	29	06/18/86	179	08/18/86	82	10/19/86	84	12/19/86	28
		04/18/86	30	06/19/86	165	08/19/86	83	10/20/86	177	12/20/86	31
		04/19/86	33	06/20/86	180	08/20/86	78	10/21/86	213	12/21/86	30
		04/20/86	35	06/21/86	244	08/21/86	82	10/22/86	216	12/22/86	33
		04/21/86	32	06/22/86	282	08/22/86	70	10/23/86	194	12/23/86	37
		04/22/86	28	06/23/86	324	08/23/86	69	10/24/86	166	12/24/86	46
		04/23/86	30	06/24/86	295	08/24/86	67	10/25/86	141	12/25/86	48
		04/24/86	31	06/25/86	279	08/25/86	59	10/26/86	130	12/26/86	42
		04/25/86	32	06/26/86	295	08/26/86	56	10/27/86	116	12/27/86	71
		04/26/86	31	06/27/86	276	08/27/86	51	10/28/86	114	12/28/86	94
		04/27/86	32	06/28/86	247	08/28/86	76	10/29/86	116	12/29/86	94
		04/28/86	30	06/29/86	239	08/29/86	73	10/30/86	103	12/30/86	96
		04/29/86	28	06/30/86	274	08/30/86	67	10/31/86	100	12/31/86	86
		04/30/86	27	07/01/86	241	08/31/86	63	11/01/86	101		
		05/01/86	25	07/02/86	243	09/01/86	61	11/02/86	96		
		05/02/86	21	07/03/86	244	09/02/86	65	11/03/86	89		
		05/03/86	19			09/03/86	67				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/87	127	03/01/87	32	05/01/87	11	07/01/87	62	09/28/87	14
01/02/87	115	03/02/87	23	05/02/87	10	07/02/87	24	09/29/87	28
01/03/87	100	03/03/87	26	05/03/87	9	07/03/87	10	09/30/87	26
01/04/87	102	03/04/87	41	05/04/87	12	07/04/87	12	10/01/87	29
01/05/87	133	03/05/87	47	05/05/87	12	07/05/87	8	10/02/87	31
01/06/87	130	03/06/87	40	05/06/87	11	07/06/87	7	10/03/87	30
01/07/87	123	03/07/87	101	05/07/87	15	07/07/87	7	10/04/87	30
01/08/87	111	03/08/87	154	05/08/87	14	07/08/87	7	10/05/87	30
01/09/87	104	03/09/87	132	05/09/87	18	07/09/87	8	10/06/87	26
01/10/87	92	03/10/87	119	05/10/87	24	07/10/87	9	10/07/87	21
01/11/87	85	03/11/87	103	05/11/87	56	07/11/87	10	10/08/87	16
01/12/87	79	03/12/87	91	05/12/87	64	07/12/87	10	10/09/87	16
01/13/87	69	03/13/87	74	05/13/87	35	07/13/87	10	10/10/87	36
01/14/87	71	03/14/87	64	05/14/87	57	07/14/87	12	10/11/87	72
01/15/87	68	03/15/87	60	05/15/87	36	07/15/87	13	10/12/87	142
01/16/87	60	03/16/87	56	05/16/87	28	07/16/87	11	10/13/87	291
01/17/87	55	03/17/87	47	05/17/87	28	07/17/87	12	10/14/87	254
01/18/87	53	03/18/87	48	05/18/87	30	07/18/87	30	10/15/87	240
01/19/87	51	03/19/87	40	05/19/87	26	07/19/87	30	10/16/87	204
01/20/87	42	03/20/87	41	05/20/87	20	07/20/87	53	10/17/87	172
01/21/87	44	03/21/87	38	05/21/87	21	07/21/87	63	10/18/87	150
01/22/87	40	03/22/87	36	05/22/87	21	07/22/87	43	10/19/87	131
01/23/87	47	03/23/87	31	05/23/87	18	07/23/87	32	10/20/87	108
01/24/87	47	03/24/87	40	05/24/87	16	07/24/87	27	10/21/87	105
01/25/87	45	03/25/87	63	05/25/87	15	07/25/87	16	10/22/87	92
01/26/87	36	03/26/87	39	05/26/87	13	07/26/87	14	10/23/87	67
01/27/87	28	03/27/87	51	05/27/87	12	07/27/87	12	10/24/87	71
01/28/87	37	03/28/87	53	05/28/87	14	07/28/87	10	10/25/87	66
01/29/87	40	03/29/87	44	05/29/87	16	07/29/87	10	10/26/87	47
01/30/87	50	03/30/87	70	05/30/87	23	07/30/87	12	10/27/87	46
01/31/87	43	03/31/87	107	05/31/87	18	07/31/87	34	10/28/87	51
02/01/87	41	04/01/87	97	06/01/87	13	08/01/87	42	10/29/87	45
02/02/87	33	04/02/87	77	06/02/87	10	08/02/87	29	10/30/87	41
02/03/87	24	04/03/87	60	06/03/87	8	08/03/87	25	10/31/87	45
02/04/87	23	04/04/87	61	06/04/87	7	08/04/87	26	11/01/87	91
02/05/87	25	04/05/87	47	06/05/87	7	08/05/87	19	11/02/87	172
02/06/87	40	04/06/87	44	06/06/87	11	08/06/87	20	11/03/87	188
02/07/87	44	04/07/87	45	06/07/87	18	08/07/87	14	11/04/87	519
02/08/87	38	04/08/87	37	06/08/87	18	08/08/87	13	11/05/87	10
02/09/87	30	04/09/87	35	06/09/87	15	08/09/87	18		
02/10/87	18	04/10/87	29	06/10/87	16	08/10/87	21		
02/11/87	17	04/11/87	25	06/11/87	16	08/11/87	20		
02/12/87	13	04/12/87	21	06/12/87	15	08/12/87	22		
02/13/87	14	04/13/87	19	06/13/87	14	08/13/87	20		
02/14/87	16	04/14/87	20	06/14/87	10	08/14/87	19		
02/15/87	25	04/15/87	23	06/15/87	8	08/15/87	20		
02/16/87	28	04/16/87	33	06/16/87	8	08/16/87	16		
02/17/87	59	04/17/87	29	06/17/87	6	08/17/87	10		
02/18/87	75	04/18/87	27	06/18/87	6	08/18/87	8		
02/19/87	49	04/19/87	26	06/19/87	6	08/19/87	8		
02/20/87	33	04/20/87	27	06/20/87	8	08/20/87	7		
02/21/87	23	04/21/87	25	06/21/87	7	08/21/87	13		
02/22/87	29	04/22/87	21	06/22/87	6	08/22/87	10		
02/23/87	21	04/23/87	27	06/23/87	6	08/23/87	13		
02/24/87	25	04/24/87	18	06/24/87	7	08/24/87	9		
02/25/87	31	04/25/87	19	06/25/87	7				
02/26/87	41	04/26/87	19	06/26/87	9				
02/27/87	25	04/27/87	22	06/27/87	8				
02/28/87	34	04/28/87	22	06/28/87	8				
		04/29/87	23	06/29/87	7				
		04/30/87	16	06/30/87	13				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
02/11/88	30	06/16/88	21	08/17/88	75	10/18/88	21	12/19/88	19
02/12/88	49	06/17/88	35	08/18/88	81	10/19/88	22	12/20/88	12
02/13/88	45	06/18/88	27	08/19/88	71	10/20/88	23	12/21/88	15
02/14/88	44	06/19/88	32	08/20/88	181	10/21/88	25	12/22/88	17
02/15/88	45	06/20/88	30	08/21/88	241	10/22/88	31	12/23/88	16
02/16/88	54	06/21/88	27	08/22/88	212	10/23/88	29	12/24/88	14
02/17/88	52	06/22/88	27	08/23/88	200	10/24/88	27	12/25/88	11
02/18/88	44	06/23/88	25	08/24/88	216	10/25/88	24	12/26/88	13
02/19/88	42	06/24/88	34	08/25/88	190	10/26/88	24	12/27/88	9
02/20/88	40	06/25/88	29	08/26/88	178	10/27/88	21	12/28/88	6
02/21/88	42	06/26/88	26	08/27/88	163	10/28/88	16	12/29/88	7
02/22/88	50	06/27/88	23	08/28/88	144	10/29/88	15	12/30/88	10
02/23/88	57	06/28/88	19	08/29/88	139	10/30/88	16	12/31/88	16
02/24/88	48	06/29/88	19	08/30/88	134	10/31/88	21		
02/25/88	46	06/30/88	23	08/31/88	134	11/01/88	25		
02/26/88	42	07/01/88	23	09/01/88	134	11/02/88	24		
02/27/88	38	07/02/88	23	09/02/88	124	11/03/88	22		
02/28/88	37	07/03/88	25	09/03/88	113	11/04/88	28		
02/29/88	38	07/04/88	23	09/04/88	101	11/05/88	36		
03/01/88	26	07/05/88	21	09/05/88	93	11/06/88	20		
03/02/88	28	07/06/88	44	09/06/88	85	11/07/88	34		
03/03/88	21	07/07/88	58	09/07/88	77	11/08/88	48		
03/04/88	17	07/08/88	49	09/08/88	77	11/09/88	26		
03/05/88	21	07/09/88	53	09/09/88	73	11/10/88	13		
03/06/88	59	07/10/88	46	09/10/88	63	11/11/88	10		
03/07/88	65	07/11/88	39	09/11/88	60	11/12/88	11		
03/08/88	31	07/12/88	32	09/12/88	55	11/13/88	15		
		07/13/88	47	09/13/88	64	11/14/88	18		
		07/14/88	141	09/14/88	45	11/15/88	18		
		07/15/88	156	09/15/88	44	11/16/88	16		
		07/16/88	145	09/16/88	42	11/17/88	12		
		07/17/88	127	09/17/88	33	11/18/88	12		
		07/18/88	119	09/18/88	38	11/19/88	14		
		07/19/88	113	09/19/88	33	11/20/88	14		
		07/20/88	102	09/20/88	30	11/21/88	16		
		07/21/88	91	09/21/88	27	11/22/88	48		
		07/22/88	82	09/22/88	28	11/23/88	59		
		07/23/88	70	09/23/88	30	11/24/88	34		
		07/24/88	88	09/24/88	26	11/25/88	30		
		07/25/88	95	09/25/88	23	11/26/88	24		
		07/26/88	83	09/26/88	22	11/27/88	11		
		07/27/88	65	09/27/88	22	11/28/88	6		
		07/28/88	68	09/28/88	24	11/29/88	8		
		07/29/88	66	09/29/88	26	11/30/88	11		
		07/30/88	61	09/30/88	23	12/01/88	10		
		07/31/88	55	10/01/88	24	12/02/88	12		
		08/01/88	44	10/02/88	21	12/03/88	12		
		08/02/88	43	10/03/88	19	12/04/88	12		
		08/03/88	45	10/04/88	16	12/05/88	13		
		08/04/88	37	10/05/88	20	12/06/88	14		
		08/05/88	30	10/06/88	30	12/07/88	16		
		08/06/88	24	10/07/88	42	12/08/88	13		
		08/07/88	29	10/08/88	39	12/09/88	16		
		08/08/88	59	10/09/88	40	12/10/88	19		
		08/09/88	59	10/10/88	35	12/11/88	32		
		08/10/88	50	10/11/88	27	12/12/88	47		
		08/11/88	49	10/12/88	27	12/13/88	33		
		08/12/88	50	10/13/88	24	12/14/88	24		
		08/13/88	45	10/14/88	26	12/15/88	20		
		08/14/88	51	10/15/88	29	12/16/88	18		
		08/15/88	79	10/16/88	27	12/17/88	18		
		08/16/88	82	10/17/88	23	12/18/88	16		

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/89	15	03/01/89	5	05/01/89	54	07/01/89	22	09/01/89	25	11/01/89	53
01/02/89	12	03/02/89	7	05/02/89	44	07/02/89	40	09/02/89	30	11/02/89	50
01/03/89	5	03/03/89	60	05/03/89	33	07/03/89	49	09/03/89	37	11/03/89	49
01/04/89	8	03/04/89	92	05/04/89	23	07/04/89	31	09/04/89	49	11/04/89	47
01/05/89	16	03/05/89	57	05/05/89	20	07/05/89	27	09/05/89	48	11/05/89	46
01/06/89	14	03/06/89	40	05/06/89	11	07/06/89	17	09/06/89	41	11/06/89	46
01/07/89	11	03/07/89	54	05/07/89	10	07/07/89	11	09/07/89	33	11/07/89	41
01/08/89	13	03/08/89	46	05/08/89	11	07/08/89	9	09/08/89	29	11/08/89	37
01/09/89	11	03/09/89	47	05/09/89	11	07/09/89	8	09/09/89	29	11/09/89	32
01/10/89	11	03/10/89	51	05/10/89	9	07/10/89	6	09/10/89	33	11/10/89	31
01/11/89	11	03/11/89	50	05/11/89	9	07/11/89	6	09/11/89	30	11/11/89	27
01/12/89	13	03/12/89	43	05/12/89	9	07/12/89	6	09/12/89	28	11/12/89	23
01/13/89	10	03/13/89	35	05/13/89	11	07/13/89	5	09/13/89	26	11/13/89	23
01/14/89	10	03/14/89	29	05/14/89	7	07/14/89	5	09/14/89	25	11/14/89	22
01/15/89	9	03/15/89	21	05/15/89	7	07/15/89	5	09/15/89	24	11/15/89	20
01/16/89	7	03/16/89	23	05/16/89	10	07/16/89	7	09/16/89	24	11/16/89	21
01/17/89	8	03/17/89	26	05/17/89	13	07/17/89	23	09/17/89	22	11/17/89	17
01/18/89	7	03/18/89	27	05/18/89	11	07/18/89	13	09/18/89	24	11/18/89	15
01/19/89	9	03/19/89	26	05/19/89	10	07/19/89	51	09/19/89	50	11/19/89	16
01/20/89	9	03/20/89	21	05/20/89	10	07/20/89	93	09/20/89	35	11/20/89	14
01/21/89	76	03/21/89	17	05/21/89	10	07/21/89	64	09/21/89	33	11/21/89	16
01/22/89	89	03/22/89	16	05/22/89	8	07/22/89	52	09/22/89	27	11/22/89	16
01/23/89	66	03/23/89	12	05/23/89	6	07/23/89	45	09/23/89	21	11/23/89	16
01/24/89	47	03/24/89	12	05/24/89	5	07/24/89	38	09/24/89	28	11/24/89	18
01/25/89	33	03/25/89	12	05/25/89	5	07/25/89	42	09/25/89	42	11/25/89	14
01/26/89	26	03/26/89	12	05/26/89	6	07/26/89	46	09/26/89	50	11/26/89	16
01/27/89	20	03/27/89	9	05/27/89	6	07/27/89	34	09/27/89	39	11/27/89	14
01/28/89	22	03/28/89	6	05/28/89	8	07/28/89	30	09/28/89	34	11/28/89	15
01/29/89	20	03/29/89	6	05/29/89	10	07/29/89	30	09/29/89	34	11/29/89	52
01/30/89	14	03/30/89	6	05/30/89	13	07/30/89	37	09/30/89	34	11/30/89	68
01/31/89	7	03/31/89	6	05/31/89	11	07/31/89	31	10/01/89	30		
02/01/89	7	04/01/89	6	06/01/89	10	08/01/89	26	10/02/89	22		
02/02/89	6	04/02/89	8	06/02/89	8	08/02/89	26	10/03/89	17		
02/03/89	5	04/03/89	9	06/03/89	6	08/03/89	39	10/04/89	18		
02/04/89	6	04/04/89	9	06/04/89	6	08/04/89	36	10/05/89	17		
02/05/89	9	04/05/89	7	06/05/89	7	08/05/89	35	10/06/89	17		
02/06/89	10	04/06/89	13	06/06/89	8	08/06/89	31	10/07/89	16		
02/07/89	11	04/07/89	23	06/07/89	42	08/07/89	25	10/08/89	61		
02/08/89	8	04/08/89	15	06/08/89	91	08/08/89	14	10/09/89	105		
02/09/89	9	04/09/89	13	06/09/89	50	08/09/89	20	10/10/89	137		
02/10/89	13	04/10/89	9	06/10/89	24	08/10/89	43	10/11/89	131		
02/11/89	13	04/11/89	8	06/11/89	21	08/11/89	39	10/12/89	142		
02/12/89	10	04/12/89	11	06/12/89	14	08/12/89	43	10/13/89	131		
02/13/89	11	04/13/89	12	06/13/89	9	08/13/89	39	10/14/89	138		
02/14/89	6	04/14/89	17	06/14/89	8	08/14/89	52	10/15/89	119		
02/15/89	4	04/15/89	17	06/15/89	4	08/15/89	52	10/16/89	106		
02/16/89	5	04/16/89	14	06/16/89	4	08/16/89	51	10/17/89	95		
02/17/89	7	04/17/89	15	06/17/89	4	08/17/89	46	10/18/89	85		
02/18/89	13	04/18/89	30	06/18/89	7	08/18/89	55	10/19/89	67		
02/19/89	17	04/19/89	32	06/19/89	8	08/19/89	66	10/20/89	68		
02/20/89	20	04/20/89	23	06/20/89	7	08/20/89	70	10/21/89	63		
02/21/89	15	04/21/89	29	06/21/89	6	08/21/89	65	10/22/89	58		
02/22/89	9	04/22/89	29	06/22/89	6	08/22/89	83	10/23/89	53		
02/23/89	8	04/23/89	23	06/23/89	7	08/23/89	90	10/24/89	54		
02/24/89	7	04/24/89	18	06/24/89	8	08/24/89	73	10/25/89	72		
02/25/89	9	04/25/89	16	06/25/89	9	08/25/89	62	10/26/89	79		
02/26/89	9	04/26/89	13	06/26/89	11	08/26/89	56	10/27/89	71		
02/27/89	10	04/27/89	10	06/27/89	11	08/27/89	50	10/28/89	75		
02/28/89	7	04/28/89	12	06/28/89	9	08/28/89	44	10/29/89	74		
		04/29/89	11	06/29/89	9	08/29/89	40	10/30/89	69		
		04/30/89	23	06/30/89	13	08/30/89	36	10/31/89	59		
						08/31/89	30				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/29/90	16	04/05/90	18	06/09/90	26	08/13/90	48	10/17/90	71	12/21/90	9
01/30/90	51	04/06/90	14	06/10/90	23	08/14/90	59	10/18/90	71	12/22/90	9
01/31/90	50	04/07/90	11	06/11/90	19	08/15/90	87	10/19/90	65	12/23/90	8
02/01/90	35	04/08/90	12	06/12/90	25	08/16/90	102	10/20/90	64	12/24/90	9
02/02/90	25	04/09/90	16	06/13/90	25	08/17/90	96	10/21/90	61	12/25/90	11
02/03/90	21	04/10/90	37	06/14/90	25	08/18/90	84	10/22/90	55	12/26/90	12
02/04/90	18	04/11/90	47	06/15/90	23	08/19/90	76	10/23/90	48	12/27/90	16
02/05/90	15	04/12/90	30	06/16/90	18	08/20/90	81	10/24/90	44	12/28/90	20
02/06/90	17	04/13/90	20	06/17/90	18	08/21/90	76	10/25/90	36	12/29/90	19
02/07/90	13	04/14/90	14	06/18/90	20	08/22/90	68	10/26/90	36	12/30/90	15
02/08/90	16	04/15/90	18	06/19/90	22	08/23/90	60	10/27/90	37	12/31/90	15
02/09/90	14	04/16/90	29	06/20/90	19	08/24/90	60	10/28/90	39	01/01/91	15
02/10/90	14	04/17/90	32	06/21/90	14	08/25/90	57	10/29/90	37	01/02/91	14
02/11/90	21	04/18/90	24	06/22/90	13	08/26/90	49	10/30/90	35	01/03/91	16
02/12/90	32	04/19/90	22	06/23/90	17	08/27/90	45	10/31/90	39	01/04/91	17
02/13/90	29	04/20/90	22	06/24/90	17	08/28/90	40	11/01/90	48	01/05/91	18
02/14/90	20	04/21/90	20	06/25/90	17	08/29/90	42	11/02/90	57	01/06/91	16
02/15/90	15	04/22/90	23	06/26/90	14	08/30/90	37	11/03/90	56	01/07/91	18
02/16/90	9	04/23/90	20	06/27/90	14	08/31/90	32	11/04/90	43	01/08/91	16
02/17/90	6	04/24/90	19	06/28/90	14	09/01/90	64	11/05/90	40	01/09/91	22
02/18/90	11	04/25/90	15	06/29/90	13	09/02/90	74	11/06/90	38	01/10/91	37
02/19/90	9	04/26/90	13	06/30/90	11	09/03/90	63	11/07/90	30	01/11/91	36
02/20/90	6	04/27/90	12	07/01/90	11	09/04/90	59	11/08/90	30	01/12/91	27
02/21/90	32	04/28/90	11	07/02/90	28	09/05/90	58	11/09/90	34	01/13/91	26
02/22/90	41	04/29/90	12	07/03/90	53	09/06/90	55	11/10/90	28	01/14/91	21
02/23/90	23	04/30/90	9	07/04/90	35	09/07/90	48	11/11/90	28	01/15/91	68
02/24/90	35	05/01/90	8	07/05/90	27	09/08/90	44	11/12/90	28	01/16/91	104
02/25/90	32	05/02/90	9	07/06/90	22	09/09/90	40	11/13/90	24	01/17/91	59
02/26/90	29	05/03/90	9	07/07/90	20	09/10/90	33	11/14/90	26	01/18/91	96
02/27/90	28	05/04/90	8	07/08/90	16	09/11/90	27	11/15/90	28	01/19/91	80
02/28/90	24	05/05/90	8	07/09/90	15	09/12/90	33	11/16/90	25	01/20/91	70
03/01/90	22	05/06/90	8	07/10/90	15	09/13/90	34	11/17/90	30	01/21/91	54
03/02/90	25	05/07/90	11	07/11/90	13	09/14/90	33	11/18/90	32	01/22/91	46
03/03/90	28	05/08/90	12	07/12/90	10	09/15/90	30	11/19/90	29	01/23/91	46
03/04/90	28	05/09/90	11	07/13/90	12	09/16/90	32	11/20/90	25	01/24/91	44
03/05/90	24	05/10/90	9	07/14/90	17	09/17/90	35	11/21/90	23	01/25/91	47
03/06/90	23	05/11/90	8	07/15/90	13	09/18/90	33	11/22/90	23	01/26/91	56
03/07/90	25	05/12/90	9	07/16/90	12	09/19/90	183	11/23/90	24	01/27/91	57
03/08/90	29	05/13/90	8	07/17/90	13	09/20/90	258	11/24/90	22	01/28/91	50
03/09/90	22	05/14/90	6	07/18/90	21	09/21/90	239	11/25/90	19	01/29/91	41
03/10/90	18	05/15/90	6	07/19/90	34	09/22/90	192	11/26/90	14	01/30/91	38
03/11/90	15	05/16/90	6	07/20/90	20	09/23/90	140	11/27/90	16	01/31/91	32
03/12/90	18	05/17/90	7	07/21/90	17	09/24/90	104	11/28/90	22	02/01/91	33
03/13/90	13	05/18/90	7	07/22/90	17	09/25/90	90	11/29/90	25	02/02/91	68
03/14/90	10	05/19/90	8	07/23/90	14	09/26/90	79	11/30/90	28	02/03/91	94
03/15/90	10	05/20/90	10	07/24/90	13	09/27/90	70	12/01/90	31	02/04/91	113
03/16/90	9	05/21/90	8	07/25/90	12	09/28/90	166	12/02/90	27	02/05/91	95
03/17/90	8	05/22/90	10	07/26/90	13	09/29/90	244	12/03/90	25	02/06/91	76
03/18/90	10	05/23/90	11	07/27/90	18	09/30/90	228	12/04/90	20	02/07/91	60
03/19/90	14	05/24/90	13	07/28/90	23	10/01/90	194	12/05/90	19	02/08/91	27
03/20/90	23	05/25/90	17	07/29/90	24	10/02/90	161	12/06/90	19		
03/21/90	32	05/26/90	20	07/30/90	19	10/03/90	138	12/07/90	20		
03/22/90	26	05/27/90	19	07/31/90	13	10/04/90	131	12/08/90	20		
03/23/90	20	05/28/90	21	08/01/90	11	10/05/90	114	12/09/90	18		
03/24/90	19	05/29/90	25	08/02/90	9	10/06/90	105	12/10/90	19		
03/25/90	17	05/30/90	41	08/03/90	12	10/07/90	84	12/11/90	17		
03/26/90	13	05/31/90	92	08/04/90	22	10/08/90	74	12/12/90	15		
03/27/90	14	06/01/90	83	08/05/90	29	10/09/90	87	12/13/90	13		
03/28/90	16	06/02/90	58	08/06/90	24	10/10/90	153	12/14/90	15		
03/29/90	16	06/03/90	48	08/07/90	26	10/11/90	143	12/15/90	13		
03/30/90	12	06/04/90	43	08/08/90	24	10/12/90	126	12/16/90	15		
03/31/90	11	06/05/90	36	08/09/90	26	10/13/90	100	12/17/90	14		
04/01/90	14	06/06/90	32	08/10/90	41	10/14/90	87	12/18/90	11		
04/02/90	18	06/07/90	32	08/11/90	38	10/15/90	79	12/19/90	10		
04/03/90	17	06/08/90	29	08/12/90	44	10/16/90	73	12/20/90	8		
04/04/90	19										

Hobe Grove Ditch (1979-1982; 1984-1992) Agency: USGS & WMD

DB KEYS 2988 & 5448

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
12/07/79	9.1	02/11/80	7	04/17/80	4.5	06/22/80	6.6	08/27/80	3.6	11/01/80	8.7
12/08/79	8.2	02/12/80	6.4	04/18/80	4.5	06/23/80	6.5	08/28/80	3.6	11/02/80	8.3
12/09/79	7.3	02/13/80	6.3	04/19/80	4.5	06/24/80	6.9	08/29/80	3.8	11/03/80	8.3
12/10/79	11	02/14/80	6.6	04/20/80	4.5	06/25/80	7.2	08/30/80	3.7	11/04/80	8.2
12/11/79	11	02/15/80	6.7	04/21/80	4.2	06/26/80	7.5	08/31/80	3.7	11/05/80	3.7
12/12/79	7.7	02/16/80	8.2	04/22/80	4.2	06/27/80	6.8	09/01/80	5.2	11/06/80	3.6
12/13/79	6.8	02/17/80	10	04/23/80	4.2	06/28/80	6.9	09/02/80	14	11/07/80	3.7
12/14/79	5.2	02/18/80	17	04/24/80	4	06/29/80	6.5	09/03/80	28	11/08/80	4
12/15/79	4.6	02/19/80	46	04/25/80	4	06/30/80	8	09/04/80	24	11/09/80	4.1
12/16/79	4.7	02/20/80	59	04/26/80	3.9	07/01/80	16	09/05/80	16	11/10/80	5
12/17/79	4.7	02/21/80	33	04/27/80	3.9	07/02/80	30	09/06/80	10	11/11/80	5.5
12/18/79	4.6	02/22/80	21	04/28/80	3.9	07/03/80	38	09/07/80	8	11/12/80	5.2
12/19/79	4.4	02/23/80	15	04/29/80	3.9	07/04/80	32	09/08/80	6.8	11/13/80	4.7
12/20/79	4.3	02/24/80	13	04/30/80	3.9	07/05/80	19	09/09/80	6.1	11/14/80	4.2
12/21/79	4.2	02/25/80	12	05/01/80	4.8	07/06/80	12	09/10/80	5.7	11/15/80	3.9
12/22/79	4.2	02/26/80	11	05/02/80	3.6	07/07/80	9.1	09/11/80	5.4	11/16/80	4
12/23/79	4.1	02/27/80	9.8	05/03/80	3.6	07/08/80	7.3	09/12/80	5.4	11/17/80	4.9
12/24/79	4.1	02/28/80	7.7	05/04/80	3.6	07/09/80	6.2	09/13/80	5.4	11/18/80	8.5
12/25/79	4.1	02/29/80	5.1	05/05/80	4.8	07/10/80	5.8	09/14/80	6.3	11/19/80	8.6
12/26/79	4	03/01/80	5.4	05/06/80	3.6	07/11/80	5.6	09/15/80	6.5	11/20/80	7.3
12/27/79	4	03/02/80	5.9	05/07/80	3.5	07/12/80	5.2	09/16/80	5.9	11/21/80	6.1
12/28/79	3.9	03/03/80	5.6	05/08/80	3.7	07/13/80	4.8	09/17/80	6.3	11/22/80	6
12/29/79	4.2	03/04/80	11	05/09/80	4.2	07/14/80	4.2	09/18/80	5.5	11/23/80	5.6
12/30/79	4.8	03/05/80	22	05/10/80	4	07/15/80	4	09/19/80	5.3	11/24/80	6.2
12/31/79	5.2	03/06/80	16	05/11/80	4	07/16/80	3.7	09/20/80	5.2	11/25/80	9.8
01/01/80	6.1	03/07/80	12	05/12/80	4	07/17/80	4.1	09/21/80	5.3	11/26/80	13
01/02/80	7	03/08/80	11	05/13/80	4	07/18/80	17	09/22/80	5	11/27/80	11
01/03/80	7.1	03/09/80	9.7	05/14/80	3.9	07/19/80	26	09/23/80	4.7	11/28/80	10
01/04/80	7.4	03/10/80	7.1	05/15/80	4	07/20/80	19	09/24/80	4.8	11/29/80	9.8
01/05/80	6.1	03/11/80	5.1	05/16/80	4.5	07/21/80	18	09/25/80	4.4	11/30/80	8.8
01/06/80	4.9	03/12/80	5	05/17/80	4.3	07/22/80	16	09/26/80	4.2	12/01/80	7.1
01/07/80	4.9	03/13/80	5.1	05/18/80	3.9	07/23/80	15	09/27/80	4.2	12/02/80	6.3
01/08/80	4.8	03/14/80	5.1	05/19/80	3.7	07/24/80	11	09/28/80	4.1	12/03/80	6.3
01/09/80	5.3	03/15/80	5	05/20/80	4.1	07/25/80	8	09/29/80	4	12/04/80	6.1
01/10/80	5.1	03/16/80	4.8	05/21/80	5.6	07/26/80	15	09/30/80	4	12/05/80	5.5
01/11/80	5	03/17/80	4.8	05/22/80	13	07/27/80	14	10/01/80	3.8	12/06/80	5.2
01/12/80	4.9	03/18/80	4.8	05/23/80	34	07/28/80	9.7	10/02/80	3.8	12/07/80	5.1
01/13/80	4.9	03/19/80	4.8	05/24/80	40	07/29/80	8	10/03/80	4.3	12/08/80	4.8
01/14/80	4.8	03/20/80	4.8	05/25/80	52	07/30/80	8.1	10/04/80	4.3	12/09/80	4.4
01/15/80	4.8	03/21/80	4.8	05/26/80	90	07/31/80	7.5	10/05/80	4.1	12/10/80	3.9
01/16/80	4.8	03/22/80	4.8	05/27/80	225	08/01/80	5.8	10/06/80	4.8	12/11/80	4
01/17/80	4.7	03/23/80	4.6	05/28/80	150	08/02/80	6.3	10/07/80	4.4	12/12/80	3.9
01/18/80	4.7	03/24/80	4.5	05/29/80	78	08/03/80	5.4	10/08/80	4.4	12/13/80	3.8
01/19/80	4.8	03/25/80	4.5	05/30/80	49	08/04/80	4.7	10/09/80	6.4	12/14/80	3.8
01/20/80	4.9	03/26/80	4.4	05/31/80	45	08/05/80	4.6	10/10/80	9.8	12/15/80	3.6
01/21/80	4.9	03/27/80	4.5	06/01/80	60	08/06/80	4.6	10/11/80	9.1	12/16/80	3.7
01/22/80	4.9	03/28/80	4.8	06/02/80	16	08/07/80	4.5	10/12/80	8.6	12/17/80	3.6
01/23/80	6.5	03/29/80	4.9	06/03/80	14	08/08/80	4.3	10/13/80	8.1	12/18/80	3.6
01/24/80	7.2	03/30/80	17	06/04/80	11	08/09/80	4.8	10/14/80	8.1	12/19/80	3.7
01/25/80	7.8	03/31/80	31	06/05/80	7.6	08/10/80	4.9	10/15/80	7.9	12/20/80	3.7
01/26/80	8.1	04/01/80	29	06/06/80	7	08/11/80	4.8	10/16/80	8	12/21/80	3.8
01/27/80	13	04/02/80	26	06/07/80	6.8	08/12/80	4.8	10/17/80	8	12/22/80	4.3
01/28/80	29	04/03/80	19	06/08/80	6.7	08/13/80	4.6	10/18/80	8.2	12/23/80	4.4
01/29/80	25	04/04/80	15	06/09/80	7.1	08/14/80	4.2	10/19/80	7.7	12/24/80	4.5
01/30/80	18	04/05/80	12	06/10/80	7.4	08/15/80	4.1	10/20/80	7.3	12/25/80	4.6
01/31/80	15	04/06/80	9.7	06/11/80	7.3	08/16/80	4.1	10/21/80	6.5	12/26/80	4.5
02/01/80	12	04/07/80	7.4	06/12/80	7.2	08/17/80	4	10/22/80	5.7	12/27/80	4.6
02/02/80	9.1	04/08/80	8.2	06/13/80	7.1	08/18/80	4.2	10/23/80	5.9	12/28/80	4.5
02/03/80	7.8	04/09/80	5.4	06/14/80	7.1	08/19/80	7.6	10/24/80	5.6	12/29/80	3.8
02/04/80	7	04/10/80	5.4	06/15/80	7	08/20/80	12	10/25/80	5.1	12/30/80	3.6
02/05/80	7	04/11/80	4.8	06/16/80	7	08/21/80	7.1	10/26/80	4.7	12/31/80	3.5
02/06/80	7	04/12/80	5.1	06/17/80	6.9	08/22/80	4.7	10/27/80	4.6		
02/07/80	6.9	04/13/80	5.1	06/18/80	6.9	08/23/80	4.6	10/28/80	4.5		
02/08/80	6.7	04/14/80	4.8	06/19/80	6.8	08/24/80	4.1	10/29/80	4.5		
02/09/80	6.8	04/15/80	4.8	06/20/80	6.8	08/25/80	3.7	10/30/80	8.9		
02/10/80	7	04/16/80	4.5	06/21/80	6.7	08/26/80	3.7	10/31/80	9.1		

Hobe Grove Ditch (1979-1982; 1984-1992) Agency: USGS & WMD

DB KEYS 2988 & 5448

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/81	3.5	03/01/81	6.6	05/01/81	1.3	07/01/81	4	09/01/81	7.5	11/01/81	3.6
01/02/81	3.5	03/02/81	5.7	05/02/81	1.1	07/02/81	4.1	09/02/81	6.8	11/02/81	3.7
01/03/81	3.4	03/03/81	5	05/03/81	1.1	07/03/81	3.9	09/03/81	6.2	11/03/81	3.7
01/04/81	3.6	03/04/81	4.2	05/04/81	0.98	07/04/81	3.9	09/04/81	5.7	11/04/81	4.1
01/05/81	3.4	03/05/81	4.3	05/05/81	0.98	07/05/81	4	09/05/81	5.3	11/05/81	4.6
01/06/81	3.5	03/06/81	4.4	05/06/81	0.91	07/06/81	4.4	09/06/81	5	11/06/81	4.7
01/07/81	3.6	03/07/81	4.7	05/07/81	1.1	07/07/81	4.5	09/07/81	4.8	11/07/81	4.7
01/08/81	3.8	03/08/81	5.1	05/08/81	1.5	07/08/81	4.4	09/08/81	4.8	11/08/81	4.4
01/09/81	3.8	03/09/81	5.5	05/09/81	1.2	07/09/81	4.3	09/09/81	4.5	11/09/81	4.5
01/10/81	4.4	03/10/81	5.3	05/10/81	1.1	07/10/81	3.9	09/10/81	3.9	11/10/81	4.5
01/11/81	5.4	03/11/81	5.4	05/11/81	1.3	07/11/81	3.4	09/11/81	4.5	11/11/81	4.4
01/12/81	6.1	03/12/81	5	05/12/81	1.3	07/12/81	3.1	09/12/81	5	11/12/81	4.3
01/13/81	4.9	03/13/81	4.7	05/13/81	1.2	07/13/81	3.1	09/13/81	4.8	11/13/81	4.6
01/14/81	4.2	03/14/81	4.3	05/14/81	1.2	07/14/81	3	09/14/81	4.1	11/14/81	4.4
01/15/81	4.2	03/15/81	4.3	05/15/81	1.2	07/15/81	2.9	09/15/81	3.5	11/15/81	4.3
01/16/81	4.3	03/16/81	4.6	05/16/81	1.3	07/16/81	2.8	09/16/81	3.4	11/16/81	4.3
01/17/81	5.2	03/17/81	4.3	05/17/81	1.3	07/17/81	2	09/17/81	3.4	11/17/81	4.2
01/18/81	6.8	03/18/81	4.8	05/18/81	1.1	07/18/81	1.8	09/18/81	6.2	11/18/81	4.1
01/19/81	6.7	03/19/81	5.4	05/19/81	1.1	07/19/81	1.5	09/19/81	6	11/19/81	3.9
01/20/81	9.4	03/20/81	5.6	05/20/81	1.2	07/20/81	1.3	09/20/81	5.3	11/20/81	3.9
01/21/81	7.5	03/21/81	6.3	05/21/81	1.5	07/21/81	1.4	09/21/81	6.6	11/21/81	3.9
01/22/81	5	03/22/81	7.5	05/22/81	1.5	07/22/81	1.4	09/22/81	7.4	11/22/81	3.8
01/23/81	4.5	03/23/81	9.5	05/23/81	1.5	07/23/81	1.4	09/23/81	11	11/23/81	3.7
01/24/81	5.1	03/24/81	10	05/24/81	1.5	07/24/81	2	09/24/81	8.9	11/24/81	3.6
01/25/81	5.7	03/25/81	7.2	05/25/81	1.4	07/25/81	1.8	09/25/81	7.7	11/25/81	3.6
01/26/81	5.9	03/26/81	5.9	05/26/81	1.4	07/26/81	12	09/26/81	12	11/26/81	3.6
01/27/81	6	03/27/81	5.9	05/27/81	1.4	07/27/81	16	09/27/81	9.1	11/27/81	3.4
01/28/81	6.1	03/28/81	7.3	05/28/81	1.4	07/28/81	8.9	09/28/81	6.9	11/28/81	3.3
01/29/81	6.1	03/29/81	8.6	05/29/81	1.3	07/29/81	7.5	09/29/81	5.6	11/29/81	3.6
01/30/81	6.3	03/30/81	8.5	05/30/81	1.2	07/30/81	7.2	09/30/81	4.5	11/30/81	3.7
01/31/81	6.3	03/31/81	8.5	05/31/81	1.4	07/31/81	6	10/01/81	4	12/01/81	3.7
02/01/81	6.1	04/01/81	8.1	06/01/81	1.3	08/01/81	5.6	10/02/81	3.4	12/02/81	3.7
02/02/81	6.1	04/02/81	8.6	06/02/81	1.3	08/02/81	5.9	10/03/81	2.7	12/03/81	3.7
02/03/81	5	04/03/81	9.1	06/03/81	1.3	08/03/81	5.6	10/04/81	2.7	12/04/81	3.7
02/04/81	5.1	04/04/81	7.3	06/04/81	1.8	08/04/81	5.3	10/05/81	2.4	12/05/81	3.4
02/05/81	5.4	04/05/81	6	06/05/81	15	08/05/81	5.1	10/06/81	2.5	12/06/81	3.3
02/06/81	6.9	04/06/81	5.2	06/06/81	17	08/06/81	5	10/07/81	2.5	12/07/81	3.1
02/07/81	6.5	04/07/81	4	06/07/81	9.3	08/07/81	4.8	10/08/81	2.5	12/08/81	3.1
02/08/81	6.1	04/08/81	1.2	06/08/81	8.5	08/08/81	4.8	10/09/81	2.5	12/09/81	2.7
02/09/81	5.4	04/09/81	0.98	06/09/81	7.3	08/09/81	4.8	10/10/81	3.2	12/10/81	1.6
02/10/81	4.6	04/10/81	1.1	06/10/81	6.8	08/10/81	4.8	10/11/81	3.5	12/11/81	1.3
02/11/81	4.6	04/11/81	1.1	06/11/81	6.5	08/11/81	5.1	10/12/81	3.8	12/12/81	1.2
02/12/81	4.8	04/12/81	1.1	06/12/81	5.7	08/12/81	5.2	10/13/81	4.1	12/13/81	0.9
02/13/81	5.3	04/13/81	1.1	06/13/81	4.6	08/13/81	4.8	10/14/81	5.1	12/14/81	1.1
02/14/81	5.6	04/14/81	1.5	06/14/81	4.4	08/14/81	4.7	10/15/81	5.2	12/15/81	1.1
02/15/81	4.8	04/15/81	1.1	06/15/81	4.4	08/15/81	4.6	10/16/81	4.4	12/16/81	0.9
02/16/81	4.2	04/16/81	0.62	06/16/81	4.3	08/16/81	7.2	10/17/81	4.1	12/17/81	0.8
02/17/81	4.1	04/17/81	0.42	06/17/81	4.1	08/17/81	39	10/18/81	4.1	12/18/81	0.9
02/18/81	4.3	04/18/81	0.38	06/18/81	3.9	08/18/81	80	10/19/81	4.1	12/19/81	0.9
02/19/81	4.1	04/19/81	0.34	06/19/81	3.9	08/19/81	165	10/20/81	3.7	12/20/81	1
02/20/81	4	04/20/81	0.38	06/20/81	4.3	08/20/81	108	10/21/81	3.4	12/21/81	0.8
02/21/81	3.9	04/21/81	0.42	06/21/81	4	08/21/81	77	10/22/81	3.3	12/22/81	0.9
02/22/81	3.7	04/22/81	0.42	06/22/81	3.9	08/22/81	112	10/23/81	3.2	12/23/81	0.8
02/23/81	3.7	04/23/81	0.42	06/23/81	4.1	08/23/81	69	10/24/81	2.9	12/24/81	0.7
02/24/81	3.7	04/24/81	0.42	06/24/81	4.3	08/24/81	42	10/25/81	2.8	12/25/81	0.8
02/25/81	3.9	04/25/81	0.77	06/25/81	4.6	08/25/81	32	10/26/81	2.9	12/26/81	0.9
02/26/81	4.1	04/26/81	0.77	06/26/81	4.6	08/26/81	26	10/27/81	2.8	12/27/81	1
02/27/81	4.8	04/27/81	0.42	06/27/81	4.4	08/27/81	22	10/28/81	2.8	12/28/81	1
02/28/81	5.8	04/28/81	0.91	06/28/81	4.5	08/28/81	16	10/29/81	2.9	12/29/81	1.1
		04/29/81	1.2	06/29/81	4.5	08/29/81	13	10/30/81	3.1	12/30/81	1.2
		04/30/81	1.3	06/30/81	4.1	08/30/81	11	10/31/81	3.3	12/31/81	1.1
						08/31/81	8.9				

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DB KEYS 2988 & 5448

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/82	1	03/01/82	7.2								
01/02/82	0.9	03/02/82	7.1								
01/03/82	1.1	03/03/82	7.2								
01/04/82	1.2	03/04/82	7.6								
01/05/82	1.2	03/05/82	8.7								
01/06/82	13	03/06/82	19								
01/07/82	10	03/07/82	31								
01/08/82	7	03/08/82	43								
01/09/82	5.6	03/09/82	34								
01/10/82	4.9	03/10/82	25								
01/11/82	4.3	03/11/82	20								
01/12/82	3.6	03/12/82	18								
01/13/82	3.2	03/13/82	16								
01/14/82	2.1	03/14/82	15								
01/15/82	1.7	03/15/82	13								
01/16/82	1.5	03/16/82	11								
01/17/82	1.5	03/17/82	9.5								
01/18/82	1.5	03/18/82	9.2								
01/19/82	1.5	03/19/82	9								
01/20/82	1.5	03/20/82	8.5								
01/21/82	1.5	03/21/82	8.5								
01/22/82	1.5	03/22/82	8.5								
01/23/82	1.5	03/23/82	8.7								
01/24/82	1.5	03/24/82	9.5								
01/25/82	1.5	03/25/82	12								
01/26/82	1.4	03/26/82	18								
01/27/82	1.4	03/27/82	19								
01/28/82	1.4	03/28/82	16								
01/29/82	1.4	03/29/82	87								
01/30/82	1.4	03/30/82	126								
01/31/82	1.6	03/31/82	82								
02/01/82	2.5	04/01/82	51								
02/02/82	14	04/02/82	40								
02/03/82	25	04/03/82	26								
02/04/82	18	04/04/82	20								
02/05/82	16	04/05/82	14								
02/06/82	13	04/06/82	9								
02/07/82	12	04/07/82	4.8								
02/08/82	16	04/08/82	4								
02/09/82	16	04/09/82	3.7								
02/10/82	16	04/10/82	3.5								
02/11/82	15	04/11/82	3.5								
02/12/82	14	04/12/82	3.6								
02/13/82	13	04/13/82	3.4								
02/14/82	12										
02/15/82	10										
02/16/82	8.9										
02/17/82	9.9										
02/18/82	11										
02/19/82	11										
02/20/82	11										
02/21/82	10										
02/22/82	8.8										
02/23/82	7.5										
02/24/82	7.3										
02/25/82	7.1										
02/26/82	7.2										
02/27/82	7.2										
02/28/82	7										

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DB KEYS 2988 & 5448

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
02/08/84	3	04/08/84	3	06/08/84	7	08/08/84	3	10/08/84	14	12/08/84	11
02/09/84	3	04/09/84	3	06/09/84	6	08/09/84	3	10/09/84	15	12/09/84	10
02/10/84	3	04/10/84	4	06/10/84	5	08/10/84	3	10/10/84	14	12/10/84	9
02/11/84	3	04/11/84	7	06/11/84	5	08/11/84	3	10/11/84	14	12/11/84	9
02/12/84	3	04/12/84	11	06/12/84	5	08/12/84	3	10/12/84	14	12/12/84	8
02/13/84	4	04/13/84	8	06/13/84	4	08/13/84	3	10/13/84	13	12/13/84	8
02/14/84	4	04/14/84	7	06/14/84	4	08/14/84	3	10/14/84	12	12/14/84	7
02/15/84	4	04/15/84	7	06/15/84	4	08/15/84	3	10/15/84	13	12/15/84	8
02/16/84	5	04/16/84	7	06/16/84	4	08/16/84	6	10/16/84	11	12/16/84	8
02/17/84	4	04/17/84	5	06/17/84	5	08/17/84	4	10/17/84	10	12/17/84	7
02/18/84	5	04/18/84	4	06/18/84	6	08/18/84	4	10/18/84	11	12/18/84	7
02/19/84	5	04/19/84	4	06/19/84	7	08/19/84	4	10/19/84	11	12/19/84	7
02/20/84	4	04/20/84	3	06/20/84	6	08/20/84	4	10/20/84	11	12/20/84	7
02/21/84	4	04/21/84	3	06/21/84	5	08/21/84	5	10/21/84	15	12/21/84	7
02/22/84	5	04/22/84	2	06/22/84	4	08/22/84	5	10/22/84	14	12/22/84	7
02/23/84	4	04/23/84	2	06/23/84	5	08/23/84	6	10/23/84	14	12/23/84	7
02/24/84	4	04/24/84	2	06/24/84	5	08/24/84	6	10/24/84	12	12/24/84	8
02/25/84	3	04/25/84	2	06/25/84	6	08/25/84	6	10/25/84	12	12/25/84	7
02/26/84	3	04/26/84	2	06/26/84	6	08/26/84	6	10/26/84	12	12/26/84	6
02/27/84	4	04/27/84	2	06/27/84	6	08/27/84	6	10/27/84	10	12/27/84	6
02/28/84	4	04/28/84	2	06/28/84	6	08/28/84	6	10/28/84	9	12/28/84	5
02/29/84	3	04/29/84	2	06/29/84	7	08/29/84	6	10/29/84	8	12/29/84	5
03/01/84	3	04/30/84	2	06/30/84	7	08/30/84	7	10/30/84	7	12/30/84	5
03/02/84	3	05/01/84	2	07/01/84	6	08/31/84	6	10/31/84	8	12/31/84	4
03/03/84	3	05/02/84	2	07/02/84	5	09/01/84	5	11/01/84	9		
03/04/84	3	05/03/84	2	07/03/84	6	09/02/84	5	11/02/84	9		
03/05/84	3	05/04/84	2	07/04/84	7	09/03/84	6	11/03/84	9		
03/06/84	3	05/05/84	2	07/05/84	8	09/04/84	6	11/04/84	10		
03/07/84	3	05/06/84	2	07/06/84	8	09/05/84	5	11/05/84	9		
03/08/84	3	05/07/84	2	07/07/84	7	09/06/84	5	11/06/84	9		
03/09/84	4	05/08/84	2	07/08/84	6	09/07/84	6	11/07/84	10		
03/10/84	4	05/09/84	2	07/09/84	5	09/08/84	7	11/08/84	10		
03/11/84	4	05/10/84	4	07/10/84	5	09/09/84	8	11/09/84	10		
03/12/84	4	05/11/84	5	07/11/84	5	09/10/84	7	11/10/84	9		
03/13/84	16	05/12/84	4	07/12/84	4	09/11/84	7	11/11/84	8		
03/14/84	18	05/13/84	3	07/13/84	4	09/12/84	6	11/12/84	7		
03/15/84	11	05/14/84	3	07/14/84	4	09/13/84	5	11/13/84	7		
03/16/84	8	05/15/84	3	07/15/84	3	09/14/84	4	11/14/84	7		
03/17/84	7	05/16/84	3	07/16/84	3	09/15/84	4	11/15/84	7		
03/18/84	7	05/17/84	3	07/17/84	3	09/16/84	4	11/16/84	7		
03/19/84	7	05/18/84	3	07/18/84	3	09/17/84	4	11/17/84	7		
03/20/84	6	05/19/84	3	07/19/84	3	09/18/84	11	11/18/84	7		
03/21/84	5	05/20/84	2	07/20/84	2	09/19/84	71	11/19/84	7		
03/22/84	5	05/21/84	2	07/21/84	3	09/20/84	86	11/20/84	8		
03/23/84	10	05/22/84	2	07/22/84	4	09/21/84	59	11/21/84	12		
03/24/84	18	05/23/84	2	07/23/84	4	09/22/84	52	11/22/84	50		
03/25/84	12	05/24/84	7	07/24/84	5	09/23/84	38	11/23/84	101		
03/26/84	9	05/25/84	15	07/25/84	5	09/24/84	31	11/24/84	128		
03/27/84	10	05/26/84	10	07/26/84	5	09/25/84	27	11/25/84	78		
03/28/84	9	05/27/84	10	07/27/84	4	09/26/84	24	11/26/84	49		
03/29/84	7	05/28/84	12	07/28/84	4	09/27/84	42	11/27/84	35		
03/30/84	6	05/29/84	33	07/29/84	4	09/28/84	69	11/28/84	34		
03/31/84	5	05/30/84	38	07/30/84	4	09/29/84	44	11/29/84	27		
04/01/84	5	05/31/84	34	07/31/84	4	09/30/84	32	11/30/84	23		
04/02/84	5	06/01/84	23	08/01/84	4	10/01/84	25	12/01/84	20		
04/03/84	4	06/02/84	16	08/02/84	3	10/02/84	22	12/02/84	17		
04/04/84	4	06/03/84	12	08/03/84	3	10/03/84	20	12/03/84	15		
04/05/84	4	06/04/84	10	08/04/84	3	10/04/84	18	12/04/84	13		
04/06/84	4	06/05/84	8	08/05/84	3	10/05/84	16	12/05/84	12		
04/07/84	4	06/06/84	7	08/06/84	3	10/06/84	14	12/06/84	12		
		06/07/84	7	08/07/84	3	10/07/84	14	12/07/84	11		

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/85	5	03/05/85	3	05/05/85	6	07/05/85	4	09/05/85	7	11/05/85	8
01/02/85	5	03/06/85	8	05/06/85	5	07/06/85	4	09/06/85	9	11/06/85	7
01/03/85	5	03/07/85	8	05/07/85	5	07/07/85	3	09/07/85	9	11/07/85	7
01/04/85	5	03/08/85	10	05/08/85	4	07/08/85	3	09/08/85	8	11/08/85	7
01/05/85	6	03/09/85	7	05/09/85	3	07/09/85	3	09/09/85	7	11/09/85	8
01/06/85	6	03/10/85	7	05/10/85	3	07/10/85	3	09/10/85	7	11/10/85	9
01/07/85	6	03/11/85	7	05/11/85	4	07/11/85	3	09/11/85	6	11/11/85	8
01/08/85	6	03/12/85	7	05/12/85	4	07/12/85	7	09/12/85	6	11/12/85	8
01/09/85	6	03/13/85	7	05/13/85	4	07/13/85	6	09/13/85	6	11/13/85	7
01/10/85	6	03/14/85	7	05/14/85	4	07/14/85	5	09/14/85	10	11/14/85	7
01/11/85	6	03/15/85	7	05/15/85	4	07/15/85	5	09/15/85	14	11/15/85	6
01/12/85	6	03/16/85	11	05/16/85	4	07/16/85	4	09/16/85	15	11/16/85	6
01/13/85	8	03/17/85	12	05/17/85	4	07/17/85	4	09/17/85	13	11/17/85	5
01/14/85	10	03/18/85	10	05/18/85	5	07/18/85	4	09/18/85	22	11/18/85	6
01/15/85	9	03/19/85	10	05/19/85	5	07/19/85	10	09/19/85	60	11/19/85	8
01/16/85	9	03/20/85	8	05/20/85	5	07/20/85	14	09/20/85	67	11/20/85	6
01/17/85	9	03/21/85	7	05/21/85	5	07/21/85	11	09/21/85	44	11/21/85	5
01/18/85	8	03/22/85	6	05/22/85	5	07/22/85	9	09/22/85	32	11/22/85	4
01/19/85	9	03/23/85	5	05/23/85	6	07/23/85	9	09/23/85	25	11/23/85	4
01/20/85	8	03/24/85	5	05/24/85	6	07/24/85	7	09/24/85	21	11/24/85	5
01/21/85	7	03/25/85	4	05/25/85	6	07/25/85	7	09/25/85	25	11/25/85	5
01/22/85	6	03/26/85	4	05/26/85	6	07/26/85	6	09/26/85	23	11/26/85	5
01/23/85	4	03/27/85	4	05/27/85	7	07/27/85	6	09/27/85	21	11/27/85	5
01/24/85	7	03/28/85	3	05/28/85	8	07/28/85	6	09/28/85	23	11/28/85	4
01/25/85	8	03/29/85	3	05/29/85	8	07/29/85	5	09/29/85	28	11/29/85	4
01/26/85	8	03/30/85	2	05/30/85	7	07/30/85	5	09/30/85	29	11/30/85	4
01/27/85	8	03/31/85	2	05/31/85	6	07/31/85	6	10/01/85	26	12/01/85	4
01/28/85	8	04/01/85	2	06/01/85	5	08/01/85	6	10/02/85	23	12/02/85	4
01/29/85	12	04/02/85	2	06/02/85	4	08/02/85	6	10/03/85	23	12/03/85	6
01/30/85	10	04/03/85	5	06/03/85	4	08/03/85	5	10/04/85	23	12/04/85	6
		04/04/85	6	06/04/85	4	08/04/85	6	10/05/85	20	12/05/85	35
		04/05/85	5	06/05/85	4	08/05/85	7	10/06/85	17	12/06/85	56
		04/06/85	5	06/06/85	4	08/06/85	7	10/07/85	17	12/07/85	32
		04/07/85	5	06/07/85	4	08/07/85	6	10/08/85	17	12/08/85	21
		04/08/85	4	06/08/85	4	08/08/85	5	10/09/85	16	12/09/85	18
		04/09/85	4	06/09/85	3	08/09/85	4	10/10/85	16	12/10/85	15
		04/10/85	4	06/10/85	4	08/10/85	4	10/11/85	15	12/11/85	11
		04/11/85	4	06/11/85	4	08/11/85	4	10/12/85	13	12/12/85	10
		04/12/85	3	06/12/85	4	08/12/85	5	10/13/85	12	12/13/85	9
		04/13/85	4	06/13/85	4	08/13/85	5	10/14/85	13	12/14/85	8
		04/14/85	4	06/14/85	5	08/14/85	5	10/15/85	13	12/15/85	8
		04/15/85	7	06/15/85	7	08/15/85	5	10/16/85	13	12/16/85	8
		04/16/85	11	06/16/85	7	08/16/85	4	10/17/85	11	12/17/85	8
		04/17/85	10	06/17/85	4	08/17/85	4	10/18/85	11	12/18/85	8
		04/18/85	7	06/18/85	4	08/18/85	4	10/19/85	11	12/19/85	8
		04/19/85	6	06/19/85	7	08/19/85	5	10/20/85	12	12/20/85	7
		04/20/85	5	06/20/85	8	08/20/85	5	10/21/85	12	12/21/85	7
		04/21/85	5	06/21/85	10	08/21/85	5	10/22/85	14	12/22/85	7
		04/22/85	4	06/22/85	14	08/22/85	5	10/23/85	11	12/23/85	7
		04/23/85	4	06/23/85	10	08/23/85	5	10/24/85	10	12/24/85	7
		04/24/85	4	06/24/85	8	08/24/85	5	10/25/85	11	12/25/85	6
		04/25/85	3	06/25/85	9	08/25/85	4	10/26/85	13	12/26/85	6
		04/26/85	3	06/26/85	7	08/26/85	3	10/27/85	13	12/27/85	6
		04/27/85	3	06/27/85	6	08/27/85	4	10/28/85	12	12/28/85	8
		04/28/85	3	06/28/85	6	08/28/85	7	10/29/85	13	12/29/85	8
		04/29/85	4	06/29/85	6	08/29/85	11	10/30/85	13	12/30/85	9
		04/30/85	6	06/30/85	5	08/30/85	9	10/31/85	12	12/31/85	9
		05/01/85	6	07/01/85	5	08/31/85	10	11/01/85	10		
		05/02/85	6	07/02/85	5	09/01/85	8	11/02/85	9		
		05/03/85	5	07/03/85	5	09/02/85	6	11/03/85	8		
		05/04/85	5	07/04/85	4	09/03/85	6	11/04/85	7		
						09/04/85	6				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/86	8	03/01/86	7	06/03/86	2	06/30/86	9	09/01/86	7	11/01/86	9
01/02/86	7	03/02/86	7	06/04/86	4	07/01/86	19	09/02/86	9	11/02/86	9
01/03/86	7	03/03/86	18	06/05/86	6	07/02/86	17	09/03/86	9	11/03/86	9
01/04/86	7	03/04/86	13	06/06/86	7	07/03/86	16	09/04/86	10	11/04/86	9
01/05/86	6	03/05/86	7	06/07/86	7	07/04/86	16	09/05/86	9	11/05/86	9
01/06/86	6	03/06/86	5	06/08/86	5	07/05/86	19	09/06/86	9	11/06/86	8
01/07/86	6	03/07/86	4	06/09/86	4	07/06/86	16	09/07/86	11	11/07/86	7
01/08/86	4	03/08/86	3	06/10/86	5	07/07/86	14	09/08/86	13	11/08/86	6
01/09/86	17	03/09/86	3	06/11/86	5	07/08/86	13	09/09/86	24	11/09/86	6
01/10/86	38	03/10/86	4	06/12/86	5	07/09/86	12	09/10/86	17	11/10/86	6
01/11/86	25	03/11/86	5	06/13/86	6	07/10/86	11	09/11/86	13	11/11/86	6
01/12/86	18	03/12/86	5	06/14/86	1	07/11/86	11	09/12/86	12	11/12/86	6
01/13/86	16	03/13/86	5			07/12/86	12	09/13/86	12	11/13/86	5
01/14/86	20	03/14/86	5			07/13/86	11	09/14/86	11	11/14/86	10
01/15/86	15	03/15/86	5			07/14/86	11	09/15/86	12	11/15/86	9
01/16/86	13	03/16/86	5			07/15/86	11	09/16/86	12	11/16/86	10
01/17/86	12	03/17/86	5			07/16/86	11	09/17/86	11	11/17/86	8
01/18/86	10	03/18/86	4			07/17/86	10	09/18/86	10	11/18/86	7
01/19/86	9	03/19/86	4			07/18/86	9	09/19/86	10	11/19/86	7
01/20/86	8	03/20/86	4			07/19/86	8	09/20/86	10	11/20/86	6
01/21/86	8	03/21/86	5			07/20/86	8	09/21/86	8	11/21/86	6
01/22/86	13	03/22/86	4			07/21/86	8	09/22/86	7	11/22/86	6
01/23/86	10	03/23/86	6			07/22/86	9	09/23/86	7	11/23/86	6
01/24/86	9	03/24/86	6			07/23/86	9	09/24/86	7	11/24/86	5
01/25/86	8	03/25/86	6			07/24/86	8	09/25/86	6	11/25/86	5
01/26/86	7	03/26/86	5			07/25/86	8	09/26/86	5	11/26/86	5
01/27/86	6	03/27/86	11			07/26/86	10	09/27/86	5	11/27/86	4
01/28/86	4	03/28/86	12			07/27/86	10	09/28/86	5	11/28/86	5
01/29/86	8	03/29/86	32			07/28/86	10	09/29/86	5	11/29/86	5
01/30/86	8	03/30/86	30			07/29/86	10	09/30/86	4	11/30/86	7
01/31/86	7	03/31/86	21			07/30/86	9	10/01/86	4	12/01/86	7
02/01/86	5	04/01/86	18			07/31/86	8	10/02/86	5	12/02/86	7
02/02/86	4	04/02/86	9			08/01/86	8	10/03/86	5	12/03/86	5
02/03/86	4	04/03/86	9			08/02/86	7	10/04/86	5	12/04/86	5
02/04/86	4	04/04/86	8			08/03/86	7	10/05/86	6	12/05/86	5
02/05/86	4	04/05/86	7			08/04/86	7	10/06/86	6	12/06/86	7
02/06/86	4	04/06/86	7			08/05/86	8	10/07/86	5	12/07/86	8
02/07/86	3	04/07/86	9			08/06/86	7	10/08/86	6	12/08/86	7
02/08/86	4	04/08/86	6			08/07/86	11	10/09/86	5	12/09/86	6
02/09/86	8	04/09/86	6			08/08/86	8	10/10/86	5	12/10/86	5
02/10/86	8	04/10/86	6			08/09/86	7	10/11/86	6	12/11/86	4
02/11/86	8	04/11/86	7			08/10/86	6	10/12/86	7	12/12/86	4
02/12/86	8	04/12/86	6			08/11/86	6	10/13/86	8	12/13/86	4
02/13/86	9	04/13/86	6			08/12/86	6	10/14/86	6	12/14/86	5
02/14/86	10	04/14/86	6			08/13/86	7	10/15/86	5	12/15/86	5
02/15/86	8	04/15/86	6			08/14/86	7	10/16/86	7	12/16/86	5
02/16/86	8	04/16/86	5			08/15/86	7	10/17/86	9	12/17/86	5
02/17/86	8	04/17/86	5			08/16/86	7	10/18/86	8	12/18/86	5
02/18/86	21	04/18/86	4			08/17/86	8	10/19/86	13	12/19/86	4
02/19/86	15	04/19/86	5			08/18/86	8	10/20/86	17	12/20/86	4
02/20/86	8	04/20/86	6			08/19/86	8	10/21/86	14	12/21/86	4
02/21/86	6	04/21/86	6			08/20/86	8	10/22/86	13	12/22/86	6
02/22/86	5	04/22/86	6			08/21/86	7	10/23/86	11	12/23/86	7
02/23/86	5	04/23/86	7			08/22/86	8	10/24/86	8	12/24/86	7
02/24/86	6	04/24/86	7			08/23/86	7	10/25/86	8	12/25/86	5
02/25/86	6	04/25/86	4			08/24/86	6	10/26/86	10	12/26/86	5
02/26/86	7					08/25/86	6	10/27/86	8	12/27/86	13
02/27/86	6					08/26/86	6	10/28/86	8	12/28/86	14
02/28/86	6					08/27/86	5	10/29/86	8	12/29/86	12
						08/28/86	5	10/30/86	8	12/30/86	12
						08/29/86	5	10/31/86	9	12/31/86	12
						08/30/86	6				
						08/31/86	7				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/87	15	04/01/87	10	06/01/87	3	08/01/87	8	10/01/87	7	12/01/87	11
01/02/87	12	04/02/87	9	06/02/87	2	08/02/87	6	10/02/87	6	12/02/87	10
01/03/87	12	04/03/87	9	06/03/87	2	08/03/87	5	10/03/87	7	12/03/87	9
01/04/87	17	04/04/87	7	06/04/87	3	08/04/87	5	10/04/87	7	12/04/87	9
01/05/87	17	04/05/87	6	06/05/87	3	08/05/87	4	10/05/87	8	12/05/87	8
01/06/87	5	04/06/87	6	06/06/87	3	08/06/87	4	10/06/87	6	12/06/87	8
		04/07/87	4	06/07/87	4	08/07/87	4	10/07/87	6	12/07/87	8
02/04/87	2	04/08/87	4	06/08/87	4	08/08/87	4	10/08/87	6	12/08/87	8
02/05/87	3	04/09/87	3	06/09/87	4	08/09/87	4	10/09/87	6	12/09/87	8
02/06/87	3	04/10/87	3	06/10/87	5	08/10/87	4	10/10/87	8	12/10/87	7
02/07/87	4	04/11/87	3	06/11/87	4	08/11/87	5	10/11/87	10	12/11/87	6
02/08/87	4	04/12/87	3	06/12/87	4	08/12/87	5	10/12/87	33	12/12/87	6
02/09/87	4	04/13/87	3	06/13/87	3	08/13/87	5	10/13/87	55	12/13/87	6
02/10/87	3	04/14/87	3	06/14/87	3	08/14/87	5	10/14/87	39	12/14/87	6
02/11/87	3	04/15/87	4	06/15/87	3	08/15/87	5	10/15/87	30	12/15/87	6
02/12/87	3	04/16/87	7	06/16/87	2	08/16/87	4	10/16/87	25	12/16/87	6
02/13/87	5	04/17/87	4	06/17/87	2	08/17/87	3	10/17/87	22	12/17/87	6
02/14/87	4	04/18/87	4	06/18/87	2	08/18/87	3	10/18/87	20	12/18/87	4
02/15/87	4	04/19/87	4	06/19/87	2	08/19/87	3	10/19/87	18	12/19/87	4
02/16/87	4	04/20/87	4	06/20/87	2	08/20/87	2	10/20/87	16	12/20/87	4
02/17/87	4	04/21/87	5	06/21/87	2	08/21/87	2	10/21/87	14	12/21/87	4
02/18/87	4	04/22/87	4	06/22/87	2	08/22/87	3	10/22/87	14	12/22/87	4
02/19/87	5	04/23/87	4	06/23/87	2	08/23/87	4	10/23/87	14	12/23/87	4
02/20/87	3	04/24/87	4	06/24/87	2	08/24/87	3	10/24/87	13	12/24/87	4
02/21/87	3	04/25/87	4	06/25/87	2	08/25/87	3	10/25/87	12	12/25/87	3
02/22/87	4	04/26/87	4	06/26/87	3	08/26/87	3	10/26/87	12	12/26/87	3
02/23/87	4	04/27/87	5	06/27/87	2	08/27/87	3	10/27/87	11	12/27/87	3
02/24/87	4	04/28/87	5	06/28/87	3	08/28/87	3	10/28/87	11	12/28/87	3
02/25/87	4	04/29/87	4	06/29/87	5	08/29/87	4	10/29/87	10	12/29/87	3
02/26/87	4	04/30/87	3	06/30/87	3	08/30/87	4	10/30/87	10	12/30/87	4
02/27/87	6	05/01/87	4	07/01/87	4	08/31/87	4	10/31/87	11	12/31/87	5
02/28/87	5	05/02/87	3	07/02/87	3	09/01/87	4	11/01/87	18		
03/01/87	4	05/03/87	2	07/03/87	3	09/02/87	4	11/02/87	22		
03/02/87	3	05/04/87	3	07/04/87	2	09/03/87	5	11/03/87	25		
03/03/87	5	05/05/87	3	07/05/87	2	09/04/87	6	11/04/87	114		
03/04/87	6	05/06/87	3	07/06/87	2	09/05/87	5	11/05/87	75		
03/05/87	4	05/07/87	3	07/07/87	3	09/06/87	5	11/06/87	51		
03/06/87	4	05/08/87	4	07/08/87	3	09/07/87	5	11/07/87	47		
03/07/87	17	05/09/87	4	07/09/87	3	09/08/87	5	11/08/87	34		
03/08/87	12	05/10/87	8	07/10/87	3	09/09/87	4	11/09/87	25		
03/09/87	10	05/11/87	8	07/11/87	3	09/10/87	4	11/10/87	19		
03/10/87	9	05/12/87	6	07/12/87	3	09/11/87	3	11/11/87	16		
03/11/87	9	05/13/87	6	07/13/87	3	09/12/87	3	11/12/87	14		
03/12/87	8	05/14/87	8	07/14/87	3	09/13/87	3	11/13/87	13		
03/13/87	10	05/15/87	6	07/15/87	3	09/14/87	3	11/14/87	13		
03/14/87	10	05/16/87	5	07/16/87	3	09/15/87	3	11/15/87	12		
03/15/87	9	05/17/87	5	07/17/87	3	09/16/87	3	11/16/87	12		
03/16/87	8	05/18/87	5	07/18/87	3	09/17/87	3	11/17/87	11		
03/17/87	7	05/19/87	5	07/19/87	6	09/18/87	3	11/18/87	10		
03/18/87	7	05/20/87	5	07/20/87	6	09/19/87	3	11/19/87	18		
03/19/87	7	05/21/87	4	07/21/87	4	09/20/87	3	11/20/87	27		
03/20/87	6	05/22/87	4	07/22/87	5	09/21/87	3	11/21/87	23		
03/21/87	7	05/23/87	5	07/23/87	4	09/22/87	4	11/22/87	20		
03/22/87	6	05/24/87	5	07/24/87	4	09/23/87	5	11/23/87	17		
03/23/87	6	05/25/87	4	07/25/87	4	09/24/87	11	11/24/87	16		
03/24/87	8	05/26/87	4	07/26/87	3	09/25/87	12	11/25/87	14		
03/25/87	7	05/27/87	4	07/27/87	3	09/26/87	9	11/26/87	13		
03/26/87	6	05/28/87	4	07/28/87	3	09/27/87	7	11/27/87	12		
03/27/87	7	05/29/87	4	07/29/87	3	09/28/87	7	11/28/87	12		
03/28/87	6	05/30/87	6	07/30/87	4	09/29/87	8	11/29/87	12		
03/29/87	6	05/31/87	5	07/31/87	7	09/30/87	7	11/30/87	12		
03/30/87	8										
03/31/87	11										

