Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 7/2/2018 (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	2.46	Very Wet	2.85	Very Wet	1.99	Wet
Multi Seasonal (Jul-Apr)	N/A	N/A	2.91	Wet	3.36	Wet	1.65	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:

6575 cfs 14-day running average for Lake Okeechobee Net Inflow through 7/1/2018.
According to the classification in Tributary Hydrologic Conditions table, this condition is Very Wet.

1.68 for Palmer Index on 6/30/2018.
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 7/2/2018

Lake Okeechobee Stage: **14.26 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		16.15	
Operational Band	High sub-band	15.68	
	Intermediate sub-band	15.22	
	Low sub-band	13.30	← 14.26
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.14	
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 7/2/2018 (ENSO Neutral Condition):

Status for week ending 7/2/2018:

District wide, Raindar rainfall was 1.84 inches for the week. Lake stage on 7/2/2018 was 14.26 ft, NGVD, up 0.21 ft from last week.

The updated June 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	1.68 (Normal to Extremely Wet)	L
	CPC Precipitation Outlook	1 month: Above Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Outlook	2.85 ft (Normal to Extremely Wet)	L
	ENSO Years		
	LOK Multi-Seasonal Net Inflow Outlook	3.36 ft (Wet)	L
	ENSO Conditions		
WCAs	WCA 1: Station Average (Site 1-7, Site 1-8T, Site 1-9)	Above Line 1 (16.37 ft)	L
	WCA 2A: Site 2-17	Above Line 1 (12.81 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.91 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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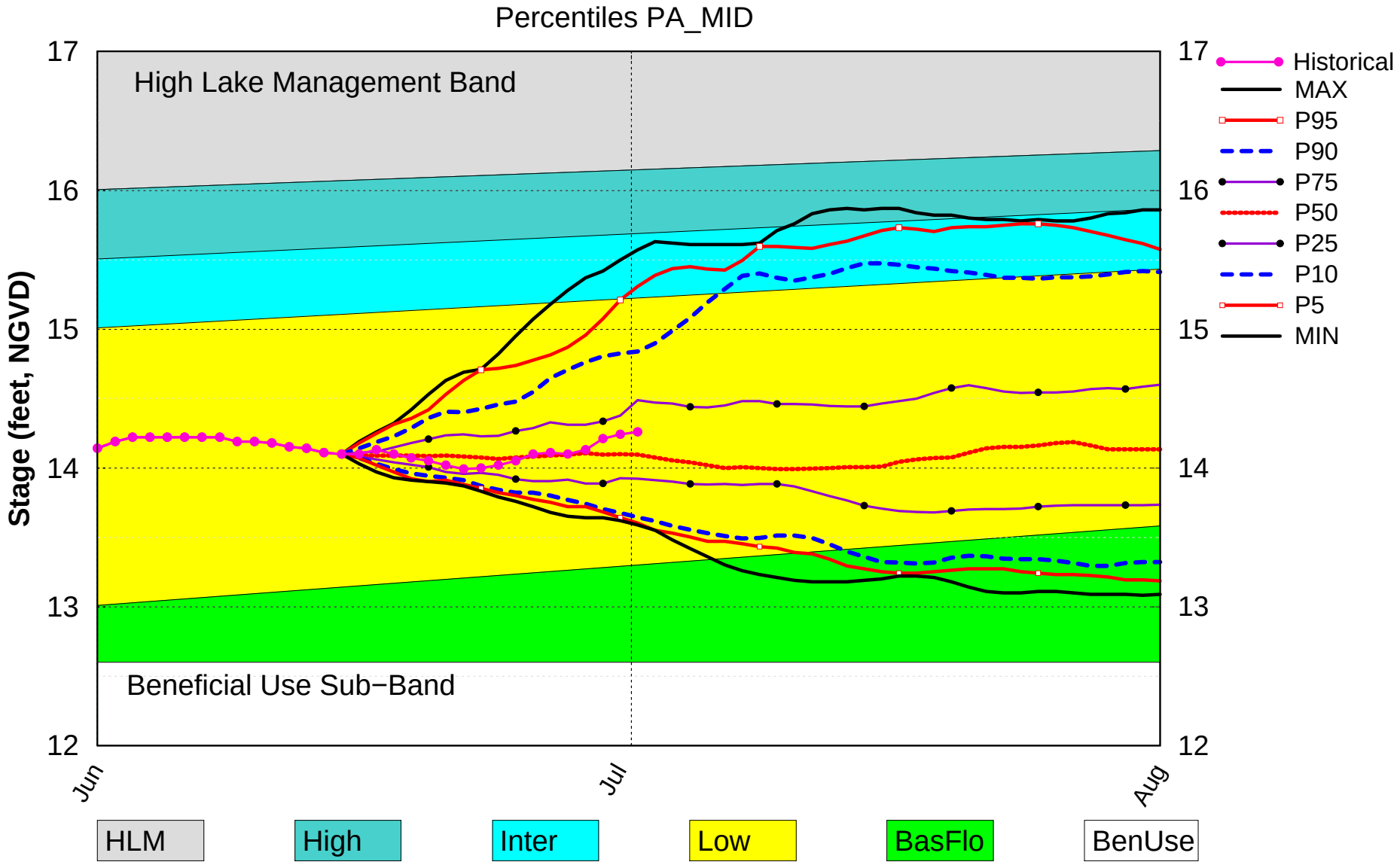
Lake Okeechobee SFWMM June 2018 Mid−Month Position Analysis

