Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 12/26/2016 (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 La Nina ENSO Years[3]		Sub-sampling of AMO Warm + La Nina ENSO Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Dec-May)	N/A	N/A	-0.17	Dry	-0.28	Dry	-0.50	Dry
Multi Seasonal (Dec-Oct)	N/A	N/A	2.38	Normal	2.74	Wet	2.00	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.

Tributary Hydrologic Conditions Graph:

-596 cfs 14-day running average for Lake Okeechobee Net Inflow through 12/25/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-1.38 for Palmer Index on 12/24/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Normal.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 12/25/2016

Lake Okeechobee Stage: **14.42 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	14.10	← 14.42
Base Flow sub-band		12.63	
Beneficial Use sub-band		12.21	
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 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**

Back to Lake Okeechobee Operations Main Page

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LORS2008 Implementation on 12/26/2016 (ENSO La Nina Condition):

Status for week ending 12/26/2016:
District wide, Raindar rainfall was 0.02 inches for the week. Lake stage on 12/27/2016 was 14.42 ft, down 0.12 ft from last week.
The updated December 2016 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 **Normal**. The PDSI indicates normal 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	Low Sub-Band	L
	Palmer Index for LOK Tributary Conditions	-1.38 (Dry)	M
	CPC Precipitation Outlook	1 month: Below Normal	M
		3 months: Below Normal	M
	LOK Seasonal Net Inflow Outlook	-0.28 ft (Extremely Dry)	H
	ENSO La Nina Years		
	LOK Multi-Seasonal Net Inflow Outlook	2.74 ft (Normal)	M
	ENSO La Nina Years		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (16.54 ft)	L
	WCA 2A: Site 2-17 HW	Above Line1 (12.33 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (9.94 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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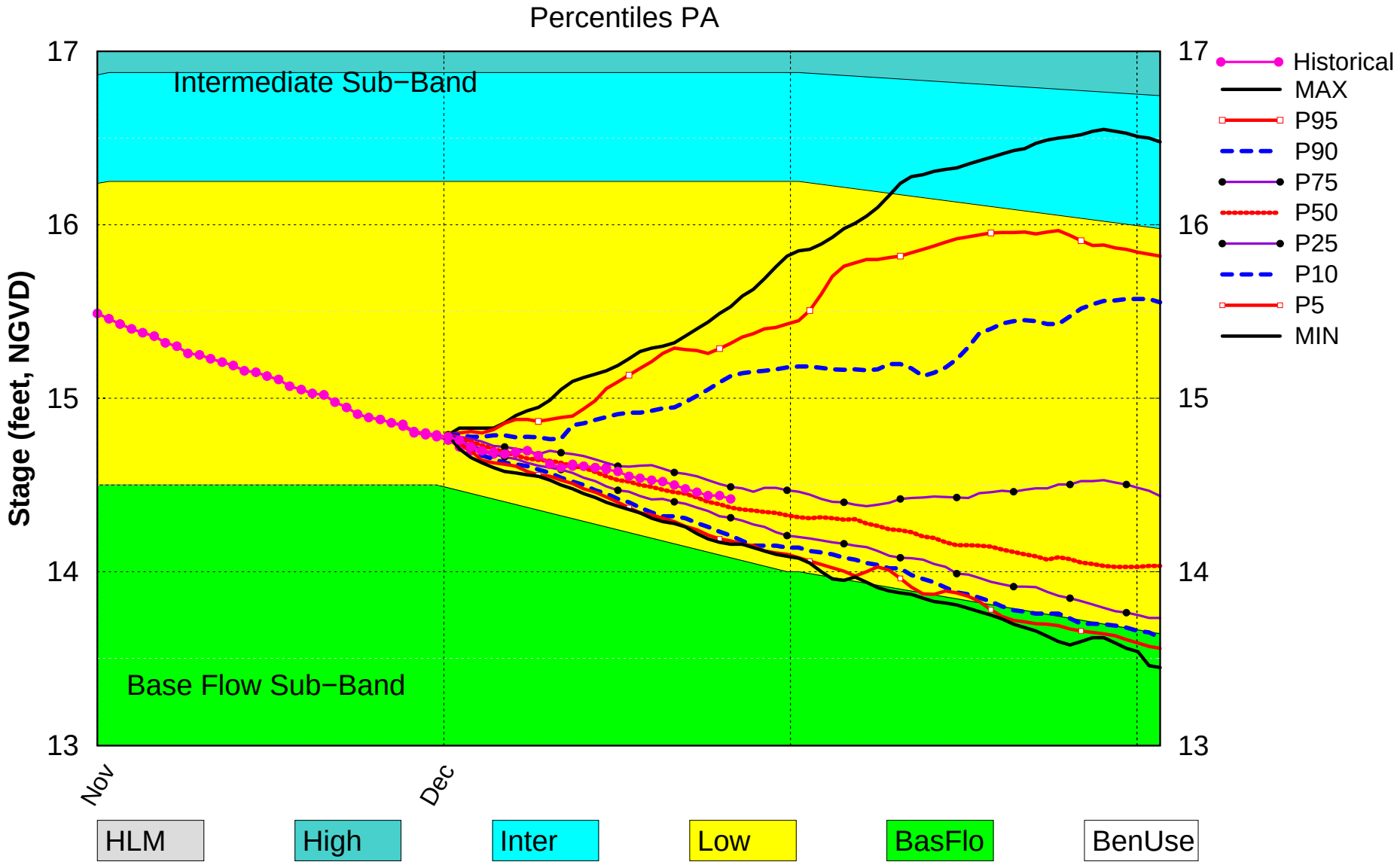
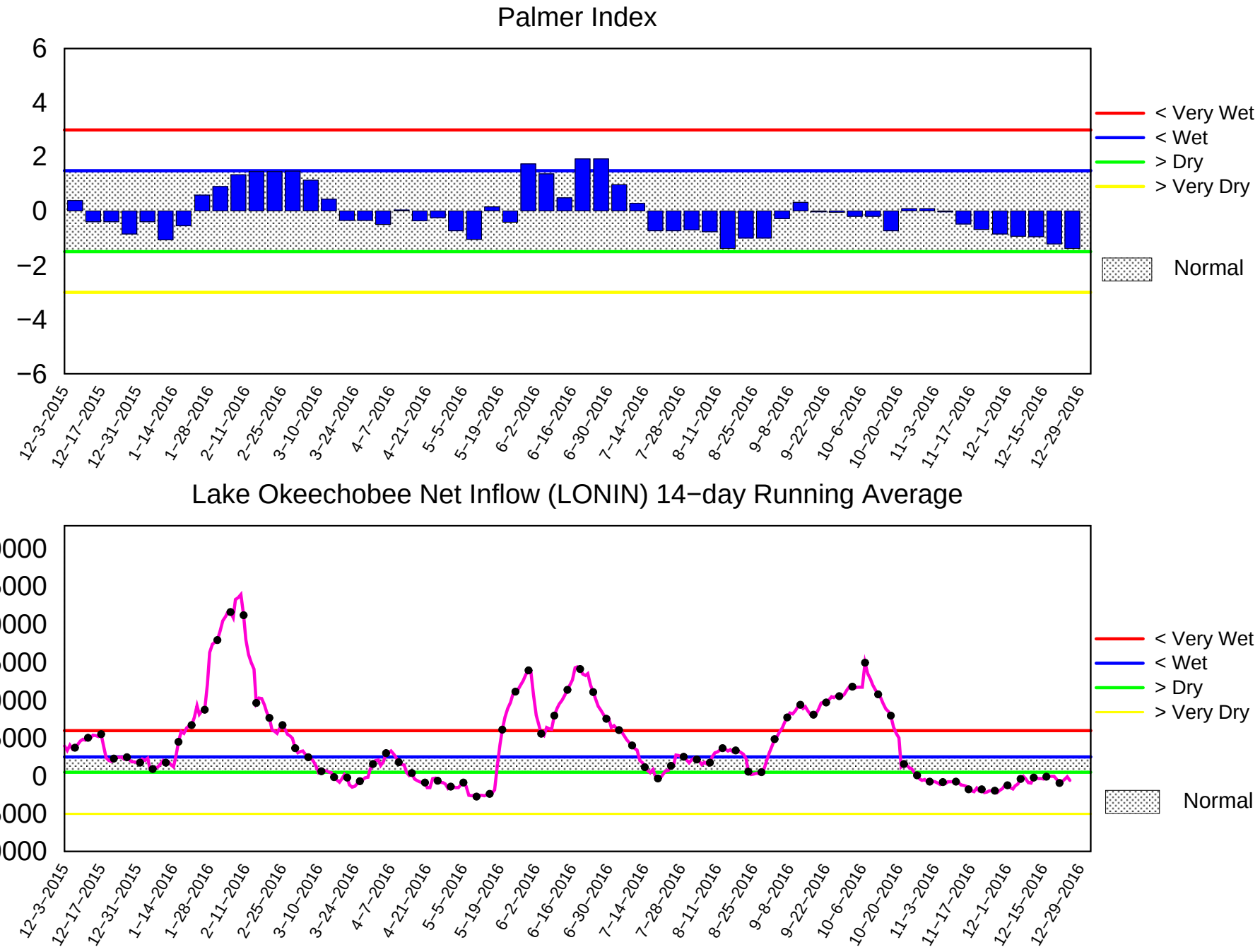
Lake Okeechobee SFWMM Dec 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Tue Dec 27 14:45:47 EST 2016

