Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 04/20/2020 (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 (Apr-Sep)	N/A	N/A	1.76	Wet	2.02	Very Wet	2.81	Very Wet
Multi Seasonal (Apr-Oct)	N/A	N/A	2.32	Normal	2.58	Wet	3.86	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:

-686 cfs 14-day running average for Lake Okeechobee Net Inflow through 04/20/2020.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-2.97 for Palmer Drought Index on 04/18/2020.
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 04/20/2020

Lake Okeechobee Stage: **11.41 feet**

Lake Okeechobee Management Zone/Band		Bottom Elevation (feet, NGVD)	Current Lake Stage
High Lake Management Band		16.88	
Operational Band	High sub-band	16.20	
	Intermediate sub-band	15.34	
	Low sub-band	13.46	
Base Flow sub-band		12.60	
Beneficial Use sub-band		11.23	← 11.41 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 unless the Governing Board recommends otherwise.

LORS2008 Implementation on 04/20/2020 (ENSO Neutral Condition):

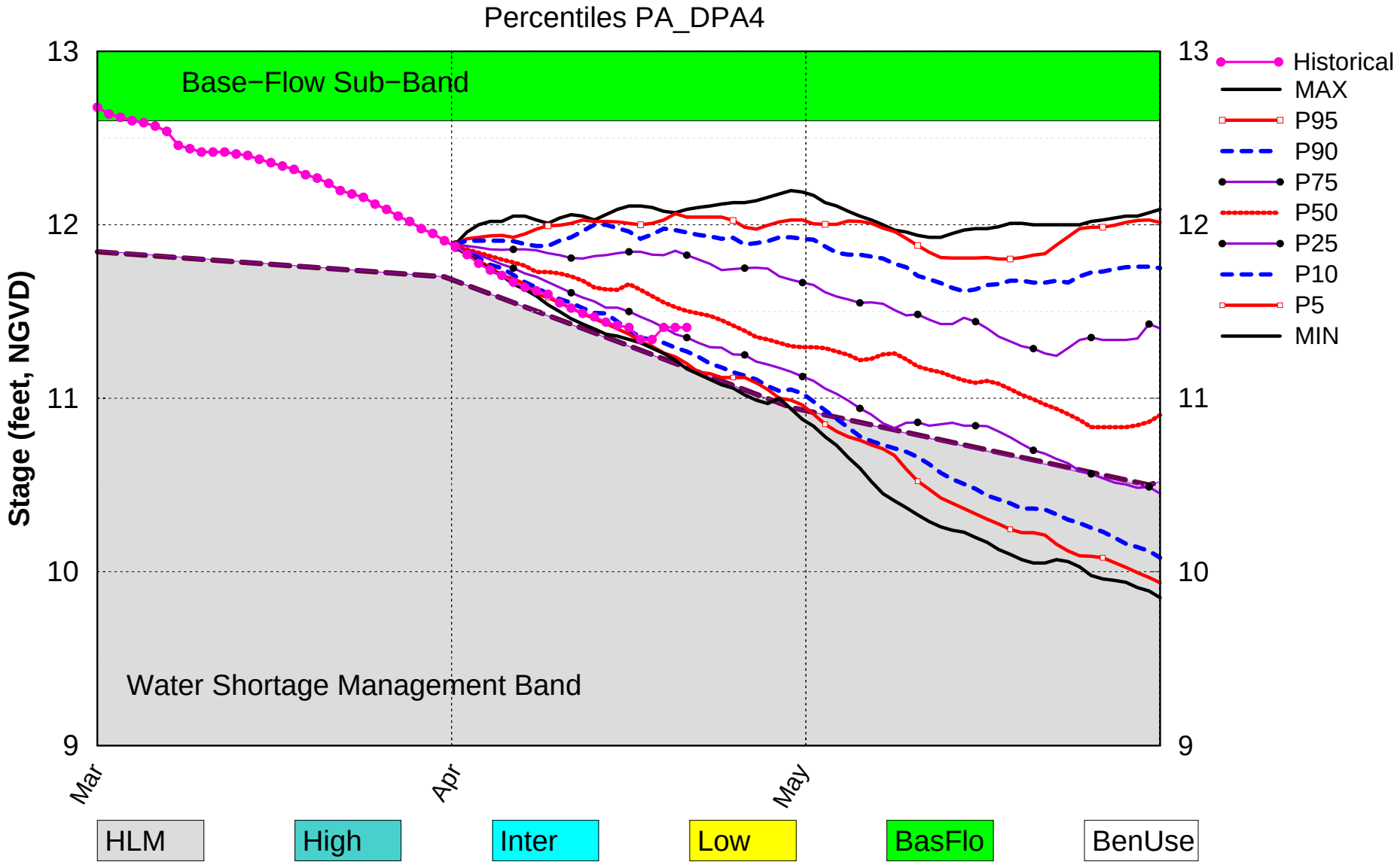
Status for week ending 4/20/2020:

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	-2.97 (Extremely Dry)	H
	CPC Precipitation Outlook	1 month: Above Normal	L
		3 months: Above Normal	L
	LOK Seasonal Net Inflow Outlook	2.02 ft (Normal to Extremely Wet)	L
	ENSO Forecast (positive)		
	LOK Multi-Seasonal Net Inflow Outlook	2.58 ft (Normal)	M
	ENSO Forecast (positive)		
WCAs	WCA 1: Site 1-8C	Above Line 1 (16.00 ft)	L
	WCA 2A: Site S-11B	Below Line 2 (10.17 ft)	H
	WCA-3A: 3 Station Average (Site 63, 64, and 65)	Line 1- Line 2 (8.62 ft)	M
LEC	Service Area 1	Year-Round Irrigation Rule in effect	L
	Service Area 2	Year-Round Irrigation Rule in effect	H
	Service Area 3	Year-Round Irrigation Rule in effect	M

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.

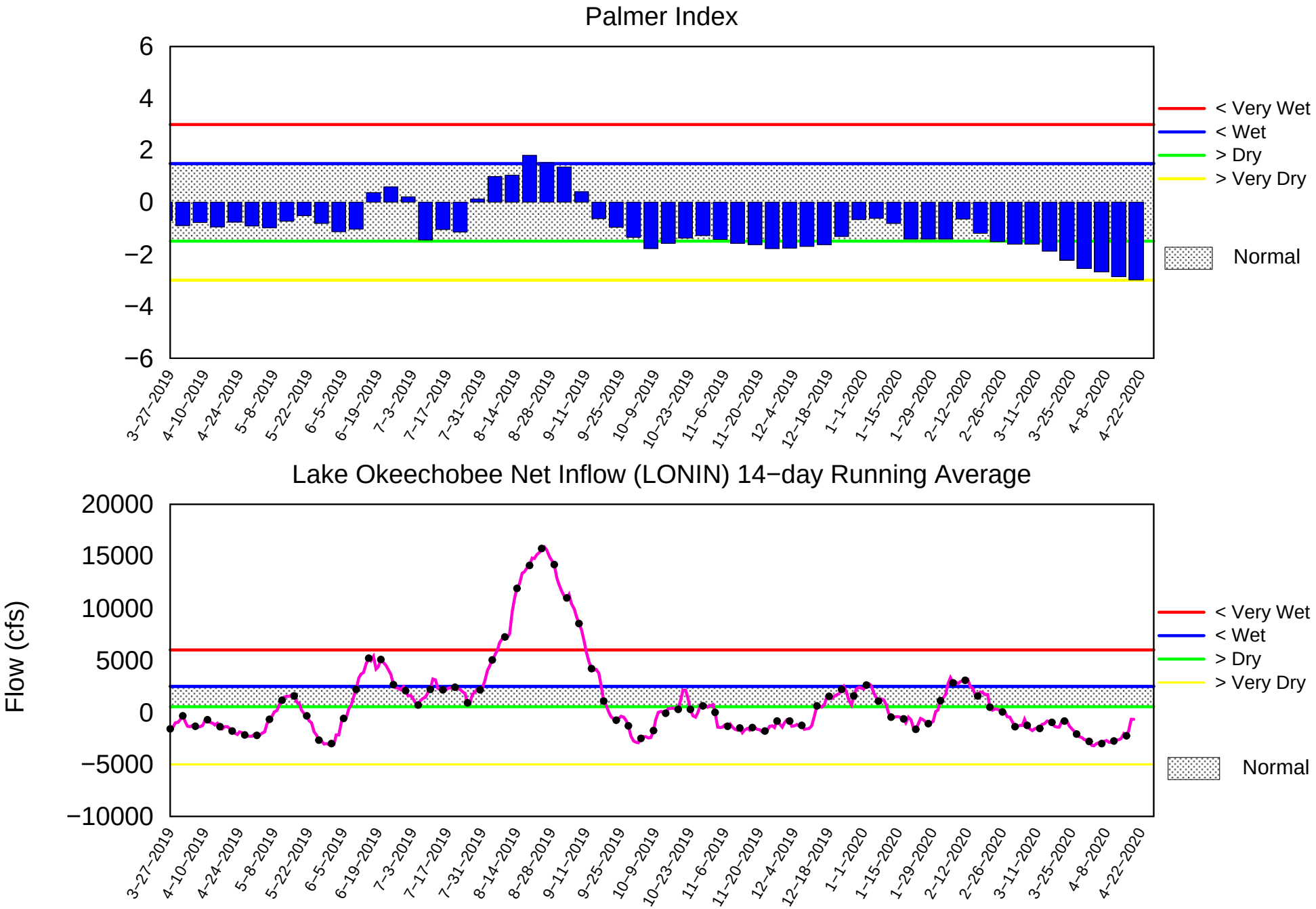
Lake Okeechobee SFWMM Apr 2020 Position Analysis



