Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 6/8/2015 (Developing El Nino Condition)

Lake Okeechobee Net Inflow Outlook:

The Lake Okeechobee Net Inflow Outlook has been computed using 4 methods: Croley's method[1], the SFWMD empirical method[2], a sub-sampling of El Nino years[3] and a sub-sampling of warm years of the Atlantic Multi-decadal Oscillation (AMO) in combination with ENSO El Nino years[4]. The results for Croley's method and the SFWMD empirical method are based on the CPC Outlook.

Table of the Lake Okeechobee Net Inflow Outlooks in feet of equivalent depth. All methods are updated on a weekly basis with observed net inflow for the current month.

Season	Croley's Method[1*]		SFWMD Empirical Method[2]		Sub-sampling of ENSO El Nino Years[3]		Sub-sampling of AMO Warm + ENSO El Nino Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Jun-Nov)	N/A	N/A	2.56	Very Wet	2.33	Very Wet	3.58	Very Wet
Multi Seasonal (Jun-Apr)	N/A	N/A	3.00	Wet	3.87	Wet	5.70	Very Wet

*Croley's Method Not Produced For This Report

See Seasonal and Multi-Seasonal tables for the classification of Lake Okeechobee Outlooks.

The recommended methods and values for estimating the Lake Okeechobee Net Inflow Outlook are shaded and should be used in the LORS2008 Release Guidance Flow Charts.

Tributary Hydrologic Conditions Graph:

-2454 cfs 14-day running average for Lake Okeechobee Net Inflow through 6/7/2015.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

- 1.43 for Palmer Index on 6/6/2015.
According to the classification in Tributary Hydrologic Conditions table, this condition is Normal.

The wetter of the two conditions above is **Normal**.

LORS2008 Classification Tables:

Lake Okeechobee Stage on 6/8/2015

Lake Okeechobee Stage: **12.57 feet**

USACE Report for Lake Okeechobee

Lake Okeechobee Stage Hydrograph

Lake Okeechobee Management Zone/Band		Bottom Elevation (feet, NGVD)	Current Lake Stage
High Lake Management Band		16.07	
Operational Band	High sub-band	15.54	
	Intermediate sub-band	15.05	
	Low sub-band	13.07	← 12.57
Base Flow sub-band		12.60	
Beneficial Use sub-band		10.64	
Water Shortage Management Band			

Part C of LORS2008: Discharge to WCA's

Release Guidance Flow Chart Outcome: No releases south to the WCAs are needed to manage lake stages.

Part D of LORS2008: Discharge to Tidewater

Release Guidance Flow Chart Outcome: No releases to the St. Lucie and Caloosahatchee estuaries.

Technical Input Summaries from:

- **Lake Okeechobee Division**
- **Coastal Ecosystems**
- **Everglades Ecosystems Division**
- **Water Supply Department**
- **Water Resource Management Release Recommendation**
- **Kissimmee Watershed Environmental Conditions**
- **Operations Department**

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LORS2008 Implementation on 6/8/2015 (ENSO Neutral Condition):

Water Supply Department Technical Input

Water Supply Outlook:

District wide, Raindar rainfall 1.34 inches for the week ending 6/9/2015. Lake stage on 6/8/2015 is 12.57 ft, down 0.12 ft from last week.
The updated June 2015 SFWMM Dynamic Position Analysis percentile graph and tracking chart for Lake Okeechobee show that the lake stage is in the Low Flow Operational Sub-Band.

The LORS2008 tributary indices are classified as **Normal**. The PDSI indicates normal condition and the LONIN is Dry. The classification is based on the wetter of the two.

Water Supply Risk Evaluation

Area	Indicator	Value	Color Coded Scoring Scheme
LOK	Projected LOK Stage for the next two months	Base Flow Sub-Band	M
	Palmer Index for LOK Tributary Conditions	-1.45 (Dry)	M
	CPC Precipitation Outlook	1 month: Above Normal	L
		3 months: Above Normal	L
	LOK Seasonal Net Inflow Forecast	3.58 ft (Normal to Extremely Wet)	L
	AMO warm/El Nino		
	LOK Multi-Seasonal Net Inflow Forecast	5.70 ft (Wet)	L
	AMO warm/El Nino		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (15.58 ft)	L
	WCA 2A: Site 2-17 HW	Below Line 2 (10.41 ft)	H
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (8.89 ft)	L
LEC	Service Area 1	Year-Round Irrigation Rule in effect	L
	Service Area 2	Year-Round Irrigation Rule in effect	L
	Service Area 3	Year-Round Irrigation Rule in effect	L

Note: The water supply risk classification based on the Palmer index, as well as the LOK seasonal and multi-seasonal net inflow forecasts use slightly different classification intervals than those used by the 2008-LORS for classifying the tributary hydrologic condition (THC).