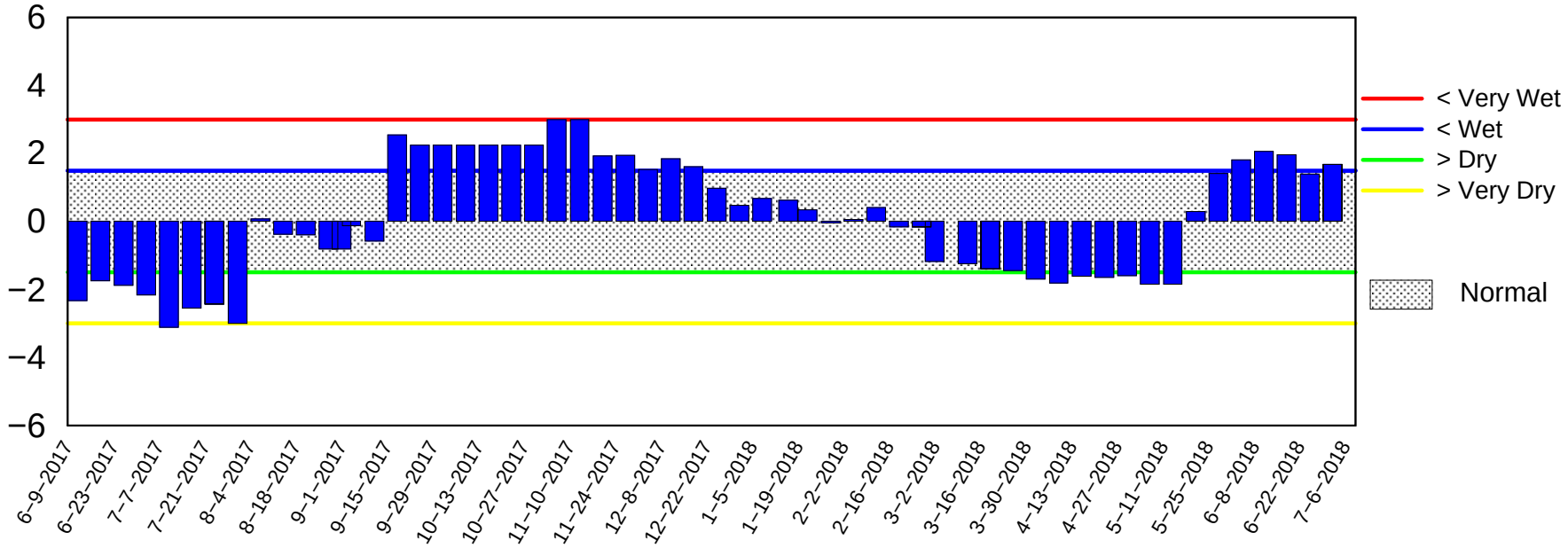


(See assumptions on the Position Analysis Results website)

