Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 12/4/2017 (ENSO La Nina 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 Neutral ENSO Years[3**]		Sub-sampling of AMO Warm + Neutral ENSO Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Dec-May)	N/A	N/A	0.16	Dry	-0.16	Dry	-0.35	Dry
Multi Seasonal (Dec-Oct)	N/A	N/A	2.52	Wet	2.58	Wet	2.15	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:

-931 cfs 14-day running average for Lake Okeechobee Net Inflow through 12/3/2017.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

1.52 for Palmer Index on 12/2/2017.
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 12/4/2017

Lake Okeechobee Stage: **15.94 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		17.25	
Operational Band	High sub-band	16.88	
	Intermediate sub-band	16.25	
	Low sub-band	14.45	← 15.94
Base Flow sub-band		12.72	
Beneficial Use sub-band		12.38	
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 3000 cfs & S-80 Up to 1170 cfs

Technical Input Summaries from:

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

Back to Lake Okeechobee Operations Main Page

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LORS2008 Implementation on 12/4/2017 (ENSO Neutral Condition):

Status for week ending 12/4/2017:

District wide, Raindar rainfall was 0.24 inches for the week. Lake stage on 12/4/2017 was 15.98 ft, down 0.28 ft from last week.

The updated Mid-November 2017 SFWMM Dynamic Position Analysis percentile graph for Lake Okeechobee show that the current lake stage is in the Low Operational Sub-Band.

