Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 7/16/2018 (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 La Nina 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 ENSO Years[3]		Sub-sampling of AMO Warm + ENSO Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Jul-Dec)	N/A	N/A	2.64	Very Wet	3.30	Very Wet	2.20	Very Wet
Multi Seasonal (Jul-Apr)	N/A	N/A	3.09	Wet	4.06	Wet	1.86	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.

**Sub-sampling is a weighted average of ENSO conditions based on the ENSO forecast used.

Tributary Hydrologic Conditions Graph:

5403 cfs 14-day running average for Lake Okeechobee Net Inflow through 7/15/2018.
According to the classification in Tributary Hydrologic Conditions table, this condition is Wet.

1.31 for Palmer Index on 7/14/2018.
According to the classification in Tributary Hydrologic Conditions table, this condition is Normal.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 7/15/2018

Lake Okeechobee Stage: **14.47 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		16.21	
Operational Band	High sub-band	15.76	
	Intermediate sub-band	15.32	
	Low sub-band	13.42	← 14.47
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.41	
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 3000 cfs & S-80 Up to 1170 cfs.

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LORS2008 Implementation on 7/16/2018 (ENSO Neutral Condition):

Status for week ending 7/16/2018:

District wide, Raindar rainfall was 1.92 inches for the week. Lake stage on 7/15/2018 was 14.47 ft, NGVD, up 0.03 ft from last week.

The updated July 2018 SFWMM Dynamic Position Analysis percentile graph for Lake Okeechobee show that the current lake stage is in the Low Flow Sub-Band.

The 2008 LORS Tributary Hydrologic Condition (THC) is classified as **Wet**. The PDSI indicates normal conditions and the LONIN is wet. The THC classification is based on the wetter of the two indices .