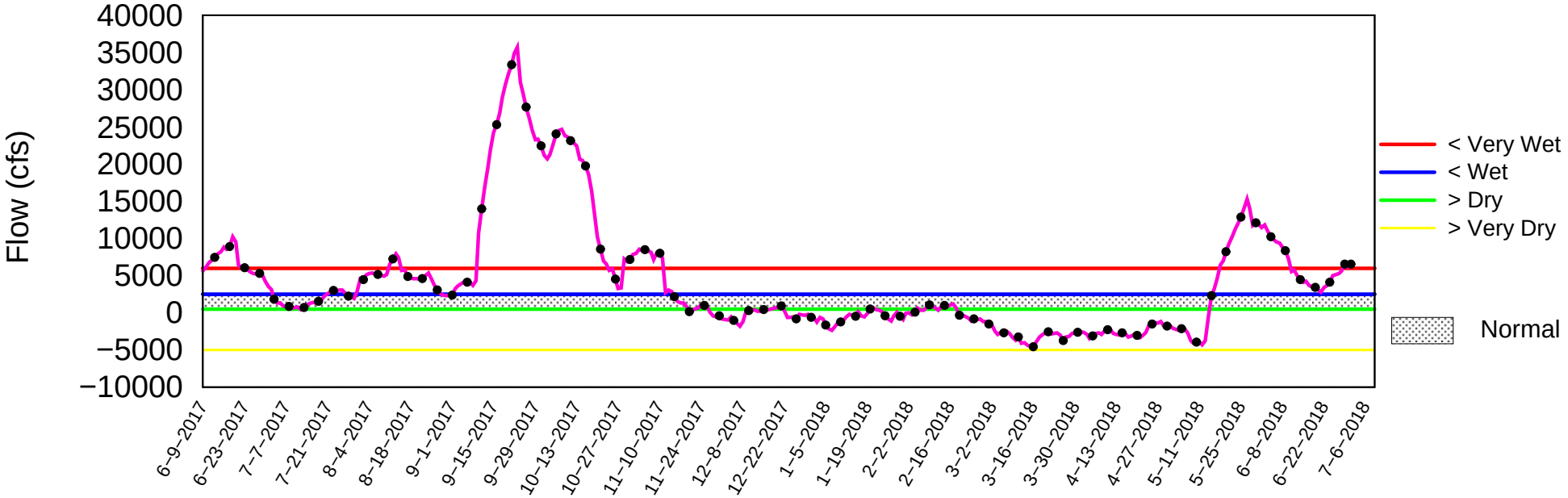
Mon Jul 02 15:20:21 EDT 2018

Tributary Basin Condition Indicators as of July 2 2018

Palmer Index



Lake Okeechobee Net Inflow (LONIN) 14−day Running Average



Mon Jul 02 15:19:59 EDT 2018