Tributary Basin Condition Indicators as of December 26 2016



Tue Dec 27 16:19:05 2016

2008 LORS

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

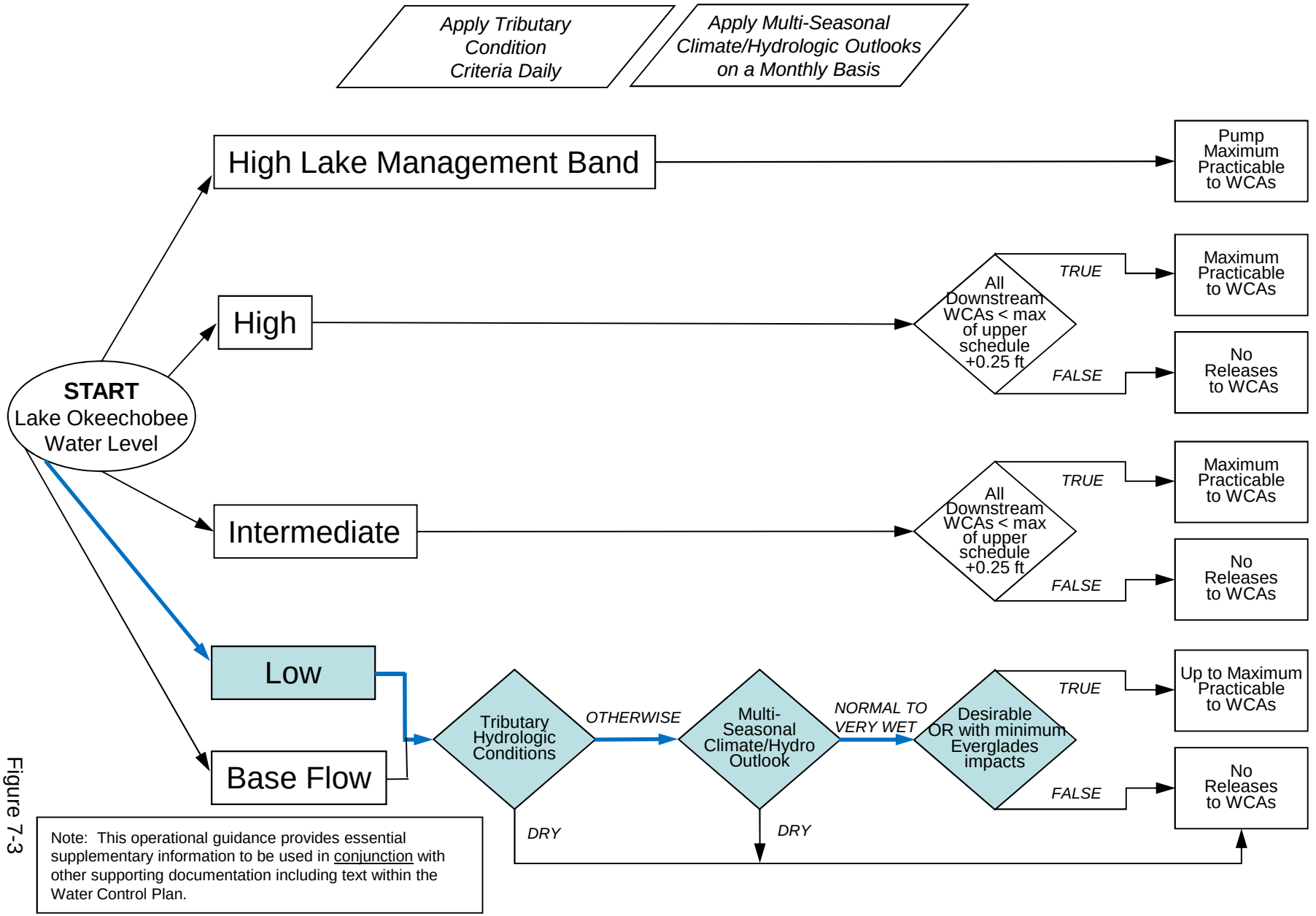


Figure 7-3

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

2008 LORS