Water Supply Risk Evaluation

Area	Indicator	Value	Color Coded Scoring Scheme
LOK	Projected LOK Stage for the next two months	Low Flow Sub Band	L
	Palmer Index for LOK Tributary Conditions	1.31 (Normal to Extremely Wet)	L
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Outlook	3.30 ft (Normal to Extremely Wet)	L
	ENSO Years		
	LOK Multi-Seasonal Net Inflow Outlook	4.06 ft (Wet)	L
	ENSO Conditions		
WCAs	WCA 1: Station Average (Site 1-7, Site 1-8T, Site 1-9)	Above Line 1 (16.32 ft)	L
	WCA 2A: Site 2-17	Above Line 1 (13.29 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.69 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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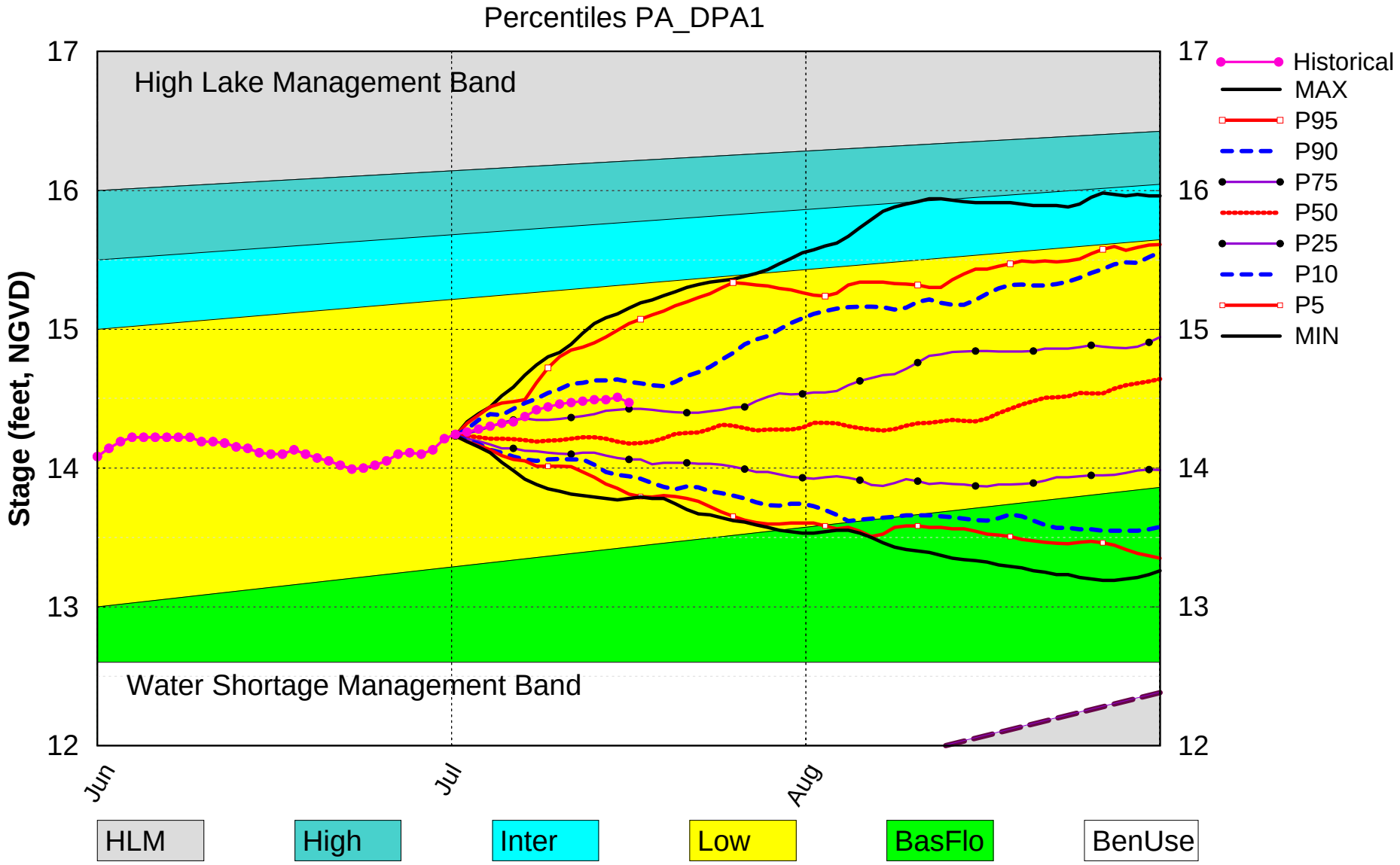
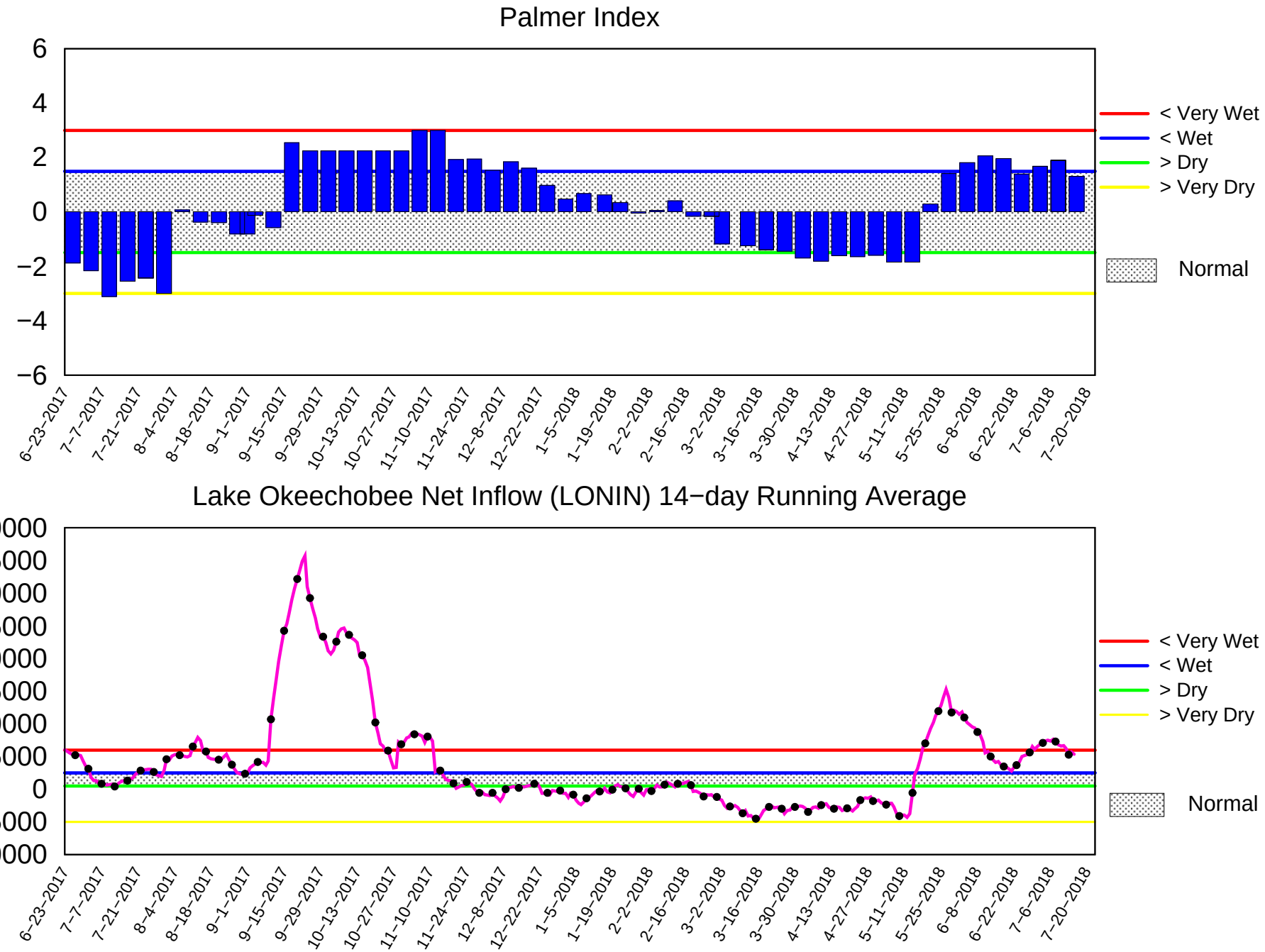
Lake Okeechobee SFWMM July 2018 Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Jul 16 13:03:48 EDT 2018

