Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 2/20/2017 (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 Neutral 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 (Feb-Jul)	N/A	N/A	0.54	Dry	0.62	Dry	0.84	Normal
Multi Seasonal (Feb-Oct)	N/A	N/A	2.18	Normal	2.80	Wet	3.61	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:

-1777 cfs 14-day running average for Lake Okeechobee Net Inflow through 2/19/2017.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-2.41 for Palmer Index on 2/18/2017.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 2/20/2017

Lake Okeechobee Stage: **13.51 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	16.67	
	Intermediate sub-band	15.84	
	Low sub-band	13.50	← 13.51
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.90	
Water Shortage Management Band			

Part C of LORS2008: Discharge to WCA's

Release Guidance Flow Chart Outcome: No releases to the WCAs.

Part D of LORS2008: Discharge to Tidewater

Release Guidance Flow Chart Outcome: S-79 up to 450 cfs and S-80 up to 200 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**
- **Operations Department**

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LORS2008 Implementation on 2/20/2017 (ENSO Neutral Condition):

Status for week ending 2/20/2017:
District wide, Raindar rainfall was 0.06 inches for the week. Lake stage on 2/20/2017 was 13.51 ft, down 0.20 ft from last week.
The updated February 2017 SFWMM Dynamic Position Analysis percentile graph for Lake Okeechobee show that the current lake stage is in the Low Operational Sub-Band.

