Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 7/30/2018 (ENSO Neutral 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 Neutral years[3] and a sub-sampling of warm years of the Atlantic Multi-decadal Oscillation (AMO) in combination with La Nina ENSO 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 Years[3]		Sub-sampling of AMO Warm + ENSO Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Jul-Dec)	N/A	N/A	2.62	Very Wet	2.93	Very Wet	2.21	Very Wet
Multi Seasonal (Jul-Apr)	N/A	N/A	3.07	Wet	3.69	Wet	1.87	Normal

*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.

**Sub-sampling is a weighted average of ENSO conditions based on the ENSO forecast used.

Tributary Hydrologic Conditions Graph:

3129 cfs 14-day running average for Lake Okeechobee Net Inflow through 7/29/2018.
According to the classification in Tributary Hydrologic Conditions table, this condition is Wet.

1.66 for Palmer Index on 7/28/2018.
According to the classification in Tributary Hydrologic Conditions table, this condition is Wet.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 7/29/2018

Lake Okeechobee Stage: **14.33 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		16.27	
Operational Band	High sub-band	15.84	
	Intermediate sub-band	15.41	
	Low sub-band	13.55	← 14.33
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.70	
Water Shortage Management Band			

Part C of LORS2008: Discharge to WCA's

Release Guidance Flow Chart Outcome: Up to maximum practicable releases to the WCAs if desirable or with minimum everglades impacts; otherwise no releases.

Part D of LORS2008: Discharge to Tidewater

Release Guidance Flow Chart Outcome: S-79 Up to 3000 cfs & S-80 Up to 1170 cfs.

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LORS2008 Implementation on 7/30/2018 (ENSO Neutral Condition):

Status for week ending 7/30/2018:

District wide, Raindar rainfall was 1.86 inches for the week. Lake stage on 7/29/2018 was 14.33 ft, NGVD, down 0.0 ft from last week.

The updated July 2018 SFWMM Dynamic Position Analysis percentile graph for Lake Okeechobee show that the current lake stage is in the Low Sub-Band.

The 2008 LORS Tributary Hydrologic Condition (THC) is classified as **Wet**. The PDSI indicates wet conditions and the LONIN is wet. The THC classification is based on the wetter of the two indices .

Water Supply Risk Evaluation

Area	Indicator	Value	Color Coded Scoring Scheme
LOK	Projected LOK Stage for the next two months	Low Sub Band	L
	Palmer Index for LOK Tributary Conditions	1.66 (Normal to Extremely Wet)	L
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Outlook	2.93 ft (Normal to Extremely Wet)	L
	ENSO Years		
	LOK Multi-Seasonal Net Inflow Outlook	3.69 ft (Wet)	L
	ENSO Conditions		
WCAs	WCA 1: Station Average (Site 1-7, Site 1-8T, Site 1-9)	Above Line 1 (16.27 ft)	L
	WCA 2A: Site 2-17	Above Line 1 (13.57 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.60 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 outlooks use slightly different classification intervals than those used by the 2008-LORS.