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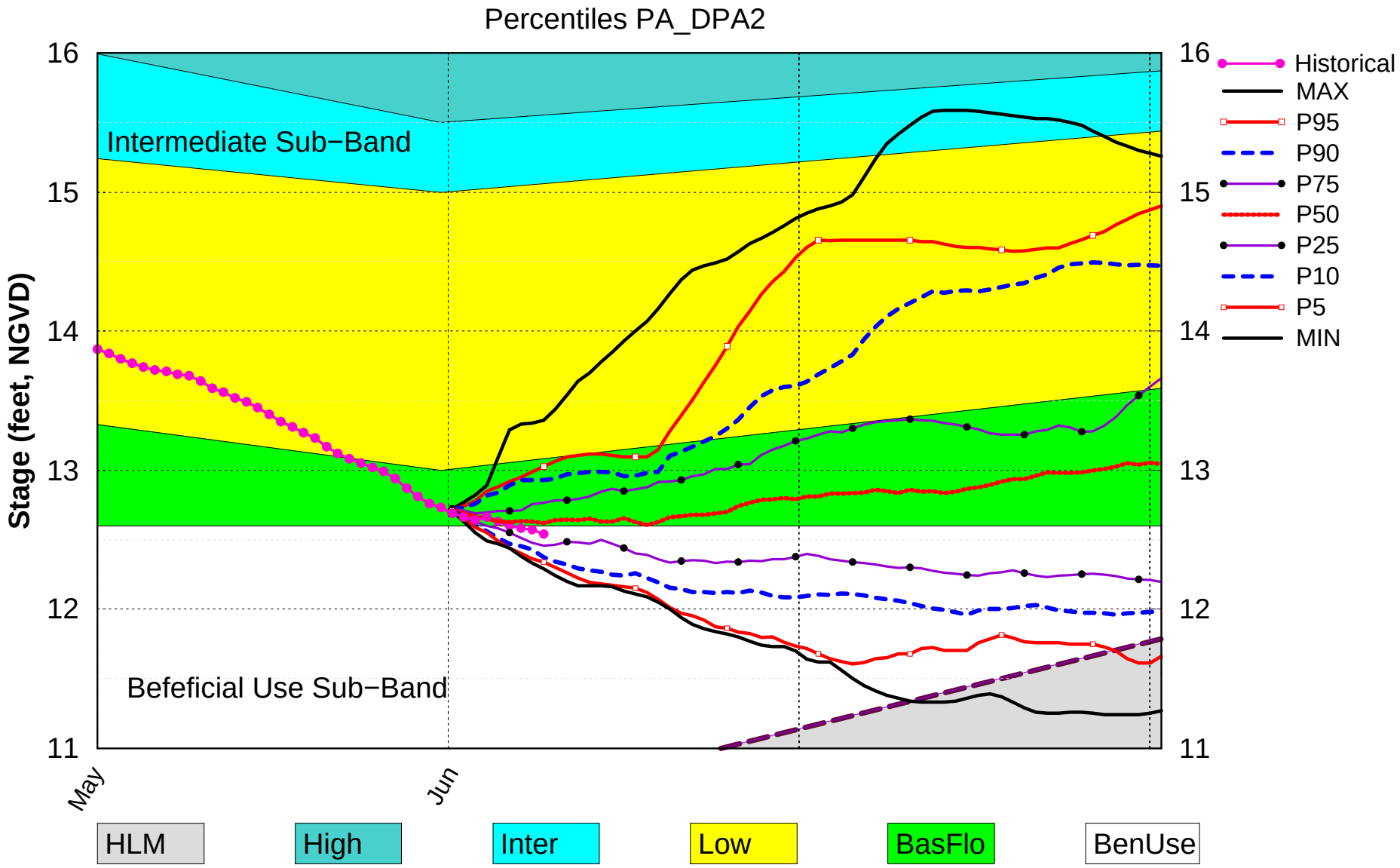
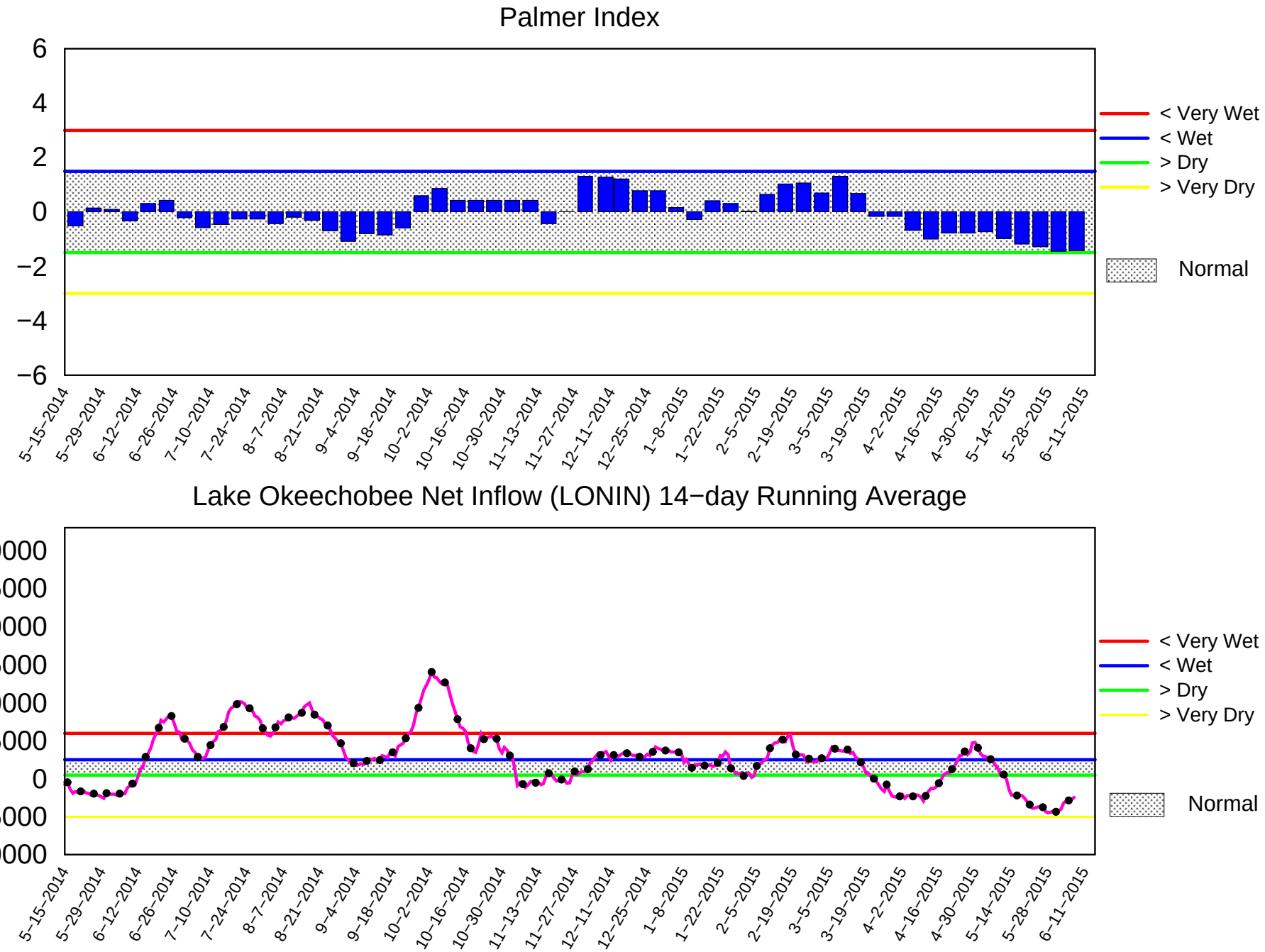
Lake Okeechobee SFWMM June 2015 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Tue Jun 9 10:20:01 2015

