Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 03/16/2020 (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 Neutral ENSO Years[3]		Sub-sampling of AMO Warm + Neutral ENSO Years[4]	
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition
Current (Mar-Aug)	N/A	N/A	1.27	Normal	1.30	Normal	2.01	Very Wet
Multi Seasonal (Mar-Oct)	N/A	N/A	2.71	Wet	2.66	Wet	4.08	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.

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

Tributary Hydrologic Conditions Graph:

-863 cfs 14-day running average for Lake Okeechobee Net Inflow through 03/15/2020.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-1.88 for Palmer Drought Index on 3/14/2020.
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 03/15/2020

Lake Okeechobee Stage: **12.36 feet**

Lake Okeechobee Management Zone/Band		Bottom Elevation (feet, NGVD)	Current Lake Stage
High Lake Management Band		17.25	
Operational Band	High sub-band	16.57	
	Intermediate sub-band	15.63	
	Low sub-band	13.50	
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.78	← 12.36 ft
Water Shortage Management Band			

Part C and Part D of LORS2008:

With Lake Okeechobee stage below the Base-Flow Sub-Band, Part C **nor** Part D of the 2008 LORS suggest releases to the WCAs or Estuaries required to manage lake stages.

Adaptive Protocol's Release Guidance: Caloosahatchee Estuary

The SFWMD's Lake Okeechobee Adaptive Protocol's Release Guidance suggests no S-77 release to the Caloosahatchee Estuary.

LORS2008 Implementation on 3/16/2020 (ENSO Neutral Condition):

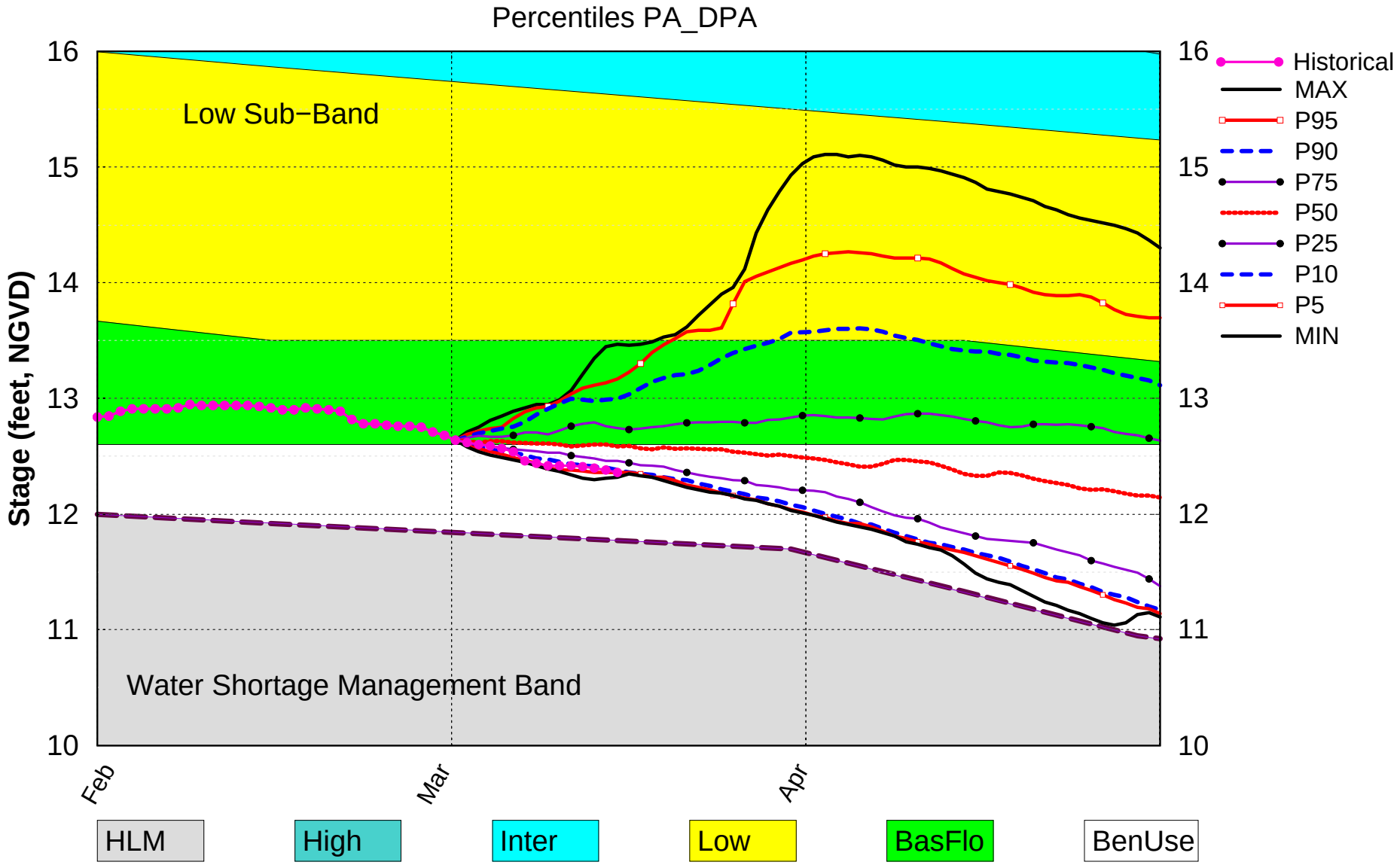
Status for week ending 3/16/2020:

Water Supply Risk Evaluation

Area	Indicator	Value	Color Coded Scoring Scheme
LOK	Projected LOK Stage for the next two months	Beneficial Use sub band	H
	Palmer Index for LOK Tributary Conditions	-1.88 (Dry)	M
	CPC Precipitation Outlook	1 month: Below Normal	H
		3 months: Normal	L
	LOK Seasonal Net Inflow Outlook	1.30 ft (Normal to Extremely Wet)	L
	ENSO Forecast (positive)		
	LOK Multi-Seasonal Net Inflow Outlook	2.66 ft (Normal)	M
	ENSO Forecast (positive)		
WCAs	WCA 1: 3 Station Average (Site 1-7, Site 1-8T & Site 1-9)	Above Line 1 (16.49 ft)	L
	WCA 2A: Site 2-17 HW	Above Line 1 (11.60 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64, and 65)	Line 1- Line 2 (8.98 ft)	M
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.

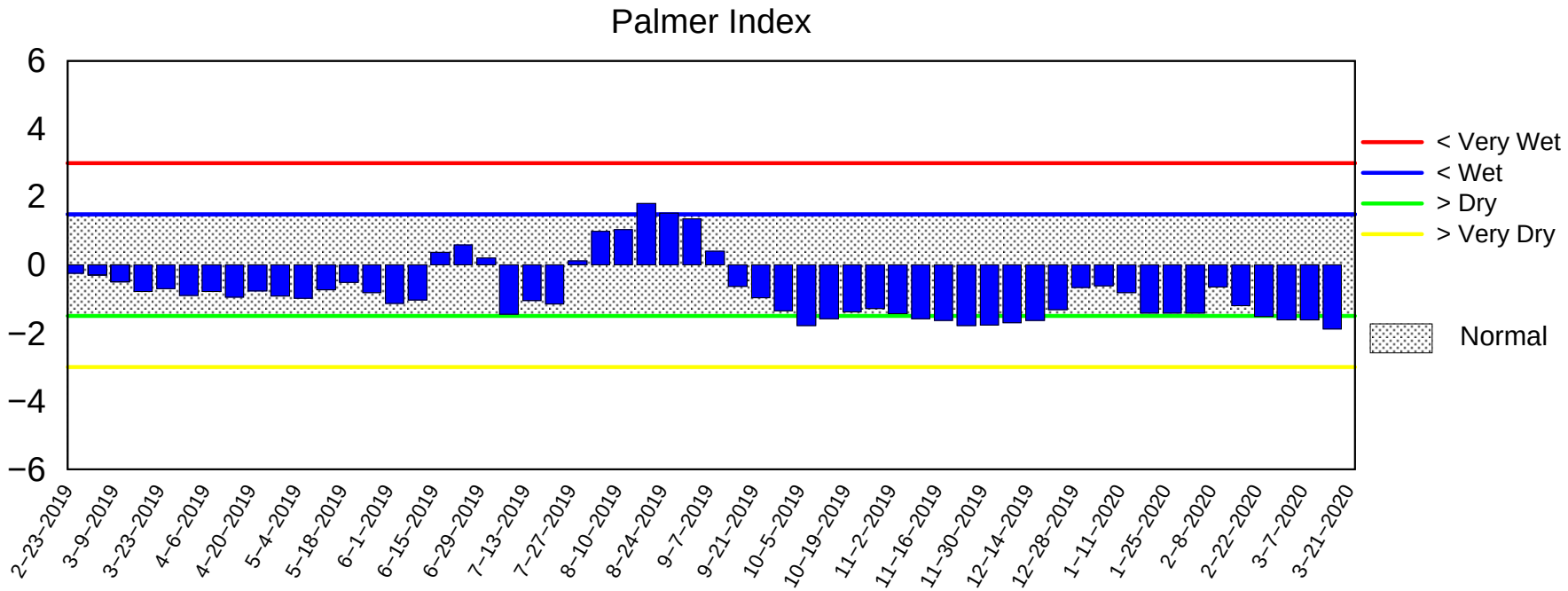
Lake Okeechobee SFWMM Mar 2020 Position Analysis