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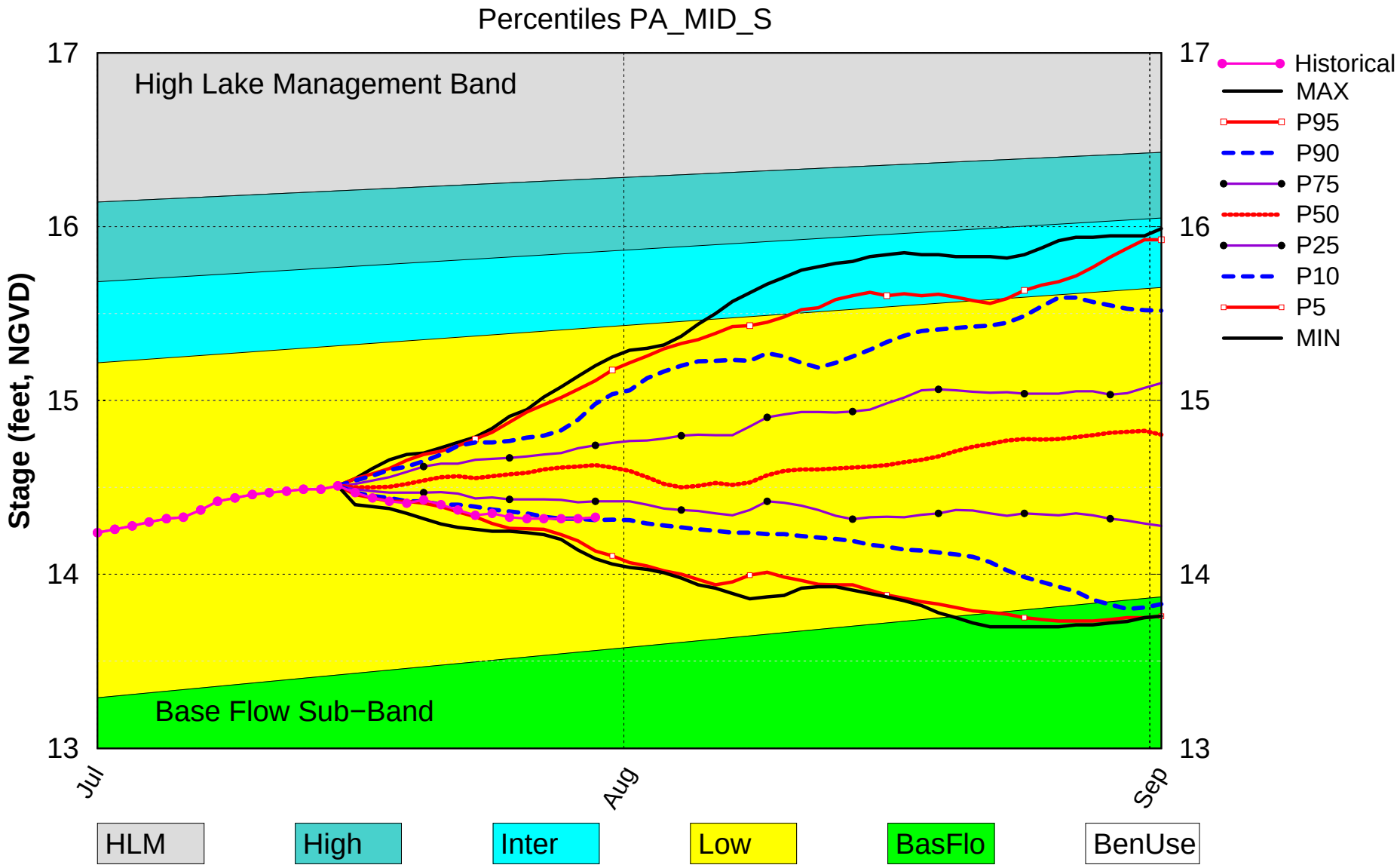
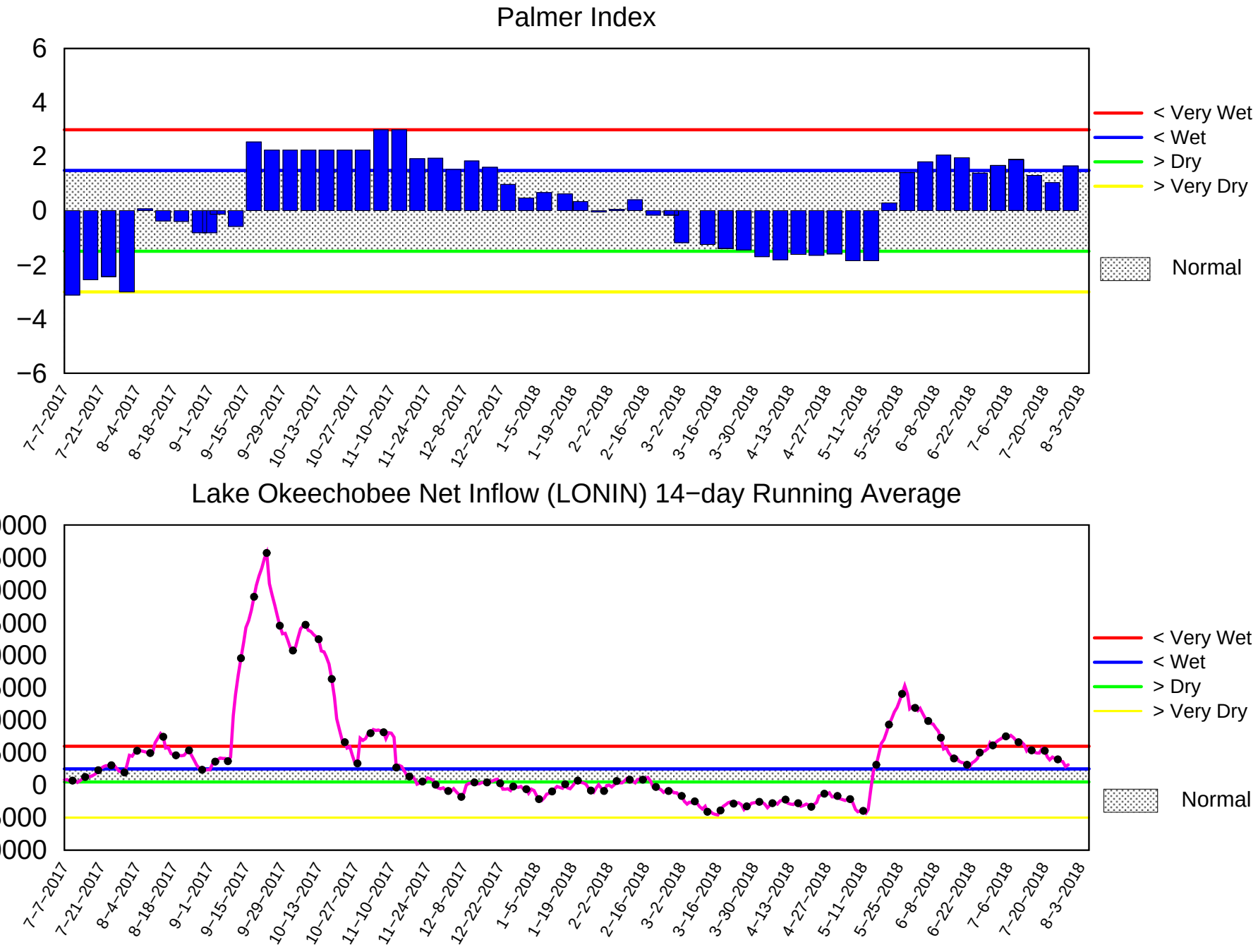
Lake Okeechobee SFWMM July 15 2018 Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Jul 30 13:29:09 EDT 2018

