Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 7/20/2015 (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 (Jul-Dec)	N/A	N/A	2.34	Very Wet	2.43	Very Wet	1.05	Normal
Multi Seasonal (Jul-Apr)	N/A	N/A	2.67	Wet	3.73	Wet	1.91	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:

21 cfs 14-day running average for Lake Okeechobee Net Inflow through 7/19/2015.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-1.99 for Palmer Index on 7/18/2015.
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 7/20/2015

Lake Okeechobee Stage: **11.99 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		16.23	
Operational Band	High sub-band	15.79	
	Intermediate sub-band	15.35	
	Low sub-band	13.47	
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.50	← 11.99
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 7/20/2015 (ENSO Neutral Condition):

Water Supply Department Technical Input

Water Supply Outlook:

District wide, Raindar rainfall 1.64 inches for the week ending 7/21/2015. Lake stage on 7/20/2015 is 11.99 ft, down 0.09 ft from last week.

The updated July 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	-1.99 (Dry)	M
	CPC Precipitation Outlook	1 month: Below Normal	M
		3 months: Normal	L
	LOK Seasonal Net Inflow Forecast AMO warm/El Nino	2.43 ft (Normal to Extremely Wet)	L
	LOK Multi-Seasonal Net Inflow Forecast AMO warm/El Nino	3.73 ft (Wet)	L
WCAs	WCA 1: Site 1-8C	Between Line 1 & 2 (14.75 ft)	M
	WCA 2A: Site 2-17 HW	Above Line 1 (11.74 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Between Line 1 & 2 (8.77 ft)	M
LEC	Service Area 1	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 2	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
	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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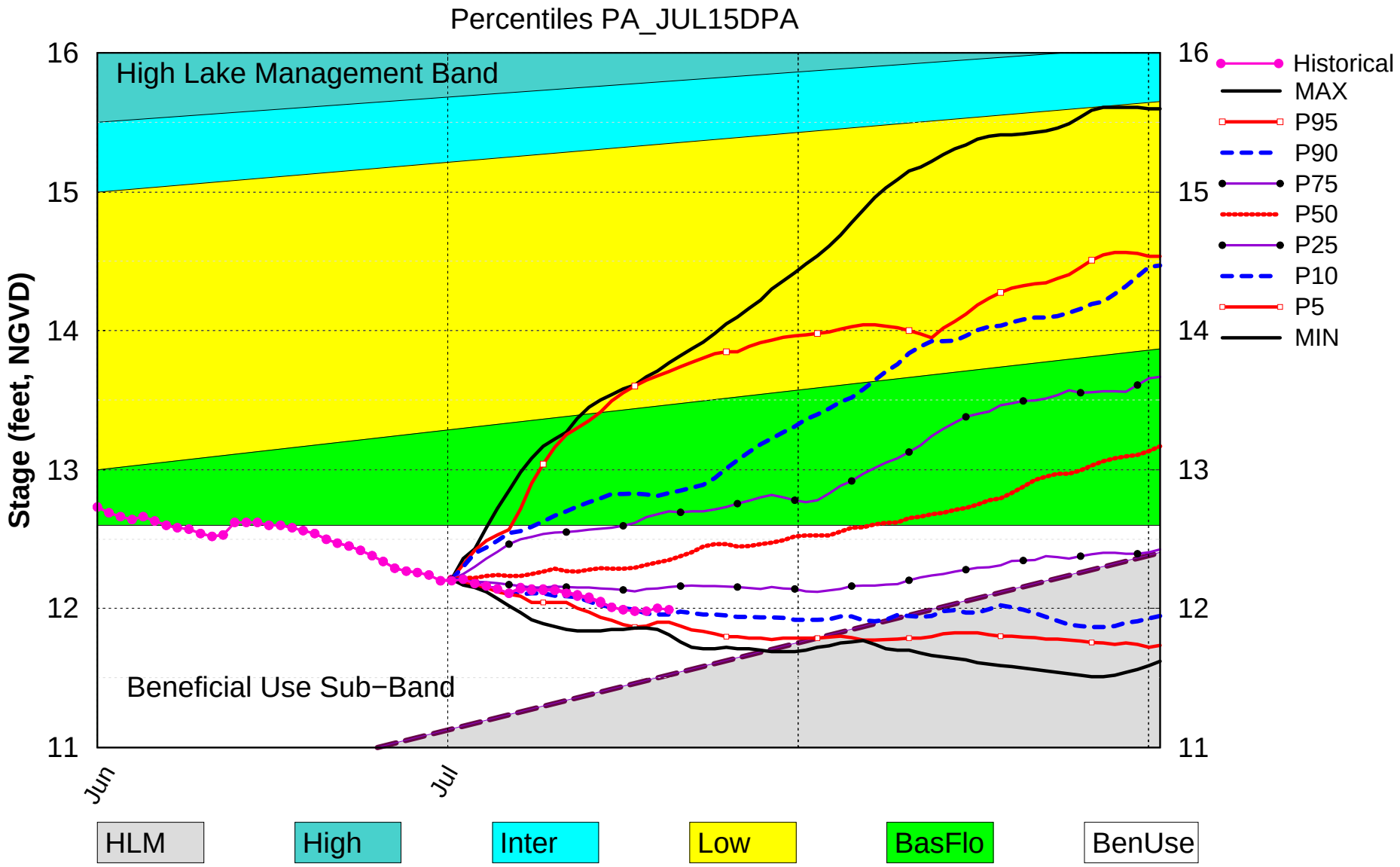
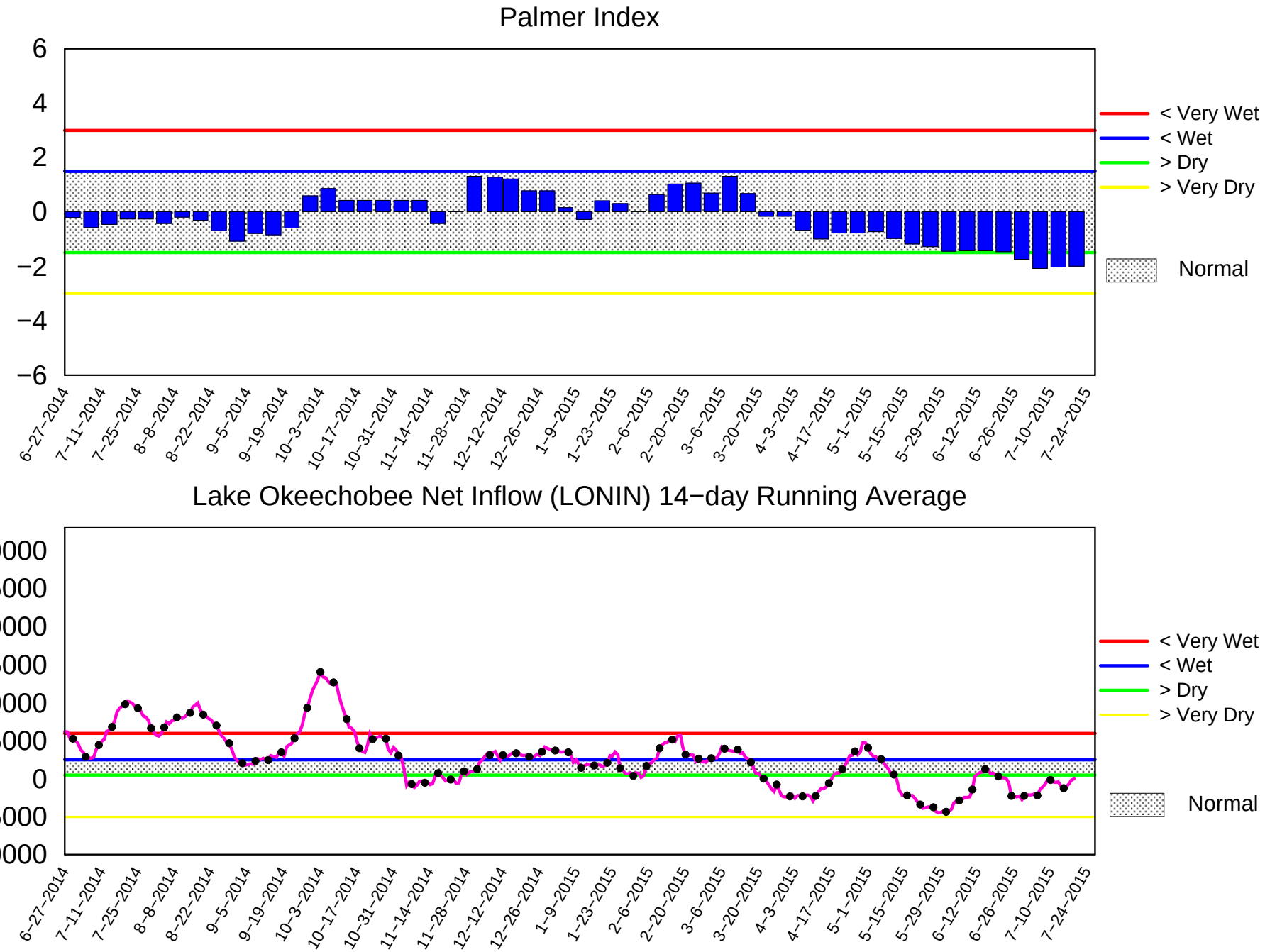
Lake Okeechobee SFWMM July 2015 Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Jul 20 16:06:46 EDT 2015