The 2008 LORS Tributary Hydrologic Condition (THC) tributary is classified as **Wet**. The PDSI indicates Wet condition and the LONIN is Dry. 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	M
	Palmer Index for LOK Tributary Conditions	1.52 (Normal)	L
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Below Normal	M
	LOK Seasonal Net Inflow Outlook	-0.16 ft (Normal)	H
	ENSO La Nina Years		
	LOK Multi-Seasonal Net Inflow Outlook	2.58 ft (Normal)	M
	ENSO La Nina Years		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (17.52 ft)	L
	WCA 2A: Site 2-17 HW	Above Line 1 (13.39 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (11.33 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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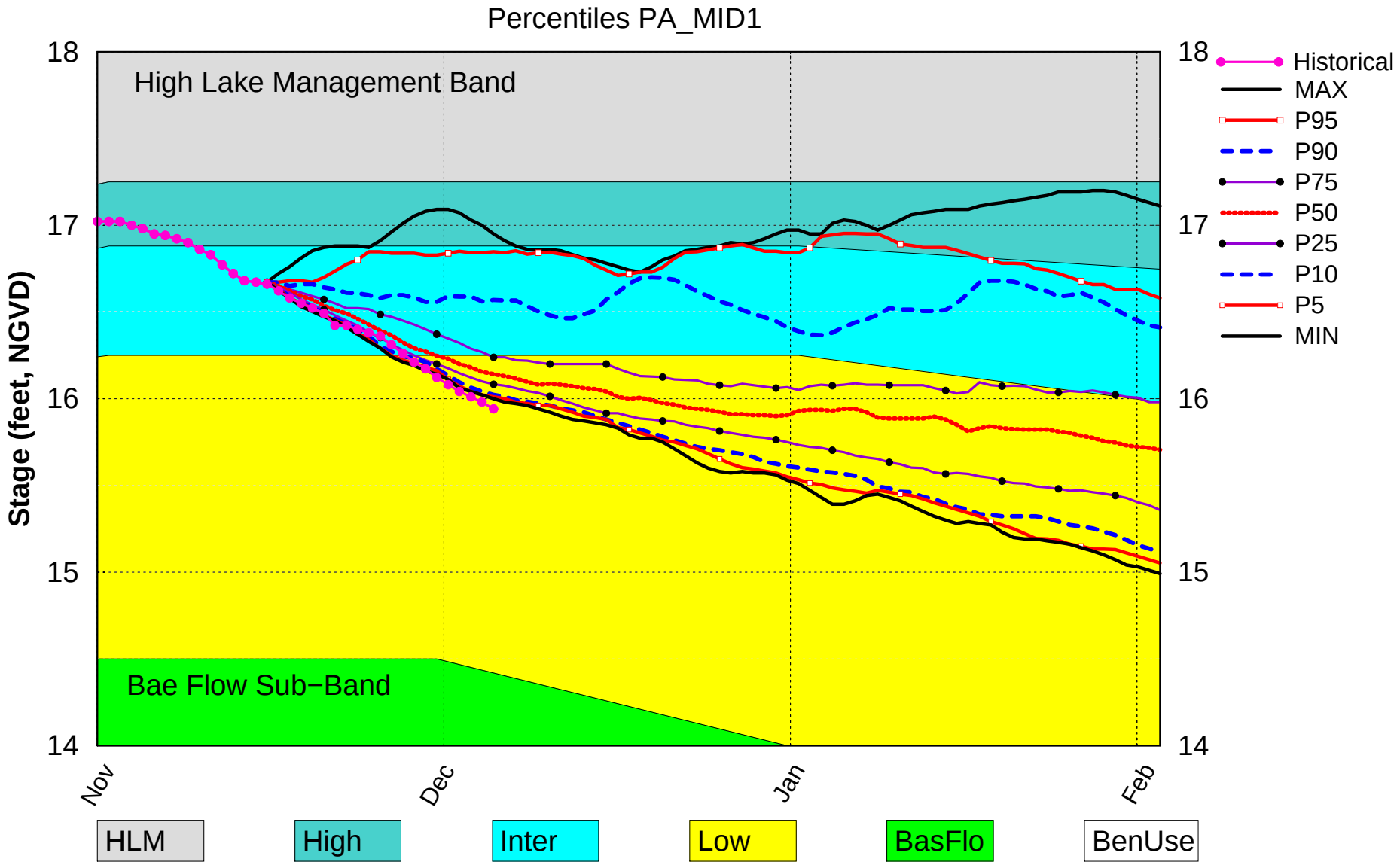
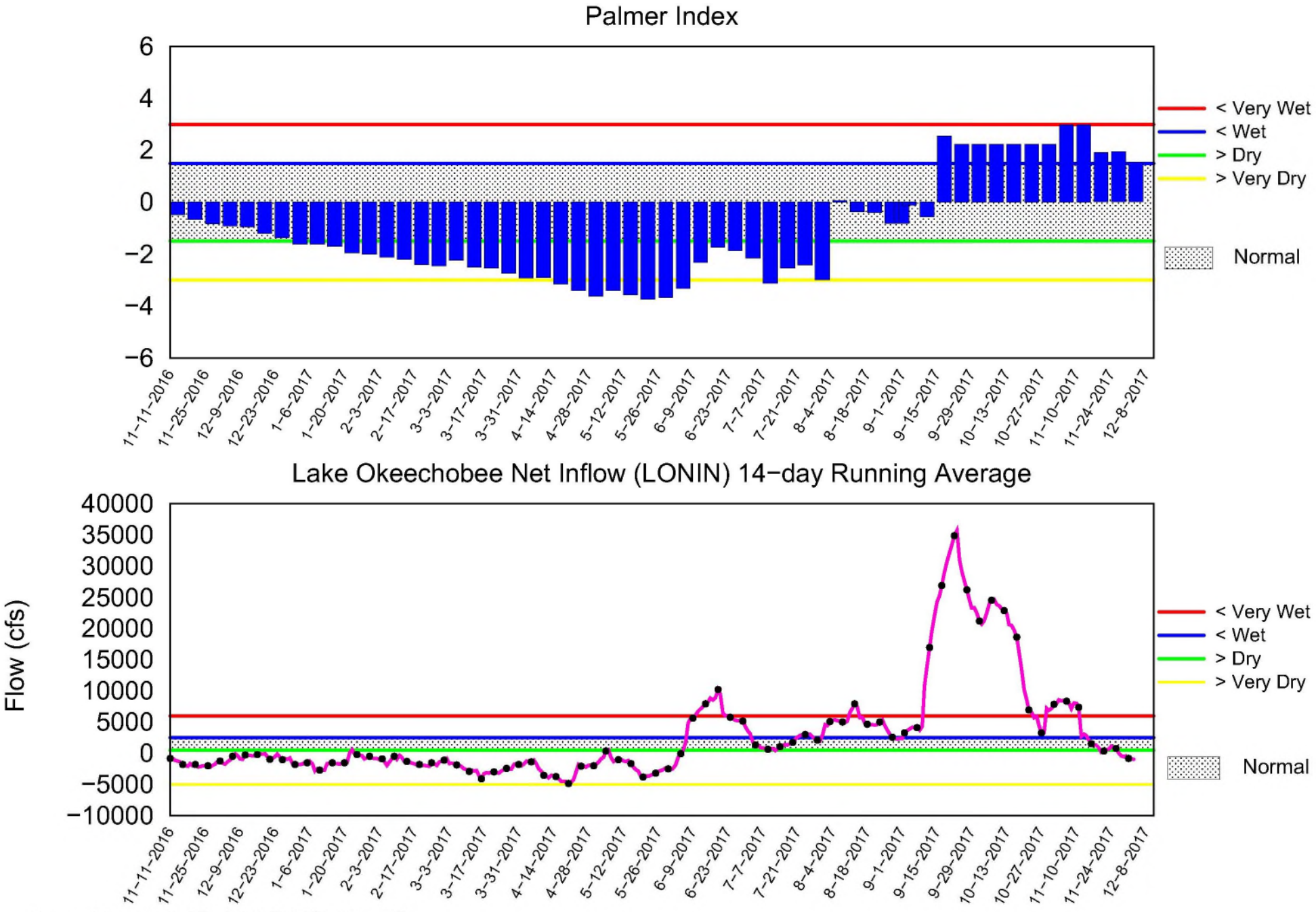
Lake Okeechobee SFWMM November 15 2017 Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Dec 4 9:05:58 2017