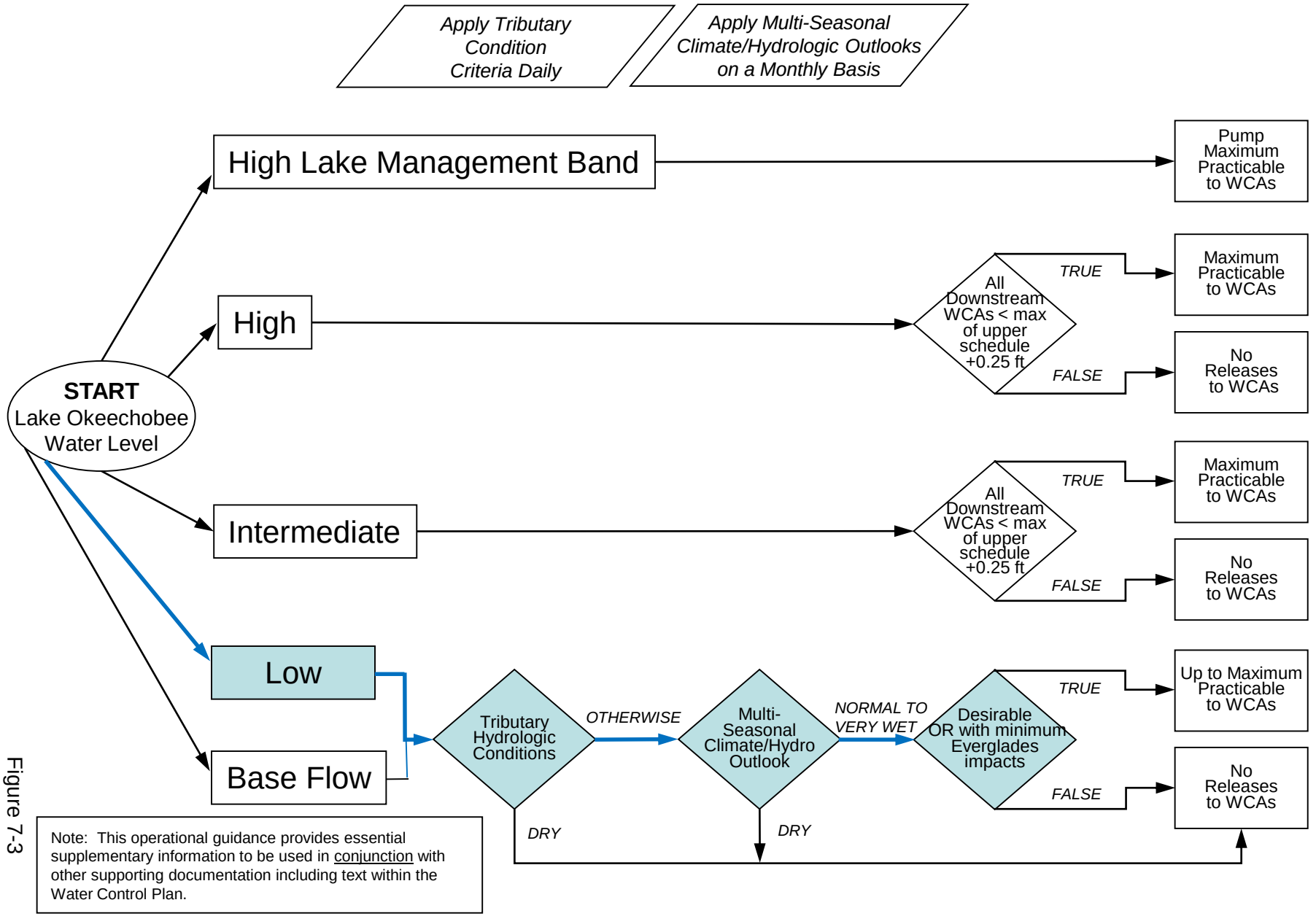
Tributary Basin Condition Indicators as of July 30 2018



