Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 7/9/2018 (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	2.58	Very Wet	3.09	Very Wet	2.12	Very Wet
Multi Seasonal (Jul-Apr)	N/A	N/A	3.03	Wet	3.60	Wet	1.79	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:

7348 cfs 14-day running average for Lake Okeechobee Net Inflow through 7/8/2018.
According to the classification in Tributary Hydrologic Conditions table, this condition is Very Wet.

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

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 7/9/2018

Lake Okeechobee Stage: **14.44 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		16.17	
Operational Band	High sub-band	15.72	
	Intermediate sub-band	15.27	
	Low sub-band	13.36	← 14.44
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.26	
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-77 Up to 4000 cfs & S-80 Up to 1800 cfs.

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LORS2008 Implementation on 7/9/2018 (ENSO Neutral Condition):

Status for week ending 7/9/2018:

District wide, Raindar rainfall was 1.92 inches for the week. Lake stage on 7/9/2018 was 14.44 ft, NGVD, up 0.18 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 Flow Sub-Band.

The 2008 LORS Tributary Hydrologic Condition (THC) is classified as **Very Wet**. The PDSI indicates wet conditions and the LONIN is very 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 Flow Sub Band	L
	Palmer Index for LOK Tributary Conditions	1.90 (Normal to Extremely Wet)	L
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Outlook	3.09 ft (Normal to Extremely Wet)	L
	ENSO Years		
	LOK Multi-Seasonal Net Inflow Outlook	3.60 ft (Wet)	L
	ENSO Conditions		
WCAs	WCA 1: Station Average (Site 1-7, Site 1-8T, Site 1-9)	Above Line 1 (16.36 ft)	L
	WCA 2A: Site 2-17	Above Line 1 (13.08 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.65 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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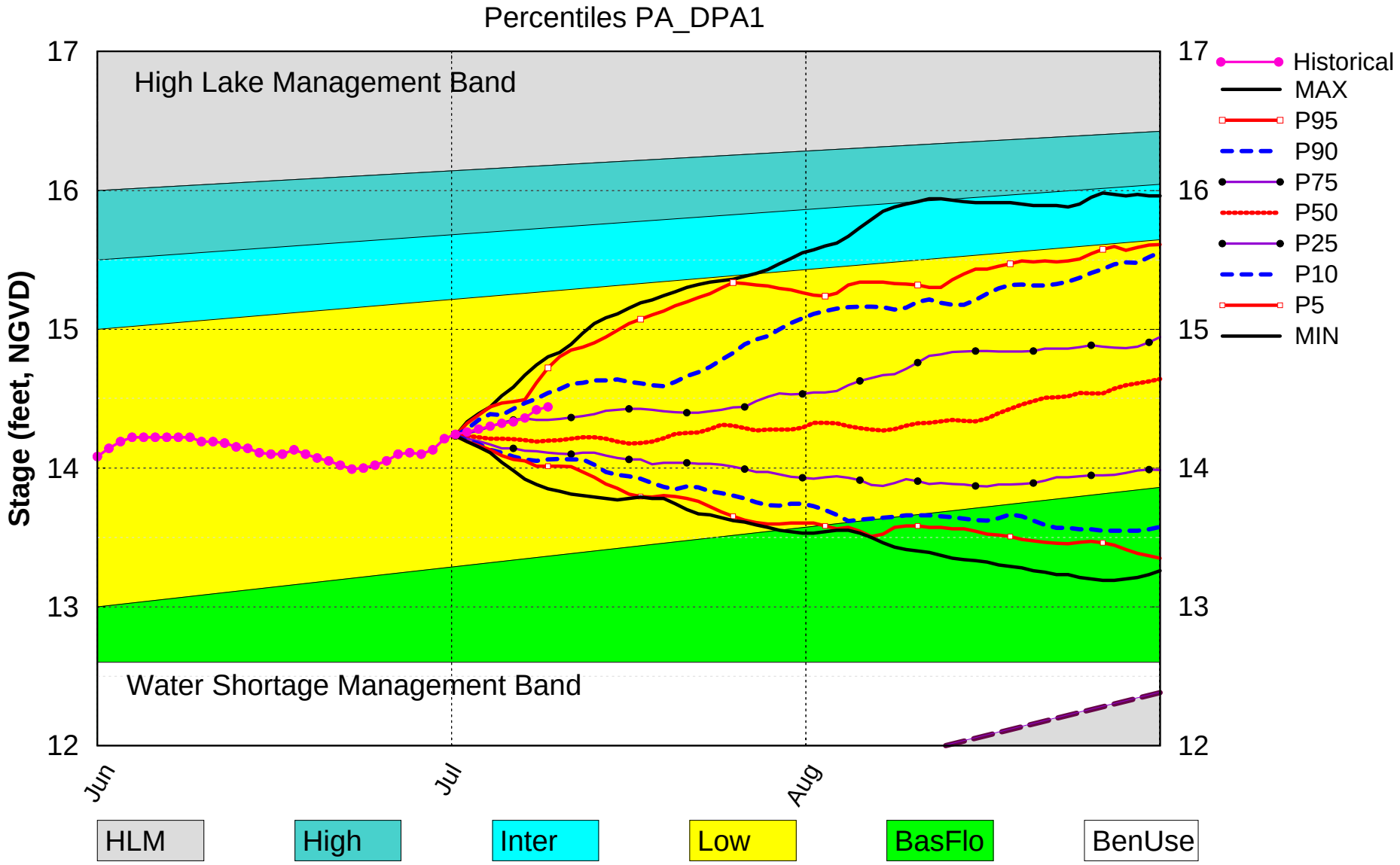
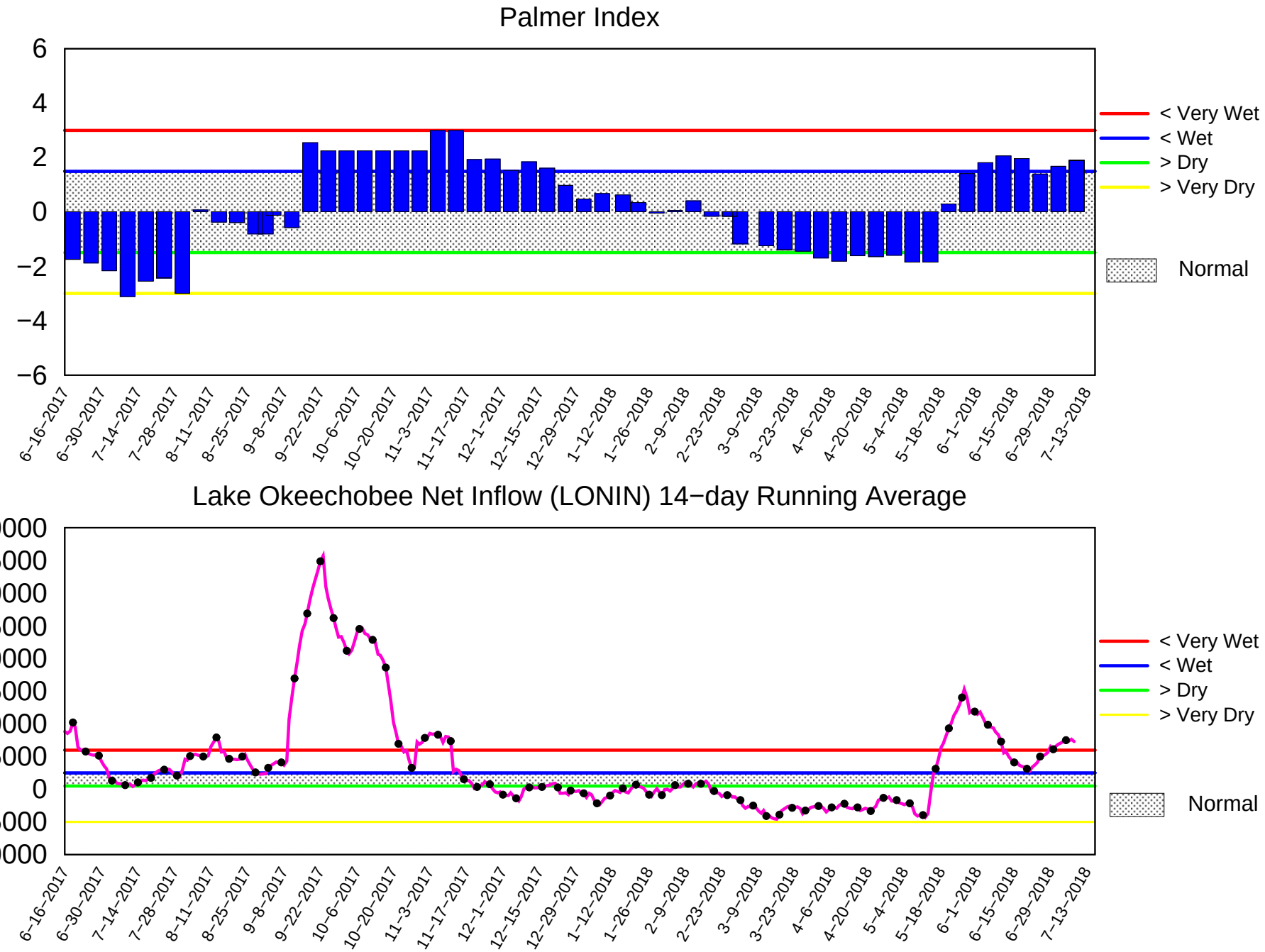
Lake Okeechobee SFWMM July 2018 Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Jul 09 13:51:31 EDT 2018