Tributary Basin Condition Indicators as of July 16 2018



Mon Jul 16 13:03:03 EDT 2018

2008 LORS

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

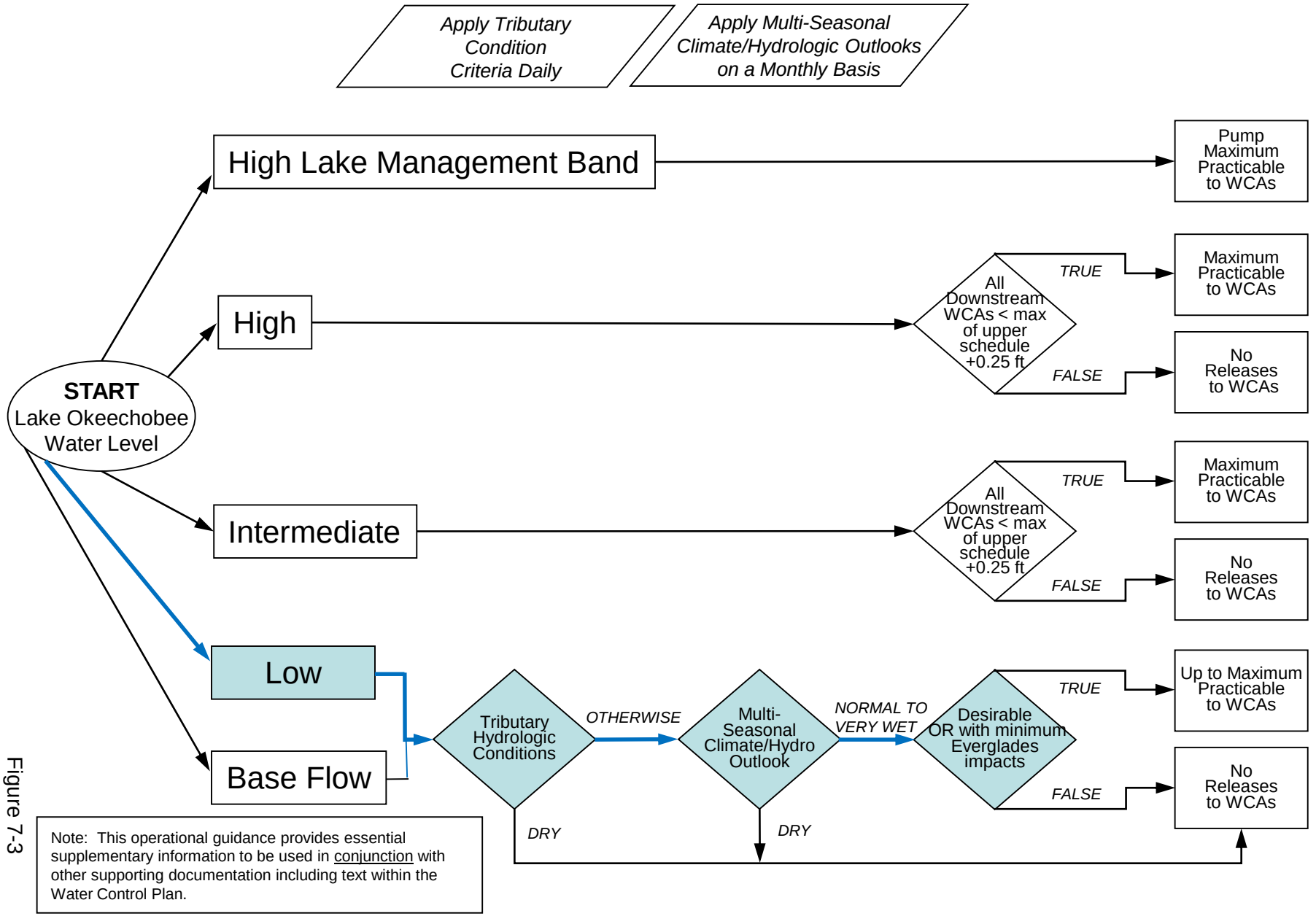