Tributary Basin Condition Indicators as of July 20 2015



Mon Jul 21 16:06:32 EDT 2015

2008 LORS

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

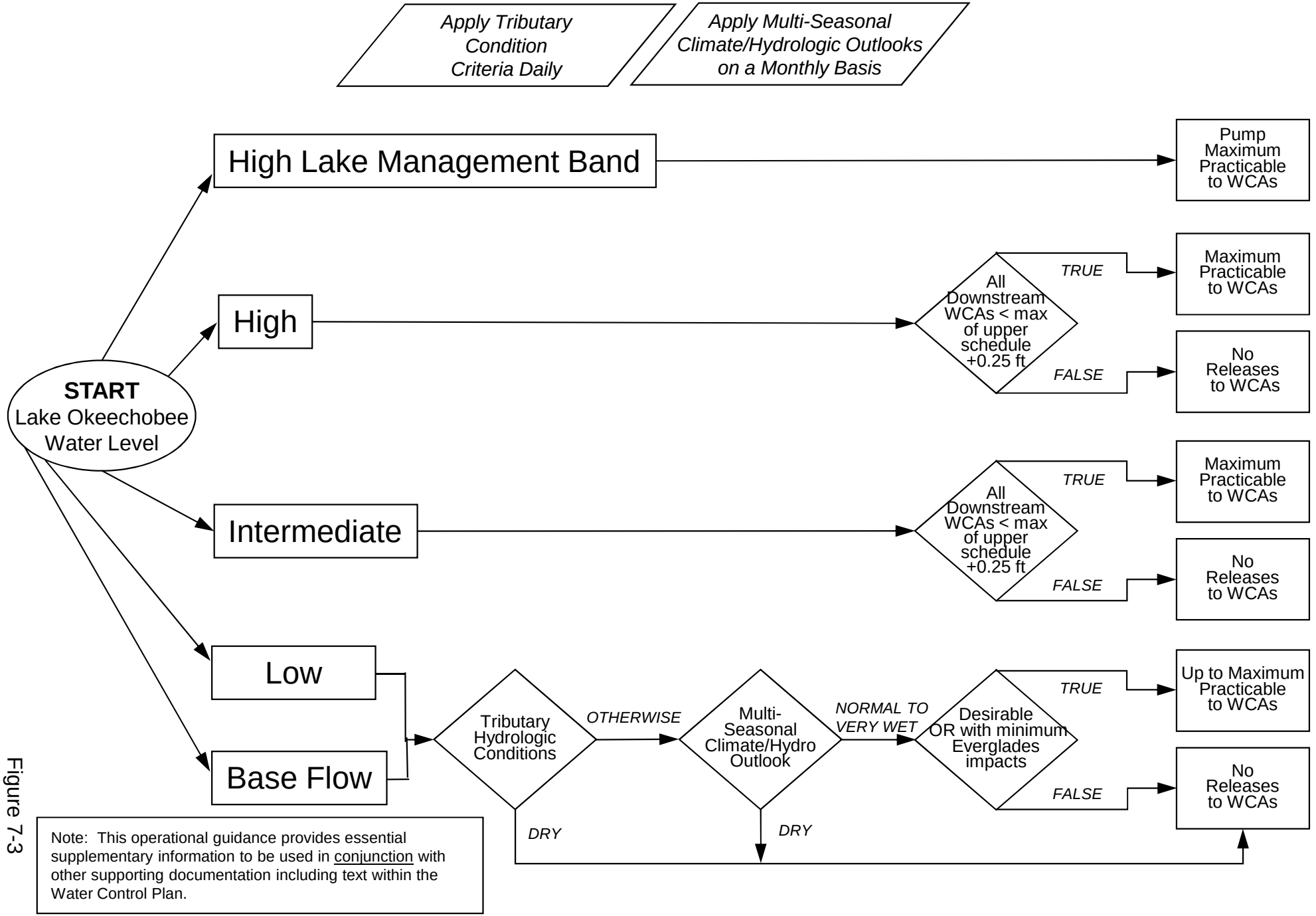


Figure 7-3

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)