2008 LORS

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

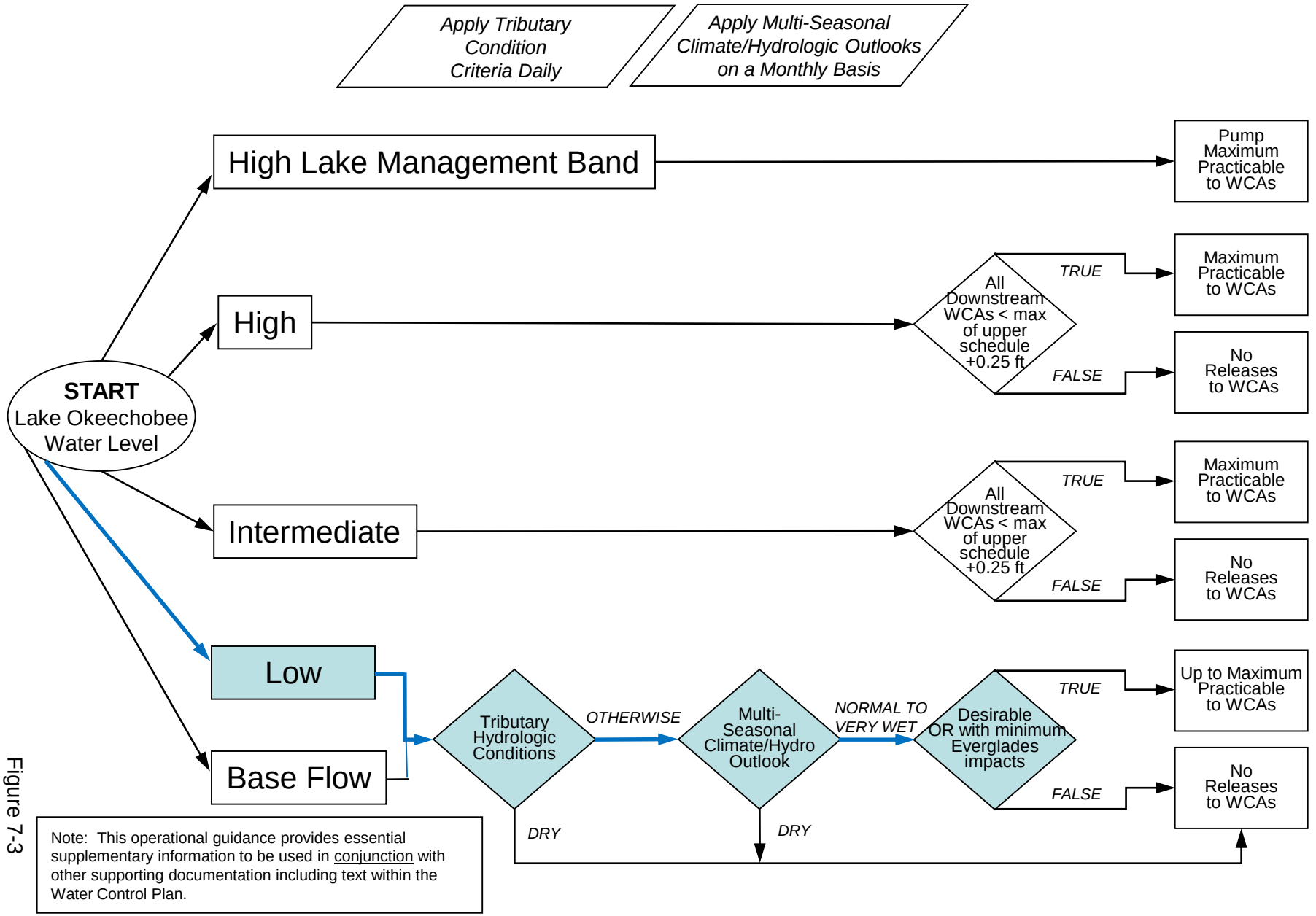


Figure 7-3

2008 LORS

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

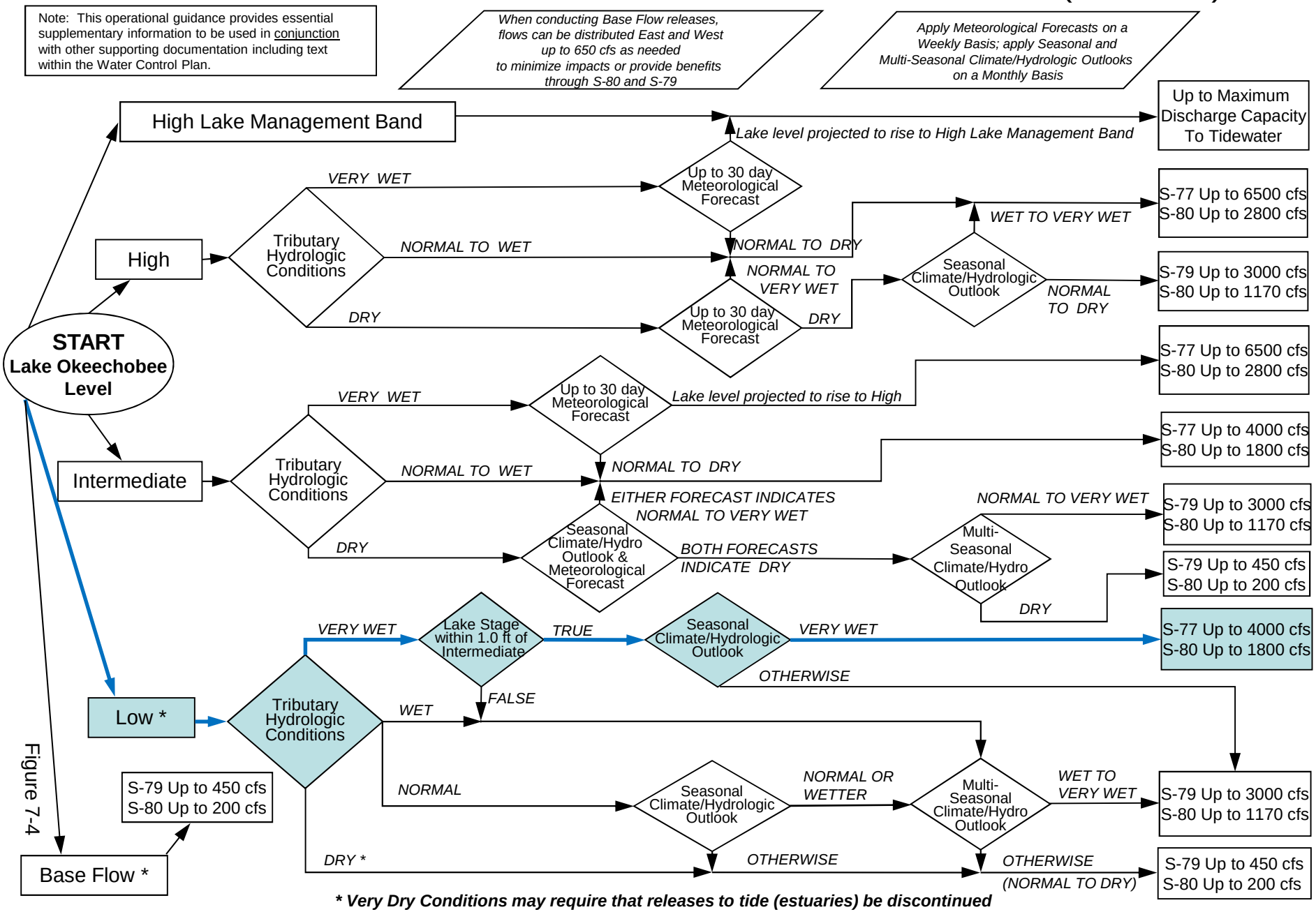
