Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 1/25/2016 (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 El Nino 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 El Nino ENSO Years[3]		Sub-sampling of AMO Warm + El Nino ENSO Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Jan-Jun)	N/A	N/A	1.19	Normal	1.85	Wet	2.35	Very Wet
Multi Seasonal (Jan-Oct)	N/A	N/A	3.39	Wet	3.88	Wet	5.61	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:

8128 cfs 14-day running average for Lake Okeechobee Net Inflow through 1/25/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Very Wet.

0.59 for Palmer Index on 1/24/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Normal.

The wetter of the two conditions above is **Very Wet**.

LORS2008 Classification Tables:

Lake Okeechobee Stage on 1/25/2016

Lake Okeechobee Stage: **15.31 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	16.78	
	Intermediate sub-band	16.06	
	Low sub-band	13.74	← 15.31
Base Flow sub-band		12.60	
Beneficial Use sub-band		12.03	
Water Shortage Management Band			

Part C of LORS2008: Discharge to WCA's

Release Guidance Flow Chart Outcome: Up to Maximum Releases to the WCAs if Desirable or with Minimum Everglades Impacts

Part D of LORS2008: Discharge to Tidewater

Release Guidance Flow Chart Outcome: S-79 up to 3000 cfs and S-80 up to 1170 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 1/25/2016 (ENSO El Nino Condition):

Water Supply Department Technical Input

Water Supply Outlook:

District wide, Raindar rainfall 1.19 inches for the week ending 1/25/2016. Lake stage on 1/25/2016 is 15.31 ft, up 0.26 ft from last week.
The updated January 2016 SFWMM Dynamic Position Analysis percentile graph and tracking chart for Lake Okeechobee show that the lake stage is in the Low Operational Sub-Band.

The LORS2008 tributary indices are classified as **Very Wet**. The PDSI indicates normal condition and the LONIN is Very Wet. 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 Flow Sub-Band	M
	Palmer Index for LOK Tributary Conditions	0.59 (Normal)	L
	CPC Precipitation Outlook	1 month: Above Normal	L
		3 months: Above Normal	L
	LOK Seasonal Net Inflow Forecast	1.85 ft (Normal to Extremely Wet)	L
	AMO warm/El Nino		
	LOK Multi-Seasonal Net Inflow Forecast	3.88 ft (Wet)	L
	AMO warm/El Nino		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (17.04 ft)	L
	WCA 2A: Site 2-17 HW	Above Line1 (12.60 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.61 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 forecasts use slightly different classification intervals than those used by the 2008-LORS for classifying the tributary hydrologic condition (THC).