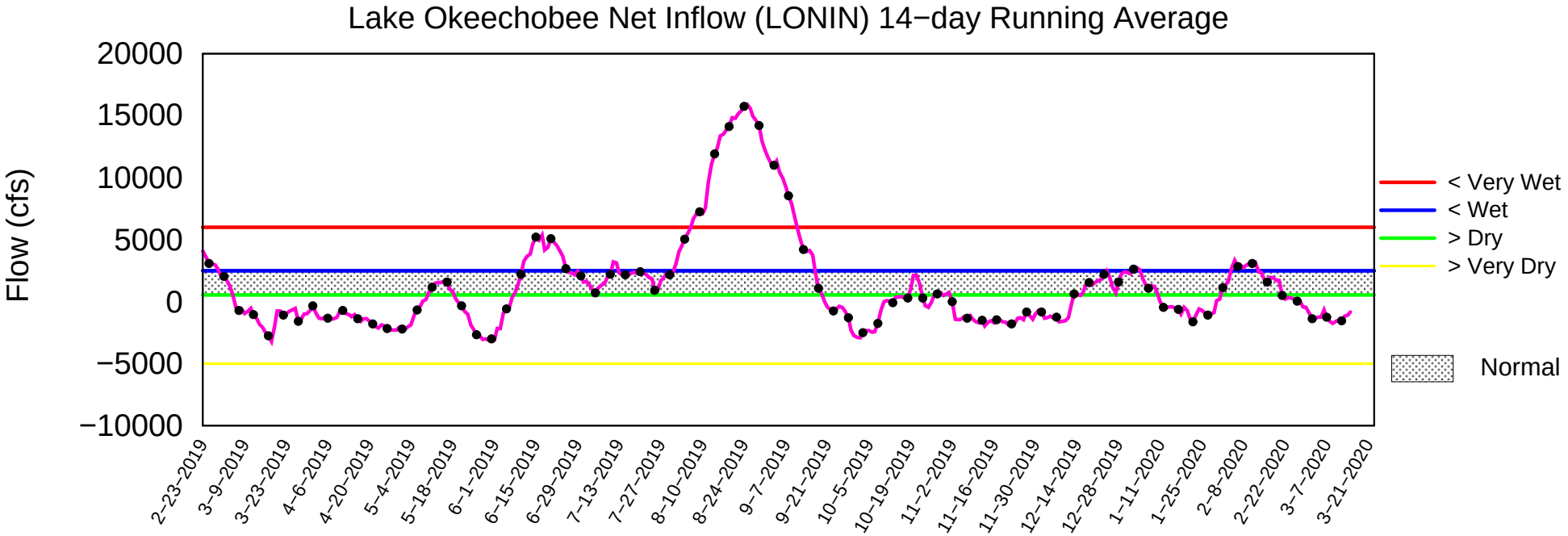


(See assumptions on the Position Analysis Results website)

