Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 10/31/2016 (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 (Nov-Apr)	N/A	N/A	0.14	Dry	0.43	Dry	0.66	Dry
Multi Seasonal (Nov-Oct)	N/A	N/A	2.58	Wet	3.38	Wet	4.57	Very 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:

-449 cfs 14-day running average for Lake Okeechobee Net Inflow through 10/30/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-0.26 for Palmer Index on 10/29/2016.
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 10/31/2016

Lake Okeechobee Stage: **15.49 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		17.22	
Operational Band	High sub-band	16.85	
	Intermediate sub-band	16.23	
	Low sub-band	14.50	← 15.49
Base Flow sub-band		12.87	
Beneficial Use sub-band		12.81	
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**

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Back to U.S. Army Corps of Engineers LORSS Homepage

LORS2008 Implementation on 10/31/2016 (ENSO Neutral Condition):

Status for week ending 10/31/2016:
District wide, Raindar rainfall was 0.23 inches for the week. Lake stage on 10/31/2016 was 15.49 ft, down 0.25 ft from last week.
The updated October 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	-0.26 (Normal)	L
	CPC Precipitation Outlook	1 month: Below Normal	M
		3 months: Below Normal	M
	LOK Seasonal Net Inflow Outlook	0.43 ft (Dry)	M
	ENSO Neutral Years		
	LOK Multi-Seasonal Net Inflow Outlook	3.38 ft (Wet)	L
	ENSO Neutral Years		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (16.88 ft)	L
	WCA 2A: Site 2-17 HW	Above Line1 (13.21 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.60 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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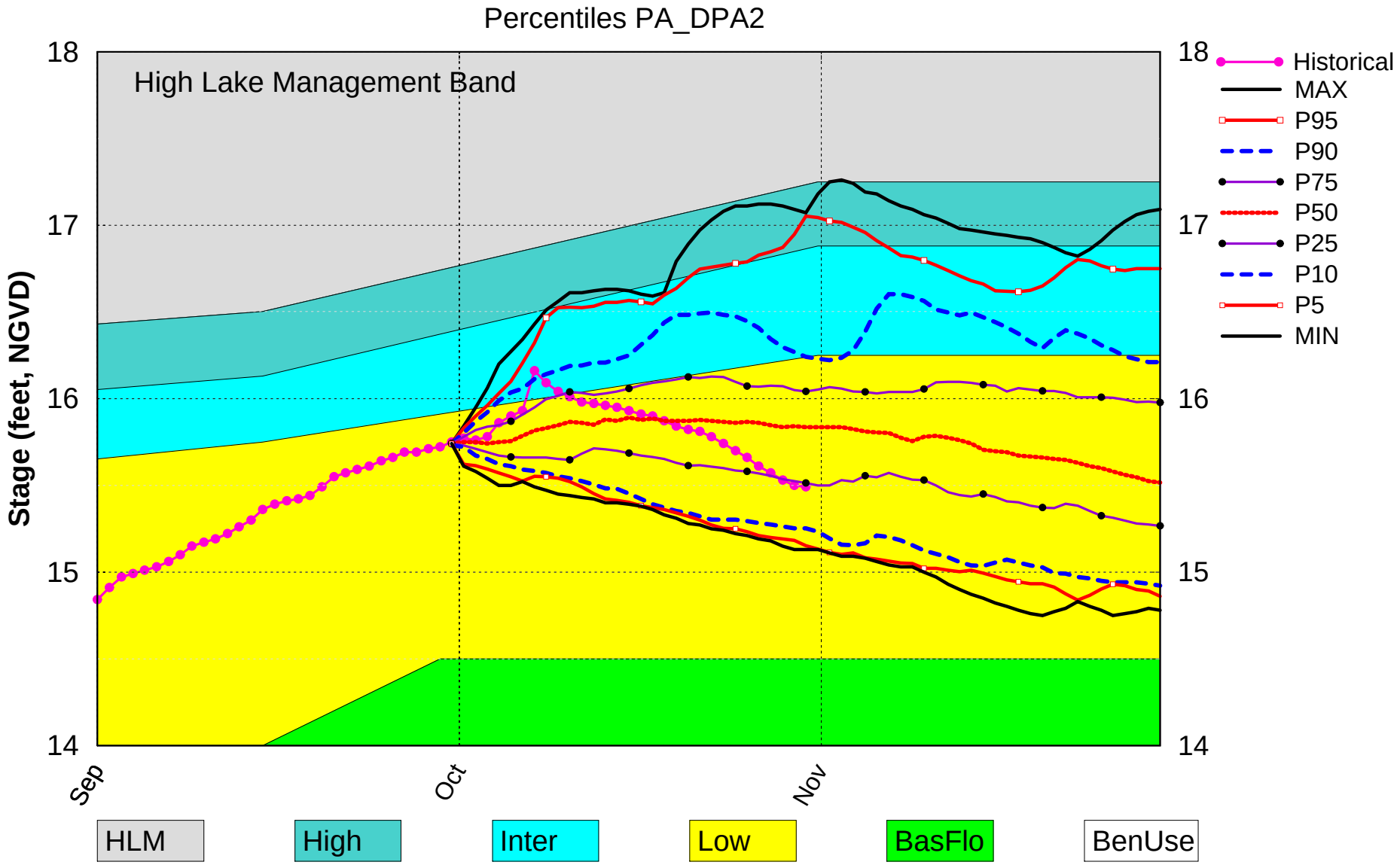
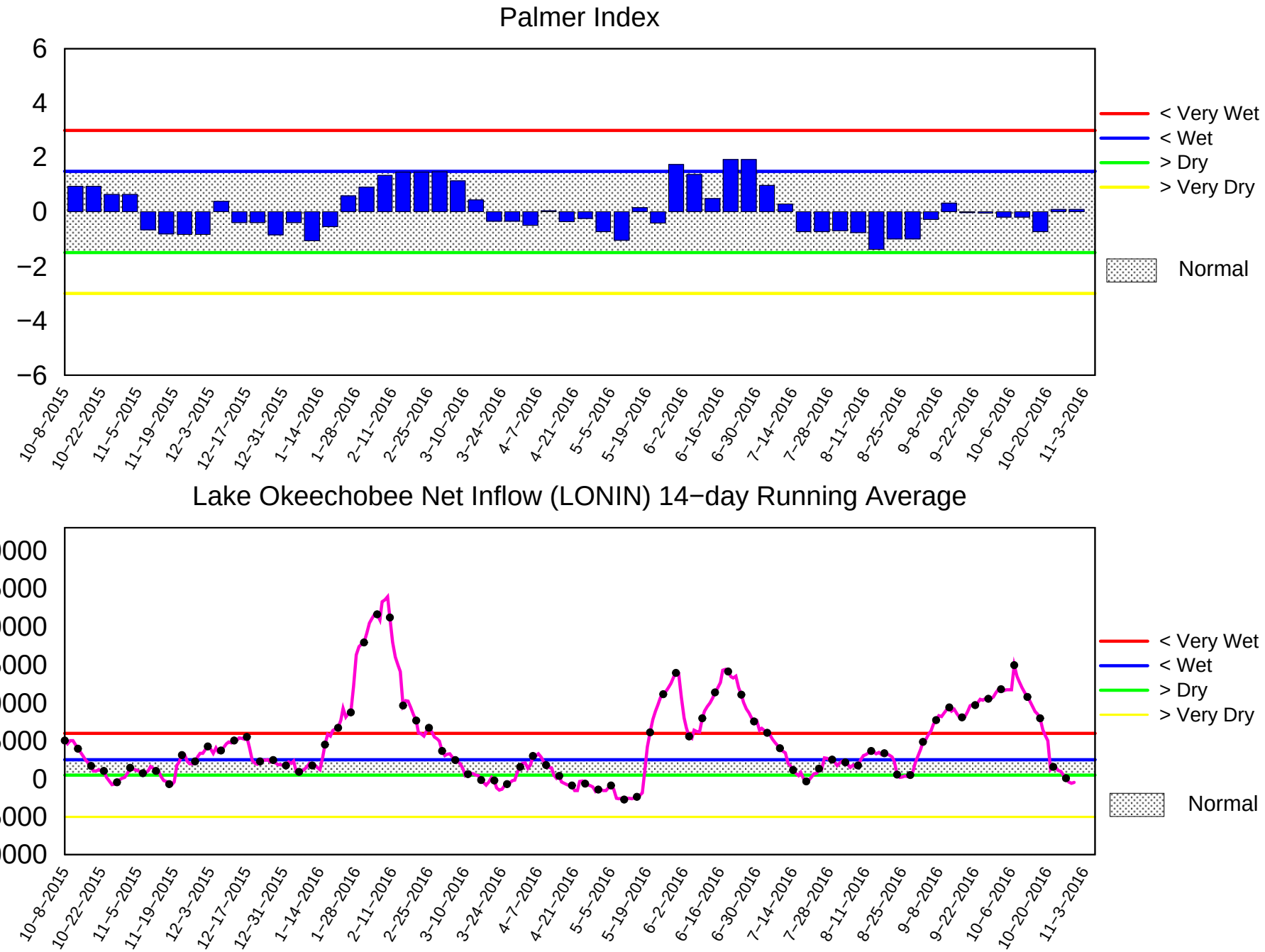
Lake Okeechobee SFWMM October 2016 Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Oct 31 12:05:37 2016