Tributary Basin Condition Indicators as of July 9 2018



Mon Jul 09 13:50:10 EDT 2018

2008 LORS

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

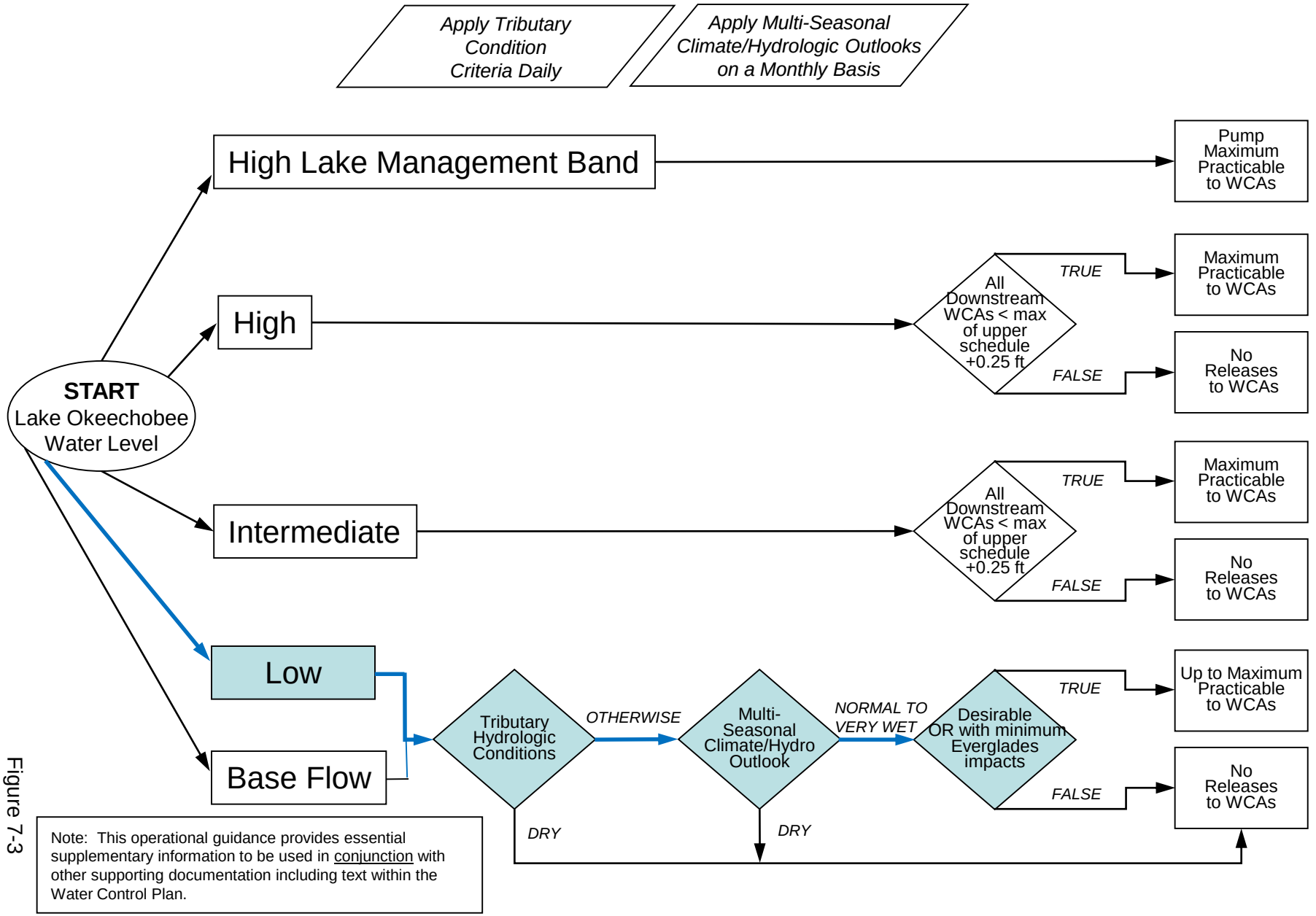