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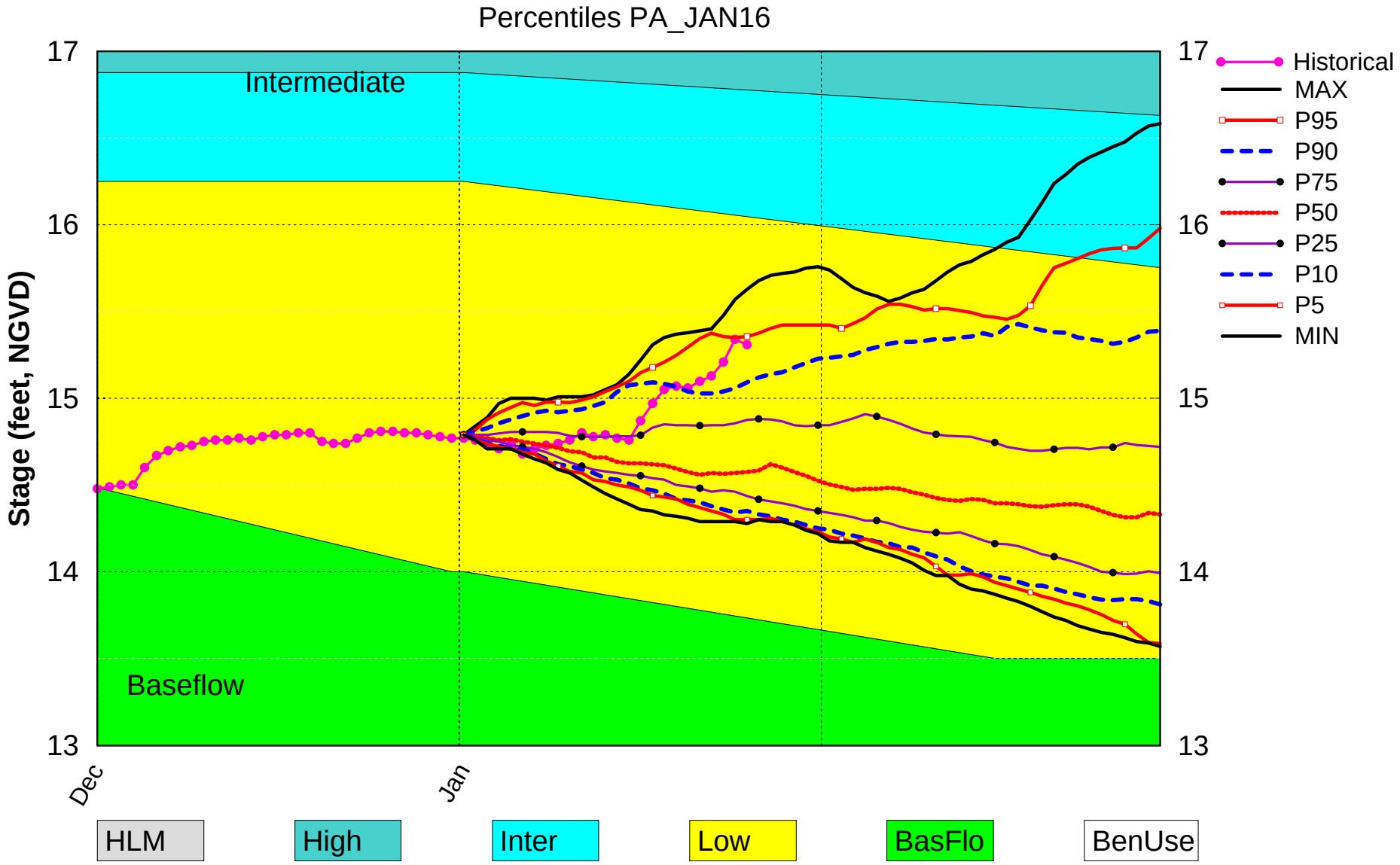
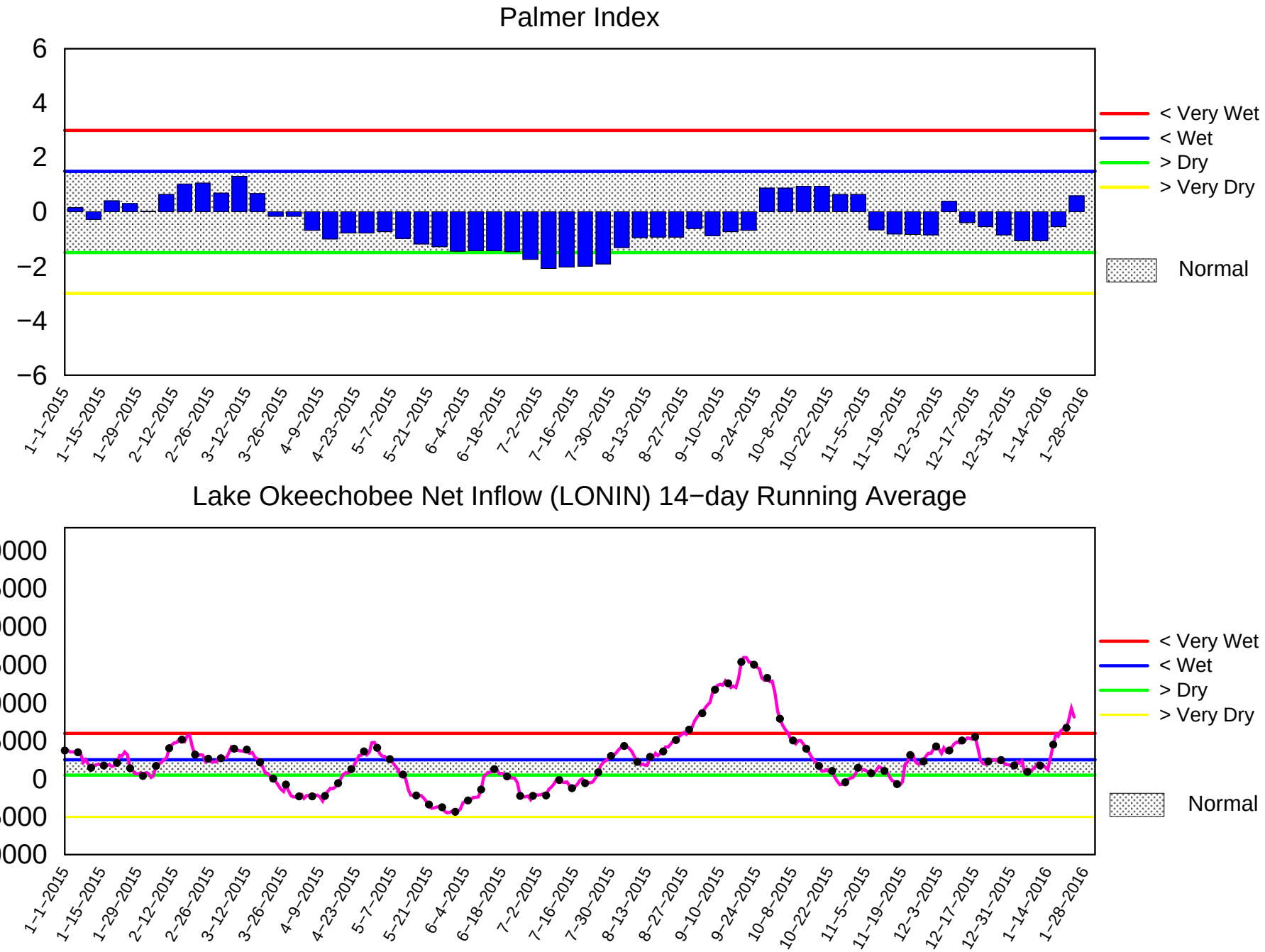
Lake Okeechobee SFWMM Jan 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Jan 25 15:07:55 2016