Mon Jul 30 13:27:12 EDT 2018

2008 LORS

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



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

Figure 7-3

2008 LORS

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

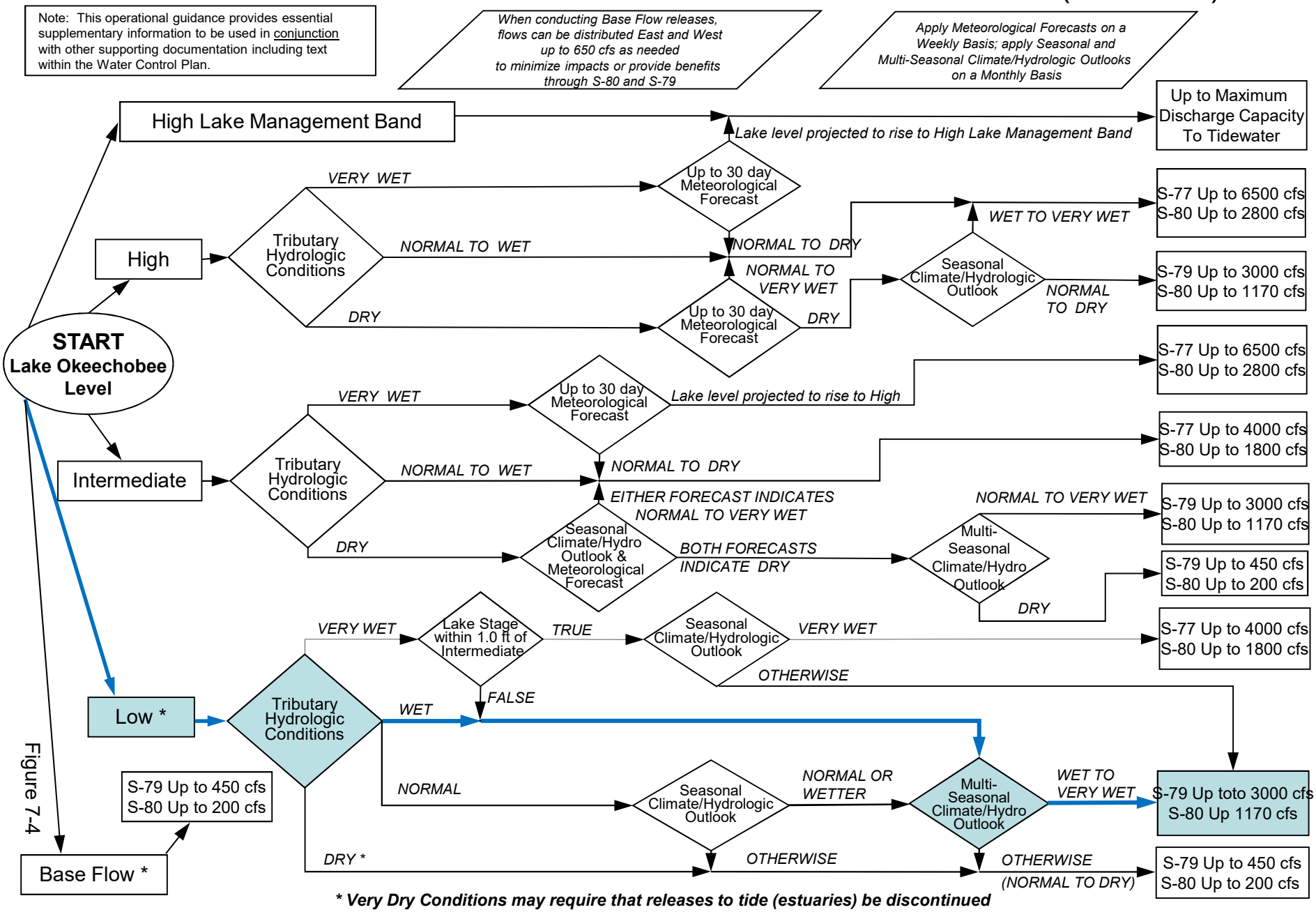
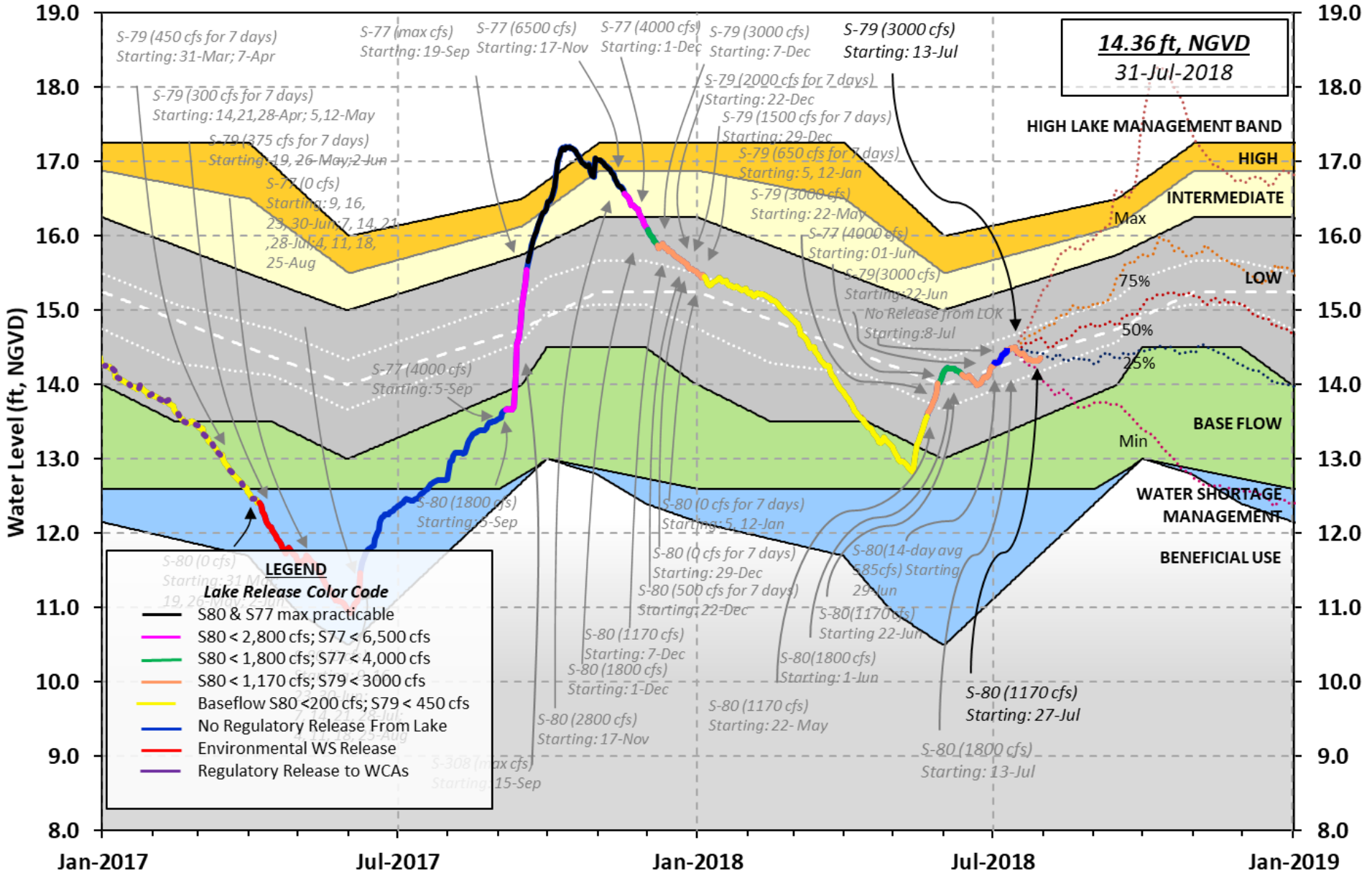


