Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 6/29/2015 (Developing El Nino 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 El Nino years[3] and a sub-sampling of warm years of the Atlantic Multi-decadal Oscillation (AMO) in combination with ENSO El Nino 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 El Nino Years[3]		Sub-sampling of AMO Warm + ENSO El Nino Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Jun-Nov)	N/A	N/A	2.39	Very Wet	2.14	Very Wet	1.47	Normal
Multi Seasonal (Jun-Apr)	N/A	N/A	2.93	Wet	3.68	Wet	3.58	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:

-2243 cfs 14-day running average for Lake Okeechobee Net Inflow through 6/28/2015.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

- 1.75 for Palmer Index on 6/27/2015.
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 6/29/2015

Lake Okeechobee Stage: **12.24 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		16.13	
Operational Band	High sub-band	15.66	
	Intermediate sub-band	15.20	
	Low sub-band	13.26	
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.07	← 12.45
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: No Releases to the Estuaries

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

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

LORS2008 Implementation on 6/29/2015 (ENSO Neutral Condition):

Water Supply Department Technical Input

Water Supply Outlook:

District wide, Raindar rainfall 1.56 inches for the week ending 6/30/2015. Lake stage on 6/29/2015 is 12.24 ft, down 0.21 ft from last week.
The updated June 2015 SFWMM Dynamic Position Analysis percentile graph and tracking chart for Lake Okeechobee show that the lake stage is in the Low Flow 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	-1.75 (Dry)	M
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Forecast	1.47 ft (Normal to Extremely Wet)	L
	AMO warm/El Nino		
	LOK Multi-Seasonal Net Inflow Forecast	3.58 ft (Wet)	L
	AMO warm/El Nino		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (15.36 ft)	L
	WCA 2A: Site 2-17 HW	Above Line 1 (11.51 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (8.74 ft)	L
LEC	Service Area 1	Year-Round Irrigation Rule in effect	L
	Service Area 2	50% or more of USGS wells are within the lowest 10% to 30% of past water elevations and not more than 25% are in the lowest 10% of past water elevations	M
	Service Area 3	50% or more of USGS wells are within the lowest 10% to 30% of past water elevations and more than 25% are in the lowest 10% of past water elevations	H

Note: The water supply risk classification based on the Palmer index, as well as the LOK seasonal and multi-seasonal net inflow forecasts use slightly different classification intervals than those used by the 2008-LORS for classifying the tributary hydrologic condition (THC).

