

Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 9/21/2015 (Developing El Nino Condition)

Lake Okeechobee Net Inflow Outlook:

The Lake Okeechobee Net Inflow Outlook has been computed using 4 methods: Croley's method¹, the SFWMD empirical method², a sub-sampling of El Nino years³ and a sub-sampling of cold years of the Atlantic Multi-decadal Oscillation (AMO) in combination with ENSO El Nino years⁴. 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 (Sep-Feb)	N/A	N/A	2.65	Very Wet	3.18	Very Wet	2.62	Very Wet
Multi Seasonal (Nov-Oct)	N/A	N/A	3.10	Wet	3.99	Wet	3.36	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:](#)

15968 cfs 14-day running average for Lake Okeechobee Net Inflow through 9/21/2015. According to the classification in [Tributary Hydrologic Conditions](#) table, this condition is Very Wet.

-0.67 for Palmer Index on 9/20/2015.

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 9/21/2015

Lake Okeechobee Stage: **14.37 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		16.58	
Operational Band	High sub-band	16.21	
	Intermediate sub-band	15.80	
	Low sub-band	14.17	← 14.37
Base Flow sub-band		12.85	
Beneficial Use sub-band		12.80	
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 1700 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 9/21/2015 (ENSO Neutral Condition):

Water Supply Department Technical Input

Water Supply Outlook:

District wide, Raindar rainfall 2.65 inches for the week ending 9/21/2015. Lake stage on 9/21/2015 is 14.37 ft, up 0.59 ft from last week.

The updated September 2015 SFWMM Dynamic Position Analysis [percentile graph](#) and [tracking chart](#) for Lake Okeechobee show that the lake stage is in the Base Flow 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

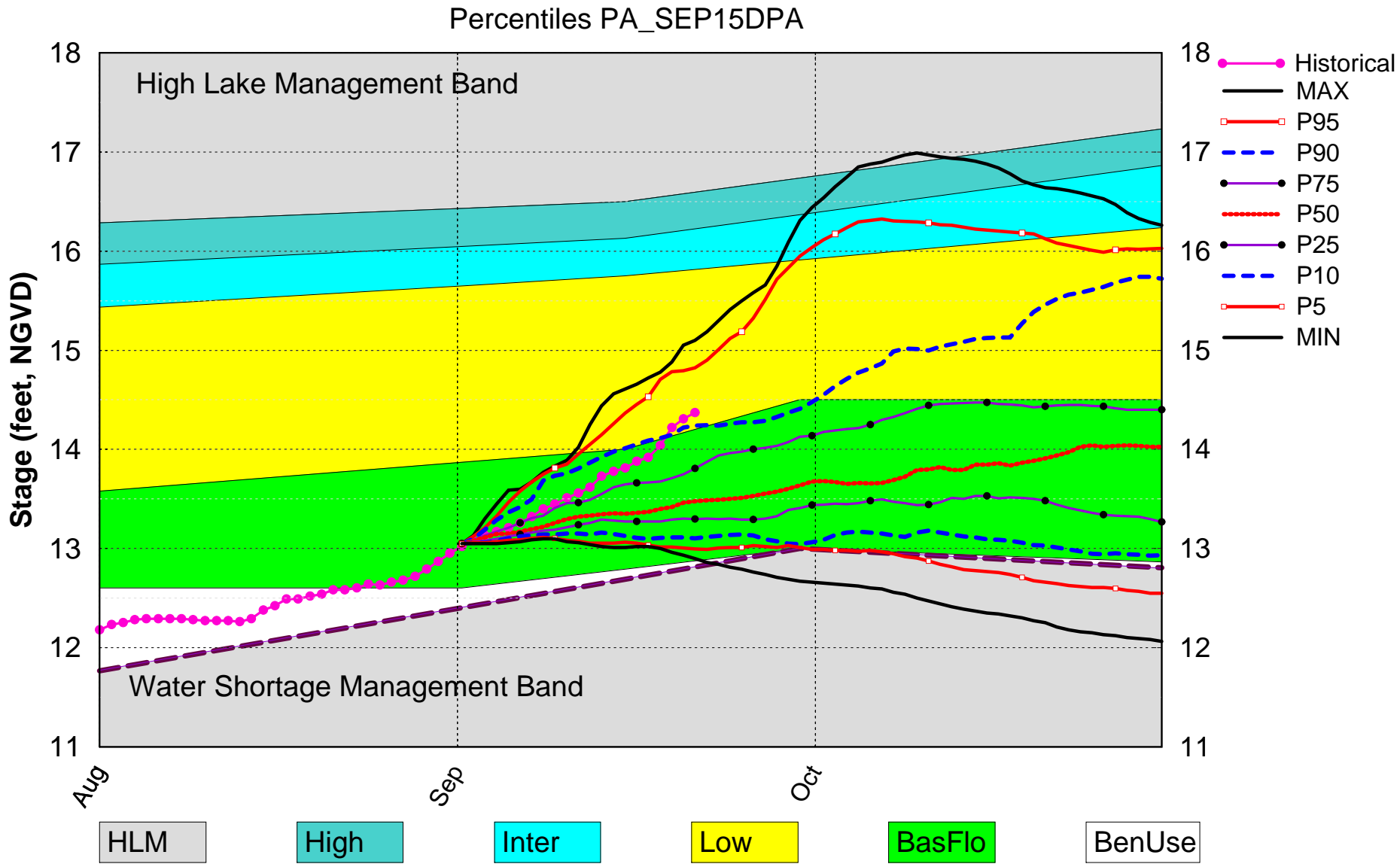
Area	Indicator	Value	Color Coded Scoring Scheme
LOK	Projected LOK Stage for the next two months	Base Flow Sub-Band	M
	Palmer Index for LOK Tributary Conditions	-0.67 (Normal)	L
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Above Normal	L
	LOK Seasonal Net Inflow Forecast	3.18 ft (Normal to Extremely Wet)	L
	AMO warm/EI Nino		
	LOK Multi-Seasonal Net Inflow Forecast	3.99 ft (Wet)	L
AMO warm/EI Nino			
WCAs	WCA 1: Site 1-8C	(16.56 ft)	L
	WCA 2A: Site 2-17 HW	(12.90 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	(9.77 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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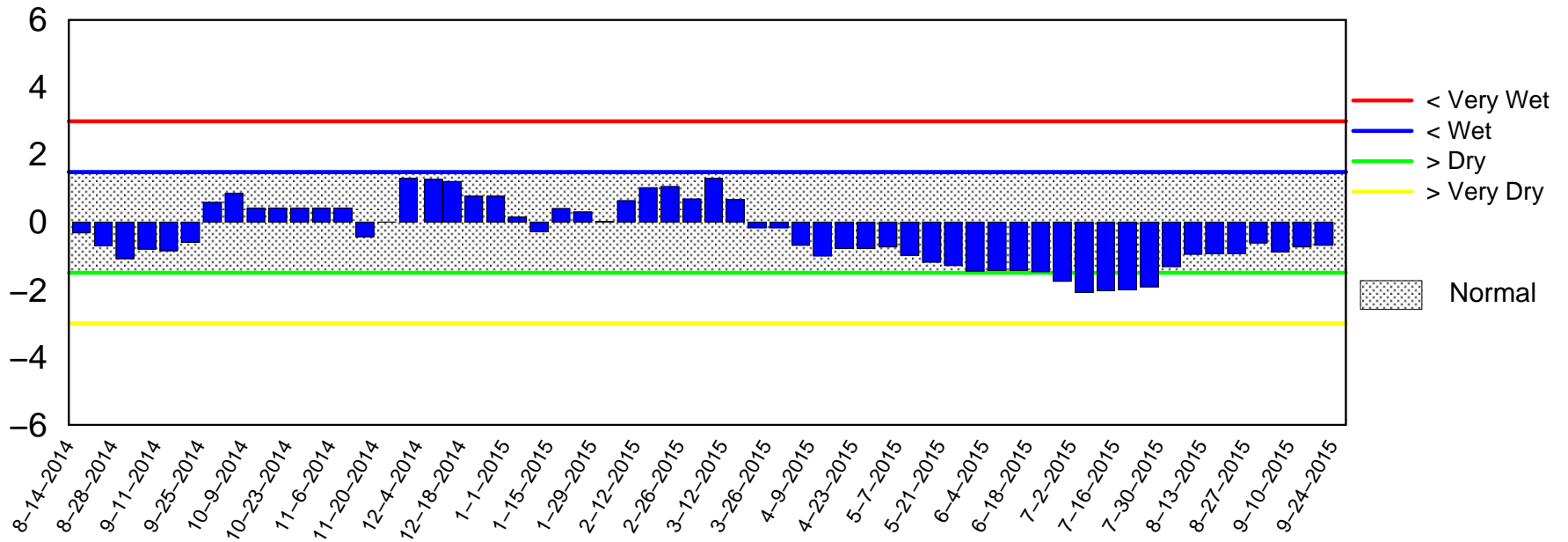
Lake Okeechobee SFWMM September 2015 Dynamic Position Analysis