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

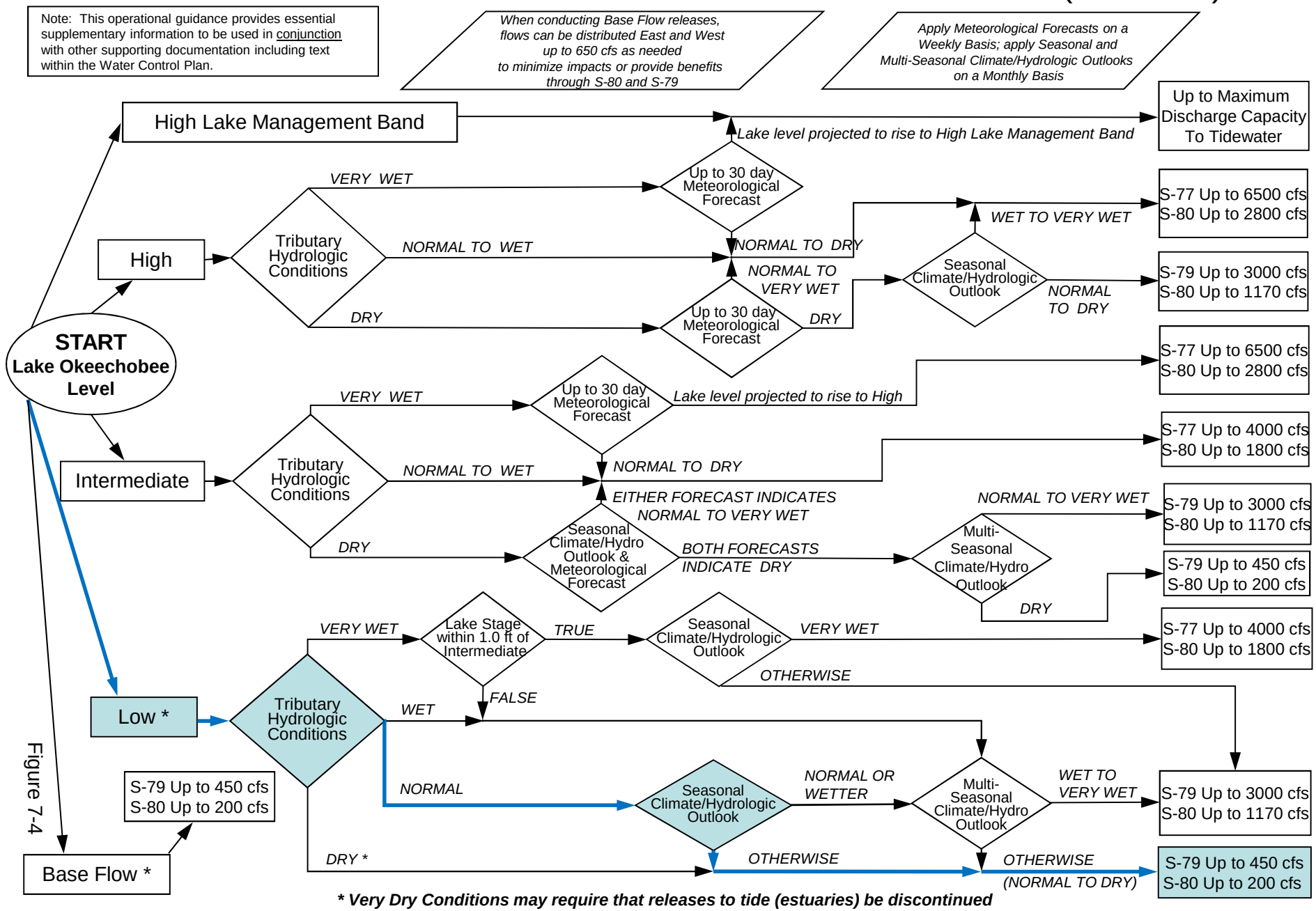
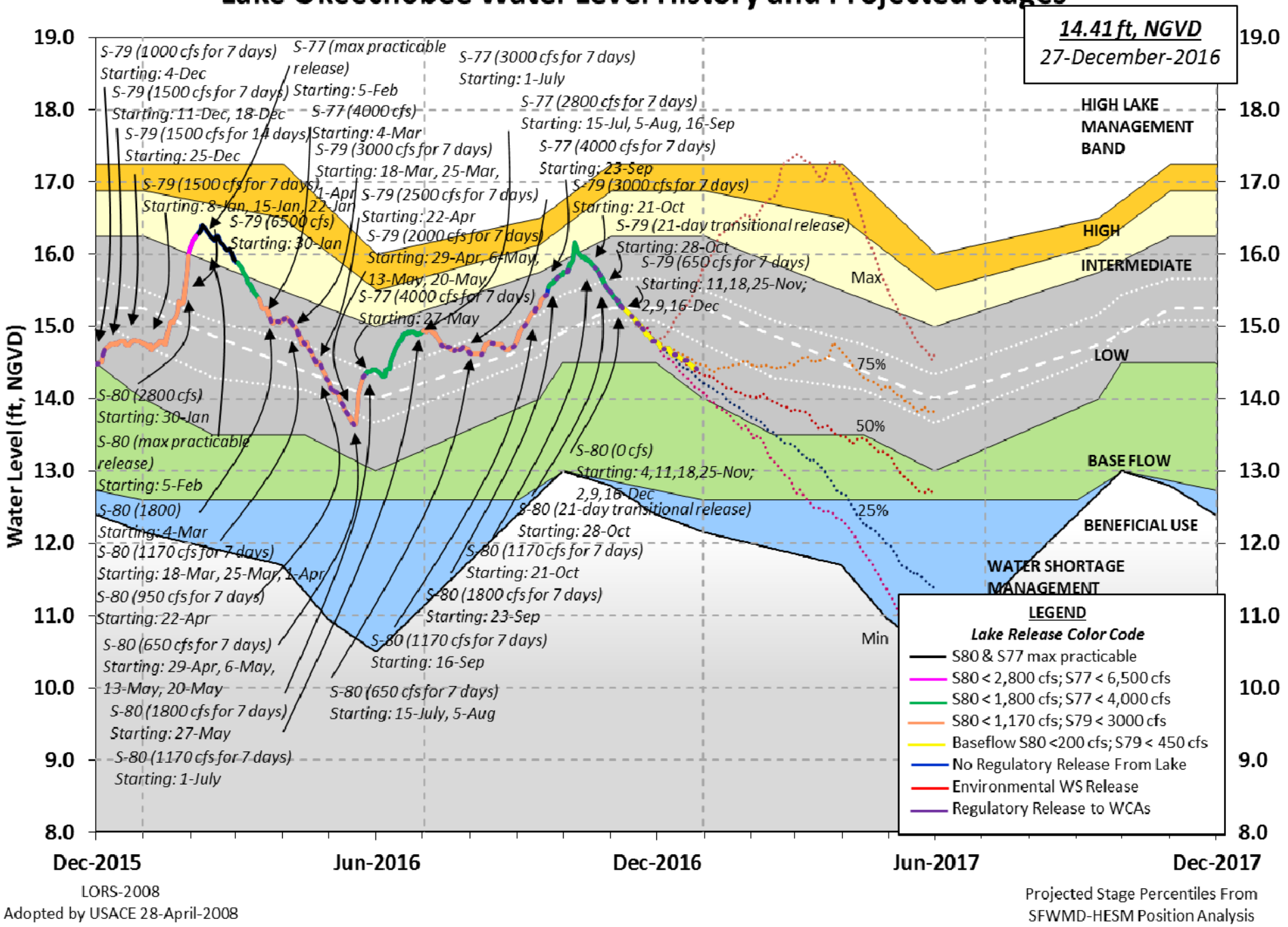


Figure 7-4

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 26 DEC 2016

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	14.41	14.80	15.27 (Official Elv)

Bottom of High Lake Mngmt= 17.25 Top of Water Short Mngmt= 12.20
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.54
Difference from Average LORS2008 0.87

26DEC (1965-2007) Period of Record Average 14.65
Difference from POR Average -0.24