Figure 7-4

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 29 JUL 2018

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)	
*Okeechobee Lake Elevation	14.33	12.72	14.69	(Official Elv)

Bottom of High Lake Mngmt= 16.27 Top of Water Short Mngmt= 11.70
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.66
Difference from Average LORS2008 1.67

29JUL (1965-2007) Period of Record Average 13.74
Difference from POR Average 0.59

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.27'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.47'
Bridge Clearance = 49.49'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.35	14.40	14.32	14.26	14.31	14.45	14.25	14.31

*Combination Okeechobee Avg-Daily Lake Average = 14.33 (*See Note)

Okeechobee Inflows (cfs):

S65E	0	S65EX1	3023	Fisheating Cr	727
S154	53	S191	40	S135 Pumps	0
S84	0	S133 Pumps	0	S2 Pumps	0
S84X	484	S127 Pumps	0	S3 Pumps	0
S71	354	S129 Pumps	0	S4 Pumps	0
S72	36	S131 Pumps	0	C5	0

Total Inflows: 4716

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	393	S77	527
S127 Culverts	0	S351	389	S308	0
S129 Culverts	0	S352	0		
S131 Culverts	0	L8 Canal Pt	4		

Total Outflows: 1314

****S77 structure flow is being used to compute Total Outflow.
****S308 structure flow is being used to compute Total Outflow.