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/88	3	03/01/88	4	05/01/88	3	09/19/88	2	11/19/88	5
01/02/88	3	03/02/88	4	05/02/88	32	09/20/88	3	11/20/88	12
01/03/88	3	03/03/88	3	05/03/88	15	09/21/88	3	11/21/88	9
01/04/88	3	03/04/88	3	05/04/88	11	09/22/88	5	11/22/88	25
01/05/88	4	03/05/88	3	05/05/88	9	09/23/88	5	11/23/88	9
01/06/88	4	03/06/88	3	05/06/88	4	09/24/88	5	11/24/88	4
01/07/88	4	03/07/88	3	05/07/88	3	09/25/88	5	11/25/88	5
01/08/88	3	03/08/88	3	05/08/88	3	09/26/88	5	11/26/88	4
01/09/88	4	03/09/88	2	05/09/88	3	09/27/88	5	11/27/88	3
01/10/88	4	03/10/88	2	05/10/88	3	09/28/88	5	11/28/88	3
01/11/88	12	03/11/88	2	05/11/88	3	09/29/88	6	11/29/88	3
01/12/88	11	03/12/88	3	05/12/88	3	09/30/88	5	11/30/88	3
01/13/88	16	03/13/88	2	05/13/88	3	10/01/88	5	12/01/88	3
01/14/88	4	03/14/88	2	05/14/88	3	10/02/88	4	12/02/88	3
01/15/88	19	03/15/88	3	05/15/88	3	10/03/88	4	12/03/88	3
01/16/88	12	03/16/88	3	05/16/88	5	10/04/88	3	12/04/88	3
01/17/88	9	03/17/88	3	05/17/88	13	10/05/88	4	12/05/88	3
01/18/88	8	03/18/88	4	05/18/88	8	10/06/88	6	12/06/88	4
01/19/88	7	03/19/88	3	05/19/88	6	10/07/88	7	12/07/88	3
01/20/88	4	03/20/88	2	05/20/88	6	10/08/88	9	12/08/88	3
01/21/88	4	03/21/88	2	05/21/88	7	10/09/88	10	12/09/88	4
01/22/88	4	03/22/88	6	05/22/88	6	10/10/88	8	12/10/88	5
01/23/88	4	03/23/88	12	05/23/88	6	10/11/88	7	12/11/88	7
01/24/88	4	03/24/88	8	05/24/88	9	10/12/88	6	12/12/88	11
01/25/88	3	03/25/88	6	05/25/88	6	10/13/88	5	12/13/88	10
01/26/88	2	03/26/88	5	05/26/88	5	10/14/88	6	12/14/88	7
01/27/88	2	03/27/88	5	05/27/88	3	10/15/88	7	12/15/88	5
01/28/88	2	03/28/88	5	05/28/88	3	10/16/88	6	12/16/88	5
01/29/88	2	03/29/88	5	05/29/88	3	10/17/88	5	12/17/88	5
01/30/88	2	03/30/88	4	05/30/88	3	10/18/88	5	12/18/88	5
01/31/88	3	03/31/88	4	05/31/88	19	10/19/88	4	12/19/88	4
02/01/88	2	04/01/88	4	06/01/88	16	10/20/88	5	12/20/88	7
02/02/88	2	04/02/88	3	06/02/88	1	10/21/88	6	12/21/88	7
02/03/88	2	04/03/88	4	06/03/88	3	10/22/88	7	12/22/88	6
02/04/88	3	04/04/88	3	06/04/88	9	10/23/88	7	12/23/88	5
02/05/88	3	04/05/88	3	06/05/88	9	10/24/88	7	12/24/88	4
02/06/88	3	04/06/88	3	06/06/88	11	10/25/88	6	12/25/88	4
02/07/88	5	04/07/88	3	06/07/88	10	10/26/88	6	12/26/88	4
02/08/88	7	04/08/88	3	06/08/88	15	10/27/88	5	12/27/88	3
02/09/88	36	04/09/88	3	06/09/88	12	10/28/88	4	12/28/88	2
02/10/88	15	04/10/88	3	06/10/88	9	10/29/88	4	12/29/88	2
02/11/88	17	04/11/88	3	06/11/88	16	10/30/88	4	12/30/88	2
02/12/88	11	04/12/88	3	06/12/88	14	10/31/88	5	12/31/88	5
02/13/88	10	04/13/88	3	06/13/88	13	11/01/88	6		
02/14/88	9	04/14/88	4	06/14/88	12	11/02/88	5		
02/15/88	9	04/15/88	5	06/15/88	11	11/03/88	5		
02/16/88	9	04/16/88	4	06/16/88	3	11/04/88	4		
02/17/88	8	04/17/88	4			11/05/88	4		
02/18/88	8	04/18/88	4			11/06/88	3		
02/19/88	8	04/19/88	2			11/07/88	4		
02/20/88	8	04/20/88	2			11/08/88	16		
02/21/88	8	04/21/88	2			11/09/88	6		
02/22/88	8	04/22/88	2			11/10/88	3		
02/23/88	7	04/23/88	2			11/11/88	3		
02/24/88	7	04/24/88	2			11/12/88	3		
02/25/88	7	04/25/88	2			11/13/88	3		
02/26/88	7	04/26/88	2			11/14/88	3		
02/27/88	7	04/27/88	3			11/15/88	3		
02/28/88	7	04/28/88	3			11/16/88	4		
02/29/88	5	04/29/88	3			11/17/88	3		
		04/30/88	3			11/18/88	3		

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/89	5	03/01/89	2	05/01/89	3	07/01/89	15	09/01/89	11	11/01/89	7
01/02/89	4	03/02/89	7	05/02/89	3	07/02/89	11	09/02/89	11	11/02/89	7
01/03/89	3	03/03/89	26	05/03/89	4	07/03/89	9	09/03/89	11	11/03/89	7
01/04/89	3	03/04/89	15	05/04/89	4	07/04/89	8	09/04/89	10	11/04/89	7
01/05/89	4	03/05/89	9	05/05/89	3	07/05/89	7	09/05/89	10	11/05/89	7
01/06/89	4	03/06/89	8	05/06/89	3	07/06/89	6	09/06/89	9	11/06/89	9
01/07/89	5	03/07/89	9	05/07/89	3	07/07/89	6	09/07/89	6	11/07/89	9
01/08/89	5	03/08/89	11	05/08/89	4	07/08/89	6	09/08/89	5	11/08/89	8
01/09/89	4	03/09/89	12	05/09/89	4	07/09/89	4	09/09/89	5	11/09/89	5
01/10/89	5	03/10/89	13	05/10/89	3	07/10/89	3	09/10/89	6	11/10/89	5
01/11/89	5	03/11/89	13	05/11/89	3	07/11/89	2	09/11/89	6	11/11/89	5
01/12/89	5	03/12/89	10	05/12/89	2	07/12/89	2	09/12/89	6	11/12/89	6
01/13/89	5	03/13/89	8	05/13/89	3	07/13/89	2	09/13/89	6	11/13/89	5
01/14/89	4	03/14/89	5	05/14/89	2	07/14/89	2	09/14/89	6	11/14/89	5
01/15/89	4	03/15/89	3	05/15/89	2	07/15/89	2	09/15/89	6	11/15/89	4
01/16/89	3	03/16/89	3	05/16/89	10	07/16/89	6	09/16/89	5	11/16/89	4
01/17/89	2	03/17/89	3	05/17/89	9	07/17/89	21	09/17/89	4	11/17/89	4
01/18/89	2	03/18/89	3	05/18/89	6	07/18/89	19	09/18/89	5	11/18/89	4
01/19/89	2	03/19/89	4	05/19/89	4	07/19/89	23	09/19/89	31	11/19/89	4
01/20/89	2	03/20/89	4	05/20/89	3	07/20/89	9	09/20/89	21	11/20/89	4
01/21/89	24	03/21/89	4	05/21/89	3	07/21/89	17	09/21/89	12	11/21/89	4
01/22/89	13	03/22/89	3	05/22/89	2	07/22/89	20	09/22/89	7	11/22/89	4
01/23/89	11	03/23/89	3	05/23/89	2	07/23/89	16	09/23/89	6	11/23/89	3
01/24/89	9	03/24/89	3	05/24/89	2	07/24/89	14	09/24/89	5	11/24/89	3
01/25/89	6	03/25/89	3	05/25/89	2	07/25/89	13	09/25/89	5	11/25/89	4
01/26/89	4	03/26/89	3	05/26/89	2	07/26/89	11	09/26/89	6	11/26/89	3
01/27/89	3	03/27/89	2	05/27/89	2	07/27/89	9	09/27/89	6	11/27/89	3
01/28/89	3	03/28/89	2	05/28/89	2	07/28/89	7	09/28/89	6	11/28/89	3
01/29/89	3	03/29/89	2	05/29/89	3	07/29/89	6	09/29/89	7	11/29/89	4
01/30/89	3	03/30/89	2	05/30/89	6	07/30/89	8	09/30/89	6	11/30/89	7
01/31/89	2	03/31/89	3	05/31/89	3	07/31/89	8	10/01/89	5	12/01/89	8
02/01/89	2	04/01/89	2	06/01/89	3	08/01/89	7	10/02/89	4	12/02/89	7
02/02/89	1	04/02/89	6	06/02/89	3	08/02/89	7	10/03/89	4	12/03/89	6
		04/03/89	4	06/03/89	2	08/03/89	7	10/04/89	4	12/04/89	6
		04/04/89	3	06/04/89	3	08/04/89	7	10/05/89	4	12/05/89	6
		04/05/89	4	06/05/89	3	08/05/89	7	10/06/89	4	12/06/89	6
		04/06/89	7	06/06/89	2	08/06/89	6	10/07/89	4	12/07/89	5
		04/07/89	7	06/07/89	6	08/07/89	6	10/08/89	4	12/08/89	5
		04/08/89	5	06/08/89	17	08/08/89	4	10/09/89	51	12/09/89	6
		04/09/89	5	06/09/89	12	08/09/89	5	10/10/89	37	12/10/89	6
		04/10/89	3	06/10/89	9	08/10/89	5	10/11/89	28	12/11/89	6
		04/11/89	2	06/11/89	7	08/11/89	8	10/12/89	23	12/12/89	4
		04/12/89	3	06/12/89	6	08/12/89	12	10/13/89	21	12/13/89	4
		04/13/89	3	06/13/89	4	08/13/89	11	10/14/89	20	12/14/89	3
		04/14/89	3	06/14/89	4	08/14/89	22	10/15/89	18	12/15/89	3
		04/15/89	4	06/15/89	4	08/15/89	14	10/16/89	11	12/16/89	3
		04/16/89	4	06/16/89	3	08/16/89	11	10/17/89	7	12/17/89	3
		04/17/89	5	06/17/89	4	08/17/89	9	10/18/89	5	12/18/89	3
		04/18/89	5	06/18/89	5	08/18/89	10	10/19/89	5	12/19/89	3
		04/19/89	5	06/19/89	4	08/19/89	10	10/20/89	28	12/20/89	4
		04/20/89	5	06/20/89	3	08/20/89	11	10/21/89	13	12/21/89	4
		04/21/89	27	06/21/89	4	08/21/89	10	10/22/89	12	12/22/89	3
		04/22/89	12	06/22/89	5	08/22/89	12	10/23/89	7	12/23/89	5
		04/23/89	9	06/23/89	5	08/23/89	21	10/24/89	5	12/24/89	4
		04/24/89	6	06/24/89	6	08/24/89	15	10/25/89	7	12/25/89	6
		04/25/89	3	06/25/89	5	08/25/89	12	10/26/89	8	12/26/89	9
		04/26/89	3	06/26/89	4	08/26/89	11	10/27/89	9	12/27/89	26
		04/27/89	3	06/27/89	3	08/27/89	13	10/28/89	11	12/28/89	5
		04/28/89	3	06/28/89	3	08/28/89	20	10/29/89	12	12/29/89	5
		04/29/89	3	06/29/89	3	08/29/89	15	10/30/89	11	12/30/89	5
		04/30/89	3	06/30/89	13	08/30/89	13	10/31/89	8	12/31/89	5
						08/31/89	12				

Hobe Grove Ditch (1979-1982; 1984-1992) Agency: USGS & WMD

DB KEYS 2988 & 5448

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/90	4	03/01/90	6	05/01/90	0	08/04/90	4	10/05/90	18	12/07/90	6
01/02/90	5	03/02/90	5	05/02/90	1	08/05/90	5	10/06/90	19	12/08/90	6
01/03/90	7	03/03/90	5	05/03/90	1	08/06/90	4	10/07/90	17	12/09/90	6
01/04/90	7	03/04/90	5	05/04/90	1	08/07/90	4	10/08/90	16	12/10/90	6
01/05/90	7	03/05/90	5	05/05/90	5	08/08/90	5	10/09/90	17	12/11/90	6
01/06/90	7	03/06/90	5	05/06/90	7	08/09/90	9	10/10/90	22	12/12/90	6
01/07/90	6	03/07/90	6	05/07/90	8	08/10/90	10	10/11/90	17	12/13/90	5
01/08/90	4	03/08/90	8	05/08/90	4	08/11/90	9	10/12/90	18	12/14/90	5
01/09/90	4	03/09/90	5	05/09/90	0	08/12/90	9	10/13/90	17	12/15/90	5
01/10/90	4	03/10/90	4	05/10/90	2	08/13/90	8	10/14/90	17	12/16/90	5
01/11/90	4	03/11/90	3	05/11/90	6	08/14/90	8	10/15/90	15	12/17/90	5
01/12/90	5	03/12/90	3	05/12/90	6	08/15/90	14	10/16/90	13	12/18/90	5
01/13/90	5	03/13/90	2	05/13/90	5	08/16/90	37	10/17/90	10	12/19/90	5
01/14/90	5	03/14/90	2	05/14/90	2	08/17/90	17	10/18/90	9	12/20/90	4
01/15/90	5	03/15/90	2	05/15/90	0	08/18/90	14	10/19/90	11	12/21/90	4
01/16/90	4	03/16/90	2	05/16/90	1	08/19/90	13	10/20/90	11	12/22/90	4
01/17/90	3	03/17/90	2	05/17/90	2	08/20/90	13	10/21/90	11	12/23/90	5
01/18/90	3	03/18/90	2	05/18/90	2	08/21/90	11	10/22/90	11	12/24/90	4
01/19/90	3	03/19/90	2	05/19/90	2	08/22/90	8	10/23/90	10	12/25/90	4
01/20/90	3	03/20/90	2	05/20/90	2	08/23/90	6	10/24/90	10	12/26/90	5
01/21/90	3	03/21/90	4	05/21/90	2	08/24/90	6	10/25/90	10	12/27/90	5
01/22/90	3	03/22/90	5	05/22/90	3	08/25/90	6	10/26/90	9	12/28/90	6
01/23/90	5	03/23/90	4	05/23/90	1	08/26/90	6	10/27/90	7	12/29/90	6
01/24/90	5	03/24/90	4			08/27/90	6	10/28/90	8	12/30/90	6
01/25/90	5	03/25/90	1	06/27/90	1	08/28/90	6	10/29/90	8	12/31/90	6
01/26/90	3	03/26/90	1	06/28/90	3	08/29/90	5	10/30/90	9	01/01/91	6
01/27/90	3	03/27/90	2	06/29/90	3	08/30/90	5	10/31/90	9	01/02/91	5
01/28/90	3	03/28/90	3	06/30/90	2	08/31/90	5	11/01/90	10	01/03/91	5
01/29/90	5	03/29/90	2	07/01/90	3	09/01/90	6	11/02/90	11	01/04/91	6
01/30/90	5	03/30/90	1	07/02/90	3	09/02/90	8	11/03/90	11	01/05/91	6
01/31/90	5	03/31/90	3	07/03/90	4	09/03/90	9	11/04/90	10	01/06/91	6
02/01/90	5	04/01/90	5	07/04/90	4	09/04/90	9	11/05/90	10	01/07/91	6
02/02/90	4	04/02/90	7	07/05/90	4	09/05/90	12	11/06/90	10	01/08/91	6
02/03/90	4	04/03/90	7	07/06/90	4	09/06/90	13	11/07/90	8	01/09/91	5
02/04/90	4	04/04/90	5	07/07/90	3	09/07/90	11	11/08/90	8	01/10/91	6
02/05/90	4	04/05/90	20	07/08/90	3	09/08/90	10	11/09/90	9	01/11/91	8
02/06/90	4	04/06/90	6	07/09/90	3	09/09/90	9	11/10/90	7	01/12/91	8
02/07/90	3	04/07/90	2	07/10/90	3	09/10/90	9	11/11/90	7	01/13/91	8
02/08/90	3	04/08/90	1	07/11/90	3	09/11/90	8	11/12/90	7	01/14/91	8
02/09/90	2	04/09/90	3	07/12/90	3	09/12/90	9	11/13/90	7	01/15/91	9
02/10/90	2	04/10/90	2	07/13/90	2	09/13/90	9	11/14/90	8	01/16/91	38
02/11/90	3	04/11/90	4	07/14/90	2	09/14/90	9	11/15/90	8	01/17/91	36
02/12/90	3	04/12/90	3	07/15/90	2	09/15/90	8	11/16/90	8	01/18/91	20
02/13/90	4	04/13/90	2	07/16/90	3	09/16/90	9	11/17/90	8	01/19/91	17
02/14/90	3	04/14/90	3	07/17/90	2	09/17/90	9	11/18/90	9	01/20/91	16
02/15/90	3	04/15/90	3	07/18/90	3	09/18/90	8	11/19/90	9	01/21/91	15
02/16/90	3	04/16/90	3	07/19/90	3	09/19/90	46	11/20/90	8	01/22/91	14
02/17/90	3	04/17/90	3	07/20/90	3	09/20/90	30	11/21/90	8	01/23/91	10
02/18/90	3	04/18/90	3	07/21/90	3	09/21/90	23	11/22/90	8	01/24/91	7
02/19/90	3	04/19/90	3	07/22/90	3	09/22/90	19	11/23/90	7	01/25/91	7
02/20/90	2	04/20/90	3	07/23/90	3	09/23/90	17	11/24/90	7	01/26/91	8
02/21/90	4	04/21/90	2	07/24/90	3	09/24/90	15	11/25/90	6	01/27/91	8
02/22/90	5	04/22/90	3	07/25/90	3	09/25/90	14	11/26/90	6	01/28/91	6
02/23/90	6	04/23/90	3	07/26/90	3	09/26/90	14	11/27/90	6	01/29/91	5
02/24/90	6	04/24/90	3	07/27/90	3	09/27/90	12	11/28/90	6	01/30/91	6
02/25/90	5	04/25/90	2	07/28/90	4	09/28/90	35	11/29/90	6	01/31/91	5
02/26/90	9	04/26/90	2	07/29/90	5	09/29/90	34	11/30/90	7	02/01/91	6
02/27/90	9	04/27/90	2	07/30/90	4	09/30/90	26	12/01/90	9	02/02/91	10
02/28/90	6	04/28/90	4	07/31/90	3	10/01/90	22	12/02/90	8	02/03/91	12
		04/29/90	3	08/01/90	3	10/02/90	19	12/03/90	8	02/04/91	44
		04/30/90	0	08/02/90	3	10/03/90	18	12/04/90	7	02/05/91	19
				08/03/90	3	10/04/90	21	12/05/90	6	02/06/91	14
								12/06/90	7	02/07/91	7
										02/08/91	2

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
12/20/79	3.6	02/21/80	3.1	04/24/80	1.1	06/26/80	2.7	08/28/80	3.4	10/30/80	4.7
12/21/79	3.4	02/22/80	2.8	04/25/80	1.1	06/27/80	3.2	08/29/80	3.2	10/31/80	4.4
12/22/79	3.2	02/23/80	2.6	04/26/80	1	06/28/80	5.8	08/30/80	2.9	11/01/80	4.2
12/23/79	2.9	02/24/80	2.3	04/27/80	0.96	06/29/80	4.9	08/31/80	2.8	11/02/80	3.9
12/24/79	2.6	02/25/80	2.2	04/28/80	0.84	06/30/80	4.8	09/01/80	5.8	11/03/80	3.3
12/25/79	2.5	02/26/80	2.1	04/29/80	0.75	07/01/80	2.5	09/02/80	18	11/04/80	2.9
12/26/79	2.3	02/27/80	2.1	04/30/80	0.66	07/02/80	8.6	09/03/80	33	11/05/80	2.6
12/27/79	2.2	02/28/80	1.9	05/01/80	0.59	07/03/80	16	09/04/80	27	11/06/80	2.3
12/28/79	2.2	02/29/80	1.7	05/02/80	0.53	07/04/80	13	09/05/80	24	11/07/80	2
12/29/79	2	03/01/80	1.7	05/03/80	0.48	07/05/80	10	09/06/80	22	11/08/80	1.8
12/30/79	2	03/02/80	3.4	05/04/80	0.47	07/06/80	7.8	09/07/80	18	11/09/80	1.7
12/31/79	1.8	03/03/80	3.7	05/05/80	0.44	07/07/80	6.1	09/08/80	16	11/10/80	1.8
01/01/80	1.7	03/04/80	3.5	05/06/80	0.41	07/08/80	6	09/09/80	14	11/11/80	2
01/02/80	1.6	03/05/80	3.4	05/07/80	0.4	07/09/80	6	09/10/80	13	11/12/80	2
01/03/80	1.5	03/06/80	3.3	05/08/80	0.43	07/10/80	5.7	09/11/80	13	11/13/80	1.9
01/04/80	1.5	03/07/80	2.9	05/09/80	0.47	07/11/80	4.7	09/12/80	12	11/14/80	1.6
01/05/80	1.5	03/08/80	2.5	05/10/80	0.43	07/12/80	4.1	09/13/80	12	11/15/80	1.9
01/06/80	1.4	03/09/80	2.2	05/11/80	0.39	07/13/80	3.4	09/14/80	13	11/16/80	2.1
01/07/80	1.4	03/10/80	2	05/12/80	0.37	07/14/80	3.1	09/15/80	12	11/17/80	6.5
01/08/80	1.2	03/11/80	1.8	05/13/80	0.34	07/15/80	2.9	09/16/80	10	11/18/80	8.4
01/09/80	1.4	03/12/80	1.6	05/14/80	0.34	07/16/80	2.8	09/17/80	7.4	11/19/80	8
01/10/80	1.3	03/13/80	1.5	05/15/80	0.36	07/17/80	2.8	09/18/80	5.7	11/20/80	7.2
01/11/80	1.2	03/14/80	1.4	05/16/80	0.32	07/18/80	3.1	09/19/80	4.4	11/21/80	6.3
01/12/80	1.2	03/15/80	1.3	05/17/80	0.3	07/19/80	4.4	09/20/80	3.6	11/22/80	5.5
01/13/80	1.2	03/16/80	1.1	05/18/80	0.29	07/20/80	11	09/21/80	3.2	11/23/80	4.7
01/14/80	1.2	03/17/80	1.1	05/19/80	0.35	07/21/80	12	09/22/80	2.6	11/24/80	5
01/15/80	1.1	03/18/80	1	05/20/80	0.53	07/22/80	9.5	09/23/80	2.8	11/25/80	8.1
01/16/80	1	03/19/80	0.93	05/21/80	0.82	07/23/80	8	09/24/80	9.6	11/26/80	8.8
01/17/80	0.93	03/20/80	0.91	05/22/80	1.2	07/24/80	9.9	09/25/80	7.9	11/27/80	9
01/18/80	0.91	03/21/80	0.91	05/23/80	3.4	07/25/80	16	09/26/80	5.8	11/28/80	8.8
01/19/80	0.89	03/22/80	0.86	05/24/80	6.8	07/26/80	26	09/27/80	5	11/29/80	8.4
01/20/80	0.86	03/23/80	0.82	05/25/80	17	07/27/80	18	09/28/80	4.4	11/30/80	9
01/21/80	0.82	03/24/80	0.77	05/26/80	62	07/28/80	13	09/29/80	3.8	12/01/80	8.4
01/22/80	0.77	03/25/80	0.66	05/27/80	52	07/29/80	11	09/30/80	3.4	12/02/80	7.8
01/23/80	0.86	03/26/80	0.63	05/28/80	46	07/30/80	9.6	10/01/80	3.1	12/03/80	7.3
01/24/80	1.1	03/27/80	0.61	05/29/80	38	07/31/80	8.4	10/02/80	2.7	12/04/80	7.1
01/25/80	0.96	03/28/80	0.59	05/30/80	35	08/01/80	7.1	10/03/80	2.4	12/05/80	6.6
01/26/80	0.89	03/29/80	0.93	05/31/80	31	08/02/80	6.4	10/04/80	2.1	12/06/80	6
01/27/80	2.3	03/30/80	4.7	06/01/80	25	08/03/80	5.3	10/05/80	1.9	12/07/80	5.5
01/28/80	2.2	03/31/80	10	06/02/80	20	08/04/80	4.3	10/06/80	1.6	12/08/80	5.1
01/29/80	2.2	04/01/80	9.3	06/03/80	16	08/05/80	3.5	10/07/80	1.4	12/09/80	4.8
01/30/80	2	04/02/80	11	06/04/80	13	08/06/80	3.1	10/08/80	1.3	12/10/80	4.4
01/31/80	1.9	04/03/80	11	06/05/80	11	08/07/80	2.7	10/09/80	4	12/11/80	4.1
02/01/80	1.8	04/04/80	10	06/06/80	8	08/08/80	2.4	10/10/80	26	12/12/80	3.8
02/02/80	1.7	04/05/80	7.9	06/07/80	6.1	08/09/80	2.2	10/11/80	23	12/13/80	3.6
02/03/80	1.6	04/06/80	5.8	06/08/80	5.6	08/10/80	2.2	10/12/80	15	12/14/80	3.3
02/04/80	1.5	04/07/80	4.4	06/09/80	4.5	08/11/80	2.1	10/13/80	11	12/15/80	3.1
02/05/80	1.4	04/08/80	3.8	06/10/80	3.4	08/12/80	2.1	10/14/80	8.6	12/16/80	3.1
02/06/80	1.3	04/09/80	3.4	06/11/80	3.5	08/13/80	2.1	10/15/80	6.6	12/17/80	3.3
02/07/80	1.2	04/10/80	3	06/12/80	3.3	08/14/80	2.2	10/16/80	10	12/18/80	3.3
02/08/80	1.1	04/11/80	2.6	06/13/80	2.9	08/15/80	2.1	10/17/80	16	12/19/80	3.1
02/09/80	1	04/12/80	2.2	06/14/80	2.7	08/16/80	2	10/18/80	28	12/20/80	3
02/10/80	1	04/13/80	1.9	06/15/80	2.4	08/17/80	1.8	10/19/80	24	12/21/80	2.9
02/11/80	1.1	04/14/80	1.7	06/16/80	2.2	08/18/80	1.9	10/20/80	19	12/22/80	4.4
02/12/80	1	04/15/80	1.6	06/17/80	2.1	08/19/80	2.8	10/21/80	15	12/23/80	5.3
02/13/80	0.82	04/16/80	1.5	06/18/80	2.1	08/20/80	4.5	10/22/80	12	12/24/80	5.7
02/14/80	0.82	04/17/80	1.4	06/19/80	1.8	08/21/80	7.8	10/23/80	11	12/25/80	5.5
02/15/80	0.98	04/18/80	1.4	06/20/80	1.8	08/22/80	6.7	10/24/80	11	12/26/80	5.3
02/16/80	1.1	04/19/80	1.3	06/21/80	1.8	08/23/80	5.8	10/25/80	10	12/27/80	5.3
02/17/80	1.1	04/20/80	1.2	06/22/80	1.8	08/24/80	4.9	10/26/80	8.5	12/28/80	5
02/18/80	1.5	04/21/80	1.2	06/23/80	1.7	08/25/80	4.7	10/27/80	7	12/29/80	4.7
02/19/80	3.2	04/22/80	1.2	06/24/80	2.2	08/26/80	3.8	10/28/80	6	12/30/80	4.3
02/20/80	3.4	04/23/80	1.2	06/25/80	2.4	08/27/80	3.6	10/29/80	5.2	12/31/80	4.1

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/81	4.1	03/01/81	0.86	05/01/81	0.07	07/01/81	0.08	09/01/81	15	11/01/81	2.8
01/02/81	3.8	03/02/81	0.98	05/02/81	0.07	07/02/81	0.11	09/02/81	14	11/02/81	2.6
01/03/81	3.6	03/03/81	0.98	05/03/81	0.06	07/03/81	0.24	09/03/81	13	11/03/81	2.5
01/04/81	3.3	03/04/81	0.8	05/04/81	0.06	07/04/81	0.24	09/04/81	12	11/04/81	2.4
01/05/81	3.1	03/05/81	0.8	05/05/81	0.06	07/05/81	0.19	09/05/81	11	11/05/81	2.2
01/06/81	3	03/06/81	0.68	05/06/81	0.06	07/06/81	0.16	09/06/81	10	11/06/81	2.1
01/07/81	2.9	03/07/81	0.6	05/07/81	0.09	07/07/81	0.18	09/07/81	9.9	11/07/81	2.1
01/08/81	2.8	03/08/81	0.48	05/08/81	0.1	07/08/81	0.14	09/08/81	9.4	11/08/81	2
01/09/81	2.7	03/09/81	0.44	05/09/81	0.08	07/09/81	0.1	09/09/81	8.8	11/09/81	1.9
01/10/81	2.6	03/10/81	0.4	05/10/81	0.07	07/10/81	0.1	09/10/81	8.2	11/10/81	1.8
01/11/81	2.5	03/11/81	0.4	05/11/81	0.07	07/11/81	0.1	09/11/81	11	11/11/81	1.7
01/12/81	2.4	03/12/81	0.34	05/12/81	0.06	07/12/81	0.09	09/12/81	17	11/12/81	1.6
01/13/81	2	03/13/81	0.38	05/13/81	0.03	07/13/81	0.09	09/13/81	21	11/13/81	1.5
01/14/81	1.7	03/14/81	0.36	05/14/81	0.06	07/14/81	0.08	09/14/81	21	11/14/81	1.4
01/15/81	1.6	03/15/81	0.32	05/15/81	0.06	07/15/81	0.08	09/15/81	18	11/15/81	1.3
01/16/81	1.7	03/16/81	0.3	05/16/81	0.06	07/16/81	0.07	09/16/81	16	11/16/81	1.3
01/17/81	1.9	03/17/81	0.29	05/17/81	0.05	07/17/81	0.07	09/17/81	18	11/17/81	1.2
01/18/81	1.9	03/18/81	0.28	05/18/81	0.05	07/18/81	0.07	09/18/81	37	11/18/81	1.2
01/19/81	1.8	03/19/81	0.3	05/19/81	0.05	07/19/81	0.08	09/19/81	32	11/19/81	1.2
01/20/81	1.8	03/20/81	0.28	05/20/81	0.07	07/20/81	0.1	09/20/81	26	11/20/81	1.1
01/21/81	1.8	03/21/81	0.27	05/21/81	0.1	07/21/81	0.15	09/21/81	39	11/21/81	1.1
01/22/81	1.8	03/22/81	0.34	05/22/81	0.08	07/22/81	0.3	09/22/81	36	11/22/81	0.98
01/23/81	1.8	03/23/81	0.59	05/23/81	0.07	07/23/81	0.6	09/23/81	41	11/23/81	0.86
01/24/81	2.2	03/24/81	0.37	05/24/81	0.06	07/24/81	1.1	09/24/81	45	11/24/81	0.76
01/25/81	2.2	03/25/81	0.38	05/25/81	0.08	07/25/81	1.5	09/25/81	37	11/25/81	0.72
01/26/81	2.2	03/26/81	0.34	05/26/81	0.09	07/26/81	1.7	09/26/81	43	11/26/81	0.68
01/27/81	2.1	03/27/81	0.31	05/27/81	0.13	07/27/81	1.1	09/27/81	32	11/27/81	0.68
01/28/81	2	03/28/81	0.28	05/28/81	0.12	07/28/81	0.6	09/28/81	26	11/28/81	0.68
01/29/81	1.8	03/29/81	0.24	05/29/81	0.1	07/29/81	0.92	09/29/81	21	11/29/81	0.6
01/30/81	1.8	03/30/81	0.23	05/30/81	0.1	07/30/81	1.3	09/30/81	17	11/30/81	0.56
01/31/81	1.7	03/31/81	0.22	05/31/81	0.15	07/31/81	1.7	10/01/81	14	12/01/81	0.52
02/01/81	1.7	04/01/81	0.2	06/01/81	0.2	08/01/81	1.5	10/02/81	13	12/02/81	0.48
02/02/81	2	04/02/81	0.21	06/02/81	0.13	08/02/81	1.2	10/03/81	11	12/03/81	0.4
02/03/81	2.2	04/03/81	0.21	06/03/81	0.13	08/03/81	0.98	10/04/81	10	12/04/81	0.38
02/04/81	2.2	04/04/81	0.19	06/04/81	0.17	08/04/81	0.76	10/05/81	8.6	12/05/81	0.36
02/05/81	2.1	04/05/81	0.18	06/05/81	0.14	08/05/81	0.6	10/06/81	7.5	12/06/81	0.34
02/06/81	2	04/06/81	0.18	06/06/81	0.12	08/06/81	0.44	10/07/81	7.1	12/07/81	0.32
02/07/81	1.9	04/07/81	0.16	06/07/81	0.14	08/07/81	0.34	10/08/81	6.5	12/08/81	0.32
02/08/81	2	04/08/81	0.17	06/08/81	0.24	08/08/81	0.26	10/09/81	6.3	12/09/81	0.3
02/09/81	2	04/09/81	0.16	06/09/81	0.18	08/09/81	0.17	10/10/81	6.1	12/10/81	0.28
02/10/81	2	04/10/81	0.16	06/10/81	0.28	08/10/81	0.13	10/11/81	5.7	12/11/81	0.26
02/11/81	2.5	04/11/81	0.15	06/11/81	0.3	08/11/81	0.26	10/12/81	5.5	12/12/81	0.24
02/12/81	3	04/12/81	0.15	06/12/81	0.2	08/12/81	0.56	10/13/81	5.4	12/13/81	0.24
02/13/81	3.7	04/13/81	0.16	06/13/81	0.17	08/13/81	1.1	10/14/81	5.2	12/14/81	0.26
02/14/81	3.9	04/14/81	0.16	06/14/81	0.16	08/14/81	1.7	10/15/81	5.1	12/15/81	0.24
02/15/81	3.9	04/15/81	0.17	06/15/81	0.15	08/15/81	2.3	10/16/81	4.9	12/16/81	0.24
02/16/81	3.7	04/16/81	0.12	06/16/81	0.13	08/16/81	3.2	10/17/81	4.8	12/17/81	0.22
02/17/81	3.4	04/17/81	0.11	06/17/81	0.11	08/17/81	5	10/18/81	4.6	12/18/81	0.22
02/18/81	3.6	04/18/81	0.1	06/18/81	0.11	08/18/81	9	10/19/81	4.5	12/19/81	0.2
02/19/81	3.7	04/19/81	0.1	06/19/81	0.11	08/19/81	16	10/20/81	4.3	12/20/81	0.22
02/20/81	3.4	04/20/81	0.09	06/20/81	0.15	08/20/81	25	10/21/81	4.2	12/21/81	0.22
02/21/81	3	04/21/81	0.09	06/21/81	0.15	08/21/81	27	10/22/81	4.1	12/22/81	0.28
02/22/81	2.6	04/22/81	0.09	06/22/81	0.13	08/22/81	28	10/23/81	4	12/23/81	0.24
02/23/81	2.4	04/23/81	0.09	06/23/81	0.11	08/23/81	29	10/24/81	3.9	12/24/81	0.24
02/24/81	2.1	04/24/81	0.08	06/24/81	0.1	08/24/81	33	10/25/81	3.7	12/25/81	0.26
02/25/81	1.9	04/25/81	0.08	06/25/81	0.09	08/25/81	34	10/26/81	3.6	12/26/81	0.24
02/26/81	1.6	04/26/81	0.08	06/26/81	0.09	08/26/81	30	10/27/81	3.5	12/27/81	0.22
02/27/81	1.3	04/27/81	0.08	06/27/81	0.09	08/27/81	27	10/28/81	3.3	12/28/81	0.22
02/28/81	0.86	04/28/81	0.08	06/28/81	0.1	08/28/81	23	10/29/81	3.2	12/29/81	0.26
		04/29/81	0.07	06/29/81	0.09	08/29/81	20	10/30/81	3.1	12/30/81	0.34
		04/30/81	0.07	06/30/81	0.08	08/30/81	18	10/31/81	3	12/31/81	0.38
						08/31/81	16				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/82	0.36	03/01/82	3	08/23/84	1.6	10/23/84	2.5	12/24/84	6.4
01/02/82	0.36	03/02/82	2.7	08/24/84	1.2	10/24/84	2.2	12/25/84	5.8
01/03/82	0.36	03/03/82	2.5	08/25/84	0.91	10/25/84	1.8	12/26/84	5.4
01/04/82	0.4	03/04/82	2.5	08/26/84	1.1	10/26/84	1.9	12/27/84	5.3
01/05/82	0.76	03/05/82	4.8	08/27/84	1.4	10/27/84	1.9	12/28/84	5.2
01/06/82	0.76	03/06/82	17	08/28/84	1.6	10/28/84	1.9	12/29/84	4.1
01/07/82	0.6	03/07/82	35	08/29/84	1.8	10/29/84	1.8	12/30/84	3.7
01/08/82	0.56	03/08/82	55	08/30/84	1.8	10/30/84	1.6	12/31/84	3.4
01/09/82	0.64	03/09/82	46	08/31/84	1.9	10/31/84	1.3		
01/10/82	0.52	03/10/82	36	09/01/84	2.1	11/01/84	1.2		
01/11/82	0.4	03/11/82	31	09/02/84	2.2	11/02/84	1.2		
01/12/82	0.4	03/12/82	29	09/03/84	2.3	11/03/84	1.6		
01/13/82	0.44	03/13/82	26	09/04/84	2.3	11/04/84	2.6		
01/14/82	0.92	03/14/82	21	09/05/84	2.3	11/05/84	2.6		
01/15/82	1.2	03/15/82	17	09/06/84	2.1	11/06/84	2.5		
01/16/82	1.3	03/16/82	14	09/07/84	2.2	11/07/84	2.3		
01/17/82	1.5	03/17/82	11	09/08/84	2.4	11/08/84	2.1		
01/18/82	1.2	03/18/82	8.9	09/09/84	2.4	11/09/84	1.8		
01/19/82	0.68	03/19/82	7.2	09/10/84	1.7	11/10/84	1.6		
01/20/82	0.44	03/20/82	6.2	09/11/84	0.61	11/11/84	1.4		
01/21/82	0.4	03/21/82	5.5	09/12/84	0.51	11/12/84	1.2		
01/22/82	0.36	03/22/82	5	09/13/84	0.5	11/13/84	1		
01/23/82	0.32	03/23/82	5.5	09/14/84	0.49	11/14/84	0.92		
01/24/82	0.3	03/24/82	9.1	09/15/84	0.55	11/15/84	0.78		
01/25/82	0.32	03/25/82	20	09/16/84	0.58	11/16/84	0.7		
01/26/82	0.3	03/26/82	33	09/17/84	0.59	11/17/84	0.65		
01/27/82	0.28	03/27/82	31	09/18/84	1.1	11/18/84	0.59		
01/28/82	0.28	03/28/82	29	09/19/84	16	11/19/84	0.57		
01/29/82	0.28	03/29/82	136	09/20/84	10	11/20/84	0.58		
01/30/82	0.26	03/30/82	123	09/21/84	12	11/21/84	1.2		
01/31/82	0.26	03/31/82	109	09/22/84	36	11/22/84	38		
02/01/82	1.4			09/23/84	21	11/23/84	169		
02/02/82	2.8			09/24/84	13	11/24/84	199		
02/03/82	3.1			09/25/84	9.3	11/25/84	134		
02/04/82	3			09/26/84	7	11/26/84	107		
02/05/82	3.3			09/27/84	42	11/27/84	92		
02/06/82	3.3			09/28/84	95	11/28/84	80		
02/07/82	4			09/29/84	61	11/29/84	73		
02/08/82	6.8			09/30/84	48	11/30/84	67		
02/09/82	10			10/01/84	40	12/01/84	60		
02/10/82	10			10/02/84	35	12/02/84	55		
02/11/82	8.9			10/03/84	29	12/03/84	50		
02/12/82	7.4			10/04/84	24	12/04/84	45		
02/13/82	6.6			10/05/84	20	12/05/84	40		
02/14/82	6.1			10/06/84	16	12/06/84	35		
02/15/82	5.6			10/07/84	14	12/07/84	30		
02/16/82	5.4			10/08/84	12	12/08/84	30		
02/17/82	6			10/09/84	11	12/09/84	25		
02/18/82	8.9			10/10/84	9.3	12/10/84	25		
02/19/82	10			10/11/84	8	12/11/84	20		
02/20/82	9			10/12/84	7.8	12/12/84	20		
02/21/82	7.7			10/13/84	7	12/13/84	18		
02/22/82	6.7			10/14/84	6.1	12/14/84	15		
02/23/82	5.8			10/15/84	5.3	12/15/84	15		
02/24/82	5.1			10/16/84	4.7	12/16/84	12		
02/25/82	4.6			10/17/84	4.4	12/17/84	11		
02/26/82	4			10/18/84	3.4	12/18/84	11		
02/27/82	3.6			10/19/84	2.9	12/19/84	9.7		
02/28/82	3.3			10/20/84	2.6	12/20/84	9.4		
				10/21/84	2.9	12/21/84	8.6		
				10/22/84	2.9	12/22/84	7.8		
						12/23/84	7		

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/85	3.3	03/01/85	0.27	05/01/85	1.6	07/01/85	0.62	09/01/85	2.9	11/01/85	14
01/02/85	3.9	03/02/85	0.26	05/02/85	1.3	07/02/85	0.58	09/02/85	2.6	11/02/85	13
01/03/85	3.9	03/03/85	0.24	05/03/85	0.9	07/03/85	0.55	09/03/85	2.9	11/03/85	12
01/04/85	4.2	03/04/85	0.21	05/04/85	0.76	07/04/85	0.51	09/04/85	3.3	11/04/85	13
01/05/85	4.4	03/05/85	0.19	05/05/85	0.71	07/05/85	0.43	09/05/85	16	11/05/85	13
01/06/85	4	03/06/85	0.19	05/06/85	0.55	07/06/85	0.38	09/06/85	46	11/06/85	12
01/07/85	3.6	03/07/85	0.19	05/07/85	0.44	07/07/85	0.33	09/07/85	29	11/07/85	12
01/08/85	3.4	03/08/85	0.19	05/08/85	0.35	07/08/85	0.3	09/08/85	20	11/08/85	10
01/09/85	3.1	03/09/85	0.17	05/09/85	0.29	07/09/85	0.27	09/09/85	16	11/09/85	8.9
01/10/85	2.9	03/10/85	0.17	05/10/85	0.26	07/10/85	0.27	09/10/85	13	11/10/85	8.5
01/11/85	2.7	03/11/85	0.18	05/11/85	0.27	07/11/85	0.26	09/11/85	10	11/11/85	8.5
01/12/85	2.5	03/12/85	0.16	05/12/85	0.25	07/12/85	0.27	09/12/85	8.2	11/12/85	8.8
01/13/85	2.3	03/13/85	0.15	05/13/85	0.19	07/13/85	0.25	09/13/85	6.8	11/13/85	8.7
01/14/85	2.2	03/14/85	0.14	05/14/85	0.16	07/14/85	0.27	09/14/85	8.1	11/14/85	8.8
01/15/85	2	03/15/85	0.14	05/15/85	0.15	07/15/85	0.93	09/15/85	9.9	11/15/85	8.3
01/16/85	1.9	03/16/85	0.17	05/16/85	0.15	07/16/85	0.74	09/16/85	10	11/16/85	7.4
01/17/85	1.8	03/17/85	0.32	05/17/85	0.17	07/17/85	0.57	09/17/85	8.9	11/17/85	7
01/18/85	1.8	03/18/85	0.28	05/18/85	0.09	07/18/85	0.57	09/18/85	61	11/18/85	7.5
01/19/85	2.4	03/19/85	0.2	05/19/85	0.08	07/19/85	4.6	09/19/85	122	11/19/85	7.3
01/20/85	2.3	03/20/85	0.16	05/20/85	0.2	07/20/85	3.3	09/20/85	93	11/20/85	6.5
01/21/85	2.1	03/21/85	0.45	05/21/85	0.24	07/21/85	3.2	09/21/85	71	11/21/85	6.4
01/22/85	1.9	03/22/85	0.87	05/22/85	0.2	07/22/85	3.4	09/22/85	61	11/22/85	6.3
01/23/85	1.8	03/23/85	0.63	05/23/85	0.17	07/23/85	5.8	09/23/85	54	11/23/85	5.9
01/24/85	1.7	03/24/85	0.6	05/24/85	0.18	07/24/85	6.2	09/24/85	49	11/24/85	5.6
01/25/85	2	03/25/85	0.55	05/25/85	0.19	07/25/85	5.6	09/25/85	46	11/25/85	5.3
01/26/85	2.2	03/26/85	0.5	05/26/85	0.18	07/26/85	4.6	09/26/85	42	11/26/85	5
01/27/85	1.9	03/27/85	0.46	05/27/85	0.18	07/27/85	3.9	09/27/85	39	11/27/85	4.6
01/28/85	1.7	03/28/85	0.44	05/28/85	0.12	07/28/85	3.2	09/28/85	49	11/28/85	4.4
01/29/85	1.6	03/29/85	0.41	05/29/85	0.1	07/29/85	2.6	09/29/85	45	11/29/85	4
01/30/85	1.4	03/30/85	0.38	05/30/85	0.09	07/30/85	2.4	09/30/85	43	11/30/85	3.7
01/31/85	1.4	03/31/85	0.39	05/31/85	0.08	07/31/85	2.1	10/01/85	37	12/01/85	3.5
02/01/85	1.3	04/01/85	0.39	06/01/85	0.08	08/01/85	1.7	10/02/85	44	12/02/85	2.9
02/02/85	1.4	04/02/85	0.46	06/02/85	0.08	08/02/85	1.5	10/03/85	53	12/03/85	2.4
02/03/85	1.4	04/03/85	0.48	06/03/85	0.07	08/03/85	1.5	10/04/85	54	12/04/85	2.5
02/04/85	1.3	04/04/85	0.38	06/04/85	0.07	08/04/85	1.3	10/05/85	54	12/05/85	63
02/05/85	1.2	04/05/85	0.34	06/05/85	0.07	08/05/85	1.1	10/06/85	46	12/06/85	132
02/06/85	1.2	04/06/85	0.31	06/06/85	0.07	08/06/85	1	10/07/85	40	12/07/85	95
02/07/85	1.1	04/07/85	0.29	06/07/85	0.07	08/07/85	1.1	10/08/85	35	12/08/85	80
02/08/85	0.96	04/08/85	0.27	06/08/85	0.07	08/08/85	1.3	10/09/85	32	12/09/85	74
02/09/85	0.91	04/09/85	0.27	06/09/85	0.09	08/09/85	1.4	10/10/85	30	12/10/85	71
02/10/85	0.82	04/10/85	0.23	06/10/85	0.19	08/10/85	1.3	10/11/85	28	12/11/85	67
02/11/85	0.78	04/11/85	0.21	06/11/85	0.19	08/11/85	1.2	10/12/85	25	12/12/85	62
02/12/85	0.86	04/12/85	0.22	06/12/85	0.19	08/12/85	1.1	10/13/85	23	12/13/85	57
02/13/85	0.91	04/13/85	0.66	06/13/85	0.21	08/13/85	1.2	10/14/85	22	12/14/85	52
02/14/85	0.73	04/14/85	0.68	06/14/85	0.26	08/14/85	1	10/15/85	20	12/15/85	48
02/15/85	0.7	04/15/85	1.2	06/15/85	0.25	08/15/85	0.93	10/16/85	18	12/16/85	44
02/16/85	0.66	04/16/85	1.2	06/16/85	0.21	08/16/85	0.92	10/17/85	16	12/17/85	42
02/17/85	0.57	04/17/85	1.2	06/17/85	0.18	08/17/85	0.92	10/18/85	15	12/18/85	40
02/18/85	0.53	04/18/85	1.1	06/18/85	0.13	08/18/85	0.81	10/19/85	16	12/19/85	37
02/19/85	0.53	04/19/85	0.92	06/19/85	0.11	08/19/85	0.76	10/20/85	18	12/20/85	34
02/20/85	0.48	04/20/85	0.91	06/20/85	0.61	08/20/85	1.3	10/21/85	19	12/21/85	30
02/21/85	0.46	04/21/85	0.94	06/21/85	0.74	08/21/85	1.8	10/22/85	17	12/22/85	28
02/22/85	0.46	04/22/85	0.94	06/22/85	0.57	08/22/85	1.7	10/23/85	15	12/23/85	26
02/23/85	0.42	04/23/85	0.83	06/23/85	0.48	08/23/85	1.5	10/24/85	13	12/24/85	25
02/24/85	0.36	04/24/85	0.69	06/24/85	0.45	08/24/85	1.4	10/25/85	13	12/25/85	27
02/25/85	0.31	04/25/85	0.59	06/25/85	0.91	08/25/85	1.2	10/26/85	12	12/26/85	26
02/26/85	0.3	04/26/85	0.52	06/26/85	0.85	08/26/85	1	10/27/85	11	12/27/85	25
02/27/85	0.29	04/27/85	0.45	06/27/85	0.9	08/27/85	1.6	10/28/85	12	12/28/85	25
02/28/85	0.27	04/28/85	0.39	06/28/85	0.8	08/28/85	1.6	10/29/85	15	12/29/85	25
		04/29/85	0.76	06/29/85	0.69	08/29/85	1.8	10/30/85	15	12/30/85	24
		04/30/85	1.4	06/30/85	0.62	08/30/85	2	10/31/85	15	12/31/85	22
						08/31/85	2.8				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/86	20	03/01/86	4.7	05/01/86	2.9	07/01/86	29	09/01/86	11	11/01/86	24
01/02/86	20	03/02/86	4.6	05/02/86	2.5	07/02/86	32	09/02/86	9.8	11/02/86	18
01/03/86	20	03/03/86	4.4	05/03/86	1.9	07/03/86	32	09/03/86	9	11/03/86	15
01/04/86	18	03/04/86	4.1	05/04/86	2	07/04/86	38	09/04/86	8.4	11/04/86	14
01/05/86	16	03/05/86	3.9	05/05/86	2	07/05/86	43	09/05/86	8.3	11/05/86	13
01/06/86	15	03/06/86	3.7	05/06/86	1.8	07/06/86	33	09/06/86	8.4	11/06/86	12
01/07/86	15	03/07/86	3.5	05/07/86	1.6	07/07/86	28	09/07/86	9.7	11/07/86	11
01/08/86	22	03/08/86	3.3	05/08/86	1.4	07/08/86	24	09/08/86	10	11/08/86	9.7
01/09/86	68	03/09/86	3.1	05/09/86	1.3	07/09/86	22	09/09/86	12	11/09/86	8.9
01/10/86	88	03/10/86	4.2	05/10/86	1.3	07/10/86	20	09/10/86	12	11/10/86	8.1
01/11/86	71	03/11/86	4.5	05/11/86	1.2	07/11/86	19	09/11/86	11	11/11/86	7.5
01/12/86	62	03/12/86	4.3	05/12/86	1	07/12/86	21	09/12/86	9.6	11/12/86	7.6
01/13/86	56	03/13/86	4.4	05/13/86	0.95	07/13/86	19	09/13/86	8.3	11/13/86	7.7
01/14/86	52	03/14/86	4.9	05/14/86	0.87	07/14/86	18	09/14/86	7.2	11/14/86	8.3
01/15/86	48	03/15/86	5.9	05/15/86	0.95	07/15/86	16	09/15/86	6.6	11/15/86	8.5
01/16/86	44	03/16/86	6.6	05/16/86	0.87	07/16/86	15	09/16/86	5.1	11/16/86	8.3
01/17/86	41	03/17/86	6.8	05/17/86	0.84	07/17/86	13	09/17/86	3.9	11/17/86	8
01/18/86	39	03/18/86	6.3	05/18/86	0.78	07/18/86	12	09/18/86	3.3	11/18/86	7.6
01/19/86	36	03/19/86	5.7	05/19/86	0.71	07/19/86	11	09/19/86	3	11/19/86	7
01/20/86	32	03/20/86	5.1	05/20/86	0.67	07/20/86	9.6	09/20/86	4.7	11/20/86	6.5
01/21/86	30	03/21/86	5	05/21/86	0.67	07/21/86	8.6	09/21/86	5.2	11/21/86	6.1
01/22/86	28	03/22/86	4.8	05/22/86	0.79	07/22/86	8	09/22/86	9.3	11/22/86	5.7
01/23/86	25	03/23/86	4.5	05/23/86	0.7	07/23/86	7.9	09/23/86	11	11/23/86	5.3
01/24/86	23	03/24/86	4.2	05/24/86	0.64	07/24/86	9.8	09/24/86	8.8	11/24/86	5
01/25/86	21	03/25/86	3.8	05/25/86	0.57	07/25/86	12	09/25/86	6.8	11/25/86	4.8
01/26/86	19	03/26/86	4.2	05/26/86	0.52	07/26/86	24	09/26/86	6.1	11/26/86	4.5
01/27/86	18	03/27/86	8.6	05/27/86	0.48	07/27/86	27	09/27/86	5.3	11/27/86	4.2
01/28/86	17	03/28/86	12	05/28/86	0.42	07/28/86	28	09/28/86	4.6	11/28/86	4
01/29/86	16	03/29/86	40	05/29/86	0.37	07/29/86	27	09/29/86	3.7	11/29/86	3.8
01/30/86	15	03/30/86	54	05/30/86	0.33	07/30/86	22	09/30/86	3.3	11/30/86	3.8
01/31/86	14	03/31/86	46	05/31/86	0.3	07/31/86	18	10/01/86	3.2	12/01/86	4.2
02/01/86	13	04/01/86	44	06/01/86	0.3	08/01/86	15	10/02/86	3.2	12/02/86	4.2
02/02/86	13	04/02/86	44	06/02/86	0.36	08/02/86	13	10/03/86	2.6	12/03/86	4.3
02/03/86	12	04/03/86	39	06/03/86	0.34	08/03/86	11	10/04/86	2.2	12/04/86	4.3
02/04/86	11	04/04/86	35	06/04/86	0.34	08/04/86	9.7	10/05/86	2.4	12/05/86	4.4
02/05/86	11	04/05/86	31	06/05/86	0.35	08/05/86	12	10/06/86	2	12/06/86	5.2
02/06/86	9.9	04/06/86	26	06/06/86	0.33	08/06/86	14	10/07/86	1.5	12/07/86	5.4
02/07/86	9.5	04/07/86	24	06/07/86	0.86	08/07/86	15	10/08/86	1.4	12/08/86	5.3
02/08/86	9.3	04/08/86	21	06/08/86	1.1	08/08/86	14	10/09/86	1.4	12/09/86	5.1
02/09/86	8.6	04/09/86	17	06/09/86	0.99	08/09/86	14	10/10/86	1.5	12/10/86	4.9
02/10/86	8	04/10/86	16	06/10/86	0.93	08/10/86	13	10/11/86	1.2	12/11/86	4.7
02/11/86	7.5	04/11/86	14	06/11/86	0.86	08/11/86	13	10/12/86	1.4	12/12/86	4.5
02/12/86	6.9	04/12/86	12	06/12/86	0.85	08/12/86	16	10/13/86	1.3	12/13/86	4.3
02/13/86	6.4	04/13/86	12	06/13/86	0.81	08/13/86	18	10/14/86	1.1	12/14/86	4.1
02/14/86	6	04/14/86	10	06/14/86	0.73	08/14/86	22	10/15/86	1.2	12/15/86	3.9
02/15/86	5.7	04/15/86	9.2	06/15/86	2.4	08/15/86	26	10/16/86	1.6	12/16/86	3.7
02/16/86	5.5	04/16/86	8.1	06/16/86	2.3	08/16/86	32	10/17/86	1.6	12/17/86	3.5
02/17/86	5.3	04/17/86	7.2	06/17/86	7.3	08/17/86	25	10/18/86	1.5	12/18/86	3.4
02/18/86	6.1	04/18/86	6.4	06/18/86	12	08/18/86	29	10/19/86	5.9	12/19/86	3.2
02/19/86	6.9	04/19/86	5.8	06/19/86	13	08/19/86	50	10/20/86	9.5	12/20/86	3.1
02/20/86	6.8	04/20/86	5.3	06/20/86	19	08/20/86	49	10/21/86	13	12/21/86	2.9
02/21/86	6.6	04/21/86	4.7	06/21/86	27	08/21/86	42	10/22/86	16	12/22/86	2.7
02/22/86	6.2	04/22/86	4.1	06/22/86	42	08/22/86	33	10/23/86	16	12/23/86	2.7
02/23/86	5.7	04/23/86	3.6	06/23/86	37	08/23/86	28	10/24/86	14	12/24/86	2.8
02/24/86	5.3	04/24/86	3.2	06/24/86	39	08/24/86	23	10/25/86	13	12/25/86	2.9
02/25/86	4.9	04/25/86	2.9	06/25/86	33	08/25/86	20	10/26/86	13	12/26/86	3.3
02/26/86	4.5	04/26/86	2.6	06/26/86	33	08/26/86	17	10/27/86	12	12/27/86	8.8
02/27/86	4.2	04/27/86	2.3	06/27/86	31	08/27/86	15	10/28/86	11	12/28/86	11
02/28/86	4.3	04/28/86	2	06/28/86	29	08/28/86	14	10/29/86	11	12/29/86	11
		04/29/86	2.1	06/29/86	29	08/29/86	14	10/30/86	11	12/30/86	11
		04/30/86	2.4	06/30/86	29	08/30/86	13	10/31/86	19	12/31/86	12
						08/31/86	11				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/87	28	03/01/87	3	05/01/87	0.85	07/01/87	1.5	09/01/87	0.66	11/01/87	15
01/02/87	21	03/02/87	2.8	05/02/87	0.86	07/02/87	1.5	09/02/87	0.53	11/02/87	25
01/03/87	17	03/03/87	2.9	05/03/87	0.84	07/03/87	1.4	09/03/87	0.51	11/03/87	37
01/04/87	19	03/04/87	3.5	05/04/87	0.79	07/04/87	1.3	09/04/87	0.84	11/04/87	203
01/05/87	27	03/05/87	3.2	05/05/87	0.76	07/05/87	1.1	09/05/87	1.3	11/05/87	101
01/06/87	25	03/06/87	3.1	05/06/87	0.73	07/06/87	1.1	09/06/87	1.6	11/06/87	82
01/07/87	23	03/07/87	16	05/07/87	0.73	07/07/87	0.95	09/07/87	1.5	11/07/87	76
01/08/87	20	03/08/87	22	05/08/87	0.81	07/08/87	0.83	09/08/87	1.4	11/08/87	68
01/09/87	18	03/09/87	18	05/09/87	1.1	07/09/87	0.71	09/09/87	1.3	11/09/87	64
01/10/87	17	03/10/87	16	05/10/87	3	07/10/87	0.57	09/10/87	1.2	11/10/87	60
01/11/87	16	03/11/87	14	05/11/87	6.2	07/11/87	0.51	09/11/87	1.1	11/11/87	59
01/12/87	14	03/12/87	13	05/12/87	7.2	07/12/87	0.47	09/12/87	0.96	11/12/87	55
01/13/87	14	03/13/87	12	05/13/87	6.6	07/13/87	0.41	09/13/87	1.1	11/13/87	51
01/14/87	12	03/14/87	10	05/14/87	6.5	07/14/87	0.72	09/14/87	1.5	11/14/87	47
01/15/87	12	03/15/87	9.3	05/15/87	6.3	07/15/87	0.89	09/15/87	1.3	11/15/87	43
01/16/87	11	03/16/87	8.3	05/16/87	5.7	07/16/87	0.82	09/16/87	1.2	11/16/87	39
01/17/87	10	03/17/87	7.4	05/17/87	4.9	07/17/87	0.82	09/17/87	1.2	11/17/87	37
01/18/87	9.8	03/18/87	6.7	05/18/87	4.5	07/18/87	0.93	09/18/87	1.1	11/18/87	35
01/19/87	9.3	03/19/87	6.2	05/19/87	4	07/19/87	1.3	09/19/87	1	11/19/87	57
01/20/87	9	03/20/87	5.6	05/20/87	3.4	07/20/87	1.4	09/20/87	0.93	11/20/87	76
01/21/87	8.4	03/21/87	5.1	05/21/87	3	07/21/87	1.3	09/21/87	0.89	11/21/87	60
01/22/87	8.3	03/22/87	4.7	05/22/87	2.5	07/22/87	1.2	09/22/87	0.84	11/22/87	53
01/23/87	8.5	03/23/87	4.3	05/23/87	2.2	07/23/87	1.1	09/23/87	1.7	11/23/87	49
01/24/87	8	03/24/87	4.2	05/24/87	1.9	07/24/87	1	09/24/87	3.1	11/24/87	46
01/25/87	7.7	03/25/87	4	05/25/87	1.7	07/25/87	0.95	09/25/87	3.8	11/25/87	42
01/26/87	7.2	03/26/87	3.8	05/26/87	1.5	07/26/87	0.97	09/26/87	3.9	11/26/87	39
01/27/87	6.8	03/27/87	4.5	05/27/87	1.3	07/27/87	0.91	09/27/87	3.7	11/27/87	36
01/28/87	6.4	03/28/87	4.6	05/28/87	1.3	07/28/87	0.83	09/28/87	3.4	11/28/87	34
01/29/87	6	03/29/87	5.4	05/29/87	1.1	07/29/87	0.75	09/29/87	3	11/29/87	31
01/30/87	5.7	03/30/87	8.4	05/30/87	1	07/30/87	1.6	09/30/87	2.8	11/30/87	29
01/31/87	5.5	03/31/87	15	05/31/87	0.97	07/31/87	2.1	10/01/87	3.5	12/01/87	27
02/01/87	5.1	04/01/87	17	06/01/87	0.9	08/01/87	1.9	10/02/87	4.1	12/02/87	25
02/02/87	4.9	04/02/87	14	06/02/87	0.82	08/02/87	1.7	10/03/87	3.6	12/03/87	22
02/03/87	4.6	04/03/87	13	06/03/87	0.77	08/03/87	1.4	10/04/87	3	12/04/87	21
02/04/87	4.4	04/04/87	11	06/04/87	0.68	08/04/87	1.5	10/05/87	2.4	12/05/87	20
02/05/87	4.5	04/05/87	9.6	06/05/87	0.61	08/05/87	1.7	10/06/87	2	12/06/87	18
02/06/87	4.8	04/06/87	8.4	06/06/87	0.52	08/06/87	1.6	10/07/87	1.8	12/07/87	16
02/07/87	4.9	04/07/87	7.4	06/07/87	0.65	08/07/87	1.5	10/08/87	1.4	12/08/87	15
02/08/87	4.9	04/08/87	6.6	06/08/87	0.58	08/08/87	1.3	10/09/87	1.3	12/09/87	14
02/09/87	4.6	04/09/87	5.8	06/09/87	0.52	08/09/87	1.3	10/10/87	2.3	12/10/87	14
02/10/87	4.3	04/10/87	5.1	06/10/87	0.51	08/10/87	1.2	10/11/87	6.3	12/11/87	13
02/11/87	4.1	04/11/87	4.6	06/11/87	0.47	08/11/87	1.1	10/12/87	86	12/12/87	12
02/12/87	3.9	04/12/87	4	06/12/87	0.41	08/12/87	0.99	10/13/87	90	12/13/87	12
02/13/87	3.7	04/13/87	3.7	06/13/87	0.37	08/13/87	0.96	10/14/87	51	12/14/87	11
02/14/87	3.6	04/14/87	3.3	06/14/87	0.35	08/14/87	0.96	10/15/87	45	12/15/87	11
02/15/87	3.3	04/15/87	3.8	06/15/87	0.32	08/15/87	0.93	10/16/87	38	12/16/87	10
02/16/87	3.3	04/16/87	3.9	06/16/87	0.3	08/16/87	0.81	10/17/87	33	12/17/87	9.4
02/17/87	3.8	04/17/87	3.4	06/17/87	0.35	08/17/87	0.7	10/18/87	30	12/18/87	9
02/18/87	3.8	04/18/87	3.1	06/18/87	0.39	08/18/87	0.52	10/19/87	28	12/19/87	8.7
02/19/87	3.7	04/19/87	2.8	06/19/87	0.38	08/19/87	0.44	10/20/87	26	12/20/87	8.3
02/20/87	3.9	04/20/87	2.5	06/20/87	0.33	08/20/87	0.43	10/21/87	23	12/21/87	7.8
02/21/87	4.4	04/21/87	2.3	06/21/87	0.29	08/21/87	0.39	10/22/87	20	12/22/87	7.2
02/22/87	4.2	04/22/87	2.1	06/22/87	0.36	08/22/87	0.46	10/23/87	17	12/23/87	6.8
02/23/87	3.9	04/23/87	1.9	06/23/87	0.6	08/23/87	1.9	10/24/87	16	12/24/87	6.5
02/24/87	3.6	04/24/87	1.7	06/24/87	0.59	08/24/87	1.6	10/25/87	15	12/25/87	6
02/25/87	3.6	04/25/87	1.5	06/25/87	0.55	08/25/87	1.3	10/26/87	14	12/26/87	5.6
02/26/87	3.4	04/26/87	1.4	06/26/87	0.58	08/26/87	1.1	10/27/87	13	12/27/87	5.4
02/27/87	3.3	04/27/87	1.3	06/27/87	0.53	08/27/87	1	10/28/87	12	12/28/87	5.2
02/28/87	3.2	04/28/87	1.2	06/28/87	2.1	08/28/87	0.9	10/29/87	11	12/29/87	4.9
		04/29/87	1.1	06/29/87	1.9	08/29/87	0.78	10/30/87	9.8	12/30/87	4.7
		04/30/87	1	06/30/87	1.5	08/30/87	0.61	10/31/87	9.3	12/31/87	4.6
						08/31/87	0.61				