Tributary Basin Condition Indicators as of June 8 2015



Mon Jun 08 14:41:45 EDT 2015

2008 LORS

Part C: Establish Allowable Lake Okeechobee Releases to the Water Conservation Areas

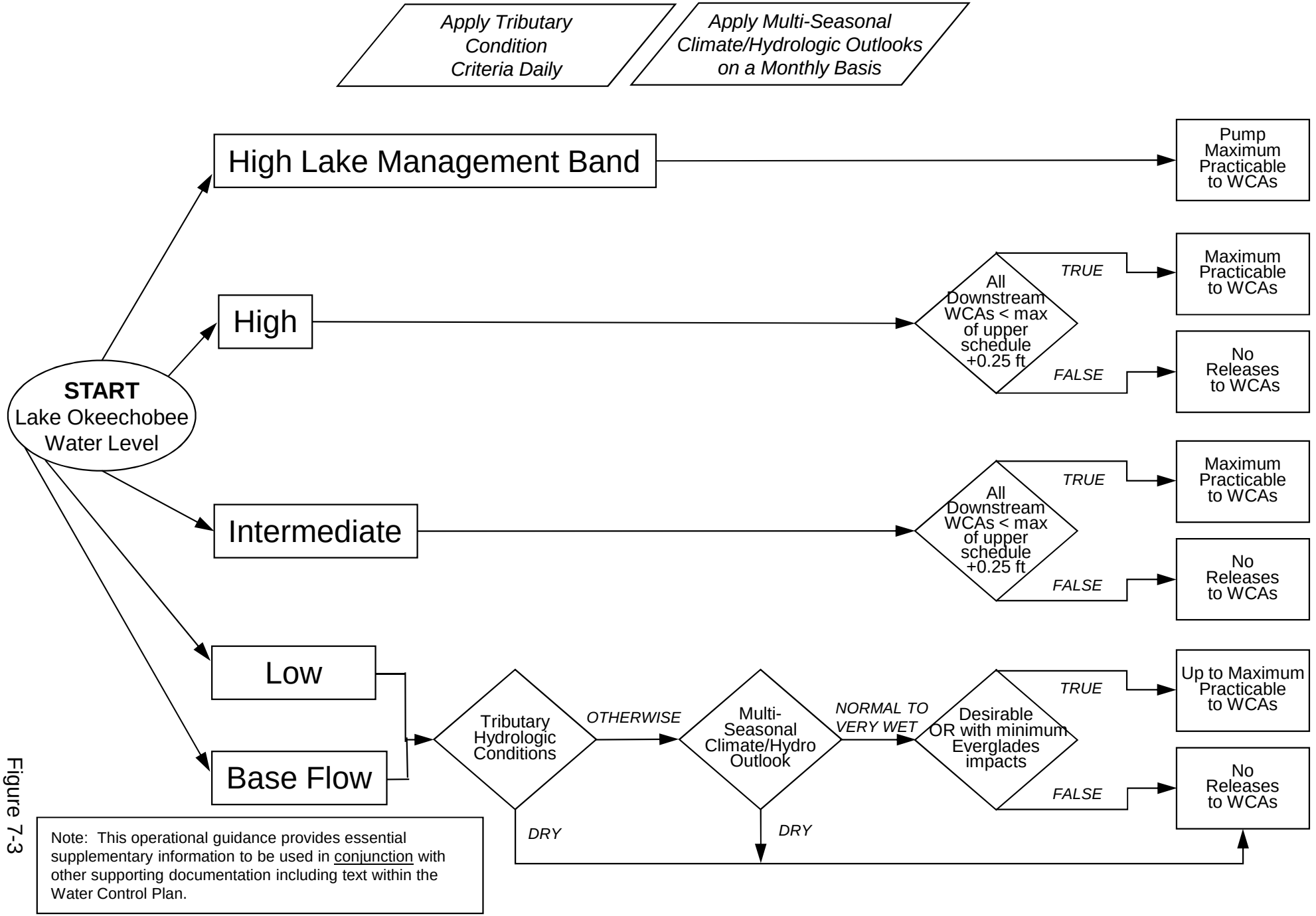


Figure 7-3

Note: This operational guidance provides essential supplementary information to be used in conjunction with other supporting documentation including text within the Water Control Plan.