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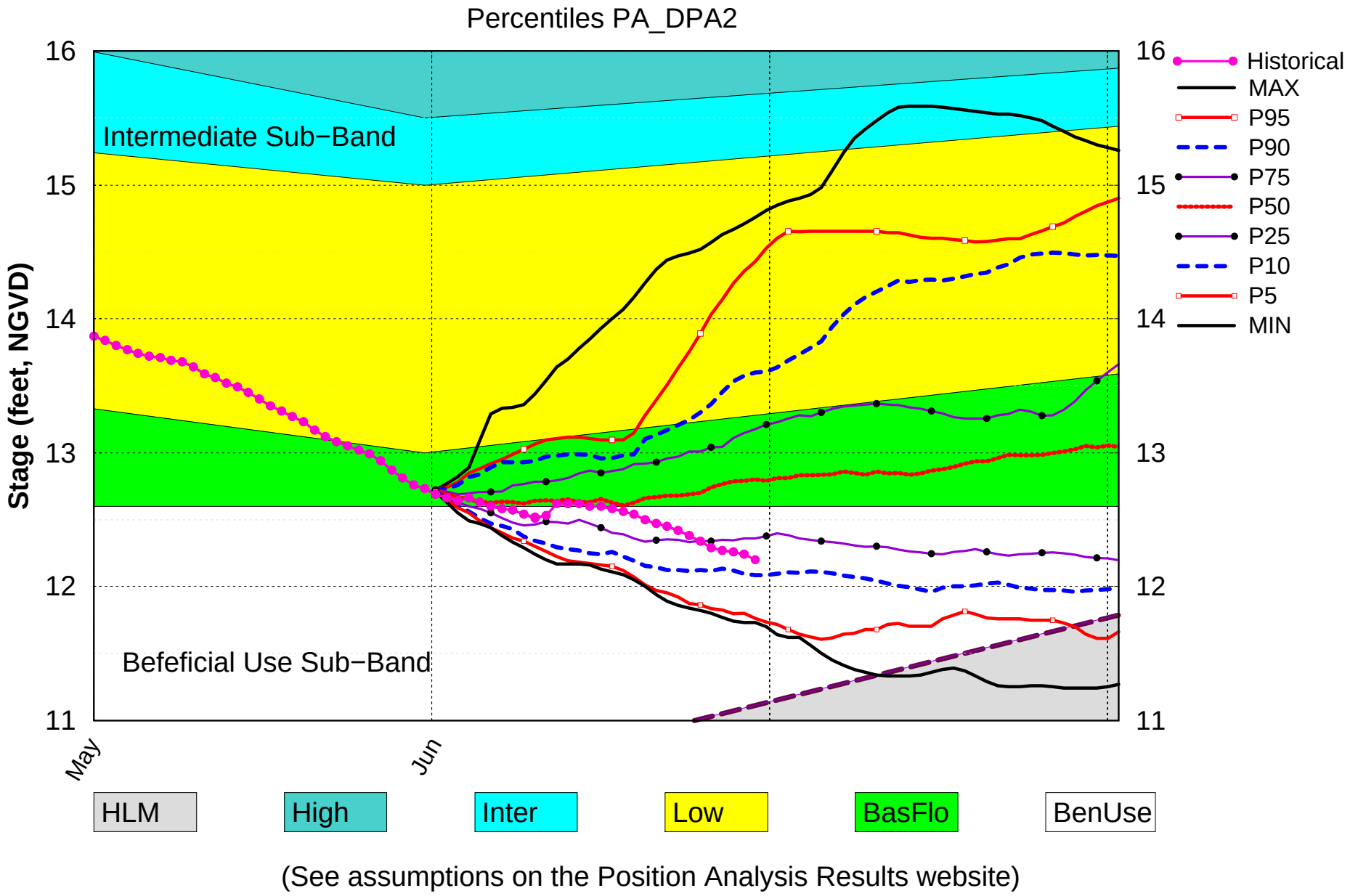
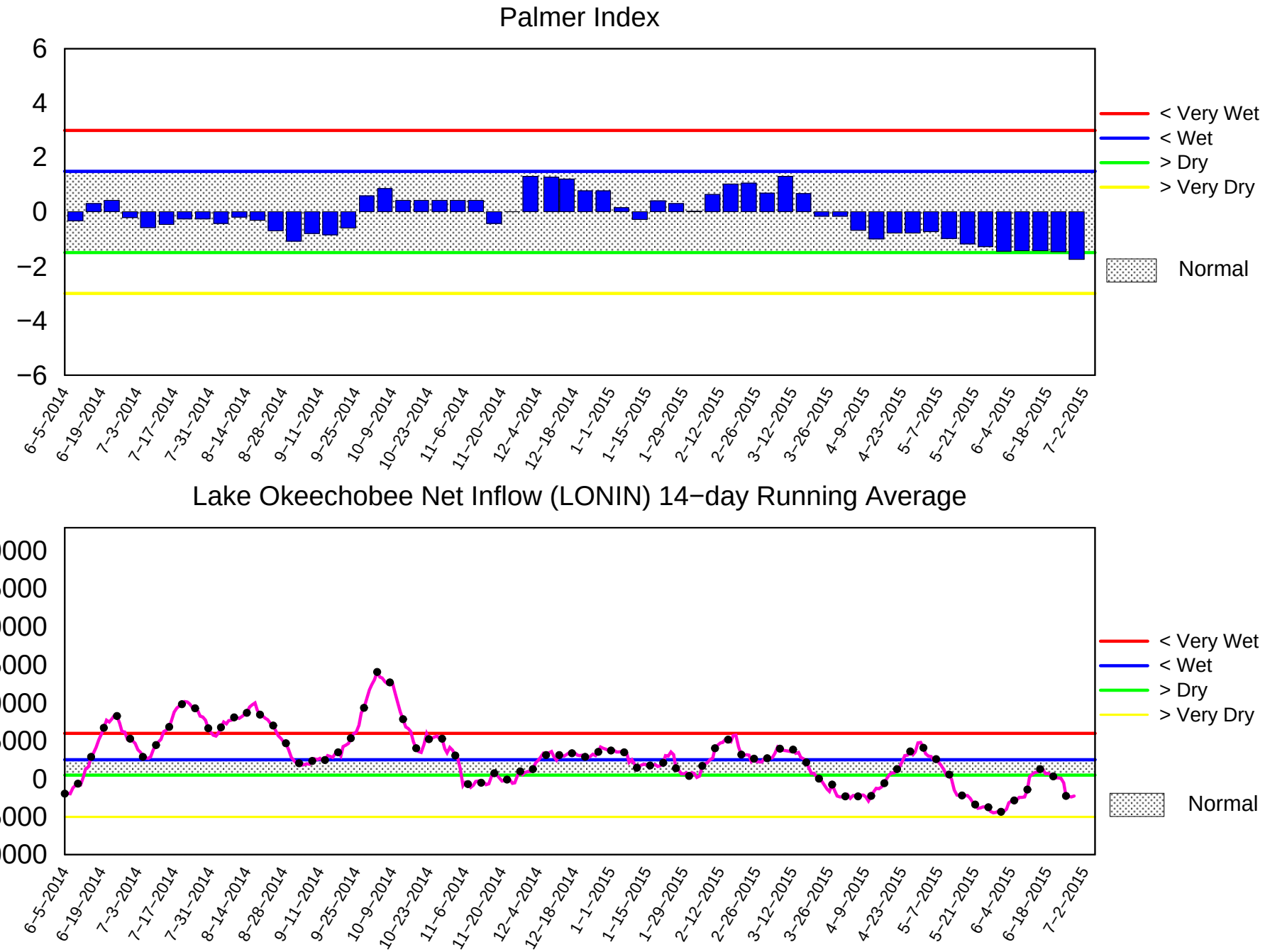
Lake Okeechobee SFWMM June 2015 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Tue Jun 30 10:23:17 EDT 2015