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/88	4.6	03/01/88	7.7	05/01/88	3.1	07/01/88	5.7	09/01/88	14	11/01/88	0.47
01/02/88	5	03/02/88	7.1	05/02/88	5.1	07/02/88	7	09/02/88	13	11/02/88	0.45
01/03/88	5.7	03/03/88	6.6	05/03/88	5.3	07/03/88	6.7	09/03/88	12	11/03/88	0.47
01/04/88	5.7	03/04/88	6.2	05/04/88	4.8	07/04/88	6.1	09/04/88	11	11/04/88	0.85
01/05/88	5.6	03/05/88	6.6	05/05/88	4.4	07/05/88	5.5	09/05/88	9.5	11/05/88	0.98
01/06/88	5.6	03/06/88	7.1	05/06/88	3.8	07/06/88	6.1	09/06/88	9.2	11/06/88	1.2
01/07/88	5.6	03/07/88	7.2	05/07/88	3.4	07/07/88	8	09/07/88	8.6	11/07/88	1.1
01/08/88	5.6	03/08/88	7.1	05/08/88	3	07/08/88	8.9	09/08/88	8.3	11/08/88	1.1
01/09/88	5.9	03/09/88	6.8	05/09/88	2.6	07/09/88	9	09/09/88	7.6	11/09/88	1
01/10/88	8	03/10/88	6.9	05/10/88	2.3	07/10/88	9.1	09/10/88	7	11/10/88	1
01/11/88	9.3	03/11/88	6.8	05/11/88	2	07/11/88	8.2	09/11/88	6.5	11/11/88	0.97
01/12/88	9.3	03/12/88	6.6	05/12/88	1.7	07/12/88	7.2	09/12/88	6	11/12/88	0.9
01/13/88	8.9	03/13/88	6.2	05/13/88	1.5	07/13/88	11	09/13/88	5.3	11/13/88	0.87
01/14/88	8.5	03/14/88	6.3	05/14/88	2.3	07/14/88	28	09/14/88	4.8	11/14/88	0.82
01/15/88	8.2	03/15/88	5.8	05/15/88	3.3	07/15/88	18	09/15/88	4.4	11/15/88	1.1
01/16/88	7.7	03/16/88	5.4	05/16/88	3.2	07/16/88	14	09/16/88	4.2	11/16/88	0.84
01/17/88	7.2	03/17/88	5.1	05/17/88	3.2	07/17/88	12	09/17/88	3.9	11/17/88	0.84
01/18/88	6.9	03/18/88	4.7	05/18/88	3.4	07/18/88	11	09/18/88	3.7	11/18/88	0.82
01/19/88	6.5	03/19/88	10	05/19/88	3.3	07/19/88	11	09/19/88	3.4	11/19/88	0.8
01/20/88	6.2	03/20/88	14	05/20/88	3.3	07/20/88	11	09/20/88	3.1	11/20/88	0.89
01/21/88	5.8	03/21/88	13	05/21/88	3.2	07/21/88	9.8	09/21/88	2.9	11/21/88	0.9
01/22/88	5.9	03/22/88	13	05/22/88	2.8	07/22/88	9.1	09/22/88	2.6	11/22/88	0.9
01/23/88	5.7	03/23/88	12	05/23/88	2.6	07/23/88	8.5	09/23/88	2.2	11/23/88	0.9
01/24/88	5.8	03/24/88	11	05/24/88	2.3	07/24/88	9.3	09/24/88	1.9	11/24/88	0.9
01/25/88	6.6	03/25/88	10	05/25/88	2	07/25/88	8.7	09/25/88	1.8	11/25/88	0.87
01/26/88	6.7	03/26/88	9.8	05/26/88	1.8	07/26/88	8.3	09/26/88	1.6	11/26/88	0.93
01/27/88	6.5	03/27/88	11	05/27/88	1.5	07/27/88	7.7	09/27/88	1.5	11/27/88	0.97
01/28/88	6.2	03/28/88	10	05/28/88	1.3	07/28/88	7.2	09/28/88	1.3	11/28/88	0.92
01/29/88	5.9	03/29/88	9.8	05/29/88	1.2	07/29/88	6.6	09/29/88	1.2	11/29/88	0.78
01/30/88	5.6	03/30/88	9	05/30/88	1.4	07/30/88	6	09/30/88	1.3	11/30/88	0.74
01/31/88	5.3	03/31/88	8.4	05/31/88	4.8	07/31/88	5.7	10/01/88	1.1	12/01/88	0.73
02/01/88	5	04/01/88	7.7	06/01/88	8.7	08/01/88	5.2	10/02/88	1	12/02/88	0.67
02/02/88	4.9	04/02/88	7.1	06/02/88	8.2	08/02/88	4.7	10/03/88	1	12/03/88	0.63
02/03/88	4.6	04/03/88	6.5	06/03/88	6.7	08/03/88	4.2	10/04/88	0.97	12/04/88	0.6
02/04/88	4.4	04/04/88	5.9	06/04/88	5.4	08/04/88	3.8	10/05/88	0.86	12/05/88	0.55
02/05/88	4.2	04/05/88	5.3	06/05/88	5.7	08/05/88	3.5	10/06/88	1.1	12/06/88	0.57
02/06/88	4.1	04/06/88	4.7	06/06/88	8.2	08/06/88	3.1	10/07/88	1.1	12/07/88	0.57
02/07/88	3.8	04/07/88	4.2	06/07/88	9.5	08/07/88	3.1	10/08/88	1	12/08/88	0.53
02/08/88	8.8	04/08/88	3.8	06/08/88	12	08/08/88	3.3	10/09/88	1	12/09/88	0.49
02/09/88	13	04/09/88	3.5	06/09/88	11	08/09/88	3.2	10/10/88	0.98	12/10/88	0.46
02/10/88	14	04/10/88	3.3	06/10/88	9.9	08/10/88	3.3	10/11/88	0.9	12/11/88	0.44
02/11/88	14	04/11/88	3.4	06/11/88	20	08/11/88	3.5	10/12/88	0.84	12/12/88	0.76
02/12/88	14	04/12/88	3.1	06/12/88	23	08/12/88	3.3	10/13/88	0.8	12/13/88	0.66
02/13/88	13	04/13/88	3	06/13/88	21	08/13/88	3.1	10/14/88	0.74	12/14/88	0.62
02/14/88	12	04/14/88	2.8	06/14/88	18	08/14/88	3.3	10/15/88	0.71	12/15/88	0.58
02/15/88	12	04/15/88	2.6	06/15/88	16	08/15/88	5.2	10/16/88	0.87	12/16/88	0.53
02/16/88	14	04/16/88	2.4	06/16/88	14	08/16/88	5.9	10/17/88	0.88	12/17/88	0.48
02/17/88	14	04/17/88	2.1	06/17/88	13	08/17/88	6	10/18/88	0.96	12/18/88	0.44
02/18/88	13	04/18/88	1.9	06/18/88	11	08/18/88	5.7	10/19/88	0.92	12/19/88	0.4
02/19/88	12	04/19/88	1.7	06/19/88	11	08/19/88	5.2	10/20/88	0.87	12/20/88	0.41
02/20/88	12	04/20/88	1.5	06/20/88	10	08/20/88	16	10/21/88	0.71	12/21/88	0.48
02/21/88	12	04/21/88	1.2	06/21/88	14	08/21/88	37	10/22/88	0.65	12/22/88	0.54
02/22/88	12	04/22/88	1.1	06/22/88	17	08/22/88	28	10/23/88	0.63	12/23/88	0.51
02/23/88	12	04/23/88	1.1	06/23/88	14	08/23/88	23	10/24/88	0.58	12/24/88	0.44
02/24/88	12	04/24/88	1.1	06/24/88	12	08/24/88	20	10/25/88	0.52	12/25/88	0.41
02/25/88	12	04/25/88	0.95	06/25/88	10	08/25/88	18	10/26/88	0.48	12/26/88	0.4
02/26/88	11	04/26/88	0.85	06/26/88	8.7	08/26/88	20	10/27/88	0.46	12/27/88	0.41
02/27/88	9.8	04/27/88	0.7	06/27/88	7.5	08/27/88	20	10/28/88	0.43	12/28/88	0.43
02/28/88	9.1	04/28/88	0.59	06/28/88	6.6	08/28/88	18	10/29/88	0.38	12/29/88	0.41
02/29/88	8.3	04/29/88	0.49	06/29/88	5.9	08/29/88	18	10/30/88	0.36	12/30/88	0.4
		04/30/88	0.9	06/30/88	5.5	08/30/88	16	10/31/88	0.46	12/31/88	0.4
						08/31/88	15				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/89	0.38	03/01/89	0.36	05/01/89	0.49	07/01/89	0.67	09/01/89	4	11/01/89	2.9
01/02/89	0.37	03/02/89	0.54	05/02/89	0.4	07/02/89	0.57	09/02/89	3.4	11/02/89	2.6
01/03/89	0.37	03/03/89	1.3	05/03/89	0.35	07/03/89	0.55	09/03/89	2.9	11/03/89	2.3
01/04/89	0.41	03/04/89	1.3	05/04/89	0.3	07/04/89	0.51	09/04/89	2.5	11/04/89	2.2
01/05/89	0.45	03/05/89	1.3	05/05/89	0.27	07/05/89	0.73	09/05/89	2.3	11/05/89	2
01/06/89	0.39	03/06/89	1.5	05/06/89	0.27	07/06/89	0.78	09/06/89	2	11/06/89	1.8
01/07/89	0.35	03/07/89	1.8	05/07/89	0.23	07/07/89	0.6	09/07/89	1.7	11/07/89	1.6
01/08/89	0.32	03/08/89	2.2	05/08/89	0.19	07/08/89	0.54	09/08/89	1.5	11/08/89	1.5
01/09/89	0.32	03/09/89	2.7	05/09/89	0.18	07/09/89	0.45	09/09/89	1.4	11/09/89	1.4
01/10/89	0.32	03/10/89	2.9	05/10/89	0.16	07/10/89	0.4	09/10/89	1.3	11/10/89	1.2
01/11/89	0.32	03/11/89	3	05/11/89	0.17	07/11/89	0.36	09/11/89	1.2	11/11/89	1.1
01/12/89	0.3	03/12/89	2.9	05/12/89	0.17	07/12/89	0.34	09/12/89	1.2	11/12/89	1.1
01/13/89	0.29	03/13/89	2.7	05/13/89	0.15	07/13/89	0.32	09/13/89	1.1	11/13/89	0.96
01/14/89	0.3	03/14/89	2.5	05/14/89	0.14	07/14/89	0.77	09/14/89	1	11/14/89	0.9
01/15/89	0.29	03/15/89	2.2	05/15/89	0.27	07/15/89	1.5	09/15/89	0.96	11/15/89	0.89
01/16/89	0.28	03/16/89	2.2	05/16/89	0.41	07/16/89	1.9	09/16/89	0.91	11/16/89	0.87
01/17/89	0.28	03/17/89	2.2	05/17/89	0.27	07/17/89	3.4	09/17/89	0.93	11/17/89	0.83
01/18/89	0.29	03/18/89	2.4	05/18/89	0.24	07/18/89	4.6	09/18/89	1.1	11/18/89	0.8
01/19/89	0.29	03/19/89	2.2	05/19/89	0.22	07/19/89	7.2	09/19/89	1.3	11/19/89	0.76
01/20/89	0.58	03/20/89	2	05/20/89	0.19	07/20/89	6.9	09/20/89	1.2	11/20/89	0.73
01/21/89	1.5	03/21/89	1.8	05/21/89	0.16	07/21/89	8	09/21/89	1	11/21/89	0.7
01/22/89	1.6	03/22/89	1.6	05/22/89	0.15	07/22/89	11	09/22/89	0.9	11/22/89	0.66
01/23/89	1.6	03/23/89	1.5	05/23/89	0.14	07/23/89	10	09/23/89	0.83	11/23/89	0.66
01/24/89	2	03/24/89	1.4	05/24/89	0.14	07/24/89	8.5	09/24/89	1	11/24/89	0.62
01/25/89	2	03/25/89	1.4	05/25/89	0.13	07/25/89	7.3	09/25/89	1.1	11/25/89	0.58
01/26/89	2	03/26/89	1.3	05/26/89	0.12	07/26/89	5.8	09/26/89	1.2	11/26/89	0.68
01/27/89	1.9	03/27/89	1.2	05/27/89	0.1	07/27/89	5	09/27/89	1.3	11/27/89	0.66
01/28/89	1.9	03/28/89	1.3	05/28/89	0.09	07/28/89	4	09/28/89	1.2	11/28/89	0.63
01/29/89	1.7	03/29/89	1.2	05/29/89	0.08	07/29/89	3	09/29/89	1.1	11/29/89	1.1
01/30/89	1.6	03/30/89	1.1	05/30/89	0.06	07/30/89	3	09/30/89	0.81	11/30/89	1
01/31/89	1.5	03/31/89	0.99	05/31/89	0.07	07/31/89	3	10/01/89	0.72	12/01/89	1
02/01/89	1.4	04/01/89	0.93	06/01/89	0.05	08/01/89	3	10/02/89	0.66	12/02/89	1.1
02/02/89	1.3	04/02/89	0.86	06/02/89	0.03	08/02/89	3	10/03/89	0.64	12/03/89	1
02/03/89	1.2	04/03/89	0.79	06/03/89	0.05	08/03/89	5	10/04/89	0.6	12/04/89	0.88
02/04/89	1.2	04/04/89	0.68	06/04/89	0.05	08/04/89	8	10/05/89	0.56	12/05/89	0.84
02/05/89	1.2	04/05/89	0.64	06/05/89	0.01	08/05/89	9	10/06/89	0.49	12/06/89	0.78
02/06/89	1.1	04/06/89	0.79	06/06/89	0.09	08/06/89	8	10/07/89	0.47	12/07/89	0.74
02/07/89	1	04/07/89	0.67	06/07/89	0.98	08/07/89	8	10/08/89	0.86	12/08/89	0.76
02/08/89	0.92	04/08/89	0.59	06/08/89	1.9	08/08/89	7	10/09/89	0.99	12/09/89	0.84
02/09/89	0.99	04/09/89	0.53	06/09/89	1	08/09/89	10	10/10/89	1.5	12/10/89	0.78
02/10/89	1.1	04/10/89	0.49	06/10/89	0.85	08/10/89	14	10/11/89	2.4	12/11/89	0.74
02/11/89	1.1	04/11/89	0.45	06/11/89	0.71	08/11/89	16	10/12/89	2.6	12/12/89	0.73
02/12/89	1.1	04/12/89	0.42	06/12/89	0.63	08/12/89	16	10/13/89	2.4	12/13/89	0.77
02/13/89	1	04/13/89	0.42	06/13/89	0.58	08/13/89	17	10/14/89	2.1	12/14/89	0.68
02/14/89	0.93	04/14/89	0.43	06/14/89	0.51	08/14/89	16	10/15/89	1.9	12/15/89	0.62
02/15/89	0.81	04/15/89	0.56	06/15/89	0.45	08/15/89	11	10/16/89	1.7	12/16/89	0.6
02/16/89	0.74	04/16/89	0.62	06/16/89	0.39	08/16/89	10	10/17/89	1.4	12/17/89	0.57
02/17/89	0.67	04/17/89	0.62	06/17/89	0.35	08/17/89	10	10/18/89	1.2	12/18/89	0.56
02/18/89	0.63	04/18/89	0.6	06/18/89	0.32	08/18/89	8.2	10/19/89	1.1	12/19/89	0.55
02/19/89	0.59	04/19/89	0.54	06/19/89	0.29	08/19/89	8	10/20/89	0.97	12/20/89	0.62
02/20/89	0.52	04/20/89	0.89	06/20/89	0.31	08/20/89	10	10/21/89	0.88	12/21/89	0.76
02/21/89	0.48	04/21/89	1.1	06/21/89	0.34	08/21/89	7	10/22/89	0.8	12/22/89	0.72
02/22/89	0.45	04/22/89	0.97	06/22/89	0.34	08/22/89	8	10/23/89	0.71	12/23/89	1.8
02/23/89	0.42	04/23/89	0.84	06/23/89	0.28	08/23/89	7	10/24/89	1	12/24/89	1.7
02/24/89	0.41	04/24/89	0.73	06/24/89	0.29	08/24/89	7	10/25/89	2.2	12/25/89	1.8
02/25/89	0.4	04/25/89	0.64	06/25/89	0.31	08/25/89	6	10/26/89	2.2	12/26/89	1.7
02/26/89	0.38	04/26/89	0.59	06/26/89	0.28	08/26/89	6	10/27/89	2.7	12/27/89	1.6
02/27/89	0.36	04/27/89	0.52	06/27/89	0.27	08/27/89	5	10/28/89	3.6	12/28/89	1.5
02/28/89	0.34	04/28/89	0.45	06/28/89	0.25	08/28/89	5	10/29/89	3.7	12/29/89	1.4
		04/29/89	0.42	06/29/89	0.27	08/29/89	6	10/30/89	3.6	12/30/89	1.3
		04/30/89	0.48	06/30/89	0.49	08/30/89	6	10/31/89	3.3	12/31/89	1.2
						08/31/89	4.8				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/90	1.2	03/01/90	1.6	05/01/90	0.24	07/01/90	0.23	09/01/90	0.15	11/01/90	2.5
01/02/90	1.2	03/02/90	1.7	05/02/90	0.21	07/02/90	0.43	09/02/90	0.13	11/02/90	2.3
01/03/90	1.1	03/03/90	1.8	05/03/90	0.19	07/03/90	0.35	09/03/90	0.11	11/03/90	2.2
01/04/90	1.1	03/04/90	1.7	05/04/90	0.17	07/04/90	0.38	09/04/90	0.15	11/04/90	2.1
01/05/90	1.4	03/05/90	1.5	05/05/90	0.16	07/05/90	0.43	09/05/90	0.3	11/05/90	2
01/06/90	1.5	03/06/90	1.3	05/06/90	0.18	07/06/90	0.36	09/06/90	0.23	11/06/90	1.8
01/07/90	1.6	03/07/90	1.2	05/07/90	0.15	07/07/90	0.33	09/07/90	0.17	11/07/90	1.7
01/08/90	1.7	03/08/90	1	05/08/90	0.12	07/08/90	0.28	09/08/90	0.17	11/08/90	1.6
01/09/90	1.7	03/09/90	0.91	05/09/90	0.11	07/09/90	0.23	09/09/90	0.19	11/09/90	1.5
01/10/90	1.6	03/10/90	0.79	05/10/90	0.18	07/10/90	0.19	09/10/90	0.14	11/10/90	1.6
01/11/90	1.4	03/11/90	0.71	05/11/90	0.21	07/11/90	0.14	09/11/90	0.12	11/11/90	1.5
01/12/90	1.4	03/12/90	0.61	05/12/90	0.16	07/12/90	0.26	09/12/90	0.17	11/12/90	1.4
01/13/90	1.2	03/13/90	0.54	05/13/90	0.13	07/13/90	0.3	09/13/90	0.13	11/13/90	1.3
01/14/90	1.2	03/14/90	0.49	05/14/90	0.13	07/14/90	0.45	09/14/90	0.11	11/14/90	1.2
01/15/90	1.1	03/15/90	0.46	05/15/90	0.12	07/15/90	0.38	09/15/90	0.11	11/15/90	1.2
01/16/90	1	03/16/90	0.42	05/16/90	0.1	07/16/90	0.33	09/16/90	0.16	11/16/90	1.1
01/17/90	1	03/17/90	0.39	05/17/90	0.09	07/17/90	0.38	09/17/90	0.21	11/17/90	1.3
01/18/90	0.94	03/18/90	0.39	05/18/90	0.08	07/18/90	0.4	09/18/90	0.18	11/18/90	1.2
01/19/90	0.88	03/19/90	0.45	05/19/90	0.08	07/19/90	0.32	09/19/90	1.1	11/19/90	1.2
01/20/90	0.82	03/20/90	0.61	05/20/90	0.07	07/20/90	0.29	09/20/90	2.4	11/20/90	1.1
01/21/90	0.79	03/21/90	0.47	05/21/90	0.07	07/21/90	0.24	09/21/90	2.7	11/21/90	1.1
01/22/90	0.86	03/22/90	0.41	05/22/90	0.07	07/22/90	0.22	09/22/90	2.6	11/22/90	1
01/23/90	0.76	03/23/90	0.37	05/23/90	0.08	07/23/90	0.27	09/23/90	2.7	11/23/90	0.98
01/24/90	0.73	03/24/90	0.33	05/24/90	0.12	07/24/90	0.26	09/24/90	2.7	11/24/90	0.93
01/25/90	0.71	03/25/90	0.3	05/25/90	0.16	07/25/90	0.19	09/25/90	2.7	11/25/90	0.88
01/26/90	0.67	03/26/90	0.28	05/26/90	0.17	07/26/90	0.16	09/26/90	2.6	11/26/90	0.85
01/27/90	0.63	03/27/90	0.26	05/27/90	0.17	07/27/90	0.16	09/27/90	2.5	11/27/90	0.88
01/28/90	0.66	03/28/90	0.25	05/28/90	0.17	07/28/90	0.14	09/28/90	21	11/28/90	0.85
01/29/90	0.96	03/29/90	0.26	05/29/90	0.13	07/29/90	0.14	09/29/90	30	11/29/90	0.83
01/30/90	0.93	03/30/90	0.24	05/30/90	0.25	07/30/90	0.1	09/30/90	30	11/30/90	0.84
01/31/90	0.9	03/31/90	1.5	05/31/90	0.81	07/31/90	0.06	10/01/90	27	12/01/90	0.67
02/01/90	0.89	04/01/90	1.7	06/01/90	0.51	08/01/90	0.03	10/02/90	23	12/02/90	0.65
02/02/90	0.88	04/02/90	1.7	06/02/90	0.52	08/02/90	0.04	10/03/90	21	12/03/90	0.74
02/03/90	0.82	04/03/90	1.7	06/03/90	0.67	08/03/90	0.14	10/04/90	18	12/04/90	0.76
02/04/90	0.76	04/04/90	1.6	06/04/90	0.74	08/04/90	0.18	10/05/90	16	12/05/90	0.68
02/05/90	0.72	04/05/90	1.4	06/05/90	0.68	08/05/90	0.13	10/06/90	14	12/06/90	0.65
02/06/90	0.64	04/06/90	1.3	06/06/90	0.63	08/06/90	0.12	10/07/90	12	12/07/90	0.66
02/07/90	0.65	04/07/90	1.1	06/07/90	0.55	08/07/90	0.1	10/08/90	9.6	12/08/90	0.66
02/08/90	0.63	04/08/90	1.1	06/08/90	0.47	08/08/90	0.17	10/09/90	8.3	12/09/90	0.62
02/09/90	0.59	04/09/90	1.2	06/09/90	0.39	08/09/90	0.29	10/10/90	15	12/10/90	0.6
02/10/90	0.56	04/10/90	1.2	06/10/90	0.32	08/10/90	0.26	10/11/90	16	12/11/90	0.58
02/11/90	0.83	04/11/90	1.1	06/11/90	0.32	08/11/90	0.24	10/12/90	16	12/12/90	0.55
02/12/90	0.86	04/12/90	1	06/12/90	0.38	08/12/90	0.3	10/13/90	16	12/13/90	0.54
02/13/90	0.8	04/13/90	0.91	06/13/90	0.28	08/13/90	0.36	10/14/90	15	12/14/90	0.53
02/14/90	0.77	04/14/90	0.81	06/14/90	0.21	08/14/90	0.41	10/15/90	15	12/15/90	0.49
02/15/90	0.73	04/15/90	0.88	06/15/90	0.18	08/15/90	0.39	10/16/90	13	12/16/90	0.48
02/16/90	0.68	04/16/90	1.1	06/16/90	0.14	08/16/90	0.44	10/17/90	11	12/17/90	0.48
02/17/90	0.63	04/17/90	0.93	06/17/90	0.11	08/17/90	0.44	10/18/90	9.5	12/18/90	0.48
02/18/90	0.58	04/18/90	0.82	06/18/90	0.12	08/18/90	0.38	10/19/90	8.6	12/19/90	0.48
02/19/90	0.54	04/19/90	0.72	06/19/90	0.1	08/19/90	0.33	10/20/90	7.7	12/20/90	0.54
02/20/90	0.55	04/20/90	0.63	06/20/90	0.07	08/20/90	0.26	10/21/90	6.7	12/21/90	0.54
02/21/90	0.78	04/21/90	0.58	06/21/90	0.06	08/21/90	0.19	10/22/90	6	12/22/90	0.58
02/22/90	0.74	04/22/90	0.53	06/22/90	0.09	08/22/90	0.22	10/23/90	5.4	12/23/90	0.54
02/23/90	0.94	04/23/90	0.48	06/23/90	0.08	08/23/90	0.31	10/24/90	5	12/24/90	0.52
02/24/90	1.3	04/24/90	0.43	06/24/90	0.1	08/24/90	0.38	10/25/90	4.8	12/25/90	0.71
02/25/90	1.5	04/25/90	0.38	06/25/90	0.08	08/25/90	0.34	10/26/90	4.4	12/26/90	0.75
02/26/90	1.6	04/26/90	0.35	06/26/90	0.12	08/26/90	0.28	10/27/90	3.9	12/27/90	0.66
02/27/90	1.5	04/27/90	0.31	06/27/90	0.18	08/27/90	0.24	10/28/90	3.5	12/28/90	0.69
02/28/90	1.5	04/28/90	0.31	06/28/90	0.18	08/28/90	0.23	10/29/90	3.1	12/29/90	0.67
		04/29/90	0.32	06/29/90	0.12	08/29/90	0.21	10/30/90	2.8	12/30/90	0.65
		04/30/90	0.29	06/30/90	0.09	08/30/90	0.17	10/31/90	2.5	12/31/90	0.63
						08/31/90	0.15				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/91	0.61	03/01/91	26	05/01/91	12	10/01/91	126	12/01/91	11
01/02/91	0.57	03/02/91	23	05/02/91	9.8	10/02/91	127	12/02/91	9.5
01/03/91	0.57	03/03/91	22	05/03/91	8.5	10/03/91	128	12/03/91	8.8
01/04/91	0.61	03/04/91	30	05/04/91	7.4	10/04/91	129	12/04/91	8.2
01/05/91	0.6	03/05/91	28	05/05/91	6.3	10/05/91	130	12/05/91	7.6
01/06/91	0.61	03/06/91	25	05/06/91	5.5	10/06/91	131	12/06/91	7
01/07/91	0.98	03/07/91	22	05/07/91	4.9	10/07/91	131	12/07/91	6.4
01/08/91	0.94	03/08/91	19	05/08/91	4.3	10/08/91	132	12/08/91	5.9
01/09/91	0.98	03/09/91	17	05/09/91	3.9	10/09/91	134	12/09/91	5.4
01/10/91	1.4	03/10/91	16	05/10/91	3.5	10/10/91	137	12/10/91	5
01/11/91	2	03/11/91	14	05/11/91	3.1	10/11/91	126	12/11/91	4.6
01/12/91	2	03/12/91	13	05/12/91	2.8	10/12/91	115	12/12/91	4.3
01/13/91	1.9	03/13/91	12	05/13/91	2.6	10/13/91	107	12/13/91	4.1
01/14/91	1.8	03/14/91	11	05/14/91	2.7	10/14/91	100	12/14/91	3.8
01/15/91	3.2	03/15/91	9.5	05/15/91	2.4	10/15/91	93	12/15/91	4
01/16/91	21	03/16/91	8.5	05/16/91	2.3	10/16/91	86	12/16/91	3.9
01/17/91	26	03/17/91	8.5	05/17/91	2	10/17/91	80	12/17/91	3.6
01/18/91	23	03/18/91	8.3	05/18/91	1.8	10/18/91	75	12/18/91	3.3
01/19/91	21	03/19/91	8.5	05/19/91	2.2	10/19/91	73	12/19/91	3.1
01/20/91	19	03/20/91	7.4	05/20/91	2.7	10/20/91	71	12/20/91	2.9
01/21/91	17	03/21/91	6.5	05/21/91	2.9	10/21/91	66	12/21/91	2.7
01/22/91	15	03/22/91	5.7	05/22/91	3.2	10/22/91	64	12/22/91	2.6
01/23/91	13	03/23/91	5.1	05/23/91	7.3	10/23/91	62	12/23/91	2.5
01/24/91	12	03/24/91	4.6			10/24/91	57	12/24/91	2.4
01/25/91	12	03/25/91	4.4			10/25/91	53	12/25/91	2.3
01/26/91	12	03/26/91	4.2			10/26/91	50	12/26/91	2.3
01/27/91	11	03/27/91	3.8			10/27/91	48	12/27/91	2.3
01/28/91	9.8	03/28/91	3.5			10/28/91	46	12/28/91	2.8
01/29/91	8.7	03/29/91	3.2			10/29/91	44	12/29/91	2.9
01/30/91	7.7	03/30/91	2.9			10/30/91	42	12/30/91	2.8
01/31/91	6.7	03/31/91	12			10/31/91	41	12/31/91	2.6
02/01/91	5.8	04/01/91	19			11/01/91	39		
02/02/91	10	04/02/91	16			11/02/91	37		
02/03/91	18	04/03/91	14			11/03/91	36		
02/04/91	31	04/04/91	26			11/04/91	34		
02/05/91	34	04/05/91	28			11/05/91	33		
02/06/91	34	04/06/91	28			11/06/91	31		
02/07/91	32	04/07/91	25			11/07/91	27		
02/08/91	29	04/08/91	21			11/08/91	25		
02/09/91	26	04/09/91	18			11/09/91	24		
02/10/91	22	04/10/91	16			11/10/91	22		
02/11/91	20	04/11/91	14			11/11/91	21		
02/12/91	17	04/12/91	13			11/12/91	20		
02/13/91	16	04/13/91	11			11/13/91	18		
02/14/91	14	04/14/91	9.4			11/14/91	16		
02/15/91	13	04/15/91	8.6			11/15/91	14		
02/16/91	12	04/16/91	7.4			11/16/91	13		
02/17/91	11	04/17/91	8.2			11/17/91	13		
02/18/91	9.8	04/18/91	16			11/18/91	12		
02/19/91	9.1	04/19/91	18			11/19/91	11		
02/20/91	8.3	04/20/91	27			11/20/91	10		
02/21/91	7.5	04/21/91	39			11/21/91	9.5		
02/22/91	6	04/22/91	31			11/22/91	9.5		
02/23/91	6.5	04/23/91	25			11/23/91	10		
02/24/91	5.5	04/24/91	21			11/24/91	11		
02/25/91	7.3	04/25/91	19			11/25/91	12		
02/26/91	18	04/26/91	21			11/26/91	14		
02/27/91	21	04/27/91	19			11/27/91	22		
02/28/91	23	04/28/91	17			11/28/91	25		
		04/29/91	15			11/29/91	18		
		04/30/91	13			11/30/91	14		

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/92	2.4	03/01/92	2.9	05/01/92	1.2	07/01/92	66	09/01/92	49	11/01/92	4.3
01/02/92	4.2	03/02/92	2.5	05/02/92	1.1	07/02/92	50	09/02/92	46	11/02/92	3.9
01/03/92	3.7	03/03/92	2.2	05/03/92	0.96	07/03/92	36	09/03/92	44	11/03/92	3.5
01/04/92	3.4	03/04/92	2	05/04/92	0.91	07/04/92	24	09/04/92	54	11/04/92	3.2
01/05/92	3.2	03/05/92	1.8	05/05/92	0.85	07/05/92	35	09/05/92	67	11/05/92	2.9
01/06/92	2.9	03/06/92	2.3	05/06/92	0.81	07/06/92	48	09/06/92	64	11/06/92	3.1
01/07/92	2.6	03/07/92	2.7	05/07/92	0.76	07/07/92	41	09/07/92	64	11/07/92	3.4
01/08/92	2.4	03/08/92	2.7	05/08/92	0.7	07/08/92	34	09/08/92	64	11/08/92	3.3
01/09/92	2.2	03/09/92	2.4	05/09/92	0.66	07/09/92	28	09/09/92	66	11/09/92	17
01/10/92	2.1	03/10/92	2.1	05/10/92	0.63	07/10/92	23	09/10/92	68	11/10/92	46
01/11/92	1.9	03/11/92	1.9	05/11/92	0.6	07/11/92	25	09/11/92	69	11/11/92	43
01/12/92	1.8	03/12/92	1.7	05/12/92	0.58	07/12/92	26	09/12/92	69	11/12/92	39
01/13/92	1.7	03/13/92	1.9	05/13/92	0.57	07/13/92	25	09/13/92	69	11/13/92	34
01/14/92	1.6	03/14/92	2	05/14/92	0.61	07/14/92	20	09/14/92	95	11/14/92	30
01/15/92	1.4	03/15/92	1.8	05/15/92	0.62	07/15/92	18	09/15/92	102	11/15/92	27
01/16/92	1.3	03/16/92	1.6	05/16/92	0.57	07/16/92	16	09/16/92	97	11/16/92	23
01/17/92	1.2	03/17/92	1.4	05/17/92	0.89	07/17/92	14	09/17/92	96	11/17/92	21
01/18/92	1.2	03/18/92	1.3	05/18/92	0.86	07/18/92	12	09/18/92	96	11/18/92	21
01/19/92	1.2	03/19/92	1.2	05/19/92	0.76	07/19/92	11	09/19/92	96	11/19/92	21
01/20/92	1.3	03/20/92	1.2	05/20/92	0.66	07/20/92	12	09/20/92	96	11/20/92	19
01/21/92	1.2	03/21/92	1.1	05/21/92	0.61	07/21/92	12	09/21/92	96	11/21/92	26
01/22/92	1.2	03/22/92	1.1	05/22/92	0.57	07/22/92	11	09/22/92	96	11/22/92	112
01/23/92	1.2	03/23/92	2	05/23/92	0.52	07/23/92	9.5	09/23/92	58	11/23/92	84
01/24/92	1.3	03/24/92	2.1	05/24/92	0.48	07/24/92	8.2	09/24/92	19	11/24/92	73
01/25/92	1.2	03/25/92	2	05/25/92	0.44	07/25/92	7	09/25/92	18	11/25/92	68
01/26/92	1.1	03/26/92	1.8	05/26/92	0.4	07/26/92	6.1	09/26/92	16	11/26/92	64
01/27/92	1.1	03/27/92	1.6	05/27/92	0.4	07/27/92	5.1	09/27/92	14	11/27/92	60
01/28/92	1.1	03/28/92	1.6	05/28/92	0.39	07/28/92	4.2	09/28/92	68	11/28/92	55
01/29/92	1.2	03/29/92	1.4	05/29/92	0.39	07/29/92	3.4	09/29/92	149	11/29/92	53
01/30/92	1.3	03/30/92	1.4	05/30/92	0.36	07/30/92	2.7	09/30/92	99	11/30/92	48
01/31/92	1.2	03/31/92	1.3	05/31/92	0.34	07/31/92	2.3	10/01/92	85	12/01/92	44
02/01/92	1.1	04/01/92	1.2	06/01/92	0.36	08/01/92	2	10/02/92	73	12/02/92	41
02/02/92	1.1	04/02/92	1	06/02/92	0.38	08/02/92	1.7	10/03/92	66	12/03/92	37
02/03/92	1	04/03/92	1.3	06/03/92	0.46	08/03/92	1.5	10/04/92	61	12/04/92	34
02/04/92	0.98	04/04/92	1.4	06/04/92	0.66	08/04/92	1.7	10/05/92	56	12/05/92	31
02/05/92	1.8	04/05/92	1.3	06/05/92	0.87	08/05/92	4.2	10/06/92	51	12/06/92	28
02/06/92	2.5	04/06/92	1.2	06/06/92	1	08/06/92	8.6	10/07/92	53	12/07/92	26
02/07/92	2.6	04/07/92	1.3	06/07/92	0.84	08/07/92	9	10/08/92	56	12/08/92	24
02/08/92	2.5	04/08/92	1.8	06/08/92	0.77	08/08/92	8.4	10/09/92	51	12/09/92	21
02/09/92	2.3	04/09/92	1.9	06/09/92	0.69	08/09/92	7.2	10/10/92	47	12/10/92	21
02/10/92	2.6	04/10/92	2	06/10/92	0.63	08/10/92	7.6	10/11/92	43	12/11/92	21
02/11/92	2.6	04/11/92	1.9	06/11/92	0.61	08/11/92	7	10/12/92	40	12/12/92	20
02/12/92	2.5	04/12/92	7.7	06/12/92	0.59	08/12/92	6	10/13/92	36	12/13/92	18
02/13/92	2.3	04/13/92	13	06/13/92	1	08/13/92	4.9	10/14/92	33	12/14/92	16
02/14/92	2.1	04/14/92	13	06/14/92	1.3	08/14/92	4.2	10/15/92	30	12/15/92	14
02/15/92	1.9	04/15/92	12	06/15/92	1.6	08/15/92	4.7	10/16/92	27	12/16/92	13
02/16/92	1.7	04/16/92	9.3	06/16/92	1.5	08/16/92	5.8	10/17/92	24	12/17/92	11
02/17/92	1.6	04/17/92	7.2	06/17/92	1.2	08/17/92	7.5	10/18/92	22	12/18/92	9.8
02/18/92	1.5	04/18/92	5.7	06/18/92	0.99	08/18/92	8.8	10/19/92	20	12/19/92	8.9
02/19/92	1.4	04/19/92	4.6	06/19/92	0.8	08/19/92	8.8	10/20/92	17	12/20/92	8.4
02/20/92	1.3	04/20/92	4.6	06/20/92	0.58	08/20/92	8.1	10/21/92	15	12/21/92	7.9
02/21/92	1.4	04/21/92	4	06/21/92	0.4	08/21/92	7.4	10/22/92	13	12/22/92	7.3
02/22/92	2.9	04/22/92	3.4	06/22/92	0.31	08/22/92	6.7	10/23/92	12	12/23/92	6.8
02/23/92	3.5	04/23/92	3	06/23/92	0.3	08/23/92	6.5	10/24/92	11	12/24/92	6.2
02/24/92	3.2	04/24/92	2.6	06/24/92	0.37	08/24/92	34	10/25/92	10	12/25/92	5.6
02/25/92	3	04/25/92	2.4	06/25/92	0.65	08/25/92	64	10/26/92	8.9	12/26/92	5.1
02/26/92	4.2	04/26/92	2	06/26/92	5.2	08/26/92	59	10/27/92	7.6	12/27/92	4.7
02/27/92	4.5	04/27/92	1.7	06/27/92	11	08/27/92	54	10/28/92	6.5	12/28/92	4.3
02/28/92	4	04/28/92	1.7	06/28/92	29	08/28/92	50	10/29/92	5.9	12/29/92	4.2
02/29/92	3.4	04/29/92	1.6	06/29/92	44	08/29/92	49	10/30/92	5.4	12/30/92	4.2
		04/30/92	1.3	06/30/92	84	08/30/92	59	10/31/92	4.9	12/31/92	4.4
						08/31/92	54				

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DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/93	5.3	03/01/93	24	05/01/93	2	07/01/93	1.3	09/01/93	2.2	11/01/93	19
01/02/93	6.3	03/02/93	22	05/02/93	1.8	07/02/93	1.8	09/02/93	2	11/02/93	18
01/03/93	6.3	03/03/93	20	05/03/93	1.6	07/03/93	2.1	09/03/93	1.9	11/03/93	17
01/04/93	6.8	03/04/93	20	05/04/93	1.5	07/04/93	2.3	09/04/93	2.4	11/04/93	15
01/05/93	8.8	03/05/93	18	05/05/93	1.3	07/05/93	2.4	09/05/93	2.5	11/05/93	14
01/06/93	9.6	03/06/93	16	05/06/93	1.2	07/06/93	2.1	09/06/93	2.7	11/06/93	13
01/07/93	10	03/07/93	14	05/07/93	1.1	07/07/93	1.9	09/07/93	2.8	11/07/93	12
01/08/93	9.6	03/08/93	13	05/08/93	1.4	07/08/93	4.2	09/08/93	2.7	11/08/93	10
01/09/93	12	03/09/93	11	05/09/93	2.2	07/09/93	6.7	09/09/93	2.6	11/09/93	9
01/10/93	16	03/10/93	9.4	05/10/93	2.2	07/10/93	6.3	09/10/93	2.7	11/10/93	8.5
01/11/93	16	03/11/93	8.1	05/11/93	1.9	07/11/93	5.3	09/11/93	2.6	11/11/93	8.2
01/12/93	15	03/12/93	7	05/12/93	1.7	07/12/93	4.3	09/12/93	2.8	11/12/93	7.9
01/13/93	14	03/13/93	9.1	05/13/93	1.5	07/13/93	3.7	09/13/93	2.6	11/13/93	6.8
01/14/93	13	03/14/93	12	05/14/93	1.4	07/14/93	5.2	09/14/93	4.8	11/14/93	5.7
01/15/93	12	03/15/93	12	05/15/93	1.2	07/15/93	4.9	09/15/93	10	11/15/93	4.8
01/16/93	12	03/16/93	12	05/16/93	1.1	07/16/93	4.4	09/16/93	15	11/16/93	4.3
01/17/93	13	03/17/93	13	05/17/93	0.93	07/17/93	3.6	09/17/93	13	11/17/93	3.9
01/18/93	13	03/18/93	18	05/18/93	0.84	07/18/93	2.9	09/18/93	12	11/18/93	3.2
01/19/93	11	03/19/93	22	05/19/93	1.6	07/19/93	2.3	09/19/93	10	11/19/93	3
01/20/93	10	03/20/93	24	05/20/93	2	07/20/93	1.8	09/20/93	8.5	11/20/93	3.2
01/21/93	9.1	03/21/93	34	05/21/93	1.5	07/21/93	1.4	09/21/93	7.2	11/21/93	20
01/22/93	8.2	03/22/93	63	05/22/93	1.3	07/22/93	1.5	09/22/93	6.1	11/22/93	56
01/23/93	7.4	03/23/93	54	05/23/93	1.1	07/23/93	2.4	09/23/93	5.2	11/23/93	39
01/24/93	6.4	03/24/93	55	05/24/93	1	07/24/93	2.9	09/24/93	4.5	11/24/93	48
01/25/93	164	03/25/93	75	05/25/93	0.91	07/25/93	3	09/25/93	4	11/25/93	98
01/26/93	287	03/26/93	70	05/26/93	0.8	07/26/93	3.4	09/26/93	3.7	11/26/93	100
01/27/93	179	03/27/93	64	05/27/93	0.75	07/27/93	3.3	09/27/93	3.5	11/27/93	90
01/28/93	140	03/28/93	59	05/28/93	0.9	07/28/93	2.9	09/28/93	3.3	11/28/93	80
01/29/93	120	03/29/93	53	05/29/93	0.94	07/29/93	2.4	09/29/93	5.3	11/29/93	75
01/30/93	110	03/30/93	47	05/30/93	1.1	07/30/93	3	09/30/93	5.8	11/30/93	70
01/31/93	103	03/31/93	43	05/31/93	1.7	07/31/93	6.9	10/01/93	5.1	12/01/93	65
02/01/93	94	04/01/93	43	06/01/93	2.1	08/01/93	12	10/02/93	4.8	12/02/93	60
02/02/93	86	04/02/93	40	06/02/93	1.8	08/02/93	13	10/03/93	5	12/03/93	55
02/03/93	78	04/03/93	36	06/03/93	1.5	08/03/93	14	10/04/93	29	12/04/93	50
02/04/93	71	04/04/93	33	06/04/93	1.5	08/04/93	14	10/05/93	56	12/05/93	45
02/05/93	67	04/05/93	34	06/05/93	1.6	08/05/93	14	10/06/93	110	12/06/93	40
02/06/93	66	04/06/93	33	06/06/93	1.4	08/06/93	13	10/07/93	105	12/07/93	35
02/07/93	81	04/07/93	31	06/07/93	1.1	08/07/93	13	10/08/93	118	12/08/93	30
02/08/93	77	04/08/93	28	06/08/93	0.91	08/08/93	12	10/09/93	119	12/09/93	25
02/09/93	72	04/09/93	26	06/09/93	0.79	08/09/93	11	10/10/93	97	12/10/93	22
02/10/93	67	04/10/93	23	06/10/93	0.67	08/10/93	10	10/11/93	82	12/11/93	20
02/11/93	63	04/11/93	21	06/11/93	0.61	08/11/93	9.6	10/12/93	68	12/12/93	19
02/12/93	62	04/12/93	18	06/12/93	0.56	08/12/93	8.7	10/13/93	79	12/13/93	18
02/13/93	59	04/13/93	16	06/13/93	0.5	08/13/93	7.9	10/14/93	75	12/14/93	16
02/14/93	54	04/14/93	14	06/14/93	0.46	08/14/93	8.1	10/15/93	90	12/15/93	14
02/15/93	49	04/15/93	12	06/15/93	0.44	08/15/93	8.4	10/16/93	80	12/16/93	13
02/16/93	45	04/16/93	12	06/16/93	0.38	08/16/93	8.5	10/17/93	65	12/17/93	12
02/17/93	42	04/17/93	12	06/17/93	0.45	08/17/93	10	10/18/93	59	12/18/93	11
02/18/93	39	04/18/93	11	06/18/93	0.4	08/18/93	9.3	10/19/93	54	12/19/93	10
02/19/93	37	04/19/93	9.7	06/19/93	0.32	08/19/93	8.1	10/20/93	49	12/20/93	9.4
02/20/93	35	04/20/93	8.6	06/20/93	0.69	08/20/93	6.9	10/21/93	45	12/21/93	8.9
02/21/93	33	04/21/93	7.6	06/21/93	0.56	08/21/93	5.8	10/22/93	42	12/22/93	8.2
02/22/93	31	04/22/93	6.8	06/22/93	0.46	08/22/93	4.8	10/23/93	40	12/23/93	7.7
02/23/93	32	04/23/93	5.8	06/23/93	0.38	08/23/93	3.9	10/24/93	37	12/24/93	7.4
02/24/93	31	04/24/93	4.8	06/24/93	0.51	08/24/93	3.2	10/25/93	34	12/25/93	7.4
02/25/93	28	04/25/93	4.1	06/25/93	0.76	08/25/93	3	10/26/93	31	12/26/93	7.2
02/26/93	27	04/26/93	3.6	06/26/93	0.71	08/26/93	3.2	10/27/93	29	12/27/93	6.8
02/27/93	27	04/27/93	3.4	06/27/93	0.74	08/27/93	3.4	10/28/93	27	12/28/93	6.5
02/28/93	26	04/28/93	3.1	06/28/93	1	08/28/93	3.2	10/29/93	25	12/29/93	6.3
		04/29/93	2.6	06/29/93	1	08/29/93	2.9	10/30/93	23	12/30/93	5.9
		04/30/93	2.3	06/30/93	1.2	08/30/93	2.7	10/31/93	21	12/31/93	5.5
						08/31/93	2.4				

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/94	5.5	03/01/94	19	05/01/94	16	07/01/94	14	09/01/94	48	11/01/94	114
01/02/94	7.1	03/02/94	19	05/02/94	25	07/02/94	14	09/02/94	44	11/02/94	99
01/03/94	8.4	03/03/94	21	05/03/94	32	07/03/94	23	09/03/94	40	11/03/94	91
01/04/94	8.7	03/04/94	20	05/04/94	33	07/04/94	39	09/04/94	38	11/04/94	83
01/05/94	8.2	03/05/94	19	05/05/94	31	07/05/94	35	09/05/94	36	11/05/94	77
01/06/94	7.5	03/06/94	18	05/06/94	29	07/06/94	32	09/06/94	52	11/06/94	71
01/07/94	6.9	03/07/94	17	05/07/94	26	07/07/94	30	09/07/94	70	11/07/94	65
01/08/94	6.8	03/08/94	16	05/08/94	25	07/08/94	27	09/08/94	66	11/08/94	60
01/09/94	9.1	03/09/94	15	05/09/94	24	07/09/94	24	09/09/94	60	11/09/94	56
01/10/94	10	03/10/94	14	05/10/94	23	07/10/94	22	09/10/94	55	11/10/94	51
01/11/94	11	03/11/94	12	05/11/94	21	07/11/94	20	09/11/94	62	11/11/94	47
01/12/94	11	03/12/94	11	05/12/94	19	07/12/94	18	09/12/94	80	11/12/94	59
01/13/94	12	03/13/94	10	05/13/94	18	07/13/94	16	09/13/94	93	11/13/94	121
01/14/94	13	03/14/94	9.2	05/14/94	16	07/14/94	14	09/14/94	76	11/14/94	119
01/15/94	12	03/15/94	8.4	05/15/94	14	07/15/94	13	09/15/94	74	11/15/94	124
01/16/94	11	03/16/94	7.7	05/16/94	14	07/16/94	11	09/16/94	76	11/16/94	357
01/17/94	9.8	03/17/94	7.2	05/17/94	12	07/17/94	9.9	09/17/94	45	11/17/94	338
01/18/94	9.2	03/18/94	6.5	05/18/94	11	07/18/94	8.9	09/18/94	54	11/18/94	243
01/19/94	9.4	03/19/94	6.1	05/19/94	10	07/19/94	8	09/19/94	80	11/19/94	208
01/20/94	9.2	03/20/94	5.7	05/20/94	9.4	07/20/94	20	09/20/94	100	11/20/94	187
01/21/94	8.3	03/21/94	5.3	05/21/94	8.5	07/21/94	73	09/21/94	60	11/21/94	167
01/22/94	8	03/22/94	5.2	05/22/94	7.9	07/22/94	50	09/22/94	66	11/22/94	152
01/23/94	7.6	03/23/94	6.2	05/23/94	7.7	07/23/94	39	09/23/94	60	11/23/94	137
01/24/94	7	03/24/94	6.2	05/24/94	7.2	07/24/94	29	09/24/94	50	11/24/94	125
01/25/94	6.5	03/25/94	5.7	05/25/94	6.3	07/25/94	24	09/25/94	54	11/25/94	113
01/26/94	6	03/26/94	5.8	05/26/94	5.5	07/26/94	25	09/26/94	90	11/26/94	104
01/27/94	5.7	03/27/94	5.2	05/27/94	4.6	07/27/94	30	09/27/94	80	11/27/94	95
01/28/94	6.1	03/28/94	4.5	05/28/94	3.6	07/28/94	27	09/28/94	65	11/28/94	87
01/29/94	5.8	03/29/94	4	05/29/94	2.9	07/29/94	46	09/29/94	54	11/29/94	81
01/30/94	5.3	03/30/94	3.9	05/30/94	2.4	07/30/94	44	09/30/94	58	11/30/94	75
01/31/94	8.7	03/31/94	5	05/31/94	1.9	07/31/94	36	10/01/94	75	12/01/94	69
02/01/94	11	04/01/94	4.7	06/01/94	1.6	08/01/94	31	10/02/94	82	12/02/94	79
02/02/94	17	04/02/94	4.1	06/02/94	1.6	08/02/94	27	10/03/94	77	12/03/94	73
02/03/94	22	04/03/94	3.5	06/03/94	3	08/03/94	25	10/04/94	71	12/04/94	68
02/04/94	22	04/04/94	3	06/04/94	5.7	08/04/94	25	10/05/94	65	12/05/94	82
02/05/94	22	04/05/94	2.6	06/05/94	5.4	08/05/94	27	10/06/94	60	12/06/94	73
02/06/94	21	04/06/94	2.3	06/06/94	5.4	08/06/94	37	10/07/94	56	12/07/94	66
02/07/94	19	04/07/94	2.1	06/07/94	5.8	08/07/94	45	10/08/94	52	12/08/94	61
02/08/94	18	04/08/94	1.9	06/08/94	7.2	08/08/94	47	10/09/94	49	12/09/94	61
02/09/94	17	04/09/94	1.8	06/09/94	8.5	08/09/94	45	10/10/94	46	12/10/94	65
02/10/94	16	04/10/94	1.6	06/10/94	17	08/10/94	43	10/11/94	49	12/11/94	60
02/11/94	14	04/11/94	1.4	06/11/94	39	08/11/94	44	10/12/94	87	12/12/94	57
02/12/94	13	04/12/94	1.3	06/12/94	28	08/12/94	51	10/13/94	93	12/13/94	54
02/13/94	11	04/13/94	1.1	06/13/94	22	08/13/94	66	10/14/94	94	12/14/94	50
02/14/94	12	04/14/94	1	06/14/94	18	08/14/94	89	10/15/94	109	12/15/94	47
02/15/94	13	04/15/94	0.89	06/15/94	15	08/15/94	81	10/16/94	96	12/16/94	44
02/16/94	13	04/16/94	0.86	06/16/94	13	08/16/94	67	10/17/94	100	12/17/94	42
02/17/94	21	04/17/94	0.77	06/17/94	11	08/17/94	60	10/18/94	90	12/18/94	40
02/18/94	31	04/18/94	0.8	06/18/94	13	08/18/94	54	10/19/94	82	12/19/94	38
02/19/94	38	04/19/94	0.8	06/19/94	13	08/19/94	51	10/20/94	72	12/20/94	35
02/20/94	31	04/20/94	0.75	06/20/94	12	08/20/94	50	10/21/94	65	12/21/94	121
02/21/94	28	04/21/94	0.83	06/21/94	17	08/21/94	48	10/22/94	60	12/22/94	156
02/22/94	26	04/22/94	1.8	06/22/94	43	08/22/94	45	10/23/94	55	12/23/94	120
02/23/94	23	04/23/94	2	06/23/94	37	08/23/94	47	10/24/94	50	12/24/94	103
02/24/94	21	04/24/94	1.9	06/24/94	31	08/24/94	77	10/25/94	46	12/25/94	90
02/25/94	20	04/25/94	2.3	06/25/94	27	08/25/94	76	10/26/94	44	12/26/94	81
02/26/94	21	04/26/94	3.2	06/26/94	24	08/26/94	99	10/27/94	51	12/27/94	74
02/27/94	21	04/27/94	5.6	06/27/94	21	08/27/94	84	10/28/94	49	12/28/94	69
02/28/94	20	04/28/94	7.3	06/28/94	19	08/28/94	71	10/29/94	46	12/29/94	64
		04/29/94	8.3	06/29/94	18	08/29/94	65	10/30/94	47	12/30/94	59
		04/30/94	11	06/30/94	16	08/30/94	58	10/31/94	151	12/31/94	53
						08/31/94	53				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/95	48	03/01/95	19	05/01/95	1.2	07/01/95	0.77	09/01/95	100	11/01/95	116
01/02/95	43	03/02/95	16	05/02/95	1	07/02/95	0.65	09/02/95	120	11/02/95	100
01/03/95	38	03/03/95	14	05/03/95	0.84	07/03/95	0.58	09/03/95	90	11/03/95	88
01/04/95	35	03/04/95	12	05/04/95	0.75	07/04/95	0.5	09/04/95	70	11/04/95	78
01/05/95	34	03/05/95	9.5	05/05/95	0.72	07/05/95	0.42	09/05/95	150	11/05/95	70
01/06/95	31	03/06/95	8	05/06/95	0.78	07/06/95	0.37	09/06/95	210	11/06/95	63
01/07/95	29	03/07/95	7.1	05/07/95	0.7	07/07/95	0.36	09/07/95	180	11/07/95	57
01/08/95	26	03/08/95	7.1	05/08/95	0.6	07/08/95	0.33	09/08/95	165	11/08/95	52
01/09/95	24	03/09/95	9.3	05/09/95	0.54	07/09/95	0.33	09/09/95	150	11/09/95	47
01/10/95	22	03/10/95	8.2	05/10/95	0.47	07/10/95	0.36	09/10/95	130	11/10/95	42
01/11/95	20	03/11/95	7	05/11/95	0.43	07/11/95	0.39	09/11/95	115	11/11/95	39
01/12/95	18	03/12/95	5.7	05/12/95	0.39	07/12/95	0.37	09/12/95	100	11/12/95	35
01/13/95	16	03/13/95	5	05/13/95	0.36	07/13/95	0.39	09/13/95	90	11/13/95	32
01/14/95	20	03/14/95	4.3	05/14/95	0.34	07/14/95	0.42	09/14/95	82	11/14/95	29
01/15/95	33	03/15/95	3.7	05/15/95	0.33	07/15/95	0.42	09/15/95	76	11/15/95	26
01/16/95	34	03/16/95	3.3	05/16/95	0.31	07/16/95	0.36	09/16/95	70	11/16/95	23
01/17/95	30	03/17/95	5.1	05/17/95	0.29	07/17/95	0.37	09/17/95	62	11/17/95	21
01/18/95	27	03/18/95	20	05/18/95	0.26	07/18/95	0.41	09/18/95	56	11/18/95	19
01/19/95	24	03/19/95	28	05/19/95	0.25	07/19/95	0.36	09/19/95	52	11/19/95	18
01/20/95	22	03/20/95	27	05/20/95	0.45	07/20/95	0.37	09/20/95	48	11/20/95	17
01/21/95	20	03/21/95	23	05/21/95	0.52	07/21/95	0.39	09/21/95	45	11/21/95	15
01/22/95	17	03/22/95	20	05/22/95	0.51	07/22/95	0.37	09/22/95	41	11/22/95	14
01/23/95	16	03/23/95	16	05/23/95	0.46	07/23/95	0.37	09/23/95	37	11/23/95	13
01/24/95	15	03/24/95	13	05/24/95	0.42	07/24/95	0.36	09/24/95	40	11/24/95	12
01/25/95	13	03/25/95	10	05/25/95	0.38	07/25/95	0.33	09/25/95	54	11/25/95	11
01/26/95	12	03/26/95	8.2	05/26/95	0.35	07/26/95	0.42	09/26/95	48	11/26/95	10
01/27/95	11	03/27/95	6.5	05/27/95	0.31	07/27/95	0.48	09/27/95	40	11/27/95	9.5
01/28/95	10	03/28/95	5.1	05/28/95	0.28	07/28/95	0.54	09/28/95	37	11/28/95	8.8
01/29/95	9.7	03/29/95	4.4	05/29/95	0.25	07/29/95	0.58	09/29/95	50	11/29/95	10
01/30/95	10	03/30/95	3.6	05/30/95	0.23	07/30/95	0.54	09/30/95	40	11/30/95	10
01/31/95	12	03/31/95	3.1	05/31/95	0.21	07/31/95	0.5	10/01/95	43	12/01/95	9.4
02/01/95	11	04/01/95	2.7	06/01/95	0.2	08/01/95	0.67	10/02/95	50	12/02/95	8.6
02/02/95	10	04/02/95	2.7	06/02/95	0.2	08/02/95	2	10/03/95	60	12/03/95	7.9
02/03/95	8.6	04/03/95	2.3	06/03/95	0.21	08/03/95	37	10/04/95	76	12/04/95	7.4
02/04/95	7.8	04/04/95	2	06/04/95	0.32	08/04/95	147	10/05/95	100	12/05/95	6.9
02/05/95	7.3	04/05/95	1.7	06/05/95	0.35	08/05/95	118	10/06/95	74	12/06/95	6.3
02/06/95	6.5	04/06/95	1.7	06/06/95	0.34	08/06/95	83	10/07/95	64	12/07/95	5.9
02/07/95	5.9	04/07/95	1.8	06/07/95	0.31	08/07/95	69	10/08/95	86	12/08/95	5.4
02/08/95	5.7	04/08/95	2.1	06/08/95	0.28	08/08/95	59	10/09/95	130	12/09/95	5
02/09/95	5.3	04/09/95	2.8	06/09/95	0.24	08/09/95	54	10/10/95	105	12/10/95	4.8
02/10/95	4.9	04/10/95	2.6	06/10/95	0.22	08/10/95	61	10/11/95	85	12/11/95	4.6
02/11/95	4.7	04/11/95	2.3	06/11/95	0.2	08/11/95	64	10/12/95	70	12/12/95	4.3
02/12/95	4.7	04/12/95	2	06/12/95	0.2	08/12/95	73	10/13/95	62	12/13/95	4
02/13/95	4.5	04/13/95	1.7	06/13/95	0.23	08/13/95	109	10/14/95	55	12/14/95	8.1
02/14/95	8.7	04/14/95	1.4	06/14/95	0.21	08/14/95	77	10/15/95	62	12/15/95	9.6
02/15/95	11	04/15/95	1.3	06/15/95	0.19	08/15/95	64	10/16/95	70	12/16/95	9.2
02/16/95	10	04/16/95	1.1	06/16/95	0.2	08/16/95	55	10/17/95	740	12/17/95	8.5
02/17/95	8.7	04/17/95	1	06/17/95	0.19	08/17/95	49	10/18/95	1230	12/18/95	8.1
02/18/95	8.3	04/18/95	0.93	06/18/95	0.2	08/18/95	42	10/19/95	760	12/19/95	7.7
02/19/95	9.9	04/19/95	0.86	06/19/95	0.2	08/19/95	42	10/20/95	575	12/20/95	6.7
02/20/95	11	04/20/95	0.78	06/20/95	0.21	08/20/95	39	10/21/95	464	12/21/95	6.1
02/21/95	14	04/21/95	0.72	06/21/95	0.24	08/21/95	40	10/22/95	383	12/22/95	5.6
02/22/95	12	04/22/95	0.64	06/22/95	0.3	08/22/95	37	10/23/95	324	12/23/95	6.3
02/23/95	11	04/23/95	0.6	06/23/95	0.28	08/23/95	51	10/24/95	277	12/24/95	6.5
02/24/95	9.4	04/24/95	0.58	06/24/95	0.19	08/24/95	282	10/25/95	242	12/25/95	6
02/25/95	8.2	04/25/95	0.58	06/25/95	0.69	08/25/95	208	10/26/95	216	12/26/95	5.4
02/26/95	17	04/26/95	0.73	06/26/95	1.4	08/26/95	176	10/27/95	198	12/27/95	5.1
02/27/95	22	04/27/95	0.76	06/27/95	1.3	08/27/95	140	10/28/95	182	12/28/95	4.7
02/28/95	21	04/28/95	1.2	06/28/95	1.1	08/28/95	123	10/29/95	163	12/29/95	4.3
		04/29/95	1.4	06/29/95	1.2	08/29/95	109	10/30/95	143	12/30/95	4.2
		04/30/95	1.3	06/30/95	0.77	08/30/95	97	10/31/95	127	12/31/95	4.4
						08/31/95	88				

