Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 11/18/2019 (ENSO Neutral 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 Neutral years³ and a sub-sampling of warm years of the Atlantic Multi-decadal Oscillation (AMO) in combination with La Nina ENSO 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 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 (Nov- Apr)	N/A	N/A	0.22	Dry	0.39	Dry	1.54	Wet
Multi Seasonal (Nov- Oct)	N/A	N/A	2.88	Wet	3.07	Wet	5.48	Very Wet

^{*}Croley's Method Not Produced for This Report

See <u>Seasonal</u> and <u>Multi-Seasonal</u> 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:

- **-1464 cfs** 14-day running average for Lake Okeechobee Net Inflow through 11/17/2019. According to the classification in <u>Tributary Hydrologic Conditions</u> table, this condition is Dry.
- **-1.63** for Palmer Index on 11/16/2019. According to the classification in <u>Tributary Hydrologic Conditions</u> table, this condition is Dry.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 11/18/2019

Lake Okeechobee Stage: 13.24feet

USACE Report for Lake Okeechobee

Lake Okeechobee Stage Hydrograph

	ee Management Band	Bottom Elevation (feet, NGVD)	Current Lake Stage
High Lake Manage	ement Band	17.25	
	High sub-band	16.88	
Operational Band	Intermediate sub-band	16.25	
	Low sub-band	14.50	
Base Flow sub-ba	nd	12.79	← 13.24
Beneficial Use sub	o-band	12.57	
Water Shortage M	lanagement Band		

Part C of LORS2008: Discharge to WCA's

NO releases to the WCAs.

Part D of LORS2008: Discharge to Tidewater

Release Guidance Flow Chart Outcome: S-79 Up to 450 cfs & S-80 Up to 200 cfs.

Adaptive Protocol's Release Guidance: Caloosahatchee Estuary

Release Guidance Flow Chart Outcome: S-79 Up to 450 cfs & S-77 baseflow release to supplement as needed.

Back to Lake Okeechobee Operations Main Page

Back to U.S. Army Corps of Engineers LORSS Homepage

LORS2008 Implementation on 11/18/2019 (ENSO Neutral Condition):

Status for week ending 11/18/2019:

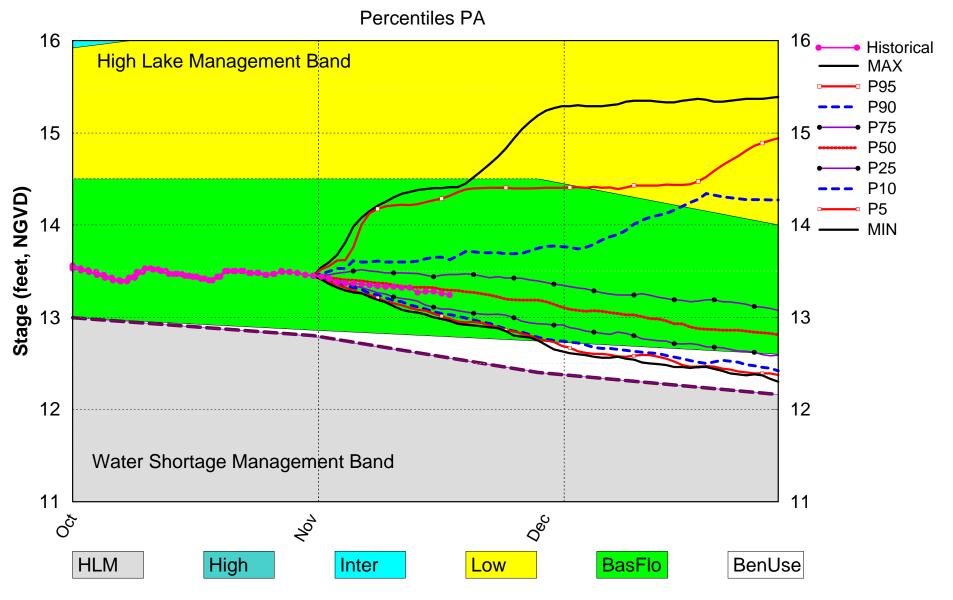
District wide, Raindar rainfall was 0.39 inches for the week. Lake stage on 11/18/2019 was 13.24 ft, NGVD, down 0.09 ft from last week .The updated November 2019 SFWMM Dynamic Position Analysis percentile graph for Lake Okeechobee show that the current lake stage is in the Base-Flow Sub-Band. The LORS2008 Tributary Hydrologic Conditions (THC) are classified as **Dry.** The PDI indicates Dry conditions and the LONIN is Dry. The THC classification is based on the wetter of the two indices.