Tributary Basin Condition Indicators as of October 31 2016



Mon Oct 31 11:57:37 EDT 2016

2008 LORS

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

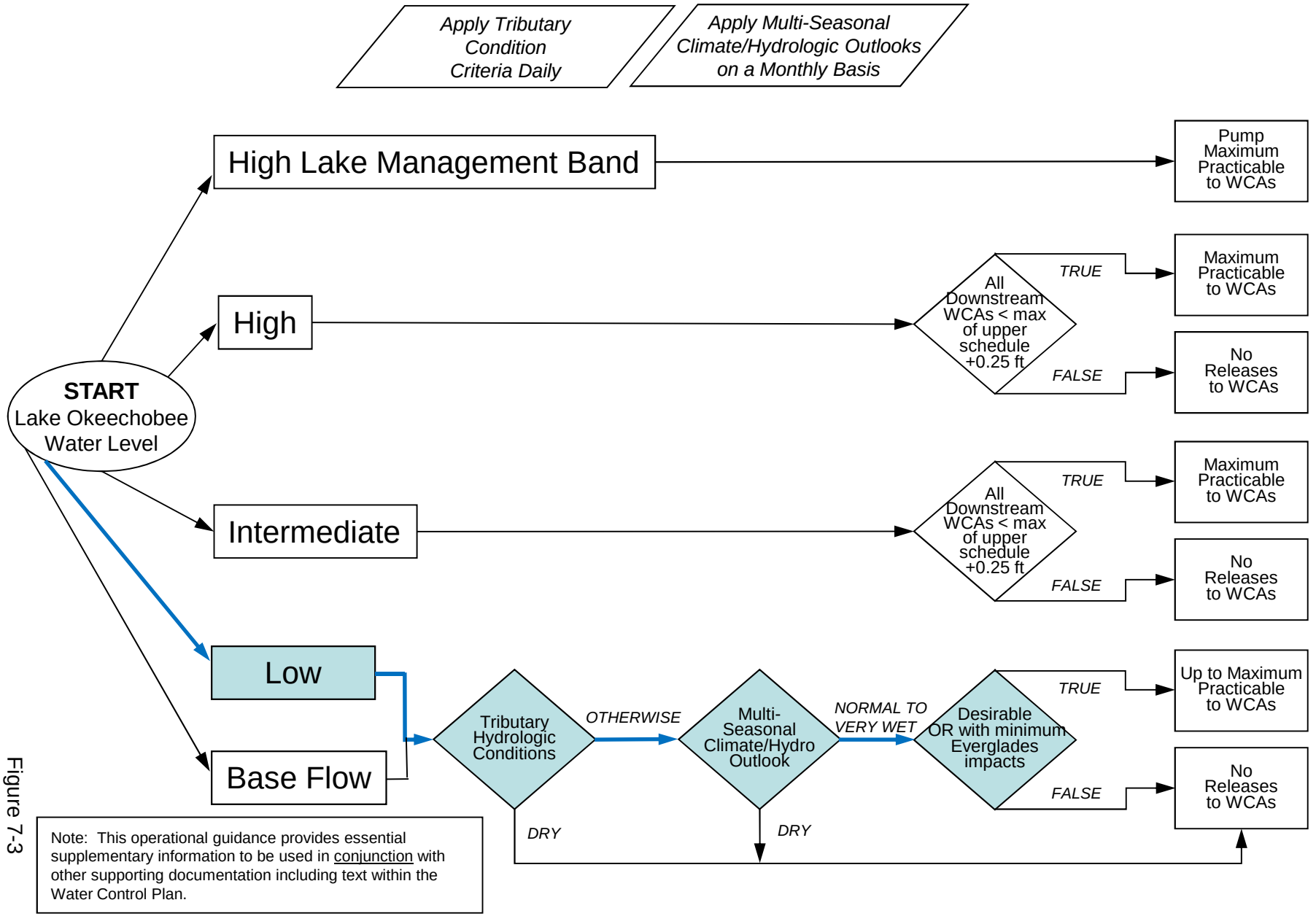


Figure 7-3

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)