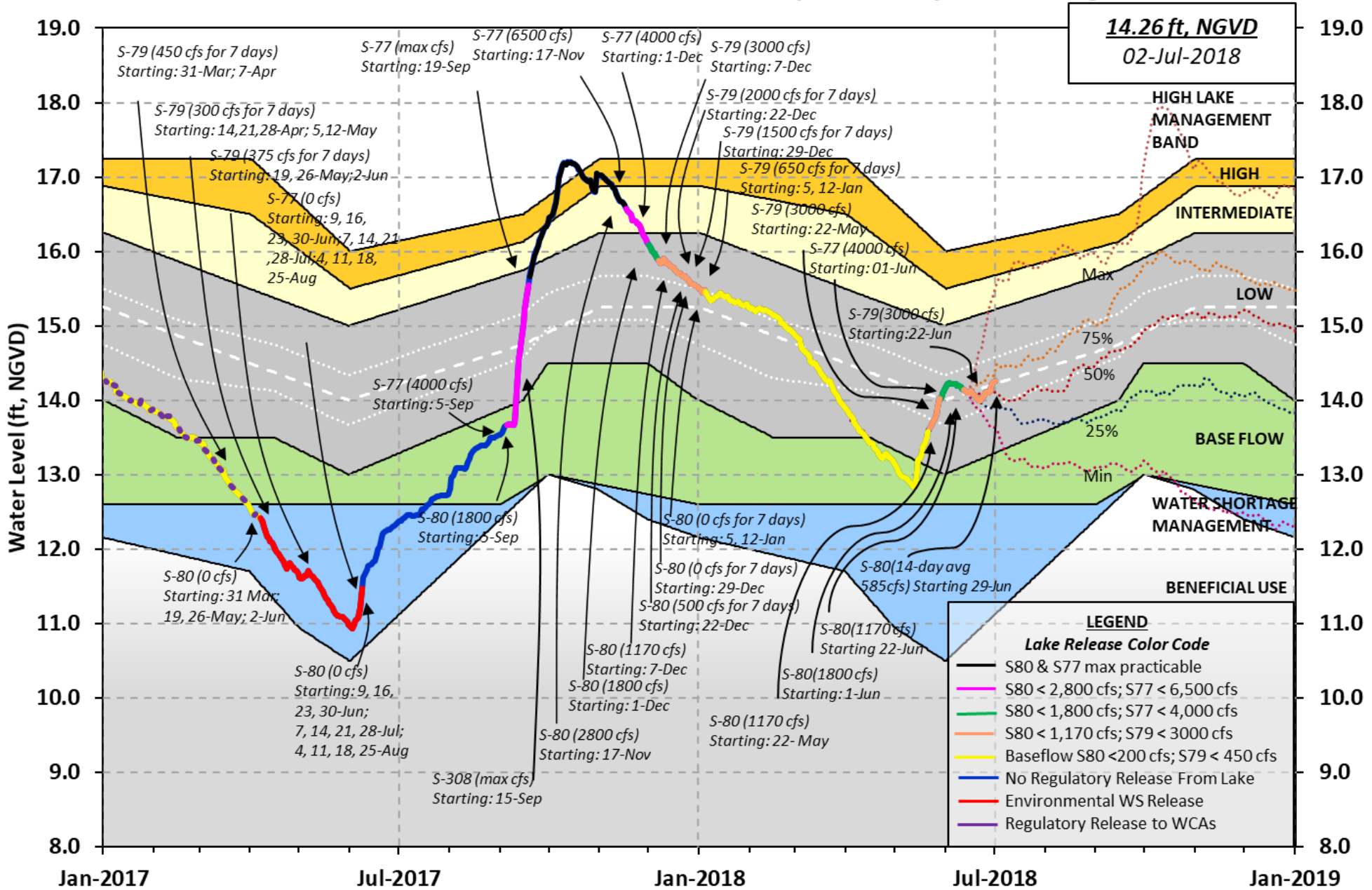


Figure 7-4

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 01 JUL 2018

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)	
*Okeechobee Lake Elevation	14.26	12.38	14.94	(Official Elv)