Water Supply Risk Evaluation

Area	Indicator	Value	Color Coded Scoring Scheme	
	Projected LOK Stage for the next two months	Base-Flow Sub-Band	M	
	Palmer Index for LOK Tributary Conditions	-1.63 (Dry)	M	
	CDC Precipitation Outlook	1 month: Normal	L	
LOK	CPC Precipitation Outlook	3 months: Normal	L	
	LOK Seasonal Net Inflow Outlook ENSO Forecast (positive)	0.39 ft (Dry)	M	
	LOK Multi-Seasonal Net Inflow Outlook	3.07 ft (Normal)	M	
	ENSO Forecast (positive)	(Normal)		
	WCA 1: 3 Station Average (Site 1-7, Site 1-8T & Site 1-9)	Above Line 1 (16.77 ft)	L	
WCAs	WCA 2A: Site 2-17 HW	Above Line 1 (12.67ft)	L	
	WCA-3A: 3 Station Average (Site 63, 64, and 65)	Above Line 1 (9.85 ft)	L	
	Service Area 1	Year-Round Irrigation Rule in effect	L	
LEC	Service Area 2	Year-Round Irrigation Rule in effect	L	
	Service Area 3	Year-Round Irrigation Rule in effect	L	

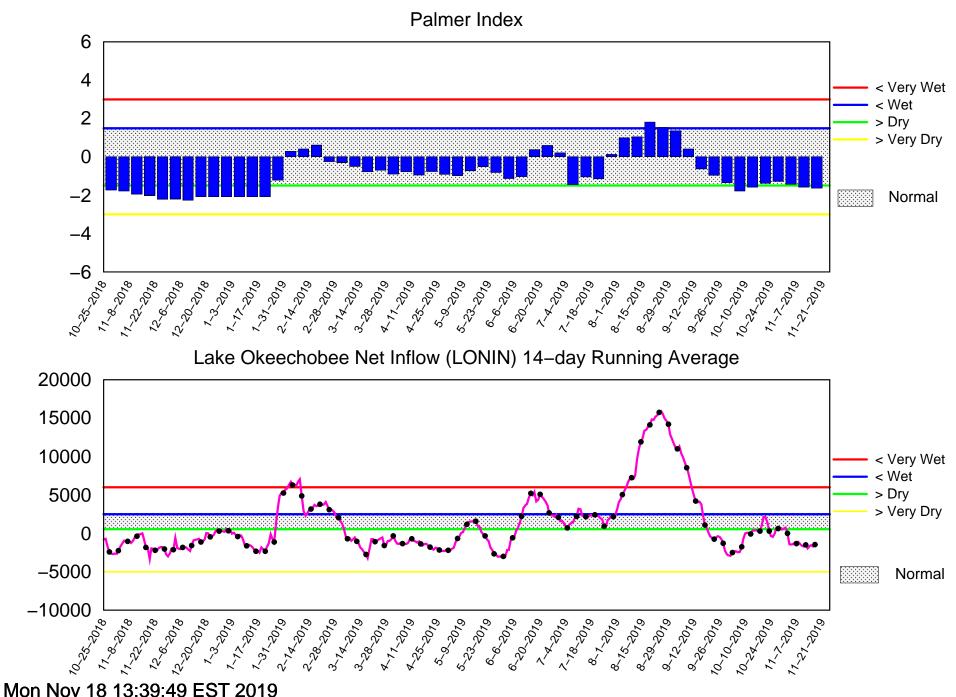
Note: The water supply risk classification based on the Palmer index, as well as the LOK seasonal and multi-seasonal net inflow outlooks use slightly different classification intervals than those used by the 2008-LORS.