(See assumptions on the Position Analysis Results website)

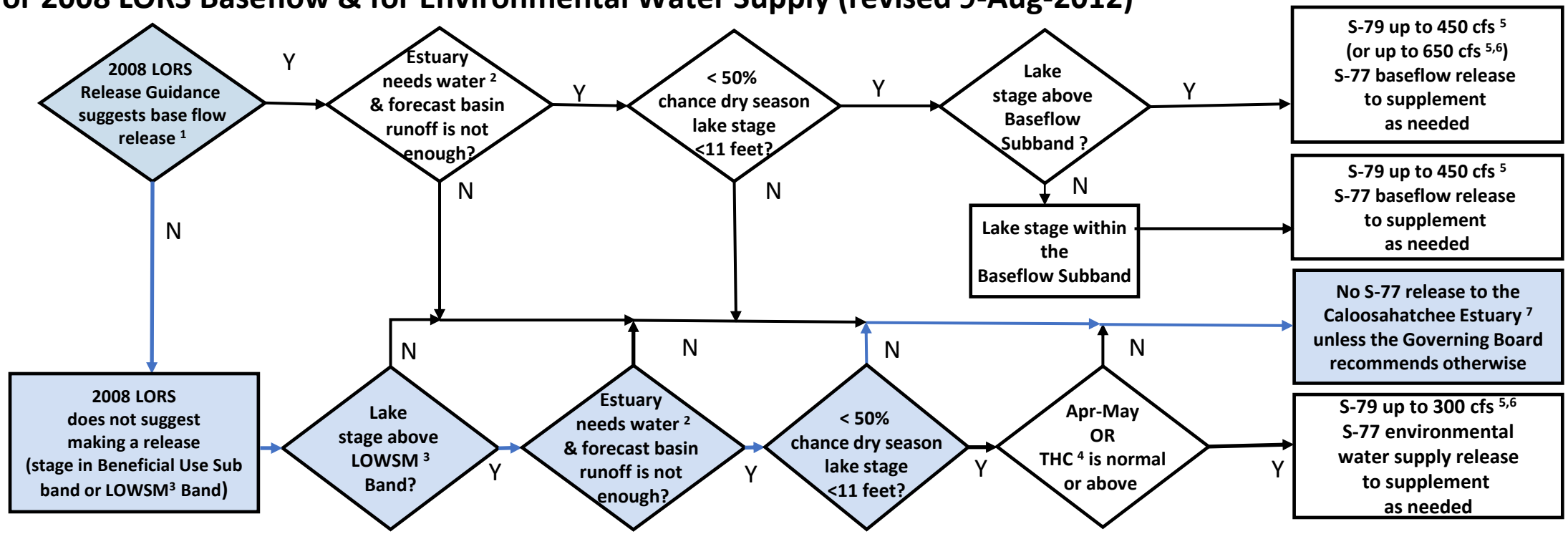
Tue Apr 21 08:39:07 EDT 2020

Tributary Basin Condition Indicators as of April 20 2020



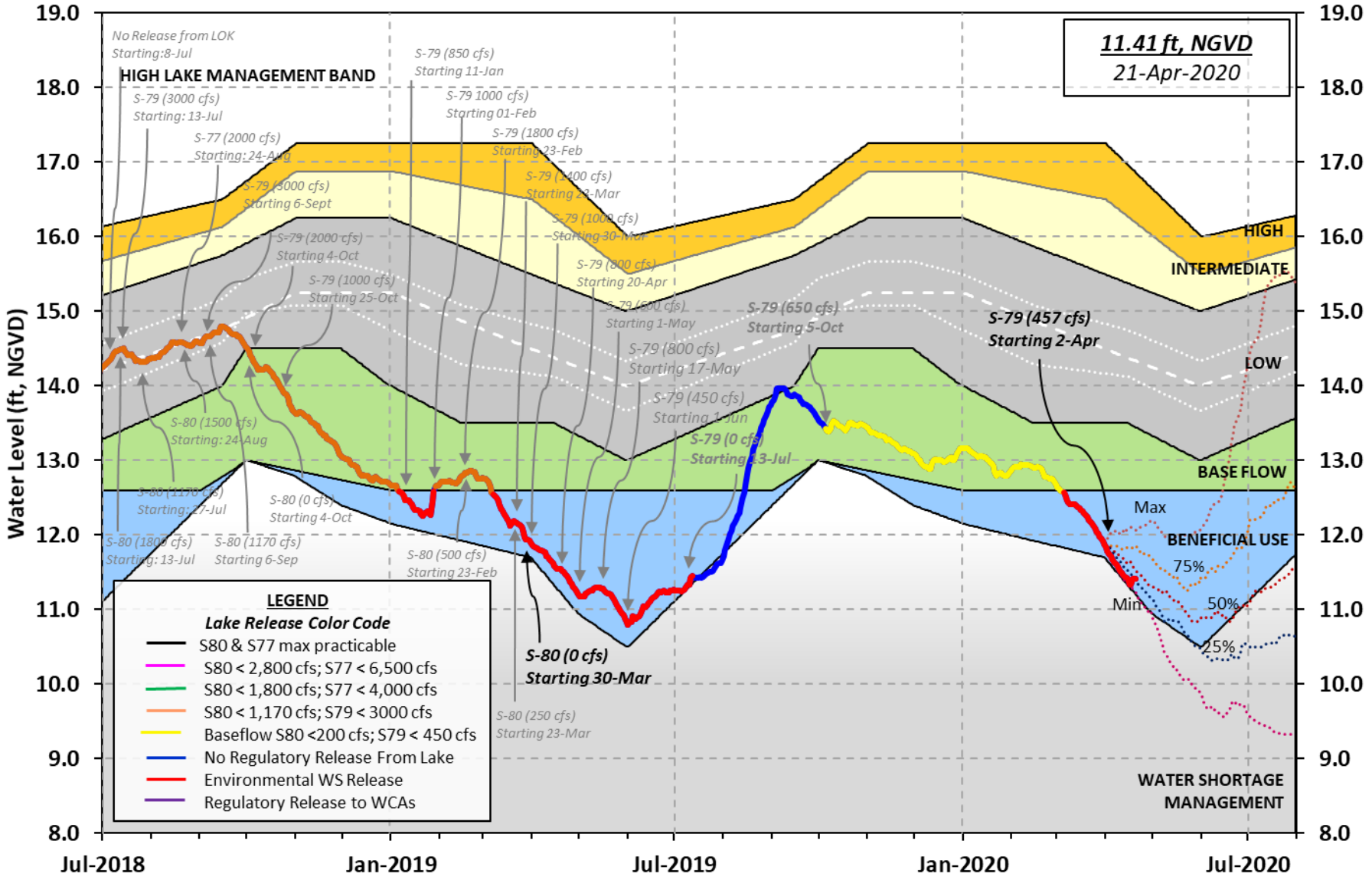
Mon Apr 20 17:38:59 EDT 2020

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 19 APR 2020

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	11.41	11.54	13.31 (Official Elv)

Bottom of High Lake Mngmt= 16.88 Top of Water Short Mngmt= 11.23
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 12.64
Difference from Average LORS2008 -1.23

19APR (1965-2007) Period of Record Average 13.87
Difference from POR Average -2.46

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 5.35'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 3.55'
Bridge Clearance = 52.11'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
11.44	11.41	11.38	11.38	11.34	11.53	11.40	11.41

*Combination Okeechobee Avg-Daily Lake Average = 11.41 (*See Note)

Okeechobee Inflows (cfs):

S65E	255	S65EX1	35	Fisheating Cr	0
S154	0	S191	0	S135 Pumps	0
S84	0	S133 Pumps	0	S2 Pumps	0
S84X	0	S127 Pumps	0	S3 Pumps	0
S71	26	S129 Pumps	0	S4 Pumps	0
S72	0	S131 Pumps	0	C5	0

Total Inflows: 316

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	0	S77	405
S127 Culverts	0	S351	0	S308	-158
S129 Culverts	0	S352	97		
S131 Culverts	0	L8 Canal Pt	-42		

Total Outflows: 302

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

Okeechobee Pan Evaporation (inches):

S77	0.23	S308	0.26

Average Pan Evap x 0.75 Pan Coefficient = 0.18" = 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 0 cfs or 0 AC-FT