The LORS2008 tributary indices are classified as **Dry**. The PDSI indicates dry 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	-2.41 (Extremely Dry)	H
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Outlook	0.62 ft (Dry)	M
	ENSO La Nina Years		
	LOK Multi-Seasonal Net Inflow Outlook	2.80 ft (Normal)	M
	ENSO La Nina Years		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (16.31 ft)	L
	WCA 2A: Site 2-17 HW	Above Line1 (11.72 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (9.48 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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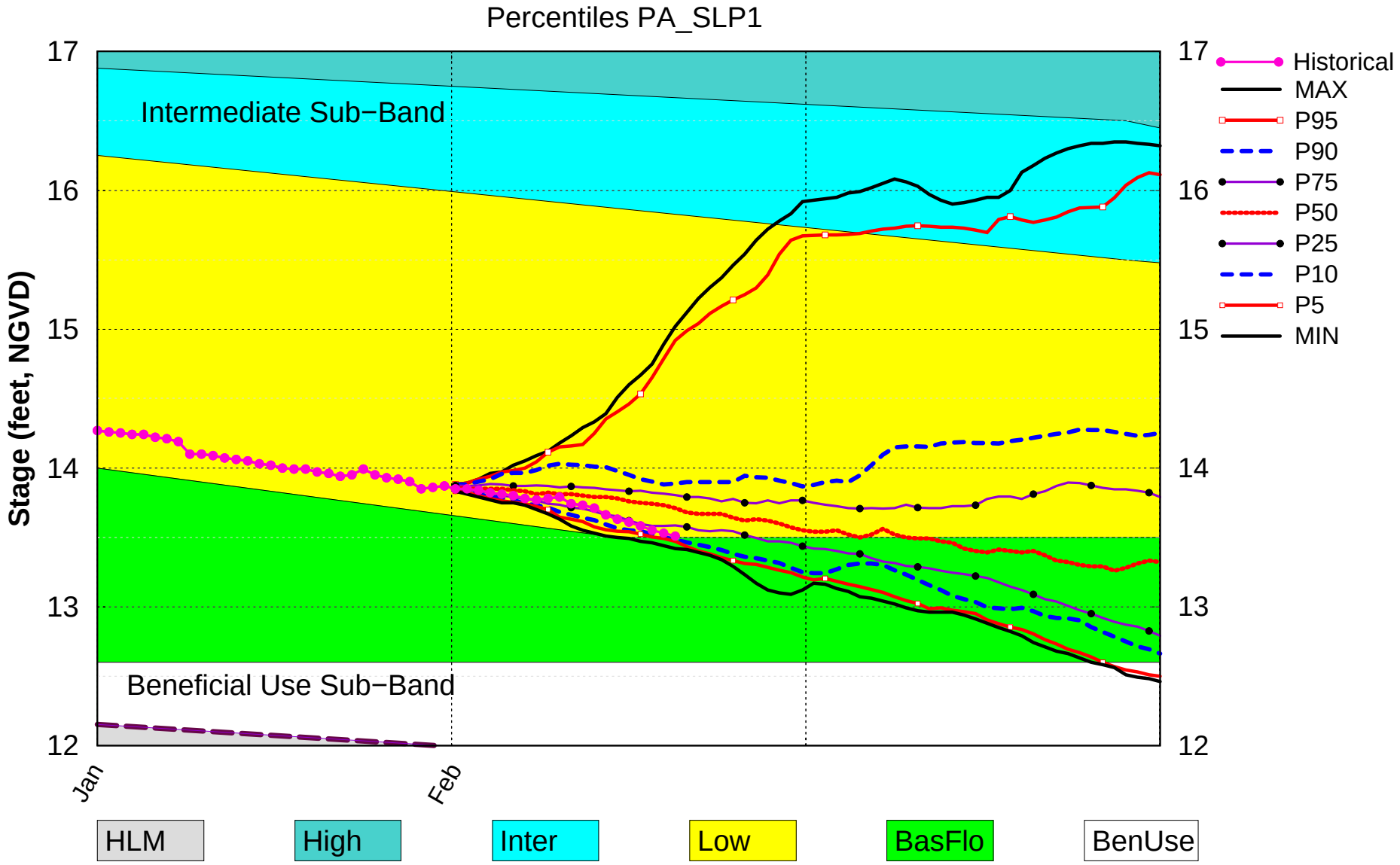
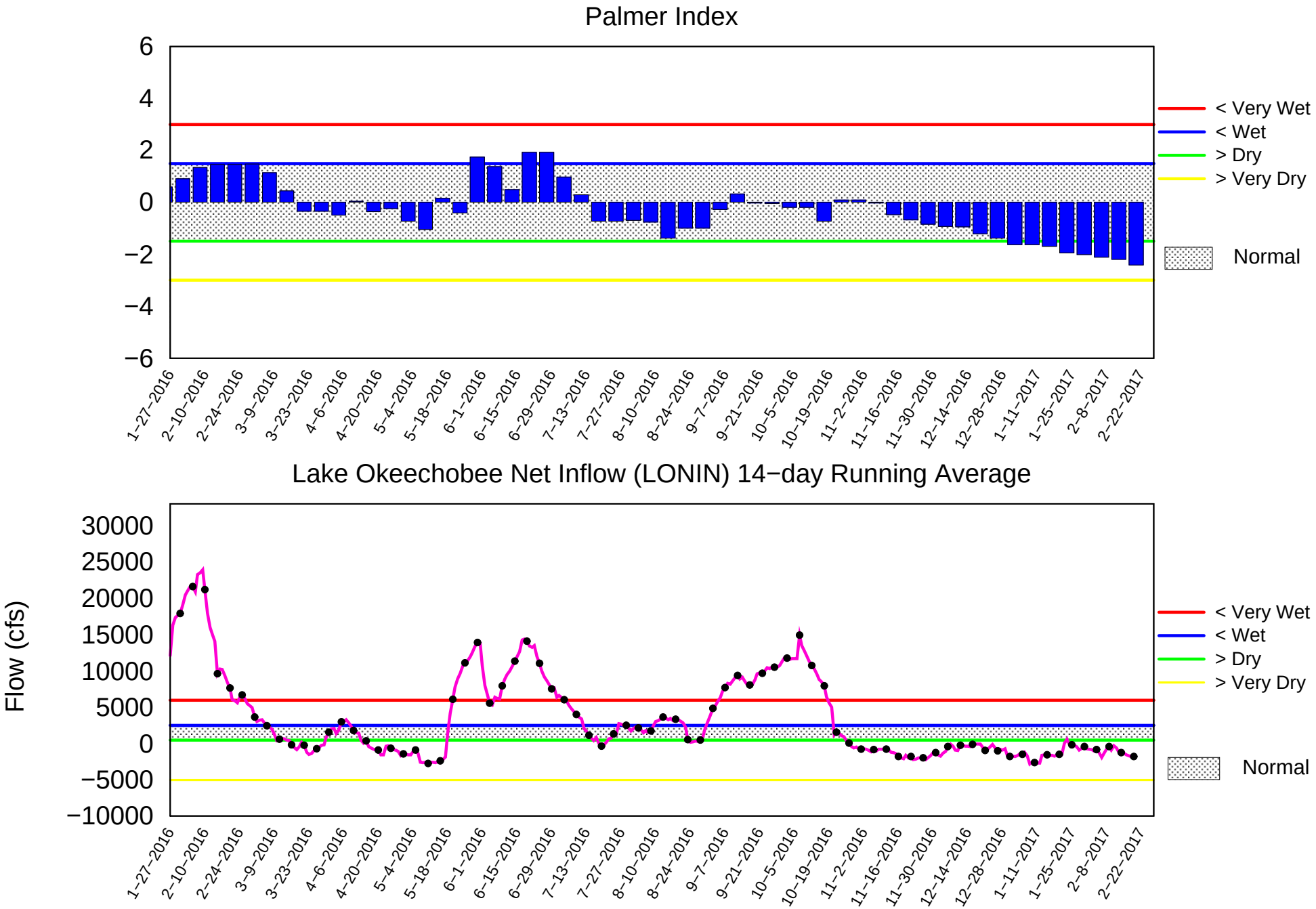
Lake Okeechobee SFWMM February 2017 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Feb 20 15:39:22 EST 2017