Tributary Basin Condition Indicators as of December 4 2017



Mon Dec 04 17:14:07 EST 2017

2008 LORS

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

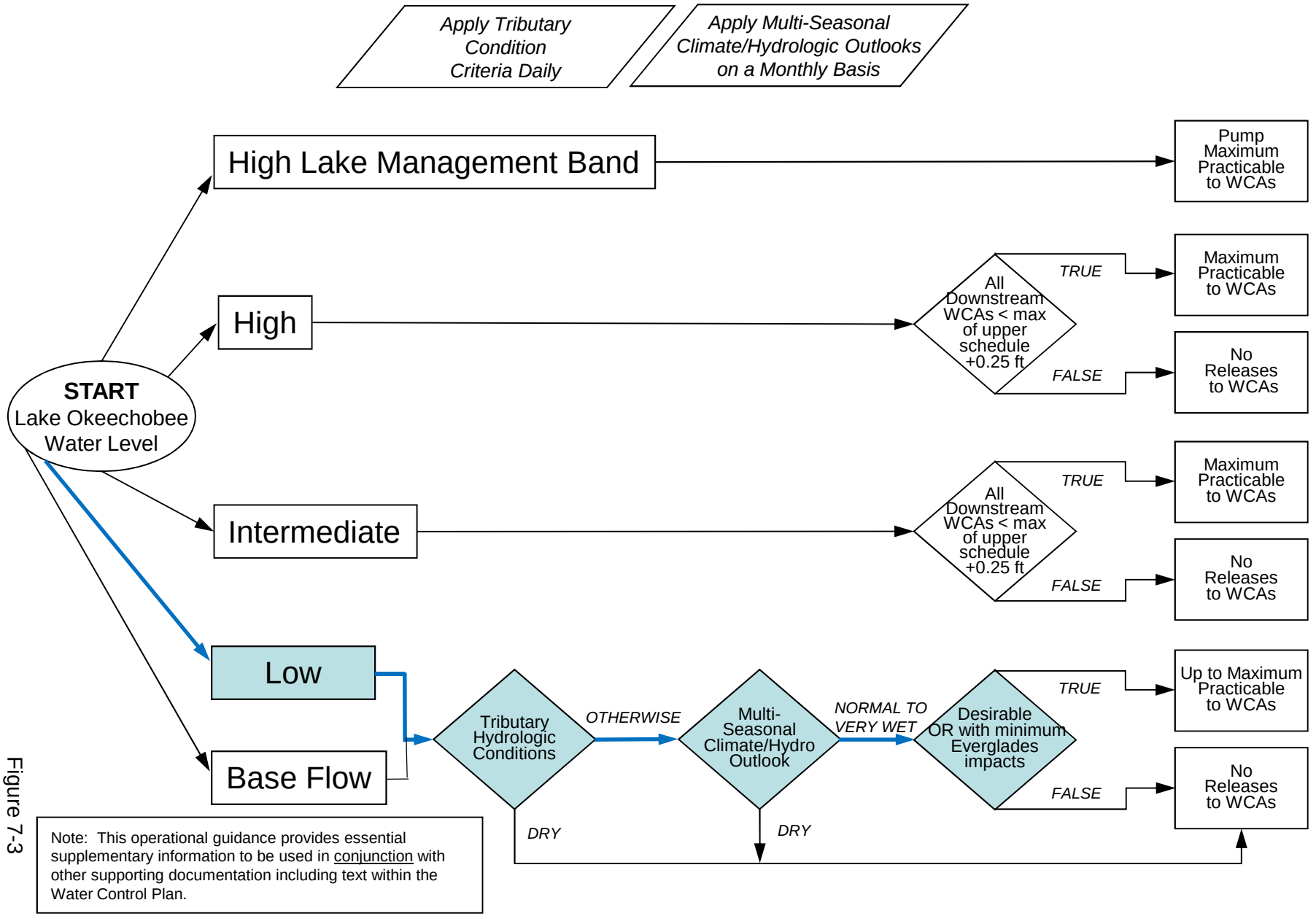