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.35'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.55'
Bridge Clearance = 49.69'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.28	14.42	14.40	14.41	14.53	14.53	14.32	14.36

*Combination Okeechobee Avg-Daily Lake Average = 14.41
(*See Note)

Okeechobee Inflows (cfs):

S65E	714	C5	-95	Fisheating Cr	-NR-
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: 619

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	240	S77	946
S127 Culverts	0	S351	441	S77Below	438
S129 Culverts	0	S352	179	S308	1
S131 Culverts	0	L8 Canal Pt	288	S308Below	129

Total Outflows: 2094

****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 0.20 S308 0.23
  Average Pan Evap x 0.75 Pan Coefficient = 0.16" = 0.01'

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

Evaporation - Precipitation: = 0.16" = 0.01'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to 3165 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is -2168 cfs or -4300 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:	13.36	14.32	0	0	0	0	0	0	(cfs)		
S193:	_____										
S191:	18.17	14.33	0	0.0	0.0	0.0					
S135 Pumps:	13.07	14.30	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	20.93	14.19	714	0.3	0.2	0.4	0.3	0.3	0.3		
S127 Pumps:	13.11	14.38	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.91	14.48	0	0	0	0			(cfs)		
S129 Culvert:			0	-NR-							
S131 Pumps:	12.80	14.52	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek											
nr Palmdale	_____		-NR-								
nr Lakeport	_____										
C5:	14.51	14.59	-95	5.3	5.3	5.3					
South Shore											
S4 Pumps:	11.10	14.51	0	0	0	0			(cfs)		
S169:	14.51	11.09	0	0.0	0.0	0.0					

```
  S310:        14.43                27
  S3 Pumps:    11.05     14.49       0      0    0    0            (cfs)
  S354:        14.49     11.05     240    0.5  0.5
  S2 Pumps:    10.88     14.46       0      0    0    0    0       (cfs)
  S351:        14.46     10.88     441    1.0  1.0  0.8
  S352:        14.55     10.88     179    0.1  0.5
  C10A:         -NR-     14.40           0.0   8.0   8.0   8.0   8.0
  L8 Canal PT            14.25     288
```