Tributary Basin Condition Indicators as of February 20 2017



Mon Feb 20 15:39:04 EST 2017

2008 LORS

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

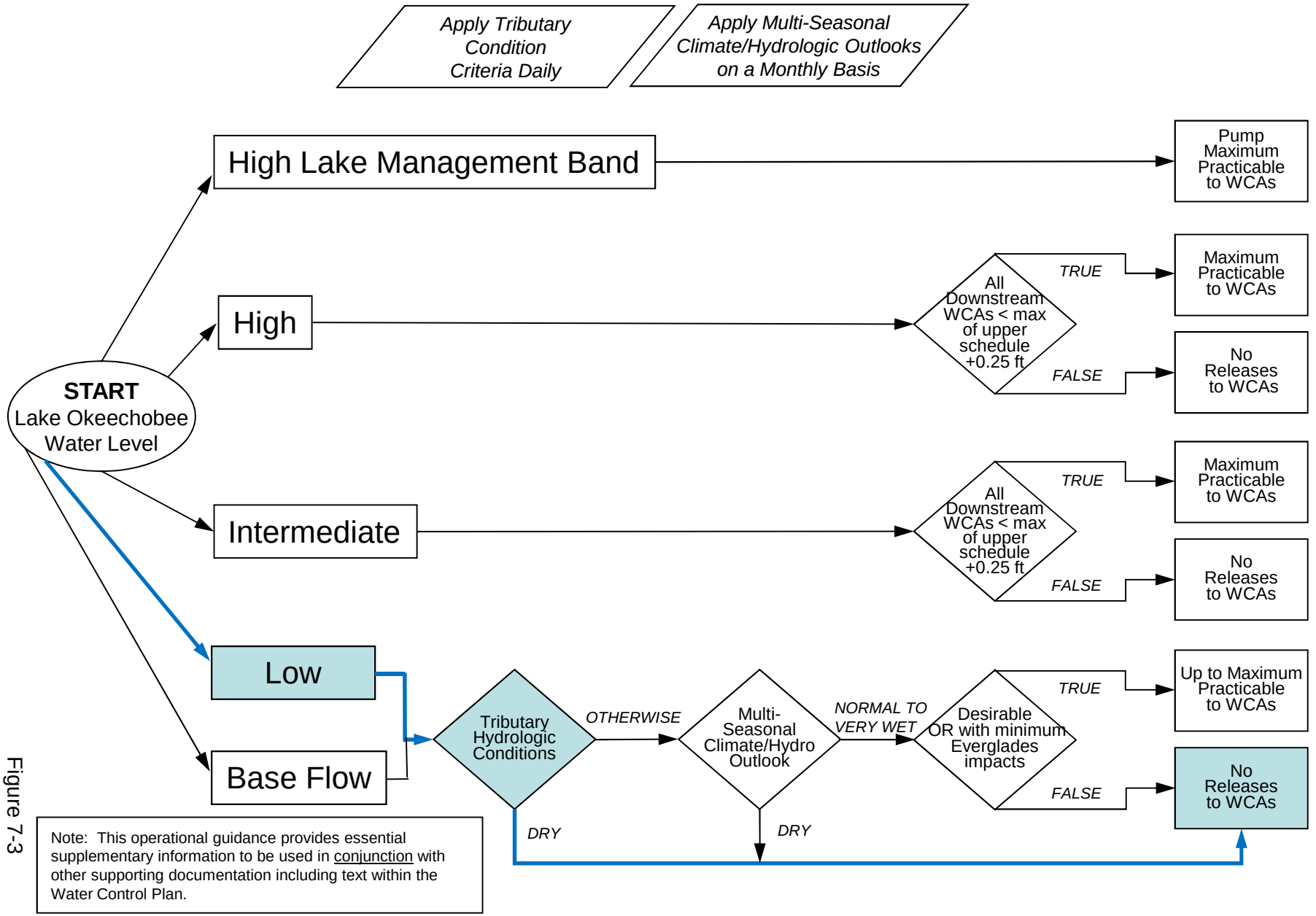


Figure 7-3

2008 LORS

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

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

When conducting Base Flow releases, flows can be distributed East and West up to 650 cfs as needed to minimize impacts or provide benefits through S-80 and S-79