	Headwater Elevation (ft-msl)	Tailwater Elevation (ft-msl)	Disch (cfs) (I) see note at bottom	Gate Positions #1 (ft)	#2 (ft)	#3 (ft)	#4 (ft)	#5 (ft)	#6 (ft)	#7 (ft)	#8 (ft)	
North East Shore												
S133 Pumps:	12.22	11.73	0	0	0	0	0	0				(cfs)
S193:												
S191:	18.21	11.75	0	0.0	0.0	-NR-						
S135 Pumps:	11.79	11.61	0	0	0	0	0					(cfs)
S135 Culverts:			0	0.0	0.0							
North West Shore												
S65E:	20.98	11.16	255	0.0	-0.0	0.3	0.3	0.0	0.0			
S65EX1:	20.98	11.16	35									
S127 Pumps:	12.13	11.41	0	0	0	0	0	0				(cfs)
S127 Culvert:			0	0.0								
S129 Pumps:	12.02	11.05	0	0	0	0						(cfs)
S129 Culvert:			0	0.0								
S131 Pumps:	12.41	11.41	0	0	0							(cfs)
S131 Culvert:			0									
Fisheating Creek												
nr Palmdale		27.38	0									
nr Lakeport												
C5:		-NR-	0	-NR-	-NR-	-NR-						
South Shore												
S4 Pumps:	11.24	11.18	0	0	0	0						(cfs)
S169:	11.23	11.20	49	5.0	5.0	5.0						
S310:	11.34		18									
S3 Pumps:	11.41	11.24	0	0	0	0						(cfs)
S354:	11.24	11.41	0	0.0	0.0							
S2 Pumps:	11.50	-NR-	0	-NR-	-NR-	-NR-	-NR-					(cfs)
S351:	-NR-	11.50	0	0.0	0.0	0.0						
S352:	11.54	10.79	97	0.0	0.2							
C10A:	-NR-	11.69		8.0	8.0	8.0	0.0	0.0				
L8 Canal PT		11.37	-42									
S351 and S352 Temporary Pumps/S354 Spillway												
S351:	11.50	-NR-	0	-NR-	-NR-	-NR-	-NR-	-NR-	-NR-			
S352:	10.79	11.54	97	-NR-	-NR-	-NR-	-NR-					
S354:	11.41	11.24	0	-NR-	-NR-	-NR-	-NR-					
Caloosahatchee River (S77, S78, S79)												
S47B:	11.25	11.10		0.0	0.0							
S47D:	11.10	11.10	-20	6.4								

```
  S77:
    Spillway and Sector Preferred Flow:
               11.05     10.96     405  4.0  4.0  4.0  0.0
    Flow Due to Lockages+:           0

  S78:
    Spillway and Sector Flow:
               11.02      3.04     298    1.0  0.0  0.0  0.0
    Flow Due to Lockages+:           17

  S79:
    Spillway and Sector Flow:
                3.20      1.43     122    0.0  0.0  0.0  0.5  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           9
    Percent of flow from S77       332%
    Chloride             (ppm)     0


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Preferred Flow:
               11.42     11.39    -158  3.0  3.0  3.0  3.0
    Flow Due to Lockages+:           0

  S153:        18.94     11.34       0    0.0  0.0
  S80:
    Spillway and Sector Flow:
               11.74      0.79       0    0.0  0.0  0.0  0.0  0.0  0.0  0.0
    Flow Due to Lockages+:           21
    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:	0.00	0.33	0.63	194	9
S78:	0.00	0.48	0.51	184	5
S79:	0.00	0.00	0.03	144	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:	41.75	44.44	44.65	172	8
S80:	0.69	2.37	2.96	198	3
Okeechobee Average	20.88	3.44	3.48		

(Sites S78, S79 and S80 not included)

Oke Nexrad Basin Avg	-NR-	0.00	0.00

Okeechobee Lake Elevations	19 APR 2020	11.41	Difference from 19APR20
19APR20 -1 Day =	18 APR 2020	11.41	0.00
19APR20 -2 Days =	17 APR 2020	11.34	-0.07
19APR20 -3 Days =	16 APR 2020	11.34	-0.07
19APR20 -4 Days =	15 APR 2020	11.41	0.00
19APR20 -5 Days =	14 APR 2020	11.42	0.01
19APR20 -6 Days =	13 APR 2020	11.44	0.03
19APR20 -7 Days =	12 APR 2020	11.47	0.06
19APR20 -30 Days =	20 MAR 2020	12.24	0.83
19APR20 -1 Year =	19 APR 2019	11.54	0.13
19APR20 -2 Year =	19 APR 2018	13.31	1.90

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
19APR20 Today =	19 APR 2020	-628	MON	502
19APR20 -1 Day =	18 APR 2020	-941	SUN	13511
19APR20 -2 Days =	17 APR 2020	-2042	SAT	3051