Figure 7-3

2008 LORS

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

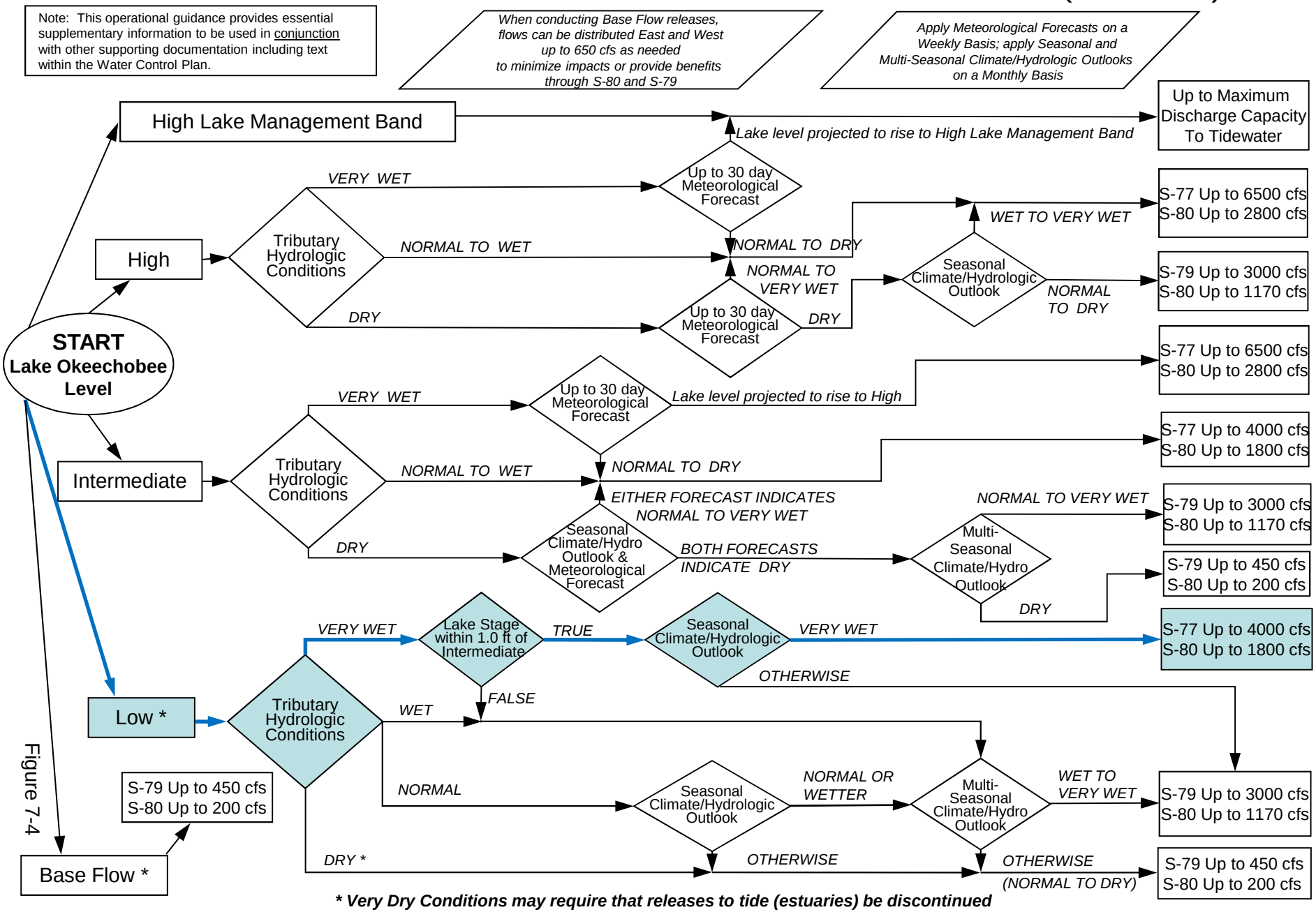
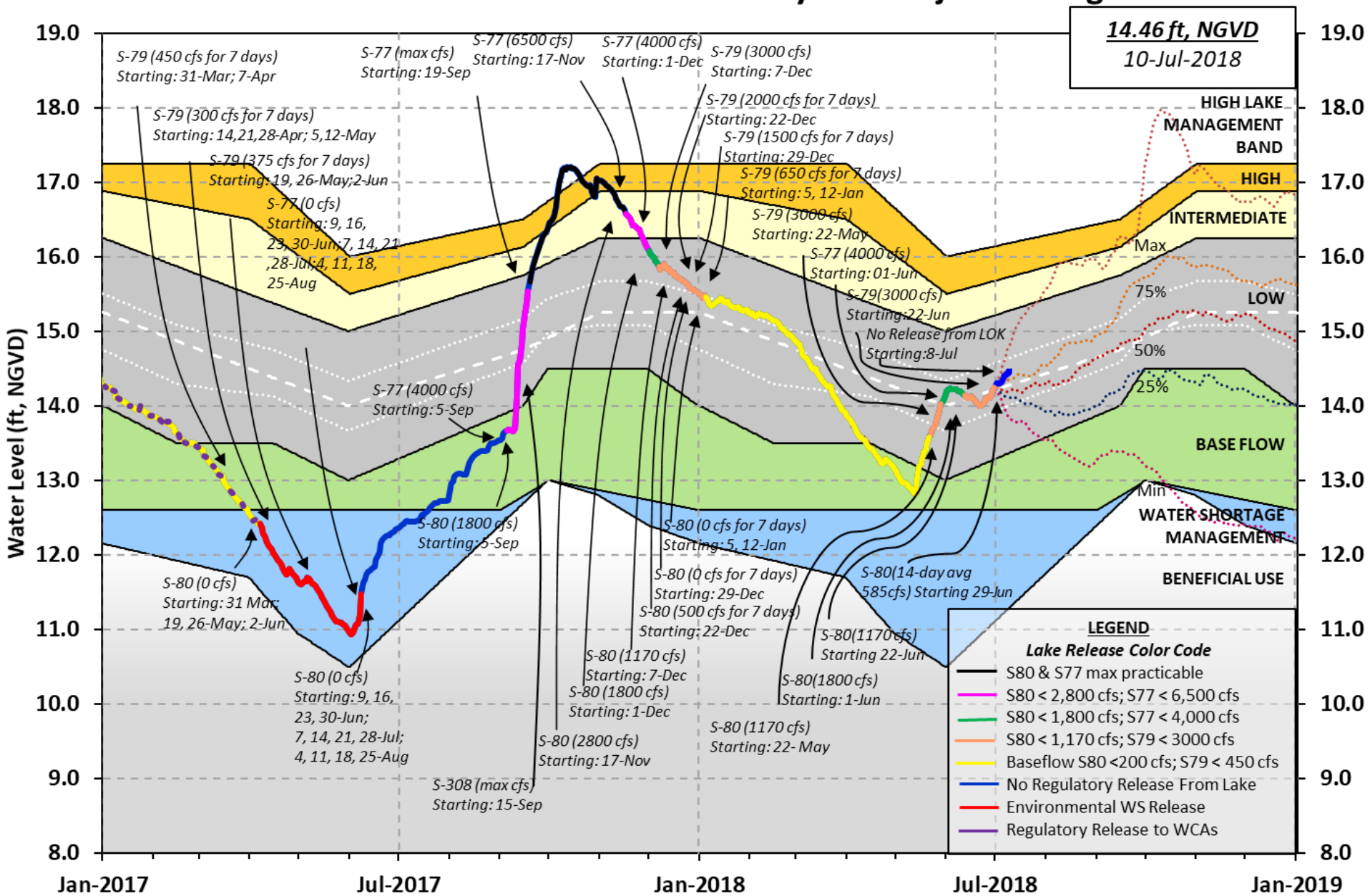