Tributary Basin Condition Indicators as of June 29 2015



Mon Jun 29 15:59:14 EDT 2015

2008 LORS

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

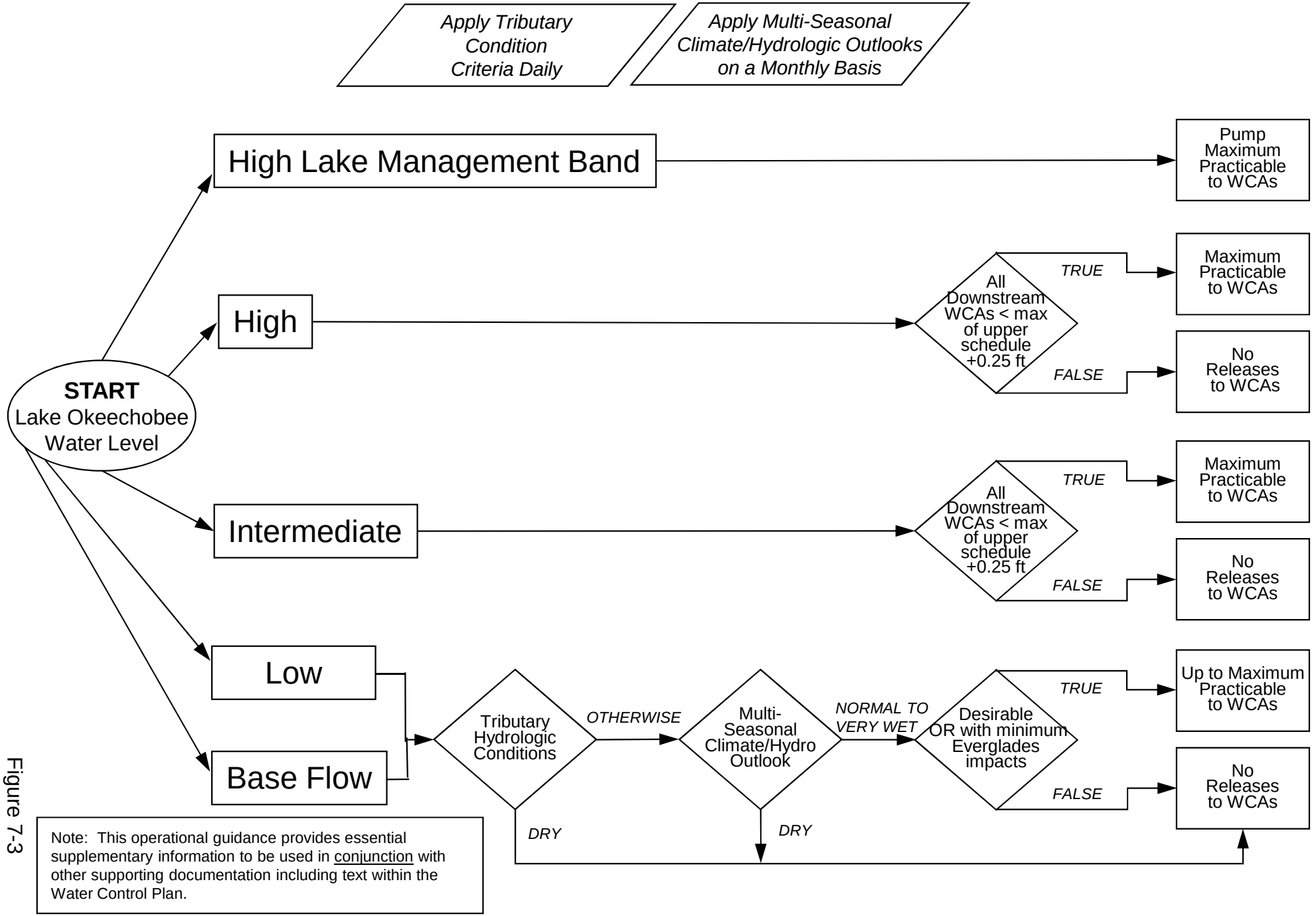


Figure 7-3

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)