Figure 7-3

2008 LORS

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

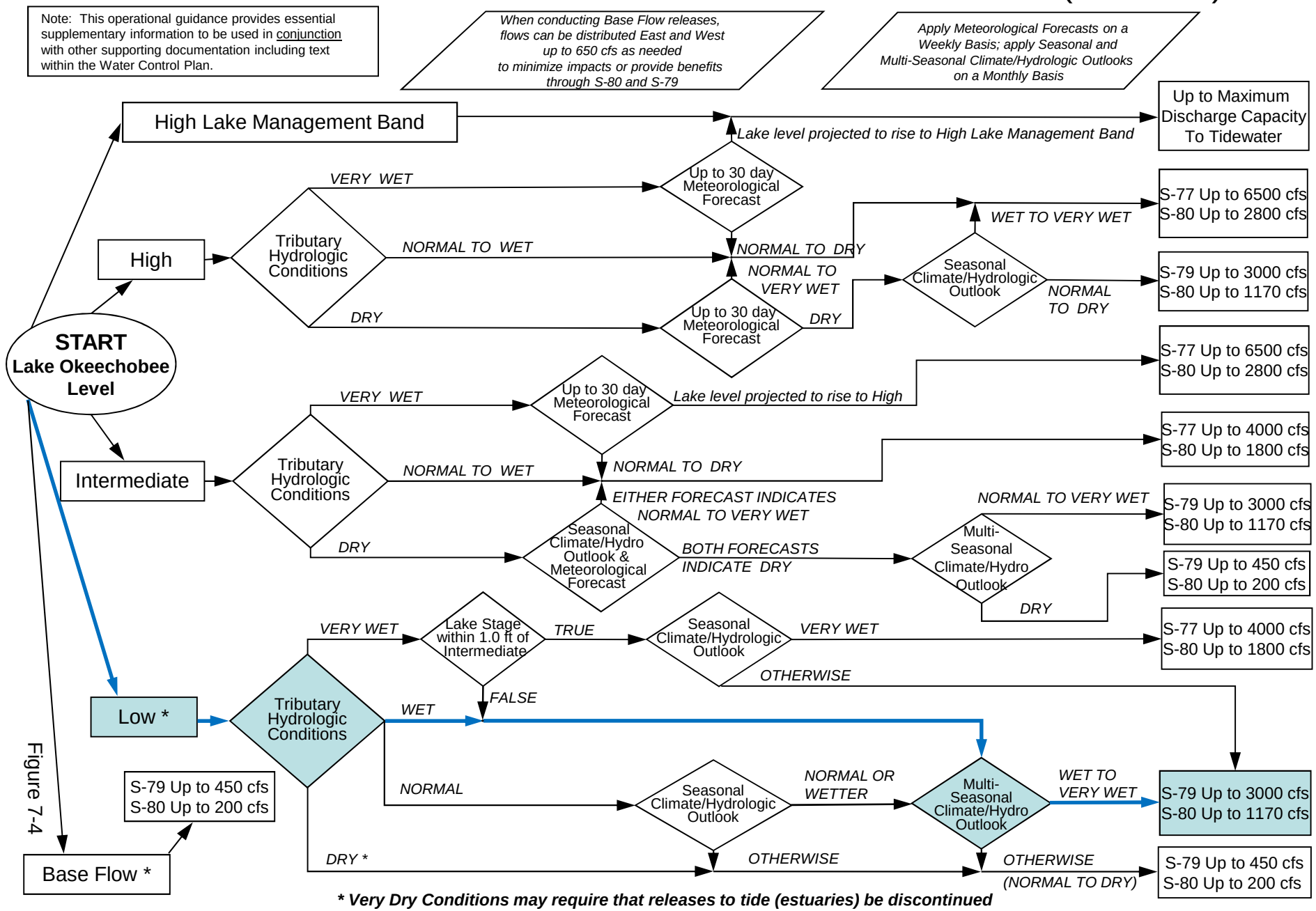
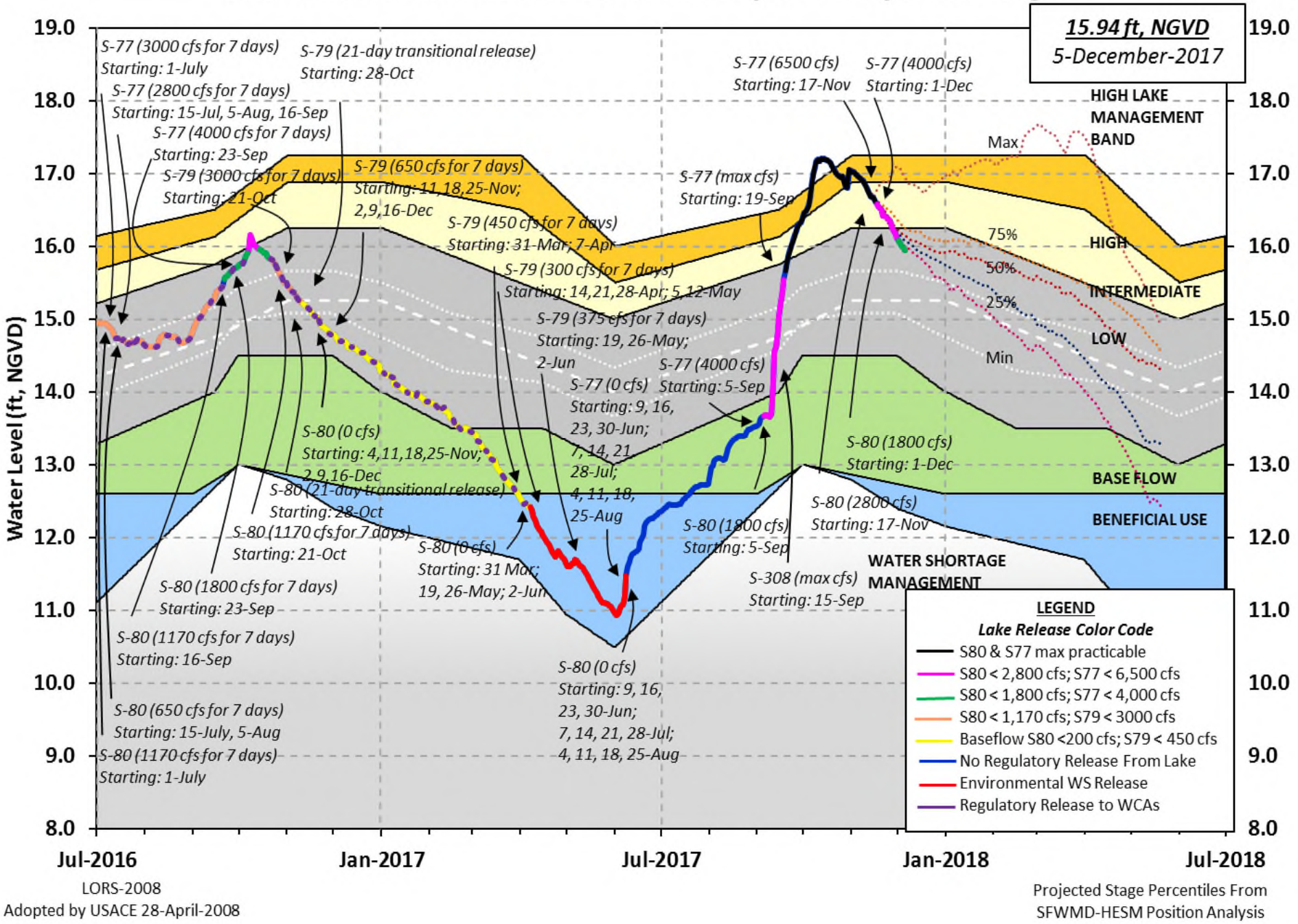