Figure 7-4

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 08 JUL 2018

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	14.44	12.44	14.89 (Official Elv)

Bottom of High Lake Mngmt= 16.17 Top of Water Short Mngmt= 11.26
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.40
Difference from Average LORS2008 2.04

08JUL (1965-2007) Period of Record Average 13.53
Difference from POR Average 0.91

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.38'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.58'
Bridge Clearance = 49.62'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.45	14.49	14.46	14.38	14.46	14.59	14.37	14.35

*Combination Okeechobee Avg-Daily Lake Average = 14.44 (*See Note)

Okeechobee Inflows (cfs):

S65E	0	S65EX1	2209	Fisheating Cr	878
S154	4	S191	142	S135 Pumps	0
S84	349	S133 Pumps	0	S2 Pumps	0
S84X	718	S127 Pumps	0	S3 Pumps	0
S71	694	S129 Pumps	0	S4 Pumps	0
S72	59	S131 Pumps	0	C5	0

Total Inflows: 5053

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	0	S77	5
S127 Culverts	0	S351	0	S308	1
S129 Culverts	0	S352	0		
S131 Culverts	0	L8 Canal Pt	-25		

Total Outflows: -19

****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 0.26 S308 0.25
Average Pan Evap x 0.75 Pan Coefficient = 0.19" = 0.02'

Lake Average Precipitation using NEXRAD: = 0.00" = 0.00'