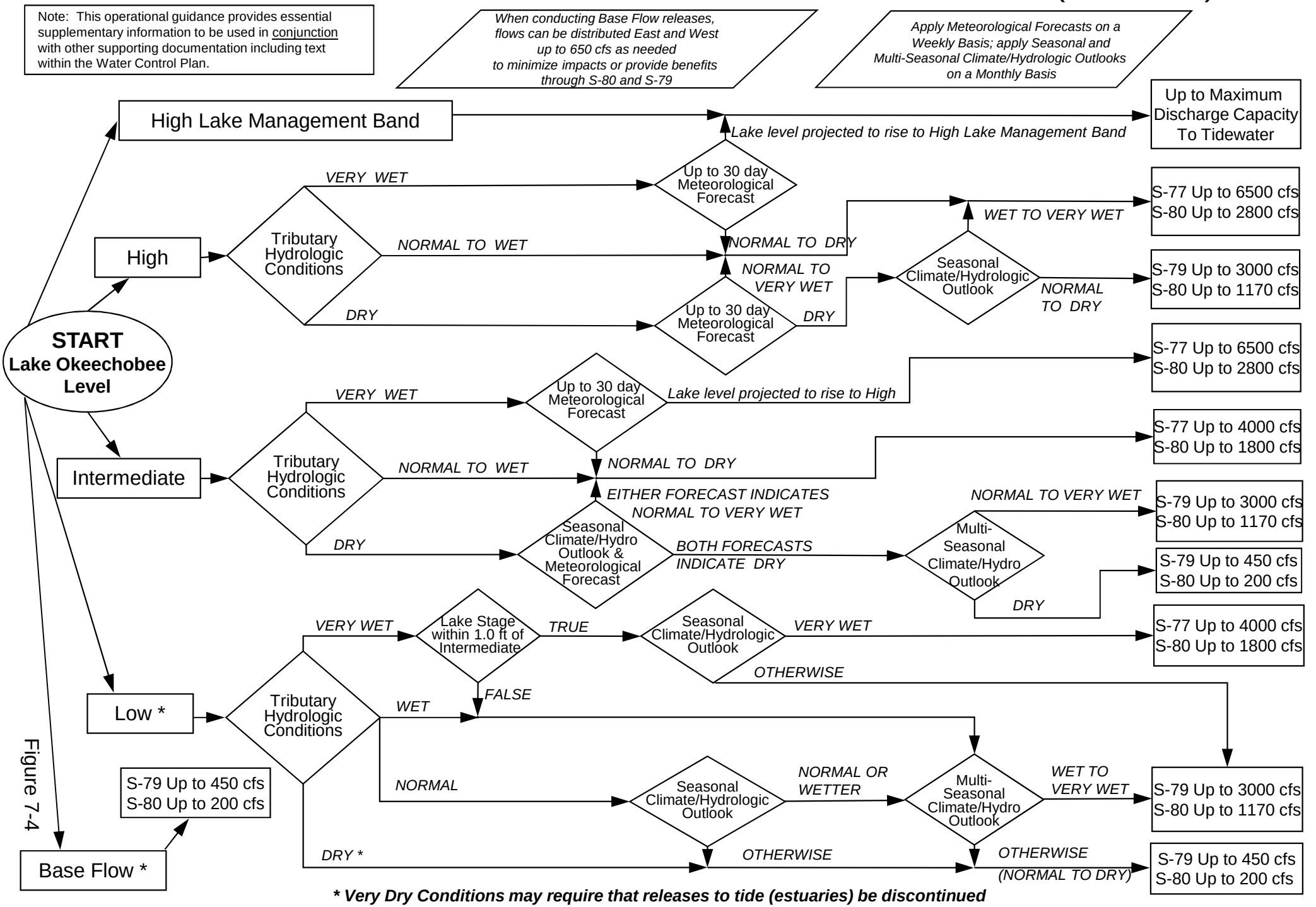
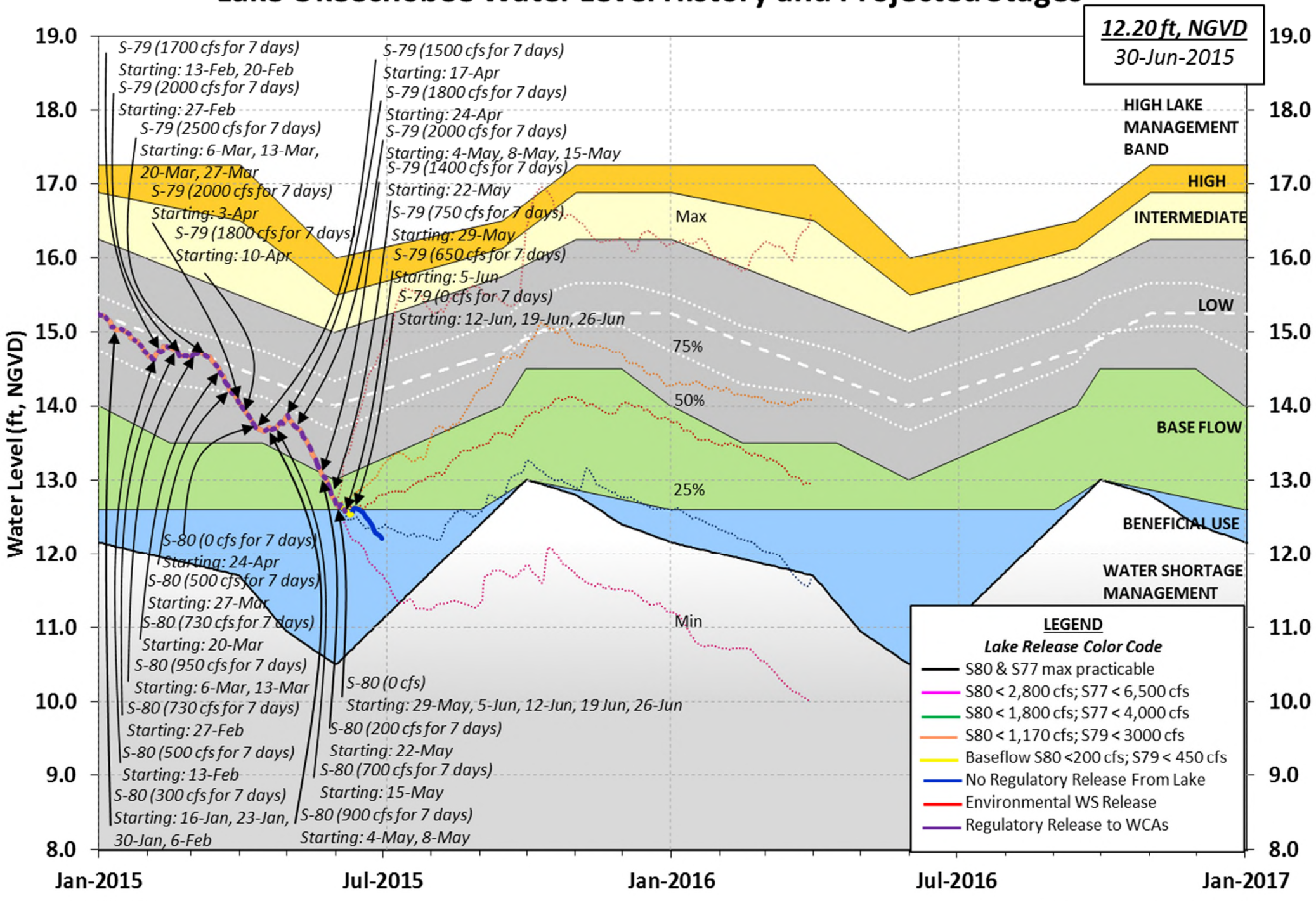