Tributary Basin Condition Indicators as of January 25 2016



Mon Jan 25 14:47:09 EST 2016

2008 LORS

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

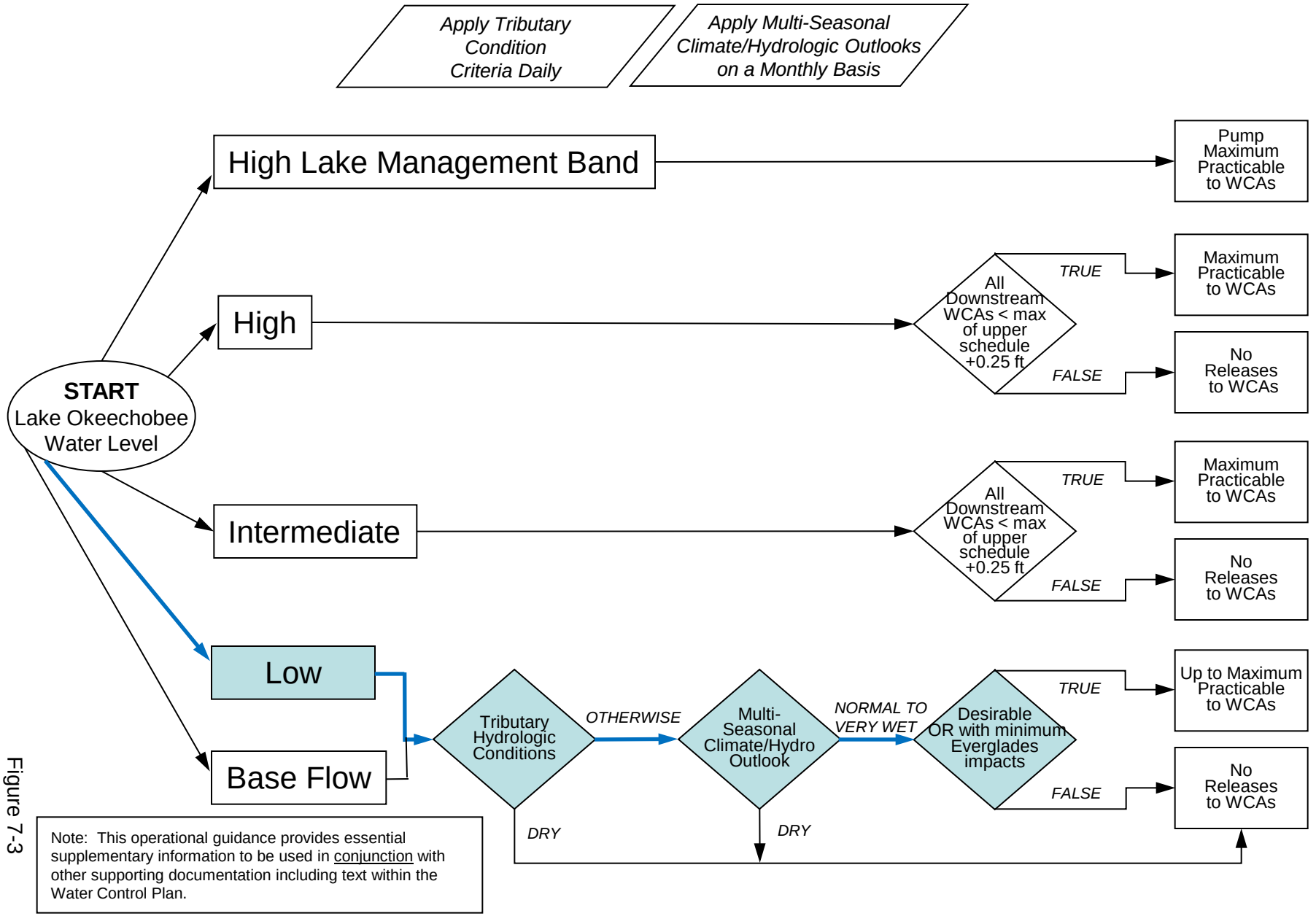


Figure 7-3