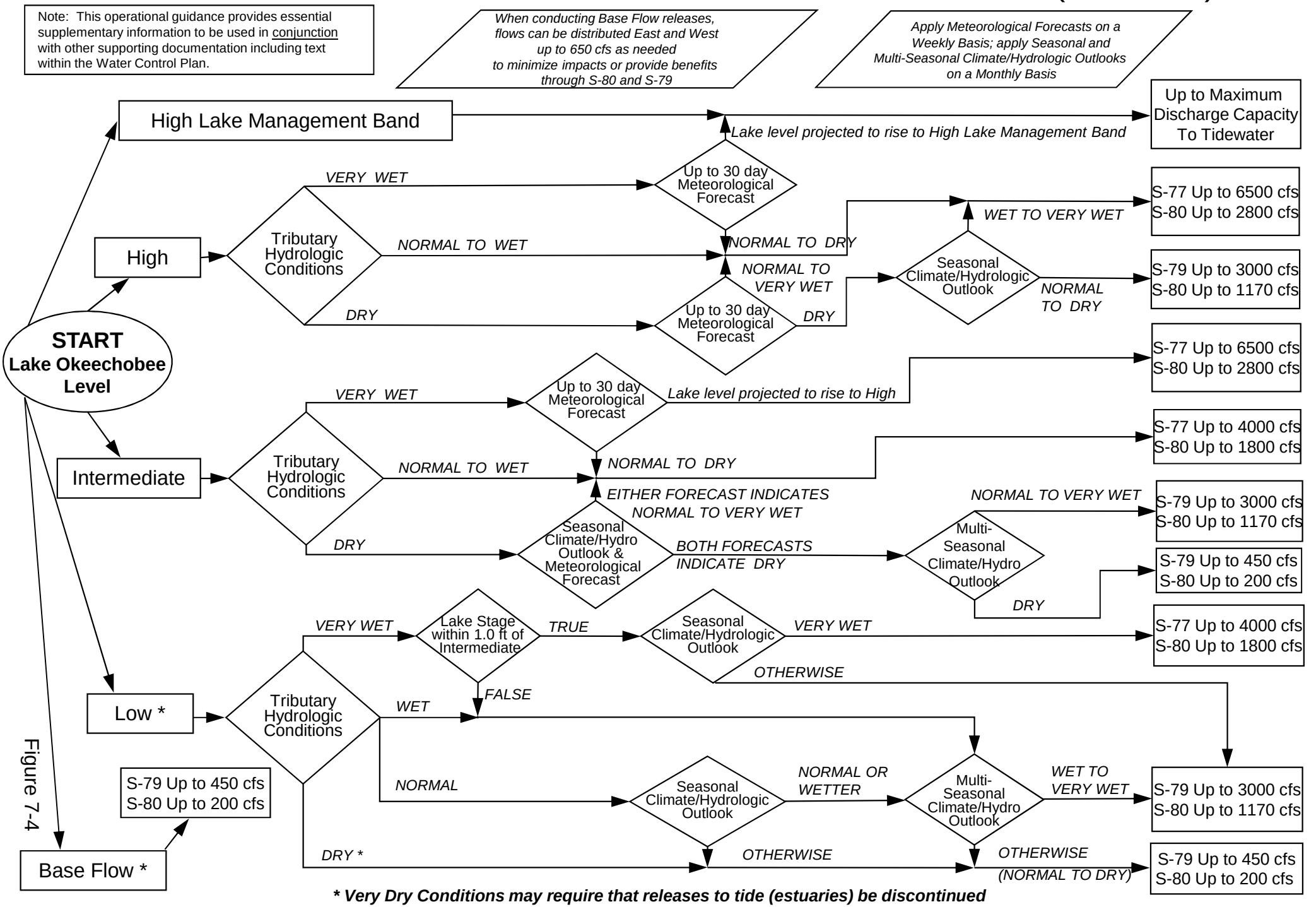