Evaporation - Precipitation: = 0.19" = 0.02'
Evaporation - Precipitation using Lake Area of 730 square miles
is equal to 3754 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is 4336 cfs or 8600 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:	13.39	14.45	0	0	0	0	0	0	(cfs)		
S193:											
S191:	18.31	14.44	142	0.0	0.0	0.3					
S135 Pumps:	13.56	14.32	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	20.96	14.40	0	0.0	0.0	0.0	0.0	-0.0	0.0		
S65EX1:	20.96	14.40	2209								
S127 Pumps:	13.44	14.43	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	13.08	14.44	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.85	14.56	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek											
nr Palmdale		32.83	878								
nr Lakeport											
C5:		-NR-	0	-NR-	-NR-	-NR-					
South Shore											
S4 Pumps:	12.26	14.45	0	0	0	0			(cfs)		
S169:	14.47	12.29	0	0.0	0.0	0.0					
S310:	14.38		-166								
S3 Pumps:	10.49	14.41	0	0	0	0			(cfs)		
S354:	14.41	10.49	0	0.0	0.0						
S2 Pumps:	10.23	14.36	0	0	0	0	0		(cfs)		
S351:	14.36	10.23	0	0.0	0.0	0.0					
S352:	14.53	10.56	0	0.0	0.0						
C10A:	-NR-	14.53		8.0	8.0	8.0	0.0	0.0			
L8 Canal PT		14.37	-25								

```
  S351:        10.23     14.36       0  -NR--NR--NR--NR--NR--NR-
  S352:        10.56     14.53       0  -NR--NR--NR--NR-
  S354:        10.49     14.41       0  -NR--NR--NR--NR-
  ________________________________________________________________________

Caloosahatchee River (S77, S78, S79)
  S47B:        13.05     12.10            0.4  0.9
  S47D:        11.21     11.20      12    6.5
  S77:
    Spillway and Sector Flow:
               14.61     11.09    0.00  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           5

  S77 Below USGS Flow Gage         345

  S78:
    Spillway and Sector Flow:
               11.00      2.67    1555    0.0  0.0  2.5  2.0
    Flow Due to Lockages+:          13

  S79:
    Spillway and Sector Flow:
                2.80      1.54    6080    3.0  3.0  3.0  3.0  2.0  3.0  3.0  2.0
    Flow Due to Lockages+:           6
    Percent of flow from S77         0%
    Chloride            (ppm)     49


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
               14.33     13.88    0.00  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           1

  S308 Below USGS Flow Gage         48
  S153:        18.89     13.70      74    0.0  0.0
  S80:
    Spillway and Sector Flow:
               14.01      0.55     665    0.0  0.0  0.0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:          28