2008 LORS

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

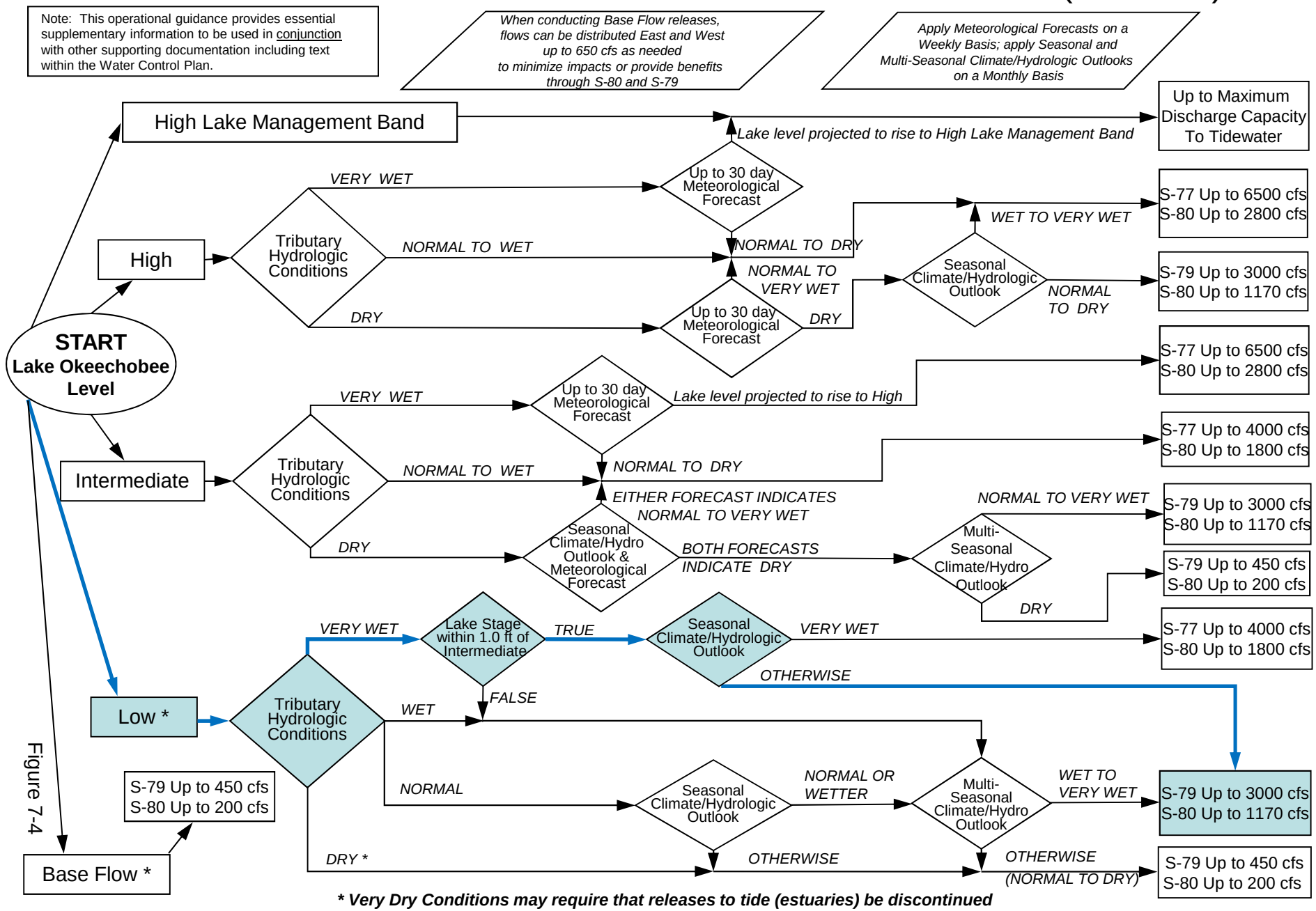


Figure 7-4

2008 LORS FORECAST

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