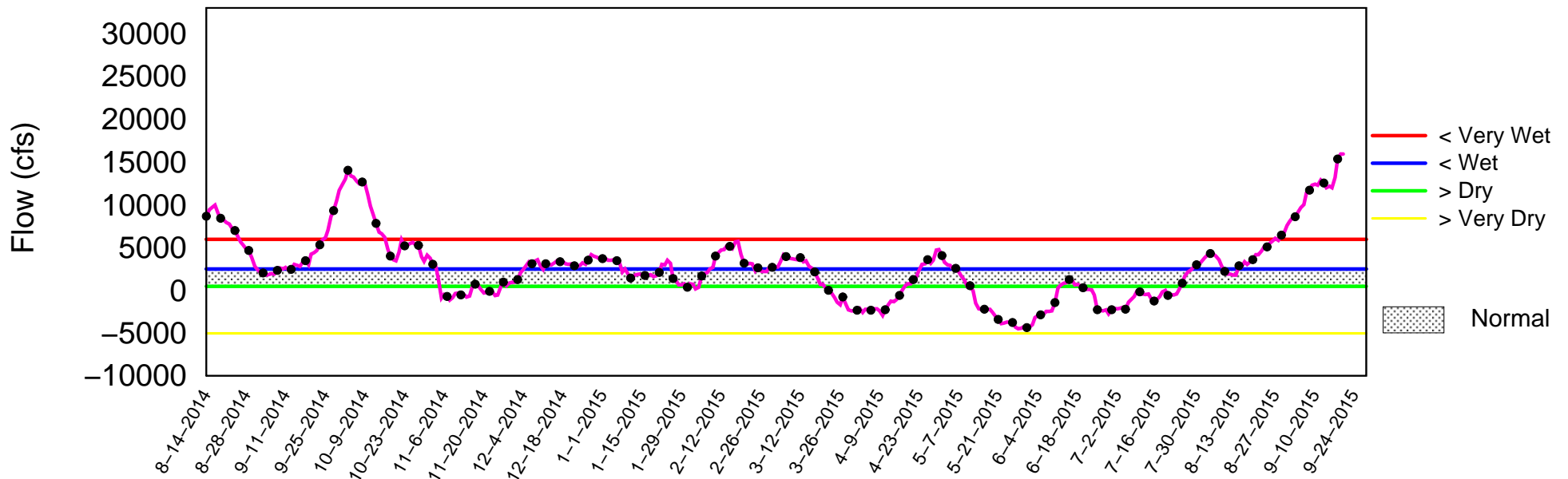
(See assumptions on the Position Analysis Results website)