Bottom of High Lake Mngmt= 16.14 Top of Water Short Mngmt= 11.12
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.27
Difference from Average LORS2008 1.99

01JUL (1965-2007) Period of Record Average 13.41
Difference from POR Average 0.85

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.20'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.40'
Bridge Clearance = 49.70'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.30	14.32	14.27	14.19	14.26	14.39	14.18	14.18

*Combination Okeechobee Avg-Daily Lake Average = 14.26
(*See Note)

Okeechobee Inflows (cfs):

S65E	0	S65EX1	1609	Fisheating Cr	1290
S154	52	S191	315	S135 Pumps	182
S84	855	S133 Pumps	168	S2 Pumps	0
S84X	757	S127 Pumps	28	S3 Pumps	0
S71	595	S129 Pumps	0	S4 Pumps	0
S72	56	S131 Pumps	0	C5	0

Total Inflows: 5907

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	0	S77	377
S127 Culverts	0	S351	0	S308	-1
S129 Culverts	0	S352	0		
S131 Culverts	0	L8 Canal Pt	-2		

Total Outflows: 374

****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           0.30
  Average Pan Evap x 0.75 Pan Coefficient =  0.21" =  0.02'

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

Evaporation - Precipitation:             =  0.21" =  0.02'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to   4122 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is   4235 cfs or   8400 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:	13.36	14.17	168	0	44	25	43	62	(cfs)		
S193:	------										
S191:	18.23	14.17	315	0.5	0.0	0.4					
S135 Pumps:	13.26	14.16	182	50	44	32	56		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	21.08	14.12	0	0.0	0.0	0.0	0.0	-0.0	0.0		
S65EX1:	21.08	14.12	1609								
S127 Pumps:	13.30	14.25	28	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.94	14.26	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.87	14.25	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek											
nr Palmdale		33.22	1290								
nr Lakeport	------										
C5:	------	-NR-	0	-NR-	-NR-	-NR-					
South Shore											
S4 Pumps:	12.89	14.27	0	0	0	0			(cfs)		
S169:	14.27	12.88	0	0.0	0.0	0.0					
S310:	14.22		-122								
S3 Pumps:	9.59	14.26	0	0	0	0			(cfs)		
S354:	14.26	9.59	0	0.0	0.0						
S2 Pumps:	9.92	14.30	0	0	0	0	0		(cfs)		
S351:	14.30	9.92	0	0.0	0.0	0.0					
S352:	14.45	9.38	0	0.0	0.0						
C10A:	-NR-	14.33		8.0	8.0	8.0	0.0	0.0			
L8 Canal PT		14.17	-2								

```
  S351:         9.92     14.30       0  -NR--NR--NR--NR--NR--NR-
  S352:         9.38     14.45       0  -NR--NR--NR--NR-
  S354:         9.59     14.26       0  -NR--NR--NR--NR-
  ____________________________________________________________________________

Caloosahatchee River (S77, S78, S79)