Figure 7-4

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 28 JUN 2015

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	12.24	12.94	14.00 (Official Elv)

Bottom of High Lake Mngmt= 16.13 Top of Water Short Mngmt= 11.06
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.21
Difference from Average LORS2008 0.03

28JUN (1965-2007) Period of Record Average 13.36
Difference from POR Average -1.12

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 6.18'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 4.38'
Bridge Clearance = 49.52'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
12.20	12.26	12.23	-NR-	12.18	12.31	12.19	12.30

*Combination Okeechobee Avg-Daily Lake Average = 12.24 (*See Note)

Okeechobee Inflows (cfs):

S65E	480	S191	0	Fisheating Cr	248
S154	0	S133 Pumps	0	S135 Pumps	0
S84	0	S127 Pumps	0	S2 Pumps	0
S71	528	S129 Pumps	0	S3 Pumps	0
S72	0	S131 Pumps	0	S4 Pumps	-NR-
C5	0				

Total Inflows: 1256

Okeechobee Outflows (cfs):

S135 Culverts	-NR-	S354	778	S77	1 (Used)
S127 Culverts	0	S351	1476	S77Below	-31 (NOT USED)

```
  S129 Culverts     0      S352            682      S308             -4
(Used)
  S131 Culverts            L8 Canal Pt     -19      S308Below         9 (NOT
USED)
Total Outflows:   2914

****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            0.34      S308          0.31
  Average Pan Evap x 0.75 Pan Coefficient =  0.24" =  0.02'

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  -3933 cfs or  -7800 AC-FT
_____________________________________________________________________________
_
_____________________________________________________________________________
_


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

             Headwater Tailwater         ----------- Gate Positions ---------
---
             Elevation Elevation  Disch   #1   #2   #3   #4   #5   #6   #7
#8
             (ft-msl)  (ft-msl)   (cfs)  (ft) (ft) (ft) (ft) (ft) (ft) (ft)
(ft)
                                (I) see note at bottom
North East Shore
  S133 Pumps:  12.93     12.22       0      0    0    0    0    0  (cfs)
  S193:        ______
  S191:         18.20     12.25       0    0.0  0.0  0.0
  S135 Pumps: ______       -NR-       0      0    0    0    0       (cfs)
  S135 Culverts:                  -NR-   -NR- -NR-

North West Shore
  S65E:         20.82     11.91     480    0.0  0.3  0.5  0.0  0.0  0.0
  S127 Pumps:  13.40     12.20       0      0    0    0    0    0  (cfs)
  S127 Culvert:                      0    0.0

  S129 Pumps:  12.59     12.07       0      0    0    0           (cfs)
  S129 Culvert:                      0    0.1

  S131 Pumps:  13.04     12.12       0      0    0               (cfs)
  S131 Culvert:

  Fisheating Creek
    nr Palmdale          31.46     248
    nr Lakeport          12.30
```

C5:	14.63	12.23	0	0.0	0.0	0.0					
South Shore											
S4 Pumps:	11.99	12.12	-NR-	0	0	-NR-					(cfs)
S169:	12.11	12.07	144	5.0	5.0	5.0					
S310:	12.09		221								
S3 Pumps:	11.07	12.25	0	0	0	0					(cfs)
S354:	12.25	11.07	778	2.6	2.9						
S2 Pumps:	10.89	12.18	0	0	0	0	0				(cfs)
S351:	12.18	10.89	1476	3.2	3.2	3.3					
S352:	12.35	11.18	682	2.1	2.3						
C10A:	-NR-	12.48		8.5	8.5	8.5	8.5	8.5			
L8 Canal PT		12.26	-19								

S351 and S352 Temporary Pumps/S354 Spillway

S351:	10.89	12.18	1476	-NR-	-NR-	-NR-	-NR-	-NR-	-NR-		
S352:	11.18	12.35	682	-NR-	-NR-	-NR-	-NR-				
S354:	11.07	12.25	778	-NR-	-NR-	-NR-	-NR-				

Caloosahatchee River (S77, S78, S79)											
S47B:	12.66	10.94		0.0	0.0						
S47D:	10.96	10.96	-5	4.8							
S77:											
Spillway and Sector Flow:											
	12.00	11.02	0	0.0	0.0	0.0	0.0				
Flow Due to Lockages+:			1								
S77 Below USGS Flow Gage			-31								
S78:											
Spillway and Sector Flow:											
	10.80	2.80	292	1.0	0.0	0.0	0.0				
Flow Due to Lockages+:			15								
S79:											
Spillway and Sector Flow:											
	2.97	0.59	1261	0.0	1.0	1.0	1.0	1.0	0.5	0.0	0.0
Flow Due to Lockages+:			4								
Percent of flow from S77			0%								
Chloride		(ppm)	70								
St. Lucie Canal (S308, S80)											
S308:											
Spillway and Sector Flow:											
	12.27	13.98	0	0.0	0.0	0.0	0.0				
Flow Due to Lockages+:			-4								
S308 Below USGS Flow Gage			9								
S153:	18.84	13.81	28	0.0	0.0						
S80:											
Spillway and Sector Flow:											
	14.14	0.18	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Flow Due to Lockages+: 21
Percent of flow from S308 NA %

Steele Point Top Salinity (mg/ml) -N
Steele Point Bottom Salinity (mg/ml) -N

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)	Speed (mph)
S133 Pump Station:	0.00	0.32	1.22		
S193:	-NR-	0.00	0.00	-NR-	-NR-
Okeechobee Field Station:	-NR-	0.00	0.00		
S135 Pump Station:	0.00	0.01	0.09		
S127 Pump Station:	0.00	0.30	0.38		
S129 Pump Station:	0.00	0.55	0.69		
S131 Pump Station:	0.00	0.98	1.23		
S77:	0.00	0.21	0.44	287	1
S78:	0.00	0.80	1.80	243	2
S79:	0.00	0.00	1.55	213	0
S4 Pump Station:	-NR-	0.00	0.00		
Clewiston Field Station:	-NR-	0.00	0.00		
S3 Pump Station:	0.00	0.05	0.44		
S2 Pump Station:	0.00	0.34	0.34		
S308:	0.00	0.15	0.19	219	10
S80:	0.00	0.14	0.55	236	2
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.22	0.39		
Oke Nexrad Basin Avg	-NR-	0.53	0.85		