Figure 7-4

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 03 DEC 2017

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	15.98	14.70	14.50 (Official Elv)

Bottom of High Lake Mngmt= 17.25 Top of Water Short Mngmt= 12.38
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.74
Difference from Average LORS2008 2.24

03DEC (1965-2007) Period of Record Average 14.80
Difference from POR Average 1.18

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 9.92'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 8.12'
Bridge Clearance = 48.65'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
15.92	16.15	15.98	15.93	15.99	16.09	15.91	15.86

*Combination Okeechobee Avg-Daily Lake Average = 15.98 (*See Note)

Okeechobee Inflows (cfs):

S65E	659	S65EX1	0	Fisheating Cr	58
S154	0	S191	0	S135 Pumps	0
S84	387	S133 Pumps	0	S2 Pumps	0
S84X	0	S127 Pumps	0	S3 Pumps	0
S71	93	S129 Pumps	0	S4 Pumps	0
S72	0	S131 Pumps	0	C5	0

Total Inflows: 1197

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	362	S77	4307
S127 Culverts	0	S351	683	S308	924
S129 Culverts	0	S352	0		
S131 Culverts	0	L8 Canal Pt	6		

Total Outflows: 6282

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

Okeechobee Pan Evaporation (inches):
  S77 0.18 S308 0.13
  Average Pan Evap x 0.75 Pan Coefficient = 0.12" = 0.01'