Tributary Basin Condition Indicators as of September 21 2015

Palmer Index



Lake Okeechobee Net Inflow (LONIN) 14-day Running Average



Mon Sep 21 17:45:37 2015

2008 LORS

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

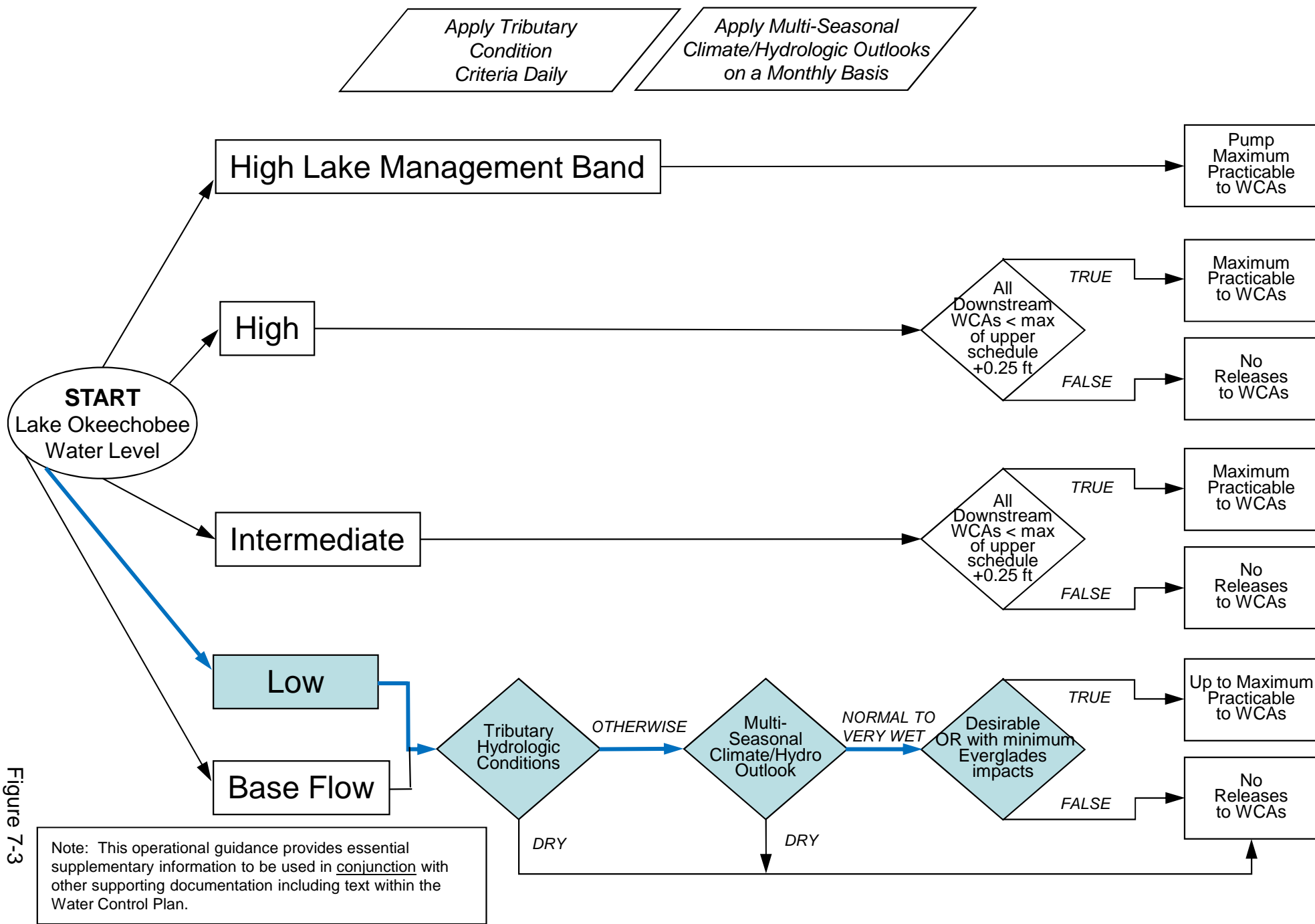


Figure 7-3

2008 LORS FORECAST

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

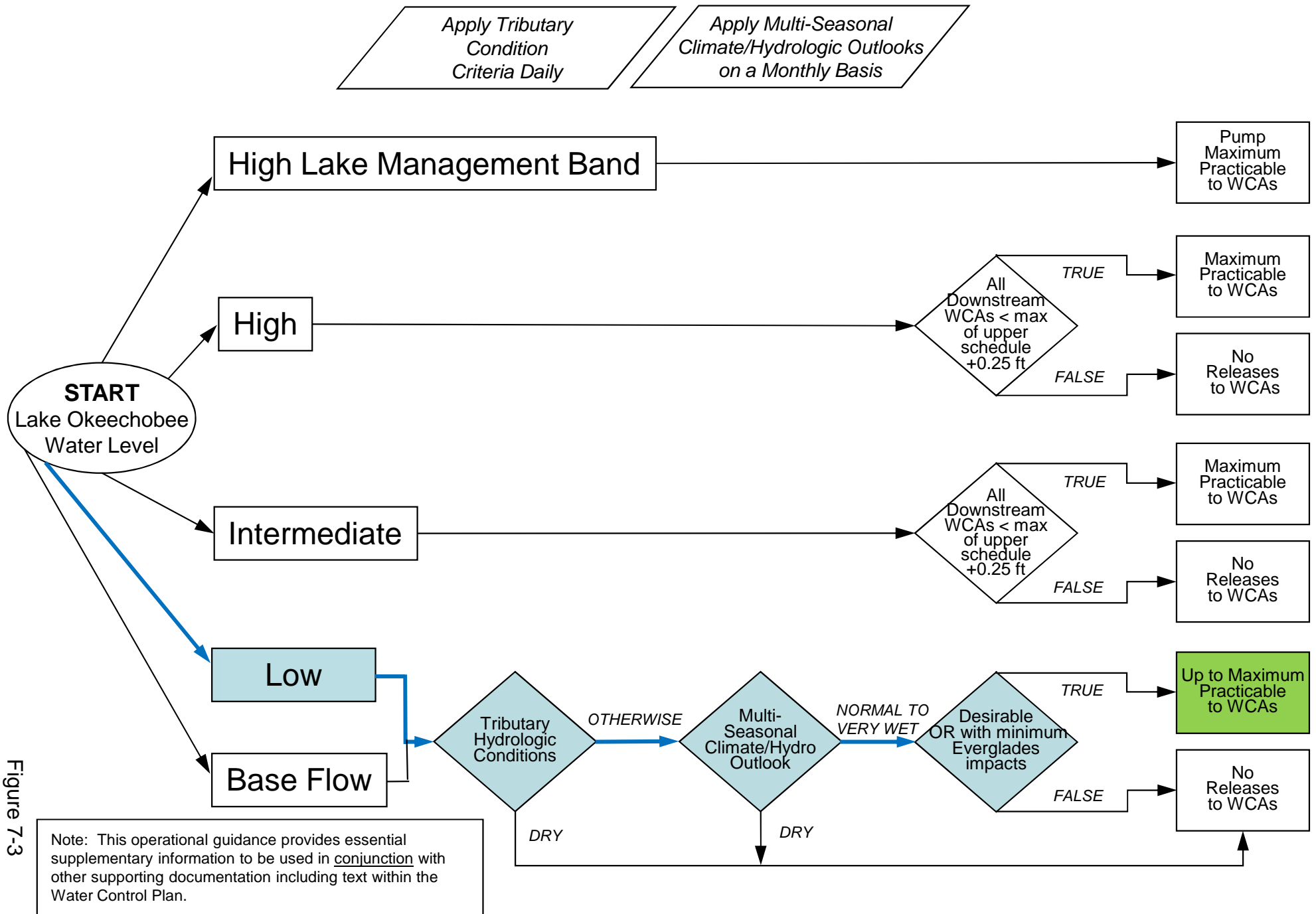


Figure 7-3

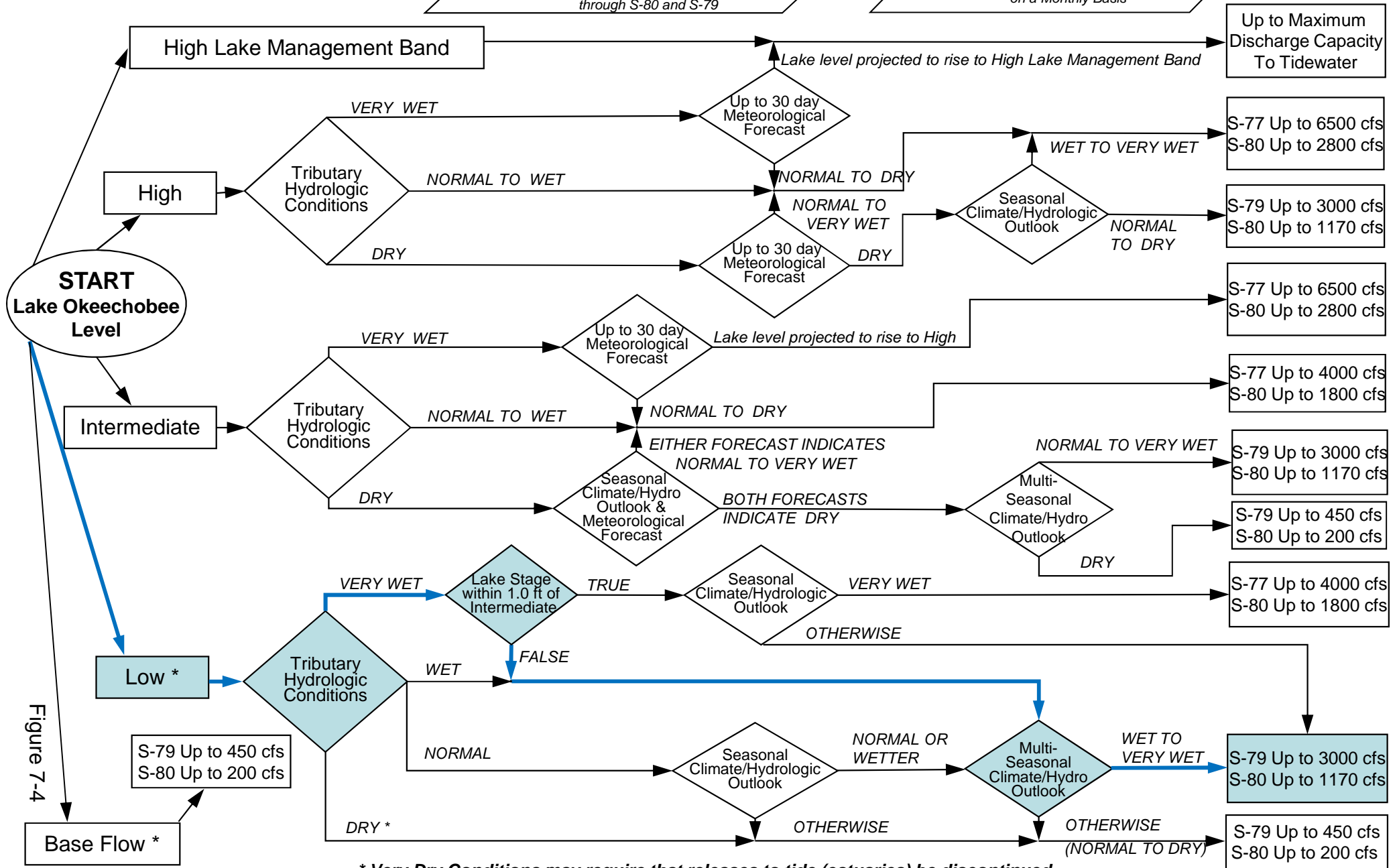
2008 LORS

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

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

When conducting Base Flow releases, flows can be distributed East and West up to 650 cfs as needed to minimize impacts or provide benefits through S-80 and S-79

Apply Meteorological Forecasts on a Weekly Basis; apply Seasonal and Multi-Seasonal Climate/Hydrologic Outlooks on a Monthly Basis



* Very Dry Conditions may require that releases to tide (estuaries) be discontinued