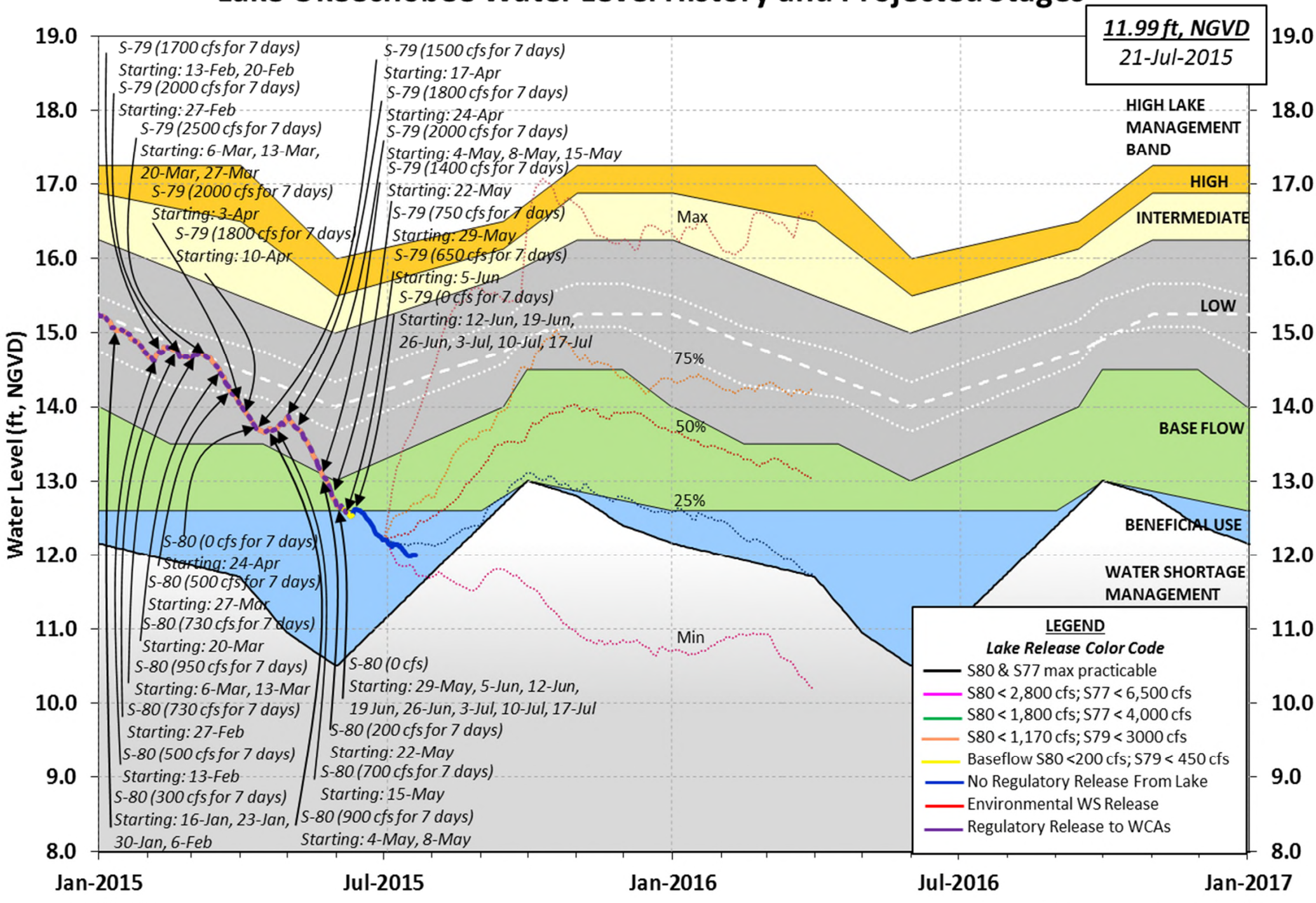