Lake Okeechobee SFWMM Nov 2019 Position Analysis



(See assumptions on the Position Analysis Results website)

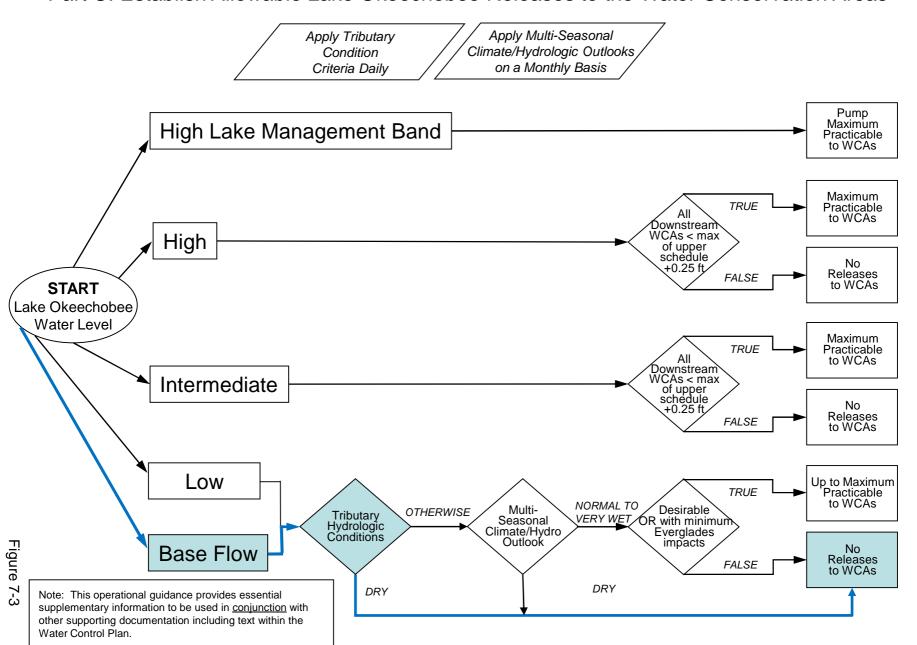
Tributary Basin Condition Indicators as of November 18 2019



Flow (cfs)