S351 and S352 Temporary Pumps/S354 Spillway

```
  S351:        10.88     14.46     441  -NR--NR--NR--NR--NR--NR-
  S352:        10.88     14.55     179  -NR--NR--NR--NR-
  S354:        11.05     14.49     240  -NR--NR--NR--NR-
```

```
Caloosahatchee River (S77, S78, S79)
  S47B:        11.96     11.06           0.0  0.0
  S47D:        11.05     11.04      15   6.0
  S77:
    Spillway and Sector Flow:
                14.49     11.16     942  0.0  0.0  4.0  0.0
    Flow Due to Lockages+:            4

  S77 Below USGS Flow Gage          438

  S78:
    Spillway and Sector Flow:
                10.93      3.07     468    1.0  0.0  0.0  0.5
    Flow Due to Lockages+:            7

  S79:
    Spillway and Sector Flow:
                 3.00      1.76     755    0.0  0.0  0.0  1.0  1.0  0.5  0.0
0.0
    Flow Due to Lockages+:           10
    Percent of flow from S77        125%
    Chloride             (ppm)      53


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
                14.34     13.81       0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:            1

  S308 Below USGS Flow Gage         129
  S153:        18.49     13.60       0    0.0  0.0
  S80:
    Spillway and Sector Flow:
                13.91      0.67       0    0.0  0.0  0.0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:            8
    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	0.00	270	0
S78:	0.00	0.00	0.03	351	1
S79:	0.00	0.00	0.00	165	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	0.00	270	0
S80:	0.00	0.00	0.96	131	3
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.00	0.00		
Oke Nexrad Basin Avg	0.00	0.04	0.04		

Okeechobee Lake Elevations 26 DEC 2016 14.41 Difference from 26DEC16

26DEC16 -1 Day =	25 DEC 2016	14.42	0.01
26DEC16 -2 Days =	24 DEC 2016	14.44	0.03
26DEC16 -3 Days =	23 DEC 2016	14.43	0.02
26DEC16 -4 Days =	22 DEC 2016	14.46	0.05
26DEC16 -5 Days =	21 DEC 2016	14.48	0.07
26DEC16 -6 Days =	20 DEC 2016	14.50	0.09
26DEC16 -7 Days =	19 DEC 2016	14.52	0.11
26DEC16 -30 Days =	26 NOV 2016	14.85	0.44
26DEC16 -1 Year =	26 DEC 2015	14.80	0.39
26DEC16 -2 Year =	26 DEC 2014	15.27	0.86

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
26DEC16	Today =	26 DEC 2016	-1052	TUE	-490
26DEC16	-1 Day =	25 DEC 2016	-972	MON	-2340
26DEC16	-2 Days =	24 DEC 2016	-208	SUN	3981
26DEC16	-3 Days =	23 DEC 2016	-688	SAT	-4026
26DEC16	-4 Days =	22 DEC 2016	-1029	FRI	-1805
26DEC16	-5 Days =	21 DEC 2016	-1191	THU	-1696
26DEC16	-6 Days =	20 DEC 2016	-675	WED	-1499
26DEC16	-7 Days =	19 DEC 2016	-170	TUE	641
26DEC16	-8 Days =	18 DEC 2016	-181	MON	-217
26DEC16	-9 Days =	17 DEC 2016	-147	SUN	-261
26DEC16	-10 Days =	16 DEC 2016	-264	SAT	-4761
26DEC16	-11 Days =	15 DEC 2016	-317	FRI	-NR-