Figure 7-3

2008 LORS

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

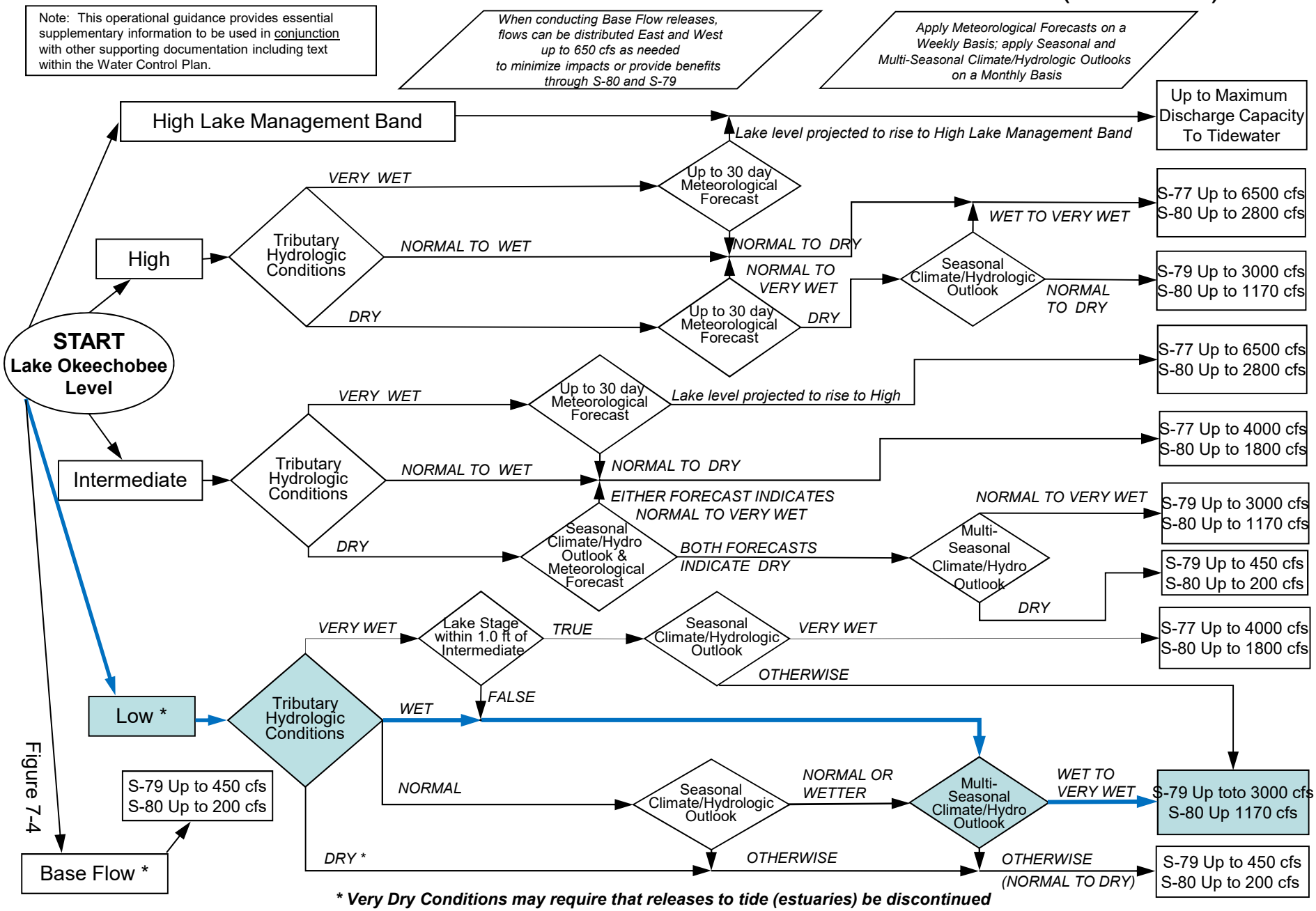
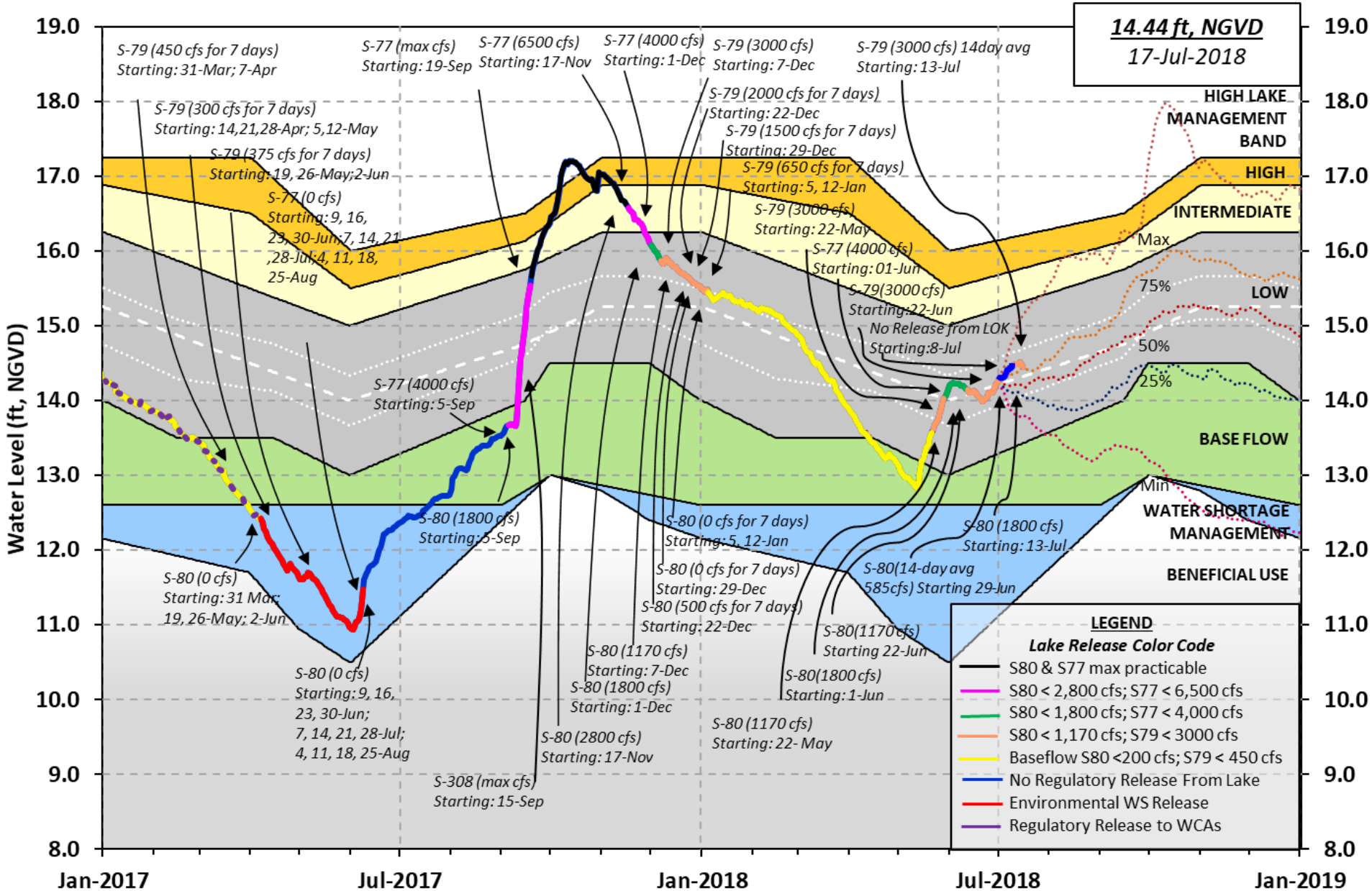