Figure 7-4

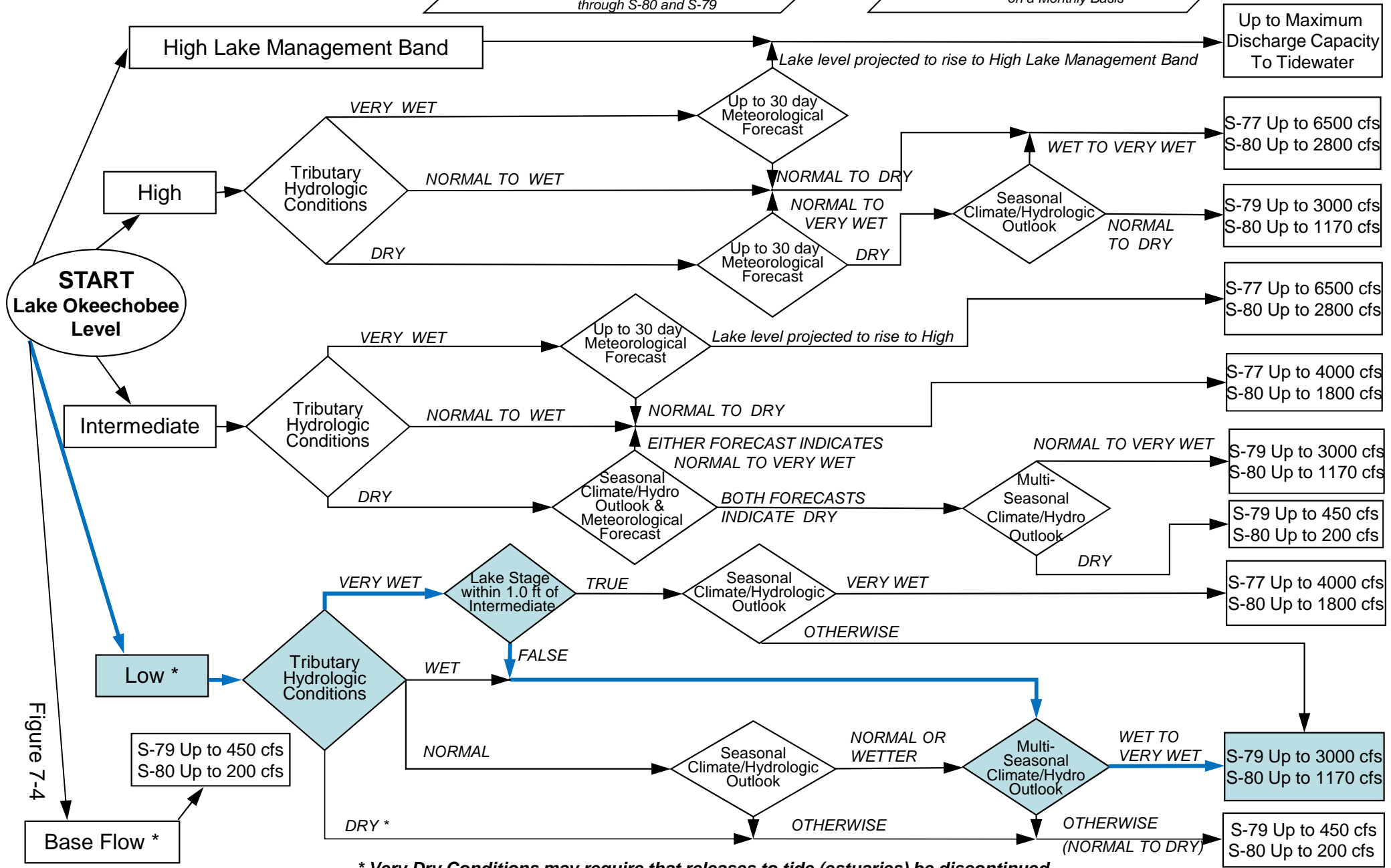
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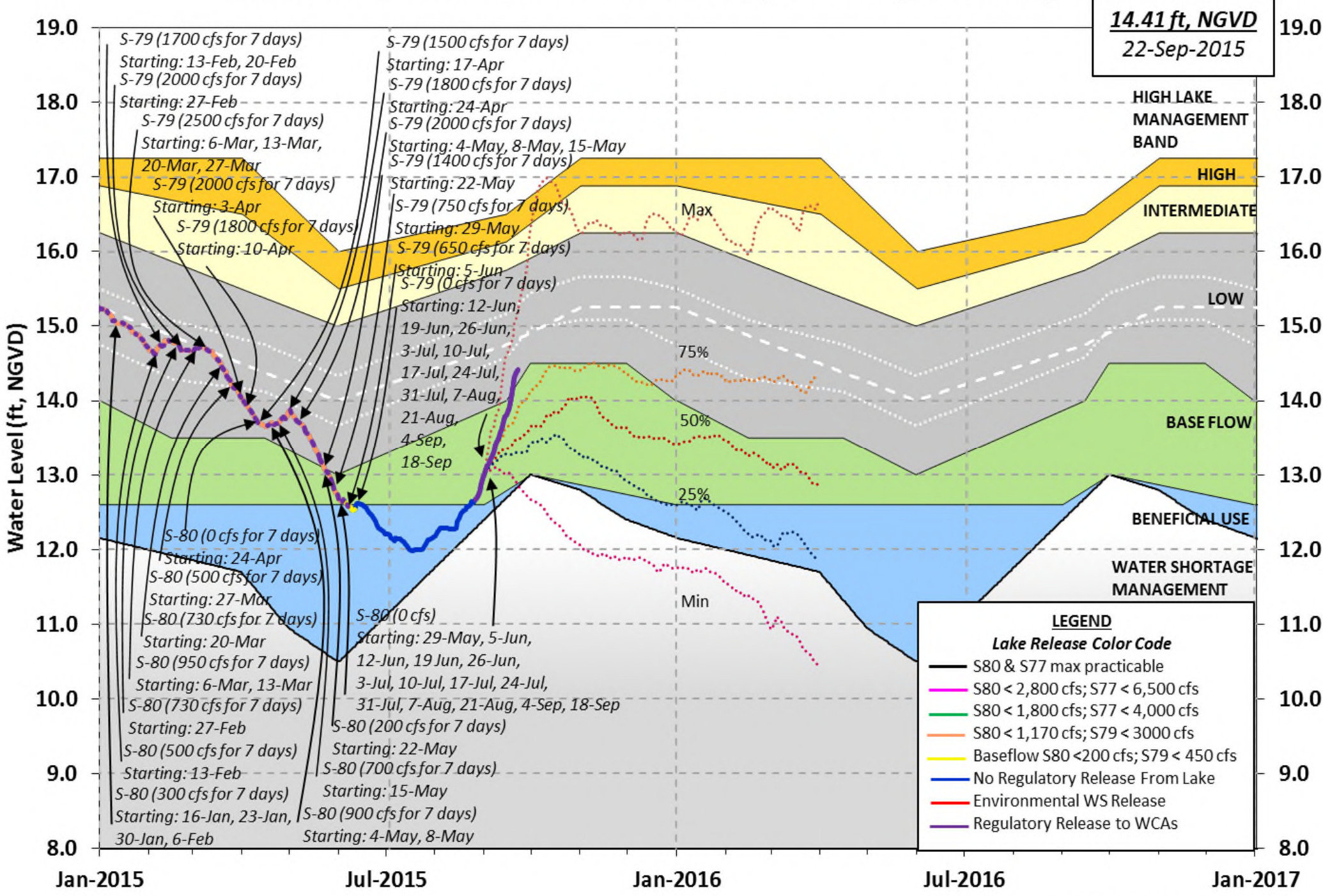
Apply Meteorological Forecasts on a Weekly Basis; apply Seasonal and Multi-Seasonal Climate/Hydrologic Outlooks on a Monthly Basis