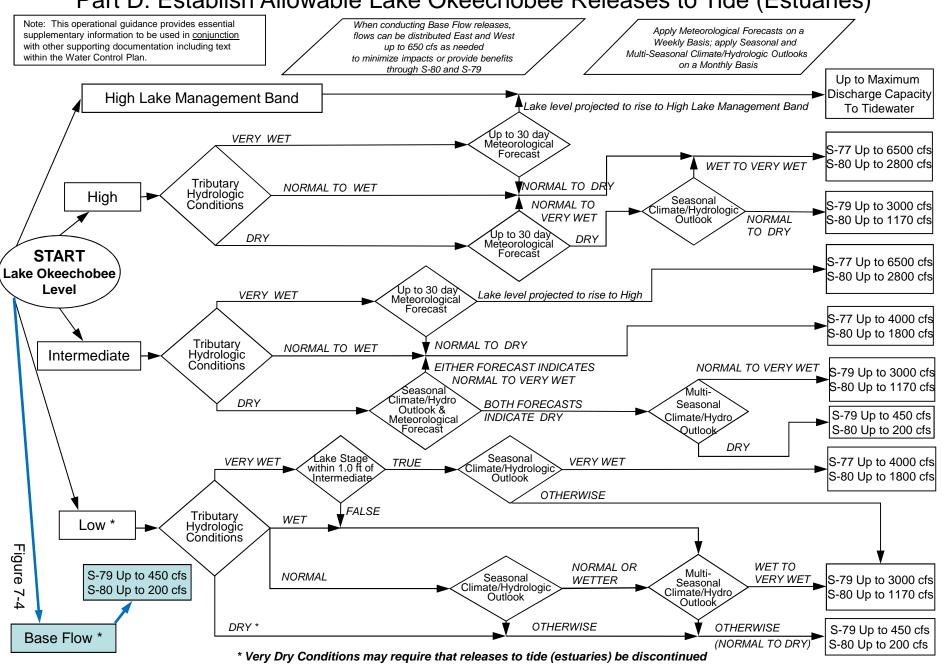
2008 LORS

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

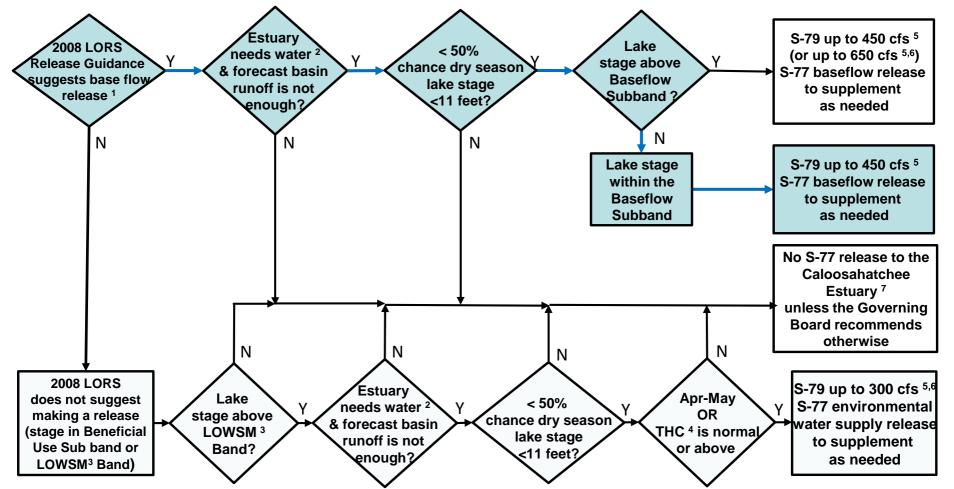


2008 LORS

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



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



¹The 2008 LORS Release Guidance (Part D) can suggest baseflow releases in the Intermediate, Low, or Baseflow Subbands.

²Estuary "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.

³LOWSM = Lake Okeechobee Water Shortage Management.

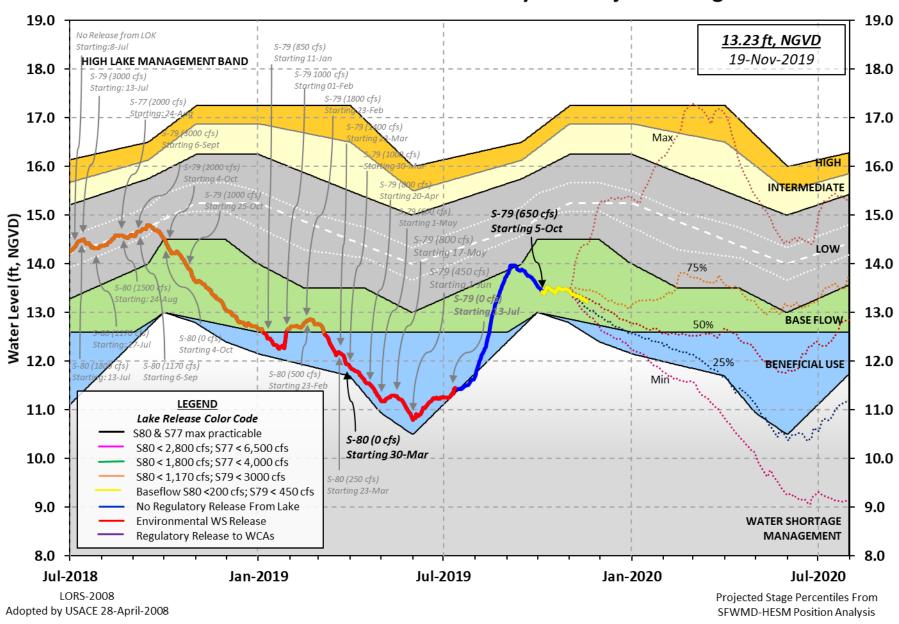
⁴Tributary Hydrologic Condition (THC) is based on classification of Lake Okeechobee Net Inflow and Palmer Index.