Apply Meteorological Forecasts on a Weekly Basis; apply Seasonal and Multi-Seasonal Climate/Hydrologic Outlooks on a Monthly Basis

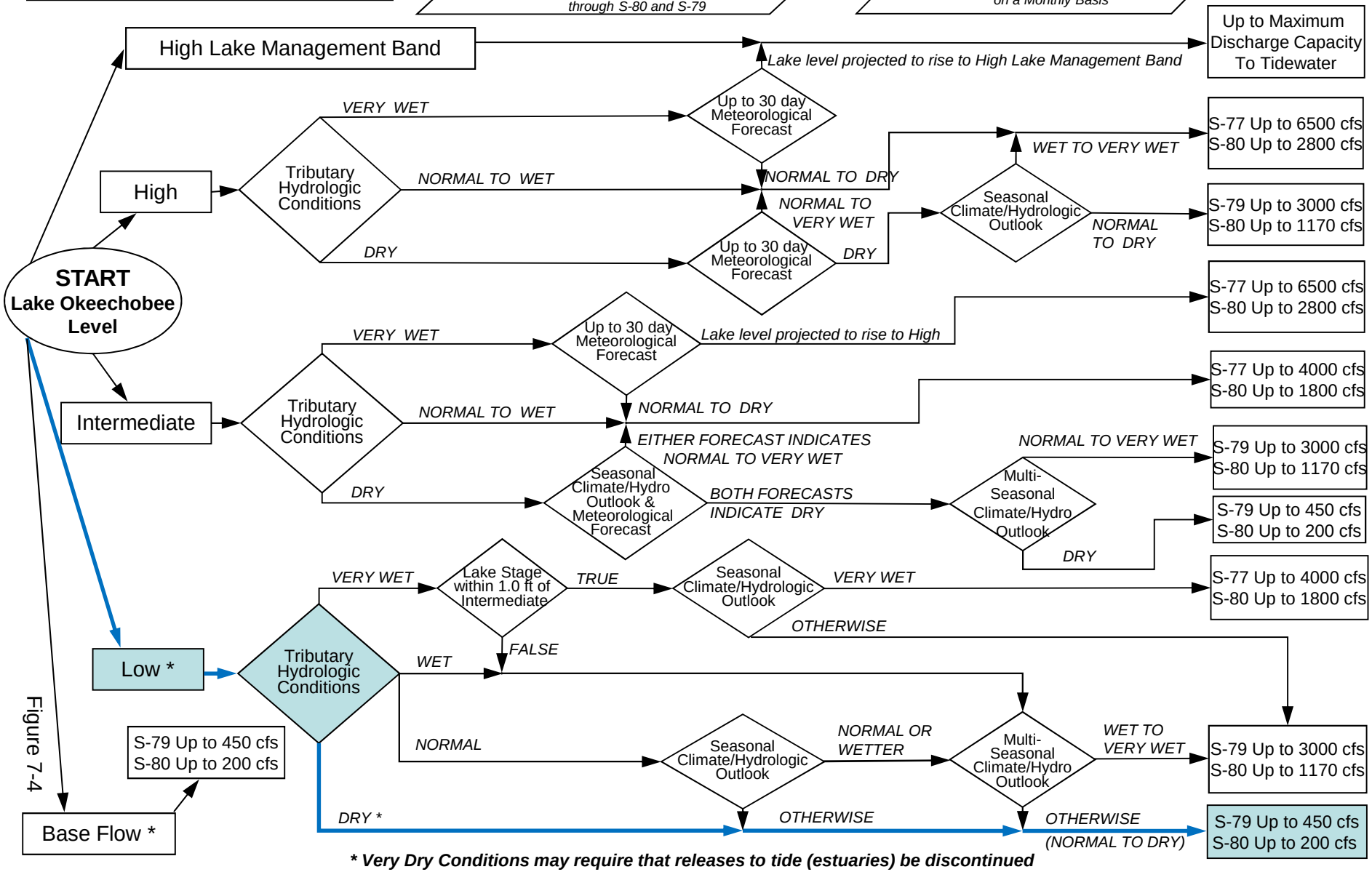
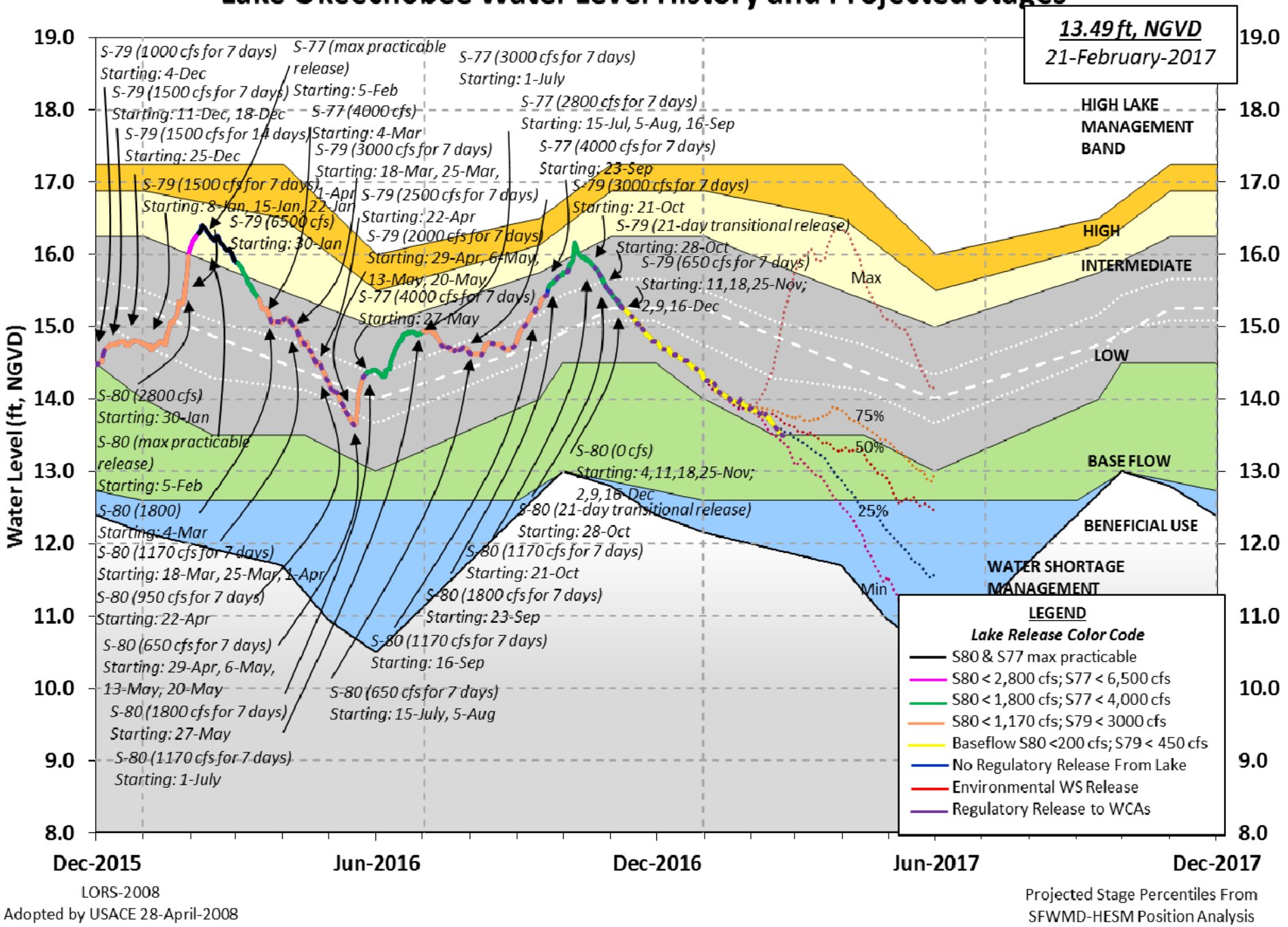


Figure 7-4

**** Very Dry Conditions may require that releases to tide (estuaries) be discontinued***

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 19 FEB 2017

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	13.51	16.16	14.74 (Official Elv)

Bottom of High Lake Mngmt= 17.25 Top of Water Short Mngmt= 11.90
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.38
Difference from Average LORS2008 0.13

19FEB (1965-2007) Period of Record Average 14.56
Difference from POR Average -1.05