Figure 7-4

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 15 JUL 2018

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	14.47	12.54	14.72 (Official Elv)

Bottom of High Lake Mngmt= 16.21 Top of Water Short Mngmt= 11.41
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.48
Difference from Average LORS2008 1.99

15JUL (1965-2007) Period of Record Average 13.59
Difference from POR Average 0.88

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.41'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.61'
Bridge Clearance = 49.32'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.52	14.55	14.50	14.42	14.38	14.61	14.38	14.44

*Combination Okeechobee Avg-Daily Lake Average = 14.47 (*See Note)

Okeechobee Inflows (cfs):

S65E	0	S65EX1	2951	Fisheating Cr	500
S154	30	S191	0	S135 Pumps	0
S84	0	S133 Pumps	0	S2 Pumps	0
S84X	487	S127 Pumps	0	S3 Pumps	0
S71	906	S129 Pumps	0	S4 Pumps	0
S72	119	S131 Pumps	0	C5	0

Total Inflows: 4993

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	1974	S77	4234
S127 Culverts	0	S351	463	S308	1867
S129 Culverts	0	S352	0		
S131 Culverts	0	L8 Canal Pt	2		

Total Outflows: 8541

****S77 structure flow is being used to compute Total Outflow.
****S308 structure flow is being used to compute Total Outflow.