Figure 7-4

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 19 JUL 2015

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	11.99	13.65	15.31 (Official Elv)

Bottom of High Lake Mngmt= 16.23 Top of Water Short Mngmt= 11.49
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.53
Difference from Average LORS2008 -0.54

19JUL (1965-2007) Period of Record Average 13.64
Difference from POR Average -1.65

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 5.93'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 4.13'
Bridge Clearance = 51.49'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
11.89	12.05	11.95	11.95	12.02	12.14	11.95	12.00

*Combination Okeechobee Avg-Daily Lake Average = 11.99
(*See Note)

Okeechobee Inflows (cfs):

S65E	531	C5	0	Fisheating Cr	506
S154	0	S191	0	S135 Pumps	0
S84	84	S133 Pumps	0	S2 Pumps	0
S84X	727	S127 Pumps	0	S3 Pumps	0
S71	143	S129 Pumps	0	S4 Pumps	0
S72	106	S131 Pumps	0		

Total Inflows: 2097

Okeechobee Outflows (cfs):

S135 Culverts	-NR-	S354	-NR-	S77	1 (Used)
S127 Culverts	0	S351	33	S77Below	-33 (NOT USED)

```
  S129 Culverts     0      S352            532      S308             -0
(Used)
  S131 Culverts            L8 Canal Pt    -160      S308Below       -10 (NOT
USED)
Total Outflows:    406

****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            0.30      S308           0.39
  Average Pan Evap x 0.75 Pan Coefficient =  0.26" =  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  -1815 cfs or  -3600 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:	12.88	11.94	0	0	0	0	0	0	(cfs)		
S193:	_____										
S191:	18.24	11.98	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:	21.03	11.90	531	0.6	0.2	0.5	0.5	0.0	0.0		
S127 Pumps:	12.99	11.96	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.43	11.90	0	0	0	0			(cfs)		
S129 Culvert:			0	0.1							
S131 Pumps:	13.39	12.15	0	0	0				(cfs)		
S131 Culvert:											
Fisheating Creek											
nr Palmdale		32.12	506								
nr Lakeport		13.33									

```
  C5:          12.08    12.02      0    0.0  0.0  0.0

South Shore
  S4 Pumps:    12.03     11.96       0      0    0    0            (cfs)
  S169:        12.03     12.02     -42    5.0  5.0  5.0
  S310:        11.99               -68
  S3 Pumps:    10.88     12.11       0      0    0    0            (cfs)
  S354:        12.11     10.88    -NR-    1.2  1.4
  S2 Pumps:    10.76     11.97       0      0    0    0    0       (cfs)
  S351:        11.97     10.76      33    0.0  0.0  0.0
  S352:        12.20     11.14     532    2.0  2.0
  C10A:         -NR-     12.26           8.5   8.5   8.5   8.5   8.5
  L8 Canal PT            12.07    -160

_____________________________________________________________________

                S351 and S352 Temporary Pumps/S354 Spillway

  S351:        10.76     11.97      33  -NR--NR--NR--NR--NR--NR-
  S352:        11.14     12.20     532  -NR--NR--NR--NR-
  S354:        10.88     12.11    -NR-  -NR--NR--NR--NR-
_____________________________________________________________________

Caloosahatchee River (S77, S78, S79)
  S47B:        14.06     10.85           0.0  0.0
  S47D:        10.87     10.88     -53   5.0
  S77:
    Spillway and Sector Flow:
               11.88     10.93       0    0.0  0.0  0.0  0.0
    Flow Due to Lockages+:             1

  S77 Below USGS Flow Gage          -33

  S78:
    Spillway and Sector Flow:
               10.73      3.11     160    0.0  0.0  0.0  0.0
    Flow Due to Lockages+:             3

  S79:
    Spillway and Sector Flow:
                3.28      1.16    2329    0.0  1.0  1.0  1.0  1.0  1.0  1.0
1.0
    Flow Due to Lockages+:             6
    Percent of flow from S77           0%
    Chloride             (ppm)     74


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
               11.97     12.01       0    0.0  0.0  0.0  0.0
    Flow Due to Lockages+:            -0

  S308 Below USGS Flow Gage         -10
  S153:        18.92     11.81       0    0.0  0.0
  S80:
    Spillway and Sector Flow:
               12.15      0.86       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)	Speed (mph)
S133 Pump Station:	-NR-	0.14	0.32		
S193:	-NR-	0.00	0.00	-NR-	-NR-
Okeechobee Field Station:	-NR-	0.00	0.00		
S135 Pump Station:	-NR-	0.02	0.20		
S127 Pump Station:	-NR-	0.39	1.34		
S129 Pump Station:	-NR-	0.03	0.78		
S131 Pump Station:	-NR-	0.01	0.99		
S77:	0.00	1.50	3.98	240	0
S78:	0.00	1.15	1.71	6	1
S79:	0.00	0.60	1.80	174	0
S4 Pump Station:	-NR-	0.00	0.00		
Clewiston Field Station:	-NR-	0.00	0.00		
S3 Pump Station:	-NR-	0.01	1.22		
S2 Pump Station:	-NR-	0.01	0.25		
S308:	0.00	0.00	0.10	90	3
S80:	0.00	0.40	1.66	215	2
Okeechobee Average (Sites S78, S79 and S80 not included)	0.00	0.16	0.71		
Oke Nexrad Basin Avg	-NR-	0.23	1.03		