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 7.45'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 5.65'
Bridge Clearance = 50.00'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
13.37	13.60	13.48	13.50	13.53	13.67	13.47	13.45

*Combination Okeechobee Avg-Daily Lake Average = 13.51 (*See Note)

Okeechobee Inflows (cfs):

S65E	0	C5	-133	Fisheating Cr	1
S154	0	S191	0	S135 Pumps	0
S84	0	S133 Pumps	0	S2 Pumps	0
S84X	0	S127 Pumps	0	S3 Pumps	0
S71	0	S129 Pumps	0	S4 Pumps	0
S72	0	S131 Pumps	0		

Total Inflows: -132

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	334	S77	1420
S127 Culverts	0	S351	466	S77Below	1156
S129 Culverts	0	S352	292	S308	-0
S131 Culverts	0	L8 Canal Pt	215	S308Below	17

Total Outflows: 2728

****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 0.18 S308 0.13
  Average Pan Evap x 0.75 Pan Coefficient = 0.12" = 0.01'

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 -4235 cfs or -8400 AC-FT

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

	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:	13.31	13.58	0	0	0	0	0	0	(cfs)		
S193:	_____										
S191:	18.10	13.54	0	0.0	0.0	0.0					
S135 Pumps:	13.19	13.44	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	20.93	13.37	0	0.0	0.0	0.0	0.0	0.0	0.0		
S127 Pumps:	13.03	13.54	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	_____	-NR-	0	0	0	0			(cfs)		
S129 Culvert:			0	-NR-							
S131 Pumps:	12.59	13.59	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek nr Palmdale		27.93	1								
nr Lakeport		_____									
C5:	13.47	13.51	-133	5.4	5.6	5.4					
South Shore											
S4 Pumps:	11.09	13.49	0	0	0	0			(cfs)		
S169:	13.51	11.07	0	0.0	0.0	0.0					

```
  S310:        13.46                33
  S3 Pumps:    10.77     13.52       0      0    0    0            (cfs)
  S354:        13.52     10.77     334    1.0  1.0
  S2 Pumps:    10.57     13.51       0      0    0    0    0       (cfs)
  S351:        13.51     10.57     466    1.0  1.0  1.0
  S352:        13.62     10.79     292    0.9  0.9
  C10A:         -NR-     13.57            0.0   8.0   8.0   8.0   8.0
  L8 Canal PT            13.40     215
```