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/96	4.5	03/01/96	0.93	05/01/96	2.6	07/01/96	17	09/01/96	4	11/01/96	19
01/02/96	4.4	03/02/96	1.1	05/02/96	2.6	07/02/96	13	09/02/96	5.3	11/02/96	17
01/03/96	4.6	03/03/96	0.89	05/03/96	2.4	07/03/96	10	09/03/96	6.6	11/03/96	15
01/04/96	4.7	03/04/96	0.78	05/04/96	2.2	07/04/96	7.8	09/04/96	6	11/04/96	13
01/05/96	4.4	03/05/96	0.79	05/05/96	2	07/05/96	9.2	09/05/96	4.9	11/05/96	19
01/06/96	4	03/06/96	0.72	05/06/96	1.9	07/06/96	78	09/06/96	3.9	11/06/96	29
01/07/96	4.4	03/07/96	0.7	05/07/96	1.8	07/07/96	80	09/07/96	3.2	11/07/96	30
01/08/96	4.6	03/08/96	0.66	05/08/96	1.7	07/08/96	68	09/08/96	2.8	11/08/96	28
01/09/96	4.4	03/09/96	115	05/09/96	1.6	07/09/96	60	09/09/96	2.9	11/09/96	25
01/10/96	4	03/10/96	243	05/10/96	1.5	07/10/96	67	09/10/96	5.9	11/10/96	22
01/11/96	3.7	03/11/96	200	05/11/96	1.6	07/11/96	65	09/11/96	8.5	11/11/96	19
01/12/96	3.4	03/12/96	189	05/12/96	1.5	07/12/96	61	09/12/96	13	11/12/96	17
01/13/96	3.3	03/13/96	126	05/13/96	1.6	07/13/96	68	09/13/96	14	11/13/96	15
01/14/96	3.1	03/14/96	90	05/14/96	1.6	07/14/96	89	09/14/96	18	11/14/96	14
01/15/96	2.9	03/15/96	76	05/15/96	1.5	07/15/96	87	09/15/96	16	11/15/96	13
01/16/96	2.8	03/16/96	67	05/16/96	1.4	07/16/96	79	09/16/96	12	11/16/96	12
01/17/96	2.7	03/17/96	59	05/17/96	1.4	07/17/96	71	09/17/96	9.6	11/17/96	11
01/18/96	2.7	03/18/96	51	05/18/96	1.3	07/18/96	63	09/18/96	8	11/18/96	10
01/19/96	2.7	03/19/96	44	05/19/96	1.3	07/19/96	54	09/19/96	7.2	11/19/96	9.3
01/20/96	2.6	03/20/96	37	05/20/96	1.4	07/20/96	47	09/20/96	5.8	11/20/96	8.4
01/21/96	2.5	03/21/96	31	05/21/96	4.3	07/21/96	40	09/21/96	4.8	11/21/96	7.8
01/22/96	2.4	03/22/96	27	05/22/96	18	07/22/96	34	09/22/96	4.1	11/22/96	7.3
01/23/96	2.3	03/23/96	23	05/23/96	19	07/23/96	28	09/23/96	3.4	11/23/96	6.6
01/24/96	2.1	03/24/96	19	05/24/96	16	07/24/96	24	09/24/96	2.9	11/24/96	5.9
01/25/96	2	03/25/96	17	05/25/96	15	07/25/96	20	09/25/96	2.5	11/25/96	5.3
01/26/96	2	03/26/96	14	05/26/96	18	07/26/96	17	09/26/96	2.2	11/26/96	4.8
01/27/96	2.1	03/27/96	12	05/27/96	17	07/27/96	15	09/27/96	1.9	11/27/96	4.4
01/28/96	2.1	03/28/96	12	05/28/96	16	07/28/96	13	09/28/96	1.7	11/28/96	4
01/29/96	1.9	03/29/96	13	05/29/96	45	07/29/96	11	09/29/96	1.6	11/29/96	3.6
01/30/96	1.8	03/30/96	16	05/30/96	96	07/30/96	9.4	09/30/96	1.6	11/30/96	3.3
01/31/96	1.7	03/31/96	67	05/31/96	89	07/31/96	8.5	10/01/96	2.5	12/01/96	3.1
02/01/96	1.6	04/01/96	65	06/01/96	59	08/01/96	7.7	10/02/96	3.8	12/02/96	2.9
02/02/96	1.5	04/02/96	56	06/02/96	45	08/02/96	6.8	10/03/96	4.5	12/03/96	2.7
02/03/96	1.5	04/03/96	49	06/03/96	35	08/03/96	6.5	10/04/96	5.9	12/04/96	2.6
02/04/96	1.5	04/04/96	42	06/04/96	28	08/04/96	6.9	10/05/96	7	12/05/96	2.5
02/05/96	1.4	04/05/96	35	06/05/96	22	08/05/96	6.2	10/06/96	6.2	12/06/96	2.6
02/06/96	1.4	04/06/96	30	06/06/96	19	08/06/96	5.4	10/07/96	6.1	12/07/96	2.7
02/07/96	1.3	04/07/96	25	06/07/96	17	08/07/96	4.7	10/08/96	7.4	12/08/96	4.7
02/08/96	1.3	04/08/96	24	06/08/96	16	08/08/96	6.1	10/09/96	9	12/09/96	5.3
02/09/96	1.3	04/09/96	26	06/09/96	17	08/09/96	6.1	10/10/96	8.1	12/10/96	5
02/10/96	1.2	04/10/96	24	06/10/96	19	08/10/96	5.2	10/11/96	6.6	12/11/96	4.8
02/11/96	1.1	04/11/96	21	06/11/96	19	08/11/96	4.7	10/12/96	5.4	12/12/96	4.3
02/12/96	1.1	04/12/96	18	06/12/96	21	08/12/96	6	10/13/96	13	12/13/96	4
02/13/96	1	04/13/96	15	06/13/96	22	08/13/96	6.1	10/14/96	22	12/14/96	3.7
02/14/96	0.94	04/14/96	13	06/14/96	23	08/14/96	5.4	10/15/96	39	12/15/96	3.4
02/15/96	0.92	04/15/96	11	06/15/96	20	08/15/96	4.9	10/16/96	43	12/16/96	3.2
02/16/96	1.2	04/16/96	11	06/16/96	15	08/16/96	4.4	10/17/96	81	12/17/96	2.9
02/17/96	1.4	04/17/96	9.5	06/17/96	13	08/17/96	4	10/18/96	105	12/18/96	2.8
02/18/96	1.3	04/18/96	8.3	06/18/96	11	08/18/96	3.6	10/19/96	115	12/19/96	2.6
02/19/96	1.2	04/19/96	7.4	06/19/96	9.4	08/19/96	3.5	10/20/96	85	12/20/96	2.5
02/20/96	1.2	04/20/96	6.4	06/20/96	8.3	08/20/96	4.5	10/21/96	72	12/21/96	3.2
02/21/96	1.2	04/21/96	5.5	06/21/96	7.8	08/21/96	4.9	10/22/96	65	12/22/96	3.9
02/22/96	1.3	04/22/96	4.8	06/22/96	8.9	08/22/96	4.3	10/23/96	59	12/23/96	3.8
02/23/96	1.2	04/23/96	4.1	06/23/96	16	08/23/96	4.1	10/24/96	53	12/24/96	3.6
02/24/96	1.1	04/24/96	3.5	06/24/96	16	08/24/96	4.7	10/25/96	48	12/25/96	3.5
02/25/96	1	04/25/96	3.1	06/25/96	13	08/25/96	4.8	10/26/96	43	12/26/96	3.4
02/26/96	0.95	04/26/96	2.7	06/26/96	10	08/26/96	5.8	10/27/96	38	12/27/96	3.4
02/27/96	0.89	04/27/96	2.5	06/27/96	13	08/27/96	6.7	10/28/96	33	12/28/96	3.3
02/28/96	0.83	04/28/96	2.3	06/28/96	26	08/28/96	6.4	10/29/96	29	12/29/96	3.1
02/29/96	0.81	04/29/96	2.1	06/29/96	26	08/29/96	5.9	10/30/96	25	12/30/96	3.3
		04/30/96	2.2	06/30/96	21	08/30/96	5.2	10/31/96	22	12/31/96	3.3
						08/31/96	4.6				

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/97	3.2	03/01/97	4.6	05/01/97	13	07/01/97	11	09/01/97	41	11/01/97	3.1
01/02/97	2.9	03/02/97	4.3	05/02/97	10	07/02/97	16	09/02/97	62	11/02/97	3.5
01/03/97	2.7	03/03/97	3.8	05/03/97	9.3	07/03/97	26	09/03/97	46	11/03/97	4.5
01/04/97	2.5	03/04/97	3.5	05/04/97	9.8	07/04/97	25	09/04/97	49	11/04/97	4.5
01/05/97	2.4	03/05/97	3.2	05/05/97	8.5	07/05/97	26	09/05/97	113	11/05/97	4.1
01/06/97	2.3	03/06/97	2.9	05/06/97	7.4	07/06/97	31	09/06/97	87	11/06/97	4.8
01/07/97	2.4	03/07/97	2.6	05/07/97	6.1	07/07/97	28	09/07/97	61	11/07/97	4.5
01/08/97	2.2	03/08/97	2.3	05/08/97	5.2	07/08/97	24	09/08/97	51	11/08/97	4
01/09/97	2.1	03/09/97	2.1	05/09/97	4.5	07/09/97	21	09/09/97	45	11/09/97	3.5
01/10/97	2.6	03/10/97	1.9	05/10/97	3.9	07/10/97	19	09/10/97	40	11/10/97	3.1
01/11/97	2.6	03/11/97	1.8	05/11/97	3.5	07/11/97	47	09/11/97	36	11/11/97	2.8
01/12/97	2.5	03/12/97	1.7	05/12/97	3.5	07/12/97	90	09/12/97	46	11/12/97	2.7
01/13/97	4.6	03/13/97	1.9	05/13/97	5	07/13/97	50	09/13/97	71	11/13/97	2.5
01/14/97	11	03/14/97	3.5	05/14/97	5	07/14/97	39	09/14/97	62	11/14/97	3.2
01/15/97	17	03/15/97	4.7	05/15/97	4.4	07/15/97	35	09/15/97	68	11/15/97	3.3
01/16/97	31	03/16/97	4.6	05/16/97	4.1	07/16/97	34	09/16/97	60	11/16/97	3.3
01/17/97	25	03/17/97	3.9	05/17/97	8.9	07/17/97	30	09/17/97	52	11/17/97	3.3
01/18/97	20	03/18/97	3.3	05/18/97	23	07/18/97	27	09/18/97	46	11/18/97	2.9
01/19/97	17	03/19/97	3.2	05/19/97	21	07/19/97	25	09/19/97	41	11/19/97	2.6
01/20/97	15	03/20/97	3.5	05/20/97	16	07/20/97	24	09/20/97	36	11/20/97	2.4
01/21/97	14	03/21/97	4.8	05/21/97	12	07/21/97	21	09/21/97	32	11/21/97	2.3
01/22/97	12	03/22/97	5.4	05/22/97	10	07/22/97	19	09/22/97	29	11/22/97	3.4
01/23/97	11	03/23/97	4.8	05/23/97	12	07/23/97	17	09/23/97	28	11/23/97	7.5
01/24/97	10	03/24/97	4	05/24/97	11	07/24/97	15	09/24/97	27	11/24/97	8
01/25/97	9.6	03/25/97	3.7	05/25/97	9.3	07/25/97	13	09/25/97	25	11/25/97	7.2
01/26/97	9	03/26/97	5.2	05/26/97	8.1	07/26/97	11	09/26/97	29	11/26/97	6.1
01/27/97	8.3	03/27/97	5.5	05/27/97	8.1	07/27/97	10	09/27/97	43	11/27/97	5.2
01/28/97	7.6	03/28/97	4.5	05/28/97	9.3	07/28/97	9.3	09/28/97	98	11/28/97	5
01/29/97	7.8	03/29/97	3.6	05/29/97	9.4	07/29/97	11	09/29/97	119	11/29/97	4.6
01/30/97	8.6	03/30/97	3	05/30/97	7.9	07/30/97	17	09/30/97	71	11/30/97	6.4
01/31/97	8.3	03/31/97	2.5	05/31/97	7.2	07/31/97	24	10/01/97	59	12/01/97	14
02/01/97	7.6	04/01/97	2.1	06/01/97	15	08/01/97	29	10/02/97	51	12/02/97	14
02/02/97	6.8	04/02/97	1.8	06/02/97	75	08/02/97	69	10/03/97	45	12/03/97	12
02/03/97	6.3	04/03/97	1.6	06/03/97	45	08/03/97	59	10/04/97	40	12/04/97	20
02/04/97	5.8	04/04/97	1.4	06/04/97	32	08/04/97	52	10/05/97	35	12/05/97	39
02/05/97	5.5	04/05/97	1.2	06/05/97	24	08/05/97	65	10/06/97	32	12/06/97	30
02/06/97	5.2	04/06/97	1.1	06/06/97	27	08/06/97	51	10/07/97	28	12/07/97	25
02/07/97	4.8	04/07/97	0.99	06/07/97	26	08/07/97	125	10/08/97	25	12/08/97	22
02/08/97	4.5	04/08/97	0.91	06/08/97	22	08/08/97	207	10/09/97	22	12/09/97	19
02/09/97	4.1	04/09/97	0.83	06/09/97	23	08/09/97	182	10/10/97	19	12/10/97	17
02/10/97	3.9	04/10/97	0.82	06/10/97	50	08/10/97	163	10/11/97	17	12/11/97	15
02/11/97	3.6	04/11/97	0.78	06/11/97	42	08/11/97	144	10/12/97	15	12/12/97	14
02/12/97	3.4	04/12/97	1.1	06/12/97	38	08/12/97	133	10/13/97	13	12/13/97	17
02/13/97	3.2	04/13/97	1.4	06/13/97	35	08/13/97	109	10/14/97	11	12/14/97	114
02/14/97	3	04/14/97	35	06/14/97	55	08/14/97	96	10/15/97	9.5	12/15/97	105
02/15/97	3.9	04/15/97	75	06/15/97	166	08/15/97	91	10/16/97	8.6	12/16/97	75
02/16/97	8.8	04/16/97	95	06/16/97	103	08/16/97	79	10/17/97	8.1	12/17/97	62
02/17/97	9.9	04/17/97	162	06/17/97	69	08/17/97	78	10/18/97	8	12/18/97	53
02/18/97	9.2	04/18/97	97	06/18/97	53	08/18/97	78	10/19/97	7.9	12/19/97	48
02/19/97	8.6	04/19/97	69	06/19/97	47	08/19/97	67	10/20/97	7.6	12/20/97	44
02/20/97	7.9	04/20/97	56	06/20/97	45	08/20/97	62	10/21/97	7.1	12/21/97	40
02/21/97	7.1	04/21/97	46	06/21/97	39	08/21/97	57	10/22/97	6.1	12/22/97	36
02/22/97	6.3	04/22/97	38	06/22/97	35	08/22/97	58	10/23/97	5.4	12/23/97	32
02/23/97	6.1	04/23/97	32	06/23/97	33	08/23/97	57	10/24/97	4.8	12/24/97	29
02/24/97	6.3	04/24/97	30	06/24/97	36	08/24/97	47	10/25/97	4.3	12/25/97	26
02/25/97	6.4	04/25/97	26	06/25/97	30	08/25/97	83	10/26/97	4	12/26/97	23
02/26/97	6.1	04/26/97	23	06/26/97	26	08/26/97	117	10/27/97	3.7	12/27/97	22
02/27/97	5.7	04/27/97	21	06/27/97	22	08/27/97	69	10/28/97	3.3	12/28/97	21
02/28/97	5.1	04/28/97	18	06/28/97	18	08/28/97	53	10/29/97	3.1	12/29/97	19
		04/29/97	17	06/29/97	15	08/29/97	44	10/30/97	2.9	12/30/97	17
		04/30/97	15	06/30/97	12	08/30/97	39	10/31/97	2.9	12/31/97	16
						08/31/97	34				

Kitching Creek (1979-2000) **Agency: USGS**

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/98	14	03/01/98	62	05/01/98	112	07/01/98	0.81	09/01/98	3.4	11/01/98	4.1
01/02/98	12	03/02/98	72	05/02/98	74	07/02/98	0.72	09/02/98	4.1	11/02/98	3.7
01/03/98	11	03/03/98	57	05/03/98	53	07/03/98	0.65	09/03/98	4.1	11/03/98	3.3
01/04/98	10	03/04/98	49	05/04/98	42	07/04/98	0.61	09/04/98	3.6	11/04/98	3.9
01/05/98	9.5	03/05/98	44	05/05/98	36	07/05/98	0.61	09/05/98	3.9	11/05/98	172
01/06/98	9.1	03/06/98	40	05/06/98	30	07/06/98	0.58	09/06/98	5.5	11/06/98	124
01/07/98	8.6	03/07/98	35	05/07/98	24	07/07/98	0.61	09/07/98	5.8	11/07/98	93
01/08/98	9.9	03/08/98	32	05/08/98	21	07/08/98	0.66	09/08/98	5.6	11/08/98	80
01/09/98	17	03/09/98	49	05/09/98	18	07/09/98	0.58	09/09/98	5.1	11/09/98	72
01/10/98	17	03/10/98	48	05/10/98	15	07/10/98	0.55	09/10/98	4.5	11/10/98	66
01/11/98	15	03/11/98	40	05/11/98	13	07/11/98	0.61	09/11/98	3.8	11/11/98	61
01/12/98	13	03/12/98	35	05/12/98	11	07/12/98	0.55	09/12/98	3.1	11/12/98	56
01/13/98	12	03/13/98	31	05/13/98	9.7	07/13/98	0.54	09/13/98	2.6	11/13/98	52
01/14/98	11	03/14/98	28	05/14/98	8.7	07/14/98	0.87	09/14/98	2.6	11/14/98	47
01/15/98	10	03/15/98	25	05/15/98	7.6	07/15/98	1.5	09/15/98	4	11/15/98	43
01/16/98	14	03/16/98	23	05/16/98	6.5	07/16/98	1.5	09/16/98	11	11/16/98	39
01/17/98	14	03/17/98	21	05/17/98	5.5	07/17/98	1.3	09/17/98	26	11/17/98	36
01/18/98	13	03/18/98	23	05/18/98	4.7	07/18/98	1.1	09/18/98	38	11/18/98	32
01/19/98	11	03/19/98	30	05/19/98	4	07/19/98	1	09/19/98	48	11/19/98	28
01/20/98	10	03/20/98	118	05/20/98	3.4	07/20/98	0.98	09/20/98	48	11/20/98	25
01/21/98	9.3	03/21/98	78	05/21/98	2.9	07/21/98	0.93	09/21/98	100	11/21/98	23
01/22/98	14	03/22/98	56	05/22/98	2.6	07/22/98	0.89	09/22/98	140	11/22/98	20
01/23/98	21	03/23/98	47	05/23/98	2.2	07/23/98	0.83	09/23/98	130	11/23/98	18
01/24/98	20	03/24/98	41	05/24/98	2	07/24/98	0.76	09/24/98	100	11/24/98	23
01/25/98	18	03/25/98	36	05/25/98	1.8	07/25/98	0.69	09/25/98	180	11/25/98	42
01/26/98	17	03/26/98	32	05/26/98	1.7	07/26/98	0.62	09/26/98	160	11/26/98	41
01/27/98	16	03/27/98	28	05/27/98	1.6	07/27/98	0.53	09/27/98	130	11/27/98	36
01/28/98	14	03/28/98	25	05/28/98	1.5	07/28/98	0.45	09/28/98	130	11/28/98	31
01/29/98	12	03/29/98	22	05/29/98	1.5	07/29/98	0.41	09/29/98	100	11/29/98	28
01/30/98	11	03/30/98	20	05/30/98	1.5	07/30/98	0.41	09/30/98	73	11/30/98	25
01/31/98	9.2	03/31/98	22	05/31/98	1.9	07/31/98	0.41	10/01/98	61	12/01/98	22
02/01/98	7.8	04/01/98	19	06/01/98	2.3	08/01/98	0.41	10/02/98	49	12/02/98	19
02/02/98	7.5	04/02/98	17	06/02/98	2.3	08/02/98	0.5	10/03/98	45	12/03/98	17
02/03/98	37	04/03/98	15	06/03/98	2	08/03/98	0.62	10/04/98	41	12/04/98	17
02/04/98	34	04/04/98	13	06/04/98	1.8	08/04/98	0.56	10/05/98	37	12/05/98	15
02/05/98	27	04/05/98	12	06/05/98	1.6	08/05/98	0.69	10/06/98	34	12/06/98	13
02/06/98	24	04/06/98	10	06/06/98	1.4	08/06/98	2.2	10/07/98	30	12/07/98	11
02/07/98	26	04/07/98	9.1	06/07/98	1.3	08/07/98	4.7	10/08/98	27	12/08/98	10
02/08/98	25	04/08/98	8.3	06/08/98	8.1	08/08/98	6.4	10/09/98	24	12/09/98	9.7
02/09/98	22	04/09/98	7.9	06/09/98	8.8	08/09/98	7.3	10/10/98	21	12/10/98	8.6
02/10/98	20	04/10/98	7.4	06/10/98	7.2	08/10/98	7	10/11/98	19	12/11/98	7.8
02/11/98	18	04/11/98	7	06/11/98	5.5	08/11/98	5.9	10/12/98	17	12/12/98	7.3
02/12/98	16	04/12/98	6.6	06/12/98	4.3	08/12/98	4.7	10/13/98	16	12/13/98	7.2
02/13/98	14	04/13/98	6.3	06/13/98	3.3	08/13/98	3.7	10/14/98	15	12/14/98	6.7
02/14/98	13	04/14/98	6	06/14/98	2.6	08/14/98	5.3	10/15/98	13	12/15/98	6.3
02/15/98	12	04/15/98	5.8	06/15/98	2.1	08/15/98	6.1	10/16/98	12	12/16/98	5.8
02/16/98	44	04/16/98	5.6	06/16/98	1.7	08/16/98	5.6	10/17/98	11	12/17/98	5.1
02/17/98	81	04/17/98	5.4	06/17/98	1.5	08/17/98	4.7	10/18/98	9.6	12/18/98	4.5
02/18/98	103	04/18/98	5.4	06/18/98	1.3	08/18/98	3.9	10/19/98	8.7	12/19/98	4.1
02/19/98	66	04/19/98	5.3	06/19/98	1.2	08/19/98	3.1	10/20/98	8.3	12/20/98	4.9
02/20/98	55	04/20/98	5.3	06/20/98	1.1	08/20/98	2.8	10/21/98	8.3	12/21/98	4.9
02/21/98	50	04/21/98	5.7	06/21/98	0.98	08/21/98	3.8	10/22/98	10	12/22/98	4.7
02/22/98	45	04/22/98	6.2	06/22/98	0.92	08/22/98	7.7	10/23/98	10	12/23/98	4.3
02/23/98	40	04/23/98	6.2	06/23/98	0.88	08/23/98	9.8	10/24/98	9.8	12/24/98	3.9
02/24/98	36	04/24/98	6.1	06/24/98	0.84	08/24/98	10	10/25/98	9.2	12/25/98	3.6
02/25/98	32	04/25/98	6	06/25/98	0.75	08/25/98	9	10/26/98	8.4	12/26/98	3.4
02/26/98	28	04/26/98	5.9	06/26/98	0.89	08/26/98	8.1	10/27/98	7.2	12/27/98	3.2
02/27/98	26	04/27/98	5.8	06/27/98	1.3	08/27/98	7.4	10/28/98	6.4	12/28/98	3.4
02/28/98	27	04/28/98	5.8	06/28/98	1.2	08/28/98	7.7	10/29/98	5.6	12/29/98	5.1
		04/29/98	5.7	06/29/98	1	08/29/98	6.6	10/30/98	4.9	12/30/98	6.5
		04/30/98	9.7	06/30/98	0.91	08/30/98	5.3	10/31/98	4.6	12/31/98	6.2
						08/31/98	4.2				

Kitching Creek (1979-2000) Agency: USGS

DB KEY 3006

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
01/01/99	5.6	03/01/99	1.4	05/01/99	0.32	07/01/99	47	09/01/99	43	11/01/99	73
01/02/99	13	03/02/99	1.3	05/02/99	0.29	07/02/99	101	09/02/99	69	11/02/99	66
01/03/99	45	03/03/99	1.3	05/03/99	0.27	07/03/99	88	09/03/99	58	11/03/99	59
01/04/99	44	03/04/99	1.3	05/04/99	0.25	07/04/99	53	09/04/99	51	11/04/99	53
01/05/99	38	03/05/99	1.2	05/05/99	0.23	07/05/99	41	09/05/99	47	11/05/99	47
01/06/99	35	03/06/99	1.2	05/06/99	0.2	07/06/99	35	09/06/99	48	11/06/99	42
01/07/99	33	03/07/99	1.1	05/07/99	0.19	07/07/99	30	09/07/99	58	11/07/99	39
01/08/99	32	03/08/99	1.1	05/08/99	0.22	07/08/99	26	09/08/99	53	11/08/99	35
01/09/99	30	03/09/99	0.99	05/09/99	0.47	07/09/99	22	09/09/99	55	11/09/99	31
01/10/99	28	03/10/99	0.95	05/10/99	0.37	07/10/99	18	09/10/99	48	11/10/99	27
01/11/99	25	03/11/99	0.89	05/11/99	0.28	07/11/99	14	09/11/99	49	11/11/99	25
01/12/99	23	03/12/99	0.81	05/12/99	0.3	07/12/99	11	09/12/99	45	11/12/99	23
01/13/99	20	03/13/99	0.75	05/13/99	0.33	07/13/99	9	09/13/99	41	11/13/99	20
01/14/99	20	03/14/99	0.74	05/14/99	0.27	07/14/99	7.4	09/14/99	39	11/14/99	17
01/15/99	22	03/15/99	0.89	05/15/99	0.26	07/15/99	6.2	09/15/99	42	11/15/99	14
01/16/99	23	03/16/99	0.82	05/16/99	0.24	07/16/99	5.4	09/16/99	40	11/16/99	12
01/17/99	31	03/17/99	0.79	05/17/99	0.24	07/17/99	4.7	09/17/99	36	11/17/99	10
01/18/99	25	03/18/99	0.72	05/18/99	0.27	07/18/99	4	09/18/99	38	11/18/99	8.7
01/19/99	21	03/19/99	0.67	05/19/99	0.21	07/19/99	3.5	09/19/99	59	11/19/99	7.4
01/20/99	17	03/20/99	0.61	05/20/99	0.2	07/20/99	3.1	09/20/99	55	11/20/99	6.7
01/21/99	15	03/21/99	0.58	05/21/99	0.2	07/21/99	2.8	09/21/99	78	11/21/99	6
01/22/99	13	03/22/99	0.55	05/22/99	0.2	07/22/99	2.4	09/22/99	64	11/22/99	5.9
01/23/99	12	03/23/99	0.53	05/23/99	0.18	07/23/99	2.1	09/23/99	54	11/23/99	6.2
01/24/99	17	03/24/99	0.53	05/24/99	0.16	07/24/99	1.9	09/24/99	50	11/24/99	5.8
01/25/99	21	03/25/99	0.51	05/25/99	0.16	07/25/99	3.5	09/25/99	48	11/25/99	5.5
01/26/99	18	03/26/99	0.51	05/26/99	0.15	07/26/99	6	09/26/99	57	11/26/99	5.4
01/27/99	15	03/27/99	0.47	05/27/99	0.15	07/27/99	8.4	09/27/99	77	11/27/99	4.9
01/28/99	12	03/28/99	0.43	05/28/99	0.18	07/28/99	10	09/28/99	76	11/28/99	4.3
01/29/99	11	03/29/99	0.41	05/29/99	0.2	07/29/99	19	09/29/99	65	11/29/99	3.9
01/30/99	9.4	03/30/99	0.39	05/30/99	0.38	07/30/99	23	09/30/99	59	11/30/99	3.5
01/31/99	8.7	03/31/99	0.37	05/31/99	0.6	07/31/99	52	10/01/99	54	12/01/99	3.2
02/01/99	10	04/01/99	0.36	06/01/99	0.4	08/01/99	32	10/02/99	51	12/02/99	2.9
02/02/99	11	04/02/99	0.37	06/02/99	0.46	08/02/99	24	10/03/99	49	12/03/99	2.6
02/03/99	10	04/03/99	0.37	06/03/99	0.64	08/03/99	19	10/04/99	46	12/04/99	2.4
02/04/99	8.8	04/04/99	0.36	06/04/99	0.45	08/04/99	16	10/05/99	48	12/05/99	2.4
02/05/99	7.8	04/05/99	0.35	06/05/99	0.37	08/05/99	14	10/06/99	46	12/06/99	2.2
02/06/99	6.8	04/06/99	0.34	06/06/99	0.33	08/06/99	14	10/07/99	94	12/07/99	2.1
02/07/99	6.1	04/07/99	0.32	06/07/99	0.51	08/07/99	12	10/08/99	187	12/08/99	2.1
02/08/99	5.4	04/08/99	0.3	06/08/99	0.99	08/08/99	10	10/09/99	127	12/09/99	2.1
02/09/99	4.9	04/09/99	0.29	06/09/99	1.3	08/09/99	8.4	10/10/99	95	12/10/99	1.9
02/10/99	4.5	04/10/99	0.3	06/10/99	1.2	08/10/99	7.2	10/11/99	84	12/11/99	1.8
02/11/99	4.1	04/11/99	0.33	06/11/99	1.4	08/11/99	6.6	10/12/99	76	12/12/99	1.8
02/12/99	3.7	04/12/99	0.28	06/12/99	1.7	08/12/99	6.5	10/13/99	70	12/13/99	1.8
02/13/99	3.7	04/13/99	0.27	06/13/99	1.5	08/13/99	11	10/14/99	171	12/14/99	1.7
02/14/99	3.5	04/14/99	0.28	06/14/99	1.3	08/14/99	39	10/15/99	203	12/15/99	1.7
02/15/99	3.3	04/15/99	0.26	06/15/99	1.2	08/15/99	44	10/16/99	722	12/16/99	1.6
02/16/99	3.2	04/16/99	0.26	06/16/99	1.2	08/16/99	30	10/17/99	396	12/17/99	3
02/17/99	3	04/17/99	0.32	06/17/99	1.7	08/17/99	24	10/18/99	281	12/18/99	6.5
02/18/99	2.8	04/18/99	0.35	06/18/99	2.6	08/18/99	22	10/19/99	224	12/19/99	6.8
02/19/99	2.6	04/19/99	0.29	06/19/99	12	08/19/99	24	10/20/99	205	12/20/99	6
02/20/99	2.4	04/20/99	0.28	06/20/99	12	08/20/99	49	10/21/99	191	12/21/99	5.5
02/21/99	2.3	04/21/99	0.27	06/21/99	9.7	08/21/99	71	10/22/99	180	12/22/99	5.5
02/22/99	2.1	04/22/99	0.26	06/22/99	8.5	08/22/99	51	10/23/99	161	12/23/99	4.9
02/23/99	2	04/23/99	0.26	06/23/99	7.2	08/23/99	45	10/24/99	144	12/24/99	4.4
02/24/99	1.9	04/24/99	0.26	06/24/99	6.3	08/24/99	63	10/25/99	130	12/25/99	3.8
02/25/99	1.8	04/25/99	0.25	06/25/99	8.1	08/25/99	91	10/26/99	120	12/26/99	3.4
02/26/99	1.7	04/26/99	0.24	06/26/99	17	08/26/99	70	10/27/99	114	12/27/99	3.1
02/27/99	1.6	04/27/99	0.34	06/27/99	24	08/27/99	58	10/28/99	105	12/28/99	3.2
02/28/99	1.5	04/28/99	0.47	06/28/99	15	08/28/99	51	10/29/99	96	12/29/99	3.4
		04/29/99	0.4	06/29/99	11	08/29/99	46	10/30/99	88	12/30/99	3.2
		04/30/99	0.36	06/30/99	12	08/30/99	41	10/31/99	82	12/31/99	3
						08/31/99	37			01/01/00	2.7
										01/02/00	2.5
										01/03/00	2.3
										01/04/00	2.2

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/20/61	0	3/22/61	6	5/22/61	6	7/22/61	0	9/21/61	6	11/21/61	11
1/21/61	0	3/23/61	6	5/23/61	6	7/23/61	2	9/22/61	37	11/22/61	6
1/22/61	125	3/24/61	6	5/24/61	6	7/24/61	6	9/23/61	91	11/23/61	82
1/23/61	0	3/25/61	6	5/25/61	0	7/25/61	116	9/24/61	5	11/24/61	71
1/24/61	0	3/26/61	4	5/26/61	94	7/26/61	26	9/25/61	2	11/25/61	11
1/25/61	0	3/27/61	29	5/27/61	74	7/27/61	0	9/26/61	0	11/26/61	15
1/26/61	2	3/28/61	62	5/28/61	0	7/28/61	0	9/27/61	0	11/27/61	15
1/27/61	121	3/29/61	52	5/29/61	78	7/29/61	17	9/28/61	0	11/28/61	17
1/28/61	0	3/30/61	5	5/30/61	132	7/30/61	107	9/29/61	0	11/29/61	17
1/29/61	0	3/31/61	1	5/31/61	124	7/31/61	0	9/30/61	0	11/30/61	14
1/30/61	0	4/1/61	0	6/1/61	18	8/1/61	0	10/1/61	47	12/1/61	12
1/31/61	0	4/2/61	0	6/2/61	18	8/2/61	4	10/2/61	70	12/2/61	12
2/1/61	56	4/3/61	0	6/3/61	125	8/3/61	6	10/3/61	5	12/3/61	43
2/2/61	68	4/4/61	58	6/4/61	0	8/4/61	31	10/4/61	2	12/4/61	101
2/3/61	0	4/5/61	55	6/5/61	1	8/5/61	97	10/5/61	0	12/5/61	14
2/4/61	0	4/6/61	0	6/6/61	60	8/6/61	5	10/6/61	2	12/6/61	10
2/5/61	7	4/7/61	0	6/7/61	110	8/7/61	5	10/7/61	98	12/7/61	11
2/6/61	121	4/8/61	0	6/8/61	7	8/8/61	5	10/8/61	34	12/8/61	11
2/7/61	0	4/9/61	0	6/9/61	5	8/9/61	3	10/9/61	5	12/9/61	11
2/8/61	5	4/10/61	0	6/10/61	29	8/10/61	0	10/10/61	6	12/10/61	13
2/9/61	5	4/11/61	0	6/11/61	119	8/11/61	0	10/11/61	6	12/11/61	17
2/10/61	0	4/12/61	113	6/12/61	7	8/12/61	0	10/12/61	88	12/12/61	17
2/11/61	126	4/13/61	0	6/13/61	3	8/13/61	105	10/13/61	45	12/13/61	17
2/12/61	4	4/14/61	0	6/14/61	2	8/14/61	15	10/14/61	5	12/14/61	16
2/13/61	0	4/15/61	0	6/15/61	131	8/15/61	0	10/15/61	5	12/15/61	12
2/14/61	0	4/16/61	0	6/16/61	9	8/16/61	0	10/16/61	3	12/16/61	12
2/15/61	0	4/17/61	0	6/17/61	5	8/17/61	44	10/17/61	1	12/17/61	12
2/16/61	0	4/18/61	0	6/18/61	2	8/18/61	75	10/18/61	71	12/18/61	7
2/17/61	52	4/19/61	0	6/19/61	36	8/19/61	5	10/19/61	78	12/19/61	6
2/18/61	83	4/20/61	0	6/20/61	25	8/20/61	6	10/20/61	6	12/20/61	4
2/19/61	5	4/21/61	0	6/21/61	75	8/21/61	131	10/21/61	1	12/21/61	0
2/20/61	5	4/22/61	0	6/22/61	61	8/22/61	50	10/22/61	88	12/22/61	0
2/21/61	5	4/23/61	0	6/23/61	3	8/23/61	72	10/23/61	50		
2/22/61	1	4/24/61	3	6/24/61	0	8/24/61	137	10/24/61	8	12/6/79	6
2/23/61	0	4/25/61	6	6/25/61	0	8/25/61	38	10/25/61	0	12/7/79	144
2/24/61	0	4/26/61	5	6/26/61	0	8/26/61	18	10/26/61	0	12/8/79	2
2/25/61	0	4/27/61	0	6/27/61	0	8/27/61	130	10/27/61	0	12/9/79	104
2/26/61	19	4/28/61	0	6/28/61	99	8/28/61	125	10/28/61	38	12/10/79	49
2/27/61	91	4/29/61	0	6/29/61	22	8/29/61	122	10/29/61	101	12/11/79	2
2/28/61	5	4/30/61	0	6/30/61	1	8/30/61	124	10/30/61	10	12/12/79	41
3/1/61	2	5/1/61	0	7/1/61	0	8/31/61	122	10/31/61	9	12/13/79	111
3/2/61	0	5/2/61	81	7/2/61	0	9/1/61	117	11/1/61	6	12/14/79	3
3/3/61	0	5/3/61	46	7/3/61	0	9/2/61	111	11/2/61	6	12/15/79	34
3/4/61	2	5/4/61	0	7/4/61	31	9/3/61	16	11/3/61	86	12/16/79	107
3/5/61	6	5/5/61	1	7/5/61	86	9/4/61	58	11/4/61	53	12/17/79	0
3/6/61	3	5/6/61	5	7/6/61	0	9/5/61	112	11/5/61	0	12/18/79	4
3/7/61	2	5/7/61	5	7/7/61	0	9/6/61	0	11/6/61	1	12/19/79	4
3/8/61	51	5/8/61	4	7/8/61	0	9/7/61	0	11/7/61	6	12/20/79	7
3/9/61	78	5/9/61	0	7/9/61	0	9/8/61	119	11/8/61	62	12/21/79	9
3/10/61	5	5/10/61	0	7/10/61	85	9/9/61	18	11/9/61	91	12/22/79	5
3/11/61	5	5/11/61	0	7/11/61	71	9/10/61	0	11/10/61	10	12/23/79	4
3/12/61	5	5/12/61	0	7/12/61	5	9/11/61	9	11/11/61	11	12/24/79	2
3/13/61	0	5/13/61	3	7/13/61	5	9/12/61	120	11/12/61	16	12/25/79	0
3/14/61	0	5/14/61	6	7/14/61	6	9/13/61	0	11/13/61	17	12/26/79	0
3/15/61	0	5/15/61	6	7/15/61	30	9/14/61	0	11/14/61	18	12/27/79	0
3/16/61	0	5/16/61	6	7/16/61	99	9/15/61	0	11/15/61	114	12/28/79	0
3/17/61	67	5/17/61	6	7/17/61	5	9/16/61	68	11/16/61	35	12/29/79	0
3/18/61	58	5/18/61	6	7/18/61	2	9/17/61	61	11/17/61	10	12/30/79	0
3/19/61	5	5/19/61	6	7/19/61	0	9/18/61	0	11/18/61	11	12/31/79	9
3/20/61	5	5/20/61	6	7/20/61	3	9/19/61	0	11/19/61	11		
3/21/61	5	5/21/61	6	7/21/61	130	9/20/61	4	11/20/61	11		

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/80	28	3/1/80	0	5/1/80	0	7/1/80	0	9/1/80	99	11/1/80	0
1/2/80	71	3/2/80	127	5/2/80	0	7/2/80	79	9/2/80	10	11/2/80	0
1/3/80	70	3/3/80	104	5/3/80	0	7/3/80	100	9/3/80	83	11/3/80	0
1/4/80	0	3/4/80	4	5/4/80	0	7/4/80	32	9/4/80	261	11/4/80	0
1/5/80	0	3/5/80	28	5/5/80	0	7/5/80	38	9/5/80	139	11/5/80	0
1/6/80	3	3/6/80	119	5/6/80	0	7/6/80	3	9/6/80	66	11/6/80	0
1/7/80	11	3/7/80	24	5/7/80	0	7/7/80	0	9/7/80	124	11/7/80	0
1/8/80	18	3/8/80	3	5/8/80	0	7/8/80	33	9/8/80	34	11/8/80	0
1/9/80	23	3/9/80	0	5/9/80	0	7/9/80	55	9/9/80	115	11/9/80	0
1/10/80	106	3/10/80	0	5/10/80	0	7/10/80	42	9/10/80	80	11/10/80	0
1/11/80	37	3/11/80	0	5/11/80	0	7/11/80	41	9/11/80	89	11/11/80	0
1/12/80	0	3/12/80	0	5/12/80	0	7/12/80	19	9/12/80	5	11/12/80	0
1/13/80	0	3/13/80	0	5/13/80	0	7/13/80	19	9/13/80	181	11/13/80	0
1/14/80	0	3/14/80	0	5/14/80	0	7/14/80	19	9/14/80	36	11/14/80	0
1/15/80	0	3/15/80	0	5/15/80	0	7/15/80	19	9/15/80	121	11/15/80	0
1/16/80	0	3/16/80	0	5/16/80	0	7/16/80	19	9/16/80	4	11/16/80	0
1/17/80	0	3/17/80	0	5/17/80	0	7/17/80	19	9/17/80	82	11/17/80	0
1/18/80	0	3/18/80	0	5/18/80	0	7/18/80	21	9/18/80	0	11/18/80	0
1/19/80	0	3/19/80	0	5/19/80	0	7/19/80	56	9/19/80	69	11/19/80	0
1/20/80	0	3/20/80	0	5/20/80	0	7/20/80	118	9/20/80	94	11/20/80	0
1/21/80	0	3/21/80	0	5/21/80	0	7/21/80	142	9/21/80	4	11/21/80	0
1/22/80	0	3/22/80	0	5/22/80	0	7/22/80	131	9/22/80	15	11/22/80	0
1/23/80	0	3/23/80	0	5/23/80	0	7/23/80	107	9/23/80	96	11/23/80	0
1/24/80	0	3/24/80	0	5/24/80	0	7/24/80	174	9/24/80	83	11/24/80	0
1/25/80	0	3/25/80	0	5/25/80	59	7/25/80	245	9/25/80	2	11/25/80	0
1/26/80	0	3/26/80	0	5/26/80	87	7/26/80	188	9/26/80	0	11/26/80	0
1/27/80	98	3/27/80	0	5/27/80	125	7/27/80	204	9/27/80	6	11/27/80	0
1/28/80	149	3/28/80	0	5/28/80	97	7/28/80	162	9/28/80	25	11/28/80	0
1/29/80	10	3/29/80	1	5/29/80	62	7/29/80	142	9/29/80	115	11/29/80	4
1/30/80	128	3/30/80	6	5/30/80	20	7/30/80	115	9/30/80	0	11/30/80	6
1/31/80	0	3/31/80	2	5/31/80	0	7/31/80	109	10/1/80	0	12/1/80	5
2/1/80	6	4/1/80	0	6/1/80	0	8/1/80	145	10/2/80	0	12/2/80	7
2/2/80	27	4/2/80	0	6/2/80	0	8/2/80	142	10/3/80	0	12/3/80	7
2/3/80	118	4/3/80	0	6/3/80	0	8/3/80	104	10/4/80	0	12/4/80	4
2/4/80	128	4/4/80	0	6/4/80	0	8/4/80	105	10/5/80	0	12/5/80	1
2/5/80	133	4/5/80	0	6/5/80	0	8/5/80	31	10/6/80	0	12/6/80	0
2/6/80	136	4/6/80	0	6/6/80	0	8/6/80	90	10/7/80	0	12/7/80	0
2/7/80	134	4/7/80	0	6/7/80	0	8/7/80	22	10/8/80	0	12/8/80	0
2/8/80	63	4/8/80	0	6/8/80	0	8/8/80	88	10/9/80	0	12/9/80	0
2/9/80	0	4/9/80	0	6/9/80	0	8/9/80	22	10/10/80	85	12/10/80	0
2/10/80	17	4/10/80	0	6/10/80	0	8/10/80	80	10/11/80	85	12/11/80	0
2/11/80	32	4/11/80	2	6/11/80	0	8/11/80	15	10/12/80	0	12/12/80	0
2/12/80	56	4/12/80	0	6/12/80	0	8/12/80	9	10/13/80	0	12/13/80	0
2/13/80	49	4/13/80	0	6/13/80	0	8/13/80	80	10/14/80	0	12/14/80	0
2/14/80	41	4/14/80	0	6/14/80	0	8/14/80	53	10/15/80	9	12/15/80	0
2/15/80	51	4/15/80	0	6/15/80	0	8/15/80	8	10/16/80	42	12/16/80	0
2/16/80	85	4/16/80	0	6/16/80	0	8/16/80	7	10/17/80	44	12/17/80	0
2/17/80	31	4/17/80	0	6/17/80	0	8/17/80	7	10/18/80	114	12/18/80	0
2/18/80	38	4/18/80	0	6/18/80	0	8/18/80	102	10/19/80	0	12/19/80	0
2/19/80	30	4/19/80	0	6/19/80	0	8/19/80	10	10/20/80	0	12/20/80	0
2/20/80	100	4/20/80	0	6/20/80	0	8/20/80	13	10/21/80	66	12/21/80	0
2/21/80	0	4/21/80	0	6/21/80	0	8/21/80	102	10/22/80	160	12/22/80	0
2/22/80	3	4/22/80	0	6/22/80	0	8/22/80	7	10/23/80	85	12/23/80	0
2/23/80	17	4/23/80	0	6/23/80	0	8/23/80	3	10/24/80	0	12/24/80	0
2/24/80	54	4/24/80	0	6/24/80	0	8/24/80	14	10/25/80	0	12/25/80	0
2/25/80	91	4/25/80	0	6/25/80	0	8/25/80	69	10/26/80	0	12/26/80	0
2/26/80	0	4/26/80	0	6/26/80	0	8/26/80	6	10/27/80	0	12/27/80	0
2/27/80	0	4/27/80	0	6/27/80	0	8/27/80	0	10/28/80	0	12/28/80	0
2/28/80	0	4/28/80	0	6/28/80	0	8/28/80	0	10/29/80	0	12/29/80	0
2/29/80	0	4/29/80	0	6/29/80	0	8/29/80	0	10/30/80	0	12/30/80	0
		4/30/80	0	6/30/80	0	8/30/80	0	10/31/80	0	12/31/80	0
						8/31/80	2				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/81	0	3/1/81	0	5/1/81	0	7/1/81	0	9/1/81	223	11/1/81	0
1/2/81	0	3/2/81	0	5/2/81	0	7/2/81	0	9/2/81	215	11/2/81	0
1/3/81	0	3/3/81	0	5/3/81	0	7/3/81	0	9/3/81	179	11/3/81	0
1/4/81	0	3/4/81	0	5/4/81	0	7/4/81	0	9/4/81	155	11/4/81	0
1/5/81	0	3/5/81	0	5/5/81	0	7/5/81	0	9/5/81	147	11/5/81	0
1/6/81	0	3/6/81	0	5/6/81	0	7/6/81	0	9/6/81	141	11/6/81	158
1/7/81	0	3/7/81	0	5/7/81	0	7/7/81	0	9/7/81	232	11/7/81	56
1/8/81	0	3/8/81	0	5/8/81	0	7/8/81	0	9/8/81	290	11/8/81	2
1/9/81	0	3/9/81	0	5/9/81	0	7/9/81	0	9/9/81	297	11/9/81	7
1/10/81	0	3/10/81	0	5/10/81	0	7/10/81	0	9/10/81	363	11/10/81	26
1/11/81	0	3/11/81	0	5/11/81	0	7/11/81	0	9/11/81	396	11/11/81	128
1/12/81	0	3/12/81	0	5/12/81	0	7/12/81	0	9/12/81	265	11/12/81	2
1/13/81	0	3/13/81	0	5/13/81	0	7/13/81	0	9/13/81	235	11/13/81	0
1/14/81	0	3/14/81	0	5/14/81	0	7/14/81	0	9/14/81	217	11/14/81	0
1/15/81	0	3/15/81	0	5/15/81	0	7/15/81	0	9/15/81	237	11/15/81	0
1/16/81	0	3/16/81	0	5/16/81	0	7/16/81	0	9/16/81	138	11/16/81	0
1/17/81	0	3/17/81	0	5/17/81	0	7/17/81	0	9/17/81	281	11/17/81	0
1/18/81	0	3/18/81	0	5/18/81	0	7/18/81	0	9/18/81	236	11/18/81	0
1/19/81	0	3/19/81	0	5/19/81	0	7/19/81	0	9/19/81	185	11/19/81	0
1/20/81	0	3/20/81	0	5/20/81	0	7/20/81	0	9/20/81	131	11/20/81	0
1/21/81	0	3/21/81	0	5/21/81	0	7/21/81	0	9/21/81	337	11/21/81	0
1/22/81	0	3/22/81	0	5/22/81	0	7/22/81	0	9/22/81	375	11/22/81	0
1/23/81	0	3/23/81	0	5/23/81	0	7/23/81	0	9/23/81	278	11/23/81	0
1/24/81	0	3/24/81	0	5/24/81	0	7/24/81	0	9/24/81	257	11/24/81	0
1/25/81	0	3/25/81	0	5/25/81	0	7/25/81	0	9/25/81	287	11/25/81	0
1/26/81	0	3/26/81	0	5/26/81	0	7/26/81	0	9/26/81	336	11/26/81	0
1/27/81	0	3/27/81	0	5/27/81	0	7/27/81	0	9/27/81	273	11/27/81	0
1/28/81	0	3/28/81	0	5/28/81	0	7/28/81	0	9/28/81	207	11/28/81	0
1/29/81	0	3/29/81	0	5/29/81	0	7/29/81	0	9/29/81	199	11/29/81	0
1/30/81	0	3/30/81	0	5/30/81	0	7/30/81	0	9/30/81	105	11/30/81	0
1/31/81	0	3/31/81	0	5/31/81	0	7/31/81	0	10/1/81	191	12/1/81	0
2/1/81	0	4/1/81	0	6/1/81	0	8/1/81	0	10/2/81	133	12/2/81	0
2/2/81	0	4/2/81	0	6/2/81	0	8/2/81	0	10/3/81	14	12/3/81	0
2/3/81	0	4/3/81	0	6/3/81	0	8/3/81	0	10/4/81	83	12/4/81	0
2/4/81	0	4/4/81	0	6/4/81	0	8/4/81	0	10/5/81	71	12/5/81	0
2/5/81	0	4/5/81	0	6/5/81	0	8/5/81	0	10/6/81	0	12/6/81	0
2/6/81	0	4/6/81	0	6/6/81	0	8/6/81	0	10/7/81	0	12/7/81	0
2/7/81	0	4/7/81	0	6/7/81	0	8/7/81	0	10/8/81	0	12/8/81	0
2/8/81	0	4/8/81	0	6/8/81	0	8/8/81	0	10/9/81	0	12/9/81	0
2/9/81	0	4/9/81	0	6/9/81	0	8/9/81	0	10/10/81	0	12/10/81	0
2/10/81	0	4/10/81	0	6/10/81	0	8/10/81	0	10/11/81	0	12/11/81	0
2/11/81	0	4/11/81	0	6/11/81	0	8/11/81	0	10/12/81	0	12/12/81	0
2/12/81	0	4/12/81	0	6/12/81	0	8/12/81	0	10/13/81	2	12/13/81	0
2/13/81	0	4/13/81	0	6/13/81	0	8/13/81	0	10/14/81	126	12/14/81	0
2/14/81	0	4/14/81	0	6/14/81	0	8/14/81	0	10/15/81	0	12/15/81	0
2/15/81	0	4/15/81	0	6/15/81	0	8/15/81	0	10/16/81	0	12/16/81	0
2/16/81	0	4/16/81	0	6/16/81	0	8/16/81	0	10/17/81	0	12/17/81	0
2/17/81	0	4/17/81	0	6/17/81	0	8/17/81	6	10/18/81	0	12/18/81	0
2/18/81	0	4/18/81	0	6/18/81	0	8/18/81	381	10/19/81	0	12/19/81	0
2/19/81	0	4/19/81	0	6/19/81	0	8/19/81	96	10/20/81	0	12/20/81	0
2/20/81	0	4/20/81	0	6/20/81	0	8/20/81	461	10/21/81	0	12/21/81	0
2/21/81	0	4/21/81	0	6/21/81	0	8/21/81	483	10/22/81	0	12/22/81	0
2/22/81	0	4/22/81	0	6/22/81	0	8/22/81	288	10/23/81	0	12/23/81	0
2/23/81	0	4/23/81	0	6/23/81	0	8/23/81	454	10/24/81	0	12/24/81	0
2/24/81	0	4/24/81	0	6/24/81	0	8/24/81	705	10/25/81	0	12/25/81	0
2/25/81	0	4/25/81	0	6/25/81	0	8/25/81	772	10/26/81	0	12/26/81	0
2/26/81	0	4/26/81	0	6/26/81	0	8/26/81	0	10/27/81	0	12/27/81	0
2/27/81	0	4/27/81	0	6/27/81	0	8/27/81	8	10/28/81	0	12/28/81	0
2/28/81	0	4/28/81	0	6/28/81	0	8/28/81	166	10/29/81	0	12/29/81	0
		4/29/81	0	6/29/81	0	8/29/81	295	10/30/81	0	12/30/81	0
		4/30/81	0	6/30/81	0	8/30/81	222	10/31/81	0	12/31/81	0
						8/31/81	217				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/82	0	3/1/82	6	5/1/82	61	7/1/82	235	9/1/82	12	11/1/82	419
1/2/82	0	3/2/82	6	5/2/82	91	7/2/82	199	9/2/82	52	11/2/82	382
1/3/82	0	3/3/82	6	5/3/82	10	7/3/82	179	9/3/82	55	11/3/82	193
1/4/82	0	3/4/82	6	5/4/82	135	7/4/82	163	9/4/82	36	11/4/82	230
1/5/82	0	3/5/82	7	5/5/82	6	7/5/82	178	9/5/82	33	11/5/82	213
1/6/82	0	3/6/82	131	5/6/82	38	7/6/82	276	9/6/82	63	11/6/82	257
1/7/82	0	3/7/82	87	5/7/82	36	7/7/82	197	9/7/82	22	11/7/82	189
1/8/82	0	3/8/82	253	5/8/82	17	7/8/82	182	9/8/82	45	11/8/82	649
1/9/82	0	3/9/82	130	5/9/82	0	7/9/82	171	9/9/82	33	11/9/82	1355
1/10/82	0	3/10/82	8	5/10/82	0	7/10/82	159	9/10/82	38	11/10/82	1273
1/11/82	0	3/11/82	113	5/11/82	0	7/11/82	180	9/11/82	3	11/11/82	925
1/12/82	0	3/12/82	18	5/12/82	0	7/12/82	177	9/12/82	1	11/12/82	703
1/13/82	0	3/13/82	14	5/13/82	0	7/13/82	251	9/13/82	64	11/13/82	580
1/14/82	0	3/14/82	21	5/14/82	0	7/14/82	107	9/14/82	2	11/14/82	441
1/15/82	0	3/15/82	13	5/15/82	0	7/15/82	125	9/15/82	10	11/15/82	395
1/16/82	0	3/16/82	11	5/16/82	0	7/16/82	126	9/16/82	11	11/16/82	1481
1/17/82	0	3/17/82	7	5/17/82	0	7/17/82	151	9/17/82	2	11/17/82	1859
1/18/82	0	3/18/82	7	5/18/82	0	7/18/82	22	9/18/82	0	11/18/82	1441
1/19/82	0	3/19/82	7	5/19/82	0	7/19/82	134	9/19/82	0	11/19/82	1118
1/20/82	0	3/20/82	7	5/20/82	0	7/20/82	318	9/20/82	0	11/20/82	962
1/21/82	0	3/21/82	7	5/21/82	0	7/21/82	244	9/21/82	5	11/21/82	570
1/22/82	0	3/22/82	7	5/22/82	1	7/22/82	344	9/22/82	83	11/22/82	488
1/23/82	0	3/23/82	7	5/23/82	134	7/23/82	257	9/23/82	120	11/23/82	491
1/24/82	0	3/24/82	9	5/24/82	295	7/24/82	358	9/24/82	216	11/24/82	448
1/25/82	0	3/25/82	33	5/25/82	285	7/25/82	221	9/25/82	279	11/25/82	383
1/26/82	0	3/26/82	152	5/26/82	279	7/26/82	319	9/26/82	417	11/26/82	350
1/27/82	0	3/27/82	59	5/27/82	386	7/27/82	180	9/27/82	413	11/27/82	296
1/28/82	0	3/28/82	59	5/28/82	351	7/28/82	303	9/28/82	443	11/28/82	263
1/29/82	0	3/29/82	1119	5/29/82	267	7/29/82	291	9/29/82	356	11/29/82	301
1/30/82	0	3/30/82	991	5/30/82	263	7/30/82	213	9/30/82	371	11/30/82	243
1/31/82	0	3/31/82	626	5/31/82	267	7/31/82	258	10/1/82	368	12/1/82	268
2/1/82	45	4/1/82	471	6/1/82	215	8/1/82	299	10/2/82	334	12/2/82	163
2/2/82	82	4/2/82	339	6/2/82	380	8/2/82	163	10/3/82	404	12/3/82	134
2/3/82	0	4/3/82	261	6/3/82	480	8/3/82	217	10/4/82	403	12/4/82	102
2/4/82	0	4/4/82	164	6/4/82	311	8/4/82	216	10/5/82	409	12/5/82	144
2/5/82	0	4/5/82	275	6/5/82	386	8/5/82	212	10/6/82	407	12/6/82	115
2/6/82	0	4/6/82	150	6/6/82	344	8/6/82	201	10/7/82	400	12/7/82	147
2/7/82	0	4/7/82	18	6/7/82	340	8/7/82	123	10/8/82	459	12/8/82	93
2/8/82	0	4/8/82	108	6/8/82	282	8/8/82	129	10/9/82	342	12/9/82	109
2/9/82	0	4/9/82	37	6/9/82	221	8/9/82	112	10/10/82	352	12/10/82	146
2/10/82	0	4/10/82	70	6/10/82	150	8/10/82	68	10/11/82	280	12/11/82	76
2/11/82	2	4/11/82	99	6/11/82	107	8/11/82	68	10/12/82	298	12/12/82	78
2/12/82	1	4/12/82	0	6/12/82	111	8/12/82	72	10/13/82	249	12/13/82	70
2/13/82	0	4/13/82	10	6/13/82	147	8/13/82	139	10/14/82	233	12/14/82	63
2/14/82	0	4/14/82	18	6/14/82	139	8/14/82	185	10/15/82	176	12/15/82	197
2/15/82	0	4/15/82	26	6/15/82	11	8/15/82	288	10/16/82	181	12/16/82	3
2/16/82	0	4/16/82	30	6/16/82	133	8/16/82	193	10/17/82	148	12/17/82	63
2/17/82	0	4/17/82	26	6/17/82	258	8/17/82	196	10/18/82	143	12/18/82	56
2/18/82	0	4/18/82	22	6/18/82	515	8/18/82	154	10/19/82	82	12/19/82	63
2/19/82	0	4/19/82	36	6/19/82	852	8/19/82	238	10/20/82	64	12/20/82	7
2/20/82	0	4/20/82	11	6/20/82	659	8/20/82	181	10/21/82	60	12/21/82	72
2/21/82	0	4/21/82	0	6/21/82	494	8/21/82	181	10/22/82	55	12/22/82	1
2/22/82	0	4/22/82	0	6/22/82	416	8/22/82	135	10/23/82	98	12/23/82	16
2/23/82	0	4/23/82	0	6/23/82	561	8/23/82	108	10/24/82	65	12/24/82	64
2/24/82	0	4/24/82	237	6/24/82	781	8/24/82	135	10/25/82	67	12/25/82	66
2/25/82	0	4/25/82	149	6/25/82	663	8/25/82	69	10/26/82	12	12/26/82	63
2/26/82	0	4/26/82	120	6/26/82	511	8/26/82	68	10/27/82	42	12/27/82	26
2/27/82	0	4/27/82	121	6/27/82	394	8/27/82	65	10/28/82	37	12/28/82	11
2/28/82	0	4/28/82	66	6/28/82	303	8/28/82	60	10/29/82	14	12/29/82	34
		4/29/82	142	6/29/82	236	8/29/82	60	10/30/82	25	12/30/82	55
		4/30/82	136	6/30/82	287	8/30/82	83	10/31/82	23	12/31/82	8
						8/31/82	92				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/83	74	3/1/83	436	5/1/83	32	7/1/83	93	9/1/83	199	11/1/83	269
1/2/83	6	3/2/83	377	5/2/83	27	7/2/83	18	9/2/83	340	11/2/83	335
1/3/83	22	3/3/83	301	5/3/83	21	7/3/83	50	9/3/83	175	11/3/83	252
1/4/83	52	3/4/83	235	5/4/83	68	7/4/83	29	9/4/83	118	11/4/83	264
1/5/83	127	3/5/83	232	5/5/83	0	7/5/83	50	9/5/83	0	11/5/83	296
1/6/83	85	3/6/83	188	5/6/83	1	7/6/83	3	9/6/83	101	11/6/83	296
1/7/83	49	3/7/83	259	5/7/83	0	7/7/83	8	9/7/83	72	11/7/83	313
1/8/83	124	3/8/83	351	5/8/83	0	7/8/83	21	9/8/83	21	11/8/83	196
1/9/83	86	3/9/83	261	5/9/83	0	7/9/83	36	9/9/83	0	11/9/83	342
1/10/83	107	3/10/83	253	5/10/83	0	7/10/83	30	9/10/83	0	11/10/83	306
1/11/83	103	3/11/83	233	5/11/83	0	7/11/83	13	9/11/83	0	11/11/83	376
1/12/83	34	3/12/83	202	5/12/83	0	7/12/83	2	9/12/83	0	11/12/83	260
1/13/83	69	3/13/83	171	5/13/83	0	7/13/83	0	9/13/83	0	11/13/83	303
1/14/83	28	3/14/83	152	5/14/83	0	7/14/83	0	9/14/83	0	11/14/83	276
1/15/83	71	3/15/83	188	5/15/83	0	7/15/83	0	9/15/83	2	11/15/83	238
1/16/83	6	3/16/83	290	5/16/83	0	7/16/83	0	9/16/83	197	11/16/83	270
1/17/83	7	3/17/83	294	5/17/83	0	7/17/83	0	9/17/83	226	11/17/83	251
1/18/83	11	3/18/83	254	5/18/83	0	7/18/83	0	9/18/83	117	11/18/83	146
1/19/83	10	3/19/83	167	5/19/83	0	7/19/83	0	9/19/83	103	11/19/83	187
1/20/83	127	3/20/83	173	5/20/83	0	7/20/83	0	9/20/83	142	11/20/83	204
1/21/83	177	3/21/83	183	5/21/83	0	7/21/83	0	9/21/83	73	11/21/83	120
1/22/83	155	3/22/83	134	5/22/83	0	7/22/83	0	9/22/83	87	11/22/83	151
1/23/83	241	3/23/83	111	5/23/83	0	7/23/83	0	9/23/83	415	11/23/83	87
1/24/83	158	3/24/83	273	5/24/83	0	7/24/83	0	9/24/83	1972	11/24/83	72
1/25/83	169	3/25/83	254	5/25/83	0	7/25/83	0	9/25/83	1855	11/25/83	137
1/26/83	90	3/26/83	185	5/26/83	0	7/26/83	0	9/26/83	1201	11/26/83	88
1/27/83	172	3/27/83	166	5/27/83	4	7/27/83	0	9/27/83	981	11/27/83	57
1/28/83	97	3/28/83	133	5/28/83	1	7/28/83	0	9/28/83	785	11/28/83	76
1/29/83	93	3/29/83	164	5/29/83	0	7/29/83	0	9/29/83	701	11/29/83	61
1/30/83	90	3/30/83	90	5/30/83	0	7/30/83	0	9/30/83	497	11/30/83	58
1/31/83	88	3/31/83	266	5/31/83	0	7/31/83	0	10/1/83	461	12/1/83	95
2/1/83	83	4/1/83	184	6/1/83	0	8/1/83	0	10/2/83	404	12/2/83	189
2/2/83	125	4/2/83	176	6/2/83	0	8/2/83	0	10/3/83	353	12/3/83	127
2/3/83	117	4/3/83	136	6/3/83	0	8/3/83	0	10/4/83	1329	12/4/83	151
2/4/83	80	4/4/83	151	6/4/83	0	8/4/83	2	10/5/83	74	12/5/83	77
2/5/83	80	4/5/83	101	6/5/83	0	8/5/83	0	10/6/83	329	12/6/83	62
2/6/83	67	4/6/83	104	6/6/83	3	8/6/83	0	10/7/83	376	12/7/83	59
2/7/83	183	4/7/83	67	6/7/83	6	8/7/83	0	10/8/83	370	12/8/83	70
2/8/83	157	4/8/83	71	6/8/83	135	8/8/83	47	10/9/83	317	12/9/83	16
2/9/83	88	4/9/83	65	6/9/83	191	8/9/83	82	10/10/83	315	12/10/83	59
2/10/83	155	4/10/83	134	6/10/83	327	8/10/83	14	10/11/83	300	12/11/83	83
2/11/83	158	4/11/83	107	6/11/83	242	8/11/83	16	10/12/83	388	12/12/83	196
2/12/83	182	4/12/83	62	6/12/83	155	8/12/83	71	10/13/83	417	12/13/83	97
2/13/83	572	4/13/83	49	6/13/83	272	8/13/83	14	10/14/83	309	12/14/83	134
2/14/83	404	4/14/83	24	6/14/83	305	8/14/83	81	10/15/83	407	12/15/83	78
2/15/83	314	4/15/83	178	6/15/83	232	8/15/83	96	10/16/83	325	12/16/83	160
2/16/83	376	4/16/83	436	6/16/83	142	8/16/83	77	10/17/83	319	12/17/83	189
2/17/83	506	4/17/83	204	6/17/83	180	8/17/83	68	10/18/83	288	12/18/83	150
2/18/83	339	4/18/83	103	6/18/83	184	8/18/83	70	10/19/83	426	12/19/83	160
2/19/83	300	4/19/83	142	6/19/83	97	8/19/83	78	10/20/83	387	12/20/83	167
2/20/83	302	4/20/83	91	6/20/83	95	8/20/83	99	10/21/83	328	12/21/83	122
2/21/83	207	4/21/83	121	6/21/83	6	8/21/83	46	10/22/83	349	12/22/83	117
2/22/83	243	4/22/83	71	6/22/83	10	8/22/83	63	10/23/83	1620	12/23/83	150
2/23/83	214	4/23/83	63	6/23/83	204	8/23/83	73	10/24/83	1517	12/24/83	80
2/24/83	218	4/24/83	93	6/24/83	172	8/24/83	135	10/25/83	835	12/25/83	92
2/25/83	200	4/25/83	49	6/25/83	176	8/25/83	245	10/26/83	504	12/26/83	98
2/26/83	143	4/26/83	57	6/26/83	123	8/26/83	70	10/27/83	360	12/27/83	69
2/27/83	482	4/27/83	61	6/27/83	138	8/27/83	86	10/28/83	404	12/28/83	84
2/28/83	596	4/28/83	11	6/28/83	78	8/28/83	119	10/29/83	288	12/29/83	141
		4/29/83	31	6/29/83	76	8/29/83	28	10/30/83	349	12/30/83	223
		4/30/83	36	6/30/83	58	8/30/83	194	10/31/83	301	12/31/83	334
						8/31/83	48				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/84	284	3/1/84	0	5/1/84	0	7/1/84	8	9/1/84	0	11/1/84	10
1/2/84	252	3/2/84	0	5/2/84	0	7/2/84	26	9/2/84	0	11/2/84	80
1/3/84	197	3/3/84	0	5/3/84	0	7/3/84	57	9/3/84	0	11/3/84	149
1/4/84	161	3/4/84	0	5/4/84	0	7/4/84	5	9/4/84	0	11/4/84	93
1/5/84	134	3/5/84	0	5/5/84	0	7/5/84	14	9/5/84	0	11/5/84	91
1/6/84	133	3/6/84	0	5/6/84	0	7/6/84	12	9/6/84	0	11/6/84	15
1/7/84	137	3/7/84	0	5/7/84	0	7/7/84	7	9/7/84	0	11/7/84	81
1/8/84	122	3/8/84	0	5/8/84	0	7/8/84	5	9/8/84	0	11/8/84	15
1/9/84	75	3/9/84	0	5/9/84	0	7/9/84	5	9/9/84	0	11/9/84	57
1/10/84	116	3/10/84	0	5/10/84	0	7/10/84	1	9/10/84	4	11/10/84	49
1/11/84	66	3/11/84	0	5/11/84	0	7/11/84	0	9/11/84	6	11/11/84	3
1/12/84	87	3/12/84	0	5/12/84	0	7/12/84	0	9/12/84	5	11/12/84	7
1/13/84	87	3/13/84	0	5/13/84	0	7/13/84	0	9/13/84	0	11/13/84	13
1/14/84	59	3/14/84	0	5/14/84	0	7/14/84	0	9/14/84	0	11/14/84	14
1/15/84	83	3/15/84	0	5/15/84	0	7/15/84	0	9/15/84	0	11/15/84	13
1/16/84	40	3/16/84	0	5/16/84	0	7/16/84	0	9/16/84	0	11/16/84	10
1/17/84	60	3/17/84	0	5/17/84	0	7/17/84	0	9/17/84	0	11/17/84	7
1/18/84	50	3/18/84	0	5/18/84	0	7/18/84	0	9/18/84	0	11/18/84	7
1/19/84	9	3/19/84	0	5/19/84	0	7/19/84	0	9/19/84	59	11/19/84	7
1/20/84	61	3/20/84	0	5/20/84	0	7/20/84	0	9/20/84	327	11/20/84	7
1/21/84	18	3/21/84	0	5/21/84	0	7/21/84	0	9/21/84	562	11/21/84	153
1/22/84	74	3/22/84	0	5/22/84	0	7/22/84	0	9/22/84	468	11/22/84	1412
1/23/84	38	3/23/84	277	5/23/84	0	7/23/84	7	9/23/84	276	11/23/84	2095
1/24/84	4	3/24/84	519	5/24/84	0	7/24/84	70	9/24/84	221	11/24/84	2178
1/25/84	6	3/25/84	174	5/25/84	0	7/25/84	10	9/25/84	187	11/25/84	2019
1/26/84	11	3/26/84	112	5/26/84	0	7/26/84	71	9/26/84	294	11/26/84	863
1/27/84	24	3/27/84	119	5/27/84	0	7/27/84	19	9/27/84	495	11/27/84	145
1/28/84	29	3/28/84	80	5/28/84	0	7/28/84	45	9/28/84	767	11/28/84	149
1/29/84	26	3/29/84	65	5/29/84	311	7/29/84	46	9/29/84	598	11/29/84	503
1/30/84	17	3/30/84	54	5/30/84	279	7/30/84	65	9/30/84	437	11/30/84	655
1/31/84	11	3/31/84	25	5/31/84	213	7/31/84	4	10/1/84	442	12/1/84	463
2/1/84	8	4/1/84	2	6/1/84	114	8/1/84	11	10/2/84	338	12/2/84	423
2/2/84	2	4/2/84	16	6/2/84	93	8/2/84	14	10/3/84	337	12/3/84	393
2/3/84	4	4/3/84	29	6/3/84	112	8/3/84	10	10/4/84	301	12/4/84	379
2/4/84	64	4/4/84	78	6/4/84	132	8/4/84	5	10/5/84	239	12/5/84	361
2/5/84	2	4/5/84	66	6/5/84	99	8/5/84	4	10/6/84	219	12/6/84	324
2/6/84	0	4/6/84	0	6/6/84	129	8/6/84	11	10/7/84	194	12/7/84	219
2/7/84	0	4/7/84	0	6/7/84	74	8/7/84	10	10/8/84	171	12/8/84	212
2/8/84	0	4/8/84	71	6/8/84	74	8/8/84	7	10/9/84	154	12/9/84	196
2/9/84	0	4/9/84	46	6/9/84	11	8/9/84	2	10/10/84	162	12/10/84	175
2/10/84	0	4/10/84	37	6/10/84	35	8/10/84	0	10/11/84	151	12/11/84	157
2/11/84	0	4/11/84	3	6/11/84	72	8/11/84	0	10/12/84	144	12/12/84	150
2/12/84	4	4/12/84	6	6/12/84	10	8/12/84	0	10/13/84	86	12/13/84	132
2/13/84	31	4/13/84	57	6/13/84	9	8/13/84	0	10/14/84	127	12/14/84	72
2/14/84	71	4/14/84	15	6/14/84	13	8/14/84	0	10/15/84	71	12/15/84	123
2/15/84	0	4/15/84	1	6/15/84	17	8/15/84	0	10/16/84	133	12/16/84	69
2/16/84	0	4/16/84	4	6/16/84	85	8/16/84	0	10/17/84	109	12/17/84	117
2/17/84	0	4/17/84	0	6/17/84	155	8/17/84	0	10/18/84	93	12/18/84	65
2/18/84	0	4/18/84	0	6/18/84	105	8/18/84	0	10/19/84	90	12/19/84	63
2/19/84	0	4/19/84	0	6/19/84	73	8/19/84	0	10/20/84	103	12/20/84	65
2/20/84	0	4/20/84	0	6/20/84	66	8/20/84	0	10/21/84	157	12/21/84	64
2/21/84	0	4/21/84	0	6/21/84	13	8/21/84	0	10/22/84	104	12/22/84	14
2/22/84	0	4/22/84	0	6/22/84	28	8/22/84	0	10/23/84	98	12/23/84	55
2/23/84	0	4/23/84	0	6/23/84	37	8/23/84	0	10/24/84	89	12/24/84	39
2/24/84	0	4/24/84	0	6/24/84	67	8/24/84	0	10/25/84	55	12/25/84	27
2/25/84	0	4/25/84	0	6/25/84	7	8/25/84	0	10/26/84	135	12/26/84	17
2/26/84	0	4/26/84	0	6/26/84	2	8/26/84	0	10/27/84	96	12/27/84	70
2/27/84	0	4/27/84	0	6/27/84	2	8/27/84	0	10/28/84	73	12/28/84	5
2/28/84	0	4/28/84	0	6/28/84	12	8/28/84	0	10/29/84	22	12/29/84	2
2/29/84	0	4/29/84	0	6/29/84	13	8/29/84	0	10/30/84	16	12/30/84	5
		4/30/84	0	6/30/84	11	8/30/84	0	10/31/84	81	12/31/84	4
						8/31/84	0				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/85	5	3/1/85	0	5/1/85	0	7/1/85	5	9/1/85	6	11/1/85	207
1/2/85	66	3/2/85	0	5/2/85	0	7/2/85	4	9/2/85	6	11/2/85	198
1/3/85	0	3/3/85	0	5/3/85	0	7/3/85	6	9/3/85	4	11/3/85	139
1/4/85	3	3/4/85	0	5/4/85	0	7/4/85	1	9/4/85	0	11/4/85	178
1/5/85	2	3/5/85	0	5/5/85	0	7/5/85	0	9/5/85	0	11/5/85	157
1/6/85	0	3/6/85	0	5/6/85	0	7/6/85	0	9/6/85	0	11/6/85	127
1/7/85	0	3/7/85	0	5/7/85	0	7/7/85	0	9/7/85	0	11/7/85	121
1/8/85	0	3/8/85	0	5/8/85	0	7/8/85	0	9/8/85	0	11/8/85	68
1/9/85	0	3/9/85	0	5/9/85	0	7/9/85	0	9/9/85	0	11/9/85	66
1/10/85	0	3/10/85	0	5/10/85	0	7/10/85	0	9/10/85	0	11/10/85	90
1/11/85	0	3/11/85	0	5/11/85	0	7/11/85	0	9/11/85	2	11/11/85	41
1/12/85	0	3/12/85	0	5/12/85	0	7/12/85	0	9/12/85	1	11/12/85	51
1/13/85	0	3/13/85	0	5/13/85	0	7/13/85	0	9/13/85	1	11/13/85	22
1/14/85	0	3/14/85	0	5/14/85	0	7/14/85	0	9/14/85	6	11/14/85	54
1/15/85	0	3/15/85	0	5/15/85	0	7/15/85	0	9/15/85	6	11/15/85	1
1/16/85	0	3/16/85	0	5/16/85	0	7/16/85	0	9/16/85	16	11/16/85	4
1/17/85	0	3/17/85	0	5/17/85	0	7/17/85	0	9/17/85	70	11/17/85	2
1/18/85	0	3/18/85	0	5/18/85	0	7/18/85	0	9/18/85	333	11/18/85	18
1/19/85	0	3/19/85	0	5/19/85	0	7/19/85	71	9/19/85	466	11/19/85	98
1/20/85	0	3/20/85	0	5/20/85	0	7/20/85	87	9/20/85	489	11/20/85	32
1/21/85	0	3/21/85	0	5/21/85	0	7/21/85	135	9/21/85	492	11/21/85	51
1/22/85	0	3/22/85	0	5/22/85	0	7/22/85	67	9/22/85	448	11/22/85	10
1/23/85	0	3/23/85	0	5/23/85	0	7/23/85	53	9/23/85	427	11/23/85	15
1/24/85	0	3/24/85	0	5/24/85	0	7/24/85	81	9/24/85	393	11/24/85	19
1/25/85	0	3/25/85	0	5/25/85	0	7/25/85	22	9/25/85	324	11/25/85	15
1/26/85	0	3/26/85	0	5/26/85	0	7/26/85	75	9/26/85	298	11/26/85	9
1/27/85	0	3/27/85	0	5/27/85	0	7/27/85	17	9/27/85	247	11/27/85	1
1/28/85	0	3/28/85	0	5/28/85	0	7/28/85	23	9/28/85	306	11/28/85	0
1/29/85	0	3/29/85	0	5/29/85	0	7/29/85	25	9/29/85	401	11/29/85	5
1/30/85	0	3/30/85	0	5/30/85	0	7/30/85	16	9/30/85	471	11/30/85	7
1/31/85	0	3/31/85	0	5/31/85	0	7/31/85	5	10/1/85	262	12/1/85	7
2/1/85	0	4/1/85	0	6/1/85	0	8/1/85	0	10/2/85	219	12/2/85	5
2/2/85	0	4/2/85	0	6/2/85	0	8/2/85	0	10/3/85	346	12/3/85	1
2/3/85	0	4/3/85	0	6/3/85	0	8/3/85	0	10/4/85	345	12/4/85	6
2/4/85	0	4/4/85	0	6/4/85	0	8/4/85	0	10/5/85	334	12/5/85	8
2/5/85	0	4/5/85	0	6/5/85	0	8/5/85	0	10/6/85	233	12/6/85	41
2/6/85	0	4/6/85	0	6/6/85	0	8/6/85	0	10/7/85	198	12/7/85	59
2/7/85	0	4/7/85	0	6/7/85	0	8/7/85	1	10/8/85	203	12/8/85	30
2/8/85	0	4/8/85	0	6/8/85	0	8/8/85	7	10/9/85	214	12/9/85	38
2/9/85	0	4/9/85	0	6/9/85	0	8/9/85	6	10/10/85	100	12/10/85	38
2/10/85	0	4/10/85	0	6/10/85	0	8/10/85	0	10/11/85	134	12/11/85	32
2/11/85	0	4/11/85	0	6/11/85	0	8/11/85	0	10/12/85	129	12/12/85	27
2/12/85	0	4/12/85	0	6/12/85	0	8/12/85	0	10/13/85	0	12/13/85	21
2/13/85	0	4/13/85	0	6/13/85	0	8/13/85	5	10/14/85	8	12/14/85	14
2/14/85	0	4/14/85	0	6/14/85	0	8/14/85	4	10/15/85	120	12/15/85	13
2/15/85	0	4/15/85	0	6/15/85	0	8/15/85	5	10/16/85	56	12/16/85	13
2/16/85	0	4/16/85	0	6/16/85	0	8/16/85	0	10/17/85	28	12/17/85	13
2/17/85	0	4/17/85	0	6/17/85	0	8/17/85	0	10/18/85	60	12/18/85	12
2/18/85	0	4/18/85	0	6/18/85	0	8/18/85	0	10/19/85	128	12/19/85	12
2/19/85	0	4/19/85	0	6/19/85	0	8/19/85	0	10/20/85	136	12/20/85	12
2/20/85	0	4/20/85	0	6/20/85	0	8/20/85	3	10/21/85	126	12/21/85	12
2/21/85	0	4/21/85	0	6/21/85	0	8/21/85	6	10/22/85	130	12/22/85	12
2/22/85	0	4/22/85	0	6/22/85	0	8/22/85	6	10/23/85	157	12/23/85	5
2/23/85	0	4/23/85	0	6/23/85	0	8/23/85	1	10/24/85	129	12/24/85	0
2/24/85	0	4/24/85	0	6/24/85	0	8/24/85	0	10/25/85	72	12/25/85	0
2/25/85	0	4/25/85	0	6/25/85	0	8/25/85	0	10/26/85	121	12/26/85	0
2/26/85	0	4/26/85	0	6/26/85	0	8/26/85	0	10/27/85	148	12/27/85	0
2/27/85	0	4/27/85	0	6/27/85	0	8/27/85	0	10/28/85	87	12/28/85	0
2/28/85	0	4/28/85	0	6/28/85	0	8/28/85	0	10/29/85	236	12/29/85	0
		4/29/85	0	6/29/85	3	8/29/85	0	10/30/85	299	12/30/85	0
		4/30/85	0	6/30/85	6	8/30/85	0	10/31/85	157	12/31/85	0
						8/31/85	3				