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Figure 7-4

Lake Okeechobee Water Level History and Projected Stages



LORS-2008

Projected Stage Percentiles From
SFWMD-HESM Position Analysis

Adopted by USACE 28-April-2008

U. S. Army Corps of Engineers, Jacksonville District
 Lake Okeechobee and Vicinity Report
 ** Preliminary Data - Subject to Revision **

Data Ending 2400 hours 20 SEP 2015

Okeechobee Lake Regulation	Elevation	Last Year	2YRS Ago
	(ft-NGVD)	(ft-NGVD)	(ft-NGVD)
*Okeechobee Lake Elevation	14.37	14.70	15.72 (Official Elv)
Bottom of High Lake Mngmt=	16.58	Top of Water Short Mngmt=	12.79
Currently in Operational Management Band			

Simulated Average LORS2008 [1965-2000] 13.60
 Difference from Average LORS2008 0.77

20SEP (1965-2007) Period of Record Average 14.65
 Difference from POR Average -0.28

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷
 8.31'
 ++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷
 6.51'
 Bridge Clearance = 49.42'

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.21	14.46	14.46	14.34	14.47	14.53	14.26	14.23

*Combination Okeechobee Avg-Daily Lake Average = 14.37
 (*See Note)

Okeechobee Inflows (cfs):

S65E	6725	C5	0	Fisheating Cr	3328
S154	142	S191	666	S135 Pumps	256
S84	1693	S133 Pumps	182	S2 Pumps	0
S84X	804	S127 Pumps	101	S3 Pumps	0
S71	732	S129 Pumps	44	S4 Pumps	537
S72	293	S131 Pumps	34		
Total Inflows: 15537					

Okeechobee Outflows (cfs):

S135 Culverts (Used)	-NR-	S354	0	S77	3
S127 Culverts USED)	0	S351	0	S77Below	-86 (NOT

C5:	14.21	14.49	0	0.0	0.0	0.0			
South Shore									
S4 Pumps:	10.23	14.53	537	0	0	537			(cfs)
S169:	14.56	10.24	0	0.0	0.0	0.0			
S310:	14.50		-78						
S3 Pumps:	9.64	14.53	0	0	0	0			(cfs)
S354:	14.53	9.64	0	0.0	0.0				
S2 Pumps:	9.63	14.43	0	0	0	0	0		(cfs)
S351:	14.43	9.63	0	0.0	0.0	0.0			
S352:	14.55	10.80	0	0.0	0.0				
C10A:	-NR-	14.52		0.0	8.5	8.5	8.5	8.5	
L8 Canal PT		14.31	132						
<hr/>									
S351 and S352 Temporary Pumps/S354 Spillway									
S351:	9.63	14.43	0	-NR-	-NR-	-NR-	-NR-	-NR-	-NR-
S352:	10.80	14.55	0	-NR-	-NR-	-NR-	-NR-		
S354:	9.64	14.53	0	-NR-	-NR-	-NR-	-NR-		
<hr/>									
Caloosahatchee River (S77, S78, S79)									
S47B:	13.29	11.00		0.0	0.5				
S47D:	10.78	10.79	5	5.0					
S77:	Spillway and Sector Flow:								
	14.35	10.82	0	0.0	0.0	0.0	0.0		
	Flow Due to Lockages+:		3						
S77 Below USGS Flow Gage			-86						
S78:	Spillway and Sector Flow:								
	10.61	2.80	1516	1.0	1.0	1.0	1.0		
	Flow Due to Lockages+:		14						
S79:	Spillway and Sector Flow:								
	2.97	1.79	5368	2.0	2.0	3.0	3.0	2.0	2.0
2.0	Flow Due to Lockages+:		0						
	Percent of flow from S77		0%						
	Chloride (ppm)		48						
St. Lucie Canal (S308, S80)									
S308:	Spillway and Sector Flow:								
	14.26	14.08	0	0.0	0.0	0.0	0.0		
	Flow Due to Lockages+:		0						
S308 Below USGS Flow Gage			36						
S153:	18.71	13.94	302	1.0	0.5				
S80:	Spillway and Sector Flow:								
	14.15	1.51	1510	0.2	0.2	0.5	0.2	0.5	0.2

Flow Due to Lockages+: 23
 Percent of flow from S308 0%

Steele Point Top Salinity (mg/ml) 4584
 Steele Point Bottom Salinity (mg/ml) ****

Speedy Point Top Salinity (mg/ml) 713
 Speedy Point Bottom Salinity (mg/ml) 751

+ 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.