S351 and S352 Temporary Pumps/S354 Spillway

```
  S351:        10.57     13.51     466  -NR--NR--NR--NR--NR--NR-
  S352:        10.79     13.62     292  -NR--NR--NR--NR-
  S354:        10.77     13.52     334  -NR--NR--NR--NR-
```

```
Caloosahatchee River (S77, S78, S79)
  S47B:        12.76     10.95            0.0  0.0
  S47D:        11.06     11.06      23    6.1
  S77:
    Spillway and Sector Flow:
                13.40     11.19    1414  0.0  3.5  3.5  0.0
    Flow Due to Lockages+:             6

  S77 Below USGS Flow Gage        1156

  S78:
    Spillway and Sector Flow:
                10.96      3.17     843    0.0  0.0  2.5  0.0
    Flow Due to Lockages+:            12

  S79:
    Spillway and Sector Flow:
                 3.02      1.25    1034    0.0  0.0  0.0  1.0  1.0  1.0  0.5
0.0
    Flow Due to Lockages+:            12
    Percent of flow from S77         137%
    Chloride            (ppm)     60


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
                13.44     13.50       0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           -0

  S308 Below USGS Flow Gage          17
  S153:        18.66     13.30       0    0.0  0.0
  S80:
    Spillway and Sector Flow:
                13.50     -0.33       0    0.0  0.0  0.0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:            29
    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)	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	0.26	73	0
S78:	0.00	0.00	0.16	41	1
S79:	0.00	0.01	0.01	165	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:	0.00	0.00	0.00	270	0
S80:	0.00	0.00	0.00	183	0
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.00	0.02		
Oke Nexrad Basin Avg	-NR-	0.00	0.00		

Okeechobee Lake Elevations	19 FEB 2017	13.51	Difference from 19FEB17
19FEB17 -1 Day =	18 FEB 2017	13.53	0.02
19FEB17 -2 Days =	17 FEB 2017	13.55	0.04
19FEB17 -3 Days =	16 FEB 2017	13.58	0.07
19FEB17 -4 Days =	15 FEB 2017	13.61	0.10
19FEB17 -5 Days =	14 FEB 2017	13.63	0.12
19FEB17 -6 Days =	13 FEB 2017	13.66	0.15
19FEB17 -7 Days =	12 FEB 2017	13.71	0.20
19FEB17 -30 Days =	20 JAN 2017	13.96	0.45
19FEB17 -1 Year =	19 FEB 2016	16.16	2.65
19FEB17 -2 Year =	19 FEB 2015	14.74	1.23

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
19FEB17	Today =	19 FEB 2017	-1894	MON	-1796
19FEB17	-1 Day =	18 FEB 2017	-1772	SUN	-2144
19FEB17	-2 Days =	17 FEB 2017	-1607	SAT	-3514
19FEB17	-3 Days =	16 FEB 2017	-1514	FRI	-3631
19FEB17	-4 Days =	15 FEB 2017	-1304	THU	-1362
19FEB17	-5 Days =	14 FEB 2017	-1147	WED	-3432
19FEB17	-6 Days =	13 FEB 2017	-1144	TUE	-7760
19FEB17	-7 Days =	12 FEB 2017	-427	MON	-1236
19FEB17	-8 Days =	11 FEB 2017	-101	SUN	787
19FEB17	-9 Days =	10 FEB 2017	-734	SAT	-8168
19FEB17	-10 Days =	09 FEB 2017	-264	FRI	4428