2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)

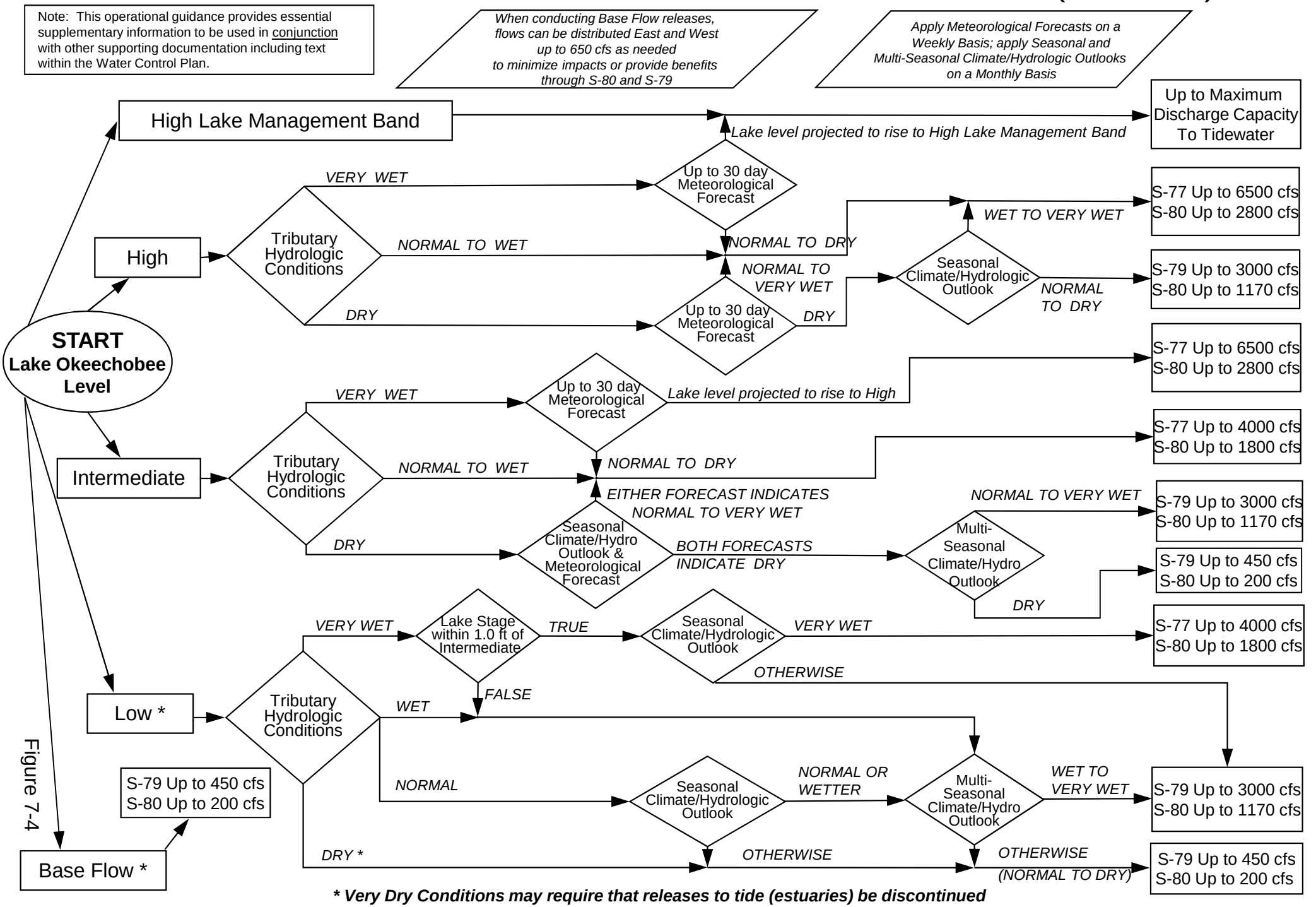
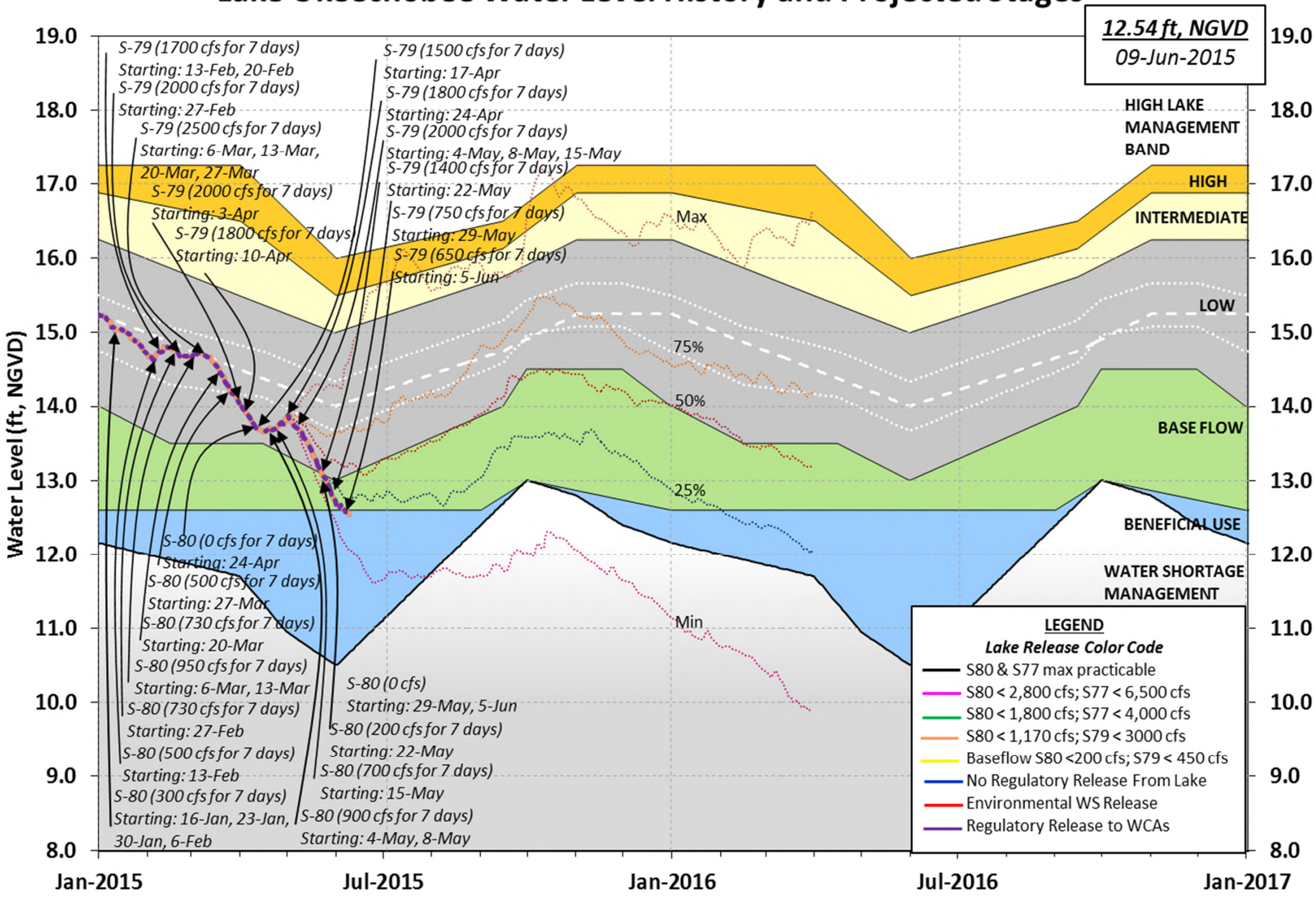