	1-Day	3-Day	7-Day	----- Wind ---	
Daily Precipitation Totals				Direction	
Speed	(inches)	(inches)	(inches)	(Degø)	
(mph)					
S133 Pump Station:	-NR-	0.00	3.95		
S193:	-NR-	0.00	0.00	-NR-	-NR-
Okeechobee Field Station:	-NR-	0.00	0.00		
S135 Pump Station:	-NR-	0.02	4.34		
S127 Pump Station:	-NR-	0.01	3.44		
S129 Pump Station:	-NR-	0.04	1.52		
S131 Pump Station:	-NR-	0.31	1.75		
S77:	0.00	0.01	2.45	92	1
S78:	0.00	0.01	36.80	93	1
S79:	0.00	0.00	1.07	171	0
S4 Pump Station:	-NR-	0.00	0.00		
Clewiston Field Station:	-NR-	0.00	0.00		
S3 Pump Station:	-NR-	0.11	4.15		
S2 Pump Station:	-NR-	1.37	4.00		
S308:	0.00	0.32	5.73	333	2
S80:	0.00	0.45	4.85	342	3
Okeechobee Average	0.00	0.17	2.41		
(Sites S78, S79 and S80 not included)					

Oke Nexrad Basin Avg	-NR-	0.00	1.19		

Okeechobee Lake Elevations	20 SEP 2015	14.37	Difference from
20SEP15			
20SEP15 -1 Day =	19 SEP 2015	14.31	-0.06
20SEP15 -2 Days =	18 SEP 2015	14.22	-0.15
20SEP15 -3 Days =	17 SEP 2015	14.04	-0.33
20SEP15 -4 Days =	16 SEP 2015	13.92	-0.45
20SEP15 -5 Days =	15 SEP 2015	13.88	-0.49
20SEP15 -6 Days =	14 SEP 2015	13.81	-0.56
20SEP15 -7 Days =	13 SEP 2015	13.78	-0.59
20SEP15 -30 Days =	21 AUG 2015	12.58	-1.79
20SEP15 -1 Year =	20 SEP 2014	14.70	0.33
20SEP15 -2 Year =	20 SEP 2013	15.72	1.35

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
20SEP15	Today =	20 SEP 2015	16228	MON	12837
20SEP15	-1 Day =	19 SEP 2015	16226	SUN	19130
20SEP15	-2 Days =	18 SEP 2015	15575	SAT	38619
20SEP15	-3 Days =	17 SEP 2015	13264	FRI	25508
20SEP15	-4 Days =	16 SEP 2015	11964	THU	8619
20SEP15	-5 Days =	15 SEP 2015	12117	WED	14991
20SEP15	-6 Days =	14 SEP 2015	11942	TUE	6516
20SEP15	-7 Days =	13 SEP 2015	12523	MON	10802
20SEP15	-8 Days =	12 SEP 2015	12890	SUN	23472
20SEP15	-9 Days =	11 SEP 2015	12268	SAT	-NR-
20SEP15	-10 Days =	10 SEP 2015	12375	FRI	10588
20SEP15	-11 Days =	09 SEP 2015	12177	THU	12494
20SEP15	-12 Days =	08 SEP 2015	11565	WED	10394
20SEP15	-13 Days =	07 SEP 2015	11240	TUE	16993

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
20SEP15	Today=	20 SEP 2015	6379	MON	6725
20SEP15	-1 Day =	19 SEP 2015	6342	SUN	6746
20SEP15	-2 Days =	18 SEP 2015	6294	SAT	6504
20SEP15	-3 Days =	17 SEP 2015	6272	FRI	6344
20SEP15	-4 Days =	16 SEP 2015	6239	THU	6259
20SEP15	-5 Days =	15 SEP 2015	6178	WED	6241
20SEP15	-6 Days =	14 SEP 2015	6085	TUE	5809
20SEP15	-7 Days =	13 SEP 2015	5996	MON	-NR-
20SEP15	-8 Days =	12 SEP 2015	5890	SUN	6030
20SEP15	-9 Days =	11 SEP 2015	5798	SAT	5968
20SEP15	-10 Days =	10 SEP 2015	5697	FRI	6356
20SEP15	-11 Days =	09 SEP 2015	5513	THU	6442
20SEP15	-12 Days =	08 SEP 2015	5313	WED	6778
20SEP15	-13 Days =	07 SEP 2015	5042	TUE	6720

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)
20 SEP 2015	0	6	-170	1722	3035	10645
19 SEP 2015	0	7	-125	2348	4180	11500
18 SEP 2015	0	2	-92	3321	4490	14283
17 SEP 2015	0	2	-100	931	1435	9099
16 SEP 2015	0	3	-104	439	655	8249
15 SEP 2015	0	2	-111	551	920	7294
14 SEP 2015	0	2	-230	556	864	4993
13 SEP 2015	0	4	-172	378	671	4960

12 SEP 2015	0	4	61	379	645	3552
11 SEP 2015	0	1	15	288	627	4322
10 SEP 2015	0	3	-95	290	651	3205
09 SEP 2015	0	5	-129	289	642	4732
08 SEP 2015	0	1	-69	217	450	4149
07 SEP 2015	0	3	45	226	646	4710