19FEB17	-11 Days =	08 FEB 2017	-625	THU	4136
19FEB17	-12 Days =	07 FEB 2017	-1233	WED	-528
19FEB17	-13 Days =	06 FEB 2017	-1825	TUE	-2291

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
19FEB17	Today=	19 FEB 2017	324	MON	0
19FEB17	-1 Day =	18 FEB 2017	382	SUN	0
19FEB17	-2 Days =	17 FEB 2017	436	SAT	0
19FEB17	-3 Days =	16 FEB 2017	475	FRI	0
19FEB17	-4 Days =	15 FEB 2017	513	THU	0
19FEB17	-5 Days =	14 FEB 2017	547	WED	0
19FEB17	-6 Days =	13 FEB 2017	583	TUE	280
19FEB17	-7 Days =	12 FEB 2017	598	MON	511
19FEB17	-8 Days =	11 FEB 2017	595	SUN	513
19FEB17	-9 Days =	10 FEB 2017	582	SAT	575
19FEB17	-10 Days =	09 FEB 2017	571	FRI	563
19FEB17	-11 Days =	08 FEB 2017	562	THU	621
19FEB17	-12 Days =	07 FEB 2017	557	WED	708
19FEB17	-13 Days =	06 FEB 2017	541	TUE	764

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)
19 FEB 2017	2816	2292	1696	2074
18 FEB 2017	2571	2472	-NR-	2149
17 FEB 2017	2079	2067	-NR-	1659
16 FEB 2017	1521	1347	686	586
15 FEB 2017	1374	1324	690	500
14 FEB 2017	1228	977	694	946
13 FEB 2017	1620	1431	1012	1647
12 FEB 2017	2877	2749	1757	2017
11 FEB 2017	2553	2700	1432	1896
10 FEB 2017	1754	1711	824	1799
09 FEB 2017	1464	1256	1009	843
08 FEB 2017	1444	1360	1045	774
07 FEB 2017	1445	1396	1061	940

DATE				
06 FEB 2017	1456	1339	1070	1664

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)
19 FEB 2017	65	924	579	581	427
18 FEB 2017	107	583	369	190	383
17 FEB 2017	136	1799	914	466	277
16 FEB 2017	116	2005	948	843	255
15 FEB 2017	119	1549	968	1497	359
14 FEB 2017	48	1896	1019	1442	397
13 FEB 2017	36	1682	884	1124	383
12 FEB 2017	123	1642	506	662	388
11 FEB 2017	63	1535	151	696	361
10 FEB 2017	27	1547	77	1178	285
09 FEB 2017	71	1606	252	1083	385
08 FEB 2017	40	1162	311	793	377
07 FEB 2017	59	405	230	637	265
06 FEB 2017	-20	599	331	1087	265

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
19 FEB 2017	-0	33	57
18 FEB 2017	0	149	26
17 FEB 2017	-0	107	49
16 FEB 2017	0	-46	50
15 FEB 2017	0	-140	23
14 FEB 2017	0	61	30
13 FEB 2017	0	102	31
12 FEB 2017	0	-45	74
11 FEB 2017	1	317	64
10 FEB 2017	-0	-157	45
09 FEB 2017	-0	-338	24
08 FEB 2017	0	-218	61
07 FEB 2017	0	221	60
06 FEB 2017	0	234	56

*** 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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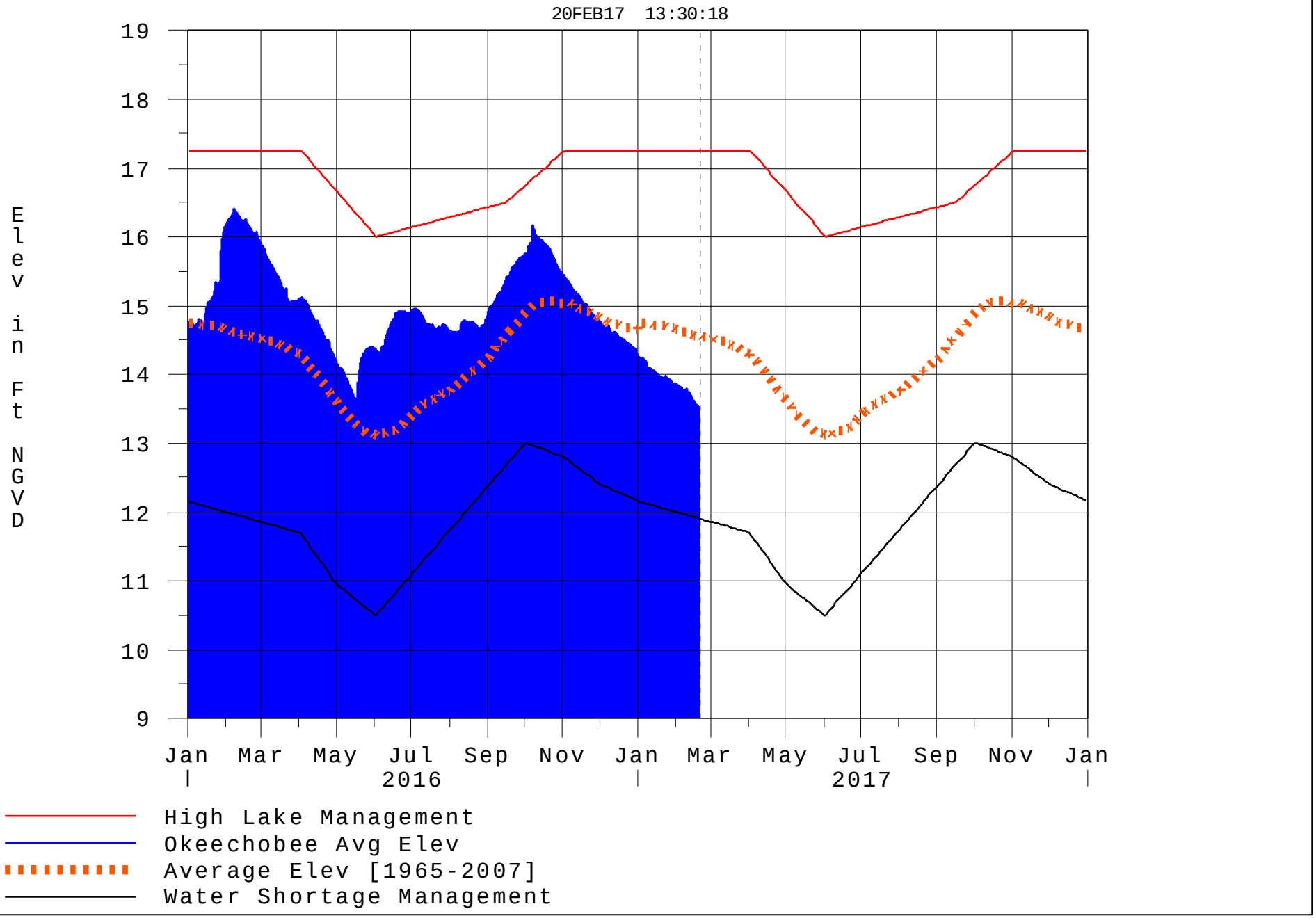
* On 11 May 1999, Lake Okeechobee Elevation was switched from Instantaneous 2400 value to an average-daily lake average.
On 14 Mar 2001, due to the isolation of various gages within the standard
10 stations, the average of the interior 4 station gages was used as the Lake Okeechobee Elevation.
On 05 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 20FEB2017 @ 13:38 ** Preliminary Data - Subject to Revision **

Lake Okeechobee



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