Okeechobee Pan Evaporation (inches):
  S77 0.25 S308 0.26
  Average Pan Evap x 0.75 Pan Coefficient = 0.19" = 0.02'

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

Evaporation - Precipitation: = 0.19" = 0.02'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to 3754 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is -8621 cfs or -17100 AC-FT

	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:	13.41	14.48	0	0	0	0	0	0	(cfs)		
S193:											
S191:	18.94	14.46	0	0.0	0.0	0.0					
S135 Pumps:	13.36	14.34	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	21.10	14.32	0	0.0	0.0	0.0	0.0	-0.0	0.0		
S65EX1:	21.10	14.32	2951								
S127 Pumps:	13.46	14.50	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.87	14.51	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.83	14.49	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek nr Palmdale		32.39	500								
nr Lakeport C5:	-NR-	-NR-	0	-NR-	-NR-	-NR-					
South Shore											
S4 Pumps:	11.57	14.33	0	0	0	0			(cfs)		
S169:	14.45	11.57	0	0.0	0.0	0.0					
S310:	14.37		45								

S3 Pumps:	10.23	14.40	0	0	0	0				(cfs)
S354:	14.40	10.23	1974	3.2	3.5					
S2 Pumps:	10.12	14.38	0	0	0	0	0			(cfs)
S351:	14.38	10.12	463	0.6	0.6	0.6				
S352:	14.55	10.05	0	0.0	0.0					
C10A:	-NR-	12.87		8.0	8.0	8.0	0.0	0.0		
L8 Canal PT		12.71	2							

S351 and S352 Temporary Pumps/S354 Spillway

S351:	10.12	14.38	463	-NR--NR--NR--NR--NR--NR-
S352:	10.05	14.55	0	-NR--NR--NR--NR-
S354:	10.23	14.40	1974	-NR--NR--NR--NR-

Caloosahatchee River (S77, S78, S79)

S47B:	13.10	12.08		0.0	0.5						
S47D:	11.27	11.28	-14	6.5							
S77:											
Spillway and Sector Flow:											
	13.84	11.28	******	5.0	5.0	5.0	5.0				
Flow Due to Lockages+:			2								
S77 Below USGS Flow Gage			4726								
S78:											
Spillway and Sector Flow:											
	10.86	-NR-	-NR-	4.0	4.0	4.5	4.0				
Flow Due to Lockages+:			-NR-								
S79:											
Spillway and Sector Flow:											
	3.32	1.64	7892	4.0	4.0	5.0	5.0	4.0	3.0	3.0	1.0
Flow Due to Lockages+:			4								
Percent of flow from S77			54%								
Chloride		(ppm)	44								

St. Lucie Canal (S308, S80)

S308:											
Spillway and Sector Flow:											
	14.34	14.18	******	5.5	5.5	5.5	5.5				
Flow Due to Lockages+:			0								
S308 Below USGS Flow Gage			1918								
S153:	19.08	13.98	24	0.0	0.0						
S80:											
Spillway and Sector Flow:											
	12.95	1.57	1712	0.5	2.5	0.0	0.0	2.5	0.0	1.0	
Flow Due to Lockages+:			12								
Percent of flow from S308			109%								

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)	Wind 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:	6.97	7.31	7.46	289	3
S78:	19.32	19.82	21.08	15	0
S79:	-25.35	-23.56	-23.42	333	0
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:	1.08	1.08	1.18	113	5
S80:	0.00	0.00	0.00	243	2
Okeechobee Average (Sites S78, S79 and S80 not included)	4.03	0.65	0.66		
Oke Nexrad Basin Avg	0.00	0.81	1.22		

Okeechobee Lake Elevations	15 JUL 2018	14.47	Difference from 15JUL18
15JUL18 -1 Day =	14 JUL 2018	14.51	0.04
15JUL18 -2 Days =	13 JUL 2018	14.49	0.02
15JUL18 -3 Days =	12 JUL 2018	14.49	0.02
15JUL18 -4 Days =	11 JUL 2018	14.48	0.01
15JUL18 -5 Days =	10 JUL 2018	14.47	0.00
15JUL18 -6 Days =	09 JUL 2018	14.46	-0.01
15JUL18 -7 Days =	08 JUL 2018	14.44	-0.03
15JUL18 -30 Days =	15 JUN 2018	14.10	-0.37
15JUL18 -1 Year =	15 JUL 2017	12.54	-1.93
15JUL18 -2 Year =	15 JUL 2016	14.72	0.25

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = 4.53

Lake Okeechobee Net Inflow (LONIN)