Mon Mar 16 12:52:55 EDT 2020

Tributary Basin Condition Indicators as of March 16 2020





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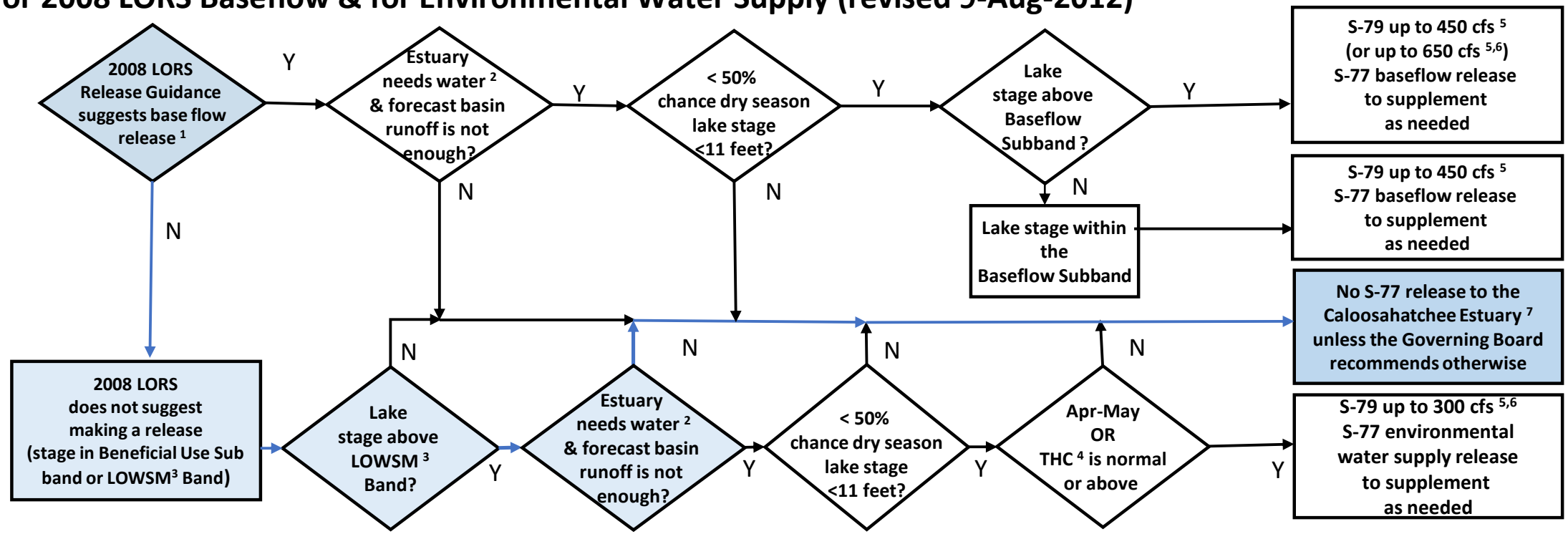
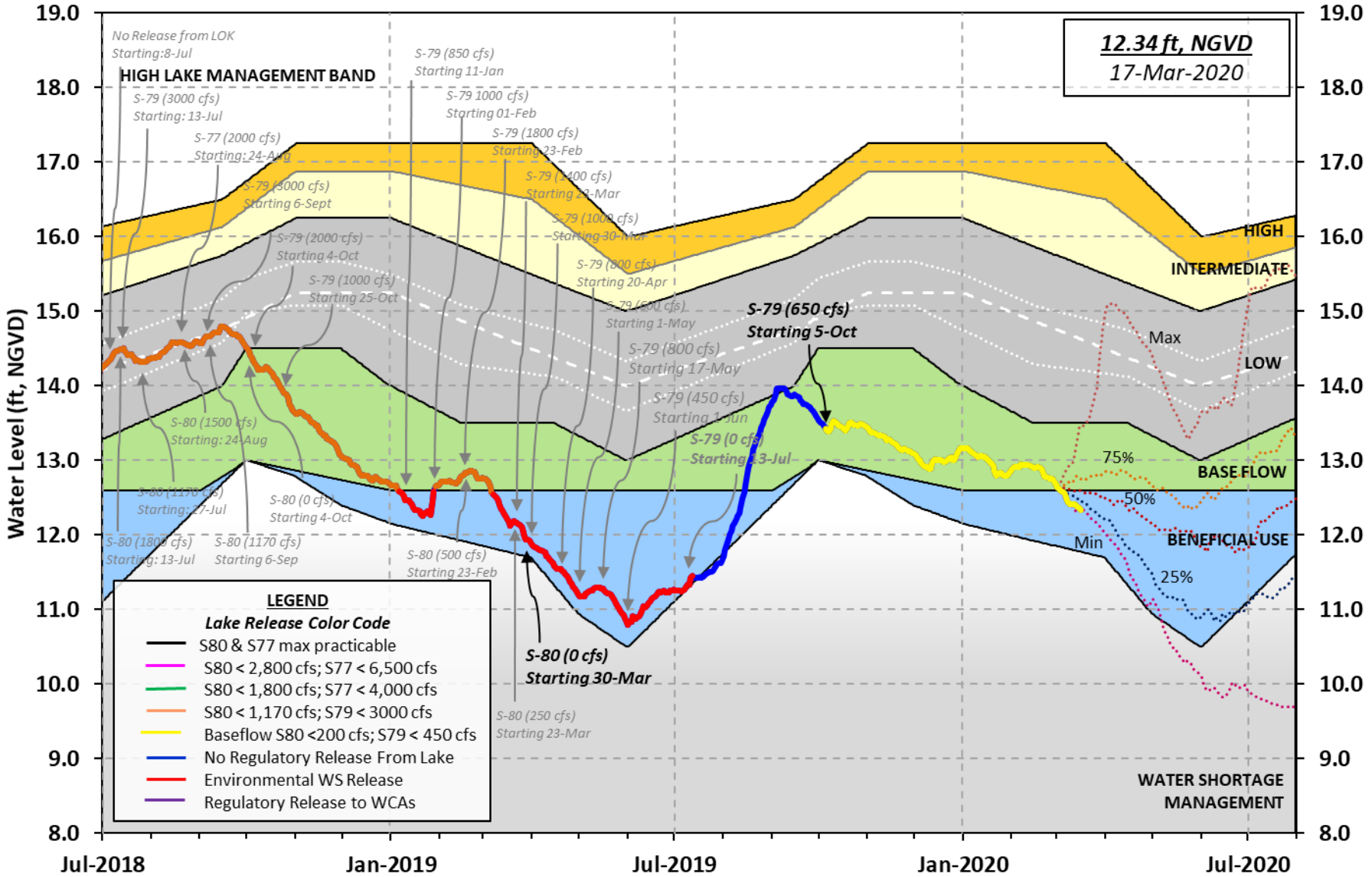
Flowchart to Guide Recommendations for Lake Okeechobee Releases to the Caloosahatchee Estuary for 2008 LORS Baseflow & for Environmental Water Supply (revised 9-Aug-2012)