  S47B:        13.37     12.13            0.5  0.5
  S47D:        11.20     11.19      30    6.5
  S77:
    Spillway and Sector Flow:
                14.14     11.10  370.00  0.0  0.0  2.5  0.0
    Flow Due to Lockages+:           7

  S77 Below USGS Flow Gage         790

  S78:
    Spillway and Sector Flow:
                10.97      3.30    1658    0.0  0.0  2.5  2.0
    Flow Due to Lockages+:          14

  S79:
    Spillway and Sector Flow:
                 3.34      1.27    3950    1.0  2.0  2.0  2.0  2.0  2.0  2.0  1.0
    Flow Due to Lockages+:           9
    Percent of flow from S77         9%
    Chloride            (ppm)     52


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
                14.21     13.80    0.00  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:          -1

  S308 Below USGS Flow Gage        -92
  S153:        18.82     13.63     166    0.4  0.0
  S80:
    Spillway and Sector Flow:
                13.83      0.82     866    0.0  1.5  0.0  0.0  1.5  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) 3685
  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)   (Degø)   (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:	5.25	5.54	7.84	149	1
S78:	15.92	16.17	18.25	57	1
S79:	-29.34	-28.44	-27.86	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:	0.88	0.90	1.00	152	2
S80:	0.00	0.00	0.00	173	1
Okeechobee Average (Sites S78, S79 and S80 not included)	3.07	0.50	0.68		
Oke Nexrad Basin Avg	0.00	0.52	1.59		

Okeechobee Lake Elevations				
01JUL18	01 JUL 2018	14.26	Difference from 01JUL18	
01JUL18 -1 Day =	30 JUN 2018	14.24	-0.02	
01JUL18 -2 Days =	29 JUN 2018	14.21	-0.05	
01JUL18 -3 Days =	28 JUN 2018	14.13	-0.13	
01JUL18 -4 Days =	27 JUN 2018	14.10	-0.16	
01JUL18 -5 Days =	26 JUN 2018	14.11	-0.15	
01JUL18 -6 Days =	25 JUN 2018	14.10	-0.16	
01JUL18 -7 Days =	24 JUN 2018	14.05	-0.21	
01JUL18 -30 Days =	01 JUL 2018	14.19	-0.07	
01JUL18 -1 Year =	01 JUL 2017	12.38	-1.88	
01JUL18 -2 Year =	01 JUL 2016	14.94	0.68	

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = 4.67

Lake Okeechobee Net Inflow (LONIN)					
	Average Flow over the previous 14 days				Avg-Daily Flow
01JUL18 Today =	01 JUL 2018	6439	MON		4605
01JUL18 -1 Day =	30 JUN 2018	6035	SUN		6634
01JUL18 -2 Days =	29 JUN 2018	6428	SAT		18269
01JUL18 -3 Days =	28 JUN 2018	5582	FRI		8930
01JUL18 -4 Days =	27 JUN 2018	5217	THU		1163
01JUL18 -5 Days =	26 JUN 2018	5070	WED		5858
01JUL18 -6 Days =	25 JUN 2018	4901	TUE		12163
01JUL18 -7 Days =	24 JUN 2018	3959	MON		9030
01JUL18 -8 Days =	23 JUN 2018	3558	SUN		9540
01JUL18 -9 Days =	22 JUN 2018	3277	SAT		8762
01JUL18 -10 Days =	21 JUN 2018	2584	FRI		1208
01JUL18 -11 Days =	20 JUN 2018	2877	THU		1413