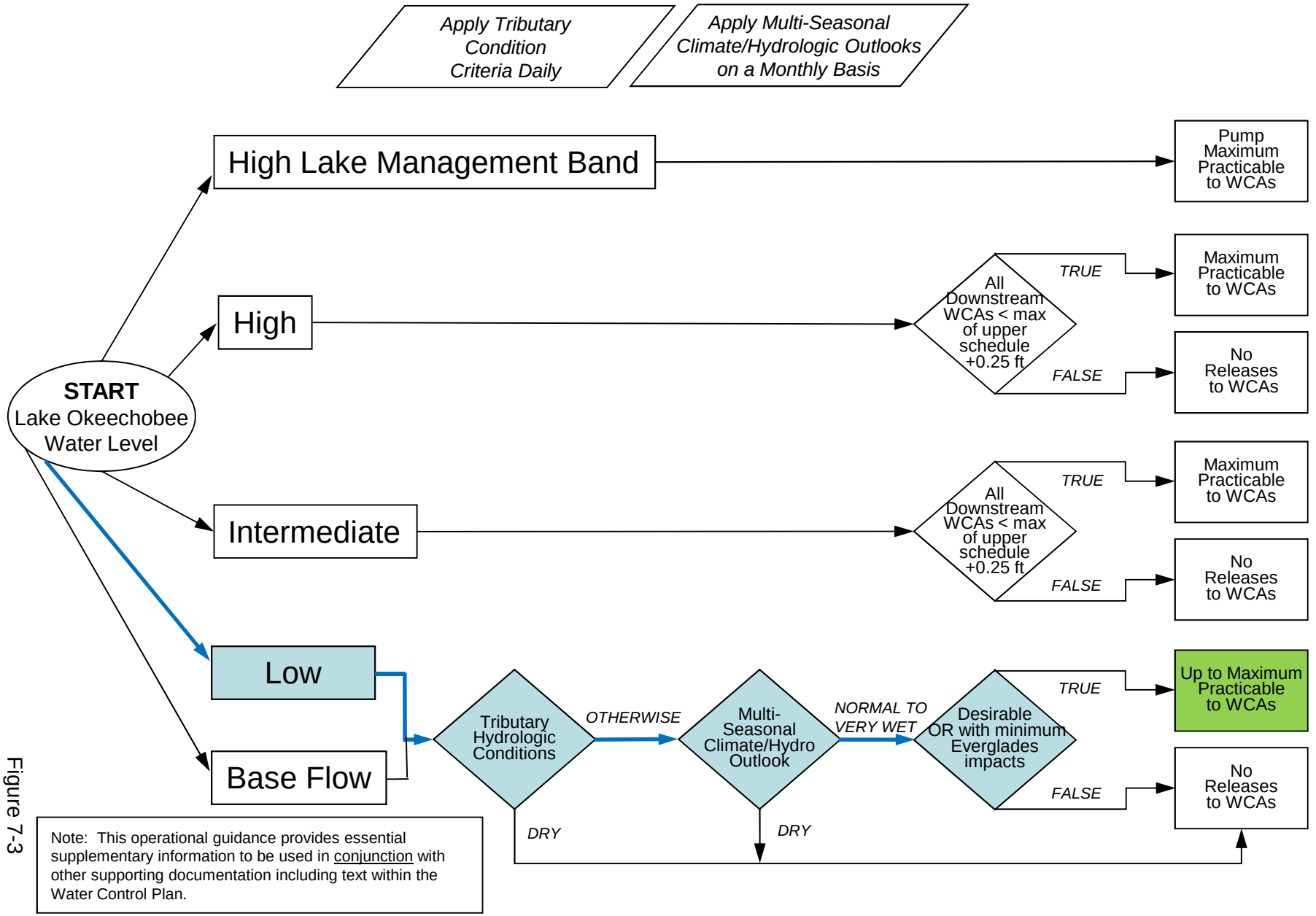


Figure 7-3

2008 LORS FORECAST

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

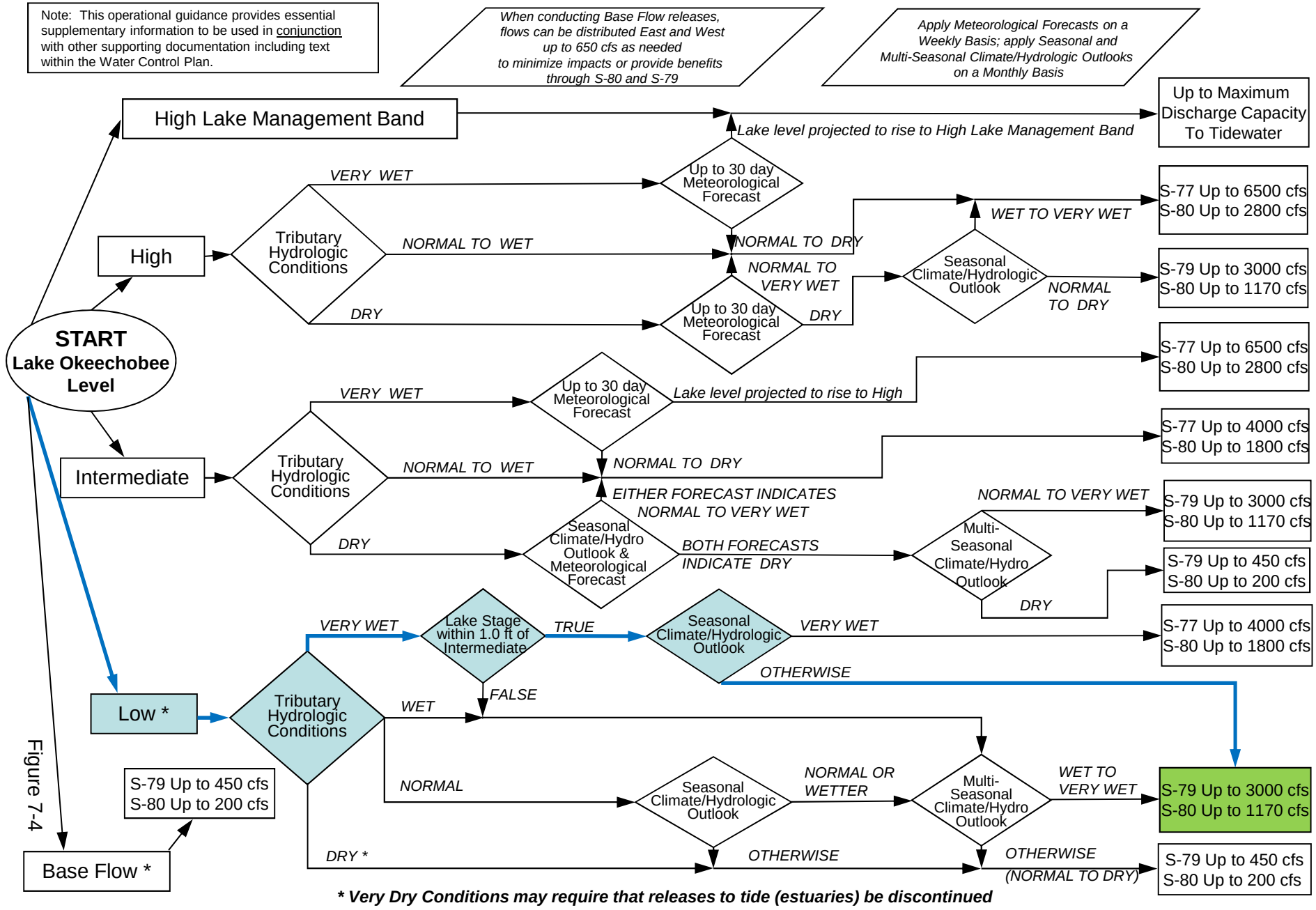
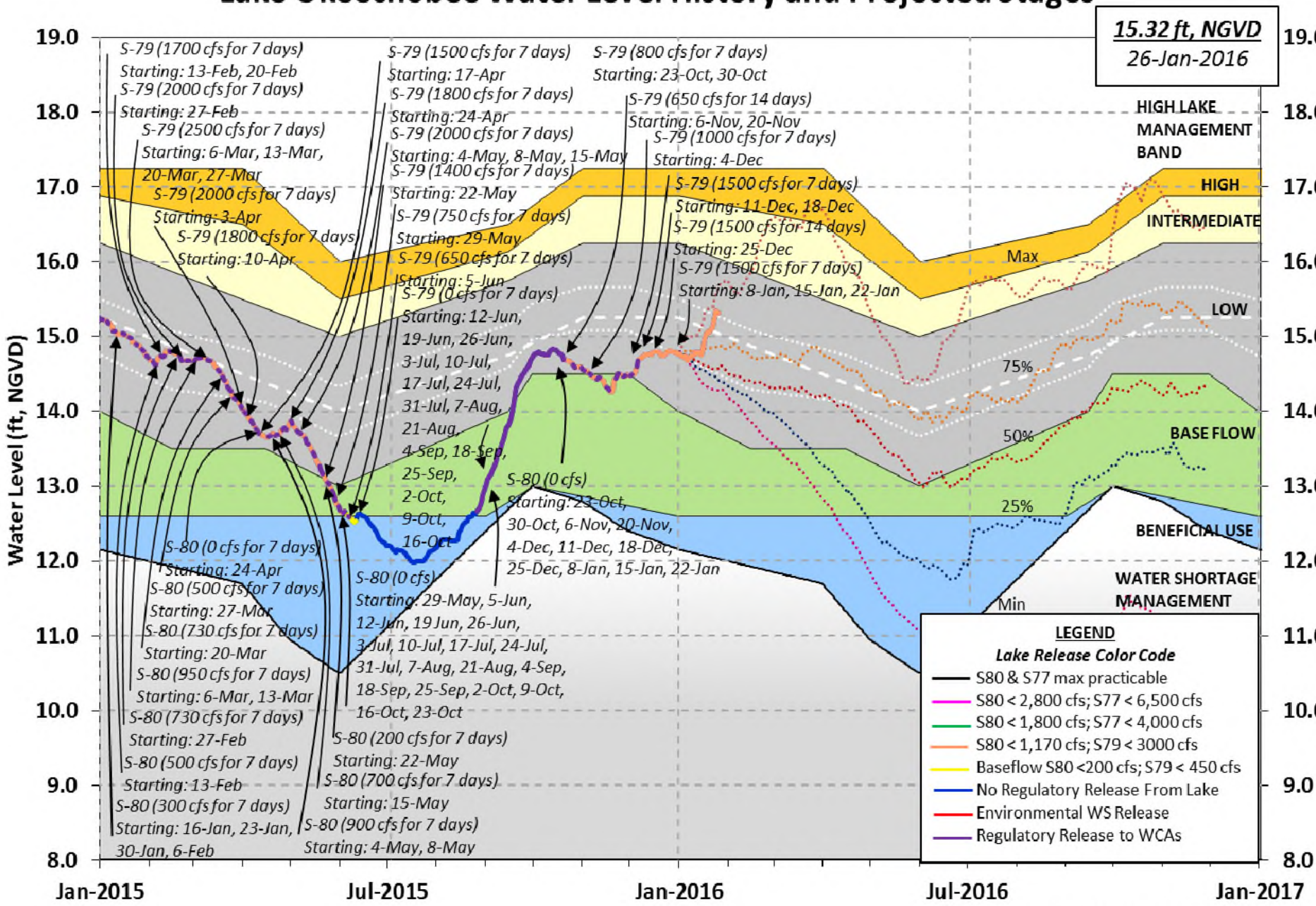