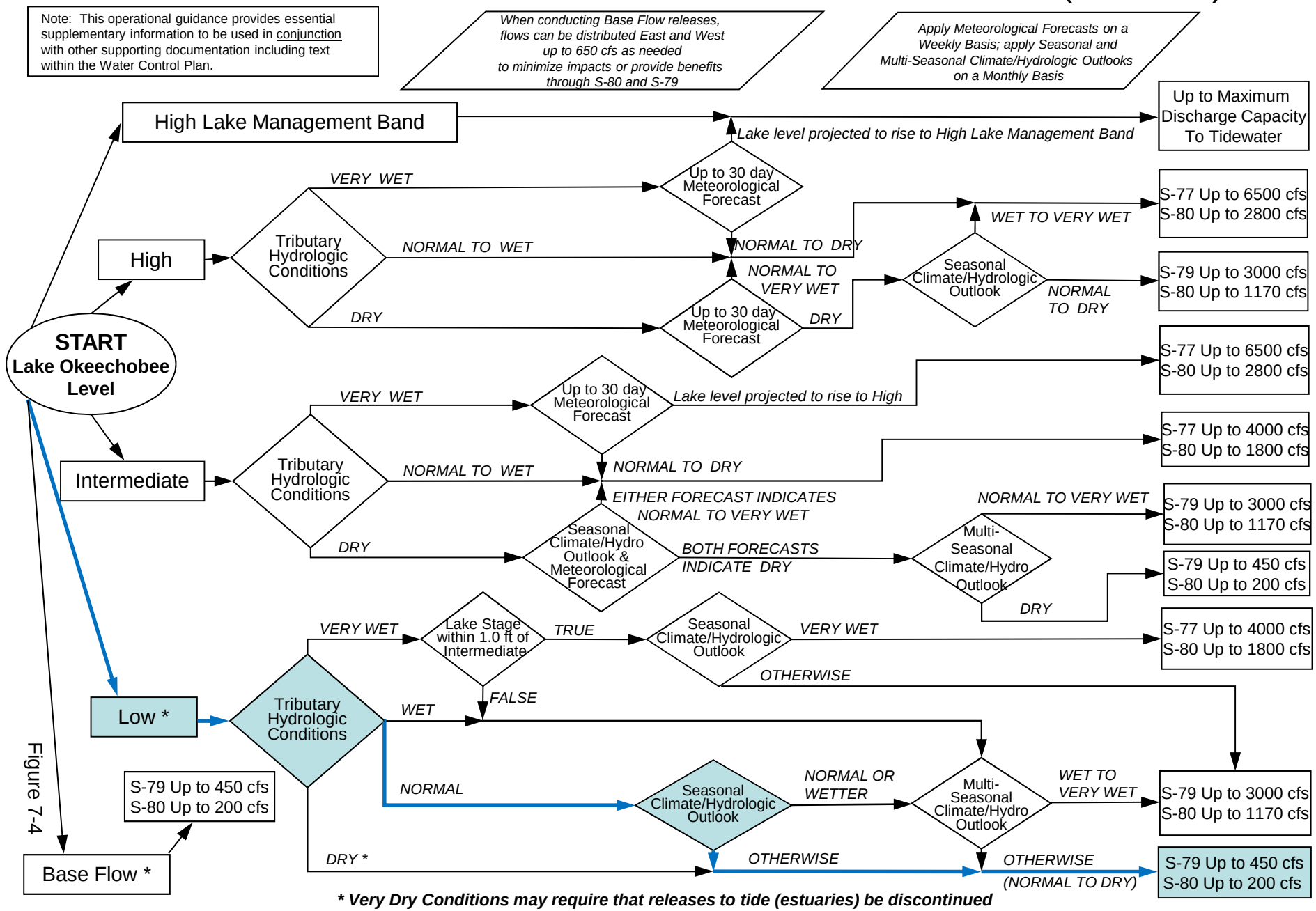