	S-310	S-351	S-352	S-354	L8 Canal Pt
	Discharge	Discharge	Discharge	Discharge	Discharge
	(ALL DAY)	(ALL DAY)	(ALL DAY)	(ALL DAY)	(ALL DAY)
DATE	(AC-FT)	(AC-FT)	(AC-FT)	(AC-FT)	(AC-FT)
20 SEP 2015	-155	0	0	0	262
19 SEP 2015	-331	0	0	0	143
18 SEP 2015	-410	0	0	0	-59
17 SEP 2015	-100	0	0	0	194
16 SEP 2015	-8	0	0	0	295
15 SEP 2015	-92	0	0	0	335
14 SEP 2015	-100	0	0	0	324
13 SEP 2015	19	0	0	0	426
12 SEP 2015	24	0	0	0	356
11 SEP 2015	7	0	0	-NR-	-53
10 SEP 2015	-12	0	0	0	-127
09 SEP 2015	-75	0	0	0	82
08 SEP 2015	-15	0	0	0	116
07 SEP 2015	6	0	0	0	105

	S-308	Below S-308	S-80
	Discharge	Discharge	Discharge
	(ALL DAY)	(ALL-DAY)	(ALL-DAY)
DATE	(AC-FT)	(AC-FT)	(AC-FT)
20 SEP 2015	0	71	3040
19 SEP 2015	-2	-161	4196
18 SEP 2015	-1	69	6942
17 SEP 2015	-1	111	3158
16 SEP 2015	-1	119	1395
15 SEP 2015	-0	135	813
14 SEP 2015	0	216	696
13 SEP 2015	-2	-133	1154
12 SEP 2015	-2	-125	1747
11 SEP 2015	0	56	146
10 SEP 2015	-1	-99	547
09 SEP 2015	-2	-116	931
08 SEP 2015	-1	-68	1443
07 SEP 2015	-3	-122	795

*** NOTE: 1) Discharge from (0700-2100) is computed using Spillway and Sector

Gate Discharges from 0700 hrs to 2100 hrs.

and 2) Discharge (ALL DAY) is computed using Spillway, Sector Gate

and Lockages Discharges from 0015 hrs to 2400 hrs.

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(I) - Flows preceded by "I" signify an instantaneous flow computed from the single value reported for the day

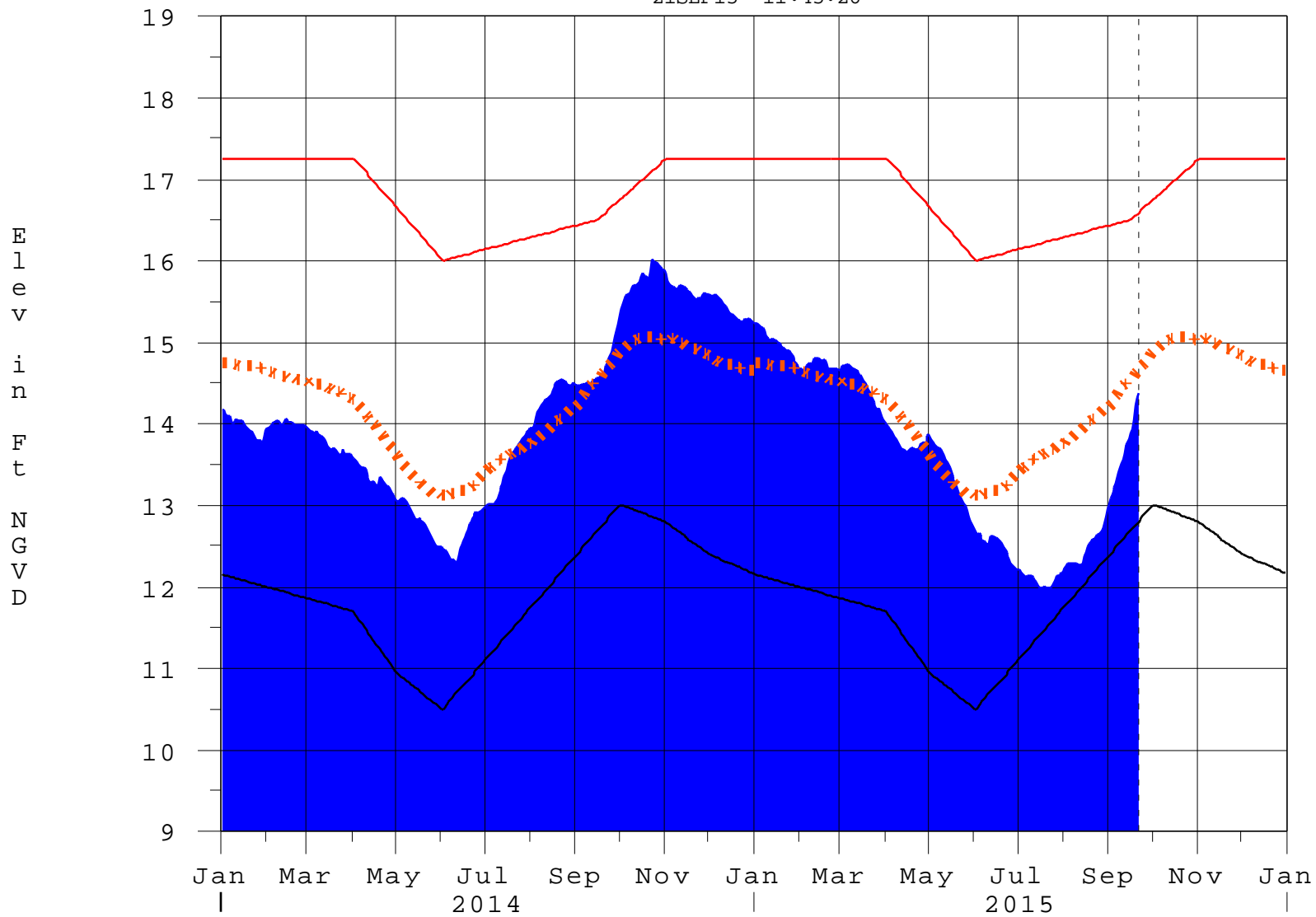
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* On 11 May 1999, Lake Okeechobee Elevation was switched from Instantaneous 2400 value to an average-daily lake average.
On 14 Mar 2001, due to the isolation of various gages within the standard
10 stations, the average of the interior 4 station gages 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 21SEP2015 @ 11:39 ** Preliminary Data - Subject to Revision
**

Lake Okeechobee

21SEP15 11:45:26



- 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 \geq 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