[1]The 2008 LORS Release Guidance (Part D) can suggest baseflow releases in the Intermediate, Low, or Baseflow Subbands.
[2]Estuary "needs" water when the 30-day moving average salinity at I-75 bridge is projected to exceed 5 practical salinity units (psu) within 2 weeks.
[3]LOWSM = Lake Okeechobee Water Shortage Management.
[4]Tributary Hydrologic Condition (THC) is based on classification of Lake Okeechobee Net Inflow and Palmer Index.
[5]Can release less than the "up to" limit if lower release is sufficient to reach or sustain desired estuary salinity; cfs = cubic feet per second.
[6]After reviewing conditions in Water Conservation Areas (WCAs), Stormwater Treatment Areas (STAs), ENP, St. Lucie Estuary and Lake Okeechobee.
[7]Should this condition be reached, the Governing Board will be briefed at their next regularly scheduled meeting as part of the State of the Water Resources agenda item.

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 MAR 2020

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	12.36	12.24	14.37 (Official Elv)

Bottom of High Lake Mngmt= 17.25 Top of Water Short Mngmt= 11.78
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.20
Difference from Average LORS2008 -0.84

15MAR (1965-2007) Period of Record Average 14.42
Difference from POR Average -2.06

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 6.30'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 4.50'
Bridge Clearance = 51.24'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
12.34	12.40	12.37	12.34	12.41	12.46	12.31	12.28

*Combination Okeechobee Avg-Daily Lake Average = 12.36 (*See Note)

Okeechobee Inflows (cfs):

S65E	661	S65EX1	215	Fisheating Cr	3
S154	0	S191	0	S135 Pumps	0
S84	0	S133 Pumps	0	S2 Pumps	0
S84X	0	S127 Pumps	0	S3 Pumps	0
S71	0	S129 Pumps	0	S4 Pumps	0
S72	0	S131 Pumps	0	C5	0

Total Inflows: 880

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	500	S77	1050
S127 Culverts	0	S351	868	S308	192
S129 Culverts	0	S352	286		
S131 Culverts	0	L8 Canal Pt	145		

Total Outflows: 3041

****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	0.19	S308	0.11

Average Pan Evap x 0.75 Pan Coefficient = 0.11" = 0.01'