		Average Flow over the previous 14 days			Avg-Daily Flow
15JUL18	Today =	15 JUL 2018	5181	MON	-82
15JUL18	-1 Day =	14 JUL 2018	5515	SUN	12646
15JUL18	-2 Days =	13 JUL 2018	5086	SAT	4573
15JUL18	-3 Days =	12 JUL 2018	6064	FRI	3460
15JUL18	-4 Days =	11 JUL 2018	6455	THU	2812
15JUL18	-5 Days =	10 JUL 2018	6337	WED	2380
15JUL18	-6 Days =	09 JUL 2018	6586	TUE	4459
15JUL18	-7 Days =	08 JUL 2018	7136	MON	4336
15JUL18	-8 Days =	07 JUL 2018	7471	SUN	10688
15JUL18	-9 Days =	06 JUL 2018	7389	SAT	8470
15JUL18	-10 Days =	05 JUL 2018	7410	FRI	2740
15JUL18	-11 Days =	04 JUL 2018	7301	THU	5861
15JUL18	-12 Days =	03 JUL 2018	6983	WED	5300
15JUL18	-13 Days =	02 JUL 2018	6803	TUE	4885

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
15JUL18	Today=	15 JUL 2018	0	MON	0
15JUL18	-1 Day =	14 JUL 2018	0	SUN	0
15JUL18	-2 Days =	13 JUL 2018	0	SAT	0
15JUL18	-3 Days =	12 JUL 2018	0	FRI	0
15JUL18	-4 Days =	11 JUL 2018	0	THU	0
15JUL18	-5 Days =	10 JUL 2018	0	WED	0
15JUL18	-6 Days =	09 JUL 2018	0	TUE	2
15JUL18	-7 Days =	08 JUL 2018	0	MON	0
15JUL18	-8 Days =	07 JUL 2018	0	SUN	0
15JUL18	-9 Days =	06 JUL 2018	0	SAT	0
15JUL18	-10 Days =	05 JUL 2018	0	FRI	0
15JUL18	-11 Days =	04 JUL 2018	0	THU	0
15JUL18	-12 Days =	03 JUL 2018	0	WED	0
15JUL18	-13 Days =	02 JUL 2018	0	TUE	0

S65EX1

		Average Flow over previous 14 days			Avg-Daily Flow
15JUL18	Today=	15 JUL 2018	2197	MON	2951
15JUL18	-1 Day =	14 JUL 2018	2102	SUN	2795
15JUL18	-2 Days =	13 JUL 2018	2026	SAT	2548
15JUL18	-3 Days =	12 JUL 2018	1963	FRI	2115
15JUL18	-4 Days =	11 JUL 2018	1927	THU	2115
15JUL18	-5 Days =	10 JUL 2018	1909	WED	2124
15JUL18	-6 Days =	09 JUL 2018	1908	TUE	2120
15JUL18	-7 Days =	08 JUL 2018	1916	MON	2209
15JUL18	-8 Days =	07 JUL 2018	1917	SUN	2206
15JUL18	-9 Days =	06 JUL 2018	1931	SAT	2050
15JUL18	-10 Days =	05 JUL 2018	1963	FRI	2098
15JUL18	-11 Days =	04 JUL 2018	1982	THU	1895
15JUL18	-12 Days =	03 JUL 2018	2023	WED	1780
15JUL18	-13 Days =	02 JUL 2018	2056	TUE	1756

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)
15 JUL 2018	8398	9372	-NR-	15605
14 JUL 2018	8447	9226	10261	13932
13 JUL 2018	5584	5766	6911	12286
12 JUL 2018	1	157	295	3874
11 JUL 2018	9	240	1657	5232
10 JUL 2018	12	455	2401	7785
09 JUL 2018	7	667	2869	8528
08 JUL 2018	10	684	3112	12078
07 JUL 2018	18	737	2785	10263
06 JUL 2018	6	478	2389	11090
05 JUL 2018	357	488	2535	10096
04 JUL 2018	1189	1339	3058	6408
03 JUL 2018	1127	1538	3093	6715
02 JUL 2018	1116	1803	3102	6464

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)
15 JUL 2018	89	918	0	1281	5
14 JUL 2018	-15	1007	0	1342	-2
13 JUL 2018	-19	1207	0	861	-1
12 JUL 2018	-15	802	0	1047	-2
11 JUL 2018	-37	373	0	611	-5
10 JUL 2018	-161	0	0	286	32
09 JUL 2018	-293	0	0	180	6
08 JUL 2018	-329	0	0	0	-49
07 JUL 2018	-418	0	0	0	-136
06 JUL 2018	-372	0	0	0	-32
05 JUL 2018	-153	0	0	587	-22
04 JUL 2018	-4	0	0	1561	6
03 JUL 2018	-16	0	0	813	14
02 JUL 2018	-126	0	0	153	2