Figure 7-4

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 24 JAN 2016

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	15.31	14.89	13.80 (Official Elv)

Bottom of High Lake Mngmt= 17.25 Top of Water Short Mngmt= 12.03
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.56
Difference from Average LORS2008 1.75

24JAN (1965-2007) Period of Record Average 14.69
Difference from POR Average 0.62

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 9.25'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 7.45'
Bridge Clearance = 49.57'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
15.07	15.30	15.39	15.31	15.43	15.57	15.33	15.13

*Combination Okeechobee Avg-Daily Lake Average = 15.31 (*See Note)

Okeechobee Inflows (cfs):

S65E	2583	C5	-159	Fisheating Cr	1164
S154	104	S191	426	S135 Pumps	122
S84	581	S133 Pumps	84	S2 Pumps	0
S84X	814	S127 Pumps	74	S3 Pumps	0
S71	837	S129 Pumps	55	S4 Pumps	359
S72	245	S131 Pumps	22		

Total Inflows: 7311

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	0	S77	475 (Used)
S127 Culverts	-NR-	S351	0	S77Below	370 (NOT USED)

```
  S129 Culverts     0      S352              0      S308              2
(Used)
  S131 Culverts     0      L8 Canal Pt       7      S308Below         6 (NOT
USED)
Total Outflows:    484

****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            0.07      S308           0.02
  Average Pan Evap x 0.75 Pan Coefficient =  0.03" =  0.00'

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

Evaporation - Precipitation:             =  0.03" =  0.00'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to    662 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is  -6504 cfs or -12900 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:	13.40	15.21	84	0	0	0	0	84	(cfs)		
S193:	_____										
S191:	18.08	15.23	426	0.7	0.2	0.7					
S135 Pumps:	_____	-NR-	122	31	31	30	30		(cfs)		
S135 Culverts:			0	-NR-	-NR-						
North West Shore											
S65E:	21.03	15.11	2583	1.5	1.2	1.0	1.0	1.0	1.0		
S127 Pumps:	13.51	-NR-	74	6	0	37	31	0	(cfs)		
S127 Culvert:			-NR-	-NR-							
S129 Pumps:	12.94	15.33	55	12	43	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.85	15.43	22	0	24				(cfs)		
S131 Culvert:			0								
Fisheating Creek											
nr Palmdale		32.95	1164								
nr Lakeport	_____										

C5:	15.38	15.27	-159	8.0	0.0	8.0					
South Shore											
S4 Pumps:	11.77	15.39	359	0	359	0					(cfs)
S169:	15.56	11.96	64	2.0	2.5	1.7					
S310:	15.28		-47								
S3 Pumps:	9.84	15.40	0	0	0	0					(cfs)
S354:	15.40	9.84	0	0.0	0.0						
S2 Pumps:	9.83	15.36	0	0	0	0	0				(cfs)
S351:	15.36	9.83	0	0.0	0.0	0.0					