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 -3832 cfs or -7600 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:	12.81	12.32	0	0	0	0	0	0	(cfs)		
S193:											
S191:	18.84	12.32	0	0.0	0.0	-NR-					
S135 Pumps:	12.47	12.26	0	0	0	0	0		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	21.06	12.02	661	0.5	0.0	0.0	0.5	0.5	0.0		
S65EX1:	21.06	12.02	215								
S127 Pumps:	13.00	12.28	0	0	0	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.65	12.25	0	0	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.92	12.56	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek											
nr Palmdale		28.19	3								
nr Lakeport											
C5:		-NR-	0	-NR-	-NR-	-NR-					
South Shore											
S4 Pumps:	12.34	12.31	0	0	0	0	0		(cfs)		
S169:	12.32	12.32	124	5.0	5.0	5.0					
S310:	12.34		142								
S3 Pumps:	11.19	12.32	0	0	0	0	0		(cfs)		
S354:	12.32	11.19	500	1.2	1.4						
S2 Pumps:	11.16	-NR-	0	0	0	0	0	0	(cfs)		
S351:	-NR-	11.16	868	1.8	1.8	2.0					
S352:	12.48	10.82	286	0.4	0.7						
C10A:	-NR-	12.50		8.0	8.0	8.0	0.0	0.0			
L8 Canal PT		12.27	145								
S351 and S352 Temporary Pumps/S354 Spillway											
S351:	11.16	-NR-	868	-NR-	-NR-	-NR-	-NR-	-NR-	-NR-		
S352:	10.82	12.48	286	-NR-	-NR-	-NR-	-NR-				
S354:	11.19	12.32	500	-NR-	-NR-	-NR-	-NR-				
Caloosahatchee River (S77, S78, S79)											
S47B:	12.44	10.77		0.0	0.0						
S47D:	10.77	10.78	-48	6.5							

```
  S77:
    Spillway and Sector Preferred Flow:
               12.28     10.67    1048  0.0  3.5  3.5  0.0
    Flow Due to Lockages+:           2

  S78:
    Spillway and Sector Flow:
               10.67      2.89     736    1.0  0.0  0.0  1.5
    Flow Due to Lockages+:           22

  S79:
    Spillway and Sector Flow:
                2.99      1.16     936    0.3  1.0  1.5  1.0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           10
    Percent of flow from S77        112%
    Chloride             (ppm)      0


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Preferred Flow:
               12.28     12.26     192  3.0  3.0  3.0  3.0
    Flow Due to Lockages+:           0

  S153:        18.95     12.07      16    0.5  0.0
  S80:
    Spillway and Sector Flow:
               12.24     -0.26       0    0.0  0.0  0.0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           25
    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.
++ Preferred flow is determined from either the spillway discharge or the below flow meter daily
```

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:	14.54	14.54	14.77	159	5
S78:	6.86	6.86	6.94	111	2
S79:	1.08	1.08	1.09	110	1
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:	38.68	38.68	38.68	86	5
S80:	0.11	0.11	0.11	78	1
Okeechobee Average	26.61	4.09	4.11		

(Sites S78, S79 and S80 not included)

Oke Nexrad Basin Avg	-NR-	0.00	0.07

Okeechobee Lake Elevations		15 MAR 2020	12.36	Difference from 15MAR20
15MAR20	-1 Day =	14 MAR 2020	12.38	0.02
15MAR20	-2 Days =	13 MAR 2020	12.40	0.04
15MAR20	-3 Days =	12 MAR 2020	12.41	0.05
15MAR20	-4 Days =	11 MAR 2020	12.42	0.06
15MAR20	-5 Days =	10 MAR 2020	12.42	0.06
15MAR20	-6 Days =	09 MAR 2020	12.42	0.06
15MAR20	-7 Days =	08 MAR 2020	12.44	0.08
15MAR20	-30 Days =	14 FEB 2020	12.92	0.56
15MAR20	-1 Year =	15 MAR 2019	12.24	-0.12
15MAR20	-2 Year =	15 MAR 2018	14.37	2.01