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

Evaporation - Precipitation: = 0.12" = 0.01'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to 2282 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is -6605 cfs or -13100 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:	13.63	15.81	0	0	0	0	0	0	(cfs)		
S193:											
S191:	19.52	15.81	0	0.0	0.0	0.0					
S135 Pumps:	13.41	15.80	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	20.98	15.68	659	0.5	0.4	0.4	0.4	0.4	0.4		
S65EX1:	20.98	15.68	0								
S127 Pumps:	13.60	15.88	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	13.09	15.96	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.83	15.99	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek nr Palmdale		30.05	58								
nr Lakeport											
C5:		-NR-	0	-NR-	-NR-	-NR-					
South Shore											
S4 Pumps:	11.17	15.98	0	0	0	0			(cfs)		
S169:	14.45	11.15	1	0.0	0.0	0.0					
S310:	15.94		9								

```
  S3 Pumps:    10.81     15.99       0      0    0    0            (cfs)
  S354:        15.99     10.81     362    0.6  0.6
  S2 Pumps:    10.77     16.02       0      0    0    0    0       (cfs)
  S351:        16.02     10.77     683    0.5  0.7  0.6
  S352:        16.06     10.33       0    0.0  0.0
  C10A:         -NR-     13.30            8.0   8.0   8.0   0.0   0.0
  L8 Canal PT            13.12       6
```