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Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/86	0	3/1/86	0	5/1/86	0	7/1/86	204	9/1/86	10	11/1/86	39
1/2/86	0	3/2/86	0	5/2/86	0	7/2/86	112	9/2/86	21	11/2/86	48
1/3/86	0	3/3/86	0	5/3/86	0	7/3/86	161	9/3/86	27	11/3/86	53
1/4/86	0	3/4/86	0	5/4/86	0	7/4/86	108	9/4/86	71	11/4/86	21
1/5/86	0	3/5/86	0	5/5/86	0	7/5/86	138	9/5/86	56	11/5/86	19
1/6/86	0	3/6/86	0	5/6/86	0	7/6/86	138	9/6/86	51	11/6/86	13
1/7/86	0	3/7/86	0	5/7/86	0	7/7/86	151	9/7/86	97	11/7/86	10
1/8/86	0	3/8/86	0	5/8/86	0	7/8/86	155	9/8/86	61	11/8/86	5
1/9/86	0	3/9/86	0	5/9/86	0	7/9/86	121	9/9/86	56	11/9/86	1
1/10/86	259	3/10/86	0	5/10/86	0	7/10/86	117	9/10/86	56	11/10/86	0
1/11/86	170	3/11/86	0	5/11/86	0	7/11/86	80	9/11/86	30	11/11/86	7
1/12/86	131	3/12/86	6	5/12/86	0	7/12/86	122	9/12/86	72	11/12/86	61
1/13/86	110	3/13/86	26	5/13/86	0	7/13/86	134	9/13/86	5	11/13/86	20
1/14/86	61	3/14/86	53	5/14/86	0	7/14/86	151	9/14/86	27	11/14/86	152
1/15/86	42	3/15/86	104	5/15/86	0	7/15/86	95	9/15/86	55	11/15/86	114
1/16/86	31	3/16/86	200	5/16/86	0	7/16/86	13	9/16/86	17	11/16/86	137
1/17/86	35	3/17/86	69	5/17/86	0	7/17/86	21	9/17/86	18	11/17/86	63
1/18/86	60	3/18/86	71	5/18/86	0	7/18/86	64	9/18/86	7	11/18/86	58
1/19/86	59	3/19/86	22	5/19/86	0	7/19/86	59	9/19/86	5	11/19/86	69
1/20/86	4	3/20/86	70	5/20/86	0	7/20/86	71	9/20/86	2	11/20/86	7
1/21/86	10	3/21/86	61	5/21/86	0	7/21/86	22	9/21/86	5	11/21/86	19
1/22/86	13	3/22/86	13	5/22/86	0	7/22/86	79	9/22/86	13	11/22/86	25
1/23/86	10	3/23/86	13	5/23/86	0	7/23/86	173	9/23/86	55	11/23/86	29
1/24/86	2	3/24/86	10	5/24/86	0	7/24/86	304	9/24/86	14	11/24/86	76
1/25/86	14	3/25/86	7	5/25/86	0	7/25/86	302	9/25/86	26	11/25/86	40
1/26/86	24	3/26/86	64	5/26/86	0	7/26/86	216	9/26/86	62	11/26/86	31
1/27/86	15	3/27/86	572	5/27/86	0	7/27/86	266	9/27/86	0	11/27/86	32
1/28/86	0	3/28/86	424	5/28/86	0	7/28/86	368	9/28/86	0	11/28/86	34
1/29/86	0	3/29/86	551	5/29/86	3	7/29/86	283	9/29/86	7	11/29/86	39
1/30/86	0	3/30/86	762	5/30/86	6	7/30/86	226	9/30/86	13	11/30/86	94
1/31/86	0	3/31/86	636	5/31/86	6	7/31/86	194	10/1/86	13	12/1/86	59
2/1/86	0	4/1/86	471	6/1/86	6	8/1/86	165	10/2/86	7	12/2/86	57
2/2/86	0	4/2/86	369	6/2/86	8	8/2/86	168	10/3/86	6	12/3/86	23
2/3/86	0	4/3/86	223	6/3/86	11	8/3/86	105	10/4/86	5	12/4/86	51
2/4/86	0	4/4/86	178	6/4/86	12	8/4/86	104	10/5/86	0	12/5/86	110
2/5/86	0	4/5/86	124	6/5/86	12	8/5/86	107	10/6/86	0	12/6/86	169
2/6/86	0	4/6/86	148	6/6/86	7	8/6/86	51	10/7/86	0	12/7/86	91
2/7/86	0	4/7/86	82	6/7/86	0	8/7/86	60	10/8/86	0	12/8/86	79
2/8/86	0	4/8/86	109	6/8/86	0	8/8/86	61	10/9/86	0	12/9/86	14
2/9/86	0	4/9/86	69	6/9/86	0	8/9/86	55	10/10/86	0	12/10/86	58
2/10/86	0	4/10/86	21	6/10/86	0	8/10/86	57	10/11/86	0	12/11/86	59
2/11/86	0	4/11/86	62	6/11/86	0	8/11/86	59	10/12/86	0	12/12/86	16
2/12/86	0	4/12/86	14	6/12/86	0	8/12/86	55	10/13/86	0	12/13/86	23
2/13/86	0	4/13/86	25	6/13/86	0	8/13/86	118	10/14/86	0	12/14/86	16
2/14/86	0	4/14/86	27	6/14/86	0	8/14/86	107	10/15/86	0	12/15/86	26
2/15/86	0	4/15/86	26	6/15/86	0	8/15/86	77	10/16/86	0	12/16/86	24
2/16/86	0	4/16/86	16	6/16/86	0	8/16/86	112	10/17/86	0	12/17/86	19
2/17/86	0	4/17/86	3	6/17/86	0	8/17/86	82	10/18/86	0	12/18/86	10
2/18/86	0	4/18/86	0	6/18/86	0	8/18/86	129	10/19/86	60	12/19/86	3
2/19/86	0	4/19/86	0	6/19/86	3	8/19/86	113	10/20/86	123	12/20/86	1
2/20/86	0	4/20/86	0	6/20/86	150	8/20/86	154	10/21/86	125	12/21/86	0
2/21/86	0	4/21/86	0	6/21/86	210	8/21/86	124	10/22/86	105	12/22/86	0
2/22/86	0	4/22/86	0	6/22/86	147	8/22/86	99	10/23/86	61	12/23/86	1
2/23/86	0	4/23/86	0	6/23/86	260	8/23/86	77	10/24/86	50	12/24/86	3
2/24/86	0	4/24/86	0	6/24/86	302	8/24/86	56	10/25/86	61	12/25/86	6
2/25/86	0	4/25/86	0	6/25/86	355	8/25/86	62	10/26/86	12	12/26/86	19
2/26/86	0	4/26/86	1	6/26/86	279	8/26/86	29	10/27/86	24	12/27/86	175
2/27/86	0	4/27/86	0	6/27/86	114	8/27/86	61	10/28/86	52	12/28/86	113
2/28/86	0	4/28/86	0	6/28/86	154	8/28/86	46	10/29/86	69	12/29/86	75
		4/29/86	0	6/29/86	118	8/29/86	17	10/30/86	47	12/30/86	96
		4/30/86	0	6/30/86	170	8/30/86	27	10/31/86	20	12/31/86	99
						8/31/86	66				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/87	407	3/1/87	0	5/1/87	0	7/1/87	0	9/1/87	0	11/1/87	0
1/2/87	201	3/2/87	0	5/2/87	0	7/2/87	0	9/2/87	0	11/2/87	4
1/3/87	104	3/3/87	0	5/3/87	0	7/3/87	0	9/3/87	0	11/3/87	249
1/4/87	352	3/4/87	0	5/4/87	0	7/4/87	0	9/4/87	0	11/4/87	1043
1/5/87	303	3/5/87	0	5/5/87	0	7/5/87	0	9/5/87	0	11/5/87	561
1/6/87	233	3/6/87	0	5/6/87	0	7/6/87	0	9/6/87	0	11/6/87	597
1/7/87	187	3/7/87	90	5/7/87	0	7/7/87	0	9/7/87	0	11/7/87	763
1/8/87	179	3/8/87	98	5/8/87	0	7/8/87	0	9/8/87	0	11/8/87	578
1/9/87	134	3/9/87	104	5/9/87	0	7/9/87	0	9/9/87	0	11/9/87	580
1/10/87	113	3/10/87	93	5/10/87	0	7/10/87	0	9/10/87	0	11/10/87	430
1/11/87	89	3/11/87	50	5/11/87	0	7/11/87	0	9/11/87	0	11/11/87	257
1/12/87	84	3/12/87	20	5/12/87	0	7/12/87	0	9/12/87	0	11/12/87	246
1/13/87	89	3/13/87	45	5/13/87	0	7/13/87	0	9/13/87	0	11/13/87	269
1/14/87	93	3/14/87	13	5/14/87	0	7/14/87	0	9/14/87	0	11/14/87	267
1/15/87	88	3/15/87	23	5/15/87	0	7/15/87	0	9/15/87	0	11/15/87	181
1/16/87	84	3/16/87	29	5/16/87	0	7/16/87	0	9/16/87	0	11/16/87	240
1/17/87	85	3/17/87	51	5/17/87	0	7/17/87	0	9/17/87	0	11/17/87	184
1/18/87	31	3/18/87	1	5/18/87	0	7/18/87	0	9/18/87	0	11/18/87	154
1/19/87	78	3/19/87	5	5/19/87	0	7/19/87	0	9/19/87	0	11/19/87	227
1/20/87	27	3/20/87	7	5/20/87	0	7/20/87	0	9/20/87	0	11/20/87	250
1/21/87	93	3/21/87	8	5/21/87	0	7/21/87	0	9/21/87	0	11/21/87	203
1/22/87	88	3/22/87	4	5/22/87	0	7/22/87	0	9/22/87	0	11/22/87	154
1/23/87	12	3/23/87	1	5/23/87	0	7/23/87	0	9/23/87	0	11/23/87	135
1/24/87	20	3/24/87	5	5/24/87	0	7/24/87	0	9/24/87	0	11/24/87	107
1/25/87	36	3/25/87	5	5/25/87	0	7/25/87	0	9/25/87	0	11/25/87	70
1/26/87	39	3/26/87	2	5/26/87	0	7/26/87	0	9/26/87	0	11/26/87	108
1/27/87	35	3/27/87	67	5/27/87	0	7/27/87	0	9/27/87	0	11/27/87	59
1/28/87	30	3/28/87	1	5/28/87	0	7/28/87	0	9/28/87	0	11/28/87	63
1/29/87	29	3/29/87	56	5/29/87	0	7/29/87	0	9/29/87	0	11/29/87	77
1/30/87	25	3/30/87	60	5/30/87	0	7/30/87	0	9/30/87	0	11/30/87	44
1/31/87	21	3/31/87	122	5/31/87	0	7/31/87	0	10/1/87	0	12/1/87	53
2/1/87	15	4/1/87	60	6/1/87	0	8/1/87	0	10/2/87	0	12/2/87	50
2/2/87	10	4/2/87	23	6/2/87	0	8/2/87	0	10/3/87	0	12/3/87	26
2/3/87	3	4/3/87	59	6/3/87	0	8/3/87	0	10/4/87	0	12/4/87	58
2/4/87	1	4/4/87	9	6/4/87	0	8/4/87	0	10/5/87	0	12/5/87	9
2/5/87	9	4/5/87	20	6/5/87	0	8/5/87	0	10/6/87	0	12/6/87	21
2/6/87	19	4/6/87	38	6/6/87	0	8/6/87	0	10/7/87	0	12/7/87	29
2/7/87	20	4/7/87	40	6/7/87	0	8/7/87	0	10/8/87	0	12/8/87	32
2/8/87	8	4/8/87	62	6/8/87	0	8/8/87	0	10/9/87	0	12/9/87	60
2/9/87	0	4/9/87	7	6/9/87	0	8/9/87	0	10/10/87	0	12/10/87	36
2/10/87	0	4/10/87	16	6/10/87	0	8/10/87	0	10/11/87	0	12/11/87	49
2/11/87	0	4/11/87	19	6/11/87	0	8/11/87	0	10/12/87	70	12/12/87	0
2/12/87	0	4/12/87	19	6/12/87	0	8/12/87	0	10/13/87	237	12/13/87	0
2/13/87	0	4/13/87	19	6/13/87	0	8/13/87	0	10/14/87	81	12/14/87	0
2/14/87	0	4/14/87	13	6/14/87	0	8/14/87	0	10/15/87	87	12/15/87	0
2/15/87	0	4/15/87	18	6/15/87	0	8/15/87	0	10/16/87	14	12/16/87	0
2/16/87	0	4/16/87	25	6/16/87	0	8/16/87	0	10/17/87	27	12/17/87	0
2/17/87	0	4/17/87	3	6/17/87	0	8/17/87	0	10/18/87	48	12/18/87	0
2/18/87	0	4/18/87	0	6/18/87	0	8/18/87	0	10/19/87	25	12/19/87	0
2/19/87	0	4/19/87	0	6/19/87	0	8/19/87	0	10/20/87	20	12/20/87	0
2/20/87	0	4/20/87	0	6/20/87	0	8/20/87	0	10/21/87	10	12/21/87	0
2/21/87	0	4/21/87	0	6/21/87	0	8/21/87	0	10/22/87	10	12/22/87	0
2/22/87	0	4/22/87	0	6/22/87	0	8/22/87	0	10/23/87	9	12/23/87	0
2/23/87	0	4/23/87	0	6/23/87	0	8/23/87	0	10/24/87	4	12/24/87	0
2/24/87	0	4/24/87	0	6/24/87	0	8/24/87	0	10/25/87	0	12/25/87	0
2/25/87	0	4/25/87	0	6/25/87	0	8/25/87	0	10/26/87	3	12/26/87	0
2/26/87	0	4/26/87	0	6/26/87	0	8/26/87	0	10/27/87	2	12/27/87	0
2/27/87	0	4/27/87	0	6/27/87	0	8/27/87	0	10/28/87	0	12/28/87	0
2/28/87	0	4/28/87	0	6/28/87	0	8/28/87	0	10/29/87	0	12/29/87	0
		4/29/87	0	6/29/87	0	8/29/87	0	10/30/87	0	12/30/87	0
		4/30/87	0	6/30/87	0	8/30/87	0	10/31/87	0	12/31/87	0
						8/31/87	0				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/88	0	3/1/88	0	5/1/88	0	7/1/88	44	9/1/88	267	11/1/88	0
1/2/88	0	3/2/88	0	5/2/88	0	7/2/88	16	9/2/88	428	11/2/88	0
1/3/88	0	3/3/88	0	5/3/88	0	7/3/88	8	9/3/88	419	11/3/88	0
1/4/88	0	3/4/88	0	5/4/88	0	7/4/88	1	9/4/88	436	11/4/88	0
1/5/88	0	3/5/88	0	5/5/88	0	7/5/88	0	9/5/88	430	11/5/88	0
1/6/88	0	3/6/88	0	5/6/88	0	7/6/88	0	9/6/88	226	11/6/88	0
1/7/88	0	3/7/88	0	5/7/88	0	7/7/88	0	9/7/88	81	11/7/88	0
1/8/88	0	3/8/88	0	5/8/88	0	7/8/88	240	9/8/88	265	11/8/88	0
1/9/88	0	3/9/88	0	5/9/88	0	7/9/88		9/9/88	311	11/9/88	0
1/10/88	0	3/10/88	0	5/10/88	0	7/10/88		9/10/88	331	11/10/88	0
1/11/88	0	3/11/88	0	5/11/88	0	7/11/88		9/11/88	315	11/11/88	0
1/12/88	9	3/12/88	0	5/12/88	0	7/12/88		9/12/88	184	11/12/88	0
1/13/88	7	3/13/88	0	5/13/88	0	7/13/88		9/13/88	47	11/13/88	0
1/14/88	37	3/14/88	7	5/14/88	0	7/14/88		9/14/88	29	11/14/88	0
1/15/88	25	3/15/88	2	5/15/88	0	7/15/88		9/15/88	57	11/15/88	0
1/16/88	16	3/16/88	0	5/16/88	0	7/16/88		9/16/88	70	11/16/88	0
1/17/88	14	3/17/88	0	5/17/88	0	7/17/88		9/17/88	73	11/17/88	0
1/18/88	13	3/18/88	0	5/18/88	0	7/18/88		9/18/88	72	11/18/88	0
1/19/88	0	3/19/88	11	5/19/88	0	7/19/88		9/19/88	64	11/19/88	0
1/20/88	2	3/20/88	35	5/20/88	0	7/20/88		9/20/88	59	11/20/88	0
1/21/88	8	3/21/88	27	5/21/88	0	7/21/88		9/21/88	65	11/21/88	0
1/22/88	38	3/22/88	4	5/22/88	0	7/22/88		9/22/88	66	11/22/88	0
1/23/88	0	3/23/88	1	5/23/88	0	7/23/88		9/23/88	50	11/23/88	0
1/24/88	3	3/24/88	22	5/24/88	0	7/24/88		9/24/88	56	11/24/88	0
1/25/88	12	3/25/88	66	5/25/88	0	7/25/88		9/25/88	56	11/25/88	0
1/26/88	1	3/26/88	32	5/26/88	0	7/26/88		9/26/88	55	11/26/88	0
1/27/88	0	3/27/88	52	5/27/88	1	7/27/88		9/27/88	47	11/27/88	0
1/28/88	0	3/28/88	31	5/28/88	4	7/28/88		9/28/88	45	11/28/88	0
1/29/88	0	3/29/88	44	5/29/88	4	7/29/88	54	9/29/88	44	11/29/88	0
1/30/88	0	3/30/88	56	5/30/88	4	7/30/88	55	9/30/88	44	11/30/88	0
1/31/88	0	3/31/88	13	5/31/88	4	7/31/88	55	10/1/88	0	12/1/88	0
2/1/88	7	4/1/88	14	6/1/88	57	8/1/88	115	10/2/88	0	12/2/88	0
2/2/88	9	4/2/88	0	6/2/88	29	8/2/88	70	10/3/88	0	12/3/88	0
2/3/88	8	4/3/88	0	6/3/88	38	8/3/88	48	10/4/88	0	12/4/88	0
2/4/88	0	4/4/88	0	6/4/88	21	8/4/88	4	10/5/88	0	12/5/88	0
2/5/88	0	4/5/88	0	6/5/88	55	8/5/88	9	10/6/88	0	12/6/88	0
2/6/88	0	4/6/88	0	6/6/88	143	8/6/88	9	10/7/88	0	12/7/88	0
2/7/88	0	4/7/88	0	6/7/88	99	8/7/88	16	10/8/88	0	12/8/88	0
2/8/88	159	4/8/88	0	6/8/88	65	8/8/88	72	10/9/88	0	12/9/88	0
2/9/88	139	4/9/88	0	6/9/88	61	8/9/88	5	10/10/88	0	12/10/88	0
2/10/88	33	4/10/88	0	6/10/88	45	8/10/88	56	10/11/88	0	12/11/88	0
2/11/88	2	4/11/88	0	6/11/88	31	8/11/88	86	10/12/88	0	12/12/88	0
2/12/88	1	4/12/88	0	6/12/88	60	8/12/88	52	10/13/88	0	12/13/88	0
2/13/88	8	4/13/88	0	6/13/88	19	8/13/88	57	10/14/88	0	12/14/88	0
2/14/88	21	4/14/88	0	6/14/88	33	8/14/88	92	10/15/88	0	12/15/88	0
2/15/88	59	4/15/88	0	6/15/88	35	8/15/88	230	10/16/88	0	12/16/88	0
2/16/88	24	4/16/88	0	6/16/88	23	8/16/88	250	10/17/88	0	12/17/88	0
2/17/88	28	4/17/88	0	6/17/88	9	8/17/88	260	10/18/88	0	12/18/88	0
2/18/88	17	4/18/88	0	6/18/88	4	8/18/88	235	10/19/88	0	12/19/88	0
2/19/88	8	4/19/88	0	6/19/88	4	8/19/88	216	10/20/88	0	12/20/88	0
2/20/88	5	4/20/88	0	6/20/88	4	8/20/88	787	10/21/88	0	12/21/88	0
2/21/88	33	4/21/88	0	6/21/88	5	8/21/88	594	10/22/88	0	12/22/88	0
2/22/88	4	4/22/88	0	6/22/88	18	8/22/88	305	10/23/88	0	12/23/88	0
2/23/88	58	4/23/88	0	6/23/88	58	8/23/88	276	10/24/88	0	12/24/88	0
2/24/88	150	4/24/88	0	6/24/88	6	8/24/88	274	10/25/88	0	12/25/88	0
2/25/88	83	4/25/88	0	6/25/88	6	8/25/88	151	10/26/88	0	12/26/88	0
2/26/88	12	4/26/88	0	6/26/88	5	8/26/88	246	10/27/88	0	12/27/88	0
2/27/88	15	4/27/88	0	6/27/88	5	8/27/88	276	10/28/88	0	12/28/88	0
2/28/88	6	4/28/88	0	6/28/88	36	8/28/88	278	10/29/88	0	12/29/88	0
2/29/88	0	4/29/88	0	6/29/88	48	8/29/88	152	10/30/88	0	12/30/88	0
		4/30/88	0	6/30/88	8	8/30/88	121	10/31/88	0	12/31/88	0
						8/31/88	141				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/89	0	3/1/89	0	5/1/89	0	7/1/89	0	9/1/89	77	11/1/89	0
1/2/89	0	3/2/89	0	5/2/89	0	7/2/89	0	9/2/89	90	11/2/89	0
1/3/89	0	3/3/89	0	5/3/89	0	7/3/89	0	9/3/89	110	11/3/89	0
1/4/89	0	3/4/89	0	5/4/89	0	7/4/89	0	9/4/89	109	11/4/89	0
1/5/89	0	3/5/89	0	5/5/89	0	7/5/89	0	9/5/89	64	11/5/89	0
1/6/89	0	3/6/89	0	5/6/89	0	7/6/89	0	9/6/89	44	11/6/89	0
1/7/89	0	3/7/89	0	5/7/89	0	7/7/89	0	9/7/89	19	11/7/89	0
1/8/89	0	3/8/89	0	5/8/89	0	7/8/89	0	9/8/89	2	11/8/89	0
1/9/89	0	3/9/89	0	5/9/89	0	7/9/89	0	9/9/89	2	11/9/89	0
1/10/89	0	3/10/89	0	5/10/89	0	7/10/89	0	9/10/89	25	11/10/89	0
1/11/89	0	3/11/89	0	5/11/89	0	7/11/89	0	9/11/89	0	11/11/89	0
1/12/89	0	3/12/89	0	5/12/89	0	7/12/89	0	9/12/89	21	11/12/89	0
1/13/89	0	3/13/89	0	5/13/89	0	7/13/89	0	9/13/89	24	11/13/89	0
1/14/89	0	3/14/89	0	5/14/89	0	7/14/89	0	9/14/89	11	11/14/89	0
1/15/89	0	3/15/89	0	5/15/89	0	7/15/89	0	9/15/89	21	11/15/89	0
1/16/89	0	3/16/89	0	5/16/89	0	7/16/89	0	9/16/89	21	11/16/89	0
1/17/89	0	3/17/89	0	5/17/89	0	7/17/89	0	9/17/89	29	11/17/89	0
1/18/89	0	3/18/89	0	5/18/89	0	7/18/89	0	9/18/89	24	11/18/89	0
1/19/89	0	3/19/89	0	5/19/89	0	7/19/89	0	9/19/89	10	11/19/89	0
1/20/89	0	3/20/89	0	5/20/89	0	7/20/89	0	9/20/89	2	11/20/89	0
1/21/89	0	3/21/89	0	5/21/89	0	7/21/89	0	9/21/89	22	11/21/89	0
1/22/89	0	3/22/89	0	5/22/89	0	7/22/89	0	9/22/89	10	11/22/89	0
1/23/89	0	3/23/89	0	5/23/89	0	7/23/89	0	9/23/89	19	11/23/89	0
1/24/89	0	3/24/89	0	5/24/89	0	7/24/89	0	9/24/89	24	11/24/89	0
1/25/89	0	3/25/89	0	5/25/89	0	7/25/89	0	9/25/89	44	11/25/89	0
1/26/89	0	3/26/89	0	5/26/89	0	7/26/89	0	9/26/89	24	11/26/89	0
1/27/89	0	3/27/89	0	5/27/89	0	7/27/89	0	9/27/89	3	11/27/89	0
1/28/89	0	3/28/89	0	5/28/89	0	7/28/89	0	9/28/89	7	11/28/89	1
1/29/89	0	3/29/89	0	5/29/89	0	7/29/89	0	9/29/89	2	11/29/89	2
1/30/89	0	3/30/89	0	5/30/89	0	7/30/89	0	9/30/89	1	11/30/89	0
1/31/89	0	3/31/89	0	5/31/89	0	7/31/89	0	10/1/89	1	12/1/89	0
2/1/89	0	4/1/89	0	6/1/89	0	8/1/89	0	10/2/89	1	12/2/89	0
2/2/89	0	4/2/89	0	6/2/89	0	8/2/89	0	10/3/89	1	12/3/89	0
2/3/89	0	4/3/89	0	6/3/89	0	8/3/89	0	10/4/89	0	12/4/89	0
2/4/89	0	4/4/89	0	6/4/89	0	8/4/89	1	10/5/89	0	12/5/89	0
2/5/89	0	4/5/89	0	6/5/89	0	8/5/89	2	10/6/89	0	12/6/89	0
2/6/89	0	4/6/89	0	6/6/89	0	8/6/89	4	10/7/89	0	12/7/89	0
2/7/89	0	4/7/89	0	6/7/89	0	8/7/89	1	10/8/89	9	12/8/89	8
2/8/89	0	4/8/89	0	6/8/89	0	8/8/89	0	10/9/89	0	12/9/89	18
2/9/89	0	4/9/89	0	6/9/89	0	8/9/89	5	10/10/89	2	12/10/89	0
2/10/89	0	4/10/89	0	6/10/89	0	8/10/89	40	10/11/89	3	12/11/89	0
2/11/89	0	4/11/89	0	6/11/89	0	8/11/89	20	10/12/89	0	12/12/89	0
2/12/89	0	4/12/89	0	6/12/89	0	8/12/89	0	10/13/89	7	12/13/89	0
2/13/89	0	4/13/89	0	6/13/89	0	8/13/89	1	10/14/89	0	12/14/89	0
2/14/89	0	4/14/89	0	6/14/89	0	8/14/89	5	10/15/89	17	12/15/89	0
2/15/89	0	4/15/89	0	6/15/89	0	8/15/89	14	10/16/89	25	12/16/89	0
2/16/89	0	4/16/89	0	6/16/89	0	8/16/89	15	10/17/89	0	12/17/89	0
2/17/89	0	4/17/89	0	6/17/89	0	8/17/89	12	10/18/89	4	12/18/89	0
2/18/89	0	4/18/89	0	6/18/89	0	8/18/89	11	10/19/89	5	12/19/89	0
2/19/89	0	4/19/89	0	6/19/89	0	8/19/89	18	10/20/89	2	12/20/89	0
2/20/89	0	4/20/89	0	6/20/89	0	8/20/89	21	10/21/89	25	12/21/89	0
2/21/89	0	4/21/89	0	6/21/89	0	8/21/89	292	10/22/89	3	12/22/89	0
2/22/89	0	4/22/89	0	6/22/89	0	8/22/89	259	10/23/89	4	12/23/89	14
2/23/89	0	4/23/89	0	6/23/89	0	8/23/89	24	10/24/89	3	12/24/89	41
2/24/89	0	4/24/89	0	6/24/89	0	8/24/89	25	10/25/89	4	12/25/89	1
2/25/89	0	4/25/89	0	6/25/89	0	8/25/89	14	10/26/89	19	12/26/89	12
2/26/89	0	4/26/89	0	6/26/89	0	8/26/89	22	10/27/89	0	12/27/89	6
2/27/89	0	4/27/89	0	6/27/89	0	8/27/89	19	10/28/89	5	12/28/89	0
2/28/89	0	4/28/89	0	6/28/89	0	8/28/89	19	10/29/89	1	12/29/89	0
		4/29/89	0	6/29/89	0	8/29/89	9	10/30/89	1	12/30/89	0
		4/30/89	0	6/30/89	0	8/30/89	18	10/31/89	0	12/31/89	0
						8/31/89	22				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/90	0	3/1/90	0	5/1/90	0	7/1/90	0	9/1/90	0	11/1/90	0
1/2/90	0	3/2/90	0	5/2/90	0	7/2/90	0	9/2/90	0	11/2/90	0
1/3/90	0	3/3/90	0	5/3/90	0	7/3/90	0	9/3/90	0	11/3/90	0
1/4/90	0	3/4/90	0	5/4/90	0	7/4/90	0	9/4/90	0	11/4/90	0
1/5/90	1	3/5/90	0	5/5/90	0	7/5/90	22	9/5/90	0	11/5/90	0
1/6/90	0	3/6/90	0	5/6/90	0	7/6/90	0	9/6/90	0	11/6/90	0
1/7/90	0	3/7/90	0	5/7/90	0	7/7/90	0	9/7/90	0	11/7/90	0
1/8/90	0	3/8/90	0	5/8/90	0	7/8/90	0	9/8/90	0	11/8/90	0
1/9/90	0	3/9/90	0	5/9/90	0	7/9/90	0	9/9/90	0	11/9/90	0
1/10/90	0	3/10/90	0	5/10/90	0	7/10/90	0	9/10/90	0	11/10/90	0
1/11/90	0	3/11/90	0	5/11/90	0	7/11/90	0	9/11/90	0	11/11/90	0
1/12/90	0	3/12/90	0	5/12/90	0	7/12/90	0	9/12/90	0	11/12/90	0
1/13/90	0	3/13/90	0	5/13/90	0	7/13/90	0	9/13/90	0	11/13/90	0
1/14/90	0	3/14/90	0	5/14/90	0	7/14/90	0	9/14/90	0	11/14/90	0
1/15/90	0	3/15/90	0	5/15/90	0	7/15/90	0	9/15/90	0	11/15/90	0
1/16/90	0	3/16/90	0	5/16/90	0	7/16/90	0	9/16/90	0	11/16/90	0
1/17/90	0	3/17/90	0	5/17/90	0	7/17/90	0	9/17/90	0	11/17/90	0
1/18/90	0	3/18/90	0	5/18/90	0	7/18/90	0	9/18/90	0	11/18/90	0
1/19/90	0	3/19/90	0	5/19/90	0	7/19/90	0	9/19/90	0	11/19/90	0
1/20/90	0	3/20/90	0	5/20/90	0	7/20/90	0	9/20/90	9	11/20/90	0
1/21/90	0	3/21/90	0	5/21/90	0	7/21/90	0	9/21/90	28	11/21/90	0
1/22/90	0	3/22/90	0	5/22/90	0	7/22/90	0	9/22/90	3	11/22/90	0
1/23/90	0	3/23/90	0	5/23/90	0	7/23/90	0	9/23/90	2	11/23/90	0
1/24/90	0	3/24/90	0	5/24/90	0	7/24/90	0	9/24/90	0	11/24/90	0
1/25/90	0	3/25/90	0	5/25/90	0	7/25/90	0	9/25/90	0	11/25/90	0
1/26/90	0	3/26/90	0	5/26/90	0	7/26/90	0	9/26/90	0	11/26/90	0
1/27/90	0	3/27/90	0	5/27/90	0	7/27/90	0	9/27/90	0	11/27/90	0
1/28/90	0	3/28/90	0	5/28/90	0	7/28/90	0	9/28/90	40	11/28/90	0
1/29/90	0	3/29/90	0	5/29/90	0	7/29/90	0	9/29/90	121	11/29/90	0
1/30/90	0	3/30/90	0	5/30/90	0	7/30/90	0	9/30/90	88	11/30/90	0
1/31/90	0	3/31/90	0	5/31/90	0	7/31/90	0	10/1/90	44	12/1/90	0
2/1/90	0	4/1/90	0	6/1/90	0	8/1/90	0	10/2/90	27	12/2/90	0
2/2/90	0	4/2/90	0	6/2/90	0	8/2/90	0	10/3/90	32	12/3/90	0
2/3/90	0	4/3/90	0	6/3/90	0	8/3/90	0	10/4/90	2	12/4/90	0
2/4/90	0	4/4/90	0	6/4/90	0	8/4/90	0	10/5/90	0	12/5/90	0
2/5/90	0	4/5/90	0	6/5/90	0	8/5/90	0	10/6/90	0	12/6/90	0
2/6/90	0	4/6/90	0	6/6/90	0	8/6/90	0	10/7/90	0	12/7/90	0
2/7/90	0	4/7/90	0	6/7/90	0	8/7/90	0	10/8/90	0	12/8/90	0
2/8/90	0	4/8/90	0	6/8/90	0	8/8/90	0	10/9/90	0	12/9/90	0
2/9/90	0	4/9/90	0	6/9/90	0	8/9/90	0	10/10/90	1	12/10/90	0
2/10/90	0	4/10/90	0	6/10/90	0	8/10/90	0	10/11/90	9	12/11/90	0
2/11/90	0	4/11/90	0	6/11/90	0	8/11/90	0	10/12/90	9	12/12/90	0
2/12/90	0	4/12/90	0	6/12/90	0	8/12/90	0	10/13/90	4	12/13/90	0
2/13/90	0	4/13/90	0	6/13/90	0	8/13/90	0	10/14/90	0	12/14/90	0
2/14/90	0	4/14/90	0	6/14/90	0	8/14/90	0	10/15/90	0	12/15/90	0
2/15/90	0	4/15/90	0	6/15/90	0	8/15/90	0	10/16/90	1	12/16/90	0
2/16/90	0	4/16/90	0	6/16/90	0	8/16/90	0	10/17/90	1	12/17/90	0
2/17/90	0	4/17/90	0	6/17/90	0	8/17/90	0	10/18/90	0	12/18/90	0
2/18/90	0	4/18/90	0	6/18/90	0	8/18/90	0	10/19/90	0	12/19/90	0
2/19/90	0	4/19/90	0	6/19/90	0	8/19/90	0	10/20/90	0	12/20/90	0
2/20/90	0	4/20/90	0	6/20/90	0	8/20/90	0	10/21/90	0	12/21/90	0
2/21/90	0	4/21/90	0	6/21/90	0	8/21/90	0	10/22/90	6	12/22/90	0
2/22/90	0	4/22/90	0	6/22/90	0	8/22/90	0	10/23/90	7	12/23/90	0
2/23/90	0	4/23/90	0	6/23/90	0	8/23/90	0	10/24/90	0	12/24/90	0
2/24/90	0	4/24/90	0	6/24/90	0	8/24/90	0	10/25/90	0	12/25/90	0
2/25/90	0	4/25/90	0	6/25/90	0	8/25/90	0	10/26/90	0	12/26/90	0
2/26/90	0	4/26/90	0	6/26/90	0	8/26/90	0	10/27/90	0	12/27/90	0
2/27/90	0	4/27/90	0	6/27/90	0	8/27/90	0	10/28/90	0	12/28/90	0
2/28/90	0	4/28/90	0	6/28/90	0	8/28/90	1	10/29/90	0	12/29/90	0
		4/29/90	0	6/29/90	0	8/29/90	2	10/30/90	0	12/30/90	0
		4/30/90	0	6/30/90	0	8/30/90	2	10/31/90	0	12/31/90	0
						8/31/90	1				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) **Agency: WMD**

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/91	0	1/1/92	0	3/30/92	0	11/26/92	101
1/2/91	0	1/2/92	0	3/31/92	0	11/27/92	82
1/3/91	0	1/3/92	0	4/1/92	0	11/28/92	71
1/4/91	0	1/4/92	0	4/2/92	0	11/29/92	66
1/5/91	0	1/5/92	0	4/3/92	0	11/30/92	68
1/6/91	0	1/6/92	0	4/4/92	0	12/1/92	57
1/7/91	0	1/7/92	0	4/5/92	0	12/2/92	49
1/8/91	0	1/8/92	0	4/6/92	0	12/3/92	30
1/9/91	0	1/9/92	0	4/7/92	0	12/4/92	44
1/10/91	0	1/10/92	0	4/8/92	0	12/5/92	27
1/11/91	0	1/11/92	0	4/9/92	0	12/6/92	19
1/12/91	0	1/12/92	0	4/10/92	0	12/7/92	16
1/13/91	0	1/13/92	0			12/8/92	13
1/14/91	0	1/14/92	0	10/8/92	35	12/9/92	4
1/15/91	0	1/15/92	0	10/9/92	43	12/10/92	0
1/16/91	543	1/16/92	0	10/10/92	37	12/11/92	0
1/17/91	960	1/17/92	0	10/11/92	37	12/12/92	0
1/18/91	525	1/18/92	0	10/12/92	44	12/13/92	0
1/19/91	0	1/19/92	0	10/13/92	30	12/14/92	0
1/20/91	0	1/20/92	0	10/14/92	27	12/15/92	0
1/21/91	0	1/21/92	0	10/15/92	15	12/16/92	0
1/22/91	0	1/22/92	0	10/16/92	16	12/17/92	0
1/23/91	0	1/23/92	0	10/17/92	15	12/18/92	0
1/24/91	0	1/24/92	0	10/18/92	0	12/19/92	0
1/25/91	0	1/25/92	0	10/19/92	0	12/20/92	0
1/26/91	0	1/26/92	0	10/20/92	0	12/21/92	0
1/27/91	0	1/27/92	0	10/21/92	0	12/22/92	0
1/28/91	0	1/28/92	0	10/22/92	0	12/23/92	0
1/29/91	0	1/29/92	0	10/23/92	0	12/24/92	0
1/30/91	0	1/30/92	0	10/24/92	0	12/25/92	0
1/31/91	0	1/31/92	0	10/25/92	0	12/26/92	0
2/1/91	0	2/1/92	0	10/26/92	0	12/27/92	0
2/2/91	0	2/2/92	0	10/27/92	3	12/28/92	0
2/3/91	0	2/3/92	0	10/28/92	0	12/29/92	0
2/4/91	0	2/4/92	0	10/29/92	2	12/30/92	0
2/5/91	0	2/5/92	0	10/30/92	0	12/31/92	0
2/6/91	0	2/6/92	0	10/31/92	0		
2/7/91	0	2/7/92	0	11/1/92	0		
2/8/91	0	2/8/92	0	11/2/92	0		
2/9/91	0	2/9/92	0	11/3/92	0		
2/10/91	0	2/10/92	0	11/4/92	0		
2/11/91	0	2/11/92	0	11/5/92	0		
2/12/91	0	2/12/92	0	11/6/92	0		
2/13/91	0			11/7/92	0		
2/14/91	0	3/12/92	0	11/8/92	0		
2/15/91	0	3/13/92	0	11/9/92	119		
2/16/91	0	3/14/92	0	11/10/92	229		
2/17/91	0	3/15/92	0	11/11/92	120		
2/18/91	0	3/16/92	0	11/12/92	82		
2/19/91	0	3/17/92	0	11/13/92	64		
2/20/91	0	3/18/92	0	11/14/92	44		
2/21/91	0	3/19/92	0	11/15/92	38		
2/22/91	0	3/20/92	0	11/16/92	31		
2/23/91	0	3/21/92	0	11/17/92	48		
2/24/91	0	3/22/92	0	11/18/92	152		
2/25/91	0	3/23/92	0	11/19/92	90		
2/26/91	0	3/24/92	0	11/20/92	89		
2/27/91	0	3/25/92	0	11/21/92	115		
2/28/91	0	3/26/92	0	11/22/92	197		
		3/27/92	0	11/23/92	152		
		3/28/92	0	11/24/92	130		
		3/29/92	0	11/25/92	108		