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
15MAR20	Today =	15 MAR 2020	-863	MON	-793
15MAR20	-1 Day =	14 MAR 2020	-1112	SUN	-995
15MAR20	-2 Days =	13 MAR 2020	-1188	SAT	835
15MAR20	-3 Days =	12 MAR 2020	-1580	FRI	-181
15MAR20	-4 Days =	11 MAR 2020	-1539	THU	1722
15MAR20	-5 Days =	10 MAR 2020	-1615	WED	2296
15MAR20	-6 Days =	09 MAR 2020	-1785	TUE	-856
15MAR20	-7 Days =	08 MAR 2020	-1595	MON	-1511
15MAR20	-8 Days =	07 MAR 2020	-1254	SUN	-13154
15MAR20	-9 Days =	06 MAR 2020	-689	SAT	-2787
15MAR20	-10 Days =	05 MAR 2020	-1258	FRI	134
15MAR20	-11 Days =	04 MAR 2020	-1258	THU	2576
15MAR20	-12 Days =	03 MAR 2020	-1408	WED	517
15MAR20	-13 Days =	02 MAR 2020	-1415	TUE	111

S65E

			Average Flow over previous 14 days		Avg-Daily Flow
15MAR20	Today=	15 MAR 2020	686	MON	761
15MAR20	-1 Day =	14 MAR 2020	685	SUN	760
15MAR20	-2 Days =	13 MAR 2020	684	SAT	644
15MAR20	-3 Days =	12 MAR 2020	706	FRI	724
15MAR20	-4 Days =	11 MAR 2020	708	THU	632
15MAR20	-5 Days =	10 MAR 2020	719	WED	506
15MAR20	-6 Days =	09 MAR 2020	739	TUE	504
15MAR20	-7 Days =	08 MAR 2020	757	MON	503
15MAR20	-8 Days =	07 MAR 2020	766	SUN	696
15MAR20	-9 Days =	06 MAR 2020	765	SAT	750
15MAR20	-10 Days =	05 MAR 2020	760	FRI	759
15MAR20	-11 Days =	04 MAR 2020	768	THU	706
15MAR20	-12 Days =	03 MAR 2020	783	WED	916
15MAR20	-13 Days =	02 MAR 2020	786	TUE	746

S65EX1

			Average Flow over previous 14 days		Avg-Daily Flow
15MAR20	Today=	15 MAR 2020	283	MON	215
15MAR20	-1 Day =	14 MAR 2020	283	SUN	215
15MAR20	-2 Days =	13 MAR 2020	282	SAT	215

15MAR20	-3 Days =	12 MAR 2020	282	FRI	348
15MAR20	-4 Days =	11 MAR 2020	273	THU	301
15MAR20	-5 Days =	10 MAR 2020	266	WED	425
15MAR20	-6 Days =	09 MAR 2020	251	TUE	423
15MAR20	-7 Days =	08 MAR 2020	252	MON	422
15MAR20	-8 Days =	07 MAR 2020	244	SUN	281
15MAR20	-9 Days =	06 MAR 2020	248	SAT	266
15MAR20	-10 Days =	05 MAR 2020	255	FRI	210
15MAR20	-11 Days =	04 MAR 2020	240	THU	211
15MAR20	-12 Days =	03 MAR 2020	233	WED	212
15MAR20	-13 Days =	02 MAR 2020	225	TUE	213

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 MAR 2020	2085	2238	1505	1892
14 MAR 2020	1687	2042	1100	1193
13 MAR 2020	1500	1600	633	346
12 MAR 2020	1569	1678	780	670
11 MAR 2020	1730	1744	955	971
10 MAR 2020	1445	1804	1155	1463
09 MAR 2020	1961	2258	1644	2141
08 MAR 2020	1679	1945	1439	1972
07 MAR 2020	1159	1274	718	1452
06 MAR 2020	1024	1149	596	505
05 MAR 2020	1008	1337	598	305
04 MAR 2020	1092	1352	621	415
03 MAR 2020	1289	1297	635	971
02 MAR 2020	1625	1605	990	1468

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 MAR 2020	282	1721	568	795	288
14 MAR 2020	374	1827	535	837	270
13 MAR 2020	206	1669	610	775	241
12 MAR 2020	22	753	171	508	272
11 MAR 2020	59	470	0	573	312
10 MAR 2020	120	1254	402	750	320
09 MAR 2020	286	1775	793	894	181
08 MAR 2020	356	1449	688	525	151
07 MAR 2020	171	1794	767	789	283
06 MAR 2020	281	1986	812	1069	344
05 MAR 2020	316	2893	909	2112	394
04 MAR 2020	314	3209	880	2058	352
03 MAR 2020	350	3129	805	1989	276
02 MAR 2020	346	2411	350	1773	227

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
15 MAR 2020	413	31	51
14 MAR 2020	692	276	50
13 MAR 2020	624	158	40
12 MAR 2020	1019	76	54
11 MAR 2020	624	209	40
10 MAR 2020	209	276	42