01JUL18 -12 Days =	19 JUN 2018	3166	WED		2786
01JUL18 -13 Days =	18 JUN 2018	3308	TUE		-217

S65E				
	Average Flow over previous 14 days			Avg-Daily Flow
01JUL18 Today=	01 JUL 2018	0	MON	0
01JUL18 -1 Day =	30 JUN 2018	0	SUN	0
01JUL18 -2 Days =	29 JUN 2018	0	SAT	0

01JUL18	-3 Days =	28 JUN 2018	0	FRI		0
01JUL18	-4 Days =	27 JUN 2018	0	THU		0
01JUL18	-5 Days =	26 JUN 2018	0	WED		0
01JUL18	-6 Days =	25 JUN 2018	0	TUE		0
01JUL18	-7 Days =	24 JUN 2018	0	MON		0
01JUL18	-8 Days =	23 JUN 2018	0	SUN		0
01JUL18	-9 Days =	22 JUN 2018	0	SAT		0
01JUL18	-10 Days =	21 JUN 2018	0	FRI		0
01JUL18	-11 Days =	20 JUN 2018	0	THU		0
01JUL18	-12 Days =	19 JUN 2018	0	WED		0
01JUL18	-13 Days =	18 JUN 2018	0	TUE		0

S65EX1

		Average Flow over previous 14 days			Avg-Daily Flow
01JUL18	Today=	01 JUL 2018	2091	MON	1609
01JUL18	-1 Day =	30 JUN 2018	2136	SUN	1733
01JUL18	-2 Days =	29 JUN 2018	2160	SAT	1672
01JUL18	-3 Days =	28 JUN 2018	2212	FRI	1610
01JUL18	-4 Days =	27 JUN 2018	2275	THU	1864
01JUL18	-5 Days =	26 JUN 2018	2299	WED	2109
01JUL18	-6 Days =	25 JUN 2018	2313	TUE	2237
01JUL18	-7 Days =	24 JUN 2018	2303	MON	2224
01JUL18	-8 Days =	23 JUN 2018	2297	SUN	2397
01JUL18	-9 Days =	22 JUN 2018	2276	SAT	2493
01JUL18	-10 Days =	21 JUN 2018	2256	FRI	2372
01JUL18	-11 Days =	20 JUN 2018	2230	THU	2469
01JUL18	-12 Days =	19 JUN 2018	2202	WED	2241
01JUL18	-13 Days =	18 JUN 2018	2190	TUE	2244

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)
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
24 JUN 2018	1616	2046	3455	6906
23 JUN 2018	4202	4441	4215	7547
22 JUN 2018	6420	6647	5782	8658
21 JUN 2018	8249	8322	8468	11357
20 JUN 2018	8490	8751	9069	11945
19 JUN 2018	8312	8919	9892	12746
18 JUN 2018	8094	9145	10002	13610

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)
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
24 JUN 2018	-125	1731	642	682	5
23 JUN 2018	-146	2202	730	1686	-4
22 JUN 2018	-129	632	773	1206	51
21 JUN 2018	61	146	750	1412	82
20 JUN 2018	-20	119	478	1795	73
19 JUN 2018	-25	0	0	1844	63
18 JUN 2018	27	0	0	997	-89

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
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
24 JUN 2018	-2	-114	52
23 JUN 2018	471	461	730
22 JUN 2018	3529	2780	2740
21 JUN 2018	3959	3434	3598
20 JUN 2018	4093	3233	3596
19 JUN 2018	3446	3362	3581
18 JUN 2018	2945	3222	3607

*** 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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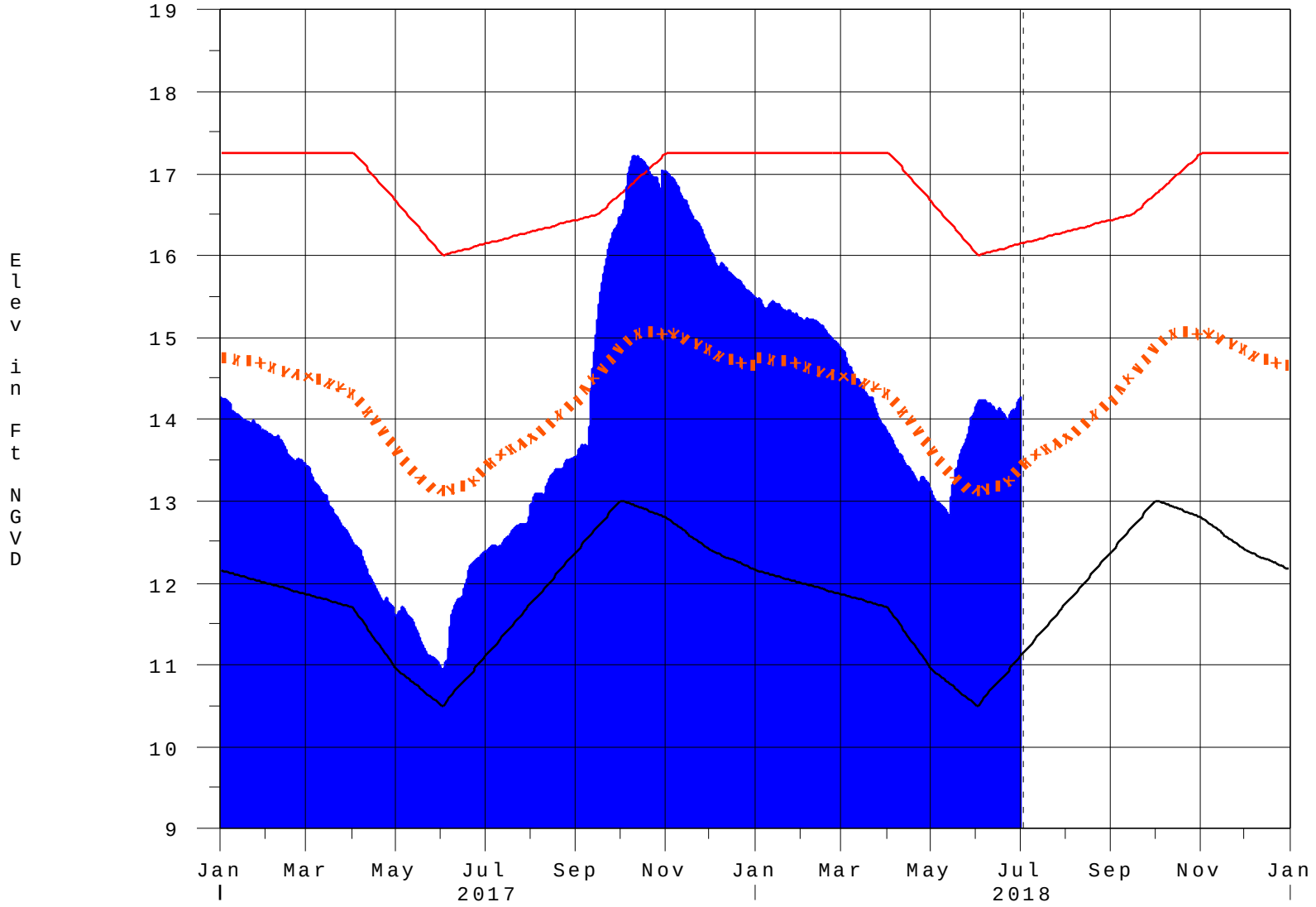
Report Generated 02JUL2018 @ 15:07 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

02JUL18 15:00:21



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

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