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/93	0	3/1/93	0	5/1/93	0	7/1/93	0	9/1/93	41	11/1/93	0
1/2/93	0	3/2/93	0	5/2/93	0	7/2/93	0	9/2/93	40	11/2/93	0
1/3/93	0	3/3/93	0	5/3/93	0	7/3/93	0	9/3/93	20	11/3/93	0
1/4/93	154	3/4/93	0	5/4/93	0	7/4/93	0	9/4/93	0	11/4/93	0
1/5/93	158	3/5/93	0	5/5/93	0	7/5/93	0	9/5/93	0	11/5/93	0
1/6/93	110	3/6/93	0	5/6/93	0	7/6/93	0	9/6/93	41	11/6/93	0
1/7/93	118	3/7/93	0	5/7/93	0	7/7/93	0	9/7/93	28	11/7/93	0
1/8/93	95	3/8/93	0	5/8/93	0	7/8/93	0	9/8/93	0	11/8/93	0
1/9/93	188	3/9/93	0	5/9/93	0	7/9/93	0	9/9/93	0	11/9/93	0
1/10/93	213	3/10/93	0	5/10/93	0	7/10/93	0	9/10/93	0	11/10/93	0
1/11/93	203	3/11/93	0	5/11/93	0	7/11/93	0	9/11/93	0	11/11/93	0
1/12/93	108	3/12/93	0	5/12/93	0	7/12/93	0	9/12/93	0	11/12/93	0
1/13/93	99	3/13/93	0	5/13/93	0	7/13/93	0	9/13/93	0	11/13/93	0
1/14/93	52	3/14/93	0	5/14/93	0	7/14/93	0	9/14/93	40	11/14/93	0
1/15/93	49	3/15/93	0	5/15/93	0	7/15/93	0	9/15/93	41	11/15/93	0
1/16/93	85	3/16/93	0	5/16/93	0	7/16/93	0	9/16/93	0	11/16/93	0
1/17/93	107	3/17/93	0	5/17/93	0	7/17/93	0	9/17/93	0	11/17/93	0
1/18/93	47	3/18/93	110	5/18/93	0	7/18/93	0	9/18/93	0	11/18/93	0
1/19/93	26	3/19/93	183	5/19/93	0	7/19/93	0	9/19/93	0	11/19/93	0
1/20/93	0	3/20/93	166	5/20/93	0	7/20/93	0	9/20/93	0	11/20/93	0
1/21/93	0	3/21/93	405	5/21/93	0	7/21/93	0	9/21/93	0	11/21/93	0
1/22/93	0	3/22/93	665	5/22/93	0	7/22/93	0	9/22/93	0	11/22/93	0
1/23/93	0	3/23/93	582	5/23/93	0	7/23/93	0	9/23/93	0	11/23/93	0
1/24/93	0	3/24/93	500	5/24/93	0	7/24/93	0	9/24/93	0	11/24/93	0
1/25/93	846	3/25/93	652	5/25/93	0	7/25/93	0	9/25/93	0	11/25/93	0
1/26/93	1457	3/26/93	481	5/26/93	0	7/26/93	0	9/26/93	0	11/26/93	0
1/27/93	989	3/27/93	339	5/27/93	0	7/27/93	0	9/27/93	0	11/27/93	0
1/28/93	541	3/28/93	195	5/28/93	0	7/28/93	0	9/28/93	0	11/28/93	0
1/29/93	525	3/29/93	120	5/29/93	0	7/29/93	0	9/29/93	0	11/29/93	0
1/30/93	295	3/30/93	135	5/30/93	0	7/30/93	0	9/30/93	0	11/30/93	0
1/31/93	332	3/31/93	105	5/31/93	0	7/31/93	0	10/1/93	0	12/1/93	0
2/1/93	216	4/1/93	102	6/1/93	0	8/1/93	0	10/2/93	0	12/2/93	0
2/2/93	159	4/2/93	47	6/2/93	0	8/2/93	0	10/3/93	0	12/3/93	0
2/3/93	151	4/3/93	41	6/3/93	0	8/3/93		10/4/93	0	12/4/93	0
2/4/93	157	4/4/93	0	6/4/93	0	8/4/93	0	10/5/93	172	12/5/93	0
2/5/93	198	4/5/93	105	6/5/93	0	8/5/93	0	10/6/93	828	12/6/93	0
2/6/93	190	4/6/93	46	6/6/93	0	8/6/93	0	10/7/93	510	12/7/93	0
2/7/93	218	4/7/93	0	6/7/93	0	8/7/93	0	10/8/93	414	12/8/93	0
2/8/93	162	4/8/93	0	6/8/93	0	8/8/93	0	10/9/93	461	12/9/93	0
2/9/93	98	4/9/93	0	6/9/93	0	8/9/93	0	10/10/93	402	12/10/93	0
2/10/93	95	4/10/93	0	6/10/93	0	8/10/93	0	10/11/93	334	12/11/93	0
2/11/93	45	4/11/93	0	6/11/93	0	8/11/93	0	10/12/93	288	12/12/93	0
2/12/93	160	4/12/93	0	6/12/93	0	8/12/93	0	10/13/93	137	12/13/93	0
2/13/93	48	4/13/93	0	6/13/93	0	8/13/93	0	10/14/93	186	12/14/93	12
2/14/93	44	4/14/93	0	6/14/93	0	8/14/93	0	10/15/93	195	12/15/93	39
2/15/93	0	4/15/93	0	6/15/93	0	8/15/93	0	10/16/93	540	12/16/93	0
2/16/93	0	4/16/93	0	6/16/93	0	8/16/93	0	10/17/93	400	12/17/93	0
2/17/93	0	4/17/93	0	6/17/93	0	8/17/93	0	10/18/93	333	12/18/93	0
2/18/93	0	4/18/93	0	6/18/93	0	8/18/93	0	10/19/93	267	12/19/93	0
2/19/93	0	4/19/93	0	6/19/93	0	8/19/93	26	10/20/93	162	12/20/93	2
2/20/93	0	4/20/93	0	6/20/93	0	8/20/93	31	10/21/93	162	12/21/93	11
2/21/93	0	4/21/93	0	6/21/93	0	8/21/93	0	10/22/93	161	12/22/93	26
2/22/93	22	4/22/93	0	6/22/93	0	8/22/93	0	10/23/93	190	12/23/93	0
2/23/93	29	4/23/93	0	6/23/93	0	8/23/93	0	10/24/93	102	12/24/93	0
2/24/93	0	4/24/93	0	6/24/93	0	8/24/93	0	10/25/93	130	12/25/93	0
2/25/93	0	4/25/93	0	6/25/93	0	8/25/93	0	10/26/93	58	12/26/93	0
2/26/93	0	4/26/93	0	6/26/93	0	8/26/93	0	10/27/93	48	12/27/93	0
2/27/93	0	4/27/93	0	6/27/93	0	8/27/93	0	10/28/93	39	12/28/93	0
2/28/93	0	4/28/93	0	6/28/93	0	8/28/93	0	10/29/93	35	12/29/93	0
		4/29/93	0	6/29/93	0	8/29/93	0	10/30/93	36	12/30/93	0
		4/30/93	0	6/30/93	0	8/30/93	0	10/31/93	4	12/31/93	0
						8/31/93	21				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/94	0	3/1/94	0	5/1/94	0	7/1/94	0	9/1/94	253	11/1/94	131
1/2/94	0	3/2/94	0	5/2/94	32	7/2/94	0	9/2/94	180	11/2/94	60
1/3/94	0	3/3/94	0	5/3/94	0	7/3/94	25	9/3/94	219	11/3/94	75
1/4/94	0	3/4/94	0	5/4/94	9	7/4/94	0	9/4/94	147	11/4/94	0
1/5/94	0	3/5/94	0	5/5/94	0	7/5/94	93	9/5/94	166	11/5/94	0
1/6/94	0	3/6/94	0	5/6/94	0	7/6/94	43	9/6/94	116	11/6/94	0
1/7/94	0	3/7/94	0	5/7/94	0	7/7/94	41	9/7/94	101	11/7/94	17
1/8/94	0	3/8/94	0	5/8/94	0	7/8/94	35	9/8/94	172	11/8/94	18
1/9/94	0	3/9/94	0	5/9/94	0	7/9/94	0	9/9/94	149	11/9/94	0
1/10/94	0	3/10/94	0	5/10/94	0	7/10/94	0	9/10/94	154	11/10/94	0
1/11/94	0	3/11/94	0	5/11/94	0	7/11/94	0	9/11/94	111	11/11/94	0
1/12/94	0	3/12/94	0	5/12/94	0	7/12/94	0	9/12/94	162	11/12/94	0
1/13/94	0	3/13/94	0	5/13/94	0	7/13/94	0	9/13/94	499	11/13/94	0
1/14/94	0	3/14/94	0	5/14/94	0	7/14/94	0	9/14/94	522	11/14/94	28
1/15/94	0	3/15/94	0	5/15/94	0	7/15/94	0	9/15/94	594	11/15/94	210
1/16/94	0	3/16/94	0	5/16/94	45	7/16/94	0	9/16/94	529	11/16/94	1577
1/17/94	0	3/17/94	0	5/17/94	0	7/17/94	0	9/17/94	452	11/17/94	1777
1/18/94	0	3/18/94	0	5/18/94	0	7/18/94	0	9/18/94	444	11/18/94	1421
1/19/94	0	3/19/94	0	5/19/94	0	7/19/94	0	9/19/94	537	11/19/94	1049
1/20/94	0	3/20/94	0	5/20/94	23	7/20/94	0	9/20/94	1209	11/20/94	901
1/21/94	0	3/21/94	0	5/21/94	0	7/21/94	0	9/21/94	832	11/21/94	781
1/22/94	0	3/22/94	0	5/22/94	0	7/22/94	0	9/22/94	731	11/22/94	645
1/23/94	0	3/23/94	0	5/23/94	33	7/23/94	0	9/23/94	696	11/23/94	583
1/24/94	0	3/24/94	5	5/24/94	0	7/24/94	0	9/24/94	736	11/24/94	461
1/25/94	0	3/25/94	6	5/25/94	0	7/25/94	0	9/25/94	702	11/25/94	396
1/26/94	0	3/26/94	0	5/26/94	0	7/26/94	0	9/26/94	851	11/26/94	335
1/27/94	0	3/27/94	0	5/27/94	0	7/27/94	0	9/27/94	723	11/27/94	333
1/28/94	0	3/28/94	1	5/28/94	0	7/28/94	98	9/28/94	504	11/28/94	260
1/29/94	0	3/29/94	0	5/29/94	0	7/29/94	77	9/29/94	527	11/29/94	236
1/30/94	0	3/30/94	0	5/30/94	0	7/30/94	0	9/30/94	479	11/30/94	236
1/31/94	0	3/31/94	0	5/31/94	0	7/31/94	39	10/1/94	617	12/1/94	147
2/1/94	0	4/1/94	0	6/1/94	0	8/1/94	14	10/2/94	700	12/2/94	369
2/2/94	72	4/2/94	0	6/2/94	0	8/2/94	48	10/3/94	552	12/3/94	318
2/3/94	75	4/3/94	0	6/3/94	0	8/3/94	134	10/4/94	497	12/4/94	294
2/4/94	0	4/4/94	0	6/4/94	0	8/4/94	112	10/5/94	383	12/5/94	588
2/5/94	0	4/5/94	25	6/5/94	0	8/5/94	240	10/6/94	276	12/6/94	406
2/6/94	0	4/6/94	0	6/6/94	0	8/6/94	183	10/7/94	276	12/7/94	319
2/7/94	0	4/7/94	0	6/7/94	54	8/7/94	208	10/8/94	235	12/8/94	318
2/8/94	0	4/8/94	0	6/8/94	111	8/8/94	280	10/9/94	216	12/9/94	225
2/9/94	0	4/9/94	0	6/9/94	165	8/9/94	214	10/10/94	195	12/10/94	236
2/10/94	0	4/10/94	0	6/10/94	298	8/10/94	393	10/11/94	254	12/11/94	271
2/11/94	0	4/11/94	0	6/11/94	85	8/11/94	246	10/12/94	470	12/12/94	247
2/12/94	0	4/12/94	0	6/12/94	59	8/12/94	413	10/13/94	565	12/13/94	190
2/13/94	0	4/13/94	0	6/13/94	61	8/13/94	575	10/14/94	546	12/14/94	136
2/14/94	0	4/14/94	0	6/14/94	0	8/14/94	659	10/15/94	433	12/15/94	111
2/15/94	0	4/15/94	0	6/15/94	0	8/15/94	466	10/16/94	333	12/16/94	126
2/16/94	0	4/16/94	0	6/16/94	0	8/16/94	431	10/17/94	249	12/17/94	89
2/17/94	0	4/17/94	0	6/17/94	0	8/17/94	351	10/18/94	208	12/18/94	53
2/18/94	23	4/18/94	0	6/18/94	0	8/18/94	260	10/19/94	158	12/19/94	55
2/19/94	95	4/19/94	0	6/19/94	38	8/19/94	288	10/20/94	136	12/20/94	54
2/20/94	0	4/20/94	0	6/20/94	0	8/20/94	253	10/21/94	106	12/21/94	994
2/21/94	0	4/21/94	0	6/21/94	56	8/21/94	225	10/22/94	104	12/22/94	1142
2/22/94	0	4/22/94	0	6/22/94	157	8/22/94	171	10/23/94	40	12/23/94	902
2/23/94	0	4/23/94	0	6/23/94	43	8/23/94	245	10/24/94	31	12/24/94	728
2/24/94	0	4/24/94	0	6/24/94	0	8/24/94	428	10/25/94	48	12/25/94	613
2/25/94	16	4/25/94	0	6/25/94	0	8/25/94	329	10/26/94	185	12/26/94	523
2/26/94	100	4/26/94	0	6/26/94	0	8/26/94	295	10/27/94	256	12/27/94	425
2/27/94	0	4/27/94	42	6/27/94	0	8/27/94	324	10/28/94	166	12/28/94	386
2/28/94	0	4/28/94	0	6/28/94	0	8/28/94	348	10/29/94	220	12/29/94	332
		4/29/94	0	6/29/94	40	8/29/94	400	10/30/94	138	12/30/94	282
		4/30/94	0	6/30/94	0	8/30/94	319	10/31/94	204	12/31/94	229
						8/31/94	282				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/95	191	3/1/95	0	5/1/95	0	7/1/95	281	9/1/95	452	11/1/95	449
1/2/95	138	3/2/95	0	5/2/95	0	7/2/95	370	9/2/95	458	11/2/95	425
1/3/95	107	3/3/95	0	5/3/95	7	7/3/95	382	9/3/95	356	11/3/95	373
1/4/95	113	3/4/95	0	5/4/95	0	7/4/95	251	9/4/95	356	11/4/95	324
1/5/95	115	3/5/95	0	5/5/95	0	7/5/95	153	9/5/95	315	11/5/95	180
1/6/95	82	3/6/95	0	5/6/95	0	7/6/95	46	9/6/95	404	11/6/95	213
1/7/95	94	3/7/95	0	5/7/95	0	7/7/95	68	9/7/95	638	11/7/95	179
1/8/95	36	3/8/95	50	5/8/95	0	7/8/95	8	9/8/95	961	11/8/95	81
1/9/95	21	3/9/95	0	5/9/95	0	7/9/95	0	9/9/95	754	11/9/95	128
1/10/95	44	3/10/95	0	5/10/95	0	7/10/95	43	9/10/95	677	11/10/95	115
1/11/95	0	3/11/95	0	5/11/95	0	7/11/95	0	9/11/95	642	11/11/95	113
1/12/95	0	3/12/95	0	5/12/95	0	7/12/95	37	9/12/95	532	11/12/95	30
1/13/95	0	3/13/95	0	5/13/95	0	7/13/95	28	9/13/95	508	11/13/95	47
1/14/95	119	3/14/95	0	5/14/95	0	7/14/95	9	9/14/95	454	11/14/95	45
1/15/95	260	3/15/95	0	5/15/95	0	7/15/95	0	9/15/95	373	11/15/95	0
1/16/95	205	3/16/95	0	5/16/95	0	7/16/95	0	9/16/95	344	11/16/95	0
1/17/95	138	3/17/95	0	5/17/95	0	7/17/95	0	9/17/95	300	11/17/95	0
1/18/95	62	3/18/95	0	5/18/95	0	7/18/95	0	9/18/95	308	11/18/95	0
1/19/95	69	3/19/95	0	5/19/95	20	7/19/95	0	9/19/95	228	11/19/95	0
1/20/95	28	3/20/95	0	5/20/95	0	7/20/95	0	9/20/95	226	11/20/95	0
1/21/95	25	3/21/95	0	5/21/95	0	7/21/95	0	9/21/95	220	11/21/95	0
1/22/95	0	3/22/95	0	5/22/95	0	7/22/95	0	9/22/95	242	11/22/95	0
1/23/95	0	3/23/95	0	5/23/95	0	7/23/95	0	9/23/95	149	11/23/95	0
1/24/95	0	3/24/95	0	5/24/95	0	7/24/95	0	9/24/95	195	11/24/95	0
1/25/95	0	3/25/95	0	5/25/95	0	7/25/95	0	9/25/95	155	11/25/95	0
1/26/95	0	3/26/95	0	5/26/95	0	7/26/95	202	9/26/95	154	11/26/95	0
1/27/95	0	3/27/95	0	5/27/95	0	7/27/95	363	9/27/95	153	11/27/95	0
1/28/95	0	3/28/95	0	5/28/95	0	7/28/95	234	9/28/95	77	11/28/95	0
1/29/95	0	3/29/95	0	5/29/95	0	7/29/95	217	9/29/95	0	11/29/95	0
1/30/95	36	3/30/95	0	5/30/95	0	7/30/95	171	9/30/95	0	11/30/95	0
1/31/95	0	3/31/95	0	5/31/95	0	7/31/95	205	10/1/95	0	12/1/95	0
2/1/95	0	4/1/95	0	6/1/95	0	8/1/95	369	10/2/95	0	12/2/95	0
2/2/95	0	4/2/95	0	6/2/95	0	8/2/95	260	10/3/95	0	12/3/95	0
2/3/95	0	4/3/95	0	6/3/95	0	8/3/95	1245	10/4/95	0	12/4/95	0
2/4/95	0	4/4/95	0	6/4/95	0	8/4/95	1410	10/5/95	0	12/5/95	0
2/5/95	0	4/5/95	0	6/5/95	0	8/5/95	1137	10/6/95	44	12/6/95	0
2/6/95	0	4/6/95	0	6/6/95	0	8/6/95	545	10/7/95	26	12/7/95	0
2/7/95	0	4/7/95	0	6/7/95	0	8/7/95	527	10/8/95	210	12/8/95	0
2/8/95	0	4/8/95	0	6/8/95	0	8/8/95	432	10/9/95	200	12/9/95	0
2/9/95	0	4/9/95	0	6/9/95	0	8/9/95	353	10/10/95	118	12/10/95	0
2/10/95	0	4/10/95	0	6/10/95	0	8/10/95	318	10/11/95	118	12/11/95	0
2/11/95	0	4/11/95	2	6/11/95	0	8/11/95	314	10/12/95	116	12/12/95	0
2/12/95	0	4/12/95	1	6/12/95	0	8/12/95	303	10/13/95	115	12/13/95	0
2/13/95	0	4/13/95	0	6/13/95	0	8/13/95	290	10/14/95	241	12/14/95	0
2/14/95	0	4/14/95	0	6/14/95	0	8/14/95	199	10/15/95	698	12/15/95	0
2/15/95	0	4/15/95	0	6/15/95	0	8/15/95	204	10/16/95	723	12/16/95	0
2/16/95	0	4/16/95	0	6/16/95	0	8/16/95	93	10/17/95	2645	12/17/95	0
2/17/95	0	4/17/95	0	6/17/95	0	8/17/95	113	10/18/95	3172	12/18/95	0
2/18/95	0	4/18/95	0	6/18/95	0	8/18/95	75	10/19/95	3039	12/19/95	1
2/19/95	0	4/19/95	0	6/19/95	0	8/19/95	74	10/20/95	2542	12/20/95	0
2/20/95	0	4/20/95	0	6/20/95	0	8/20/95	73	10/21/95	2216	12/21/95	0
2/21/95	0	4/21/95	0	6/21/95	0	8/21/95	188	10/22/95	1889	12/22/95	0
2/22/95	0	4/22/95	0	6/22/95	0	8/22/95	148	10/23/95	1586	12/23/95	0
2/23/95	0	4/23/95	0	6/23/95	0	8/23/95	522	10/24/95	1381	12/24/95	0
2/24/95	0	4/24/95	0	6/24/95	0	8/24/95	1847	10/25/95	1257	12/25/95	0
2/25/95	0	4/25/95	0	6/25/95	0	8/25/95	1504	10/26/95	1098	12/26/95	0
2/26/95	0	4/26/95	0	6/26/95	0	8/26/95	1301	10/27/95	1034	12/27/95	0
2/27/95	0	4/27/95	0	6/27/95	0	8/27/95	814	10/28/95	929	12/28/95	0
2/28/95	0	4/28/95	0	6/28/95	0	8/28/95	662	10/29/95	821	12/29/95	0
		4/29/95	0	6/29/95	0	8/29/95	763	10/30/95	563	12/30/95	0
		4/30/95	0	6/30/95	3	8/30/95	560	10/31/95	453	12/31/95	0
						8/31/95	482				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/96	0	3/1/96	0	5/1/96	0	7/1/96	264	9/1/96	0	11/1/96	0
1/2/96	0	3/2/96	0	5/2/96	0	7/2/96	138	9/2/96	79	11/2/96	0
1/3/96	0	3/3/96	0	5/3/96	0	7/3/96	97	9/3/96	89	11/3/96	0
1/4/96	0	3/4/96	0	5/4/96	0	7/4/96	117	9/4/96	0	11/4/96	0
1/5/96	0	3/5/96	0	5/5/96	0	7/5/96	195	9/5/96	0	11/5/96	280
1/6/96	0	3/6/96	0	5/6/96	0	7/6/96	1347	9/6/96	0	11/6/96	481
1/7/96	0	3/7/96	0	5/7/96	0	7/7/96	1529	9/7/96	0	11/7/96	268
1/8/96	0	3/8/96	0	5/8/96	0	7/8/96	1126	9/8/96	0	11/8/96	229
1/9/96	0	3/9/96	0	5/9/96	0	7/9/96	975	9/9/96	0	11/9/96	127
1/10/96	0	3/10/96	0	5/10/96	0	7/10/96	919	9/10/96	144	11/10/96	160
1/11/96	0	3/11/96	0	5/11/96	0	7/11/96	685	9/11/96	360	11/11/96	94
1/12/96	0	3/12/96	0	5/12/96	0	7/12/96	390	9/12/96	537	11/12/96	109
1/13/96	0	3/13/96	0	5/13/96	0	7/13/96	558	9/13/96	267	11/13/96	95
1/14/96	0	3/14/96	20	5/14/96	0	7/14/96	566	9/14/96	317	11/14/96	119
1/15/96	0	3/15/96	10	5/15/96	0	7/15/96	440	9/15/96	251	11/15/96	47
1/16/96	0	3/16/96	0	5/16/96	0	7/16/96	429	9/16/96	153	11/16/96	77
1/17/96	0	3/17/96	0	5/17/96	0	7/17/96	332	9/17/96	118	11/17/96	63
1/18/96	0	3/18/96	17	5/18/96	0	7/18/96	334	9/18/96	84	11/18/96	48
1/19/96	0	3/19/96	13	5/19/96	0	7/19/96	196	9/19/96	84	11/19/96	58
1/20/96	0	3/20/96	33	5/20/96	0	7/20/96	193	9/20/96	0	11/20/96	59
1/21/96	0	3/21/96	10	5/21/96	0	7/21/96	140	9/21/96	0	11/21/96	75
1/22/96	0	3/22/96	6	5/22/96	0	7/22/96	77	9/22/96	0	11/22/96	0
1/23/96	3	3/23/96	7	5/23/96	12	7/23/96	116	9/23/96	0	11/23/96	52
1/24/96	0	3/24/96	0	5/24/96	0	7/24/96	42	9/24/96	0	11/24/96	5
1/25/96	0	3/25/96	19	5/25/96	0	7/25/96	0	9/25/96	0	11/25/96	82
1/26/96	0	3/26/96	7	5/26/96	52	7/26/96	0	9/26/96	0	11/26/96	12
1/27/96	0	3/27/96	5	5/27/96	29	7/27/96	0	9/27/96	0	11/27/96	0
1/28/96	0	3/28/96	0	5/28/96	167	7/28/96	0	9/28/96	0	11/28/96	0
1/29/96	0	3/29/96	0	5/29/96	475	7/29/96	0	9/29/96	0	11/29/96	0
1/30/96	0	3/30/96	0	5/30/96	310	7/30/96	0	9/30/96	0	11/30/96	0
1/31/96	0	3/31/96	177	5/31/96	225	7/31/96	0	10/1/96	0	12/1/96	0
2/1/96	0	4/1/96	107	6/1/96	152	8/1/96	3	10/2/96	0	12/2/96	0
2/2/96	0	4/2/96	5	6/2/96	26	8/2/96	0	10/3/96	0	12/3/96	0
2/3/96	0	4/3/96	0	6/3/96	15	8/3/96	0	10/4/96	0	12/4/96	0
2/4/96	0	4/4/96	0	6/4/96	0	8/4/96	0	10/5/96	0	12/5/96	0
2/5/96	0	4/5/96	0	6/5/96	0	8/5/96	0	10/6/96	0	12/6/96	0
2/6/96	0	4/6/96	0	6/6/96	0	8/6/96	0	10/7/96	58	12/7/96	0
2/7/96	0	4/7/96	0	6/7/96	3	8/7/96	0	10/8/96	158	12/8/96	0
2/8/96	0	4/8/96	0	6/8/96	0	8/8/96	0	10/9/96	90	12/9/96	0
2/9/96	0	4/9/96	0	6/9/96	0	8/9/96	70	10/10/96	87	12/10/96	67
2/10/96	0	4/10/96	0	6/10/96	0	8/10/96	30	10/11/96	6	12/11/96	0
2/11/96	0	4/11/96	0	6/11/96	12	8/11/96	3	10/12/96	5	12/12/96	0
2/12/96	0	4/12/96	0	6/12/96	113	8/12/96	16	10/13/96	256	12/13/96	0
2/13/96	0	4/13/96	0	6/13/96	156	8/13/96	0	10/14/96	243	12/14/96	0
2/14/96	0	4/14/96	0	6/14/96	118	8/14/96	12	10/15/96	353	12/15/96	0
2/15/96	0	4/15/96	0	6/15/96	84	8/15/96	43	10/16/96	427	12/16/96	0
2/16/96	0	4/16/96	0	6/16/96	72	8/16/96	0	10/17/96	736	12/17/96	0
2/17/96	0	4/17/96	0	6/17/96	0	8/17/96	0	10/18/96	681	12/18/96	0
2/18/96	0	4/18/96	0	6/18/96	21	8/18/96	0	10/19/96	434	12/19/96	0
2/19/96	0	4/19/96	0	6/19/96	64	8/19/96	0	10/20/96	203	12/20/96	0
2/20/96	0	4/20/96	0	6/20/96	115	8/20/96	2	10/21/96	211	12/21/96	0
2/21/96	0	4/21/96	0	6/21/96	120	8/21/96	0	10/22/96	202	12/22/96	0
2/22/96	0	4/22/96	0	6/22/96	139	8/22/96	0	10/23/96	130	12/23/96	0
2/23/96	0	4/23/96	0	6/23/96	223	8/23/96	0	10/24/96	121	12/24/96	0
2/24/96	0	4/24/96	0	6/24/96	100	8/24/96	0	10/25/96	118	12/25/96	0
2/25/96	0	4/25/96	0	6/25/96	107	8/25/96	0	10/26/96	85	12/26/96	0
2/26/96	0	4/26/96	0	6/26/96	27	8/26/96	0	10/27/96	53	12/27/96	0
2/27/96	0	4/27/96	0	6/27/96	60	8/27/96	0	10/28/96	20	12/28/96	0
2/28/96	0	4/28/96	0	6/28/96	283	8/28/96	0	10/29/96	64	12/29/96	0
2/29/96	0	4/29/96	0	6/29/96	251	8/29/96	0	10/30/96	6	12/30/96	0
		4/30/96	0	6/30/96	282	8/30/96	0	10/31/96	0	12/31/96	0
						8/31/96	0				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/97	0	3/1/97	0	5/1/97	0	7/1/97	109	9/1/97	395	11/1/97	0
1/2/97	0	3/2/97	0	5/2/97	0	7/2/97	87	9/2/97	567	11/2/97	0
1/3/97	0	3/3/97	0	5/3/97	18	7/3/97	47	9/3/97	457	11/3/97	0
1/4/97	0	3/4/97	0	5/4/97	0	7/4/97	70	9/4/97	397	11/4/97	0
1/5/97	0	3/5/97	0	5/5/97	0	7/5/97	148	9/5/97	847	11/5/97	2
1/6/97	0	3/6/97	0	5/6/97	0	7/6/97	257	9/6/97	622	11/6/97	14
1/7/97	0	3/7/97	0	5/7/97	0	7/7/97	148	9/7/97	249	11/7/97	12
1/8/97	0	3/8/97	0	5/8/97	0	7/8/97	135	9/8/97	370	11/8/97	1
1/9/97	0	3/9/97	0	5/9/97	0	7/9/97	119	9/9/97	259	11/9/97	0
1/10/97	0	3/10/97	0	5/10/97	0	7/10/97	178	9/10/97	219	11/10/97	0
1/11/97	0	3/11/97	0	5/11/97	0	7/11/97	192	9/11/97	264	11/11/97	0
1/12/97	0	3/12/97	0	5/12/97	0	7/12/97	456	9/12/97	268	11/12/97	0
1/13/97	0	3/13/97	0	5/13/97	0	7/13/97	311	9/13/97	251	11/13/97	0
1/14/97	0	3/14/97	0	5/14/97	0	7/14/97	274	9/14/97	328	11/14/97	0
1/15/97	0	3/15/97	0	5/15/97	0	7/15/97	285	9/15/97	461	11/15/97	0
1/16/97	0	3/16/97	0	5/16/97	0	7/16/97	291	9/16/97	367	11/16/97	0
1/17/97	0	3/17/97	0	5/17/97	0	7/17/97	214	9/17/97	208	11/17/97	0
1/18/97	0	3/18/97	0	5/18/97	0	7/18/97	198	9/18/97	244	11/18/97	0
1/19/97	0	3/19/97	0	5/19/97	0	7/19/97	145	9/19/97	120	11/19/97	0
1/20/97	0	3/20/97	0	5/20/97	0	7/20/97	139	9/20/97	159	11/20/97	0
1/21/97	0	3/21/97	0	5/21/97	0	7/21/97	97	9/21/97	149	11/21/97	0
1/22/97	10	3/22/97	0	5/22/97	0	7/22/97	135	9/22/97	76	11/22/97	0
1/23/97	12	3/23/97	0	5/23/97	0	7/23/97	116	9/23/97	104	11/23/97	0
1/24/97	9	3/24/97	0	5/24/97	0	7/24/97	91	9/24/97	115	11/24/97	0
1/25/97	0	3/25/97	0	5/25/97	0	7/25/97	67	9/25/97	39	11/25/97	1
1/26/97	0	3/26/97	0	5/26/97	0	7/26/97	41	9/26/97	94	11/26/97	2
1/27/97	7	3/27/97	0	5/27/97	0	7/27/97	56	9/27/97	279	11/27/97	0
1/28/97	5	3/28/97	0	5/28/97	0	7/28/97	0	9/28/97	351	11/28/97	0
1/29/97	0	3/29/97	0	5/29/97	0	7/29/97	0	9/29/97	380	11/29/97	0
1/30/97	0	3/30/97	0	5/30/97	0	7/30/97	91	9/30/97	282	11/30/97	0
1/31/97	0	3/31/97	0	5/31/97	0	7/31/97	9	10/1/97	221	12/1/97	0
2/1/97	0	4/1/97	0	6/1/97	48	8/1/97	291	10/2/97	197	12/2/97	7
2/2/97	0	4/2/97	0	6/2/97	383	8/2/97	621	10/3/97	121	12/3/97	23
2/3/97	0	4/3/97	0	6/3/97	231	8/3/97	427	10/4/97	138	12/4/97	85
2/4/97	0	4/4/97	0	6/4/97	114	8/4/97	372	10/5/97	135	12/5/97	100
2/5/97	0	4/5/97	0	6/5/97	163	8/5/97	376	10/6/97	125	12/6/97	29
2/6/97	0	4/6/97	0	6/6/97	114	8/6/97	271	10/7/97	79	12/7/97	64
2/7/97	0	4/7/97	0	6/7/97	111	8/7/97	414	10/8/97	90	12/8/97	27
2/8/97	0	4/8/97	0	6/8/97	54	8/8/97	732	10/9/97	34	12/9/97	27
2/9/97	0	4/9/97	0	6/9/97	197	8/9/97	866	10/10/97	12	12/10/97	24
2/10/97	0	4/10/97	0	6/10/97	375	8/10/97	664	10/11/97	89	12/11/97	16
2/11/97	0	4/11/97	0	6/11/97	332	8/11/97	563	10/12/97	0	12/12/97	9
2/12/97	0	4/12/97	0	6/12/97	349	8/12/97	507	10/13/97	4	12/13/97	116
2/13/97	0	4/13/97	0	6/13/97	268	8/13/97	424	10/14/97	7	12/14/97	847
2/14/97	0	4/14/97	90	6/14/97	353	8/14/97	357	10/15/97	7	12/15/97	635
2/15/97	0	4/15/97	305	6/15/97	503	8/15/97	379	10/16/97	5	12/16/97	244
2/16/97	82	4/16/97	253	6/16/97	419	8/16/97	324	10/17/97	10	12/17/97	354
2/17/97	35	4/17/97	242	6/17/97	485	8/17/97	359	10/18/97	109	12/18/97	285
2/18/97	0	4/18/97	143	6/18/97	697	8/18/97	438	10/19/97	26	12/19/97	193
2/19/97	0	4/19/97	52	6/19/97	701	8/19/97	394	10/20/97	86	12/20/97	210
2/20/97	0	4/20/97	0	6/20/97	549	8/20/97	415	10/21/97	2	12/21/97	175
2/21/97	0	4/21/97	0	6/21/97	311	8/21/97	479	10/22/97	9	12/22/97	182
2/22/97	0	4/22/97	0	6/22/97	315	8/22/97	461	10/23/97	11	12/23/97	142
2/23/97	0	4/23/97	0	6/23/97	315	8/23/97	373	10/24/97	11	12/24/97	113
2/24/97	12	4/24/97	0	6/24/97	347	8/24/97	496	10/25/97	7	12/25/97	120
2/25/97	0	4/25/97	0	6/25/97	279	8/25/97	433	10/26/97	3	12/26/97	67
2/26/97	0	4/26/97	0	6/26/97	174	8/26/97	379	10/27/97	0	12/27/97	70
2/27/97	0	4/27/97	0	6/27/97	195	8/27/97	330	10/28/97	0	12/28/97	119
2/28/97	0	4/28/97	0	6/28/97	76	8/28/97	294	10/29/97	0	12/29/97	101
		4/29/97	0	6/29/97	108	8/29/97	240	10/30/97	0	12/30/97	9
		4/30/97	0	6/30/97	105	8/30/97	254	10/31/97	0	12/31/97	99
						8/31/97	137				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/98	11	3/1/98	367	5/1/98	9	7/1/98	0	9/1/98	1	11/1/98	0
1/2/98	4	3/2/98	134	5/2/98	66	7/2/98	0	9/2/98	5	11/2/98	0
1/3/98	9	3/3/98	145	5/3/98	0	7/3/98	0	9/3/98	11	11/3/98	0
1/4/98	13	3/4/98	111	5/4/98	10	7/4/98	0	9/4/98	13	11/4/98	29
1/5/98	16	3/5/98	124	5/5/98	0	7/5/98	0	9/5/98	87	11/5/98	1989
1/6/98	19	3/6/98	81	5/6/98	0	7/6/98	0	9/6/98	80	11/6/98	1660
1/7/98	23	3/7/98	26	5/7/98	0	7/7/98	0	9/7/98	114	11/7/98	1074
1/8/98	22	3/8/98	103	5/8/98	3	7/8/98	0	9/8/98	55	11/8/98	625
1/9/98	25	3/9/98	147	5/9/98	0	7/9/98	0	9/9/98	67	11/9/98	586
1/10/98	67	3/10/98	87	5/10/98	0	7/10/98	0	9/10/98	69	11/10/98	596
1/11/98	0	3/11/98	64	5/11/98	0	7/11/98	0	9/11/98	21	11/11/98	467
1/12/98	0	3/12/98	11	5/12/98	0	7/12/98	0	9/12/98	85	11/12/98	469
1/13/98	0	3/13/98	73	5/13/98	0	7/13/98	0	9/13/98	8	11/13/98	408
1/14/98	0	3/14/98	20	5/14/98	0	7/14/98	0	9/14/98	86	11/14/98	324
1/15/98	0	3/15/98	0	5/15/98	0	7/15/98	29	9/15/98	23	11/15/98	303
1/16/98	0	3/16/98	0	5/16/98	0	7/16/98	23	9/16/98	181	11/16/98	221
1/17/98	1	3/17/98	0	5/17/98	0	7/17/98	51	9/17/98	434	11/17/98	170
1/18/98	1	3/18/98	0	5/18/98	0	7/18/98	8	9/18/98	401	11/18/98	180
1/19/98	1	3/19/98	8	5/19/98	0	7/19/98	17	9/19/98	572	11/19/98	98
1/20/98	0	3/20/98	410	5/20/98	0	7/20/98	21	9/20/98	781	11/20/98	87
1/21/98	0	3/21/98	175	5/21/98	0	7/21/98	23	9/21/98	987	11/21/98	2
1/22/98	945	3/22/98	148	5/22/98	0	7/22/98	60	9/22/98	1088	11/22/98	1
1/23/98	1119	3/23/98	113	5/23/98	0	7/23/98	19	9/23/98	826	11/23/98	0
1/24/98	500	3/24/98	111	5/24/98	0	7/24/98	17	9/24/98	610	11/24/98	3
1/25/98	480	3/25/98	2	5/25/98	0	7/25/98	7	9/25/98	630	11/25/98	86
1/26/98	386	3/26/98	23	5/26/98	0	7/26/98	0	9/26/98	388	11/26/98	19
1/27/98	356	3/27/98	54	5/27/98	0	7/27/98	0	9/27/98	517	11/27/98	24
1/28/98	327	3/28/98	1	5/28/98	0	7/28/98	0	9/28/98	393	11/28/98	15
1/29/98	210	3/29/98	2	5/29/98	0	7/29/98	0	9/29/98	326	11/29/98	2
1/30/98	241	3/30/98	3	5/30/98	0	7/30/98	0	9/30/98	321	11/30/98	0
1/31/98	133	3/31/98	4	5/31/98	0	7/31/98	0	10/1/98	318	12/1/98	0
2/1/98	148	4/1/98	1	6/1/98	0	8/1/98	0	10/2/98	172	12/2/98	0
2/2/98	186	4/2/98	0	6/2/98	0	8/2/98	0	10/3/98	160	12/3/98	0
2/3/98	475	4/3/98	0	6/3/98	0	8/3/98	0	10/4/98	138	12/4/98	8
2/4/98	321	4/4/98	0	6/4/98	0	8/4/98	0	10/5/98	138	12/5/98	1
2/5/98	209	4/5/98	0	6/5/98	0	8/5/98	26	10/6/98	130	12/6/98	0
2/6/98	225	4/6/98	0	6/6/98	0	8/6/98	111	10/7/98	90	12/7/98	0
2/7/98	275	4/7/98	0	6/7/98	0	8/7/98	5	10/8/98	14	12/8/98	4
2/8/98	252	4/8/98	0	6/8/98	0	8/8/98	104	10/9/98	60	12/9/98	8
2/9/98	153	4/9/98	0	6/9/98	0	8/9/98	122	10/10/98	5	12/10/98	8
2/10/98	135	4/10/98	0	6/10/98	0	8/10/98	67	10/11/98	20	12/11/98	5
2/11/98	128	4/11/98	0	6/11/98	0	8/11/98	17	10/12/98	20	12/12/98	7
2/12/98	81	4/12/98	0	6/12/98	0	8/12/98	35	10/13/98	21	12/13/98	11
2/13/98	11	4/13/98	0	6/13/98	0	8/13/98	10	10/14/98	13	12/14/98	7
2/14/98	99	4/14/98	0	6/14/98	0	8/14/98	8	10/15/98	2	12/15/98	2
2/15/98	50	4/15/98	0	6/15/98	0	8/15/98	2	10/16/98	0	12/16/98	0
2/16/98	447	4/16/98	0	6/16/98	0	8/16/98	0	10/17/98	10	12/17/98	0
2/17/98	742	4/17/98	0	6/17/98	0	8/17/98	0	10/18/98	17	12/18/98	0
2/18/98	856	4/18/98	0	6/18/98	0	8/18/98	0	10/19/98	14	12/19/98	0
2/19/98	522	4/19/98	0	6/19/98	0	8/19/98	0	10/20/98	18	12/20/98	0
2/20/98	532	4/20/98	0	6/20/98	0	8/20/98	0	10/21/98	65	12/21/98	1
2/21/98	371	4/21/98	0	6/21/98	0	8/21/98	0	10/22/98	125	12/22/98	1
2/22/98	347	4/22/98	5	6/22/98	0	8/22/98	8	10/23/98	15	12/23/98	0
2/23/98	131	4/23/98	0	6/23/98	0	8/23/98	104	10/24/98	12	12/24/98	0
2/24/98	124	4/24/98	0	6/24/98	0	8/24/98	23	10/25/98	3	12/25/98	0
2/25/98	124	4/25/98	0	6/25/98	0	8/25/98	12	10/26/98	0	12/26/98	0
2/26/98	119	4/26/98	0	6/26/98	0	8/26/98	58	10/27/98	0	12/27/98	0
2/27/98	123	4/27/98	0	6/27/98	0	8/27/98	20	10/28/98	10	12/28/98	6
2/28/98	114	4/28/98	0	6/28/98	0	8/28/98	3	10/29/98	5	12/29/98	14
		4/29/98	0	6/29/98	0	8/29/98	4	10/30/98	0	12/30/98	1
		4/30/98	0	6/30/98	0	8/30/98	3	10/31/98	0	12/31/98	0
						8/31/98	1				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/99	2	3/1/99	7	5/1/99	0	7/1/99	474	9/1/99	941	11/1/99	781
1/2/99	1008	3/2/99	0	5/2/99	0	7/2/99	586	9/2/99	399	11/2/99	589
1/3/99	1022	3/3/99	0	5/3/99	0	7/3/99	343	9/3/99	259	11/3/99	397
1/4/99	735	3/4/99	0	5/4/99	0	7/4/99	226	9/4/99	186	11/4/99	394
1/5/99	575	3/5/99	0	5/5/99	0	7/5/99	174	9/5/99	140	11/5/99	328
1/6/99	359	3/6/99	0	5/6/99	0	7/6/99	147	9/6/99	183	11/6/99	328
1/7/99	308	3/7/99	0	5/7/99	0	7/7/99	108	9/7/99	240	11/7/99	241
1/8/99	264	3/8/99	0	5/8/99	0	7/8/99	110	9/8/99	255	11/8/99	261
1/9/99	223	3/9/99	0	5/9/99	0	7/9/99	52	9/9/99	330	11/9/99	243
1/10/99	189	3/10/99	0	5/10/99	0	7/10/99	2	9/10/99	247	11/10/99	173
1/11/99	130	3/11/99	0	5/11/99	0	7/11/99	5	9/11/99	247	11/11/99	224
1/12/99	135	3/12/99	0	5/12/99	0	7/12/99	1	9/12/99	259	11/12/99	94
1/13/99	124	3/13/99	0	5/13/99	0	7/13/99	0	9/13/99	290	11/13/99	124
1/14/99	67	3/14/99	0	5/14/99	0	7/14/99	0	9/14/99	164	11/14/99	66
1/15/99	113	3/15/99	0	5/15/99	0	7/15/99	0	9/15/99	126	11/15/99	92
1/16/99	83	3/16/99	0	5/16/99	0	7/16/99	1	9/16/99	73	11/16/99	66
1/17/99	100	3/17/99	0	5/17/99	0	7/17/99	0	9/17/99	161	11/17/99	9
1/18/99	89	3/18/99	0	5/18/99	0	7/18/99	0	9/18/99	228	11/18/99	59
1/19/99	37	3/19/99	0	5/19/99	0	7/19/99	0	9/19/99	522	11/19/99	49
1/20/99	40	3/20/99	0	5/20/99	0	7/20/99	0	9/20/99	575	11/20/99	5
1/21/99	20	3/21/99	0	5/21/99	0	7/21/99	0	9/21/99	597	11/21/99	7
1/22/99	19	3/22/99	0	5/22/99	0	7/22/99	0	9/22/99	356	11/22/99	3
1/23/99	9	3/23/99	0	5/23/99	0	7/23/99	0	9/23/99	355	11/23/99	1
1/24/99	67	3/24/99	0	5/24/99	0	7/24/99	0	9/24/99	353	11/24/99	0
1/25/99	38	3/25/99	0	5/25/99	0	7/25/99	1	9/25/99	281	11/25/99	0
1/26/99	41	3/26/99	0	5/26/99	0	7/26/99	5	9/26/99	460	11/26/99	0
1/27/99	17	3/27/99	0	5/27/99	0	7/27/99	2	9/27/99	516	11/27/99	0
1/28/99	16	3/28/99	0	5/28/99	0	7/28/99	0	9/28/99	434	11/28/99	0
1/29/99	5	3/29/99	0	5/29/99	0	7/29/99	0	9/29/99	332	11/29/99	0
1/30/99	0	3/30/99	0	5/30/99	0	7/30/99	0	9/30/99	233	11/30/99	0
1/31/99	0	3/31/99	0	5/31/99	0	7/31/99	0	10/1/99	216	12/1/99	0
2/1/99	7	4/1/99	0	6/1/99	0	8/1/99	0	10/2/99	149	12/2/99	0
2/2/99	7	4/2/99	0	6/2/99	0	8/2/99	0	10/3/99	160	12/3/99	0
2/3/99	0	4/3/99	0	6/3/99	0	8/3/99	0	10/4/99	170	12/4/99	0
2/4/99	0	4/4/99	0	6/4/99	0	8/4/99	0	10/5/99	151	12/5/99	0
2/5/99	3	4/5/99	0	6/5/99	0	8/5/99	0	10/6/99	136	12/6/99	0
2/6/99	0	4/6/99	0	6/6/99	0	8/6/99	0	10/7/99	131	12/7/99	0
2/7/99	2	4/7/99	0	6/7/99	0	8/7/99	0	10/8/99	208	12/8/99	0
2/8/99	11	4/8/99	0	6/8/99	0	8/8/99	0	10/9/99	181	12/9/99	0
2/9/99	10	4/9/99	0	6/9/99	0	8/9/99	2	10/10/99	110	12/10/99	0
2/10/99	3	4/10/99	0	6/10/99	0	8/10/99	17	10/11/99	90	12/11/99	0
2/11/99	0	4/11/99	0	6/11/99	0	8/11/99	5	10/12/99	107	12/12/99	0
2/12/99	0	4/12/99	0	6/12/99	0	8/12/99	0	10/13/99	135	12/13/99	0
2/13/99	0	4/13/99	0	6/13/99	1	8/13/99	0	10/14/99	1189	12/14/99	0
2/14/99	2	4/14/99	0	6/14/99	0	8/14/99	57	10/15/99	1577	12/15/99	0
2/15/99	12	4/15/99	0	6/15/99	0	8/15/99	23	10/16/99	2875	12/16/99	0
2/16/99	10	4/16/99	0	6/16/99	0	8/16/99	4	10/17/99	2202	12/17/99	23
2/17/99	9	4/17/99	0	6/17/99	0	8/17/99	0	10/18/99	1739	12/18/99	86
2/18/99	6	4/18/99	0	6/18/99	0	8/18/99	12	10/19/99	1340	12/19/99	14
2/19/99	3	4/19/99	0	6/19/99	4	8/19/99	78	10/20/99	1106	12/20/99	14
2/20/99	0	4/20/99	0	6/20/99	8	8/20/99	103	10/21/99	927	12/21/99	14
2/21/99	0	4/21/99	0	6/21/99	29	8/21/99	86	10/22/99	852	12/22/99	18
2/22/99	0	4/22/99	0	6/22/99	191	8/22/99	38	10/23/99	736	12/23/99	15
2/23/99	0	4/23/99	0	6/23/99	123	8/23/99	40	10/24/99	752	12/24/99	9
2/24/99	0	4/24/99	0	6/24/99	16	8/24/99	361	10/25/99	615	12/25/99	1
2/25/99	2	4/25/99	0	6/25/99	103	8/25/99	421	10/26/99	539	12/26/99	0
2/26/99	5	4/26/99	0	6/26/99	226	8/26/99	366	10/27/99	432	12/27/99	0
2/27/99	8	4/27/99	0	6/27/99	295	8/27/99	171	10/28/99	319	12/28/99	0
2/28/99	10	4/28/99	0	6/28/99	102	8/28/99	132	10/29/99	319	12/29/99	0
		4/29/99	0	6/29/99	86	8/29/99	91	10/30/99	260	12/30/99	0
		4/30/99	0	6/30/99	252	8/30/99	75	10/31/99	464	12/31/99	0
						8/31/99	17				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
1/1/00	0	3/1/00	0	5/1/00	0	7/1/00	0	9/1/00	0	11/1/00	5
1/2/00	0	3/2/00	0	5/2/00	0	7/2/00	0	9/2/00	0	11/2/00	0
1/3/00	0	3/3/00	0	5/3/00	0	7/3/00	0	9/3/00	0	11/3/00	0
1/4/00	0	3/4/00	0	5/4/00	0	7/4/00	0	9/4/00	0	11/4/00	3
1/5/00	0	3/5/00	0	5/5/00	0	7/5/00	0	9/5/00	0	11/5/00	6
1/6/00	0	3/6/00	0	5/6/00	0	7/6/00	0	9/6/00	0	11/6/00	3
1/7/00	0	3/7/00	0	5/7/00	0	7/7/00	0	9/7/00	0	11/7/00	0
1/8/00	0	3/8/00	0	5/8/00	0	7/8/00	0	9/8/00	0	11/8/00	0
1/9/00	0	3/9/00	0	5/9/00	0	7/9/00	0	9/9/00	0	11/9/00	0
1/10/00	0	3/10/00	0	5/10/00	0	7/10/00	0	9/10/00	0	11/10/00	0
1/11/00	0	3/11/00	0	5/11/00	0	7/11/00	0	9/11/00	0	11/11/00	0
1/12/00	0	3/12/00	0	5/12/00	0	7/12/00	0	9/12/00	0	11/12/00	0
1/13/00	0	3/13/00	0	5/13/00	0	7/13/00	0	9/13/00	0	11/13/00	0
1/14/00	0	3/14/00	0	5/14/00	0	7/14/00	0	9/14/00	0	11/14/00	0
1/15/00	0	3/15/00	0	5/15/00	0	7/15/00	0	9/15/00	0	11/15/00	0
1/16/00	0	3/16/00	0	5/16/00	0	7/16/00	0	9/16/00	0	11/16/00	0
1/17/00	0	3/17/00	0	5/17/00	0	7/17/00	0	9/17/00	0	11/17/00	0
1/18/00	0	3/18/00	0	5/18/00	0	7/18/00	0	9/18/00	0	11/18/00	0
1/19/00	0	3/19/00	0	5/19/00	0	7/19/00	0	9/19/00	0	11/19/00	0
1/20/00	0	3/20/00	0	5/20/00	0	7/20/00	0	9/20/00	0	11/20/00	0
1/21/00	0	3/21/00	0	5/21/00	0	7/21/00	0	9/21/00	0	11/21/00	0
1/22/00	0	3/22/00	0	5/22/00	0	7/22/00	0	9/22/00	0	11/22/00	0
1/23/00	0	3/23/00	0	5/23/00	0	7/23/00	0	9/23/00	0	11/23/00	0
1/24/00	0	3/24/00	0	5/24/00	0	7/24/00	0	9/24/00	0	11/24/00	0
1/25/00	0	3/25/00	0	5/25/00	0	7/25/00	0	9/25/00	0	11/25/00	0
1/26/00	0	3/26/00	0	5/26/00	0	7/26/00	0	9/26/00	0	11/26/00	0
1/27/00	0	3/27/00	0	5/27/00	0	7/27/00	0	9/27/00	0	11/27/00	0
1/28/00	0	3/28/00	0	5/28/00	0	7/28/00	0	9/28/00	0	11/28/00	0
1/29/00	0	3/29/00	0	5/29/00	0	7/29/00	0	9/29/00	0	11/29/00	0
1/30/00	0	3/30/00	0	5/30/00	0	7/30/00	0	9/30/00	0	11/30/00	0
1/31/00	0	3/31/00	0	5/31/00	0	7/31/00	0	10/1/00	0	12/1/00	0
2/1/00	0	4/1/00	0	6/1/00	0	8/1/00	0	10/2/00	0	12/2/00	0
2/2/00	0	4/2/00	0	6/2/00	0	8/2/00	0	10/3/00	23	12/3/00	0
2/3/00	0	4/3/00	0	6/3/00	0	8/3/00	0	10/4/00	1270	12/4/00	0
2/4/00	0	4/4/00	0	6/4/00	0	8/4/00	0	10/5/00	1067	12/5/00	0
2/5/00	0	4/5/00	0	6/5/00	0	8/5/00	0	10/6/00	569	12/6/00	0
2/6/00	0	4/6/00	0	6/6/00	0	8/6/00	0	10/7/00	435	12/7/00	0
2/7/00	0	4/7/00	0	6/7/00	0	8/7/00	0	10/8/00	384	12/8/00	0
2/8/00	0	4/8/00	0	6/8/00	0	8/8/00	0	10/9/00	250	12/9/00	0
2/9/00	0	4/9/00	0	6/9/00	0	8/9/00	0	10/10/00	156	12/10/00	0
2/10/00	0	4/10/00	0	6/10/00	0	8/10/00	0	10/11/00	140	12/11/00	0
2/11/00	0	4/11/00	0	6/11/00	0	8/11/00	0	10/12/00	105	12/12/00	0
2/12/00	0	4/12/00	0	6/12/00	0	8/12/00	0	10/13/00	74	12/13/00	0
2/13/00	0	4/13/00	0	6/13/00	0	8/13/00	0	10/14/00	76	12/14/00	0
2/14/00	0	4/14/00	0	6/14/00	0	8/14/00	0	10/15/00	0	12/15/00	1
2/15/00	0	4/15/00	0	6/15/00	0	8/15/00	0	10/16/00	0	12/16/00	0
2/16/00	0	4/16/00	82	6/16/00	0	8/16/00	0	10/17/00	0	12/17/00	0
2/17/00	0	4/17/00	16	6/17/00	0	8/17/00	0	10/18/00	9	12/18/00	0
2/18/00	0	4/18/00	0	6/18/00	0	8/18/00	0	10/19/00	0	12/19/00	0
2/19/00	0	4/19/00	0	6/19/00	0	8/19/00	0	10/20/00	0	12/20/00	0
2/20/00	0	4/20/00	0	6/20/00	0	8/20/00	0	10/21/00	7	12/21/00	0
2/21/00	0	4/21/00	0	6/21/00	0	8/21/00	0	10/22/00	2	12/22/00	0
2/22/00	0	4/22/00	0	6/22/00	0	8/22/00	0	10/23/00	0	12/23/00	0
2/23/00	0	4/23/00	0	6/23/00	0	8/23/00	0	10/24/00	0	12/24/00	0
2/24/00	0	4/24/00	0	6/24/00	0	8/24/00	0	10/25/00	0	12/25/00	0
2/25/00	0	4/25/00	0	6/25/00	0	8/25/00	0	10/26/00	0	12/26/00	0
2/26/00	0	4/26/00	0	6/26/00	0	8/26/00	0	10/27/00	1	12/27/00	0
2/27/00	0	4/27/00	0	6/27/00	0	8/27/00	0	10/28/00	0	12/28/00	0
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		4/30/00	0	6/30/00	0	8/30/00	0	10/31/00	12	12/31/00	0
						8/31/00	0				

C-18 Canal @ S-46 (1961-2001, but with gaps in data) Agency: WMD

DB KEYS 15734, 04370, 13118

Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)	Date	Flow (cfs)
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1/2/01	0	3/2/01	0	5/2/01	0	7/2/01	14	9/2/01	0
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1/5/01	0	3/5/01	0	5/5/01	0	7/5/01	0		
1/6/01	0	3/6/01	0	5/6/01	0	7/6/01	2		
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						8/31/01	0		

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APPENDIX E -- PRELIMINARY RESULTS OF THE LOXAHATCHEE ESTUARY HYDRODYNAMICS/SALINITY MODEL

Contents

1. Introduction

The upstream migration of salt water into the historic freshwater reaches of the Loxahatchee River has altered the floodplain cypress forest community along the Northwest Fork and some of its tributaries. A hydrodynamic/salinity model was developed to study the influence of freshwater input on the salinity conditions in the river and estuary. The purpose of this modeling effort was to predict salinity conditions at various points in the estuary with respect of freshwater inflow rates and tidal fluctuations. The two-dimensional hydrodynamic/salinity model was also used to provide a preliminary assessment on the impacts of inlet deepening and sea level rise on the salinity regime in the estuary.

During model development, it was apparent after initial data review that a more coordinated data collection program in the study area was needed. A data collection plan was developed in 2001. The data collection project obtained the Governing Board approval in September 2002. The instrument installation has begun in the field. It is expected that the first patch of data will be available before the end of 2002.

In order to meet the MFL study schedule, parallel with the data collection plan development, the hydrodynamic model was developed in a 6-month time frame using available data. The model will be revised when a new and more complete data set becomes available.

The model was calibrated and verified against field data that were collected from January to June of 1999. Then the model was applied to scenarios that were proposed by the study team. Two series of model simulations were requested. The first simulation (Simulation #1) included flows from the Northwest Fork of the River and its three tributaries based on flow ratios established by a previous study. The second model run was named Simulation #2 and contained a minimum amount of freshwater input from the three tributaries. Simulation #1 was used to predict salinity conditions with various freshwater inflow rates that follow historic freshwater input patterns. The purpose of Simulation #2 was to predict salinity condition on a "worst case" scenario with the Northwest Fork of the river providing the majority of water with minimum freshwater input provided by the three tributaries to the estuary.

These model results were used to provide an estimate of the volume of water needed from the Northwest Fork of the river to maintain salinity within the range that was recommended by biological studies. Model simulation indicates that there is a strong correlation between freshwater inflow and salinity regime in the estuary. Based on this relationship, a computer program was developed to provide an estimate on the historic salinity conditions at eight sites in the Northwest Fork.

This document outlines the basic model setup, assumptions and calibration/verification process. A summary of preliminary results of model applications is presented.

2. Model Description

2.1. Computer Model (Software) Description

The software used in the development of Loxahatchee River Hydrodynamics/Salinity Model were computer programs RMA-2 and RMA-4 that were developed by Army Corps of Engineers (USACE, 1996).

RMA2 is a two dimensional depth averaged finite element hydrodynamic numerical model. It computes water surface elevations and horizontal velocity components for subcritical, free-surface flow in two dimensional flow fields. RMA2 computes a finite element solution of the Reynolds form of the Navier-Stokes equations for turbulent flows. Friction is calculated with the Manning's or Chezy equation, and eddy viscosity coefficients are used to define turbulence characteristics. Both steady and unsteady state (dynamic) problems can be analyzed.

The program has been applied to calculate water levels and flow distribution around islands; flow at bridges having one or more relief openings, in contracting and expanding reaches, into and out of off-channel hydropower plants, at river junctions, and into and out of pumping plant channels; circulation and transport in water bodies with wetlands; and general water levels and flow patterns in rivers, reservoirs, and estuaries.

The water quality model, RMA4, is designed to simulate the depth-average advection-diffusion process in an aquatic environment. The model is used for investigating the physical processes of migration and mixing of a soluble substance in reservoirs, rivers, bays, estuaries and coastal zones. The model is useful for evaluation of the basic processes or for defining the effectiveness of remedial measures. For complex geometries, the model utilizes the depth-averaged hydrodynamics from RMA2.

The formulation of RMA4 is limited to one-dimensional (cross-sectionally averaged) and two-dimensional (depth-averaged) situations in which the concentration is fairly well mixed in the vertical direction. It will not provide accurate concentrations for stratified situations in which the constituent concentration influences the density of the fluid. The preliminary results indicated that the model was able to predict the salinity fluctuation driven by the tide cycle and the influence of freshwater input on the salinity regime in the river. On the other hand, since the model only simulates the water movement in the horizontal direction all the output is depth-averaged. The model does not simulate the stratification that exists in the system. While the whole system is driven by the horizontal salinity gradient between the ocean and freshwater, there could be some density-induced circulation locally that could not be simulated. The South Florida Water Management District has started a data collection program in Loxahatchee River that would provide field data for the development of a 3-D model that can simulate currents and transport in 3-D environment including stratified systems.

2.2. Data Sources and Assumptions

RMA-2 and RMA-4 are two-dimensional models that are based on the real topography of the modeling area. In addition to the geographic data, the model also requires flow and tide data to form the boundary conditions. The model requires freshwater inflow data at all tributaries and tide data on the ocean boundary. Wind, precipitation and evaporation have not been included in the study at this stage. These factors will be included in the second phase of the model development when field data is available.

2.2.1 Bathymetric data

Bathymetry for the model development was provided by the Florida Department of Transportation. The original survey report has not been located. Since the data was produced by a recent survey in 1999, it was assumed that the datum of the survey data was NAD 83 and NAVD 88. While the bathymetric data fit well with other data in NAD 83 and NAVD 88, the data datum is still to be confirmed by the original report or a report that describes the survey data.

The bathymetric data does not cover the upstream portion of Northwest Fork above river mile 4. The approximate channel depth was based on a bathymetric map produced by USGS in 1982 (McPherson, Sabanskas, & Long, 1982) and lead line measurements by the district staff.

2.2.2 Model Datum

The model was developed in North America Datum 83 (NAD83) and North America Vertical Datum 88 (NAVD88). All the XY coordinates are in State Plane Florida East.

2.2.3 Surface Freshwater Inflows

Surface water inflow records were needed for model calibration and verification period January through June 1999. Flow records for that period at S-46, Lainhart Dam and Kitching Creek were retrieved from the South Florida Water Management District database DBHYDRO. Flow data of Cypress Creek, Hobe Grove, and North Fork for the same period was not found. A previous study (Russell and McPherson, 1983) conducted by USGS analyzed two years of the flow record and calculated the relative magnitude of freshwater inflow from each tributaries of the Loxahatchee river. The flow ratios between tributaries provided in the USGS report were applied to the calibration/verification period to estimate the freshwater flow from Cypress Creek and Hobe Grove. The upstream model boundary is the Florida Turnpike. Freshwater inflow at this location was estimated based on the flow record at the Lainhart Dam and an incremental ratio derived from the USGS data set.

2.2.4 Groundwater Inflows

One of the major tasks of model calibration was to estimate the magnitude of groundwater input to the system. Based on flow and salinity record of a dry period in May 1999, it was estimated that there was approximately 40 cfs groundwater input to the upstream portion of Northwest Fork above Kitching Creek. Groundwater seepage into the river depends on the groundwater table and the stage of the river. Before a formula is established for groundwater calculation, a constant 40 cfs was applied to model verification and subsequent scenario simulations. The district is in the process of developing an integrated surface/groundwater model that can calculate groundwater in put to the system more accurately.

2.2.5 Tide Data

Tide is a major driving force of the system. Since no measured tidal data is available for the model calibration/verification period, an ocean tide model developed by Army Corps of Engineers (Scheffner, 1994; Borgman and Scheffner, 1991) was applied to generate the time sequence of tide heights. The time sequence of tide heights at 30 minutes intervals were generated by the model for an off shore location near Jupiter Inlet at Latitude North 26.94998, and Longitude West 80.04684. The tide heights were generated based on 8 tidal constituents, K1, O1, P1, Q1, N2, M2, S2 and K2.

In the model calibration process, the model output was compared with the NOAA tide book. The NOAA tide table has predicted tides for 10 locations in Loxahatchee River and its tributaries. The latitude and longitude in NOAA Tide Table (NOS, 1998) were converted to State Plane Florida East with conversion software *CORPSCON 5.11.08* developed by U.S. Army Topographic Engineering Center.

The ocean model, NOAA Tide Table and the bathymetric data use different vertical datum. The ocean model output generates tide heights relative to mean tide level. The NOAA tide table provides tide height in mean lower low water. The model output is in NAVD88. To compare with model output, tide data have to be converted to the same geodetic datum NAVD88. A research of NOAA tidal benchmark record located two benchmarks that are related to NATIONAL GEODETIC VERTICAL DATUM-1929 (NGVD29). At NOAA tide site North Fork Entrance, 0 NGVD is at 0.59 FEET MLLW. At South Jetty of Jupiter Inlet, 0 NGVD is at 1.2 FEET MLLW. In the model calibration process, the model output and NOAA data were compared at absolute elevation at these two sites. For other stations, the comparison was only on tide amplitude.

In the process of model calibration, the tide data generated by the ocean model was adjusted to reflect the amplitude attenuation over the shelf and the difference between the vertical datum NGVD29 and MTL. With a conversion formula of

$$\text{ModelBoundaryTide} = \text{OceanTide}*0.7+0.88',$$

the model output at South Jetty of Jupiter Inlet would match the NOAA predicted tide. This conversion of ocean tide was applied to all the simulations in the subsequent model simulations and produced results that are consistent with NOAA predicted tides.

2.2.6 Salinity Data

Salinity data was provided by the Loxahatchee River District for the period of record January 1994 - July 2000. Sampling equipment consisted of three Hydrolab Datasonde Model #3 monitoring probes and a data logger unit. This equipment provided readings for salinity (specific conductivity) dissolved oxygen, depth and other parameters. Data were recorded at one half hour intervals.

2.3 Model Calibration and Verification

During model development, it was apparent after initial data review that a more coordinated data collection program in the study area was needed. A data collection plan was developed in 2001. The data collection project obtained the Governing Board approval in September 2002. The instrument installation has begun in the field. It is expected that the first patch of data will be available before the end of 2002.

In order to meet the MFL study schedule, parallel with the data collection plan development, the hydrodynamic model was developed in a 6-month time frame using available data. This section describes the process of preliminary model assessment. The model will be revised when a new and more complete data set becomes available.

2.3.1 Preliminary Calibration and Verification against Field Data

4736 topographic data points are derived from survey data of Loxahatchee estuary to form the model grid/mesh. The XY coordinates and elevation of the 4736 points form the geometry of the model. Figure 1 is the finite element model mesh that was developed for Loxahatchee Estuary salinity study.

Accurate salinity prediction is based on the accurate prediction of tides. Hydrodynamic calibration and verification in tide simulations lays the groundwork for salinity simulations. The hydrodynamic model was calibrated against NOAA data for a three-month period from December 1996 to February 1997. Then the tidal output was verified against NOAA data for a four-month period from January 1999 to April 1999. Tide verification results are presented in subsequent sections.

Salinity model calibration was based on flow and salinity records from January 1 to April 30, 1999. The period includes a typical transition from wet season to dry season. While the flow record at Lainhart Dam shows a decreasing freshwater inflow to the estuary, the salinity records indicate that the salinity went up significantly even at the upstream portion of the estuary. Figure 2 and 3 are comparisons between model output and the field records at Station 64 (River Mile 7.7) and Station 65 (River Mile 8.6).

Model verification was based on the field records of the subsequent two months - May and June 1999. Starting in May, the freshwater inflow increased and salinity level dropped accordingly. Model output was depicted with two different colors in Figure 3. The first portion was the model calibration result. The second portion was the model verification result. The verification result was also compared with field data at Station 66 Hobe Grove (River Mile 9.4) as presented in Figure 4.

2.3.2 Comparison with Existing Regression Models

In addition to preliminary model calibration and verification that was outlined previously, the model was compared with three regression models that were based on field data. Two regression models were developed by district staff. The other regression model was developed by Gary Russell and Ben McPherson of USGS in 1984.

a. Comparison with SFWMD (Linton) Regression Models

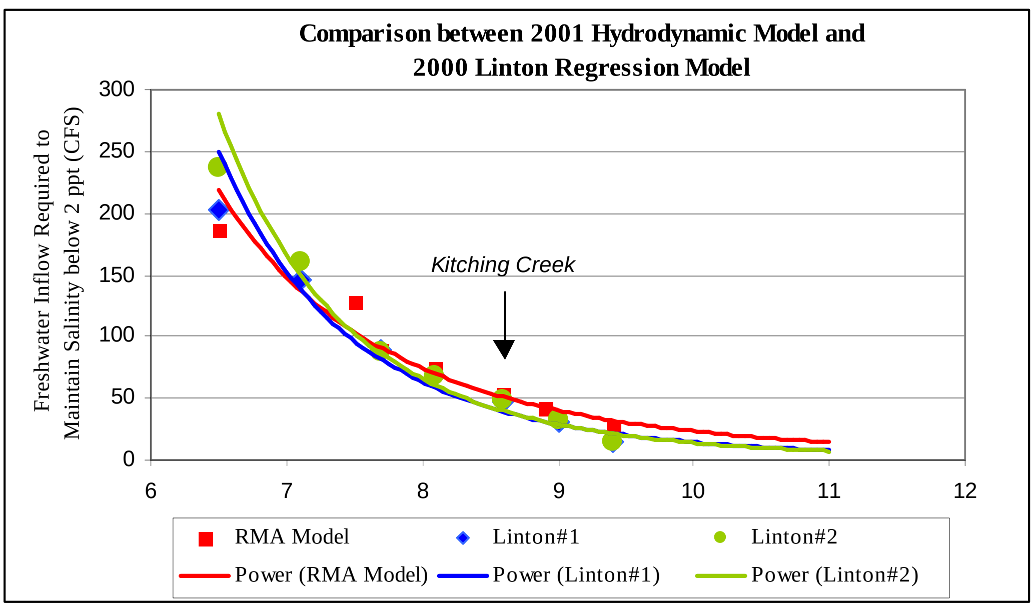

Chart 1. Comparison of hydrodynamic model with Linton regression model

Before the hydrodynamic model was developed, district staff developed two regression models that describe the freshwater inflow and salinity relationship in 1990s both before and after several river restoration projects were implemented. In Chart 1, the relationships produced by the two regression models were compared with the results of the hydrodynamic model. The hydrodynamic model produces results that reflect factors such as tide regime changes between spring and neap tides, transition between salinity regimes and daily salinity fluctuation due to tides. The model results were averaged and simplified in Chart 1 so that it can be compared directly with regression models that do not simulate the dynamic processes. The MFL study has been focused on river reaches above the Kitching Creek, the comparison seems to indicated that the hydrodynamic model result is on the conservative side (requiring more freshwater) among the three models.

b. Comparison with USGS Regression Model (Russell & McPherson, 1984)

In early 1980s, USGS conducted the most extensive and the best-documented investigation in the history of Loxahatchee River study. Freshwater inflow was measured on all the major tributaries for a period of two years from February 1980 through March 1982. The two-year period included both dry and wet periods and the Tropical Storm Dennis in the August of 1981. Tide and salinity measuring instruments were deployed in both main channel and tributaries. The instrument calibration was verified each day before and after field measurements. Based on this comprehensive concurrent data set, Russell and McPherson developed a regression model that describes the relationship between the freshwater inflow and the salinity level in the river. In Chart 2, the relationship was presented in blue color with freshwater inflow versus the position of 2 ppt salinity line in river miles. The same relationship that was produced by the hydrodynamic model is plotted in red color for purpose of comparison.

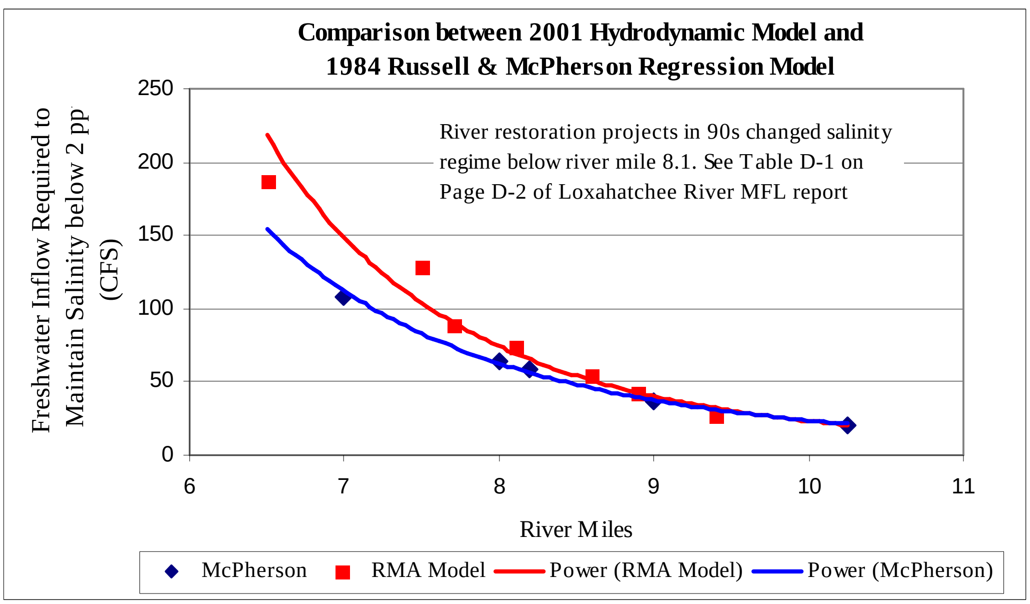

Chart 2. Comparison of 2001 hydrodynamic model and 1984 USGS regression model

The geometry of the hydrodynamic model was based on a bathymetric survey conducted in 1999. The model was also calibrated using flow and salinity measurement in 1999. Therefore the 2000 hydrodynamic model reflects the 1999 condition of the river. On the other hand, the Russell & McPherson model that was based on data collected in early 80s, documented the historic condition that existed almost two decades ago. It is interesting to see how these two models would compare.

The comparison in Chart 2 indicated that the two models gave approximately same results for river reaches above Kitching Creek. The differences over the downstream reaches were possibly due to the changes in the geometry of the river channel over the two decades. Major changes taking place in the period were river restoration projects in the 1990s.

A separate field data analysis was carried to verify the impact of river restoration projects on salinity regime. Relationships between flow and saltwater wedge position was developed based on field measurements from the period both before and after the restoration projects were implemented. Then the two relationships were compared. The results indicated that, while the flow difference at river mile 6.5 can be as high as 33 cfs, the impact on the river reaches above river mile 8.1 is as small as 1 to 2 cfs. (Table D-1, Page D-2 of Loxahatchee River MFL Report, July 15, 2002 Draft). Above river mile 9.4, no differences were detected. The comparison of the 2002 hydrodynamic model and the 1984 USGS model in Chart 2 seems to confirm the findings described above.

The analysis of both 2000 hydrodynamic model and 1984 USGS regression model results indicates:

1. The difference between the two models below Kitching Creek was probably due to the changes in the river (such as several river restoration projects) between early 1980s and 1999.
2. The two models give almost identical results for river reaches above the Kitching Creek. This seems to indicate that the flow ~ salinity relationship in this part of the river has not changed significantly in the period between early 1980s and late 1990s.

The Loxahatchee MFL study has been focused on the river reaches above the Kitching Creek. The fact that the 1984 regression model and the 2000 hydrodynamic model are producing very similar flow vs. salinity relationship for river reaches above the Kitching Creek is significant. We will come back to this point later in this section.

c. Comparison with SAS Regression Results

The district staff also conducted regression analysis on data from three stations with SAS. While the statistic analysis with SAS was continuing, some early results were presented in Loxahatchee River MFL Report, July 15, 2002 Draft (Page D-11 through D-22). The SAS curve in the draft report indicates a higher freshwater demand at Station 64 when compared with other modeling results and analysis.

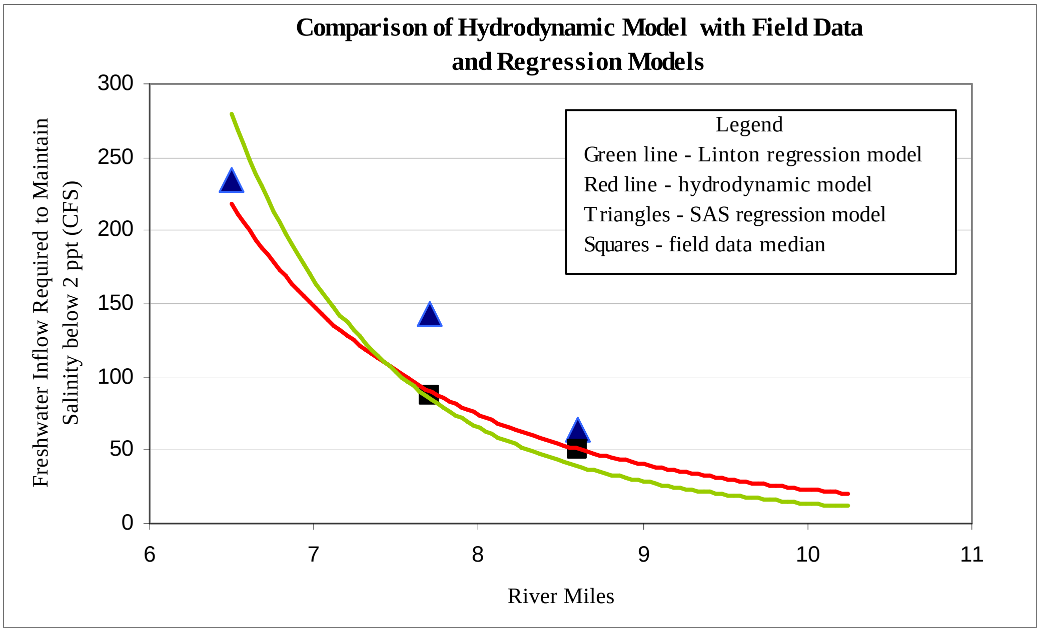

Chart 3. Comparison of SAS analysis with other regression models and the hydrodynamic model

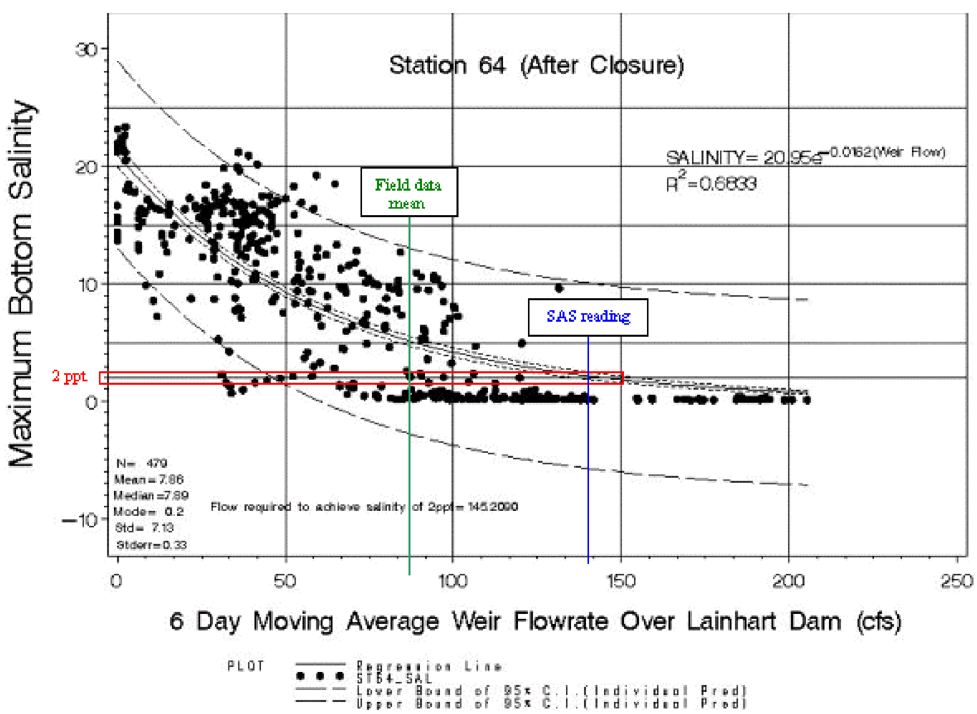

Chart 4. Examination of a regression chart on Page D-18 of the July 15, 2002 draft MFL report

Chart 3 is a comparison of SAS results with Linton regression model and the hydrodynamic model. The SAS results are consistent with other models except at Station 64. At Station 64, SAS seems to indicate a higher demand of freshwater to maintain salinity below 2 ppt. An examination of the original analysis is illustrated in Chart 4. If the regression curve in Chart 4 is compared with the dots on the chart that represent original field data it becomes apparent that, while the curve gives a decent fit on a very scattered data set, the curve does not fit the field data well in the low salinity range. In the area below 4 ppt, all data dots fall below the curve. It is difficult for a regression model to fit all the field data well over the entire data range. Apparently the curve in Figure 4 does not fit field data well in the 2 ppt salinity range. The blue line in the figure illustrates how a 140 cfs reading could have been obtained from the regression curve from the point it intersects with the 2 ppt horizontal line that is marked with red lines. All the data points along the 2 ppt line fall on the left hand (smaller) side of the curve. The 140 cfs reading from the curve is larger than any field data points. A good fit regression model should predict a value that is close to the mean or median value of the field data. The median value of the field data that fall between 1.5 ppt and 2.5 ppt at Station 64 is 87.6 cfs. The other regression model (Linton model) predicted a freshwater demand of 87 cfs. The hydrodynamic model predicted a demand of 89 cfs. Both are in close range of field data median. In order to achieve a better fit in the low salinity range, more regression analysis with SAS has been conducted. Using the same function type, when analysis is on data between 0 ppt and 10 ppt, the regression curve intersects the 2 ppt line at 100 cfs that is much closer to the field data median. Chart 5 is plotted with the revised SAS regression result. This chart might be further revised when the SAS analysis is finalized.