Okeechobee Pan Evaporation (inches):
  S77 0.17 S308 0.10
  Average Pan Evap x 0.75 Pan Coefficient = 0.10" = 0.01'

Lake Average Precipitation using NEXRAD: = 0.22" = 0.02'

Evaporation - Precipitation: = -0.12" = -0.01'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to 2331 cfs into the lake.
Lake Okeechobee (Change in Storage) Flow is 2118 cfs or 4200 AC-FT

	Headwater Elevation (ft-msl)	Tailwater Elevation (ft-msl)	Disch (cfs)	Gate Positions #1 (ft)	#2 (ft)	#3 (ft)	#4 (ft)	#5 (ft)	#6 (ft)	#7 (ft)	#8 (ft)
			(I) see note at bottom								
North East Shore											
S133 Pumps:	13.57	14.40	0	0	0	0	0	0	(cfs)		
S193:											
S191:	18.37	14.37	40	0.0	0.0	0.0					
S135 Pumps:	13.23	14.24	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	21.17	14.49	0	0.0	0.0	0.0	0.0	0.0	0.0		
S65EX1:	21.17	14.49	3023								
S127 Pumps:	13.74	14.33	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.99	14.35	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	13.02	14.39	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek											
nr Palmdale		32.77	727								
nr Lakeport											
C5:		-NR-	0	-NR-	-NR-	-NR-					
South Shore											
S4 Pumps:	12.64	14.32	0	0	0	0			(cfs)		
S169:	14.29	12.64	0	0.0	0.0	0.0					
S310:	14.23		-126								

S3 Pumps:	10.03	14.34	0	0	0	0			(cfs)
S354:	14.34	10.03	393	0.6	0.8				
S2 Pumps:	10.36	14.37	0	0	0	0	0		(cfs)
S351:	14.37	10.36	389	0.6	0.5	0.4			
S352:	14.43	9.81	0	0.0	0.0				
C10A:	-NR-	14.15		8.0	8.0	8.0	0.0	0.0	
L8 Canal PT		13.99	4						

S351 and S352 Temporary Pumps/S354 Spillway

S351:	10.36	14.37	389	-NR--NR--NR--NR--NR--NR-
S352:	9.81	14.43	0	-NR--NR--NR--NR-
S354:	10.03	14.34	393	-NR--NR--NR--NR-

Caloosahatchee River (S77, S78, S79)

S47B:	13.74	12.06		0.5	0.5							
S47D:	11.37	11.38	-7	6.5								
S77:												
Spillway and Sector Flow:												
	14.46	11.27	524.00	0.0	0.0	0.0	0.0					
Flow Due to Lockages+:			3									
S77 Below USGS Flow Gage			702									
S78:												
Spillway and Sector Flow:												
	11.19	3.45	1611	0.0	0.0	4.5	0.0					
Flow Due to Lockages+:			13									
S79:												
Spillway and Sector Flow:												
	3.39	1.14	3878	2.0	2.0	3.0	3.0	3.0	2.0	1.0	0.0	
Flow Due to Lockages+:			4									
Percent of flow from S77			14%									
Chloride		(ppm)	45									

St. Lucie Canal (S308, S80)

S308:												
Spillway and Sector Flow:												
	14.24	14.01	0.00	0.0	0.0	0.0	0.0					
Flow Due to Lockages+:			0									
S308 Below USGS Flow Gage			34									
S153:	18.67	13.83	46	0.5	0.0							
S80:												
Spillway and Sector Flow:												
	14.05	0.73	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Flow Due to Lockages+:			12									
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	0.00		
S193:	-NR-	0.00	0.00	-NR-	-NR-
Okeechobee Field Station:	-NR-	0.00	0.00		
S135 Pump Station:	-NR-	0.00	0.00		
S127 Pump Station:	-NR-	0.00	0.00		
S129 Pump Station:	-NR-	0.00	0.00		
S131 Pump Station:	-NR-	0.00	0.00		
S77:	0.13	0.31	1.36	185	2
S78:	0.49	2.62	4.07	185	1
S79:	2.49	2.66	3.03	270	0
S4 Pump Station:	-NR-	0.00	0.00		
Clewiston Field Station:	-NR-	0.00	0.00		
S3 Pump Station:	-NR-	0.00	0.00		
S2 Pump Station:	-NR-	0.00	0.00		
S308:	0.02	0.05	0.10	82	4
S80:	0.00	0.00	0.00	98	1
Okeechobee Average (Sites S78, S79 and S80 not included)	0.08	0.03	0.11		
Oke Nexrad Basin Avg	0.22	0.54	1.39		

Okeechobee Lake Elevations	29 JUL 2018	14.33	Difference from 29JUL18
29JUL18 -1 Day =	28 JUL 2018	14.32	-0.01
29JUL18 -2 Days =	27 JUL 2018	14.32	-0.01
29JUL18 -3 Days =	26 JUL 2018	14.32	-0.01
29JUL18 -4 Days =	25 JUL 2018	14.32	-0.01
29JUL18 -5 Days =	24 JUL 2018	14.33	0.00
29JUL18 -6 Days =	23 JUL 2018	14.35	0.02
29JUL18 -7 Days =	22 JUL 2018	14.34	0.01
29JUL18 -30 Days =	29 JUN 2018	14.21	-0.12
29JUL18 -1 Year =	29 JUL 2017	12.72	-1.61
29JUL18 -2 Year =	29 JUL 2016	14.69	0.36

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = 4.52

Lake Okeechobee Net Inflow (LONIN)