S351 and S352 Temporary Pumps/S354 Spillway

```
  S351:        10.77     16.02     683  -NR--NR--NR--NR--NR--NR-
  S352:        10.33     16.06       0  -NR--NR--NR--NR-
  S354:        10.81     15.99     362  -NR--NR--NR--NR-
```

```
Caloosahatchee River (S77, S78, S79)
  S47B:        13.32     11.00            0.0  0.0
  S47D:        11.05     11.03     110    6.5
  S77:
    Spillway and Sector Flow:
                15.68     11.20  ******  3.5  3.5  5.0  3.0
    Flow Due to Lockages+:          10

  S77 Below USGS Flow Gage        4297

  S78:
    Spillway and Sector Flow:
                10.77      2.84    4010    0.0  4.5  5.0  3.0
    Flow Due to Lockages+:          14

  S79:
    Spillway and Sector Flow:
                 2.88      2.06    5033    2.0  3.0  3.0  3.0  3.0  3.0  2.5
2.0
    Flow Due to Lockages+:           6
    Percent of flow from S77        85%
    Chloride            (ppm)     42


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
                15.86     14.85  921.48  3.3  3.3  3.3  3.3
    Flow Due to Lockages+:           3

  S308 Below USGS Flow Gage        921
  S153:        18.73     14.65      42    0.0  0.0
  S80:
    Spillway and Sector Flow:
                14.10      1.92    1815    0.0  2.5  0.0  0.0  2.5  0.0  2.0
    Flow Due to Lockages+:          28
    Percent of flow from S308       51%

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

Speedy Point Top Salinity (mg/ml) 4231
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)	Wind 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:	0.00	0.00	0.00	84	2
S78:	0.00	0.00	0.00	40	2
S79:	0.00	0.00	0.00	193	2
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:	0.00	0.00	0.01	68	5
S80:	0.00	0.00	0.00	15	1
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.00	0.00		
Oke Nexrad Basin Avg	0.00	0.00	0.02		

Okeechobee Lake Elevations	03 DEC 2017	15.98	Difference from 03DEC17
03DEC17 -1 Day =	02 DEC 2017	16.01	0.03
03DEC17 -2 Days =	01 DEC 2017	16.04	0.06
03DEC17 -3 Days =	30 NOV 2017	16.08	0.10
03DEC17 -4 Days =	29 NOV 2017	16.12	0.14
03DEC17 -5 Days =	28 NOV 2017	16.17	0.19
03DEC17 -6 Days =	27 NOV 2017	16.21	0.23
03DEC17 -7 Days =	26 NOV 2017	16.26	0.28
03DEC17 -30 Days =	03 NOV 2017	16.98	1.00
03DEC17 -1 Year =	03 DEC 2016	14.70	-1.28
03DEC17 -2 Year =	03 DEC 2015	14.50	-1.48

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = 2.33

Lake Okeechobee Net Inflow (LONIN)

		Average Flow over the previous 14 days			Avg-Daily Flow
03DEC17	Today =	03 DEC 2017	-916	MON	-335
03DEC17	-1 Day =	02 DEC 2017	-852	SUN	-620
03DEC17	-2 Days =	01 DEC 2017	-758	SAT	-2470
03DEC17	-3 Days =	30 NOV 2017	-371	FRI	-1226
03DEC17	-4 Days =	29 NOV 2017	-532	THU	-3410
03DEC17	-5 Days =	28 NOV 2017	-390	WED	-606
03DEC17	-6 Days =	27 NOV 2017	103	TUE	-3658
03DEC17	-7 Days =	26 NOV 2017	782	MON	-3859
03DEC17	-8 Days =	25 NOV 2017	1030	SUN	-3948
03DEC17	-9 Days =	24 NOV 2017	1146	SAT	2777
03DEC17	-10 Days =	23 NOV 2017	627	FRI	2671
03DEC17	-11 Days =	22 NOV 2017	600	THU	2845
03DEC17	-12 Days =	21 NOV 2017	395	WED	7218
03DEC17	-13 Days =	20 NOV 2017	144	TUE	-8200

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
03DEC17	Today=	03 DEC 2017	1252	MON	751
03DEC17	-1 Day =	02 DEC 2017	1290	SUN	886
03DEC17	-2 Days =	01 DEC 2017	1321	SAT	1089