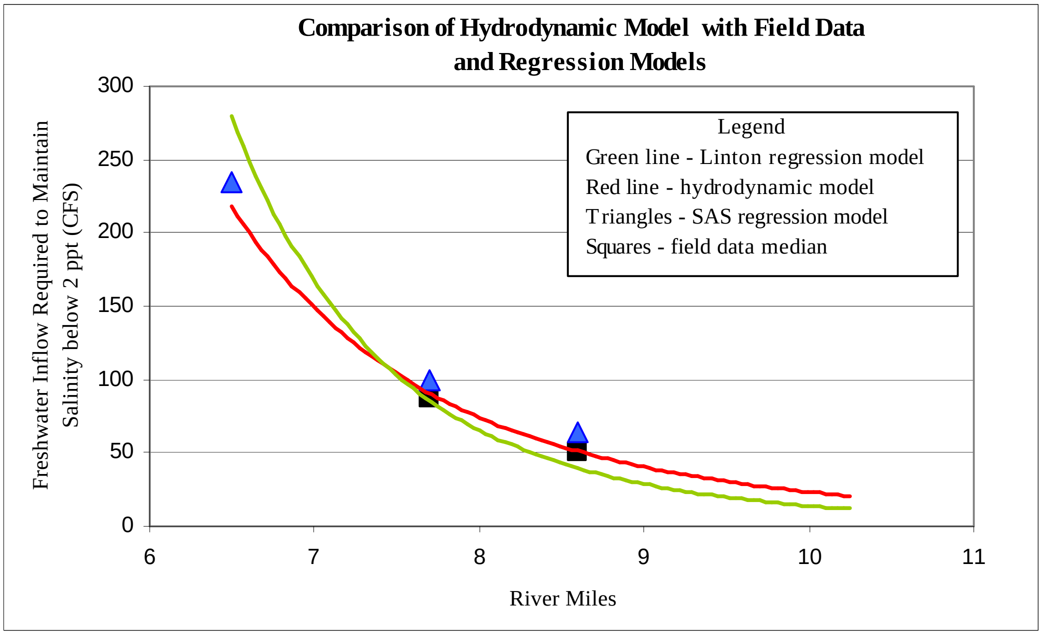

Chart 5. Comparison of new SAS analysis with other regression models and the hydrodynamic model

2.3.3 Preliminary Model Assessment

Since the hydrodynamic model was based on recent data, it is necessary to assess the changes in the river that have taken place in the past decades and how that would affect the accuracy of the model applications.

While the development of a watershed model is underway to assess the changes in hydrology over the past decades, it is safe to assume that some changes took place in the watershed that would have affected hydrology. The hydrodynamic model is an estuary model. The model itself does not simulate watershed hydrological process nor produce the amount of freshwater input to the estuary. Freshwater inflow is provided to the model in the form of model input. Therefore when historic flow record was used in model simulation, the historic flow condition under historic hydrology was reflected in the flow input files.

Besides changes in the watershed, there have also been changes in the river. Most visible of these changes is the implementation of river restoration projects (such as the closing of gaps between oxbows). District staff analyzed field data from the periods both before and after the river restoration projects. Comparison of the flow ~ salinity relationship from the two periods indicates a detectable difference for river reaches below river mile 8 (Table D-1, Page D-2 of Loxahatchee River MFL Report, July 15, 2002 Draft). There was no detectable changes in flow ~ salinity relationship for rivers above river mile 8. Comparison between 2000 SFWMD hydrodynamic model and 1984 USGS regression model led to the same conclusion as discussed previously.

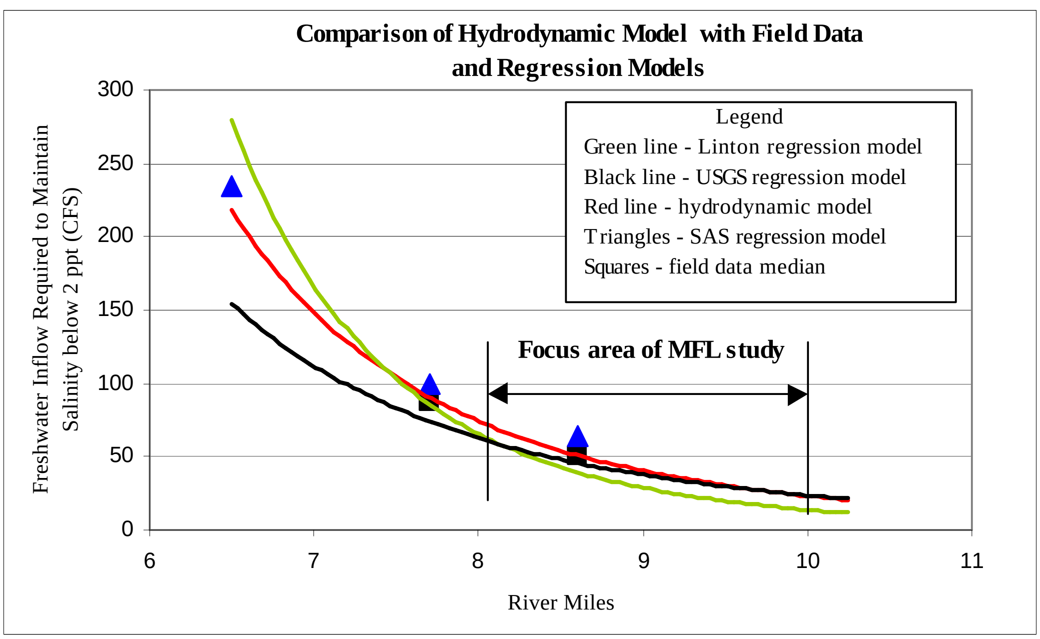

Chart 6. Comparison of all available models and field data median

A more comprehensive review of historic field data is currently underway. All the analysis that have been completed so far has not detected any significant difference in flow ~ salinity relationship above river mile 8, which is the focus of the current MFL study.

Loxahatchee Estuary is a very dynamic, tide driven system. While changes in freshwater affect salinity, tide makes salinity change at a more rapid pace. Even in the upper Northwest Fork, daily salinity variation can be 10 ppt or more between high tide and low tide. Tide regime change between spring and neap tides also affect salinity greatly. These are factors that make regression analysis difficult to obtain a clear freshwater flow ~ salinity relationship. This is the main reason that data points in the regression analysis are so scattered, which reduce the confidence level of regression results. On the other hand, a hydrodynamic model can simulates all the tide-related factors in addition to freshwater inflow.

Another underlining assumption of all the existing modeling effort including both hydrodynamic model and regression models is the assumption that total freshwater inflow is proportional to the flow at Lainhart Dam. Flow data analysis indicated that this flow ratio assumption is valid on long term basis. But apparently this ratio will vary greatly on daily basis. Along with the on going MFL study, a data collection network is being deployed in the river and the watershed. This network will provide a comprehensive and CONCURRENT data set. More improvement to the models will be implemented when new data becomes available.

Both hydrodynamic models and regression models are important tools in this study. Each type of model has its own advantages and shortcomings. Regression models, while they are not capable of complicated dynamic simulations, are important tools as a reality check since they are usually empirical in nature and therefore have more direct links with field data.

MFL study was based on the “best available data” approach. The analysis outlined above compared the hydrodynamic model with all other available regression models as a reality check. The analysis indicates that the hydrodynamic model output was consistent with regression model results.

The district staff is working on more regression analysis with SAS. The SAS results for Station 63 and 65 that appeared in this memo are the early preliminary results presented in Loxahatchee River MFL Report, July 15, 2002 Draft. They will be revised when final results are available.

In river reaches below Kitching Creek, it appears that there is a difference between models that were developed based on recent data and the USGS regression model that was based on early 1980s condition. The current MFL study focuses on reaches above the Kitching Creek where all models appear to converge to a narrow band. This seems to indicate that the flow ~ salinity relationship in reaches above the Kitching Creek has been relatively stable.

3. Model Application Results

3.1 Tides

The hydrodynamic model was calibrated against NOAA data for a three-month period from December 1996 to February 1997. Then the tidal output was verified against NOAA data for a four-month period from January 1999 to April 1999. This section describes the basic characteristics of tides in the Loxahatchee Estuary.

3.1.1 Semidiurnal Tidal Cycle

Both field data and the model simulation indicate strong tidal influence to the system. Semidiurnal tidal cycle has two highs and two lows each day with about 6 hours between each high and the next low. The semidiurnal tides generate flooding and ebbing in the estuary and cause salinity fluctuations. This tidal influence can be detected even at the far upstream portion of the Northwest Fork of the River. Figure 5 is the salinity record at Station 65 located at River Miles 8.6 of the Northwest Fork for March 31, 1999. Salinity was recorded as below 1 ppt at low tide at 4 am and increases to over 7 ppt at high tide at 10 am. Another pair of low and high occurred at 16:00 and 22:00.

3.1.2 Monthly Tidal Cycle

Monthly tidal cycle includes two spring tides and two neap tides. Spring tides of increased range between high water and low water occur semimonthly as the results of the Moon being new or full. Neap tides of decreased range occur semimonthly as the result of the Moon being in quadrature. Figure 6 compares the NOAA predicted tide with Loxahatchee model output at station BoyScoutDock. In the four months period, there are eight spring tides and eight neap tides in between. (The spring tide at the beginning and the end of the period make one complete spring tide and is counted as one.)

3.1.3 Comparison of Model Tide Output and NOAA Predicted Tide

Before the salinity model was calibrated and verified, the model was calibrated and verified to ensure that the hydrodynamic model can generated tides correctly. Since no continuous tidal record has been located for the model calibration and verification period, the model output was compared with NOAA Tide Table. Figure 6 presents both model output and NOAA predicted tide at station BoyScoutDock. This station is the most upstream (inland) station that is listed in the NOAA Tide Table. Model output was also verified against data of other NOAA sites at Middle and Lower Estuary and at the Jupiter Inlet.

3.2 The Influence of Freshwater Input on the Salinity Regime in the Estuary

3.2.1 Response Time

The estuarine salinity regime is the result of a dynamic process that involves mainly tides and freshwater inflow. Transition of estuarine salinity regime occurs constantly in response to the changes in tides and freshwater inflow. Even if the freshwater inflow is constant, there is a significant variation in salinity within each tidal cycle. On the other hand, daily average salinity does tend to reach a quasi-equilibrium state if freshwater inflow is steady. There is a time lag (response time) between the time of freshwater inflow change and the time when salinity adjustment is completed. If freshwater inflow is steady after the adjustment, daily salinity variation will stay within a fixed range with the same highs and lows everyday. At this point it is said that the salinity condition has reached a new equilibrium. Comparing a continuous concurrent flow and salinity record helps understand the response time of the system. Figure 7a is flow and salinity record for a 10-day period in April 1999. Salinity at Station 65 (River Mile 8.6) went up by about 7 ppt after a 30-cfs freshwater input decrease at the Lainhart Dam.

Since the difference between the spring tide and the neap tide has a significant impact on salinity levels, the salinity changes due to freshwater input changes are often overshadowed by tide regime transition. To further investigate the salinity response time, a model simulation was designed. The mean tide range of 2.46' was applied to the entire simulation so that the impact of freshwater inflow rate can be detected clearly. Figure 7b is the model output for three locations in the Northwest Fork. Although there are certain variations in response time in field data, they appear to be mostly completed within a 10-day time window. This is consistent with the model output in Figure 7b. The speed of transition is proportional to the magnitude of the difference between the current condition and the anticipated equilibrium condition. Therefore a large portion of salinity adjustment takes place in the early stage of the transition. While it takes about 8 to 10 days to complete the salinity regime transition and reach a new equilibrium completely, 90% or more of the changes appear to be completed in 5 to 6 days.

3.2.2 Relationship between Freshwater Input and Salinity Regime in Northwest Fork

Modeling Approach

The estuary receives freshwater input from numerous sources; it is necessary to find a surrogate that could represent the freshwater input level. Due to the lack of data for groundwater and flow from other tributaries, the model calibration was based on the historic flow record at Lainhart Dam to estimate the total freshwater input to the system. While the model was not able to repeat all the fluctuations over the 6-month period, it did reproduce the general trend rather accurately. This seems to confirm that the flow rate at Lainhart dam can be used as a surrogate of overall freshwater input amount. This also shows the potential that the discharge at Lainhart Dam could be a management target. In the model simulations described below the total freshwater input was linked to the discharge at the Lainhart Dam with the flow ratios that were applied in model calibration and verification.

Another indicator was needed to describe the salinity condition at certain sites. Considering that the tidal range variation between spring and neap tides is another major factor that affects the salinity, a 28-day tidal cycle with two spring tides and two neap tides was chosen for all the flow scenario simulations. The model predicts salinity for each of the over 3000 nodes at 30 minutes intervals. To reduce the amount of information for analysis at this level, the model output was filtered to select high tide and low tide salinity only. Then the 56 high tide salinity and 56 low tide salinity were averaged to find the mean high tide salinity and the mean low tide salinity for the 28-day period. This data retrieval and processing was completed for 13 sites in the Northwest Fork, the middle and lower estuary, and at the inlet.

Freshwater Flow Scenarios

Two series of model simulations were conducted. Simulation #1 was developed using calculations of flow data for tributaries based on flow ratios applied in model calibration and verification. In contrast, Simulation #2 consists of a flow scenario with minimum amount of freshwater input from the three tributaries. Simulation #2 was considered the worst case scenario while Simulation #1 was developed to predict salinity conditions at various freshwater input levels that follow historic pattern. 10 cfs groundwater input was added to the Northwest Fork and its three major tributaries based on the model calibration results. Table 1 through Table 3 listed the flow scenarios of Simulations #1 and #2.

Table 1. Freshwater Input of Simulation #1 (without groundwater input)

RunSeries	LainhartDam	LOXTnpk	Trappers	CypressCrk	HobeGrv	KitchenCrk	NWFTotal	NF	S46
1	200	233	279	131	29	16	455	4	500
2	200	233	279	131	29	16	455	4	5
3	150	174	209	98	21	12	341	4	5
4	100	116	140	65	14	8	227	4	5
5	85	99	119	56	12	7	193	4	5
6	65	76	91	42	9	5	148	4	5
7	50	58	70	33	7	4	114	4	5
8	40	47	56	26	6	3	91	4	5
9	30	35	42	20	4	2	68	4	5
10	20	23	28	13	3	2	45	4	5
11	10	12	14	7	1	1	23	4	5
12	10	12	14	7	1	1	23	4	10
13	20	23	28	13	3	2	45	4	10

Table 2. Freshwater Input of Simulation #1 (with groundwater input)

RunSeries	LainhartDam	LOXTnpk	Trappers	CypressCrk	HobeGrv	KitchenCrk	NWFTotal	NF	S46
1	200	233	289	141	39	26	495	4	500
2	200	233	289	141	39	26	495	4	5
3	150	174	219	108	31	22	381	4	5
4	100	116	150	75	24	18	267	4	5
5	85	99	129	66	22	17	233	4	5
6	65	76	101	52	19	15	188	4	5
7	50	58	80	43	17	14	154	4	5
8	40	47	66	36	16	13	131	4	5
9	30	35	52	30	14	12	108	4	5
10	20	23	38	23	13	12	85	4	5
11	10	12	24	17	11	11	63	4	5
12	10	12	14	7	1	1	23	4	10
13	20	23	28	13	3	2	45	4	10

Table 3. Freshwater Input of Simulation #2 (Unit: cfs)

RunSeries	LainhartDam	LOXTnpk	CypressCrk	HobeGrv	KitchenCrk	NWFTotal	NF	S46
1	200	279	7	2	1	289	4	500
2	200	279	7	2	1	289	4	5
3	150	209	7	2	1	219	4	5
4	100	140	7	2	1	150	4	5
5	85	119	7	2	1	129	4	5
6	65	91	7	2	1	101	4	5
7	50	70	7	2	1	80	4	5
8	40	56	7	2	1	66	4	5
9	30	42	7	2	1	52	4	5
10	20	28	7	2	1	38	4	5
11	10	14	7	2	1	24	4	5
12	10	14	7	2	1	24	4	10
13	20	28	7	2	1	38	4	10

Results of Simulation #1 and #2

The output of the 11 model runs in each simulation scenario were analyzed to find the "average high tide salinity" and the "average low tide salinity". The results of Simulation #1 are condensed into two color plates that are attached to this document (Figure 12 - 13). The charts include the flow ~ salinity relationship at 7 sites in the Northwest Fork. On the horizontal axis of these charts, the amount of freshwater input was represented by the flow rate at the Lainhart Dam. Given a flow rate on the horizontal axis and draw a vertical line from that point, the line will intersect the seven curves in the chart. Then the salinity of the seven intersecting points can be read from the vertical axis. These are the predicted salinity for the seven locations in the Northwest Fork Loxahatchee River with the given freshwater discharge.

The flow ~ salinity relationship for one of the sites, Site 8a at River Mile 8.1, are plotted in Figure 8 - 11.

A more detailed discussion on Simulation #1 results can be found in the conclusion section of this document.

3.3 The Influence of Inlet Conveyance and Sea Level Rise on the Salinity Regime

3.3.1 Long shore sediment transport and inlet sedimentation

Historic evidence indicates that the Loxahatchee estuary was periodically closed and opened to the sea (McPherson, Sabanskas and Long, 1982). Due to active long shore sediment transport, the Jupiter Inlet was probably characterized by shifting sandbars through which ran a narrow and unstable channel. When James Henshall visited the area in early 1880s, he observed the "Jupiter River" flowing "eastward, and over Jupiter Bar into the sea". He also described the difficulty of sailing through the inlet, which was "quite narrow" and had "an angle in its channel at the worst possible place" (Henshall, 1884). The aerial photo of the inlet from 1940s shows extensive flood shoals (sandbars that were formed by sands pushed into an inlet by tides) which would have limited the hydraulic conveyance of the inlet and the tidal range in the estuary. Under natural conditions with active sedimentation, the hydraulic conveyance of the inlet would be smaller than the conveyance under dredged conditions.

3.3.2 Sea Level Rise

Extensive analyses of tidal records indicates that global sea level has risen at a rate approximately 2 mm per year for at least the last century or so (Douglas, B. C., 1991, 1992). Based on this estimate, the sea level around 1900 would be about eight inches lower than the present level. A lower sea level means a smaller range of tidal influence in an estuary.

The sea level rise was at an even faster rate prior to 1900. About 15,000 years ago, the shore of the Atlantic Ocean was several miles east and more than 300 feet lower than its present location and altitude at Jupiter Inlet. From about 15,000 to 6,000 years ago, sea level rose at a rate of more than 3 feet per century. Tidal waters began to flood the estuary embayment. Prior to this time, the embayment was probably a flood plain or freshwater marsh (McPherson, Sabanskas and Long, 1982).

The rise of sea level has likely increased the range of tidal influence in the Loxahatchee River. If the sea level rise continues as predicted, it is foreseeable that the tide influence will move further upstream along with the sea level rise.

3.3.3 The Effects of Inlet Deepening and Sea Level Rise

The hydrodynamic/salinity model was applied to a preliminary investigation on the impact of inlet dredging and sea level rise. This section outlines the preliminary results of six model simulations that have been completed. Discharges from North Fork and South Fork were assumed constant in this preliminary investigation.

Freshwater input was kept constant through all the six model simulations, only sea level and inlet depth were changed so that their effects on the position of saltwater wedge could be examined. Table 4 lists boundary conditions of five model simulations. Inlet depth was reduced from current condition to an average depth of 6, 4, and 2 feet subsequently. While the first four simulations were all at current sea level, Simulation 5 was at 1900 sea level, which was 8 inches lower. The sixth model simulation, which is not listed in Table 4, used the boundary condition of Simulation 1 except that sea level was one foot higher. The purpose of this simulation was to estimate the possible effects of future sea level rise.

Table 4. Boundary conditions of model simulations

Boundary Condition	Simulation 1	Simulation 2	Simulation 3	Simulation 4	Simulation 5
Sea level	Present MSL	Present MSL	Present MSL	Present MSL	1900 MSL
Discharge at Lainhart Dam	65 cfs	65 cfs	65 cfs	65 cfs	65 cfs
Total freshwater input to Northwest Fork	188 cfs	188 cfs	188 cfs	188 cfs	188 cfs
Freshwater input to North Fork	4 cfs	4 cfs	4 cfs	4 cfs	4 cfs
Freshwater input to South Fork	5 cfs	5 cfs	5 cfs	5 cfs	5 cfs
Inlet condition	1999 condition*	Average depth 6 feet	Average depth 4 feet	Average depth 2 feet	Average depth 2 feet

* The average depth was approximately 8 - 10 feet

To compare the range of tidal influence with various inlet depths, the location of 2 ppt salinity lines of the model simulations 1 through 4 were plotted in Figure 16. The model output indicates that a shallower inlet would reduce the tidal influence on the river. For example, when the inlet depth is reduced to 4 feet by sedimentation, the 2 ppt line would move close to 1 mile downstream from where it is under the current inlet condition. Therefore dredging of the inlet in the past several decades probably has helped move the salt wedge upstream.

The two green lines in Figure 17 are positions of 2 ppt salinity lines at estimated 1900 sea level and a predicted future sea level. The estimated mean sea level in 1900 is 8 inches lower than the current mean sea level. Comparing the results of Simulations 4 (current sea level) and 5 (1900 sea level), the sea level rise itself in the past century would have moved the salt wedge upstream for nearly 0.5 miles. The green line at the upstream end is predicted position of 2 ppt salinity line with one foot sea level rise from current sea level. If the inlet depth and freshwater inflow remain unchanged, the effect of sea level rise will push saltwater further inland.

3.3.4 Discussion

The position of the salt wedge is the balance point between ocean tides and freshwater flow from inland. While the reduction in freshwater flow could cause saltwater intrusion, the modeling results illustrated that deepened inlet and rising sea level would also push salt wedge further inland. Apparently sea level rise and inlet dredging have significant impacts on the salinity regime in the Loxahatchee Estuary.

A relationship between the freshwater inflow and the position of salt wedge in the Loxahatchee Estuary was described in Section 3.2.2. The analysis was based on the current inlet configuration and sea level. Based on the model simulations with shower inlet and lower sea level, Table 5 lists the amount of freshwater required under the present condition to keep the 2 ppt line at the positions that correspond to the 2ppt line position under the three historic scenarios.

Table 5. Increased freshwater demand to prevent saltwater intrusion

Present and historic conditions	2 ppt line river mile	Required freshwater under historic condition (cfs)		Required freshwater under present condition (cfs)	
		Freshwater discharge at Lainhart Dam	Freshwater input to NWF	Freshwater discharge at Lainhart Dam	Freshwater input to NWF
A-Present condition	8.25			65	188
B-Inlet average depth 6 ft	7.7	65	188	85	246
C-Inlet average depth 4 ft	7.4	65	188	100	289
D-Inlet depth 4 ft, 1900 MSL	7.0	65	188	120	347

While the relationship between sea level rise and salt wedge intrusion may not be linear, a rough estimate can be made based on the modeling results. According to Table 2, the freshwater required to overcome the effects of sea level rise over the last 100 years is about 20 cfs. If the sea level rise continues at the same rate, the freshwater demand will increase at a rate of 0.2 cfs per year at Lainhart Dam and 0.6 cfs per year for the Northwest Fork.

3.3.5 Summary

The analysis outlined above indicates that sea level rise and inlet dredging have significant impacts on the salinity regime in the Loxahatchee Estuary. Due to the changes in sea level and inlet configuration, the demand for freshwater has increased to prevent salt water intrusion.

Inlet sedimentation is a very dynamic process. The modeling effort outlined in this document is just the first step of a preliminary investigation. More efforts are necessary to acquire historic bathymetry and sea level data and improve the accuracy of model simulation.

3.4 Modeling Historic Salinity Conditions in the Northwest Fork from 1971 to 2000

3.4.1 Methodology

Based on the simulation with various freshwater inflows, a flow/salinity relationship was established for locations in the Northwest Fork Loxahatchee River. The salinity in the following table is the average of high and low tide salinity that were presented in the previous sections.

Table 6. Estimated daily mean salinity in Northwest Fork vs. flow at Lainhart Dam

	Station ID							
Flow(cfs)	10B	9C	66	9B	8st	65	8B	64
200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
150	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4
100	0.1	0.1	0.1	0.1	0.2	0.3	0.5	1.5
85	0.1	0.1	0.1	0.2	0.3	0.5	0.9	2.3
65	0.1	0.2	0.2	0.3	0.7	1.3	1.9	4.2
50	0.1	0.3	0.5	0.8	1.3	2.3	3.3	6.2
40	0.2	0.6	0.9	1.4	2.2	3.5	4.7	8.0
30	0.3	1.2	1.8	2.5	3.6	5.3	6.7	10.4
20	0.8	2.3	3.3	4.2	5.6	7.7	9.3	13.1
10	2.0	4.7	5.9	7.2	8.8	11.2	12.8	16.6

While the salinity level in the table is based on an equilibrium state with steady freshwater inflow, in reality freshwater inflow rarely is constant. The salinity condition observed in the estuary is the results of a series of transitions from one state to the next. Therefore the change in salinity always lags behind the flow change. Following is a graphic description of salinity transition. The dotted line indicates the equilibrium salinity. Following an increase of freshwater inflow, salinity in the estuary will decrease accordingly and approach gradually to a new equilibrium state.

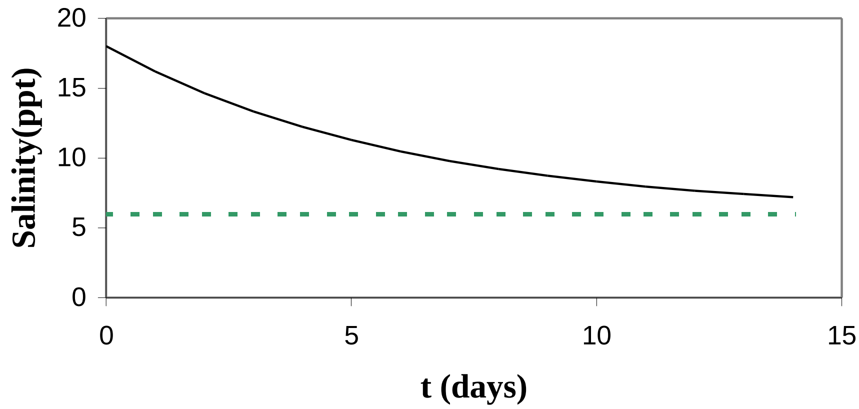

Chart 7. Salinity regime transition process

Both field observation and model simulation indicate that the salinity condition in the estuary is consisted of a series of transitions from one quasi-equilibrium condition to another. A computer program was written based on this concept. Both field data and model output were analyzed to establish the transition time and freshwater inflow/salinity relationship for stations in the estuary. The computer program firstly calculates the potential target (equilibrium) salinity based on the magnitude of freshwater inflow. Then it calculates the salinity change on daily time steps. This calculation would consider both target salinity and the initial salinity condition at the beginning of the time step. If there is further freshwater inflow change before the transition is completed, then a new transition begins and the program repeats the same computational procedure for the new transition. Since the computer program was designed for long term salinity calculations, it will be referred to as "long-term model" in the subsequent sections.

Figure 19 through 21 are the testing output of the long-term model. The output was compared with real data at three salinity stations in the Northwest Fork. Since the model operates on daily time steps, the model output is daily averaged value that does not depict the daily variation between two high and two low tides. The model was developed based on mean salinity over two spring-neap tidal cycles, it does not reflect the tidal regime difference between spring and neap tides.

3.4.2 Long-term model applications

The long-term model was applied to provide a hind cast of the salinity conditions at eight sites in the Northwest Fork for the period from 1970 to 2001. Figure 22 and 23 are the long term model outputs for Station 64 and 65. The results were used by biologists in the study team to investigate the effects of salinity on the biological characteristics of the upper Northwest Fork.

4. Discussion

The 2-D hydrodynamic/salinity model was able to follow the general trend of salinity changes that was observed in the system. This seems to confirm that the freshwater inflow rate at Lainhart Dam can be used as an surrogate indicator of total freshwater input to the estuary. On the other hand, the lack of flow data from several major tributaries has been a limiting factor in model calibration and applications.

Groundwater input is a major factor in the salinity balance of the system, especially under dry conditions. The groundwater input to the system is affected by groundwater table and river stage. The constant groundwater input assumption used in this study is just the first step in bringing groundwater into consideration. When the preliminary model results are applied to conditions where groundwater input could be less during an extended drought or more after a rainy season, the chart reading should be adjusted accordingly.

Precipitation and evaporation are not simulated in the current model. Precipitation and evaporation should be included in the model at the next step to improve the model accuracy.

The model results have been highly summarized in this document. The dynamic nature of the system response is not fully reflected in the charts that are presented. The original model output contains a huge amount of information that describes the dynamic process in the system.

When new information on freshwater inflow, groundwater input, continuous tide record, precipitation and evaporation becomes available, the model can be improved to provide more accurate results.

The modeling results described in this document are concentrated in the Northwest Fork. Since the model mesh covers the entire estuary it can be potentially applied to studies in other areas, including middle and lower estuary and the inlet, within the model mesh.

5. Conclusions

The Loxahatchee Estuary Salinity Model was developed using field data that had been acquired since the previous major salinity modeling effort for Loxahatchee Estuary. Compared to the USGS model developed in early 80s, the current model was able to cover the upstream portion of the Northwest Fork where the Loxahatchee River District has established long-term salinity records. The model output is consistent with the results of field measurements and indicates a clear correlation between salinity condition and freshwater inflow rate. The relationship described in this document, when combined with the results of biological studies, could provide a scientific basis for system management decision making.

Both field data analysis and the model output indicate a strong correlation between the amount of freshwater input and the estuarine salinity regime. The upstream portion of Northwest Fork is especially sensitive to changes in the freshwater input. Both the field data and model results indicate that a change of freshwater input as small as 10 cfs can cause detectable salinity changes in the area.

To facilitate the management decision making process, maps of 2-ppt salinity lines were prepared based on model output (Figure 14 and 15). Figure 14 shows the spatial positions of 2-ppt salinity lines with various freshwater inflow rates at high tide. Figure 15 shows the 2-ppt lines at low tide. The maps are summaries of a series of 9 model simulations with various freshwater inflow rates. Since the salt wedge is closely associated with 2-ppt salinity line, these two maps illustrate the relationship between salt wedge position and freshwater inflow rate. Salt wedge moves following tides. Therefore maps were developed at both high and low tides.

The difference between spring and neap tides is also a significant factor. To present the 2-ppt lines under an average tide condition, the results in Figure 14 and 15 were taken at a tide range of 2.48 ft at Jupiter Inlet. The mean tidal range there is 2.46 ft according to NOAA data. Therefore the results presented on the maps are under an “average tidal condition”. The 2-ppt lines shown in these maps will be at about the middle point between the position of salt wedge at spring tides and that at the neap tides.

2-ppt salinity line locations can also be interpreted from charts in Figure 12 and 13. Table 7 is based on flow ~ salinity relationship presented in Figure 12. The table listed the flow rate of freshwater input that is required to maintain salinity below 2-ppt at various locations in the Northwest Fork.

Table 7. Freshwater inflow required to maintain high tide salinity below 2ppt at seven locations in the Northwest Fork

River Mile	Station #	Freshwater discharge into Northwest Fork above Kitching Creek (cfs)*	Estimated discharge at Lainhart Dam(cfs)
6.5	#63	424	187
7.5	7B	291	128
7.7	#64	202	89
8.1	8A	168	74
8.6	#65	123	54
8.9	8st	95	42
9.4	#66	64	28

*Assume an additional 40-cfs from groundwater that is not included in this number.

Charts in Figure 12 and 13 were based on “average high tide salinity” or “average low tide salinity”. Compared to the maps in Figure 14 and 15, the freshwater inflow rate subtracted from the charts in Figure 12 or 13 will tend to be conservative requiring a slightly higher freshwater inflow.

The two-dimensional hydrodynamic/salinity model simulations indicates the hydraulic conveyance of the inlet and sea level rise have significant impact on the salinity regime in the estuary. In addition to freshwater inflow, the effects of inlet deepening and sea level rise need to be considered in system management.

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Preliminary Results of Loxahatchee Estuary Hydrodynamics/Salinity Model

Figures

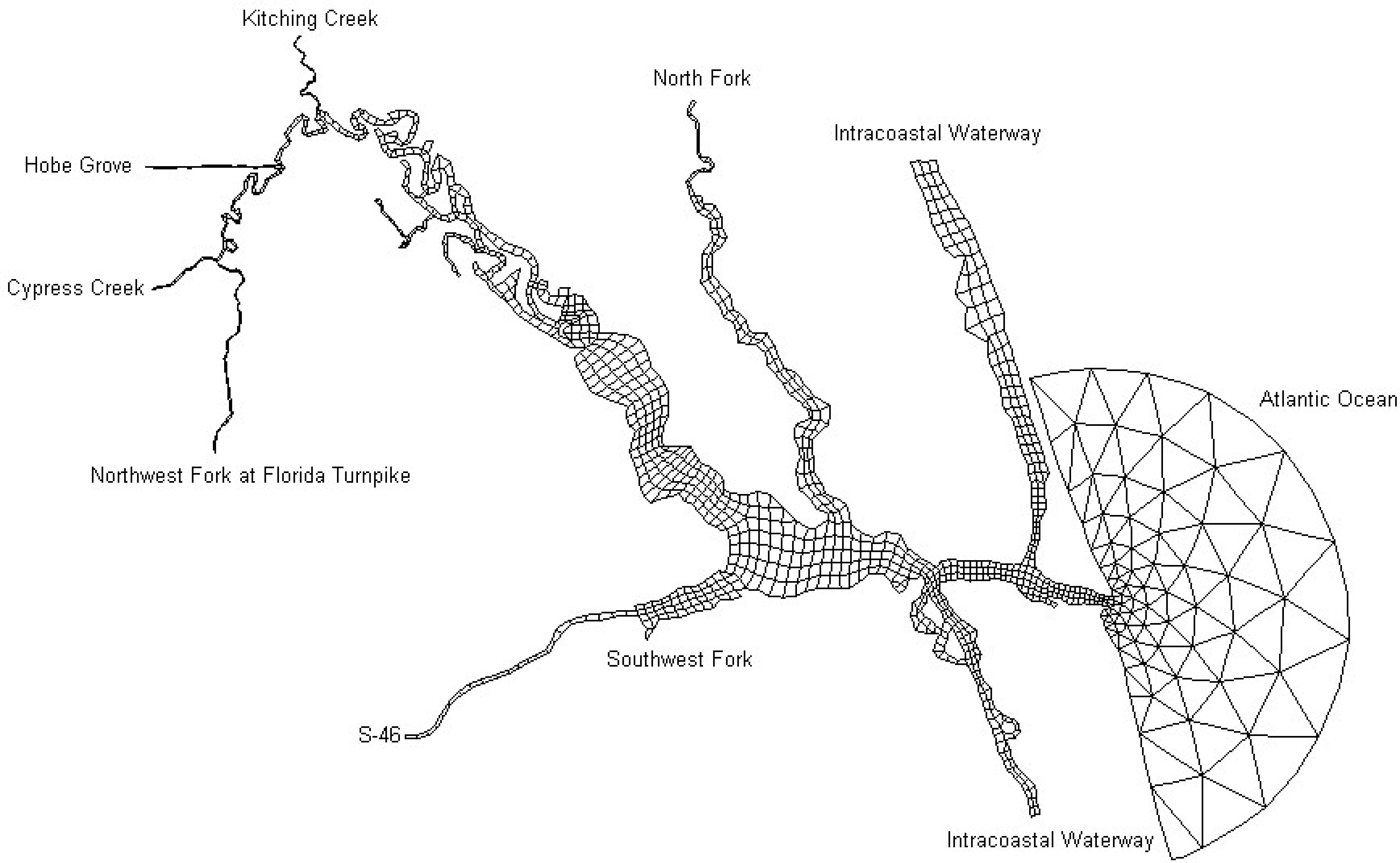


Figure 1. Finite element mesh of Loxahatchee Estuary Salinity Model

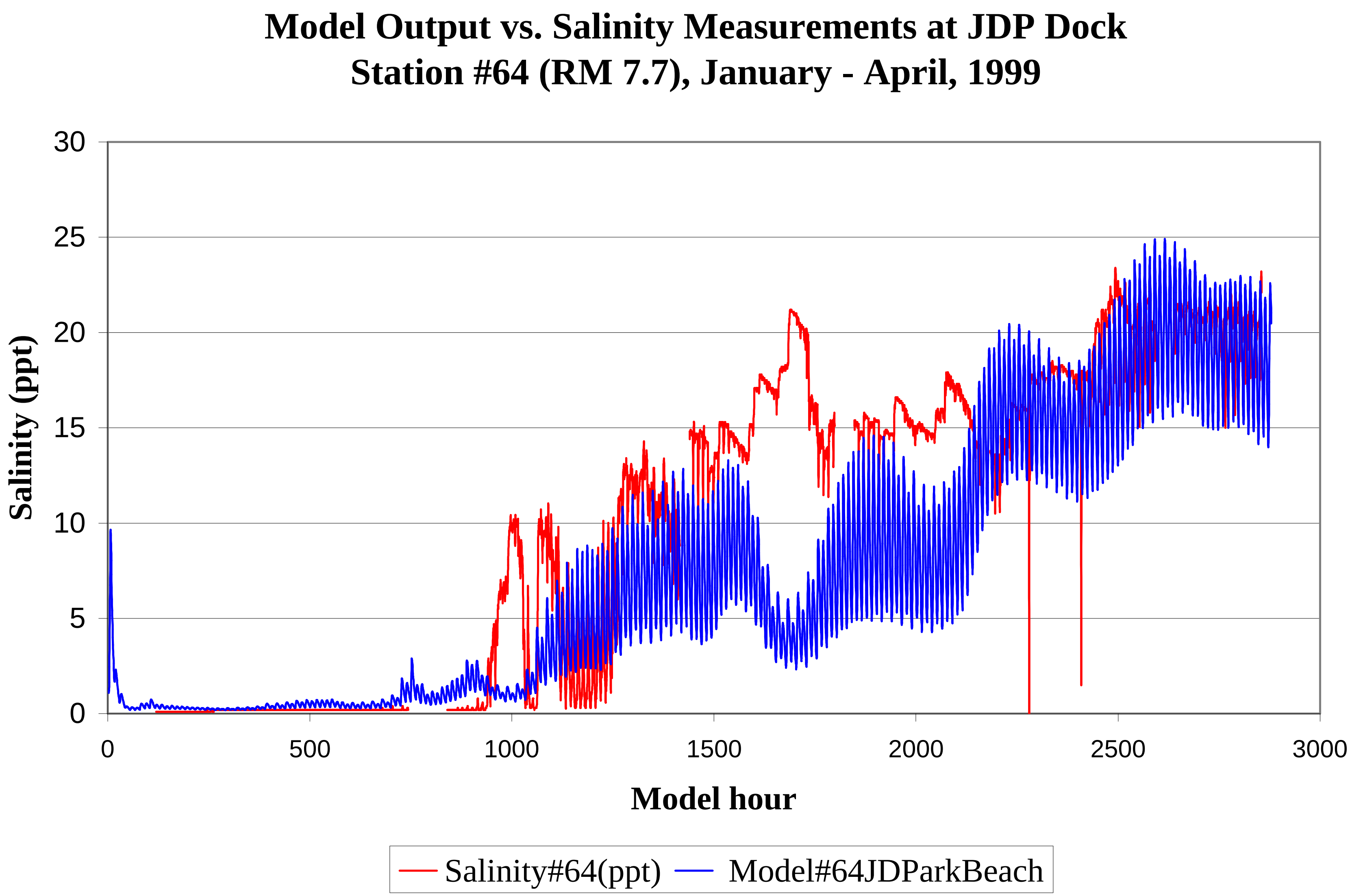


Figure 2. Comparison of model output and field record at Station 64 (RM 7.7)

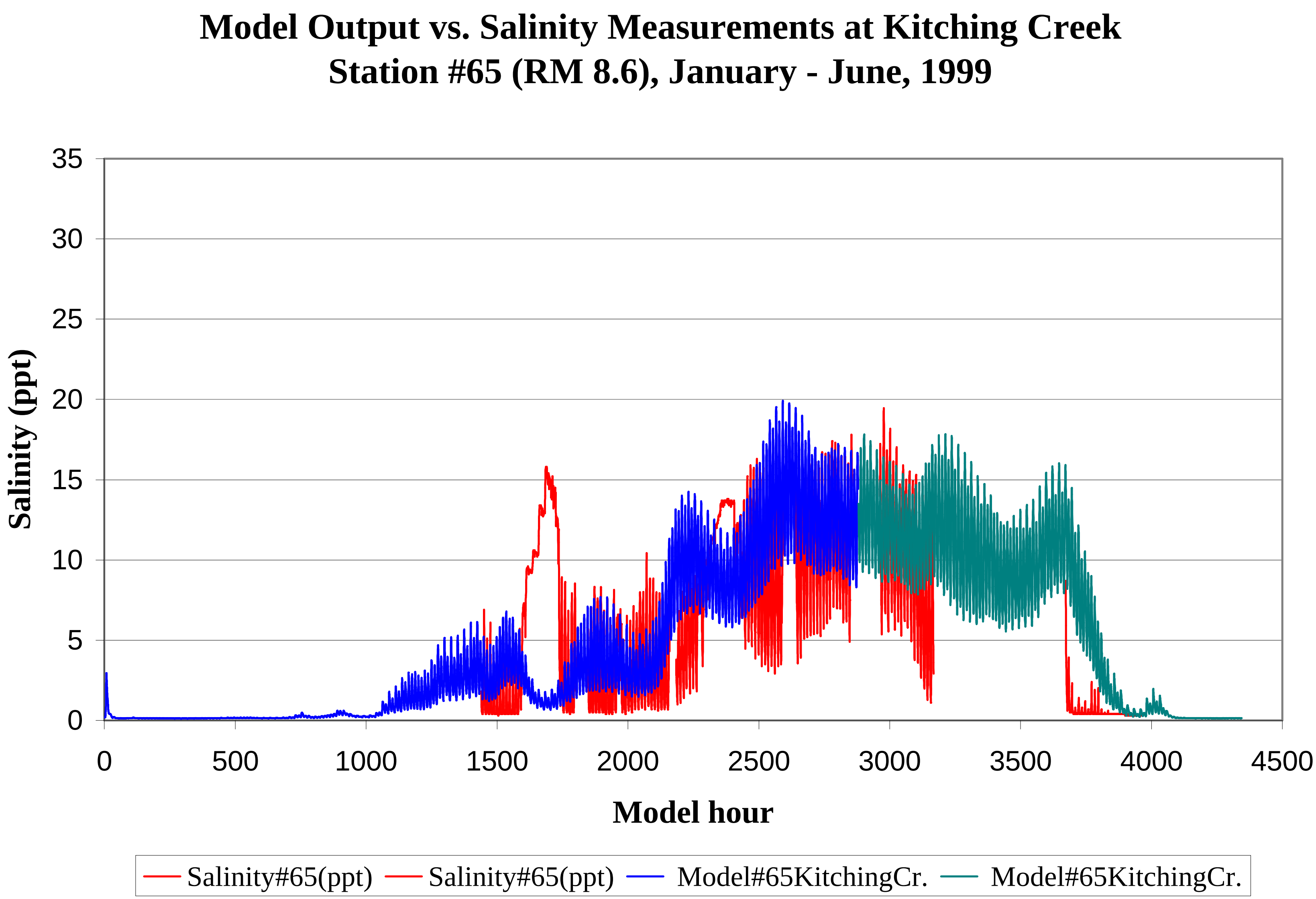


Figure 3. Comparison of model output and field record at Station 65 (RM 8.6)

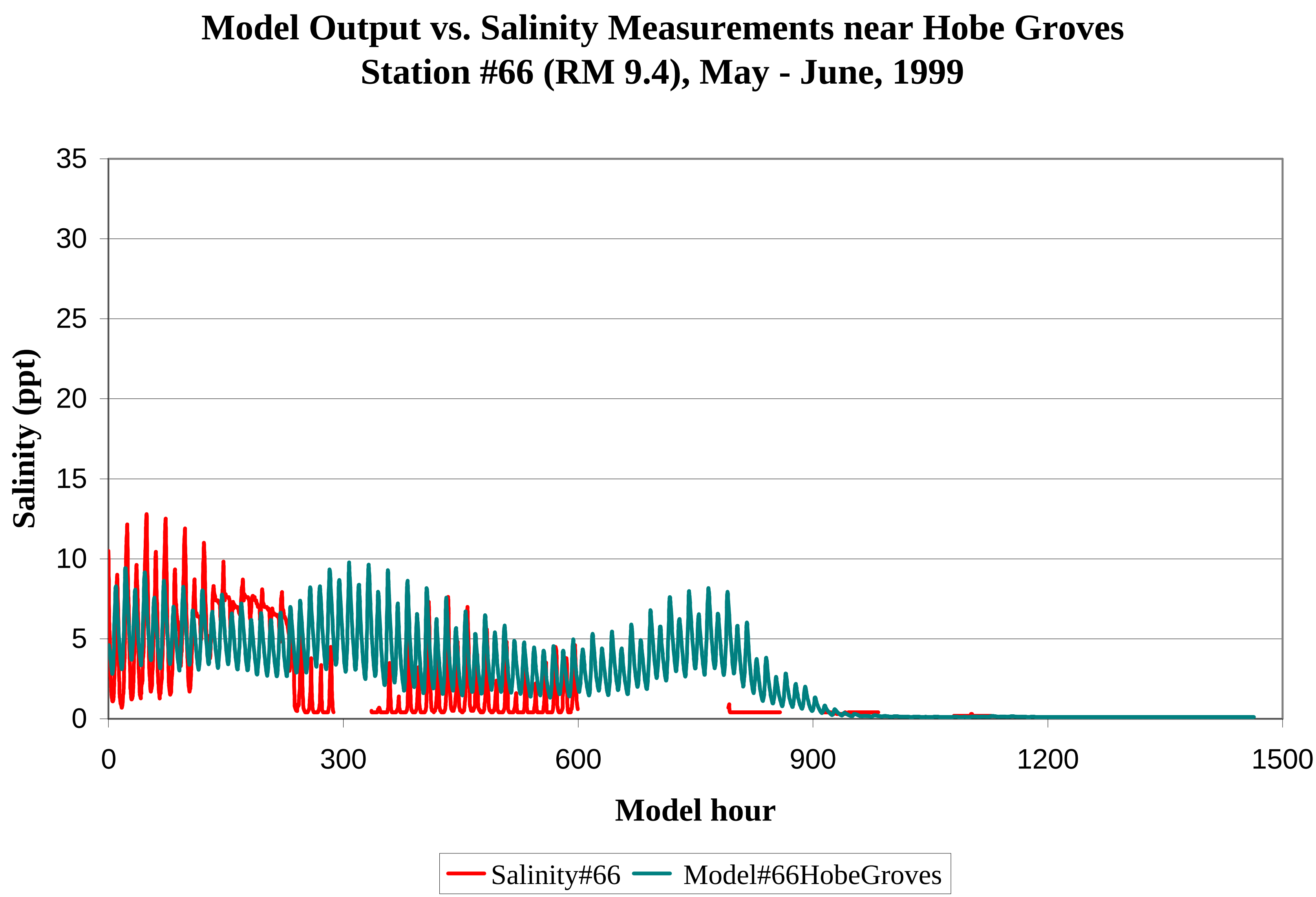


Figure 4. Comparison of model output and field record at Station 66 (RM 9.4)

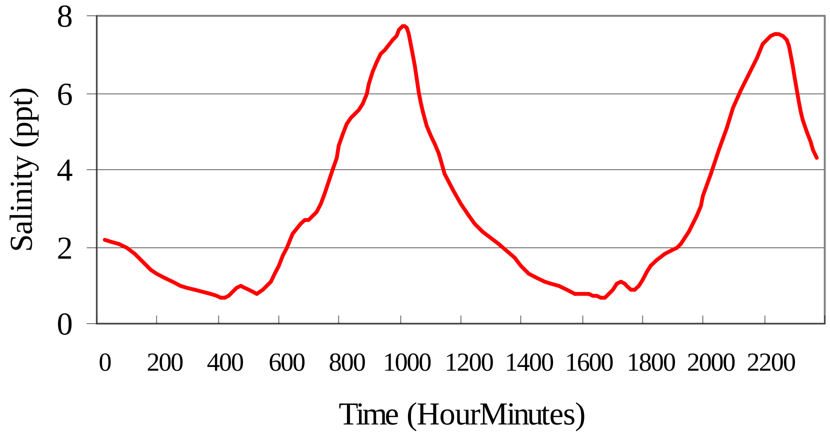


Figure 5. Semidiurnal salinity fluctuation at Station 66 (RM 8.6), March 31, 1999

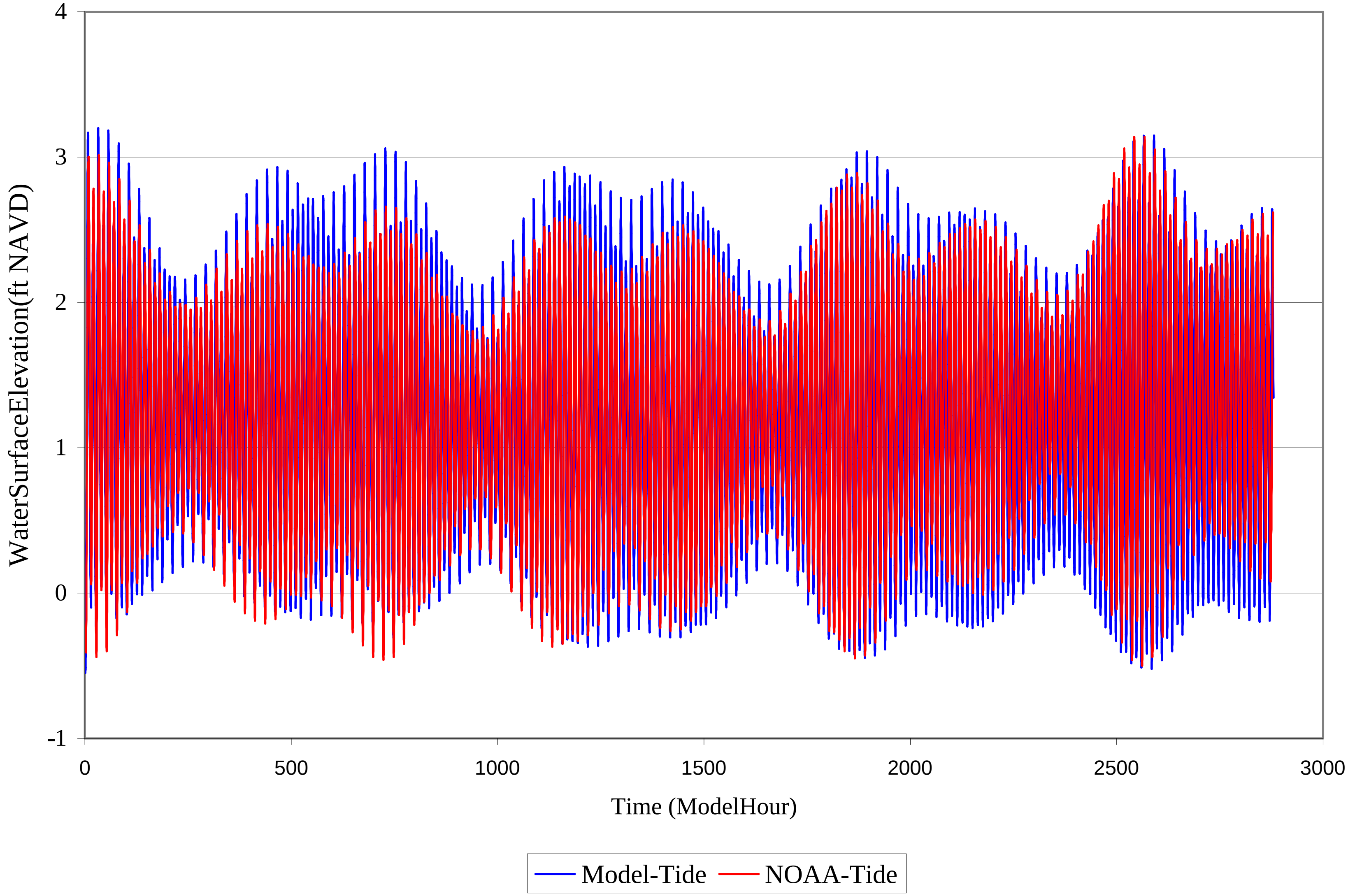
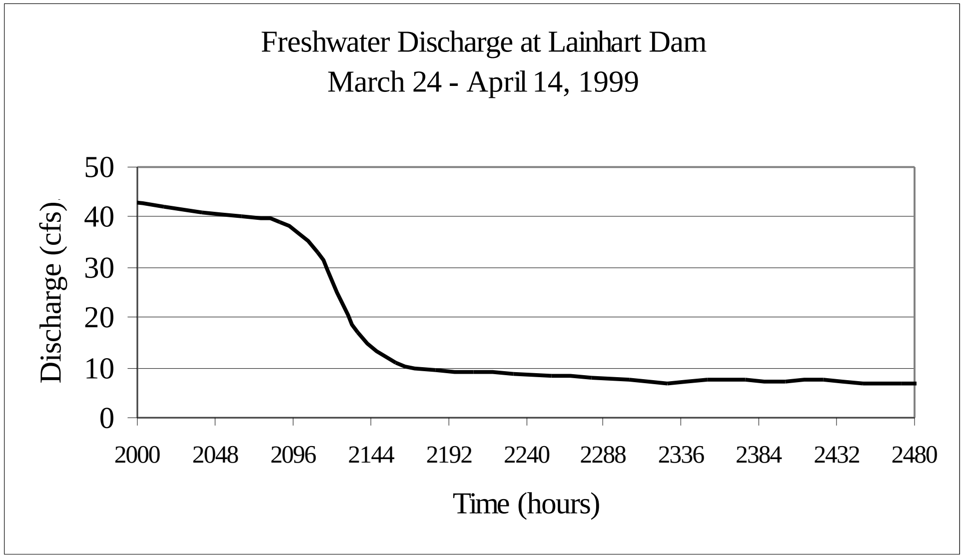


Figure 6. Model output vs. NOAA data: Tides at BoyScoutDock, January 1 - April 30, 1999



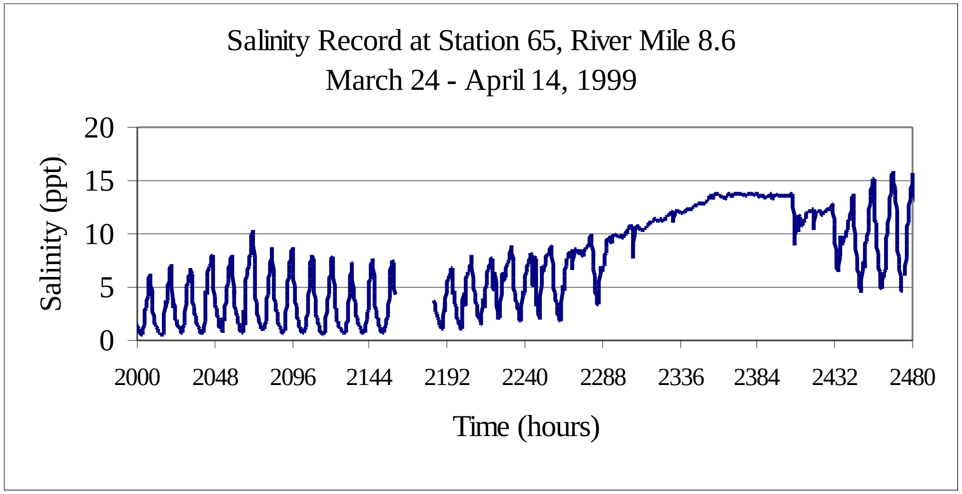


Figure 7a. Transition of salinity regime in response to freshwater input decrease

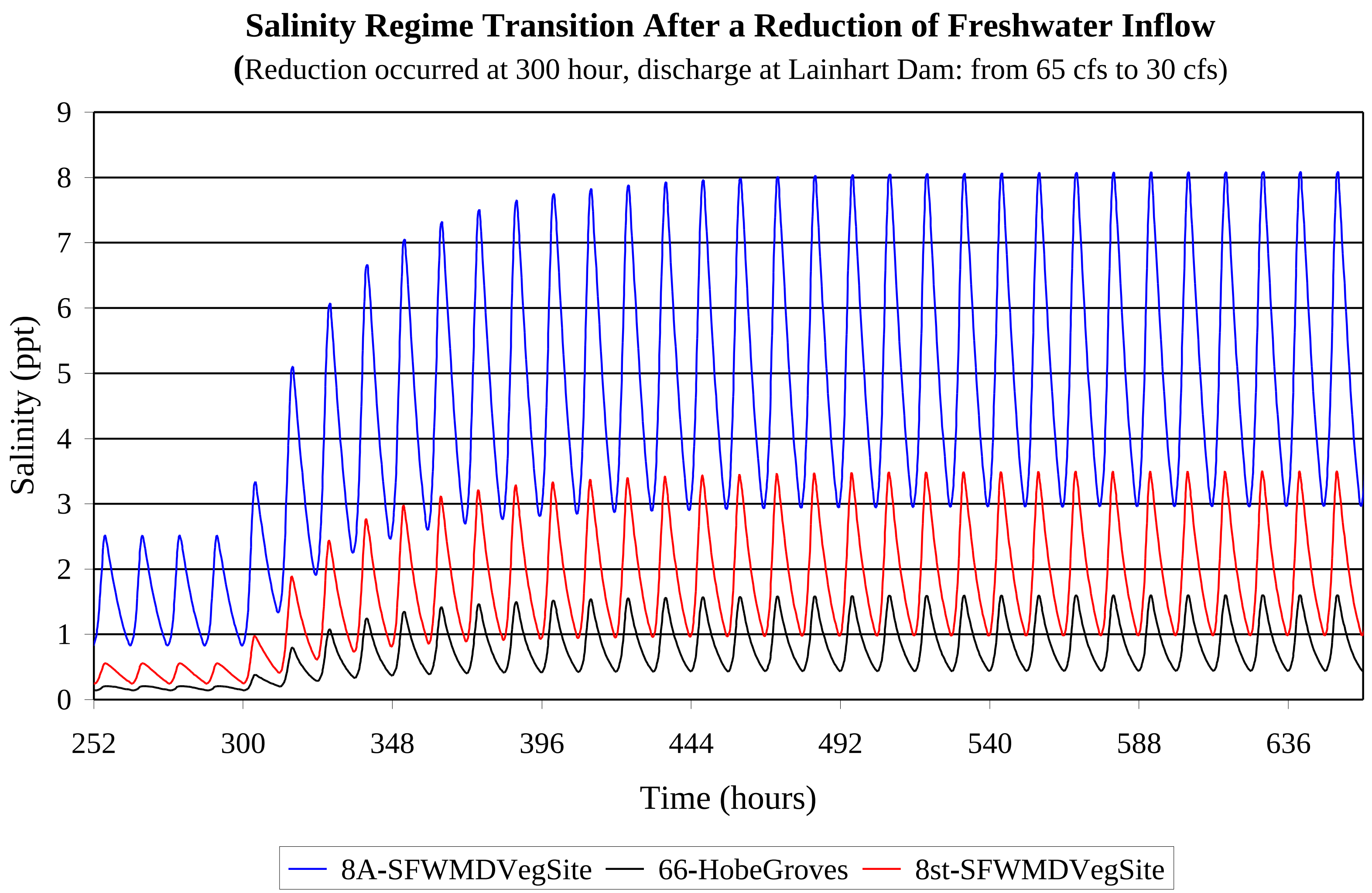


Figure 7b. Transition of salinity regime in response to freshwater input change (Model simulation)

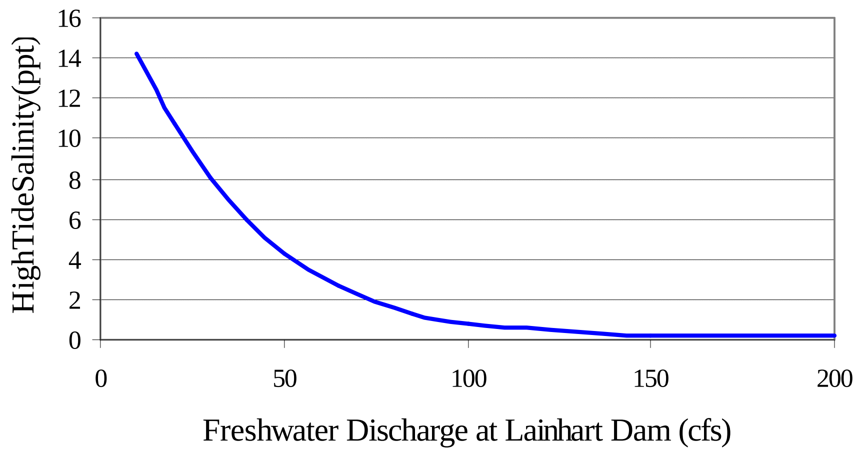


Figure 8. Results of Simulation #1: High tide salinity at Station 8a (RM 8.1)

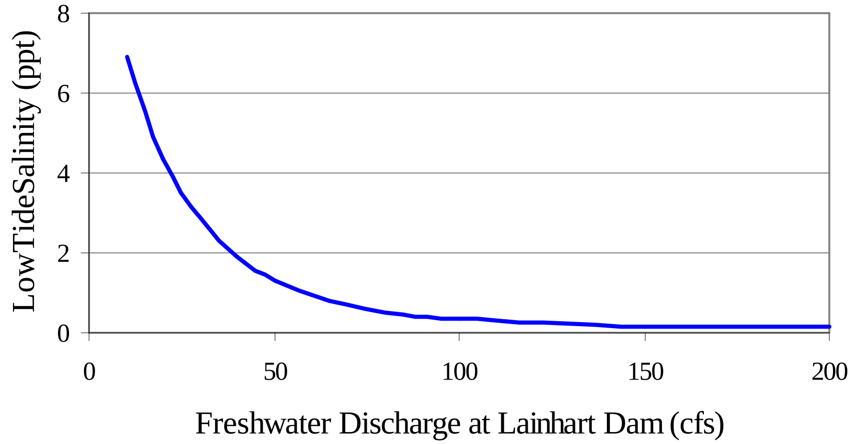


Figure 9. Results of Simulation #1: Low tide salinity at Station 8a (RM 8.1)

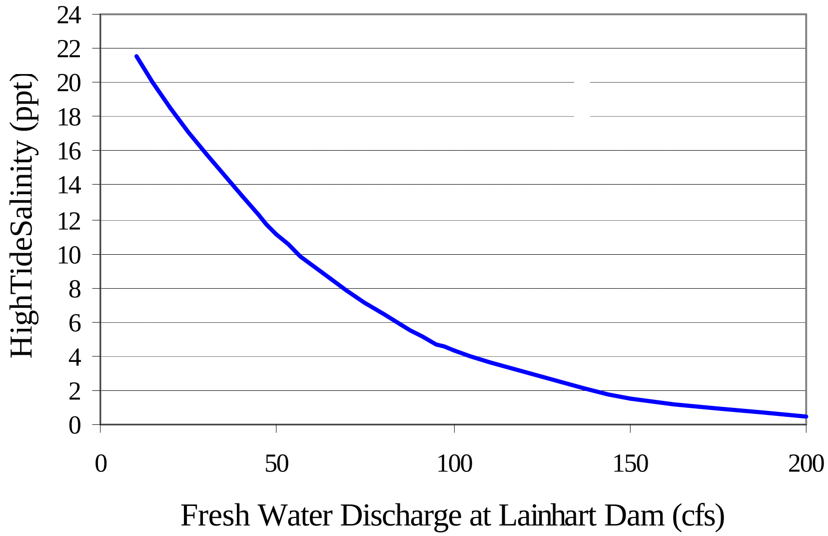


Figure 10. Results of Simulation #2: High tide salinity at Station 8a (RM 8.1)
(Worst case, low flow scenario)

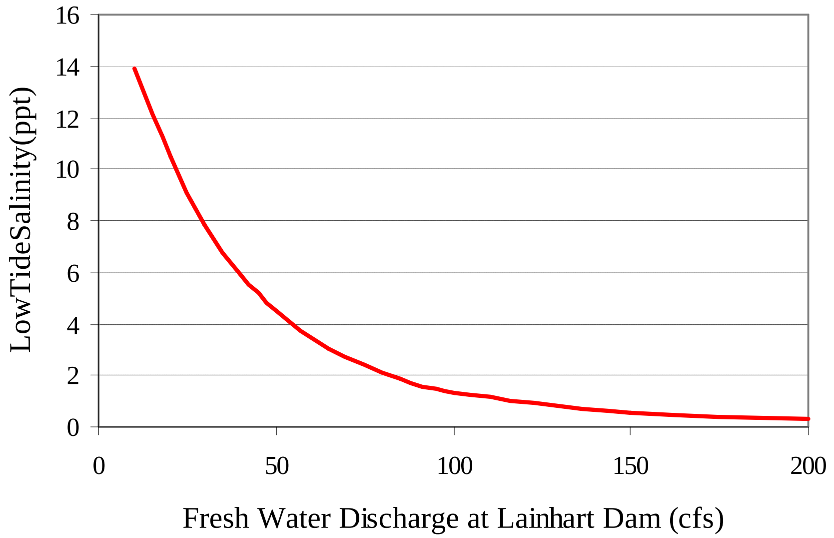


Figure 11. Results of Simulation #2: Low tide salinity at Station 8a (RM 8.1)
(Worst case, low flow scenario)