    Percent of flow from S308        0%

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

  Speedy Point Top Salinity    (mg/ml) 6985
  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.
______________________________________________________________________________
                                                                 ----- Wind ----
Daily Precipitation Totals     1-Day       3-Day       7-Day     Direction Speed
                              (inches)    (inches)    (inches)    (Deg0)   (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:	6.47	6.71	7.69	150	4
S78:	17.56	18.52	19.20	84	4
S79:	-27.28	-26.64	-25.22	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:	0.98	1.06	1.08	64	4
S80:	0.00	0.00	0.00	108	1
Okeechobee Average (Sites S78, S79 and S80 not included)	3.72	0.60	0.67		
Oke Nexrad Basin Avg	0.00	0.69	1.67		

Okeechobee Lake Elevations		08 JUL 2018	14.44	Difference from 08JUL18
08JUL18	-1 Day =	07 JUL 2018	14.42	-0.02
08JUL18	-2 Days =	06 JUL 2018	14.37	-0.07
08JUL18	-3 Days =	05 JUL 2018	14.33	-0.11
08JUL18	-4 Days =	04 JUL 2018	14.32	-0.12
08JUL18	-5 Days =	03 JUL 2018	14.30	-0.14
08JUL18	-6 Days =	02 JUL 2018	14.28	-0.16
08JUL18	-7 Days =	01 JUL 2018	14.26	-0.18
08JUL18	-30 Days =	08 JUN 2018	14.19	-0.25
08JUL18	-1 Year =	08 JUL 2017	12.44	-2.00
08JUL18	-2 Year =	08 JUL 2016	14.89	0.45

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = 4.56

Lake Okeechobee Net Inflow (LONIN)

		Average Flow over the previous 14 days			Avg-Daily Flow
08JUL18	Today =	08 JUL 2018	7136	MON	4336
08JUL18	-1 Day =	07 JUL 2018	7471	SUN	10688
08JUL18	-2 Days =	06 JUL 2018	7389	SAT	8470
08JUL18	-3 Days =	05 JUL 2018	7410	FRI	2740
08JUL18	-4 Days =	04 JUL 2018	7301	THU	5862
08JUL18	-5 Days =	03 JUL 2018	6983	WED	5300
08JUL18	-6 Days =	02 JUL 2018	6803	TUE	4885
08JUL18	-7 Days =	01 JUL 2018	6439	MON	4605
08JUL18	-8 Days =	30 JUN 2018	6035	SUN	6634
08JUL18	-9 Days =	29 JUN 2018	6428	SAT	18269
08JUL18	-10 Days =	28 JUN 2018	5582	FRI	8930
08JUL18	-11 Days =	27 JUN 2018	5217	THU	1163
08JUL18	-12 Days =	26 JUN 2018	5070	WED	5858
08JUL18	-13 Days =	25 JUN 2018	4901	TUE	12163

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
08JUL18	Today=	08 JUL 2018	0	MON	0
08JUL18	-1 Day =	07 JUL 2018	0	SUN	0
08JUL18	-2 Days =	06 JUL 2018	0	SAT	0

08JUL18	-3 Days =	05 JUL 2018	0	FRI	0
08JUL18	-4 Days =	04 JUL 2018	0	THU	0
08JUL18	-5 Days =	03 JUL 2018	0	WED	0
08JUL18	-6 Days =	02 JUL 2018	0	TUE	0
08JUL18	-7 Days =	01 JUL 2018	0	MON	0
08JUL18	-8 Days =	30 JUN 2018	0	SUN	0
08JUL18	-9 Days =	29 JUN 2018	0	SAT	0
08JUL18	-10 Days =	28 JUN 2018	0	FRI	0