09 MAR 2020	1136	262	-NR-
08 MAR 2020	1428	112	41
07 MAR 2020	828	48	23
06 MAR 2020	836	-152	42
05 MAR 2020	273	-88	-NR-
04 MAR 2020	1004	-57	39
03 MAR 2020	814	-31	60
02 MAR 2020	1176	-66	52

*** 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

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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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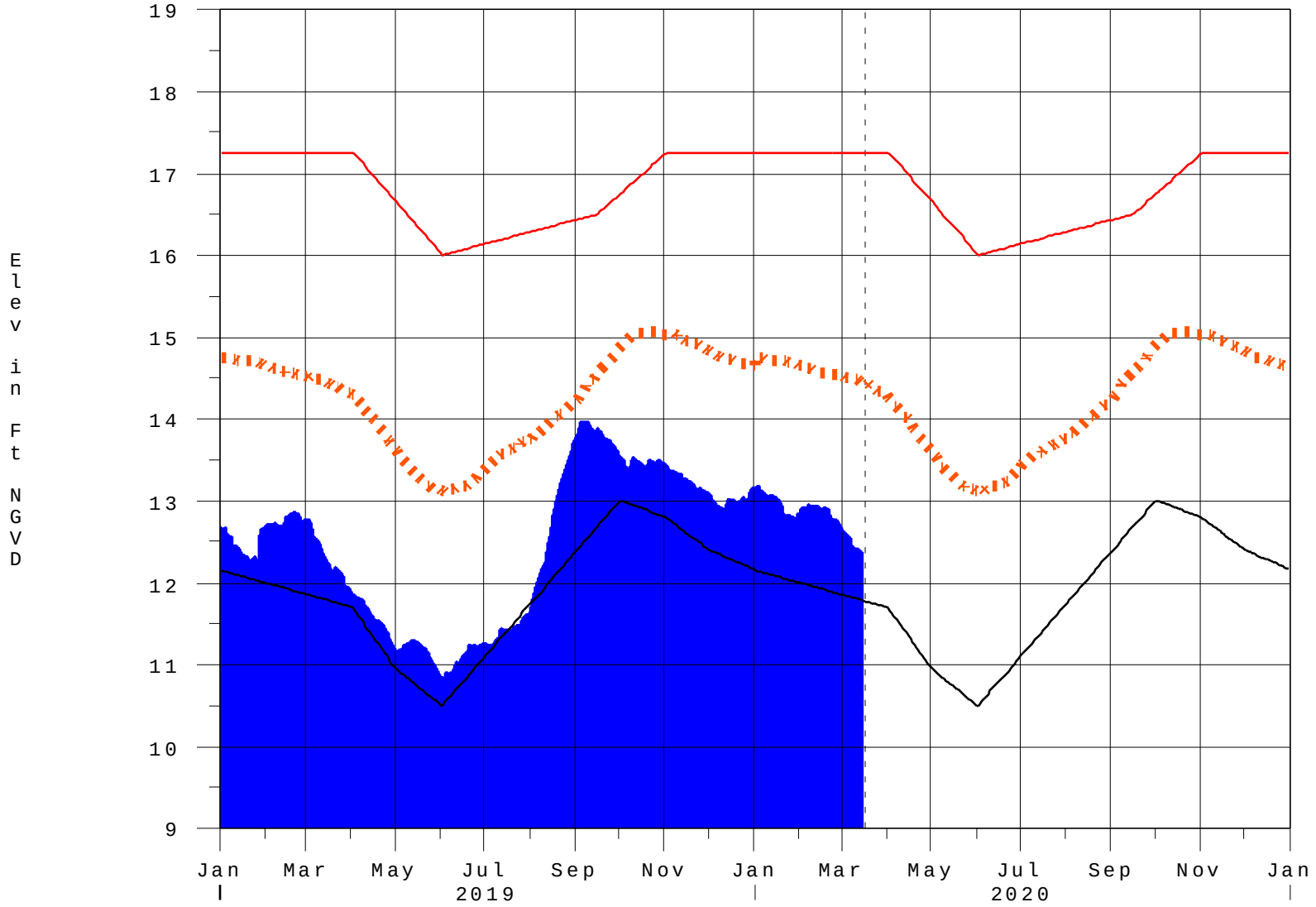
Report Generated 16MAR2020 @ 23:38 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

16MAR20 12:30:21



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