Okeechobee Lake Elevations	19 JUL 2015	11.99	Difference from 19JUL15
19JUL15 -1 Day =	18 JUL 2015	12.00	0.01
19JUL15 -2 Days =	17 JUL 2015	11.98	-0.01
19JUL15 -3 Days =	16 JUL 2015	11.98	-0.01
19JUL15 -4 Days =	15 JUL 2015	11.99	0.00
19JUL15 -5 Days =	14 JUL 2015	12.01	0.02
19JUL15 -6 Days =	13 JUL 2015	12.04	0.05
19JUL15 -7 Days =	12 JUL 2015	12.07	0.08
19JUL15 -30 Days =	19 JUN 2015	12.50	0.51
19JUL15 -1 Year =	19 JUL 2014	13.65	1.66
19JUL15 -2 Year =	19 JUL 2013	15.31	3.32

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
19JUL15	Today =	19 JUL 2015	394	MON	-NR-
19JUL15	-1 Day =	18 JUL 2015	61	SUN	4734
19JUL15	-2 Days =	17 JUL 2015	-451	SAT	1557
19JUL15	-3 Days =	16 JUL 2015	-730	FRI	573
19JUL15	-4 Days =	15 JUL 2015	-830	THU	-897
19JUL15	-5 Days =	14 JUL 2015	-825	WED	-2713
19JUL15	-6 Days =	13 JUL 2015	-188	TUE	-3416
19JUL15	-7 Days =	12 JUL 2015	-308	MON	-1993
19JUL15	-8 Days =	11 JUL 2015	-225	SUN	-1338
19JUL15	-9 Days =	10 JUL 2015	-27	SAT	-1726
19JUL15	-10 Days =	09 JUL 2015	79	FRI	1331
19JUL15	-11 Days =	08 JUL 2015	-35	THU	1405
19JUL15	-12 Days =	07 JUL 2015	-179	WED	-159
19JUL15	-13 Days =	06 JUL 2015	-182	TUE	7769

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
19JUL15	Today=	19 JUL 2015	878	MON	531
19JUL15	-1 Day =	18 JUL 2015	877	SUN	626
19JUL15	-2 Days =	17 JUL 2015	856	SAT	655
19JUL15	-3 Days =	16 JUL 2015	842	FRI	703
19JUL15	-4 Days =	15 JUL 2015	853	THU	877
19JUL15	-5 Days =	14 JUL 2015	851	WED	880
19JUL15	-6 Days =	13 JUL 2015	805	TUE	1036
19JUL15	-7 Days =	12 JUL 2015	738	MON	1132
19JUL15	-8 Days =	11 JUL 2015	683	SUN	1186
19JUL15	-9 Days =	10 JUL 2015	625	SAT	1177
19JUL15	-10 Days =	09 JUL 2015	569	FRI	1047
19JUL15	-11 Days =	08 JUL 2015	526	THU	871
19JUL15	-12 Days =	07 JUL 2015	492	WED	779
19JUL15	-13 Days =	06 JUL 2015	460	TUE	795

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)
19 JUL 2015	0	1	-65	140	324	4629
18 JUL 2015	0	1	-88	542	626	3807
17 JUL 2015	0	1	-94	0	18	2346
16 JUL 2015	4	-NA-	-15	0	20	1516
15 JUL 2015	214	375	406	0	16	478
14 JUL 2015	250	430	629	0	4	757
13 JUL 2015	123	176	192	0	18	600
12 JUL 2015	4	-NA-	39	0	18	1651

11 JUL 2015	263	439	463	0	23	900
10 JUL 2015	139	-NA-	81	0	13	2490
09 JUL 2015	0	2	-267	21	161	1802
08 JUL 2015	0	3	-226	133	310	4005
07 JUL 2015	0	1	-133	132	303	4844
06 JUL 2015	0	-NA-	-49	123	178	3650

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 JUL 2015	-134	65	1055	-NR-	-317
18 JUL 2015	-91	555	984	650	-329
17 JUL 2015	9	813	1069	1206	-281
16 JUL 2015	-44	1832	1140	1660	-265
15 JUL 2015	93	2530	1263	1553	-266
14 JUL 2015	392	2969	1388	1533	-313
13 JUL 2015	431	2042	1182	1525	-351
12 JUL 2015	287	1739	1001	995	-359
11 JUL 2015	221	2023	960	1626	-317
10 JUL 2015	104	1634	710	1634	-359
09 JUL 2015	-45	1202	260	1178	-460
08 JUL 2015	-249	1481	139	1166	-588
07 JUL 2015	118	1805	603	1077	-565
06 JUL 2015	276	1569	912	1456	-589