08JUL18	-11 Days =	27 JUN 2018	0	THU	0
08JUL18	-12 Days =	26 JUN 2018	0	WED	0
08JUL18	-13 Days =	25 JUN 2018	0	TUE	0

S65EX1

		Average Flow over previous 14 days			Avg-Daily Flow
08JUL18	Today=	08 JUL 2018	1916	MON	2209
08JUL18	-1 Day =	07 JUL 2018	1917	SUN	2206
08JUL18	-2 Days =	06 JUL 2018	1931	SAT	2050
08JUL18	-3 Days =	05 JUL 2018	1963	FRI	2098
08JUL18	-4 Days =	04 JUL 2018	1982	THU	1895
08JUL18	-5 Days =	03 JUL 2018	2023	WED	1780
08JUL18	-6 Days =	02 JUL 2018	2056	TUE	1756
08JUL18	-7 Days =	01 JUL 2018	2091	MON	1609
08JUL18	-8 Days =	30 JUN 2018	2136	SUN	1732
08JUL18	-9 Days =	29 JUN 2018	2160	SAT	1672
08JUL18	-10 Days =	28 JUN 2018	2212	FRI	1610
08JUL18	-11 Days =	27 JUN 2018	2275	THU	1864
08JUL18	-12 Days =	26 JUN 2018	2299	WED	2109
08JUL18	-13 Days =	25 JUN 2018	2313	TUE	2237

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)
08 JUL 2018	10	684	3112	12078
07 JUL 2018	18	737	2785	10263
06 JUL 2018	6	478	2389	11090
05 JUL 2018	357	488	2535	10096
04 JUL 2018	1189	1339	3058	6408
03 JUL 2018	1127	1538	3093	6715
02 JUL 2018	1116	1803	3102	6464
01 JUL 2018	775	1567	3300	7799
30 JUN 2018	14	1045	3557	8547
29 JUN 2018	9	1035	3395	7543
28 JUN 2018	1033	1769	3243	7123
27 JUN 2018	2198	2723	3213	6506
26 JUN 2018	2966	3369	3688	6773
25 JUN 2018	1635	1761	4070	5912

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)
08 JUL 2018	-329	0	0	0	-49
07 JUL 2018	-418	0	0	0	-136
06 JUL 2018	-372	0	0	0	-32

05 JUL 2018	-153	0	0	587	-22
04 JUL 2018	-4	0	0	1561	6
03 JUL 2018	-16	0	0	813	14
02 JUL 2018	-126	0	0	153	2
01 JUL 2018	-243	0	0	0	-4
30 JUN 2018	-205	0	0	0	3
29 JUN 2018	-212	0	248	0	-3
28 JUN 2018	-212	0	714	0	-1
27 JUN 2018	-247	0	748	0	-4
26 JUN 2018	-233	0	744	0	-4
25 JUN 2018	-174	218	710	59	5

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
08 JUL 2018	1	95	1332
07 JUL 2018	1	-100	1907
06 JUL 2018	0	-110	1280
05 JUL 2018	-0	-78	332
04 JUL 2018	1	-11	585
03 JUL 2018	5	-41	373
02 JUL 2018	3	-204	1117
01 JUL 2018	-3	-182	1757
30 JUN 2018	528	400	737
29 JUN 2018	2200	1668	2684
28 JUN 2018	2790	2807	3622
27 JUN 2018	3464	3309	4212
26 JUN 2018	3479	3000	4185
25 JUN 2018	406	202	2539

*** 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

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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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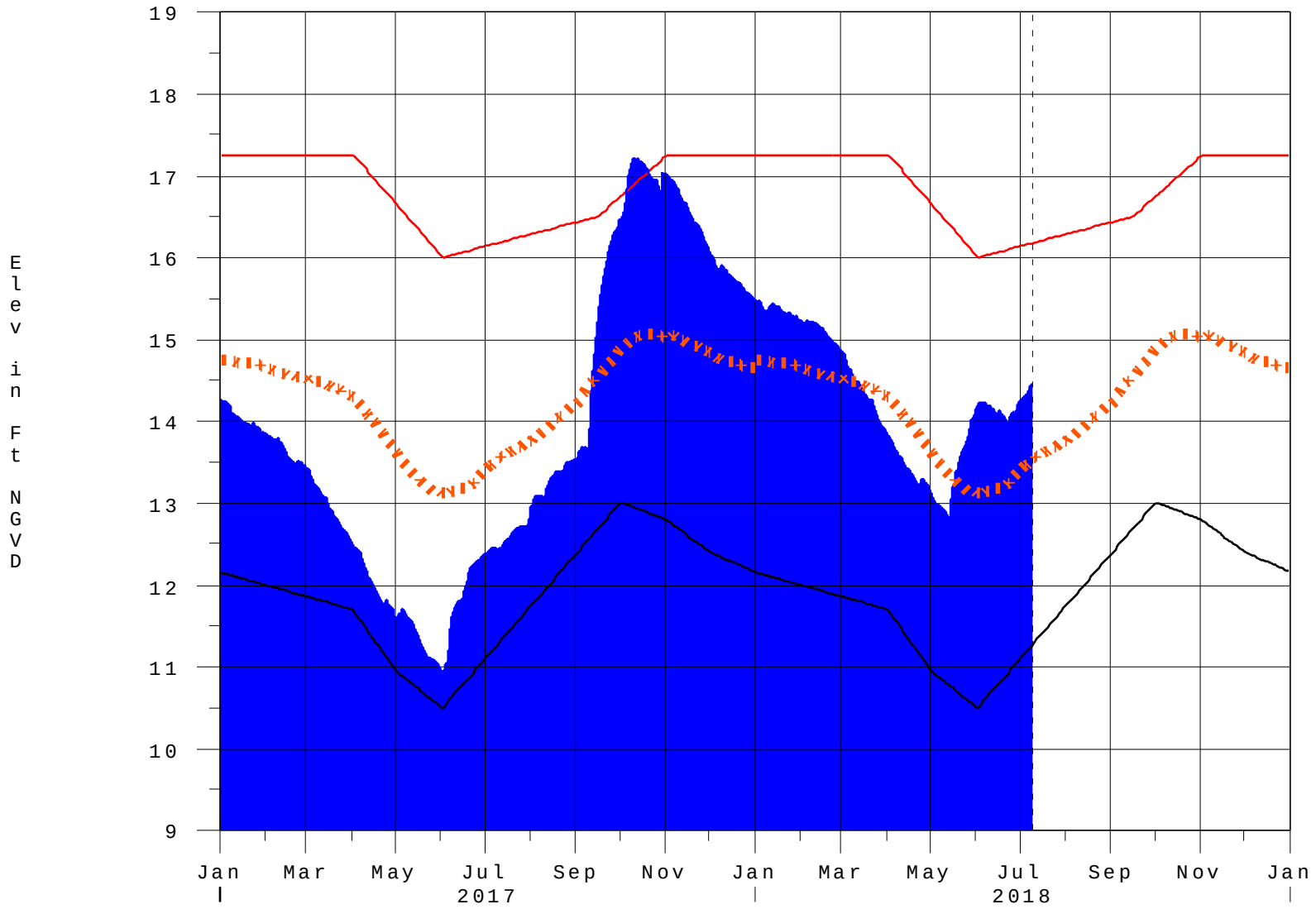
Report Generated 09JUL2018 @ 13:39 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

09JUL18 13:30:21



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