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
15 JUL 2018	3728	3803	3439
14 JUL 2018	2927	3046	2626
13 JUL 2018	1077	676	1405
12 JUL 2018	0	-242	289
11 JUL 2018	0	-98	977
10 JUL 2018	-0	203	972
09 JUL 2018	1	-36	704
08 JUL 2018	1	95	1332
07 JUL 2018	1	-100	1907
06 JUL 2018	0	-110	1280
05 JUL 2018	-0	-78	332
04 JUL 2018	1	-11	585
03 JUL 2018	5	-41	373

02 JUL 2018 3 -204 1117

*** 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

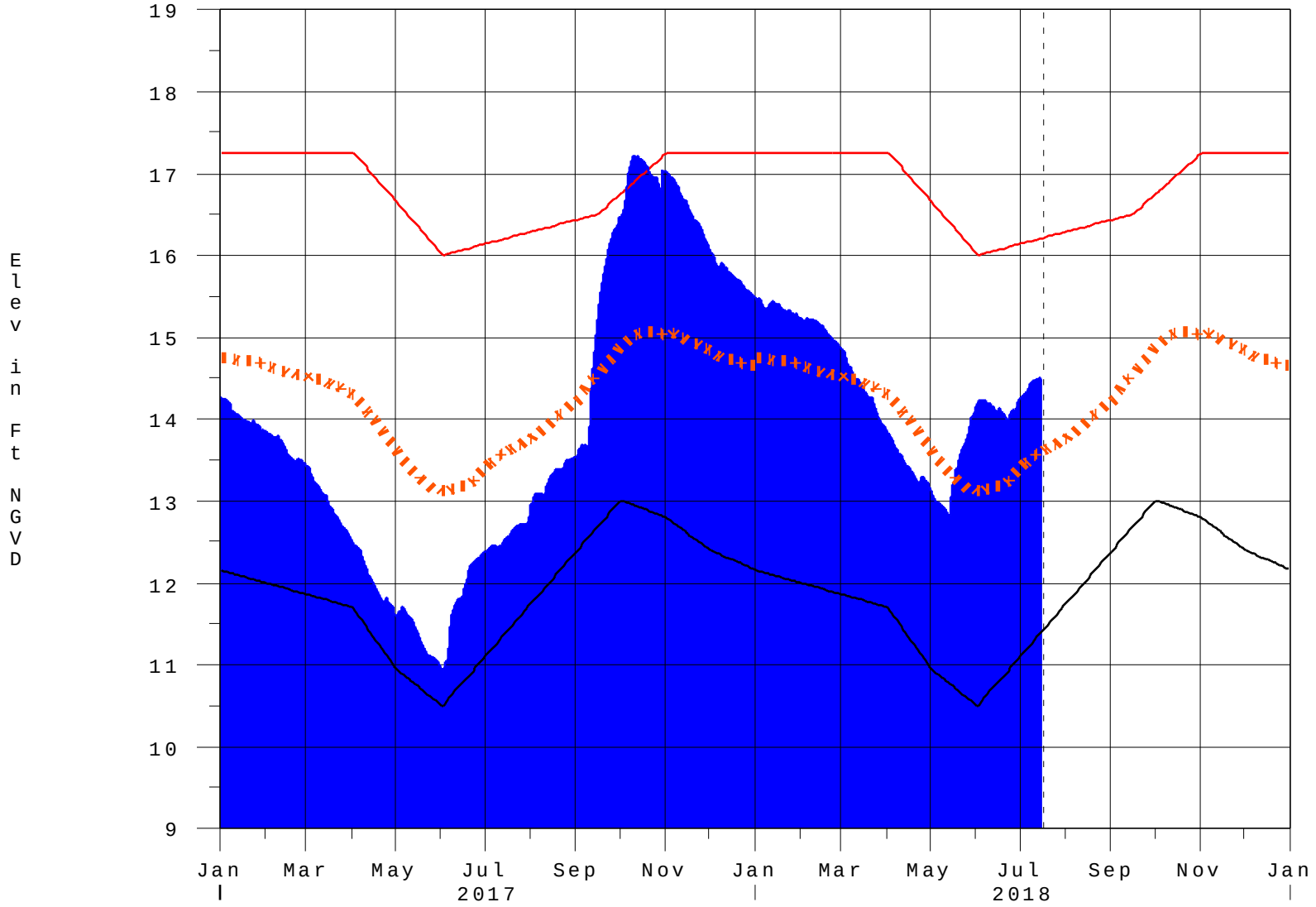
---

* 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 16JUL2018 @ 12:38 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

16JUL18 12:45:24



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