Okeechobee Lake Elevations	28 JUN 2015	12.24	Difference from 28JUN15
28JUN15 -1 Day =	27 JUN 2015	12.26	0.02
28JUN15 -2 Days =	26 JUN 2015	12.27	0.03
28JUN15 -3 Days =	25 JUN 2015	12.29	0.05
28JUN15 -4 Days =	24 JUN 2015	12.34	0.10
28JUN15 -5 Days =	23 JUN 2015	-NR-	-NR-
28JUN15 -6 Days =	22 JUN 2015	12.42	0.18
28JUN15 -7 Days =	21 JUN 2015	12.45	0.21
28JUN15 -30 Days =	29 MAY 2015	12.76	0.52
28JUN15 -1 Year =	28 JUN 2014	12.94	0.70
28JUN15 -2 Year =	28 JUN 2013	14.00	1.76

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
28JUN15	Today =	28 JUN 2015	-2015	MON	-997
28JUN15	-1 Day =	27 JUN 2015	-2206	SUN	1038
28JUN15	-2 Days =	26 JUN 2015	-2265	SAT	-459
28JUN15	-3 Days =	25 JUN 2015	-2181	FRI	-NR-
28JUN15	-4 Days =	24 JUN 2015	-155	THU	-NR-
28JUN15	-5 Days =	23 JUN 2015	263	WED	-NR-
28JUN15	-6 Days =	22 JUN 2015	219	TUE	-2889
28JUN15	-7 Days =	21 JUN 2015	272	MON	-1562
28JUN15	-8 Days =	20 JUN 2015	544	SUN	-10975
28JUN15	-9 Days =	19 JUN 2015	1435	SAT	-NR-
28JUN15	-10 Days =	18 JUN 2015	1435	FRI	-1381
28JUN15	-11 Days =	17 JUN 2015	1350	THU	-NR-
28JUN15	-12 Days =	16 JUN 2015	1756	WED	-2017
28JUN15	-13 Days =	15 JUN 2015	1878	TUE	1109

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
28JUN15	Today=	28 JUN 2015	472	MON	480
28JUN15	-1 Day =	27 JUN 2015	477	SUN	468
28JUN15	-2 Days =	26 JUN 2015	504	SAT	497
28JUN15	-3 Days =	25 JUN 2015	539	FRI	-NR-
28JUN15	-4 Days =	24 JUN 2015	547	THU	-NR-
28JUN15	-5 Days =	23 JUN 2015	550	WED	-NR-
28JUN15	-6 Days =	22 JUN 2015	518	TUE	439
28JUN15	-7 Days =	21 JUN 2015	511	MON	471
28JUN15	-8 Days =	20 JUN 2015	499	SUN	273
28JUN15	-9 Days =	19 JUN 2015	496	SAT	465
28JUN15	-10 Days =	18 JUN 2015	498	FRI	508
28JUN15	-11 Days =	17 JUN 2015	488	THU	-NR-
28JUN15	-12 Days =	16 JUN 2015	490	WED	469
28JUN15	-13 Days =	15 JUN 2015	476	TUE	655

Lake Okeechobee Outlets Last 14 Days

DATE	S-77 Discharge (0700-2100) (AC-FT)	S-77 Discharge (ALL DAY) (AC-FT)	Below S-77 Discharge (ALL-DAY) (AC-FT)	S-78 Discharge (0700-2100) (AC-FT)	S-78 Discharge (ALL DAY) (AC-FT)	S-79 Discharge (ALL DAY) (AC-FT)
28 JUN 2015	0	2	-62	343	608	2508
27 JUN 2015	0	2	-66	340	584	2588
26 JUN 2015	0	2	-34	342	602	2412
25 JUN 2015	79	-NA-	86	189	-NR-	2302
24 JUN 2015	229	404	395	0	23	1074
23 JUN 2015	268	414	537	0	22	258
22 JUN 2015	170	-NA-	213	0	22	671
21 JUN 2015	172	-NA-	129	0	35	600

20 JUN 2015	180	-NA-	186	0	24	570
19 JUN 2015	128	-NA-	14	0	17	545
18 JUN 2015	0	6	-633	0	271	1202
17 JUN 2015	0	6	-264	542	1286	2388
16 JUN 2015	0	3	-126	587	978	1844
15 JUN 2015	0	3	-41	58	546	2104

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)
28 JUN 2015	438	2927	1352	1543	-37
27 JUN 2015	382	3068	1311	1578	-70
26 JUN 2015	527	3518	1311	2060	-4
25 JUN 2015	557	-NR-	-NR-	-NR-	77
24 JUN 2015	149	-NR-	-NR-	-NR-	-66
23 JUN 2015	166	-NR-	-NR-	-NR-	13
22 JUN 2015	248	2741	1047	1898	-28
21 JUN 2015	156	2118	1144	1150	-128
20 JUN 2015	150	1993	1027	-13411	20
19 JUN 2015	174	2175	1408	-NR-	93
18 JUN 2015	151	1979	1412	1636	33
17 JUN 2015	27	-NR-	-NR-	1263	21
16 JUN 2015	-78	1337	1218	1245	-41
15 JUN 2015	-156	472	738	990	-50