		Average Flow over the previous 14 days			Avg-Daily Flow
29JUL18	Today =	29 JUL 2018	3125	MON	3428
29JUL18	-1 Day =	28 JUL 2018	2874	SUN	2416
29JUL18	-2 Days =	27 JUL 2018	3605	SAT	2149
29JUL18	-3 Days =	26 JUL 2018	3778	FRI	1178
29JUL18	-4 Days =	25 JUL 2018	3941	THU	846
29JUL18	-5 Days =	24 JUL 2018	4082	WED	126
29JUL18	-6 Days =	23 JUL 2018	4242	TUE	8916
29JUL18	-7 Days =	22 JUL 2018	3924	MON	348
29JUL18	-8 Days =	21 JUL 2018	4209	SUN	131
29JUL18	-9 Days =	20 JUL 2018	4963	SAT	1188
29JUL18	-10 Days =	19 JUL 2018	5483	FRI	12383
29JUL18	-11 Days =	18 JUL 2018	4794	THU	6451
29JUL18	-12 Days =	17 JUL 2018	4752	WED	3190
29JUL18	-13 Days =	16 JUL 2018	4903	TUE	1001

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
29JUL18	Today=	29 JUL 2018	0	MON	0
29JUL18	-1 Day =	28 JUL 2018	0	SUN	0
29JUL18	-2 Days =	27 JUL 2018	0	SAT	0
29JUL18	-3 Days =	26 JUL 2018	0	FRI	0
29JUL18	-4 Days =	25 JUL 2018	0	THU	0
29JUL18	-5 Days =	24 JUL 2018	0	WED	0
29JUL18	-6 Days =	23 JUL 2018	0	TUE	0
29JUL18	-7 Days =	22 JUL 2018	0	MON	0
29JUL18	-8 Days =	21 JUL 2018	0	SUN	0
29JUL18	-9 Days =	20 JUL 2018	0	SAT	0
29JUL18	-10 Days =	19 JUL 2018	0	FRI	0
29JUL18	-11 Days =	18 JUL 2018	0	THU	0
29JUL18	-12 Days =	17 JUL 2018	0	WED	0
29JUL18	-13 Days =	16 JUL 2018	0	TUE	0

S65EX1

		Average Flow over previous 14 days			Avg-Daily Flow
29JUL18	Today=	29 JUL 2018	2582	MON	3023
29JUL18	-1 Day =	28 JUL 2018	2580	SUN	2592
29JUL18	-2 Days =	27 JUL 2018	2594	SAT	2269
29JUL18	-3 Days =	26 JUL 2018	2614	FRI	2270
29JUL18	-4 Days =	25 JUL 2018	2603	THU	2161
29JUL18	-5 Days =	24 JUL 2018	2600	WED	2213
29JUL18	-6 Days =	23 JUL 2018	2593	TUE	2271
29JUL18	-7 Days =	22 JUL 2018	2583	MON	2371
29JUL18	-8 Days =	21 JUL 2018	2571	SUN	2510
29JUL18	-9 Days =	20 JUL 2018	2549	SAT	2601
29JUL18	-10 Days =	19 JUL 2018	2510	FRI	2737
29JUL18	-11 Days =	18 JUL 2018	2464	THU	3012
29JUL18	-12 Days =	17 JUL 2018	2385	WED	3016
29JUL18	-13 Days =	16 JUL 2018	2296	TUE	3106

Lake Okeechobee Outlets Last 14 Days

DATE	S-77 Discharge (ALL DAY) (AC-FT)	Below S-77 Discharge (ALL-DAY) (AC-FT)	S-78 Discharge (ALL DAY) (AC-FT)	S-79 Discharge (ALL DAY) (AC-FT)
29 JUL 2018	1016	1393	3194	7710
28 JUL 2018	3130	3222	3531	6670
27 JUL 2018	2605	2752	-NR-	5793
26 JUL 2018	922	1094	-NR-	4110
25 JUL 2018	4627	4356	-NR-	6526
24 JUL 2018	6119	5870	5515	9096
23 JUL 2018	6813	5672	-NR-	8286
22 JUL 2018	8284	5957	-NR-	7966
21 JUL 2018	7779	5781	-NR-	7737
20 JUL 2018	6535	6101	-NR-	8357
19 JUL 2018	6800	6506	-NR-	9024
18 JUL 2018	6703	6728	-NR-	10209
17 JUL 2018	6753	6693	-NR-	10502
16 JUL 2018	7377	7593	-NR-	13556

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)
29 JUL 2018	-250	771	0	708	9
28 JUL 2018	-287	752	0	180	8
27 JUL 2018	-163	157	0	79	7
26 JUL 2018	28	476	0	827	-7
25 JUL 2018	61	10	0	1031	9
24 JUL 2018	17	49	0	1130	-7
23 JUL 2018	21	307	0	1660	-2
22 JUL 2018	112	695	14	1612	-8
21 JUL 2018	89	523	18	1822	-7
20 JUL 2018	209	1880	226	1898	-5
19 JUL 2018	186	1607	149	1093	-3
18 JUL 2018	67	1040	0	301	-6
17 JUL 2018	37	1015	0	976	-8
16 JUL 2018	76	997	0	1333	5