⁵Can release less than the "up to" limit if lower release is sufficient to reach or sustain desired estuary salinity; cfs = cubic feet per second.

⁶After reviewing conditions in Water Conservation Areas (WCAs), Stormwater Treatment Areas (STAs), ENP, St. Lucie Estuary and Lake Okeechobee.

⁷Should 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



Data Ending 2400 hours 17 NOV 2019

Okeechobee Lake Regulation *Okeechobee Lake Elevation Bottom of High Lake Mngmt:	(ft-NGVD) n 13.24	(ft-NGV 13.3	D) (ft-NGVD) 7 -NR- (Off	icial Elv) 7
Currently in Operational I			2	
Simulated Average LORS2008 Difference from Average LO		13.87 -0.63		
17NOV (1965-2007) Period of Difference from POR Average		re 14. -1.7		
Today Lake Okeechobee electrons	vation is determ	nined fro	m the 4 Int & 4	Edge
++Navigation Depth (Based	on 2007 Channel	Conditi	on Survey) Rout	e 1 ÷
7.18'	0000 %	~ 1'.'		0
++Navigation Depth (Based 5.38'	on 2008 Channel	Conditi	on Survey) Rout	e 2 ÷
Bridge Clearance = 50.40'				
_				
4 Interior and 4 Edge Okeech	hobee Lake Avera	.ge (Avg-	Daily values):	
L001 L005 L006 LZ40	S4 S352	S308	S133	
13.12 13.17 -NR- 13.20				
*Combination Okeechobee A	va-Dailv Lake Av	rerage =	13 24	
	vy barry bane niv	crage	(*See Note)	
_				
Okeechobee Inflows (cfs):				
	S65EX1	0	Fisheating Cr	13
	S191	0	S135 Pumps	0
	S133 Pumps	0	S2 Pumps	0
	S127 Pumps	0	S3 Pumps	0
	S129 Pumps S131 Pumps	0 0	S4 Pumps C5	0 0
Total Inflows: 223	υτυτ εαπρο	U		U
Okeechobee Outflows (cfs):				
	S354	0	S77	326
	S351	0	S308	125
	S352 L8 Canal Pt	0 -27		
Total Outflows: 424	no canar re	<u> </u>		