19APR20 -3 Days =	16 APR 2020	-2529	FRI	-8743
19APR20 -4 Days =	15 APR 2020	-2321	THU	1906
19APR20 -5 Days =	14 APR 2020	-2873	WED	47
19APR20 -6 Days =	13 APR 2020	-3019	TUE	-2563
19APR20 -7 Days =	12 APR 2020	-3092	MON	-927
19APR20 -8 Days =	11 APR 2020	-3188	SUN	-2505
19APR20 -9 Days =	10 APR 2020	-3304	SAT	-2616
19APR20 -10 Days =	09 APR 2020	-3357	FRI	-6078
19APR20 -11 Days =	08 APR 2020	-3130	THU	-830
19APR20 -12 Days =	07 APR 2020	-3340	WED	-1113
19APR20 -13 Days =	06 APR 2020	-3562	TUE	-2436

S65E

	Average Flow over previous 14 days			Avg-Daily Flow
19APR20 Today=	19 APR 2020	315	MON	304
19APR20 -1 Day =	18 APR 2020	320	SUN	308
19APR20 -2 Days =	17 APR 2020	324	SAT	306
19APR20 -3 Days =	16 APR 2020	314	FRI	309
19APR20 -4 Days =	15 APR 2020	318	THU	304
19APR20 -5 Days =	14 APR 2020	311	WED	302
19APR20 -6 Days =	13 APR 2020	314	TUE	324
19APR20 -7 Days =	12 APR 2020	315	MON	148
19APR20 -8 Days =	11 APR 2020	327	SUN	355
19APR20 -9 Days =	10 APR 2020	326	SAT	357
19APR20 -10 Days =	09 APR 2020	329	FRI	273
19APR20 -11 Days =	08 APR 2020	346	THU	352
19APR20 -12 Days =	07 APR 2020	366	WED	270
19APR20 -13 Days =	06 APR 2020	394	TUE	499

S65EX1

	Average Flow over previous 14 days			Avg-Daily Flow
19APR20 Today=	19 APR 2020	18	MON	35
19APR20 -1 Day =	18 APR 2020	15	SUN	75
19APR20 -2 Days =	17 APR 2020	10	SAT	0

19APR20	-3 Days =	16 APR 2020	10	FRI	0
19APR20	-4 Days =	15 APR 2020	10	THU	0
19APR20	-5 Days =	14 APR 2020	10	WED	0
19APR20	-6 Days =	13 APR 2020	10	TUE	64
19APR20	-7 Days =	12 APR 2020	5	MON	0
19APR20	-8 Days =	11 APR 2020	5	SUN	0
19APR20	-9 Days =	10 APR 2020	7	SAT	0
19APR20	-10 Days =	09 APR 2020	10	FRI	74
19APR20	-11 Days =	08 APR 2020	4	THU	0
19APR20	-12 Days =	07 APR 2020	4	WED	0