Figure 7-4

Lake Okeechobee Water Level History and Projected Stages



LORS-2008
Adopted by USACE 28-April-2008

Projected Stage Percentiles From
SFWMD-HESM Position Analysis

U. S. Army Corps of Engineers, Jacksonville District
Lake Okeechobee and Vicinity Report
** Preliminary Data - Subject to Revision **

Data Ending 2400 hours 07 JUN 2015

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	12.57	12.32	13.69 (Official Elv)

Bottom of High Lake Mngmt= 16.03 Top of Water Short Mngmt= 10.62
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 11.97
Difference from Average LORS2008 0.60

07JUN (1965-2007) Period of Record Average 13.14
Difference from POR Average -0.57

Today Lake Okeechobee elevation is determined from the 4 Int & 4 Edge stations

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 6.51'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 4.71'
Bridge Clearance = 51.16'

---

4 Interior and 4 Edge Okeechobee Lake Average (Avg-Daily values):

L001	L005	L006	LZ40	S4	S352	S308	S133
12.43	12.70	12.58	12.53	12.65	12.67	12.45	12.51

*Combination Okeechobee Avg-Daily Lake Average = 12.57 (*See Note)

Okeechobee Inflows (cfs):

S65E	338	S191	0	Fisheating Cr	7
S154	0	S133 Pumps	0	S135 Pumps	0
S84	0	S127 Pumps	0	S2 Pumps	0
S71	0	S129 Pumps	0	S3 Pumps	0
S72	0	S131 Pumps	-NR-	S4 Pumps	0
C5	0				

Total Inflows: 345

Okeechobee Outflows (cfs):

S135 Culverts	-NR-	S354	965	S77	1008 (Used)
S127 Culverts	0	S351	1031	S77Below	763 (NOT USED)

```
  S129 Culverts     0      S352            591      S308              0
(Used)
  S131 Culverts            L8 Canal Pt      75      S308Below        32 (NOT
USED)
Total Outflows:   3671

****S77 Structure outflow is being used to compute Total Outflow.
****S308 Structure outflow is being used to compute Total Outflow.

Okeechobee Pan Evaporation (inches):
  S77            0.30      S308          0.25
  Average Pan Evap x 0.75 Pan Coefficient =  0.21" =  0.02'

Lake Average Precipitation using NEXRAD: =  -NR-" =  -NR-'

Evaporation - Precipitation:             =  -NR-" =  -NR-'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to   -NR-
Lake Okeechobee (Change in Storage) Flow is  -1966 cfs or  -3900 AC-FT
_____________________________________________________________________________
_
_____________________________________________________________________________
_


Note: Headwater, tailwater, and stage values below are instantaneous values
      unless otherwise specified.

             Headwater Tailwater         ----------- Gate Positions ---------
---
             Elevation Elevation  Disch   #1   #2   #3   #4   #5   #6   #7
#8
             (ft-msl)  (ft-msl)   (cfs)  (ft) (ft) (ft) (ft) (ft) (ft) (ft)
(ft)
                                (I) see note at bottom
North East Shore
  S133 Pumps:  13.06     12.57       0      0    0    0    0    0  (cfs)
  S193:        ______
  S191:        18.21     12.53       0    0.0  0.0  0.0
  S135 Pumps: ______      -NR-       0      0    0    0    0       (cfs)
  S135 Culverts:                  -NR-   -NR- -NR-

North West Shore
  S65E:        20.99     12.35     338    0.2  0.2  0.2  0.2  0.2  0.0
  S127 Pumps:  13.24     12.60       0      0    0    0    0    0  (cfs)
  S127 Culvert:                      0    0.0

  S129 Pumps:  12.98     12.82       0      0    0    0           (cfs)
  S129 Culvert:                      0    0.1

  S131 Pumps: ______      -NR-     -NR-   -NR- -NR-               (cfs)
  S131 Culvert:

  Fisheating Creek
    nr Palmdale          28.55       7
    nr Lakeport          12.86
```

C5:	12.93	12.70	0	0.0	0.0	0.0					
South Shore											
S4 Pumps:	11.17	12.55	0	0	0	0					(cfs)
S169:	12.53	11.16	0	0.0	0.0	0.0					
S310:	12.47		86								
S3 Pumps:	11.21	12.55	0	0	0	0					(cfs)
S354:	12.55	11.21	965	3.0	3.0						
S2 Pumps:	10.88	12.46	0	0	0	0	0				(cfs)
S351:	12.46	10.88	1031	2.4	2.4	2.4					
S352:	12.69	10.94	591	1.5	1.7						
C10A:	-NR-	12.70		8.5	8.5	8.5	8.5	8.5			
L8 Canal PT		12.54	75								