26DEC16	-12 Days =	14 DEC 2016	-317	THU	-NR-
26DEC16	-13 Days =	13 DEC 2016	-317	WED	-145

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
26DEC16	Today=	26 DEC 2016	888	TUE	832
26DEC16	-1 Day =	25 DEC 2016	896	MON	866
26DEC16	-2 Days =	24 DEC 2016	899	SUN	868
26DEC16	-3 Days =	23 DEC 2016	903	SAT	873
26DEC16	-4 Days =	22 DEC 2016	906	FRI	930
26DEC16	-5 Days =	21 DEC 2016	904	THU	936
26DEC16	-6 Days =	20 DEC 2016	897	WED	913
26DEC16	-7 Days =	19 DEC 2016	894	TUE	880
26DEC16	-8 Days =	18 DEC 2016	893	MON	845
26DEC16	-9 Days =	17 DEC 2016	894	SUN	850
26DEC16	-10 Days =	16 DEC 2016	897	SAT	862
26DEC16	-11 Days =	15 DEC 2016	901	FRI	924
26DEC16	-12 Days =	14 DEC 2016	900	THU	916
26DEC16	-13 Days =	13 DEC 2016	899	WED	938

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)
26 DEC 2016	1875	868	942	1518
25 DEC 2016	2142	1668	1310	1793
24 DEC 2016	2001	1542	1571	2011
23 DEC 2016	1426	1292	1175	1692
22 DEC 2016	1152	1027	305	518
21 DEC 2016	1164	1044	307	487
20 DEC 2016	1187	1102	494	1153
19 DEC 2016	1554	1498	1604	1822
18 DEC 2016	2474	1873	1604	1946
17 DEC 2016	2260	1628	1592	1898
16 DEC 2016	1172	-4225	1160	1762
15 DEC 2016	279	-NR-	-NR-	587
14 DEC 2016	562	-NR-	-NR-	783

13 DEC 2016	1657	1299	783	885

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)
26 DEC 2016	55	875	355	403	571
25 DEC 2016	12	740	387	414	571
24 DEC 2016	20	656	258	438	584
23 DEC 2016	-1	1083	855	946	597
22 DEC 2016	22	1222	823	1108	618
21 DEC 2016	72	1325	668	1309	650
20 DEC 2016	39	1503	736	1344	629
19 DEC 2016	3	1507	656	1216	592
18 DEC 2016	38	779	2	500	590
17 DEC 2016	40	694	123	444	579
16 DEC 2016	6	1198	333	890	606
15 DEC 2016	90	1216	478	944	628
14 DEC 2016	16	940	474	865	635
13 DEC 2016	42	1031	137	819	625

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
26 DEC 2016	1	255	15
25 DEC 2016	0	177	8
24 DEC 2016	1	117	15
23 DEC 2016	0	142	37
22 DEC 2016	-0	221	38
21 DEC 2016	0	238	-NR-
20 DEC 2016	0	111	-NR-
19 DEC 2016	0	-149	-NR-
18 DEC 2016	0	25	-NR-
17 DEC 2016	1	213	31
16 DEC 2016	0	129	27
15 DEC 2016	1	-53	43
14 DEC 2016	1	-91	51
13 DEC 2016	1	-145	27

*** 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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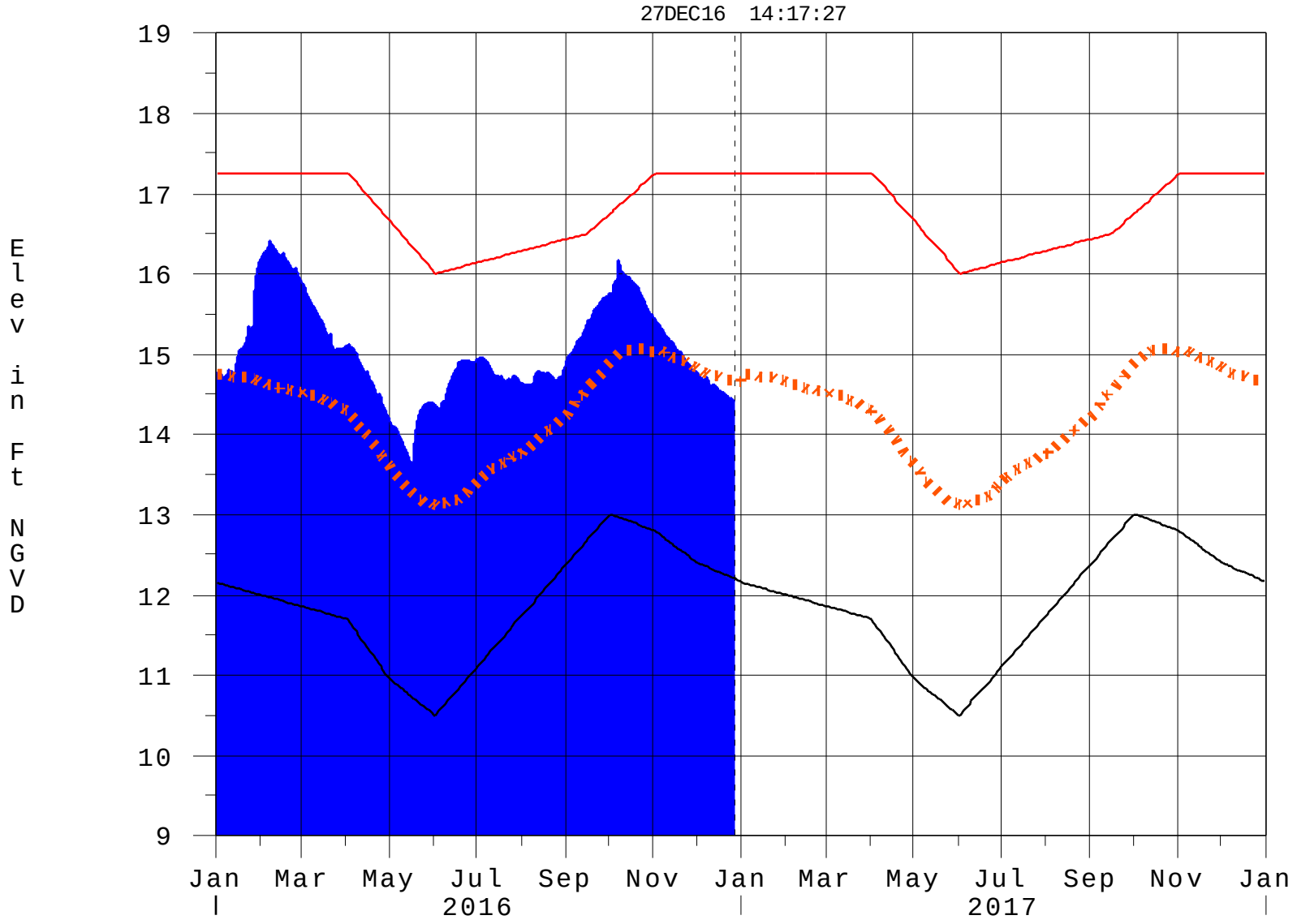
* On 11 May 1999, Lake Okeechobee Elevation was switched from Instantaneous 2400 value to an average-daily lake average.
On 14 Mar 2001, due to the isolation of various gages within the standard
10 stations, the average of the interior 4 station gages was used as the Lake Okeechobee Elevation.
On 05 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 27DEC2016 @ 14:15 ** 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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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