S352:	15.46	9.32	0	0.0	0.0						
C10A:	-NR-	12.66		0.0	0.0	0.0	0.0	0.0			
L8 Canal PT		12.42	7								

S351 and S352 Temporary Pumps/S354 Spillway

S351:	9.83	15.36	0	-NR--NR--NR--NR--NR--NR-
S352:	9.32	15.46	0	-NR--NR--NR--NR-
S354:	9.84	15.40	0	-NR--NR--NR--NR-

Caloosahatchee River (S77, S78, S79)											
S47B:	13.22	11.45		0.5	1.0						
S47D:	11.43	11.42	40	5.0							
S77:											
Spillway and Sector Flow:											
	15.19	11.50	471	0.0	2.5	0.0	0.5				
Flow Due to Lockages+:			4								
S77 Below USGS Flow Gage			370								
S78:											
Spillway and Sector Flow:											
	11.31	2.65	1290	0.5	1.0	1.0	1.0				
Flow Due to Lockages+:			25								
S79:											
Spillway and Sector Flow:											
	2.76	0.43	3479	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Flow Due to Lockages+:			9								
Percent of flow from S77			14%								
Chloride		(ppm)	52								
St. Lucie Canal (S308, S80)											
S308:											
Spillway and Sector Flow:											
	15.30	13.93	0	0.0	0.0	0.0	0.0				
Flow Due to Lockages+:			2								
S308 Below USGS Flow Gage			6								
S153:	19.03	13.75	120	0.5	0.0						
S80:											
Spillway and Sector Flow:											
	13.95	1.53	724	0.0	0.5	0.5	0.0	0.5	0.5	0.0	

Flow Due to Lockages+: 10
Percent of flow from S308 0%

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

Speedy Point Top Salinity (mg/ml) 9843
Speedy Point Bottom Salinity (mg/ml) -N

+ 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	1.98	1.98	213	0
S78:	0.00	0.93	0.93	128	1
S79:	0.00	0.78	0.78	167	4
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:	*******	*******	*******	270	0
S80:	0.00	0.59	1.55	309	4
Okeechobee Average (Sites S78, S79 and S80 not included)	*******	6541.08	*******		
Oke Nexrad Basin Avg	0.00	1.25	1.25		

Okeechobee Lake Elevations		24 JAN 2016	15.31	Difference from 24JAN16
24JAN16	-1 Day =	23 JAN 2016	15.34	0.03
24JAN16	-2 Days =	22 JAN 2016	15.21	-0.10
24JAN16	-3 Days =	21 JAN 2016	15.13	-0.18
24JAN16	-4 Days =	20 JAN 2016	15.10	-0.21
24JAN16	-5 Days =	19 JAN 2016	15.06	-0.25
24JAN16	-6 Days =	18 JAN 2016	15.07	-0.24
24JAN16	-7 Days =	17 JAN 2016	15.05	-0.26
24JAN16	-30 Days =	25 DEC 2015	14.81	-0.50
24JAN16	-1 Year =	24 JAN 2015	14.89	-0.42
24JAN16	-2 Year =	24 JAN 2014	13.80	-1.51

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
24JAN16	Today =	24 JAN 2016	8074	MON	-6026
24JAN16	-1 Day =	23 JAN 2016	9162	SUN	28285
24JAN16	-2 Days =	22 JAN 2016	7550	SAT	17533
24JAN16	-3 Days =	21 JAN 2016	6508	FRI	6711
24JAN16	-4 Days =	20 JAN 2016	6345	THU	9022
24JAN16	-5 Days =	19 JAN 2016	6167	WED	-1974
24JAN16	-6 Days =	18 JAN 2016	5427	TUE	4502