	iicaawacci	Idliwatti				Gat	C I O	316101	15	
	Elevation	Elevation	Disch	#1	#2	#3	#4	#5	#6	#7
#8	(ft-msl)	(ft-msl)	(afa)	(f+)	(f+)	(f+)	(f+)	(f+)	(f+)	(f+)
(ft)	(IC msi)	(IC msI)	(CIS)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
		(I) see n	ote at	bott	com				
North East Sh	nore									
S133 Pumps S193:	: 12.98	13.02	0	0	0	0	0	0	(cfs	;)
	18.31	13.05	0	-NR-	0.0	0.0				
S135 Pumps		13.13	0	0		0.0	0		(cfs	.)
S135 Culve		13.13	0	0.0		O	O		(CIS	, ,
North West Sh	2020									
		10.00	010	0 5	0 1	0 0	0 2	0 1	0 0	
S65E:	21.19	12.93	210	0.5	0.1	0.0	0.3	0.1	0.0	
	21.19	12.93	0							
S127 Pumps		13.06	0	0	0	0	0	0	(cfs	;)
S127 Culve	rt:		0	0.0						
S129 Pumps	: 12.91	13.18	0	0	0	0			(cfs	;)
S129 Culve	rt:		0	0.0						
S131 Pumps	: 12.97	13.08	0	0	0				(cfs	;)
S131 Culve			0							
Fisheating	Creek									
nr Palmda		28.62	13							
nr Lakepo	ort									
C5:		-NR-	0	-NF	RNF	RNF	-5			
South Shore										
S4 Pumps:	11.73	13.26	0	0	0	0			(cfs	;)
S169:	13.32	11.78	105	1.0	1.0	0.5			,	•
S310:	13.19	11.70	36	1.0		0.5				

```
      S3 Pumps:
      9.51
      13.37
      0
      0
      0
      0

      S354:
      13.37
      9.51
      0
      0.0
      0.0

      S2 Pumps:
      9.17
      -NR-
      0
      0
      0
      0

      S351:
      -NR-
      9.17
      0
      0.0
      0.0
      0.0

      S352:
      13.46
      9.17
      0
      0.0
      0.0

      C10A:
      -NR-
      13.53
      8.0
      8.0
      8.0

                                                                       (cfs)
                                                 0 0 0 0
                                                                               (cfs)
                            13.53
13.33 -27
                                                8.0 8.0 8.0 0.0 0.0
  L8 Canal PT
                      S351 and S352 Temporary Pumps/S354 Spillway
                            -NR- 0 -NR--NR--NR--NR--NR-
13.46 0 -NR--NR--NR-
13.37 0 -NR--NR--NR-
                  9.17
  S351:
  S352:
                  9.17
  S354:
                  9.51
Caloosahatchee River (S77, S78, S79)
  S47B: 12.99 12.59
                                                0.0 0.0
                            12.59 0.0
11.10 7 0.0
  S47D:
                 12.59
  S77:
    Spillway and Sector Preferred Flow:
                 12.90 10.98 322 0.0 0.0 2.5 0.0
                                         4
    Flow Due to Lockages+:
  S78:
    Spillway and Sector Flow:
                10.97 2.63 174 0.0 0.0 0.0 0.5
    Flow Due to Lockages+:
                                          11
  S79:
    Spillway and Sector Flow:
                         1.49 761 0.0 0.0 0.0 1.0 1.0 0.0 0.0
                   2.72
0.0
    Flow Due to Lockages+:
    Percent of flow from S77
                                          42%
                  (ppm)
    Chloride
                                          0
St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Preferred Flow:
                 13.26 13.10 125 0.0 0.0 0.0 0.0
    Flow Due to Lockages+:
                                           0
          18.73 12.86 0 0.0 0.0
  S153:
  S80:
    Spillway and Sector Flow:
    13.23 2.69 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Flow Due to Lockages+: 18
    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

---- Wind ---Daily Precipitation Totals 1-Day 3-Day 7-Day Direction Speed (inches) (inches) (inches) (Degø) (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: 0.00 0.00 -NR--NR-S127 Pump Station: 0.00 0.00 S129 Pump Station: -NR-0.00 0.00 0.00 0.00 S131 Pump Station: -NR-S77: 0.00 0.36 0.38 300 S78: 0.00 0.09 0.14 302 S79: 2.88 2.89 352 3 2.54 0.00 S4 Pump Station: 0.00 -NR-Clewiston Field Station: -NR-0.00 0.00 0.00 0.00 S3 Pump Station: -NR-S2 Pump Station: -NR-0.00 0.00 31.13 31.13 S308: 346 31.02 S80: 8.51 8.68 8.95 307 5 Okeechobee Average 15.51 2.42 2.42 (Sites S78, S79 and S80 not included) Oke Nexrad Basin Avg 0.00 0.21 0.23 ______

_ Okeechobee Lake Elevations	17 NOV 2019	13.24 Difference from	
17NOV19			
17NOV19 - 1 Day =	16 NOV 2019	13.26 0.02	!
17NOV19 - 2 Days =	15 NOV 2019	13.28 0.04	
17NOV19 - 3 Days =	14 NOV 2019	13.28 0.04	
17NOV19 - 4 Days =	13 NOV 2019	13.27 0.03	}
17NOV19 - 5 Days =	12 NOV 2019	13.32 0.08	}
17NOV19 - 6 Days =	11 NOV 2019	13.32 0.08	}
17NOV19 - 7 Days =	10 NOV 2019	13.33 0.09)
17NOV19 - 30 Days =	18 OCT 2019	13.40 0.16	
17NOV19 -1 Year =	17 NOV 2018	13.37 0.13	}
17NOV19 - 2 Year =	17 NOV 2017	-NRNR-	

Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = 2.74

	17NOV19	-	Today	=	17	NOV	2019	-1435	MON	-3788
	17NOV19	-1	Day	=	16	NOV	2019	-1663	SUN	-4154
	17NOV19	-2	Days	=			2019	-1515	SAT	398
	17NOV19		Days				2019	-1645	FRI	2829
	17NOV19		Days				2019	-1939	THU	-9651
	17NOV19		Days				2019	-1498	WED	827
	17NOV19		Days				2019	-1678	TUE	-1194
	17NOV19		Days				2019	-1740	MON	369
			_				2019	-1740	_	I .
	17NOV19		Days						SUN	-1546
	17NOV19		Days				2019	-1040	SAT	-1365
	17NOV19		_				2019	-1214	FRI	-1453
	17NOV19		_				2019	-1105	THU	-1371
	17NOV19		_				2019	-1298	WED	760
	17NOV19	-13	Days	=	04	NOV	2019	-1350	TUE	-751
_										
_						C (55E			
					71102222			nrossi oud	14 days	l Arra Dailr Elou
	1 7NOV11 0		тоде-				2019	previous 217	MON	Avg-Daily Flow 246
	17NOV19	1	Today							I .
	17NOV19		Day				2019	220	SUN	360
	17NOV19		Days				2019	217	SAT	360
	17NOV19		Days				2019	215	FRI	248
	17NOV19		Days				2019	217	THU	352
	17NOV19	-5	Days	=			2019	216	WED	-NR-
	17NOV19	-6	Days	=			2019	231	TUE	-NR-
	17NOV19	-7	Days	=	10	NOV	2019	230	MON	-NR-
	17NOV19	-8	Days	=	09	NOV	2019	246	SUN	0
	17NOV19	-9	Days	=	08	NOV	2019	272	SAT	35
	17NOV19	-10	Days	=	07	NOV	2019	294	FRI	249
	17NOV19		_		06	NOV	2019	294	THU	228
	17NOV19		_				2019	303	WED	170
	17NOV19						2019	316	TUE	135
										I
_										
_										
							55EX1			
								previous		Avg-Daily Flow
	17NOV19		Today	<i>y</i> =			2019	61	MON	0
	17NOV19	-1	Day	=	16	NOV	2019	69	SUN	0