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
28 JUN 2015	-8	17	41
27 JUN 2015	-11	-204	36
26 JUN 2015	-6	-108	20
25 JUN 2015	-5	-97	36
24 JUN 2015	-8	-144	32
23 JUN 2015	-5	-66	28
22 JUN 2015	-5	-115	20
21 JUN 2015	-5	-77	44
20 JUN 2015	-14	18	-NR-
19 JUN 2015	-8	-82	36
18 JUN 2015	-7	-107	36
17 JUN 2015	-10	-149	125
16 JUN 2015	-5	-12	395
15 JUN 2015	-8	-72	332

*** NOTE: 1) Discharge from (0700-2100) is computed using Spillway and Sector
Gate Discharges from 0700 hrs to 2100 hrs.
2) 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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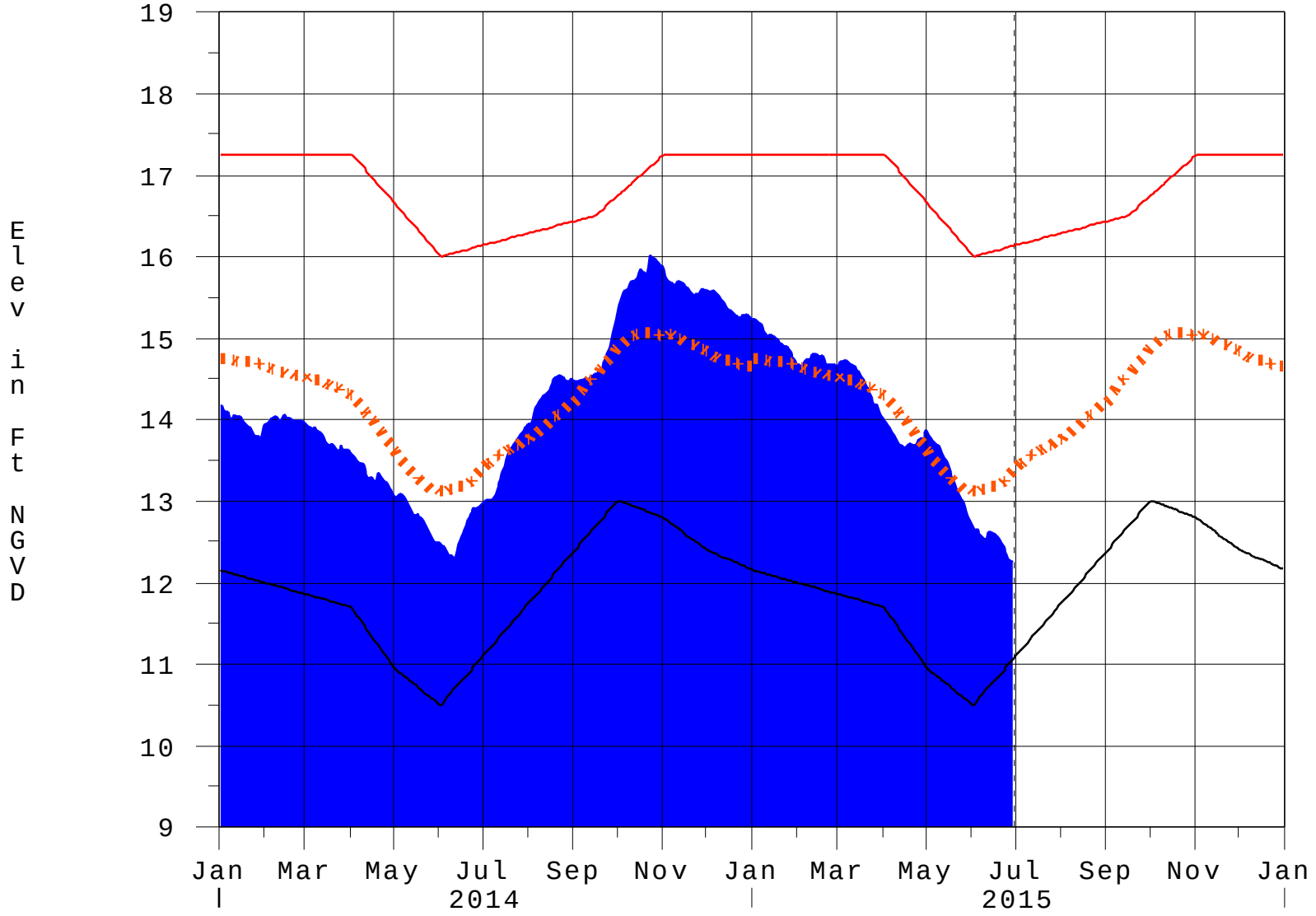
Report Generated 29JUN2015 @ 15:15 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

29JUN15 15:30:23



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

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