24JAN16	-7 Days =	17 JAN 2016	5625	MON	17362
24JAN16	-8 Days =	16 JAN 2016	4191	SUN	21470
24JAN16	-9 Days =	15 JAN 2016	2380	SAT	23705
24JAN16	-10 Days =	14 JAN 2016	682	FRI	-1919
24JAN16	-11 Days =	13 JAN 2016	946	THU	-4009
24JAN16	-12 Days =	12 JAN 2016	1218	WED	2340
24JAN16	-13 Days =	11 JAN 2016	1040	TUE	-3973

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
24JAN16	Today=	24 JAN 2016	2256	MON	2583
24JAN16	-1 Day =	23 JAN 2016	2142	SUN	3197
24JAN16	-2 Days =	22 JAN 2016	1972	SAT	2956
24JAN16	-3 Days =	21 JAN 2016	1800	FRI	2708
24JAN16	-4 Days =	20 JAN 2016	1649	THU	3069
24JAN16	-5 Days =	19 JAN 2016	1471	WED	3345
24JAN16	-6 Days =	18 JAN 2016	1275	TUE	3216
24JAN16	-7 Days =	17 JAN 2016	1083	MON	2965
24JAN16	-8 Days =	16 JAN 2016	904	SUN	2055
24JAN16	-9 Days =	15 JAN 2016	793	SAT	1660
24JAN16	-10 Days =	14 JAN 2016	708	FRI	874
24JAN16	-11 Days =	13 JAN 2016	676	THU	1115
24JAN16	-12 Days =	12 JAN 2016	644	WED	876
24JAN16	-13 Days =	11 JAN 2016	611	TUE	970

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)
24 JAN 2016	-NR-	943	733	-NR-	2607	6917
23 JAN 2016	-NR-	2	-441	-NR-	3016	10195
22 JAN 2016	-NR-	8	67	-NR-	1859	6986
21 JAN 2016	-NR-	13	-108	-NR-	1145	6901
20 JAN 2016	-NR-	295	376	-NR-	1258	5476
19 JAN 2016	-NR-	13	90	-NR-	3591	8760
18 JAN 2016	-NR-	11	23	-NR-	4347	9314
17 JAN 2016	-NR-	5	146	-NR-	3950	10256

16 JAN 2016	-NR-	11	191	-NR-	2516	7613
15 JAN 2016	-NR-	7	28	-NR-	957	5297
14 JAN 2016	-NR-	9	-87	-NR-	897	1110
13 JAN 2016	-NR-	7	-89	-NR-	1018	1976
12 JAN 2016	-NR-	13	-133	-NR-	1314	2388
11 JAN 2016	-NR-	137	89	-NR-	1322	3216

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)
24 JAN 2016	-93	0	0	0	14
23 JAN 2016	-163	0	0	0	203
22 JAN 2016	-71	0	0	0	377
21 JAN 2016	-90	0	0	0	410
20 JAN 2016	-53	0	0	0	416
19 JAN 2016	13	0	0	0	385
18 JAN 2016	-109	0	0	0	330
17 JAN 2016	-137	0	0	0	336
16 JAN 2016	-127	0	0	0	285
15 JAN 2016	-87	0	0	0	118
14 JAN 2016	-3	0	0	0	394
13 JAN 2016	-50	0	0	0	448
12 JAN 2016	-74	0	0	0	442
11 JAN 2016	-89	0	0	0	392

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
24 JAN 2016	3	13	1455
23 JAN 2016	2	-158	1108
22 JAN 2016	4	-265	1118
21 JAN 2016	7	353	398
20 JAN 2016	5	-60	595
19 JAN 2016	2	59	708
18 JAN 2016	3	-47	719
17 JAN 2016	2	-352	1296
16 JAN 2016	2	-291	864
15 JAN 2016	4	-337	681
14 JAN 2016	1	75	1065
13 JAN 2016	1	94	42
12 JAN 2016	1	52	41
11 JAN 2016	2	6	183

*** 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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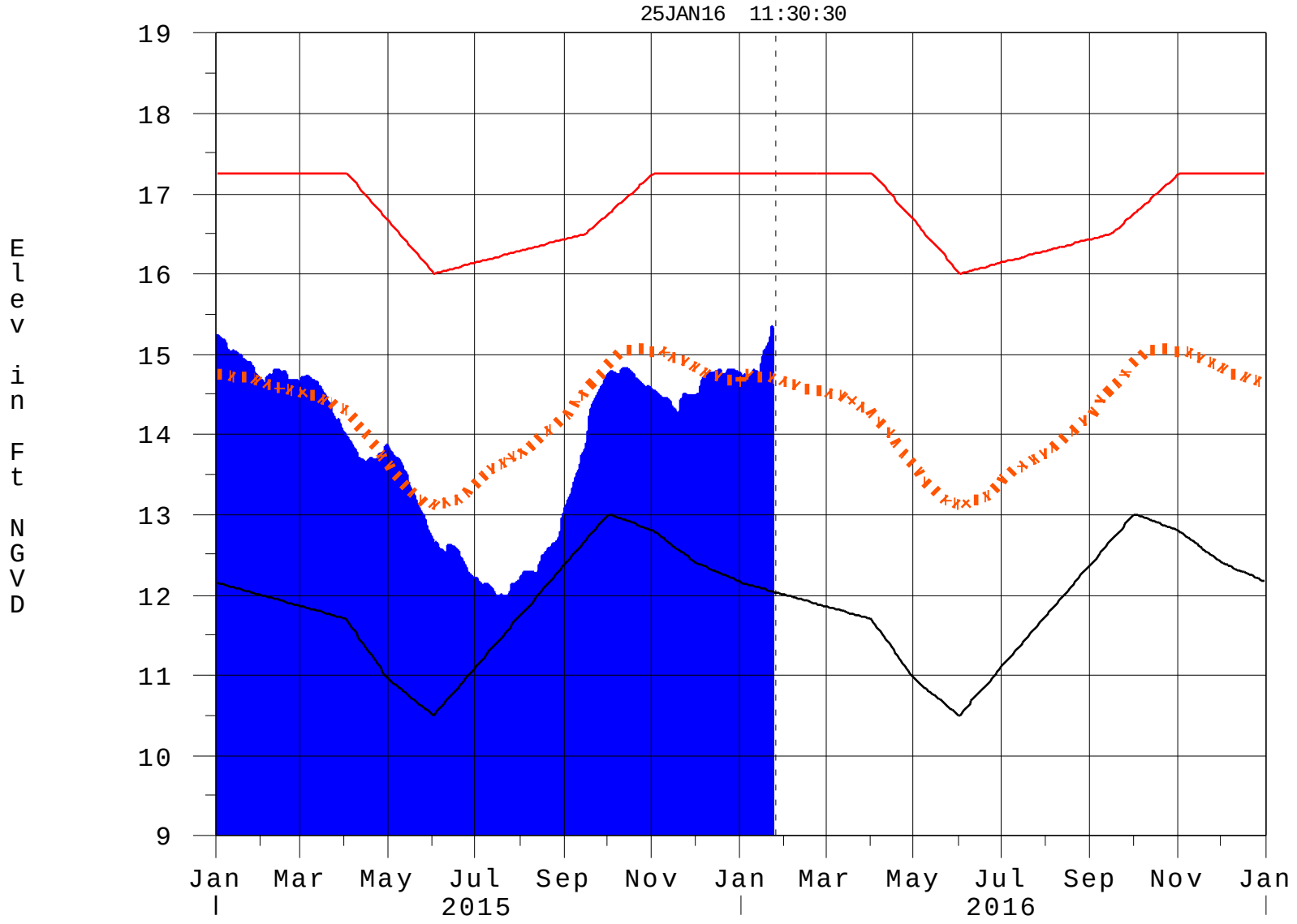
Report Generated 25JAN2016 @ 11:15 ** Preliminary Data - Subject to Revision **

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