	17NOV19	-2	Days	=	15	NOV	2019	76	SAT	0
	17NOV19	-3	Days	=	14	NOV	2019	83	FRI	0
	17NOV19	-4	Days	=	13	NOV	2019	87	THU	j o
	17NOV19		Days				2019	94	WED	0
	17NOV19		Days				2019	104	TUE	77
	17NOV19		Days				2019	98	MON	55
	17NOV19		Days				2019	102	SUN	0
			Days							17
	17NOV19		-				2019	110	SAT	!
	17NOV19						2019	115	FRI	170
	17NOV19		_				2019	106	THU	86
	17NOV19		_				2019	107	WED	216
	17NOV19	-13	Days	=	04	NOV	2019	102	TUE	228

	_	Below S-77 Discharge	S-78 Discharge	S-79 Discharge	
	(ALL DAY)	(ALL-DAY)	(ALL DAY)	(ALL DAY)	
DATE	(AC-FT)	(AC-FT)	(AC-FT)	(AC-FT)	
17 NOV 2019		700	366	1516	
16 NOV 2019		-69	356	1490	
15 NOV 2019		663	707	416	
14 NOV 2019		1286	1428	1016	
13 NOV 2019		1378	965	1290	
12 NOV 2019		1598	1045	924	
11 NOV 2019		1656	1470	1560	
10 NOV 2019		710	1523	2212	
09 NOV 2019		752	766	1508	
08 NOV 2019		933	317	438	
07 NOV 2019		896	317	653	
06 NOV 2019		897	494	1215	
05 NOV 2019		1150	922	1377	
04 NOV 2019	2223	2224	1334	1770	
	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)
17 NOV 2019		0	0	0	-53
16 NOV 2019		0	0	0	-114
15 NOV 2019		0	0	0	15
14 NOV 2019		0	0	0	-69 50
13 NOV 2019		0	0	0	-58
12 NOV 2019 11 NOV 2019		0	0	0 0	-9 -129
10 NOV 2019		0	0	0	-129 -176
09 NOV 2019		101	0	52	-176
08 NOV 2019		289	0	137	108
07 NOV 2019		0	0	176	145
06 NOV 2019		0	0	173	147
05 NOV 2019		0	0	69	142
04 NOV 2019		136	0	133	180
04 NOV 2013	, 141	130	O	133	100
	S-308	Below S-308	S-80		
	Discharge	Discharge	Discharge	2	
	(ALL DAY)	(ALL-DAY)	(ALL-DAY)	1	
DATE	(AC-FT)	(AC-FT)	(AC-FT)		
17 NOV 2019	399	106	35		
16 NOV 2019	232	112	47		
15 NOV 2019	318	479	26		
14 NOV 2019	1	182	39		
13 NOV 2019		197	25		
12 NOV 2019		-87	29		
11 NOV 2019		229	41		
10 NOV 2019		-389	41		
09 NOV 2019		-38	22		
08 NOV 2019		71	60		
07 NOV 2019		18	34		
06 NOV 2019		-369	24		
05 NOV 2019		-143	58		
04 NOV 2019	-1	155	48		

*** NOTE: Discharge (ALL DAY) is computed using Spillway, Sector Gate and

Lockages Discharges from 0015 hrs to 2400 hrs.

(I) - Flows preceded 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.

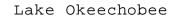
Today Lake Okechobee elevation is determined from the 4 Int & 4 Edge stations

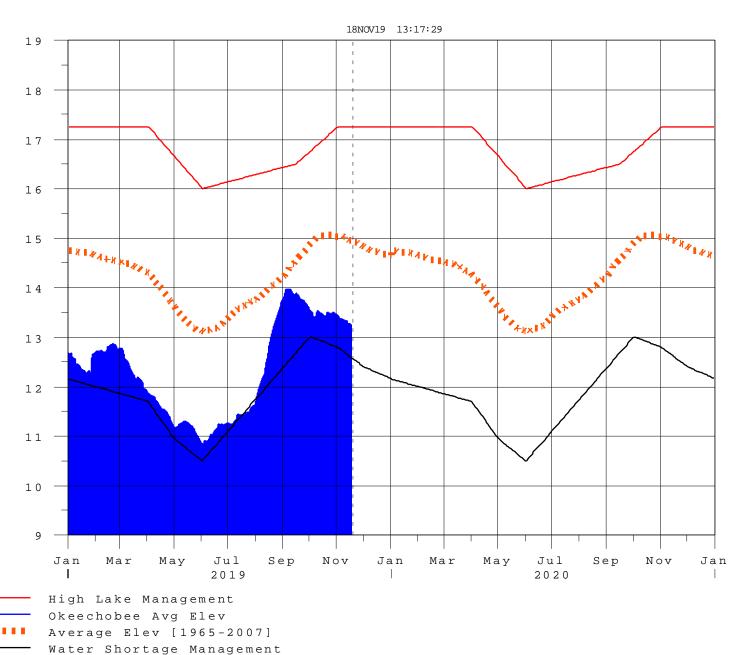
++ For more information see the Jacksonville District Navigation website at http://www.saj.usace.army.mil/

\$ For information regarding Lake Okeechobee Service Area water restrictions

please refer to www.sfwmd.gov

Report Generated 18NOV2019 @ 13:15 ** Preliminary Data - Subject to Revision **





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G V D

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	Palmer Index	2-wk Mean L.O. Net
Classification*	Class Limits	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	Equivalent Depth**	Lake Okeechobee
[million acre-feet]	[feet]	Net Inflow
	20003	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	Equivalent Depth**	Lake Okeechobee
[million acre-feet]	[feet]	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