19APR20	-13 Days =	06 APR 2020	4	TUE	0

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)
19 APR 2020	802	955	623	261
18 APR 2020	777	730	613	394
17 APR 2020	1403	1322	607	377
16 APR 2020	1729	2549	602	27
15 APR 2020	1319	1514	723	392
14 APR 2020	1844	1950	594	1060
13 APR 2020	1143	1288	663	1055
12 APR 2020	1380	1420	830	972
11 APR 2020	1957	1896	603	972
10 APR 2020	1874	1781	595	586
09 APR 2020	1411	1461	588	614
08 APR 2020	1433	1482	601	684
07 APR 2020	1420	1374	667	877
06 APR 2020	1819	1820	1003	1057

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 APR 2020	35	0	193	0	-82
18 APR 2020	32	545	665	157	33
17 APR 2020	59	2496	993	514	26
16 APR 2020	547	2984	1037	1079	104
15 APR 2020	390	2626	1011	1467	237
14 APR 2020	417	2729	719	1432	166
13 APR 2020	286	2313	645	1015	157
12 APR 2020	179	2178	399	696	39
11 APR 2020	310	2193	548	829	86
10 APR 2020	435	1990	579	884	143
09 APR 2020	309	2162	705	950	232
08 APR 2020	215	1978	673	793	262
07 APR 2020	332	1789	508	680	218
06 APR 2020	195	2179	462	633	202

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
19 APR 2020	-908	-314	41
18 APR 2020	-309	-376	31
17 APR 2020	-87	323	29
16 APR 2020	681	178	21
15 APR 2020	788	519	13
14 APR 2020	904	321	26

13 APR 2020	1188	370	13
12 APR 2020	-54	190	18
11 APR 2020	459	313	47
10 APR 2020	594	-38	25
09 APR 2020	-436	207	19
08 APR 2020	-163	189	21
07 APR 2020	-320	102	26
06 APR 2020	135	146	6

*** 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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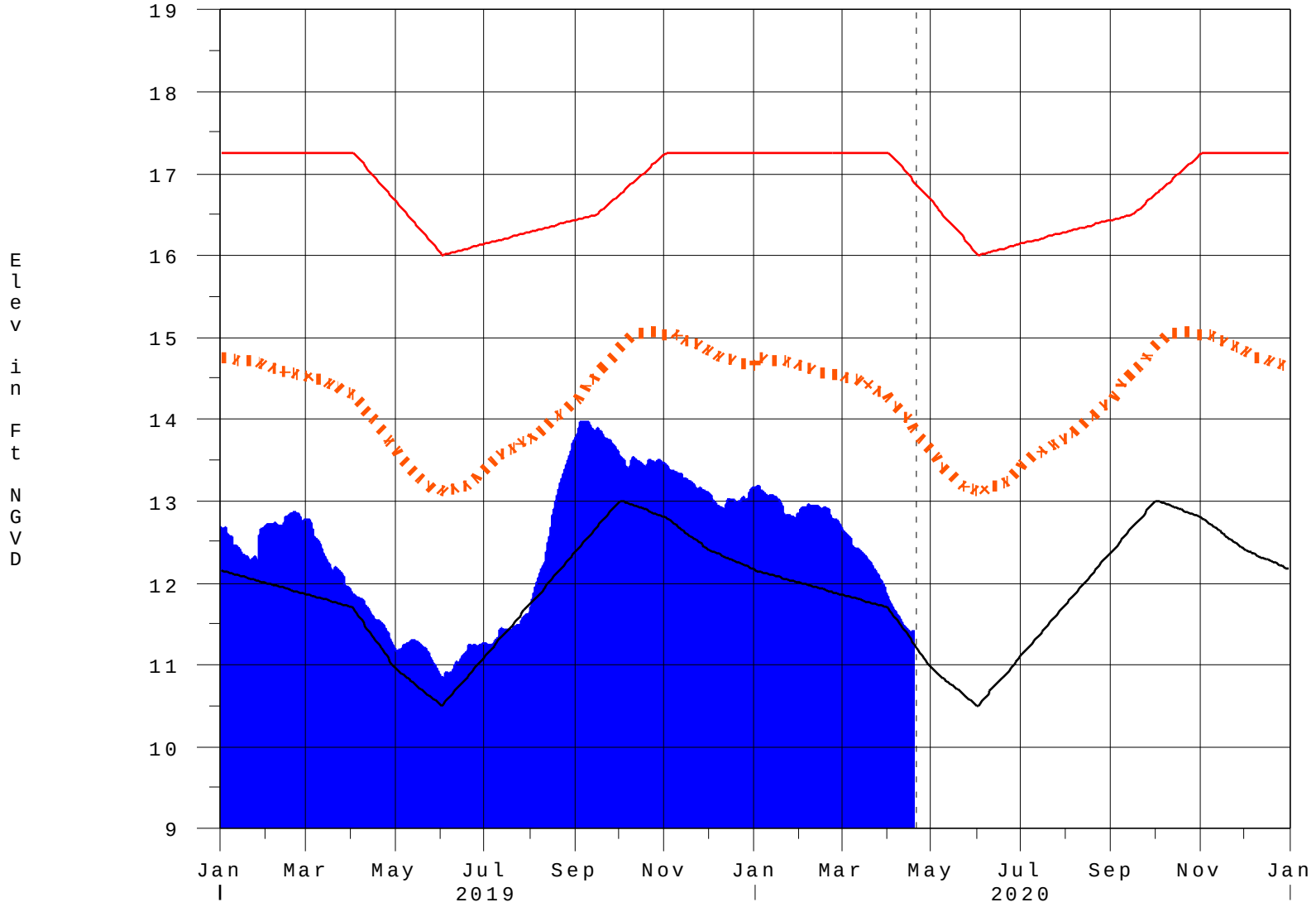
Report Generated 20APR2020 @ 17:15 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

20APR20 17:30:19



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