S351 and S352 Temporary Pumps/S354 Spillway

S351:	10.88	12.46	1031	-NR-	-NR-	-NR-	-NR-	-NR-	-NR-		
S352:	10.94	12.69	591	-NR-	-NR-	-NR-	-NR-				
S354:	11.21	12.55	965	-NR-	-NR-	-NR-	-NR-				

Caloosahatchee River (S77, S78, S79)											
S47B:	14.93	11.18		1.0	1.0						
S47D:	11.20	11.20	27	4.8							
S77:											
Spillway and Sector Flow:											
	12.52	11.27	1006	0.0	3.5	3.5	0.0				
Flow Due to Lockages+:			2								
S77 Below USGS Flow Gage			763								
S78:											
Spillway and Sector Flow:											
	11.07	3.23	694	0.0	0.0	1.0	1.0				
Flow Due to Lockages+:			13								
S79:											
Spillway and Sector Flow:											
	3.24	1.10	1124	0.0	0.0	1.0	1.0	1.0	1.0	0.0	0.0
Flow Due to Lockages+:			4								
Percent of flow from S77			90%								
Chloride		(ppm)	58								
St. Lucie Canal (S308, S80)											
S308:											
Spillway and Sector Flow:											
	12.46	12.34	0	0.0	0.0	0.0	0.0				
Flow Due to Lockages+:			0								
S308 Below USGS Flow Gage			32								
S153:	_____	-NR-	-NR-	0.0	-NR-						
S80:											
Spillway and Sector Flow:											
	12.46	0.65	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Flow Due to Lockages+: 18
Percent of flow from S308 NA %

Steele Point Top Salinity (mg/ml) ****
Steele Point Bottom Salinity (mg/ml) ****

Speedy Point Top Salinity (mg/ml) ****
Speedy Point Bottom Salinity (mg/ml) ****

+ Flow Due to lockages is computed utilizing average daily headwater and tailwater along with total number of lockages for the day to calculate a volume which is then converted to an average discharge in cfs.

Daily Precipitation Totals	1-Day (inches)	3-Day (inches)	7-Day (inches)	----- Wind ----- Direction (Degø)	Speed (mph)
S133 Pump Station:	-NR-	0.00	1.15		
S193:	-NR-	0.00	0.00	-NR-	-NR-
Okeechobee Field Station:	-NR-	0.00	0.00		
S135 Pump Station:	-NR-	0.00	1.07		
S127 Pump Station:	-NR-	0.00	1.12		
S129 Pump Station:	-NR-	0.00	0.34		
S131 Pump Station:	-NR-	0.00	1.62		
S77:	0.00	0.16	0.40	198	1
S78:	0.00	0.00	0.02	340	2
S79:	1.53	1.53	2.26	163	1
S4 Pump Station:	-NR-	0.00	0.00		
Clewiston Field Station:	-NR-	0.00	0.00		
S3 Pump Station:	-NR-	0.00	0.44		
S2 Pump Station:	-NR-	0.00	0.25		
S308:	0.01	0.19	2.05	46	2
S80:	0.00	0.00	0.04	100	0
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.03	0.65		
Oke Nexrad Basin Avg	-NR-	0.00	0.97		

Okeechobee Lake Elevations			07 JUN 2015	12.57 Difference from 07JUN15
07JUN15	-1 Day =	06 JUN 2015	12.58	0.01
07JUN15	-2 Days =	05 JUN 2015	12.60	0.03
07JUN15	-3 Days =	04 JUN 2015	12.63	0.06
07JUN15	-4 Days =	03 JUN 2015	12.66	0.09
07JUN15	-5 Days =	02 JUN 2015	12.64	0.07
07JUN15	-6 Days =	01 JUN 2015	12.66	0.09
07JUN15	-7 Days =	31 MAY 2015	12.69	0.12
07JUN15	-30 Days =	08 MAY 2015	13.68	1.11
07JUN15	-1 Year =	07 JUN 2014	12.32	-0.25
07JUN15	-2 Year =	07 JUN 2013	13.69	1.12

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = -NR-

Lake Okeechobee Net Inflow (LONIN)

		Average Flow over the previous 14 days			Avg-Daily Flow
07JUN15	Today =	07 JUN 2015	-2322	MON	1702
07JUN15	-1 Day =	06 JUN 2015	-2678	SUN	-279
07JUN15	-2 Days =	05 JUN 2015	-2805	SAT	-NR-
07JUN15	-3 Days =	04 JUN 2015	-2850	FRI	-2405
07JUN15	-4 Days =	03 JUN 2015	-3047	THU	6629
07JUN15	-5 Days =	02 JUN 2015	-4070	WED	-428
07JUN15	-6 Days =	01 JUN 2015	-4263	TUE	-1868
07JUN15	-7 Days =	31 MAY 2015	-4369	MON	-3551
07JUN15	-8 Days =	30 MAY 2015	-4303	SUN	-NR-
07JUN15	-9 Days =	29 MAY 2015	-4318	SAT	-4861
07JUN15	-10 Days =	28 MAY 2015	-4321	FRI	-6445
07JUN15	-11 Days =	27 MAY 2015	-4113	THU	-8431
07JUN15	-12 Days =	26 MAY 2015	-3629	WED	-5382
07JUN15	-13 Days =	25 MAY 2015	-3541	TUE	-2551