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
19 JUL 2015	-0	-20	17
18 JUL 2015	-1	25	21
17 JUL 2015	-1	33	14
16 JUL 2015	-3	-140	29
15 JUL 2015	-4	-247	-NR-
14 JUL 2015	-5	-221	37
13 JUL 2015	-6	-68	23
12 JUL 2015	-5	-130	35
11 JUL 2015	-5	-124	23
10 JUL 2015	-5	-153	19
09 JUL 2015	-4	63	31
08 JUL 2015	-8	156	42
07 JUL 2015	-2	90	15
06 JUL 2015	-7	-84	30

*** 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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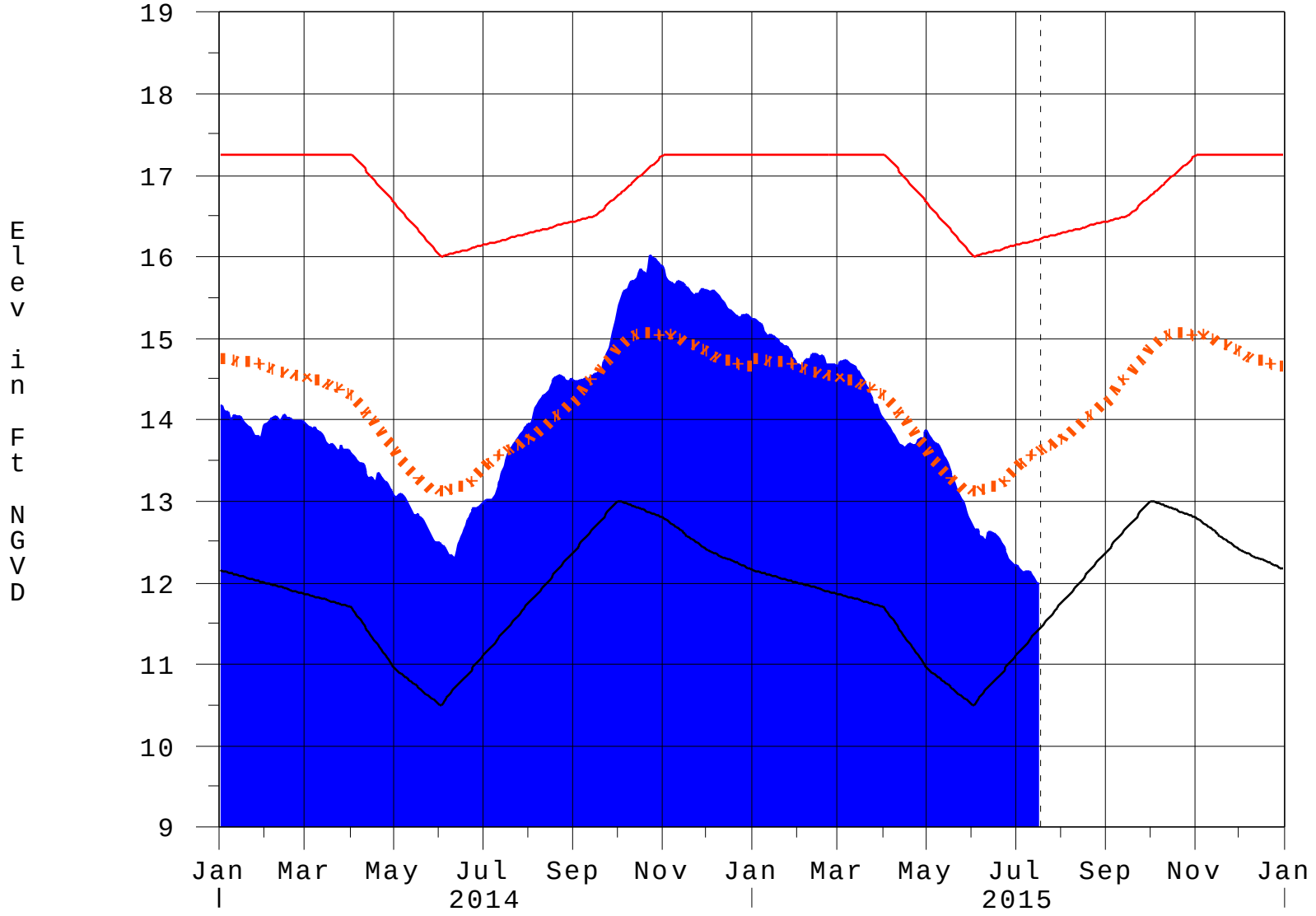
Report Generated 20JUL2015 @ 11:06 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

17JUL15 10:45:53



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