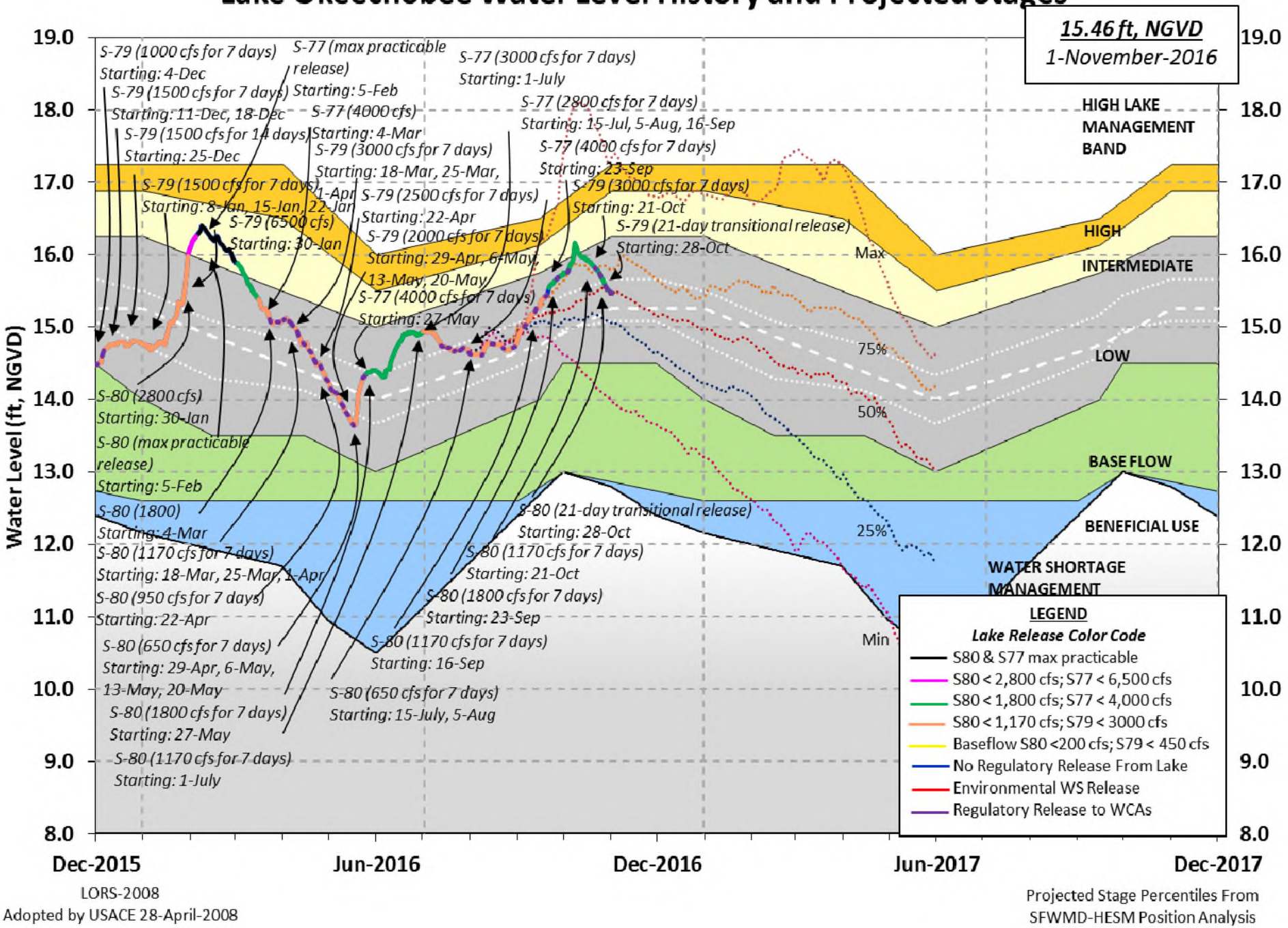