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
07JUN15	Today=	07 JUN 2015	340	MON	338
07JUN15	-1 Day =	06 JUN 2015	343	SUN	232
07JUN15	-2 Days =	05 JUN 2015	367	SAT	-NR-
07JUN15	-3 Days =	04 JUN 2015	357	FRI	381
07JUN15	-4 Days =	03 JUN 2015	362	THU	515
07JUN15	-5 Days =	02 JUN 2015	362	WED	287
07JUN15	-6 Days =	01 JUN 2015	376	TUE	287
07JUN15	-7 Days =	31 MAY 2015	396	MON	287
07JUN15	-8 Days =	30 MAY 2015	389	SUN	-NR-
07JUN15	-9 Days =	29 MAY 2015	373	SAT	337
07JUN15	-10 Days =	28 MAY 2015	381	FRI	320
07JUN15	-11 Days =	27 MAY 2015	391	THU	261
07JUN15	-12 Days =	26 MAY 2015	407	WED	377
07JUN15	-13 Days =	25 MAY 2015	432	TUE	456

Lake Okeechobee Outlets Last 14 Days

DATE	S-77 Discharge (0700-2100) (AC-FT)	S-77 Discharge (ALL DAY) (AC-FT)	Below S-77 Discharge (ALL-DAY) (AC-FT)	S-78 Discharge (0700-2100) (AC-FT)	S-78 Discharge (ALL DAY) (AC-FT)	S-79 Discharge (ALL DAY) (AC-FT)
07 JUN 2015	1206	-NA-	1513	819	1401	2237
06 JUN 2015	1147	-NA-	1502	812	1396	2151
05 JUN 2015	1576	-NA-	2055	804	1377	2184
04 JUN 2015	998	-NA-	1126	809	1376	2335
03 JUN 2015	1009	-NA-	1409	817	1402	2215
02 JUN 2015	1410	-NA-	1947	810	1378	1768
01 JUN 2015	1327	-NA-	1786	811	1402	1794
31 MAY 2015	1382	-NA-	2030	992	1751	2046

30 MAY 2015	1768	-NA-	2382	1132	1786	2249
29 MAY 2015	1112	-NA-	1886	633	1402	1542
28 MAY 2015	1167	-NA-	2045	634	1417	1329
27 MAY 2015	1166	-NA-	2141	635	1417	1602
26 MAY 2015	1156	-NA-	1862	617	1526	2044
25 MAY 2015	994	-NA-	1509	897	1989	2551

DATE	S-310 Discharge (ALL DAY) (AC-FT)	S-351 Discharge (ALL DAY) (AC-FT)	S-352 Discharge (ALL DAY) (AC-FT)	S-354 Discharge (ALL DAY) (AC-FT)	L8 Canal Pt Discharge (ALL DAY) (AC-FT)
07 JUN 2015	170	2044	1172	1914	150
06 JUN 2015	164	1935	1253	1935	68
05 JUN 2015	149	-NR-	-NR-	-NR-	122
04 JUN 2015	106	1886	1037	1791	157
03 JUN 2015	84	1491	664	1493	55
02 JUN 2015	103	1838	1122	1327	122
01 JUN 2015	159	2378	1392	1654	129
31 MAY 2015	175	2514	1503	1931	70
30 MAY 2015	154	-NR-	-NR-	-NR-	128
29 MAY 2015	176	3107	1682	2288	156
28 MAY 2015	162	3159	1697	2320	333
27 MAY 2015	182	2976	1662	2384	381
26 MAY 2015	177	2481	1202	2048	337
25 MAY 2015	78	1906	605	1878	299

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
07 JUN 2015	0	64	36
06 JUN 2015	0	51	40
05 JUN 2015	0	168	30
04 JUN 2015	111	139	31
03 JUN 2015	0	160	27
02 JUN 2015	1	110	-NR-
01 JUN 2015	1	81	48
31 MAY 2015	0	14	45
30 MAY 2015	127	181	45
29 MAY 2015	130	347	54
28 MAY 2015	1	141	-NR-
27 MAY 2015	298	405	107
26 MAY 2015	325	415	340
25 MAY 2015	433	538	562

*** NOTE: 1) Discharge from (0700-2100) is computed using Spillway and Sector
Gate Discharges from 0700 hrs to 2100 hrs.
2) Discharge (ALL DAY) is computed using Spillway, Sector Gate and
Lockages Discharges from 0015 hrs to 2400 hrs.

(I) - Flows preceeded by "I" signify an instantaneous
flow computed from the single value reported for the day

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* On 11 May 1999, Lake Okeechobee Elevation was switched from Instantaneous 2400 value to an average-daily lake average.
On 14 Mar 2001, due to the isolation of various gages within the standard
10 stations, the average of the interior 4 station gages was used as the Lake Okeechobee Elevation.
On 05 November 2010, Lake Okeechobee Elevation was switched to a 9 gage mix of interior and edge gages to obtain a more reliable representation of the lake level.
On 09 May 2011, Lake Okeechobee Elevation was switched to a 8 gage mix of interior and edge gages to obtain a more reliable representation of the lake level due to isolation of S135 from low lake levels.
Today Lake Okechobee elevation is determined from the 4 Int & 4 Edge stations
++ For more information see the Jacksonville District Navigation website at http://www.saj.usace.army.mil/
$ For information regarding Lake Okeechobee Service Area water restrictions
please refer to www.sfwmd.gov