03DEC17	-3 Days =	30 NOV 2017	1343	FRI	1149
03DEC17	-4 Days =	29 NOV 2017	1369	THU	1217
03DEC17	-5 Days =	28 NOV 2017	1397	WED	1273
03DEC17	-6 Days =	27 NOV 2017	1434	TUE	1341
03DEC17	-7 Days =	26 NOV 2017	1483	MON	1394
03DEC17	-8 Days =	25 NOV 2017	1526	SUN	1394
03DEC17	-9 Days =	24 NOV 2017	1568	SAT	1458
03DEC17	-10 Days =	23 NOV 2017	1600	FRI	1480
03DEC17	-11 Days =	22 NOV 2017	1630	THU	1478
03DEC17	-12 Days =	21 NOV 2017	1656	WED	1343
03DEC17	-13 Days =	20 NOV 2017	1689	TUE	1279

S65EX1

		Average Flow over previous 14 days			Avg-Daily Flow
03DEC17	Today=	03 DEC 2017	84	MON	0
03DEC17	-1 Day =	02 DEC 2017	125	SUN	0
03DEC17	-2 Days =	01 DEC 2017	166	SAT	0
03DEC17	-3 Days =	30 NOV 2017	208	FRI	0
03DEC17	-4 Days =	29 NOV 2017	249	THU	0
03DEC17	-5 Days =	28 NOV 2017	290	WED	0
03DEC17	-6 Days =	27 NOV 2017	331	TUE	0
03DEC17	-7 Days =	26 NOV 2017	366	MON	0
03DEC17	-8 Days =	25 NOV 2017	394	SUN	0
03DEC17	-9 Days =	24 NOV 2017	421	SAT	103
03DEC17	-10 Days =	23 NOV 2017	456	FRI	113
03DEC17	-11 Days =	22 NOV 2017	500	THU	136
03DEC17	-12 Days =	21 NOV 2017	555	WED	311
03DEC17	-13 Days =	20 NOV 2017	609	TUE	514

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)
03 DEC 2017	8333	8521	7986	9970
02 DEC 2017	8452	8692	7890	9864
01 DEC 2017	9637	9695	9081	11176
30 NOV 2017	12055	11875	11819	13936
29 NOV 2017	12109	11984	11859	14270
28 NOV 2017	12177	12072	11843	14137
27 NOV 2017	12284	12020	11855	14188
26 NOV 2017	12317	11875	11997	14692
25 NOV 2017	12178	11873	12408	14185
24 NOV 2017	11922	11646	12505	16099
23 NOV 2017	12014	11771	12533	14462
22 NOV 2017	12222	12057	12386	15565
21 NOV 2017	12433	12109	12256	14748
20 NOV 2017	12583	12269	12420	14637

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)
03 DEC 2017	17	-72243	0	700	12
02 DEC 2017	96	******	0	718	21
01 DEC 2017	195	0	0	880	17
30 NOV 2017	112	0	0	629	16
29 NOV 2017	48	25160	0	500	13
28 NOV 2017	93	143890	232	1053	14
27 NOV 2017	106	0	0	365	14
26 NOV 2017	136	0	0	0	14
25 NOV 2017	133	0	0	0	0
24 NOV 2017	93	0	0	0	-8
23 NOV 2017	20	0	0	0	12
22 NOV 2017	26	0	0	0	10
21 NOV 2017	16	0	0	0	1
20 NOV 2017	41	0	0	0	18

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
03 DEC 2017	4175	1827	3650
02 DEC 2017	3985	2011	3649
01 DEC 2017	4537	2406	4175
30 NOV 2017	5464	3039	5485
29 NOV 2017	5417	3224	5495
28 NOV 2017	5461	2852	5491
27 NOV 2017	5389	2809	5508
26 NOV 2017	5365	2953	5533
25 NOV 2017	5401	2794	5568
24 NOV 2017	5295	2859	5598
23 NOV 2017	5425	2512	5555
22 NOV 2017	5577	2573	5516
21 NOV 2017	5006	2203	5610

20 NOV 2017 5379 2946 5844

*** 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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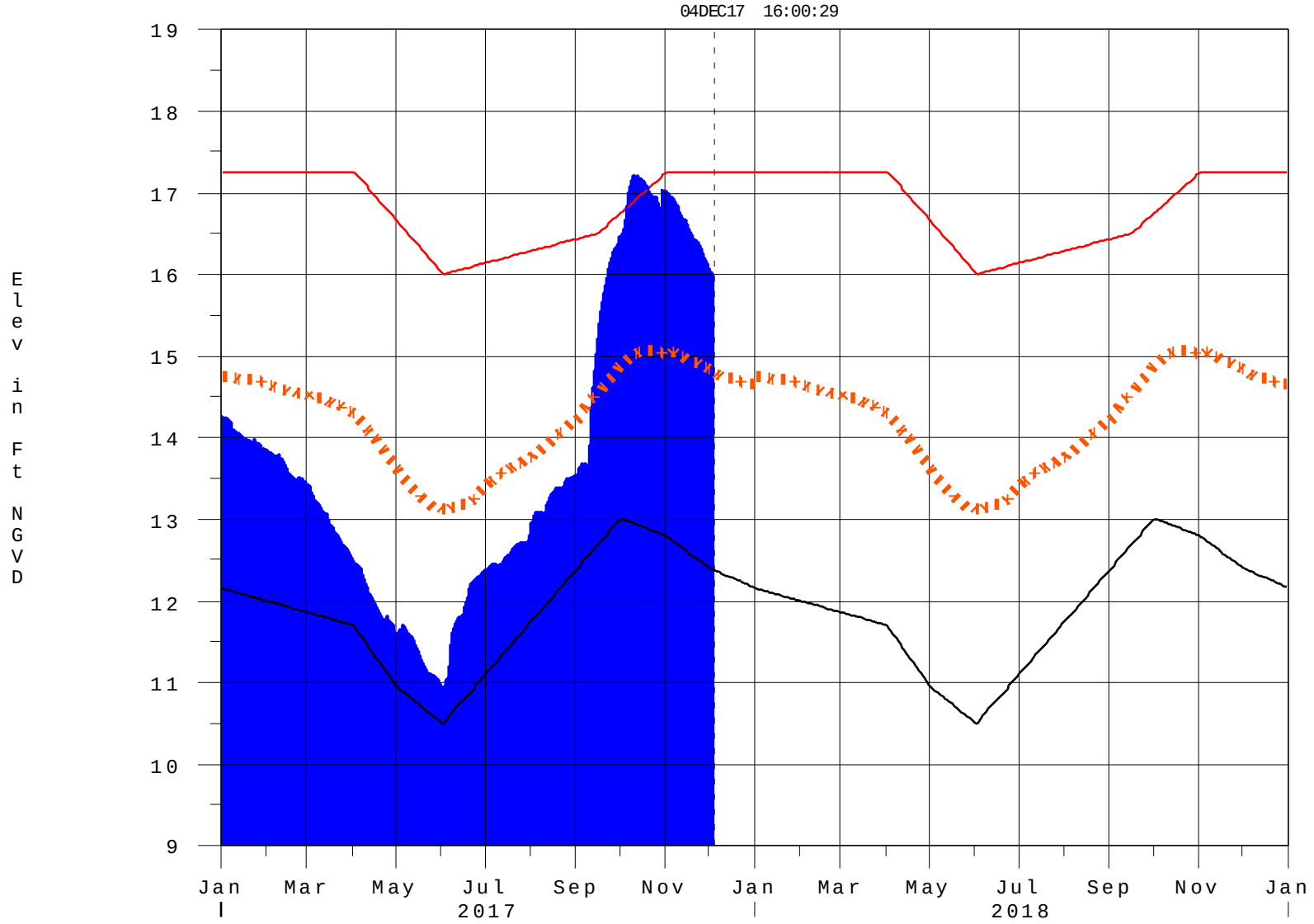
* On 11 May 1999, Lake Okeechobee Elevation was switched from
Instantaneous 2400 value to an average-daily lake average.
On 14 Mar 2001, due to the isolation of various gages within the standard
10 stations, the average of the interior 4 station gages was used
as the Lake Okeechobee Elevation.
On 05 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

Report Generated 04DEC2017 @ 15:40 ** Preliminary Data - Subject to Revision **

Lake Okeechobee



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

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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