Figure 7-4

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 30 OCT 2016

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	15.49	14.58	15.88 (Official Elv)

Bottom of High Lake Mngmt= 17.22 Top of Water Short Mngmt= 12.81
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.97
Difference from Average LORS2008 1.52

30OCT (1965-2007) Period of Record Average 15.03
Difference from POR Average 0.46

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 9.43'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 7.63'
Bridge Clearance = 49.38'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
15.32	15.58	15.53	15.49	15.62	15.57	15.43	15.38

*Combination Okeechobee Avg-Daily Lake Average = 15.49 (*See Note)

Okeechobee Inflows (cfs):

S65E	994	C5	-90	Fisheating Cr	51
S154	38	S191	0	S135 Pumps	0
S84	0	S133 Pumps	0	S2 Pumps	0
S84X	343	S127 Pumps	0	S3 Pumps	0
S71	27	S129 Pumps	0	S4 Pumps	0
S72	0	S131 Pumps	0		

Total Inflows: 1363

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	313	S77	2680
S127 Culverts	0	S351	538	S77Below	3481
S129 Culverts	0	S352	954	S308	5
S131 Culverts	0	L8 Canal Pt	201	S308Below	107

Total Outflows: 4691

****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 0.14
  Average Pan Evap x 0.75 Pan Coefficient = 0.13" = 0.01'

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

Evaporation - Precipitation: = 0.13" = 0.01'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to 2503 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:	13.79	15.35	0	0	0	0	0	0	(cfs)		
S193:											
S191:	19.08	15.37	0	0.0	0.0	0.0					
S135 Pumps:	13.97	15.36	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	20.99	15.24	994	0.5	0.5	0.4	0.4	0.5	0.5		
S127 Pumps:	13.62	15.43	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	13.32	15.51	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.99	15.50	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek nr Palmdale	29.88		51								
nr Lakeport											
C5:	15.49	15.61	-90	5.3	5.3	5.3					
South Shore											
S4 Pumps:	10.79	15.60	0	0	0	0			(cfs)		
S169:	15.35	10.78	0	0.0	0.0	0.0					

S310:	15.53		86						
S3 Pumps:	11.37	15.63	0	0	0	0			(cfs)
S354:	15.63	11.37	313	0.8	0.8				
S2 Pumps:	10.92	15.63	0	0	0	0	0		(cfs)
S351:	15.63	10.92	538	0.5	0.5	0.5			
S352:	15.60	11.28	954	1.6	1.7				
C10A:	-NR-	14.49		0.0	0.0	8.0	0.0	0.0	
L8 Canal PT		14.34	201						

S351 and S352 Temporary Pumps/S354 Spillway

S351:	10.92	15.63	538	-NR-	-NR-	-NR-	-NR-	-NR-	-NR-		
S352:	11.28	15.60	954	-NR-	-NR-	-NR-	-NR-				
S354:	11.37	15.63	313	-NR-	-NR-	-NR-	-NR-				

Caloosahatchee River (S77, S78, S79)

S47B:	12.61	10.78		0.0	0.0						
S47D:	10.88	10.89	6	6.0							
S77:											
Spillway and Sector Flow:											
	15.44	11.01	2671	0.0	3.5	3.0	3.0				
Flow Due to Lockages+:			9								
S77 Below USGS Flow Gage			3481								
S78:											
Spillway and Sector Flow:											
	10.96	2.96	2252	3.0	0.0	4.0	0.0				
Flow Due to Lockages+:			17								
S79:											
Spillway and Sector Flow:											
	3.02	1.19	3133	1.0	1.0	1.5	2.0	2.0	2.0	1.5	1.0
Flow Due to Lockages+:			9								
Percent of flow from S77			85%								
Chloride		(ppm)	45								

St. Lucie Canal (S308, S80)

S308:											
Spillway and Sector Flow:											
	15.46	14.12	0	0.0	0.0	0.0	0.0				
Flow Due to Lockages+:			5								
S308 Below USGS Flow Gage			107								
S153:	18.86	13.91	29	0.1	0.0						
S80:											
Spillway and Sector Flow:											
	14.18	2.13	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Flow Due to Lockages+:			25								
Percent of flow from S308		NA	%								

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

Speedy Point Top Salinity (mg/ml) 7693
Speedy Point Bottom Salinity (mg/ml) 8276

+ 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)	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	20.56	57	2
S78:	0.00	0.00	23.50	239	2
S79:	0.00	0.00	0.00	152	3
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	5.52	270	0
S80:	0.00	0.01	1.58	96	5
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.00	2.01		
Oke Nexrad Basin Avg	0.00	0.00	0.02		

Okeechobee Lake Elevations			30 OCT 2016	15.49 Difference from 30OCT16
30OCT16	-1 Day =	29 OCT 2016	15.50	0.01
30OCT16	-2 Days =	28 OCT 2016	15.53	0.04
30OCT16	-3 Days =	27 OCT 2016	15.57	0.08
30OCT16	-4 Days =	26 OCT 2016	15.61	0.12
30OCT16	-5 Days =	25 OCT 2016	15.66	0.17
30OCT16	-6 Days =	24 OCT 2016	15.70	0.21
30OCT16	-7 Days =	23 OCT 2016	15.74	0.25
30OCT16	-30 Days =	30 SEP 2016	15.75	0.26
30OCT16	-1 Year =	30 OCT 2015	14.58	-0.91
30OCT16	-2 Year =	30 OCT 2014	15.88	0.39