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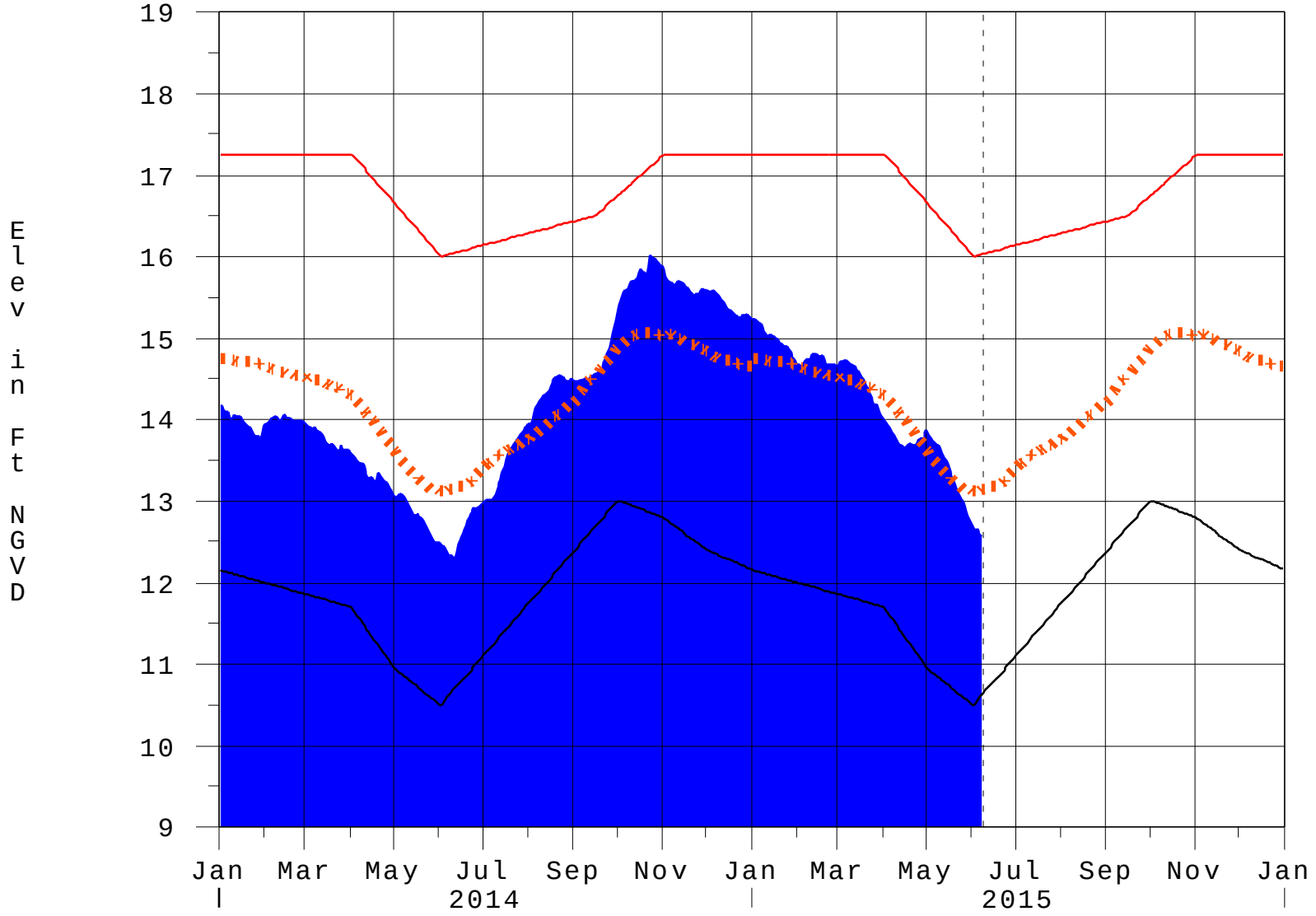
Report Generated 08JUN2015 @ 11:06 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

08JUN15 10:49:08



High Lake Management
Okeechobee Avg Elev
Average Elev [1965-2007]
Water Shortage Management

Classification Tables

Supplemental Tables used in conjunction with the LORS2008 Release

Guidance Flow Charts

- Class Limits for Tributary Hydrologic Conditions

Table K-2 in the Lake Okeechobee Water Control Plan

- 6-15 Day Precipitation Outlook Categories

Table ?? in the Lake Okeechobee Water Control Plan

- Classification of Lake Okeechobee Net Inflow for Seasonal Outlook

Table K-3 in the Lake Okeechobee Water Control Plan

- Classification of Lake Okeechobee Net Inflow for Multi-Seasonal Outlook

Table K-4 in the Lake Okeechobee Water Control Plan

Back to Lake Okeechobee Operations Main Page

Back to U.S. Army Corps of Engineers Lake Okeechobee Operations Homepage

Tributary Hydrologic Classification*	Palmer Index Class Limits	2-wk Mean L.O. Net Inflow Class Limits
Very Wet	3.0 or greater	Greater >= 6000 cfs
Wet	1.5 to 2.99	2500 - 5999 cfs
Near Normal	-1.49 to 1.49	500 - 2499 cfs
Dry	-2.99 to -1.5	-5000 – 500 cfs
Very Dry	-3.0 or less	Less than -5000 cfs

* use the wettest of the two indicators

Classification of Lake Okeechobee Net Inflow Seasonal Outlook*

Lake Net Inflow Prediction [million acre-feet]	Equivalent Depth** [feet]	Lake Okeechobee Net Inflow Seasonal Outlook
> 0.93	> 2.0	Very Wet
0.71 to 0.93	1.51 to 2.0	Wet
0.35 to 0.70	0.75 to 1.5	Normal
< 0.35	< 0.75	Dry

****Volume-depth conversion based on average lake surface area of 467,000 acres**

Classification of Lake Okeechobee Net Inflow Multi-Seasonal Outlook*

Lake Net Inflow Prediction [million acre-feet]	**Equivalent Depth** [feet]**	**Lake Okeechobee Net Inflow Multi-Seasonal Outlook**
> 2.0	> 4.3	Very Wet
1.18 to 2.0	2.51 to 4.3	Wet
0.5 to 1.17	1.1 to 2.5	Normal
< 0.5	< 1.1	Dry

****Volume-depth conversion based on average lake surface area of 467,000 acres**

6-15 Day Precipitation Outlook Categories*

6-15 Day Precipitation Outlook Categories	WSE Decision Tree Categories
Above Normal	Wet to Very Wet
Normal	Normal
Below Normal	Dry

*** Corresponds to Table 7-6 in the Lake Okeechobee Water Control Plan**

Under Construction