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
29 JUL 2018	1	67	24
28 JUL 2018	667	963	692
27 JUL 2018	1480	1981	1616
26 JUL 2018	0	73	20
25 JUL 2018	1	41	12
24 JUL 2018	1258	1052	1005
23 JUL 2018	4043	4334	3912
22 JUL 2018	4314	4346	3939
21 JUL 2018	4359	4556	3953
20 JUL 2018	4461	4706	3925
19 JUL 2018	4466	4810	3938
18 JUL 2018	4613	4549	3944
17 JUL 2018	4264	4431	3950

16 JUL 2018 4248 4391 3775

*** NOTE: 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

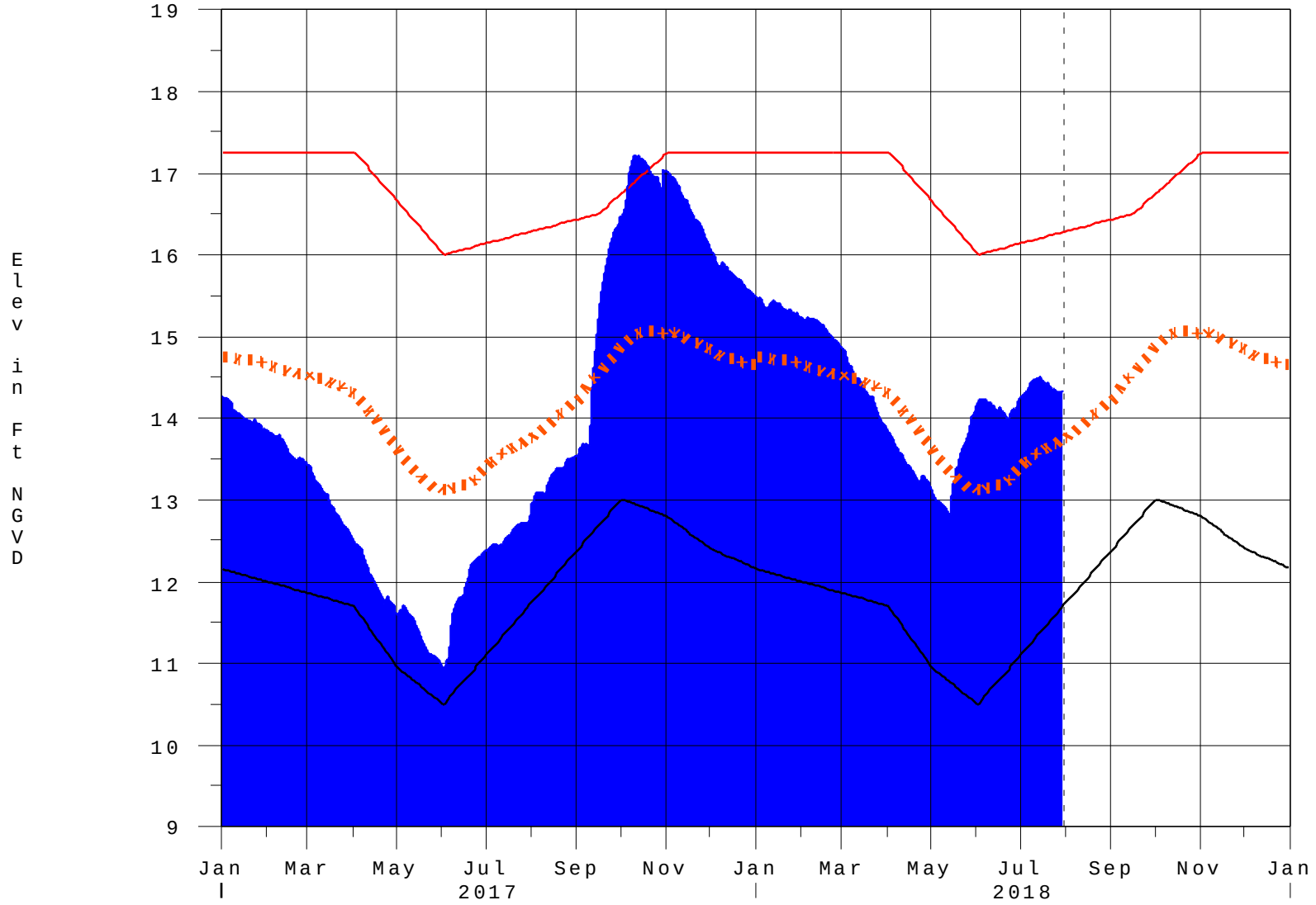
---

* 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

Report Generated 30JUL2018 @ 13:15 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

30JUL18 13:17:20



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

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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