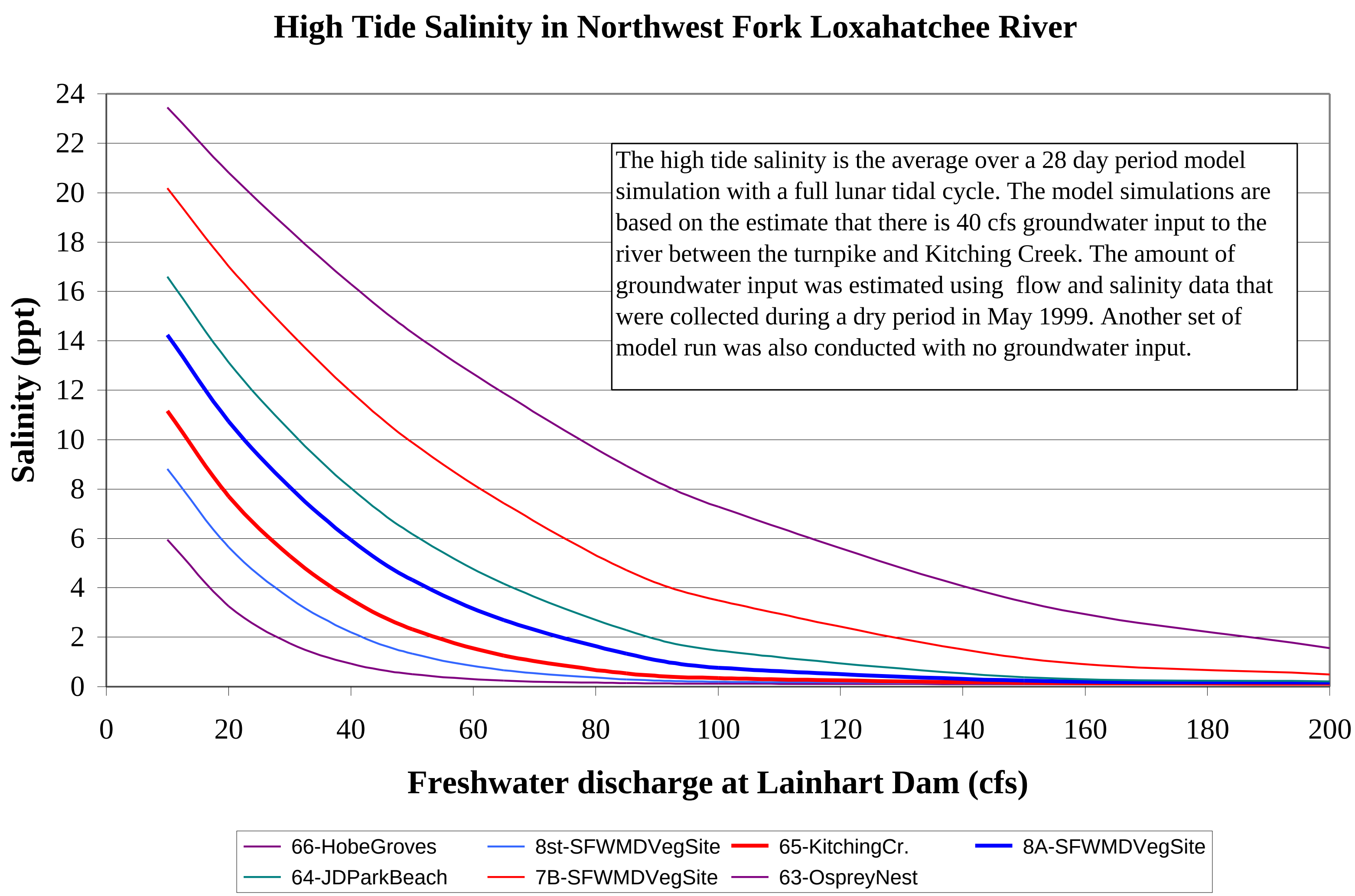


Figure 12. The relationship between high tide salinity and the amount of freshwater inflow

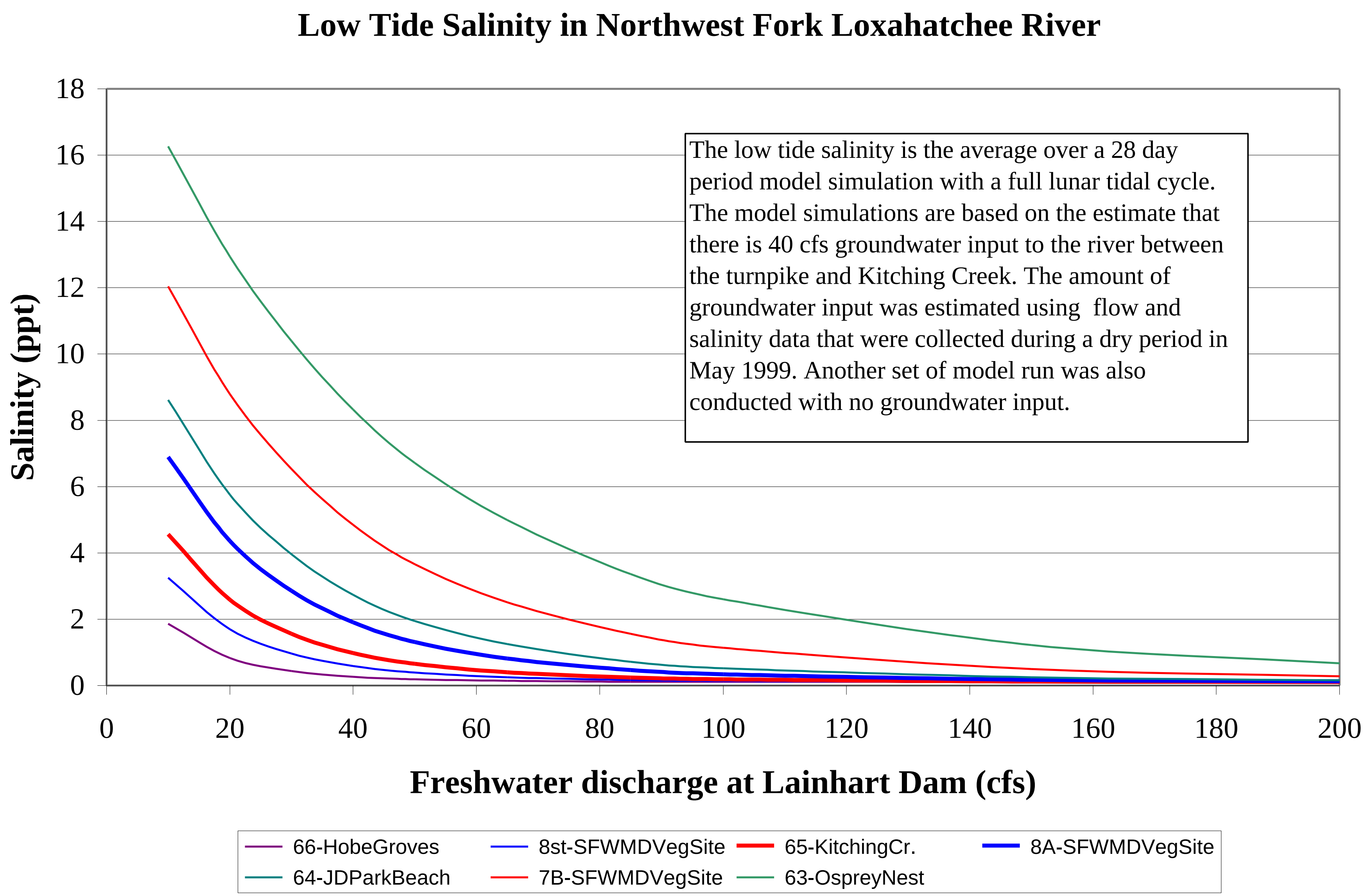


Figure 13. The relationship between low tide salinity and the amount of freshwater inflow

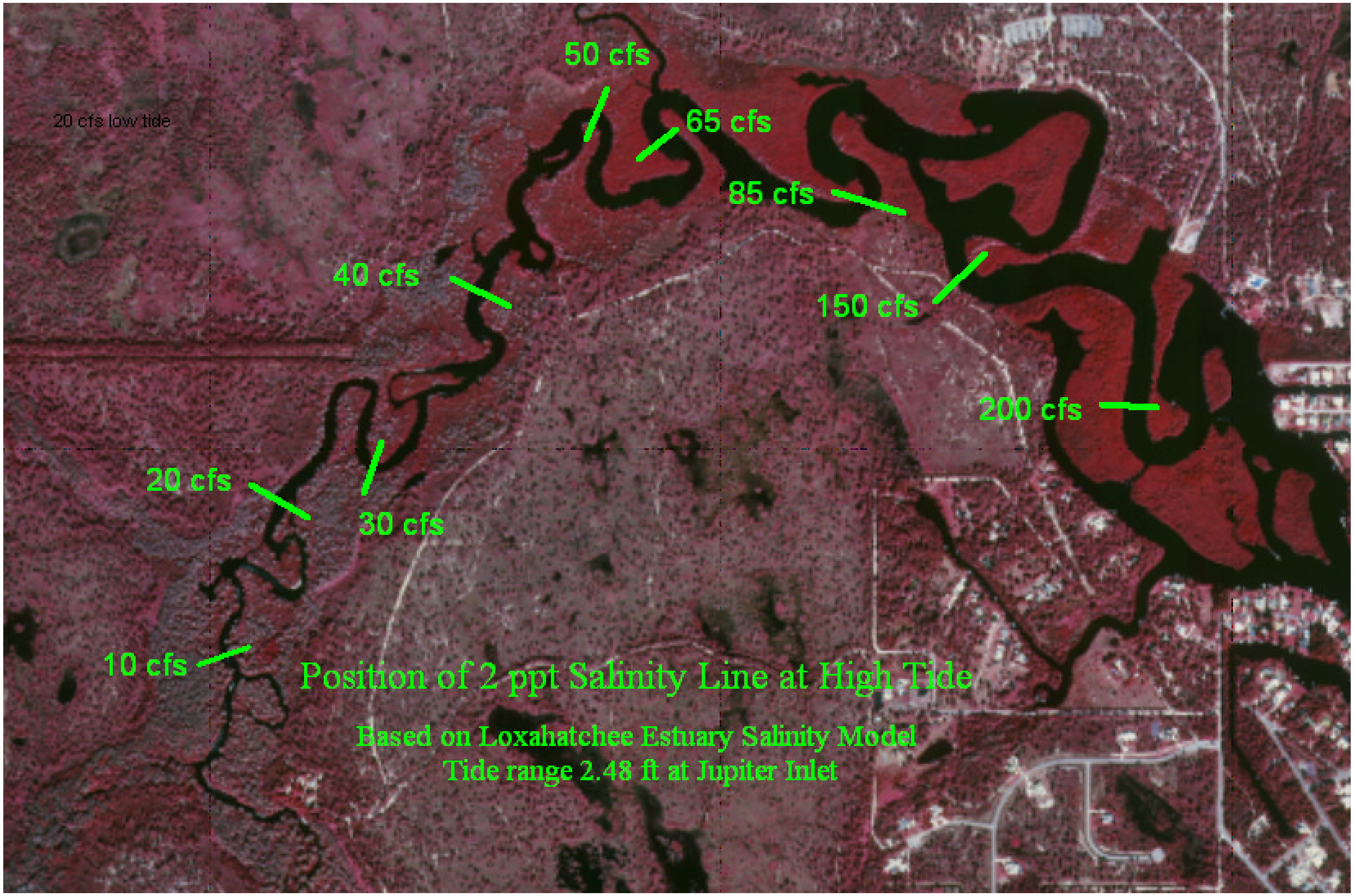


Figure 14. 2-ppt salinity line position at high tide
2-ppt lines are labeled with discharge at Lainhart Dam

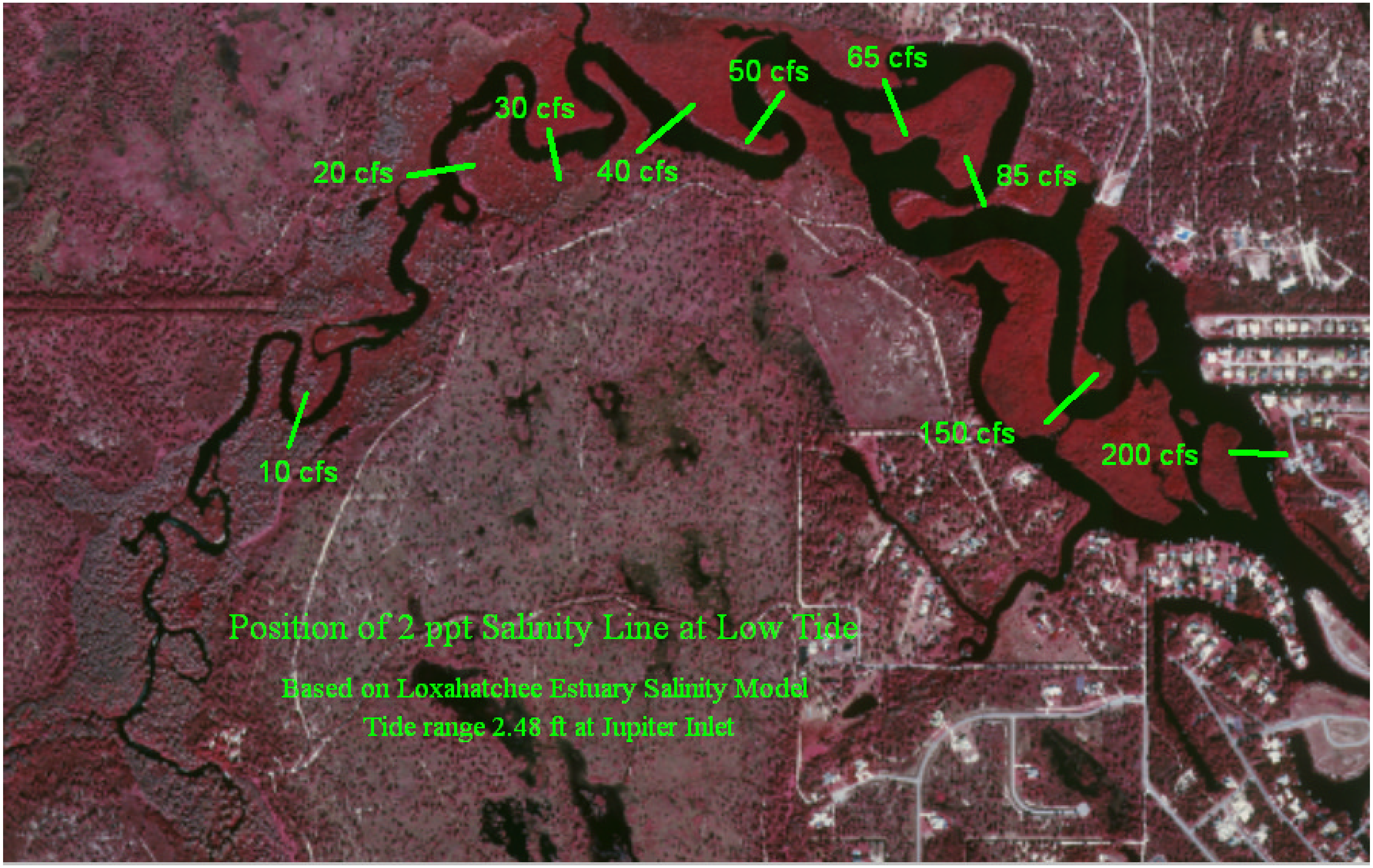


Figure 15. 2-ppt salinity line position at low tide.
2-ppt lines are labeled with discharge at Lainhart Dam

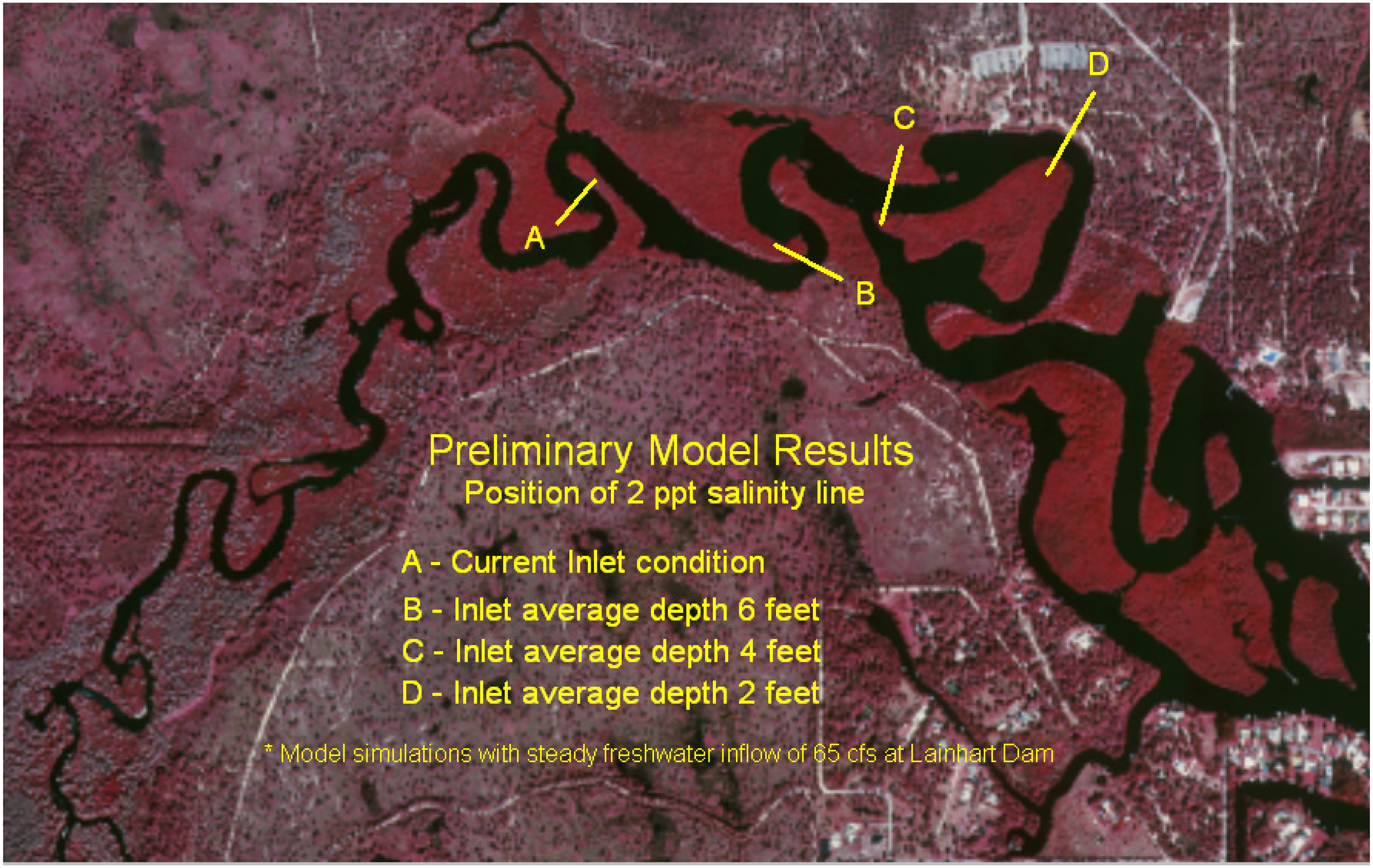


Figure 16. 2-ppt salinity line position at various inlet depths.
2-ppt lines are labeled with depth at Jupiter Inlet

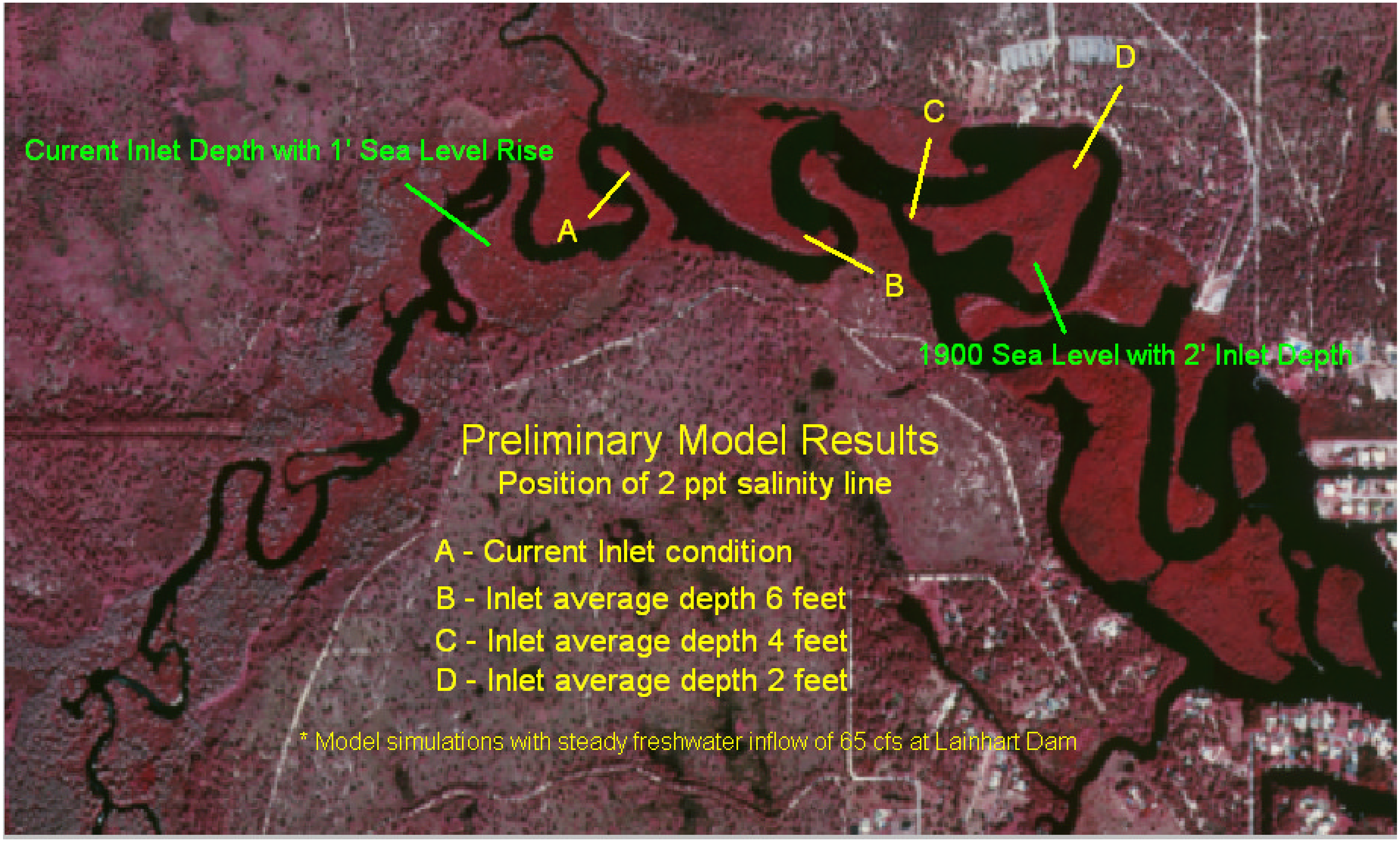


Figure 17. 2-ppt salinity line position at various inlet depths and sea level.
2-ppt lines are labeled with depth at Jupiter Inlet and sea level

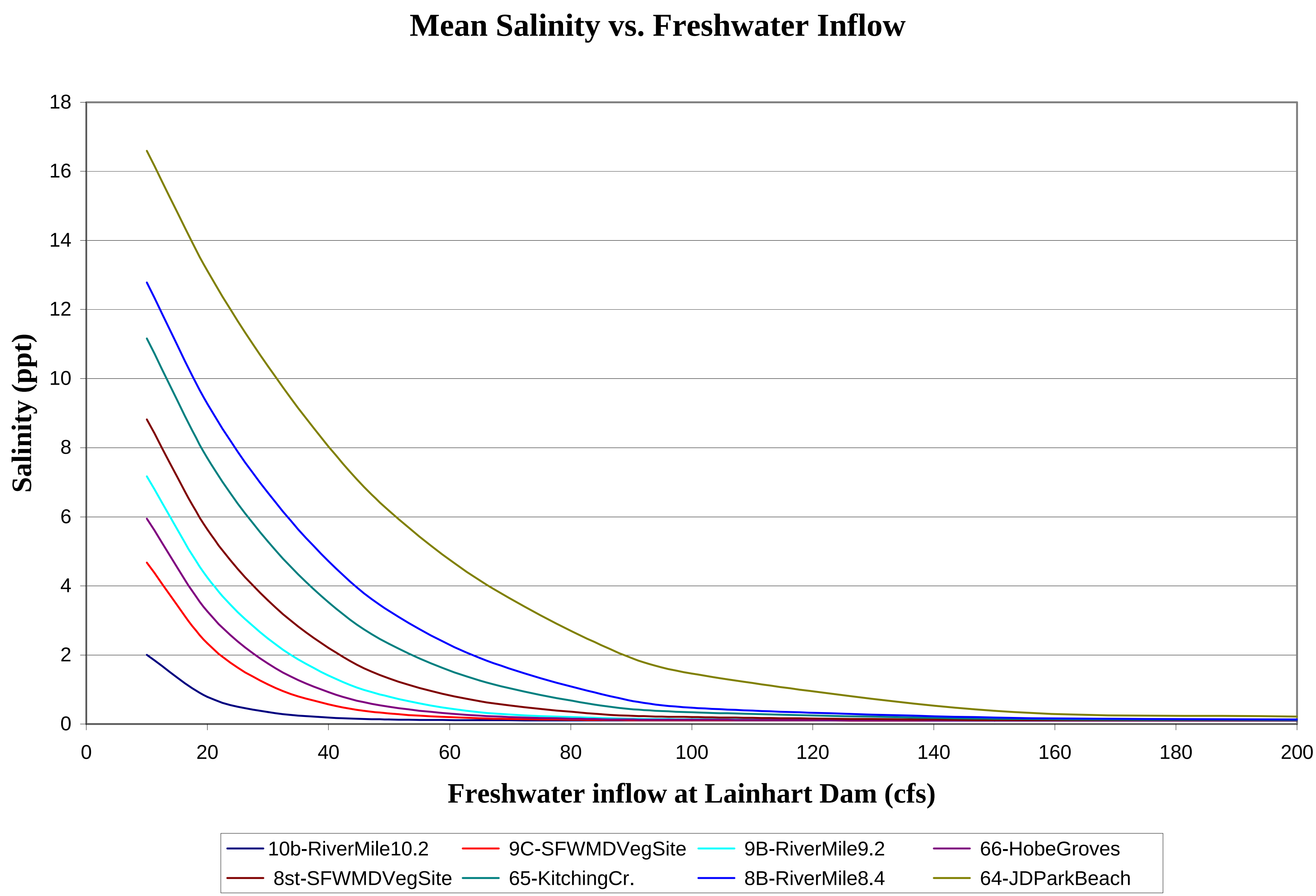


Figure 18. The relationship between mean salinity and the amount of freshwater inflow

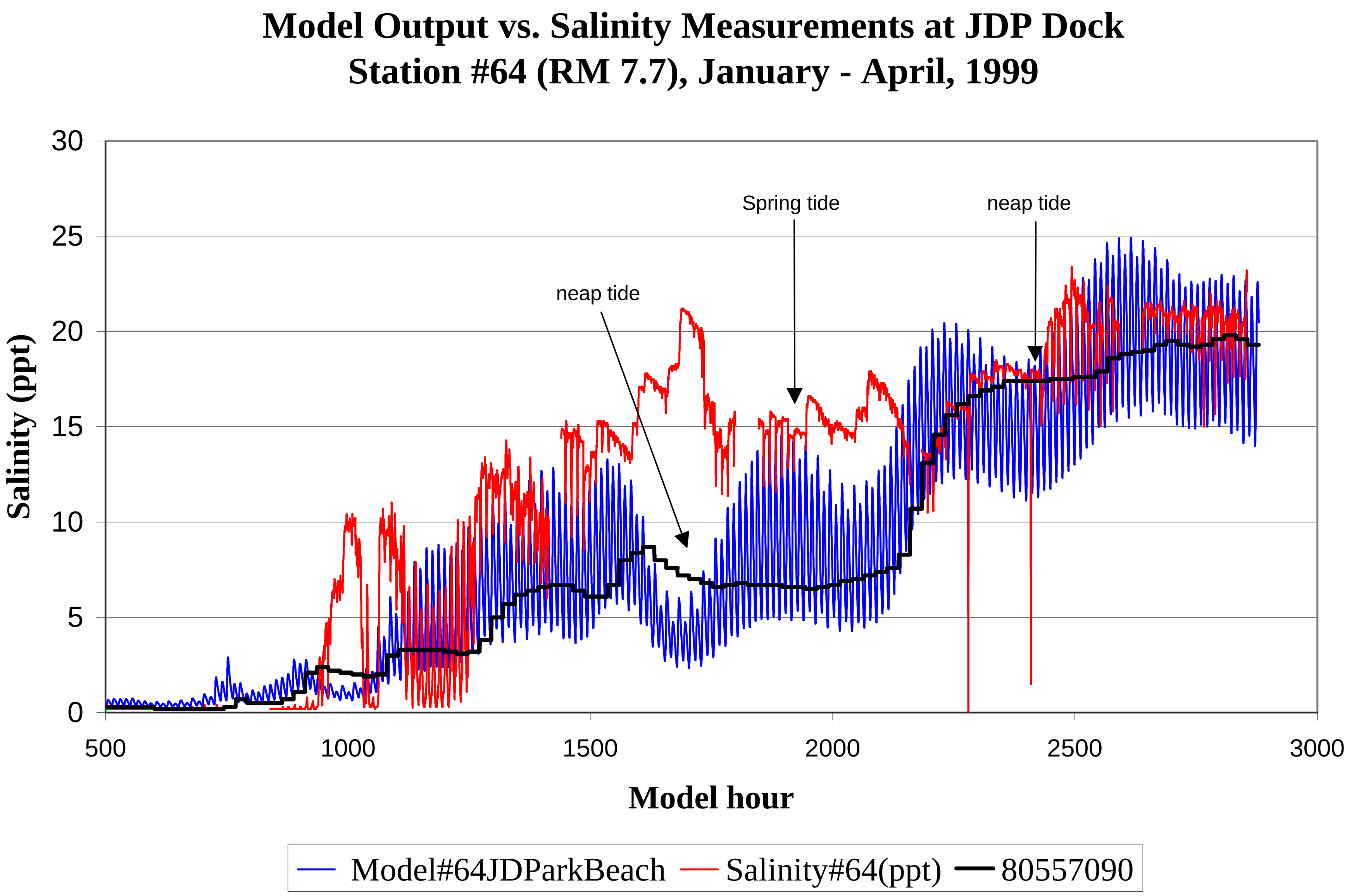


Figure 19. The long term model verification – Site 64

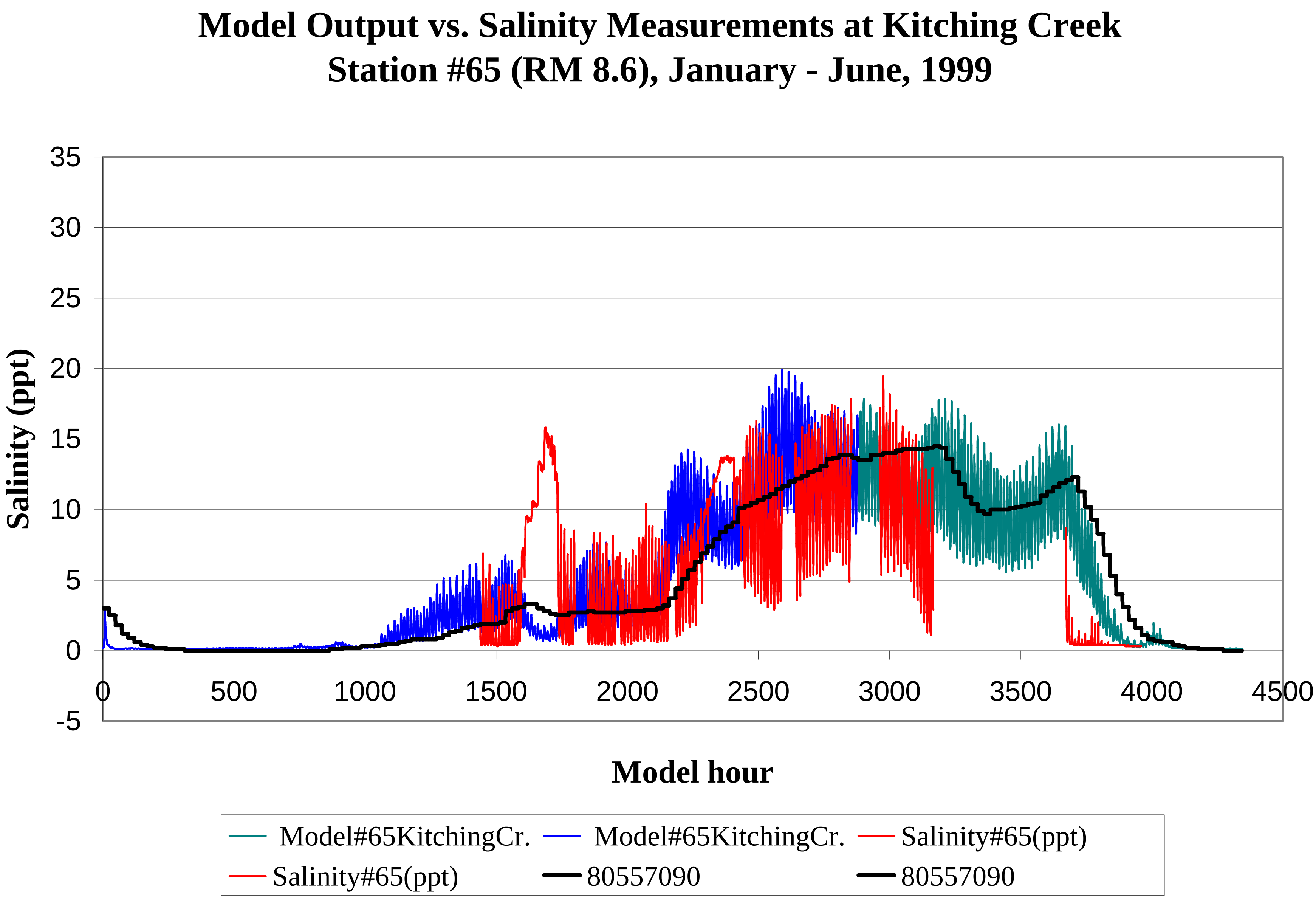


Figure 20. The long term model verification – Site 65

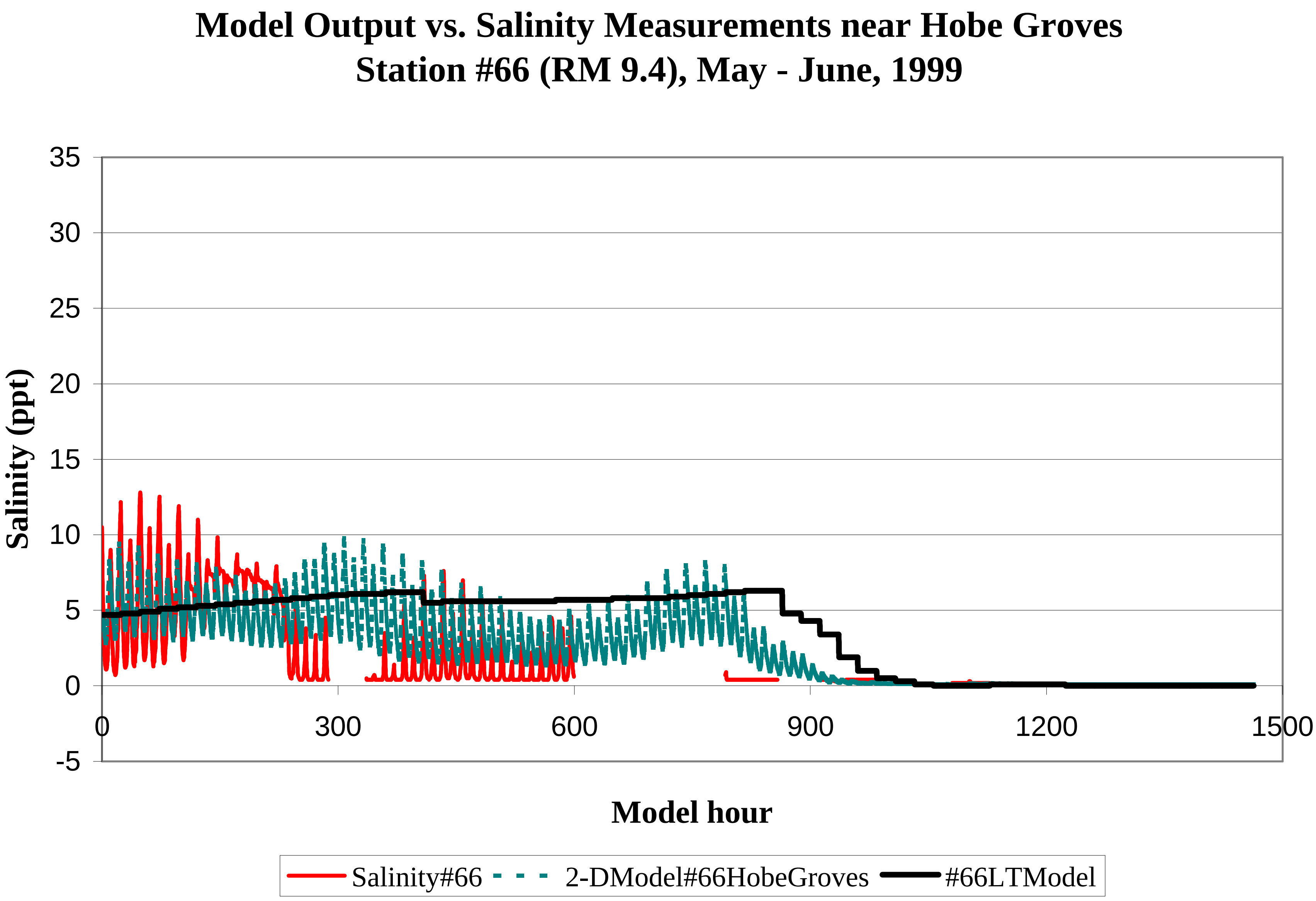


Figure 21. The long term model verification – Site 66

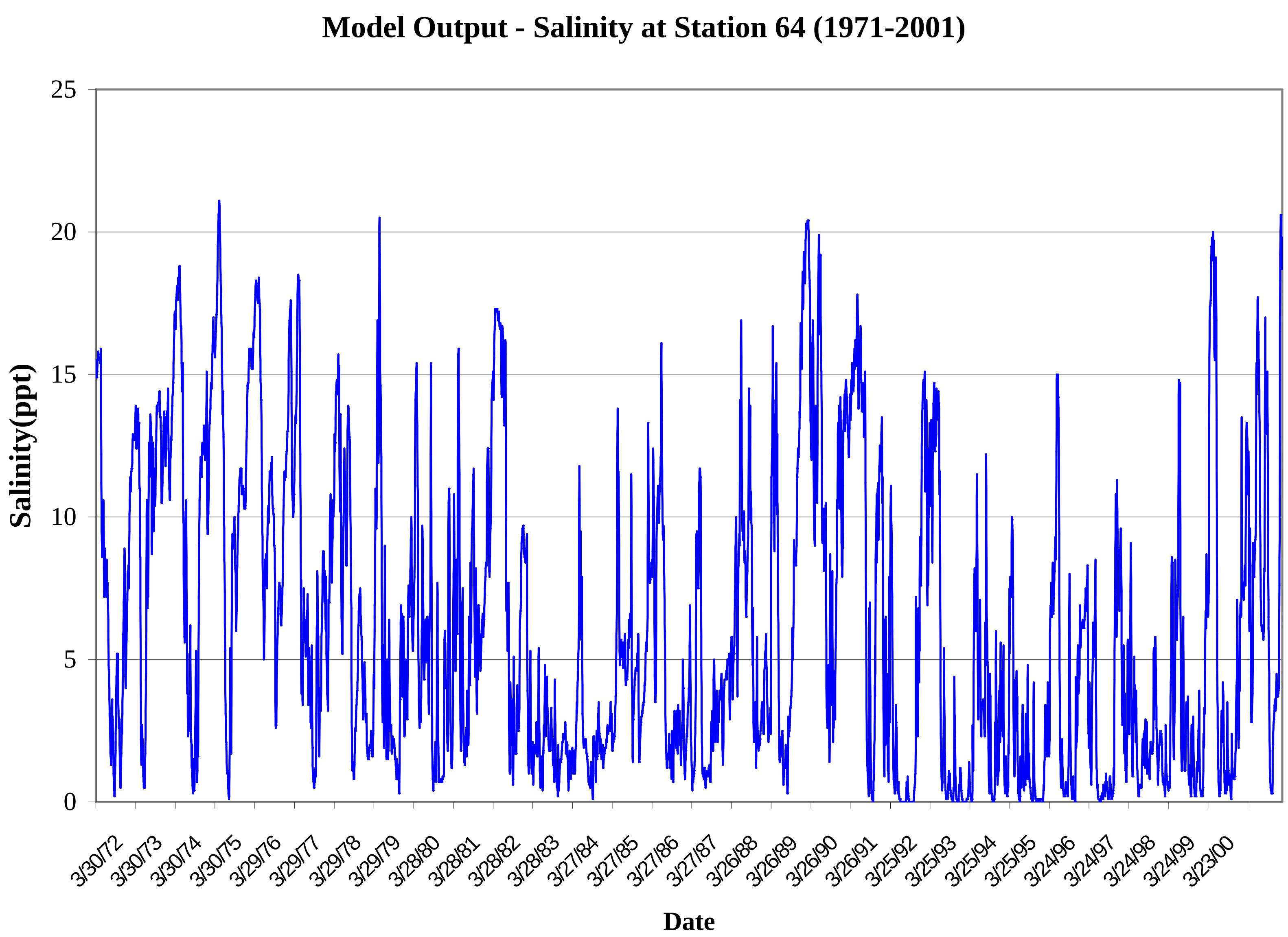


Figure 22. Model simulation of historic salinity condition (Station 64)

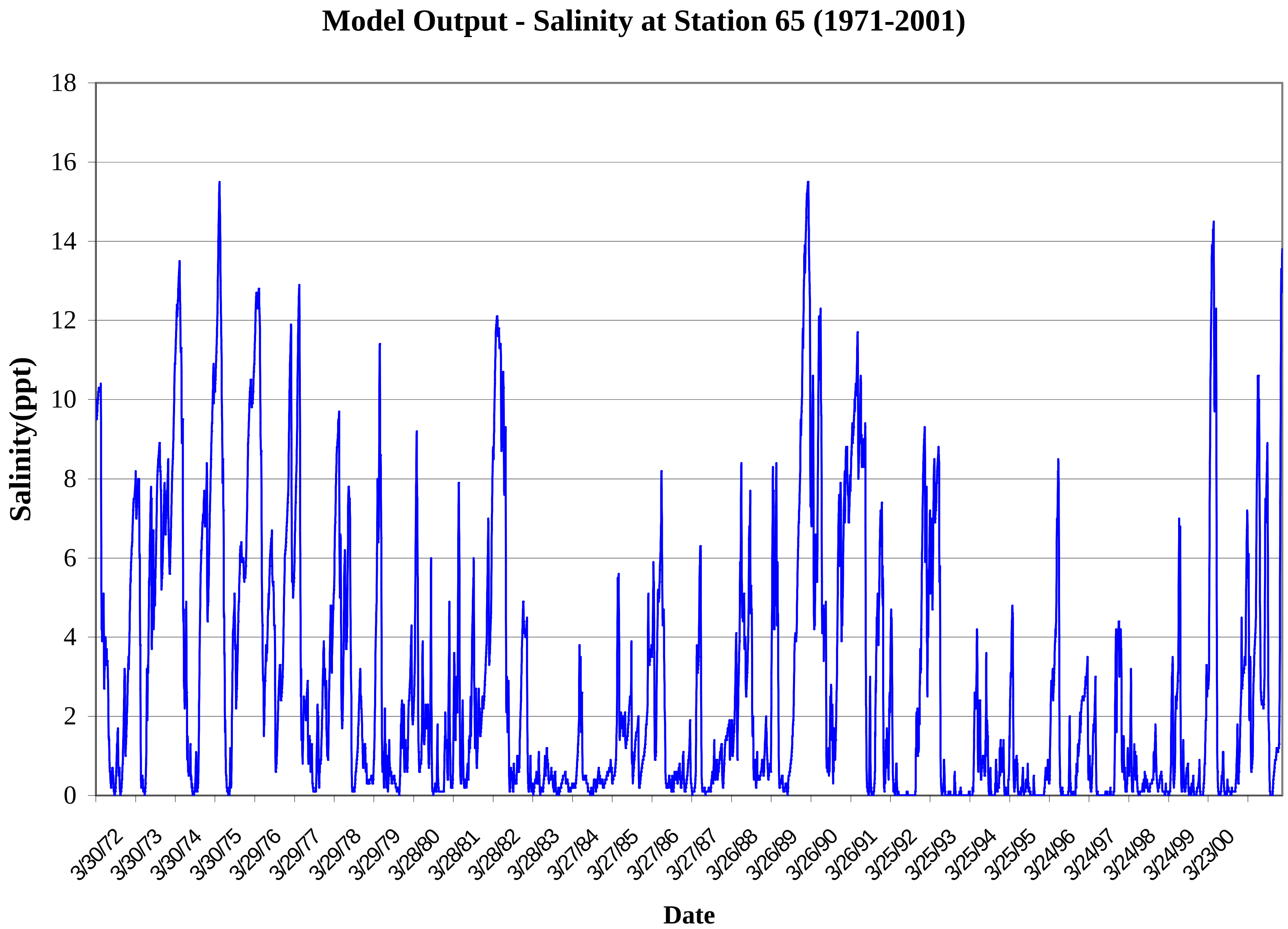


Figure 23. Model simulation of historic salinity condition (Station 65)

Appendix F -- Salinity Conditions in the Loxahatchee Estuary (Based on Russell and McPherson (1984))

CONTENTS

Summary of salinity conditions in the Loxahatchee estuary during an extremely wet period following hurricane Dennis (August 20, 1981) when flows of 840 cfs were occurring in the Northwest Fork.

(Figure 10)

- Top salinities
  - North fork and outer estuary -- range from 15 to 30 ppt.
  - NW fork -- range from 1-5 ppt
  - SW Fork -- less than 1 ppt
- Bottom salinities --High tide
  - Most areas range from 25 -35 ppt.
  - South Fork and NW Fork upper reaches -- salinities are 20-25 ppt
- Bottom salinities -- Low tide
  - South fork bottom salinities are 15-20 ppt
  - Northwest fork range from 10 ppt to 35 ppt.

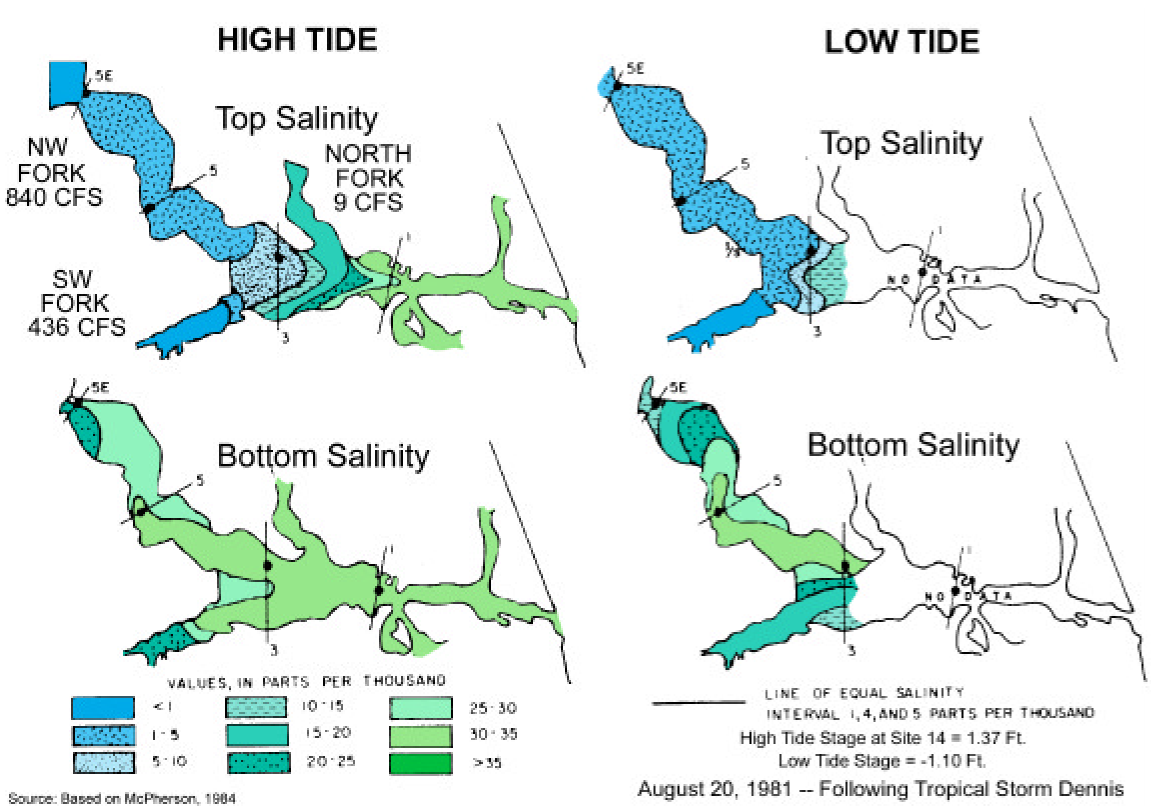


Figure F-1

Summary of salinity conditions in the Loxahatchee estuary during a typical wet season when flows of 104-113 cfs were occurring in the Northwest Fork (November 20-21, 1980).

(Figure 13)

- Top salinities
  - NW Fork. ranges from 10 to 35 ppt
  - Outer estuary ranges from 25 to 35 ppt
  - SW fork is 10-15 ppt
  - North Fork is 30 ppt or higher

- Bottom salinities high tide
  - Northwest fork ranges from 10 to 35 ppt
  - SW fork is 10-15 ppt
  - North Fork is 35 ppt or higher

- Bottom salinities at low tide
  - Northwest fork range from 25 - 35 ppt.
  - SW fork is 30-35 ppt
  - North Fork is 30-35 ppt

Some areas of the bottom experience rapid changes in salinity during the course of a tidal cycle.

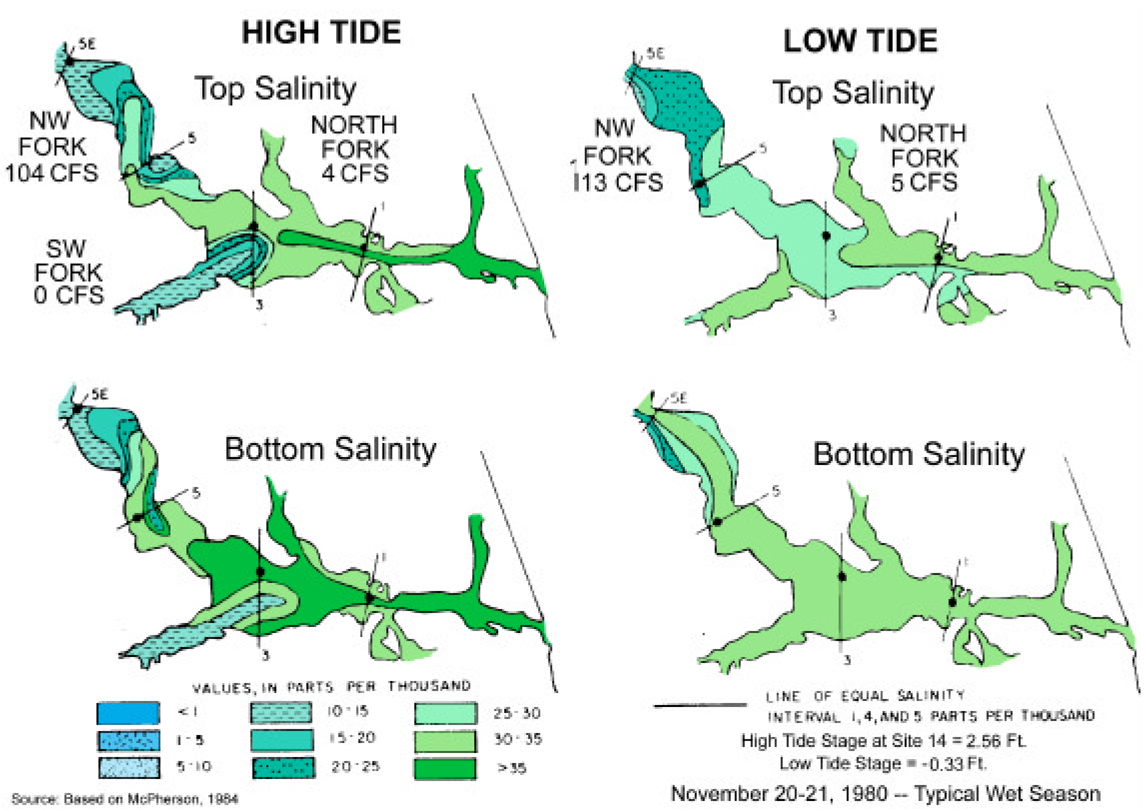


Figure F-2

Summary of salinity conditions in the Loxahatchee estuary during a typical dry season when flows of 30-60 cfs were occurring in the Northwest Fork (May 6-7, 1980).

(Figure 16)

- Top salinities
  - NW fork range from 20 -30 ppt
  - Outer estuary is 30 -35 ppt at low tide
  - Outer estuary is above 35 ppt at high tide.
  - North Fork is above 35 ppt at high tide.

- Bottom salinities
  - North Fork and South Fork are 25 ppt and above
  - Most of the estuary is above 35 ppt at high tide.
  -

Top and bottom salinities in the south Fork range from 30-35 ppt.

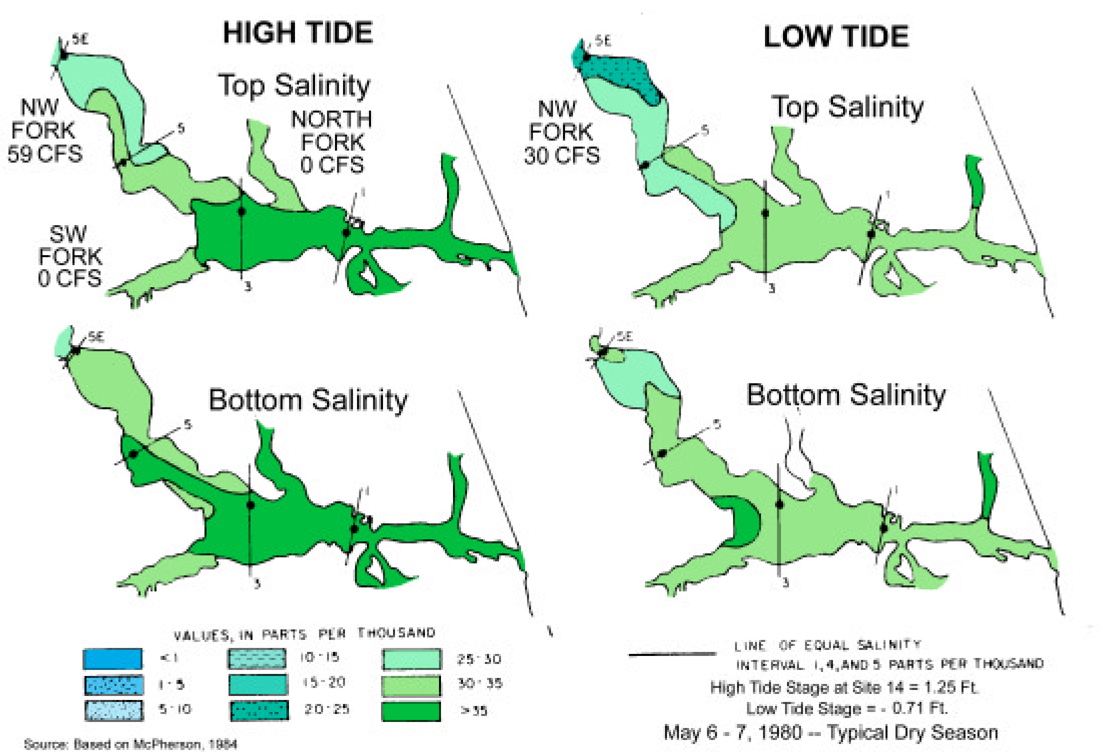


Figure F-3

Summary of salinity conditions in the Loxahatchee estuary during an extremely dry period with 9 cfs of flow occurring from the Northwest Fork (May 4, 1981).

Outer estuary is above 35 ppt.
Northwest and Southwest Forks range from 30 ppt to above 35ppt

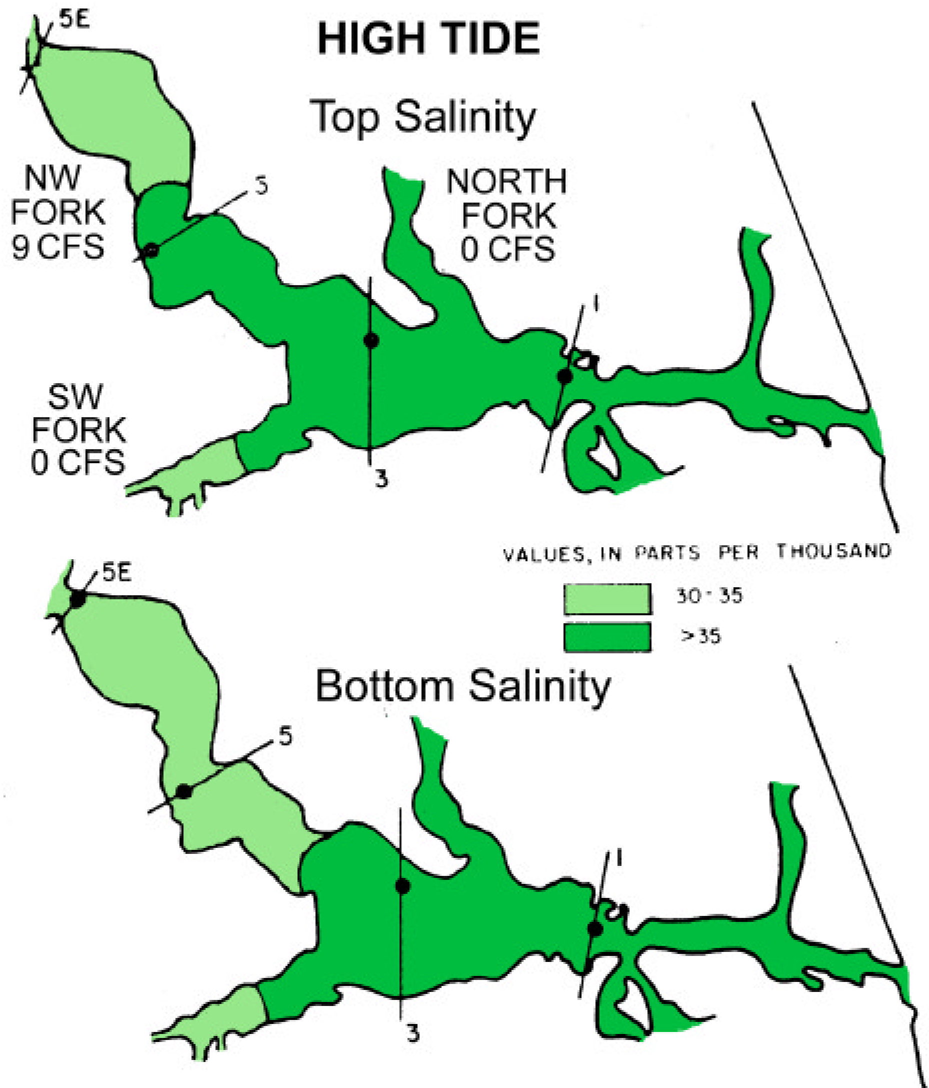


Figure F-4

Profiles of Estuary Showing Location and Extent of Saltwater-Freshwater Interface in the Northwest Fork under Various Flow Conditions - see reference Map (Figure F-6)

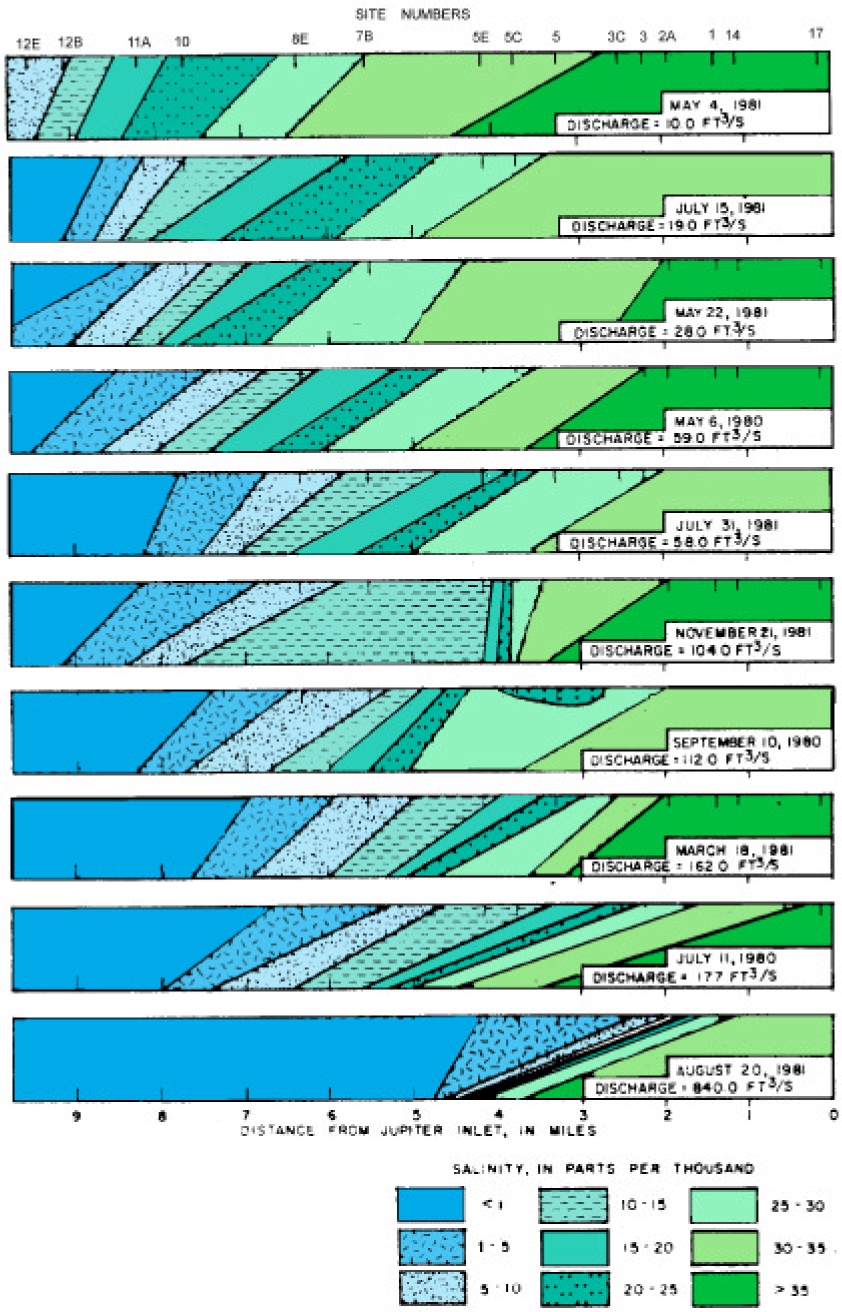


Figure F-5

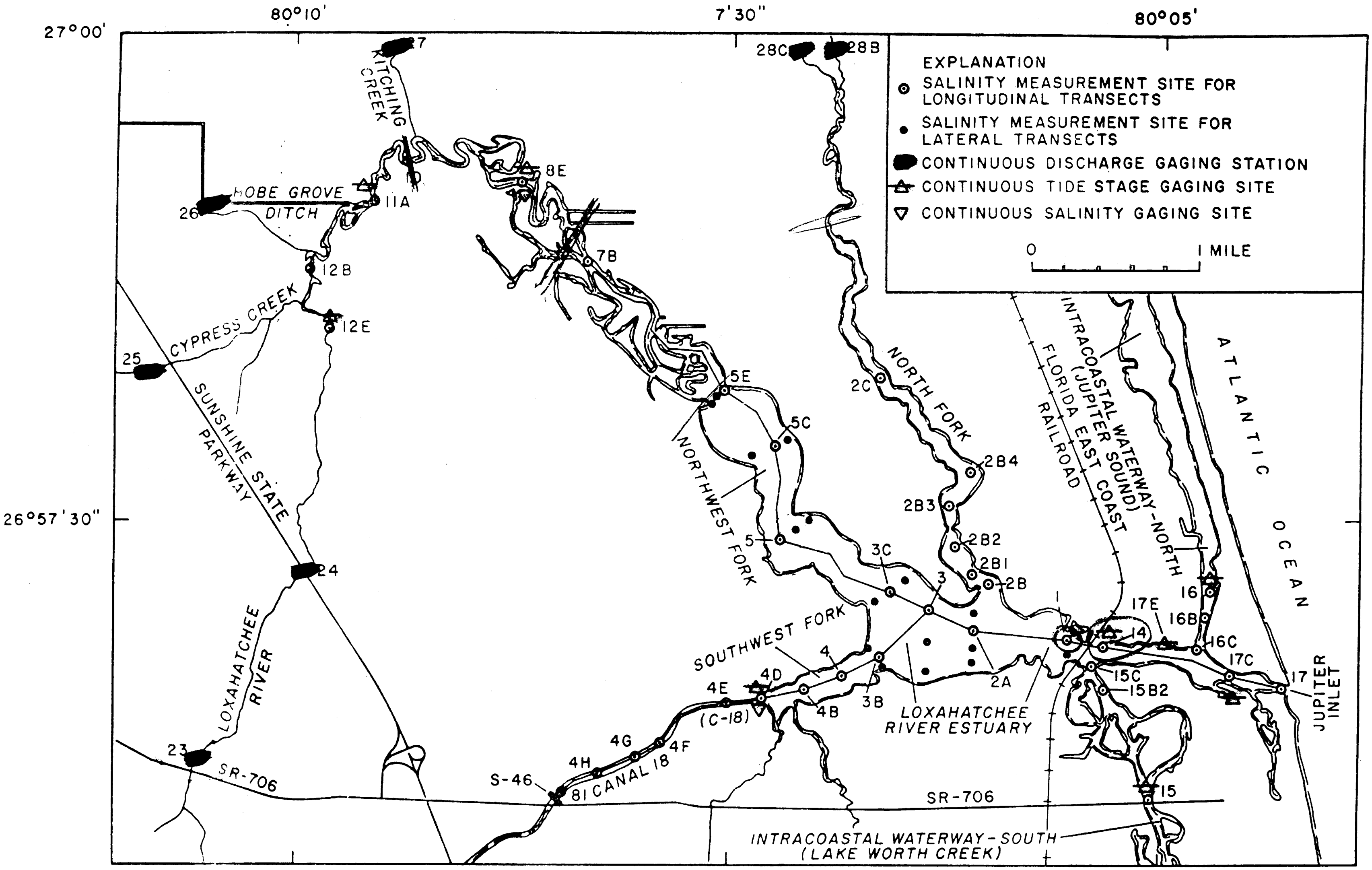


Figure F-6. Locations of Salinity Sampling Sites Used by Russell and McPherson 1984