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
30OCT16	Today =	30 OCT 2016	-448	MON	3358
30OCT16	-1 Day =	29 OCT 2016	-583	SUN	-883
30OCT16	-2 Days =	28 OCT 2016	-240	SAT	-1496
30OCT16	-3 Days =	27 OCT 2016	52	FRI	-534
30OCT16	-4 Days =	26 OCT 2016	98	THU	-2736
30OCT16	-5 Days =	25 OCT 2016	334	WED	-1318
30OCT16	-6 Days =	24 OCT 2016	420	TUE	-3285
30OCT16	-7 Days =	23 OCT 2016	837	MON	-4631
30OCT16	-8 Days =	22 OCT 2016	836	SUN	-2902
30OCT16	-9 Days =	21 OCT 2016	604	SAT	2314
30OCT16	-10 Days =	20 OCT 2016	5088	FRI	2231
30OCT16	-11 Days =	19 OCT 2016	5793	THU	-957
30OCT16	-12 Days =	18 OCT 2016	6766	WED	-10
30OCT16	-13 Days =	17 OCT 2016	8461	TUE	4571

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
30OCT16	Today=	30 OCT 2016	1923	MON	1134
30OCT16	-1 Day =	29 OCT 2016	2063	SUN	1187
30OCT16	-2 Days =	28 OCT 2016	2204	SAT	1162
30OCT16	-3 Days =	27 OCT 2016	2370	FRI	1424
30OCT16	-4 Days =	26 OCT 2016	2542	THU	1640
30OCT16	-5 Days =	25 OCT 2016	2724	WED	1577
30OCT16	-6 Days =	24 OCT 2016	2915	TUE	1831
30OCT16	-7 Days =	23 OCT 2016	3096	MON	2017
30OCT16	-8 Days =	22 OCT 2016	3244	SUN	2281
30OCT16	-9 Days =	21 OCT 2016	3368	SAT	2328
30OCT16	-10 Days =	20 OCT 2016	3475	FRI	2446
30OCT16	-11 Days =	19 OCT 2016	3590	THU	2580
30OCT16	-12 Days =	18 OCT 2016	3688	WED	2718
30OCT16	-13 Days =	17 OCT 2016	3784	TUE	2602

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)
30 OCT 2016	5315	6903	4500	6231
29 OCT 2016	5236	6803	4455	5838
28 OCT 2016	5105	6735	4557	5382
27 OCT 2016	5454	7150	4593	6112
26 OCT 2016	5553	7057	4481	6330
25 OCT 2016	5414	6896	4419	5372
24 OCT 2016	5059	6307	4488	5495
23 OCT 2016	4855	6384	4471	6092
22 OCT 2016	4452	5724	4491	6105
21 OCT 2016	5513	6644	5102	6466
20 OCT 2016	7764	9592	6478	8982
19 OCT 2016	7565	8132	7795	7236
18 OCT 2016	7618	10219	7877	10169

17 OCT 2016 8394 11001 8430 10217

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)
30 OCT 2016	170	1067	1892	486	399
29 OCT 2016	28	1531	1945	401	130
28 OCT 2016	66	1231	1896	976	299
27 OCT 2016	26	1305	1866	591	418
26 OCT 2016	21	1194	1910	355	426
25 OCT 2016	93	984	1281	274	452
24 OCT 2016	91	880	718	28	291
23 OCT 2016	116	773	180	89	147
22 OCT 2016	211	704	145	0	148
21 OCT 2016	103	541	145	0	147
20 OCT 2016	106	1037	182	254	140
19 OCT 2016	15	833	123	159	144
18 OCT 2016	-8	0	337	686	141
17 OCT 2016	-18	0	0	0	133

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
30 OCT 2016	10	212	49
29 OCT 2016	521	336	468
28 OCT 2016	3546	3094	1825
27 OCT 2016	5103	4807	2903
26 OCT 2016	5431	5128	3456
25 OCT 2016	5052	4696	2895
24 OCT 2016	2848	2458	1690
23 OCT 2016	576	438	38
22 OCT 2016	608	422	8
21 OCT 2016	1742	1411	1247
20 OCT 2016	1896	1817	2370
19 OCT 2016	1812	1609	1089
18 OCT 2016	1708	1494	923
17 OCT 2016	2545	2229	1278

*** 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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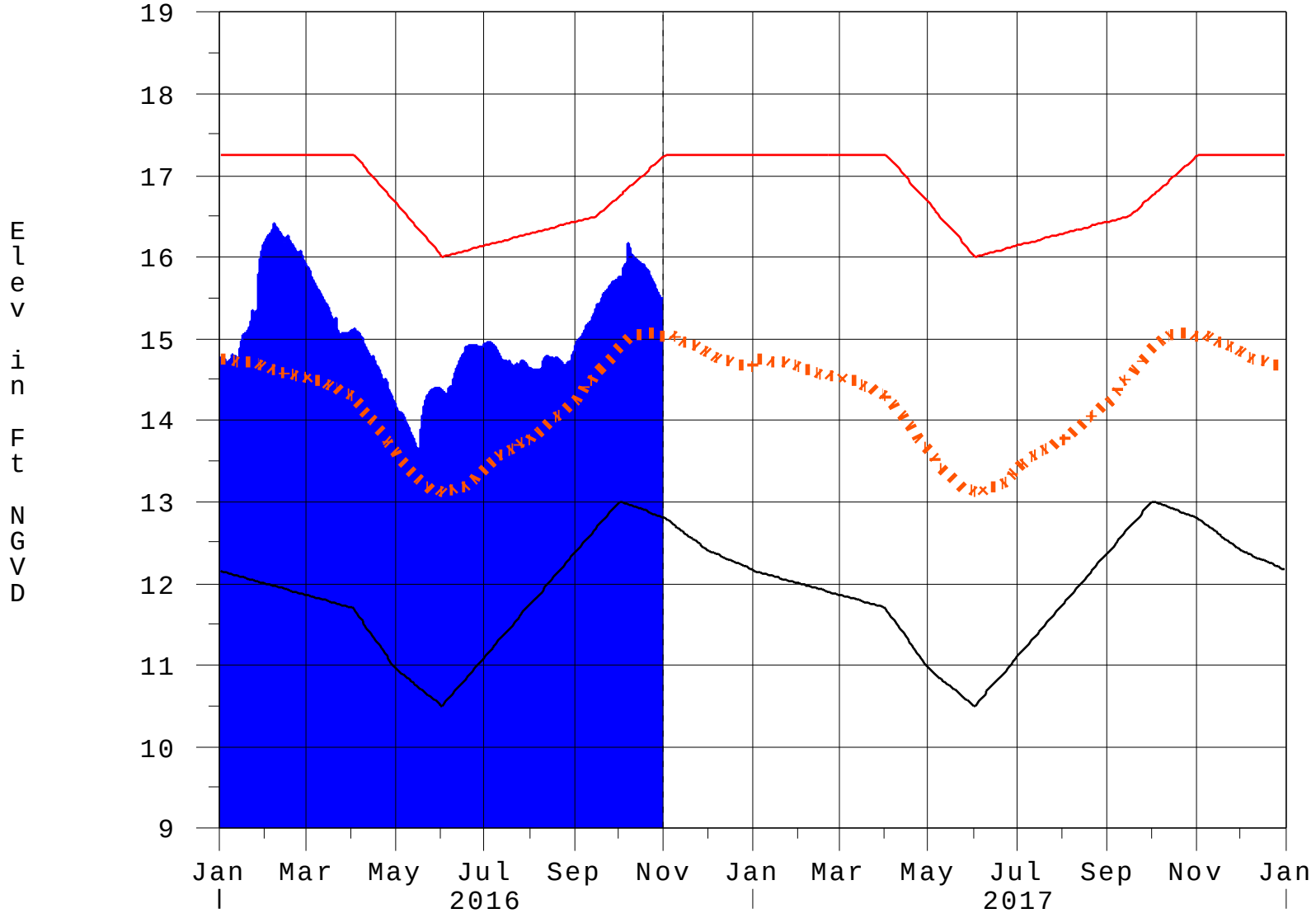
* On 11 May 1999, Lake Okeechobee Elevation was switched from
Instantaneous 2400 value to an average-daily lake average.
On 14 Mar 2001, due to the isolation of various gages within the standard
10 stations, the average of the interior 4 station gages was used
as the Lake Okeechobee Elevation.
On 05 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 31OCT2016 @ 11:15 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

31OCT16 11:01:16



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