Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 5/2/2016 (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 Neutral ENSO years⁴. The results for Croley's method and the SFWMD empirical method are based on the <u>CPC Outlook</u>.

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	Cı Me	roley's ethod ^{1*}	SFWMD Empirical Method ²		Sub-sa Neuti Y	ampling of ral ENSO rears ³	Sub-sampling of AMO Warm + Neutral ENSO Years ⁴		
	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	Condition	Value (ft)	<u>Condition</u>	
Current (Apr- Sep)	N/A	N/A	2.31	Very Wet	2.46	Very Wet	2.73	Very Wet	
Multi Seasonal (May- Apr)	N/A	N/A	2.56	Wet	2.90	Wet	4.37	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.

Tributary Hydrologic Conditions Graph:

-1441 cfs 14-day running average for Lake Okeechobee Net Inflow through 5/1/2016. According to the classification in <u>Tributary Hydrologic Conditions</u> table, this condition is Dry.

-0.72 for Palmer Index on 4/30/2016.

According to the classification in <u>Tributary Hydrologic Conditions</u> table, this condition is Normal.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 5/2/2016

Lake Okeechobee Stage: 14.15 feet

USACE Report for Lake Okeechobee

Lake Okeechobee Stage Hydrograph

Lake Okeechob Zone/	ee Management 'Band	Bottom Elevation (feet, NGVD)	Current Lake Stage
High Lake Manage	ement Band	16.61	
	High sub-band	15.99	
Operational Band	Intermediate sub-band	15.25	
	Low sub-band	13.33	← 14.15
Base Flow sub-ba	nd	12.60	
Beneficial Use sub	o-band	10.93	
Water Shortage M	anagement 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 1170 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

Back to Lake Okeechobee Operations Main Page

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

LORS2008 Implementation on 5/2/2016 (ENSO Neutral Condition):

Water Supply Department Technical Input

Water Supply Outlook:

District wide, Raindar rainfall 0.30 inches for the week ending 5/2/2016. Lake stage on 5/2/2016 is 14.15 ft, down 0.32 ft from last week.

The updated April 2016 SFWMM Dynamic Position Analysis <u>percentile graph</u> and <u>tracking chart</u> for Lake Okeechobee show that the lake stage is in the Low Operational Sub-Band.

The LORS2008 tributary <u>indices</u> are classified as **Normal**. The PDSI indicates normal condition and the LONIN is Dry. The classification is based on the wetter of the two.

Water Supply Risk Evaluation

Area	Indicator	Value	Color Coded Scoring Scheme
	Projected LOK Stage for the next two months	Low Sub-Band	L
	Palmer Index for LOK Tributary Conditions	-0.72 (Normal)	L
	CPC Precipitation Outlook	1 month: Above Normal	L
LOK	CI CI recipitation Outlook	3 months: Above Normal	L
	LOK Seasonal Net Inflow Forecast El Nino	2.46 ft (Normal to Extremely Wet)	L
	LOK Multi-Seasonal Net Inflow Forecast El Nino	3.90 ft (Wet)	L
	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (15.82 ft)	L
WCAs	WCA 2A: Site 2-17 HW	Above Line1 (11.57 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (9.72 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 forecasts use slightly different classification intervals than those used by the 2008-LORS.

Back to Lake Okeechobee Operations Main Page Back to U.S. Army Corps of Engineers LORSS Homepage

Lake Okeechobee SFWMM April 2016 Position Analysis



(See assumptions on the Position Analysis Results website)

Tributary Basin Condition Indicators as of May 2 2016

Palmer Index



Mon May 02 13:02:14 EDT 2016

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)



2008 LORS FORECAST

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



2008 LORS FORECAST

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



Lake Okeechobee Water Level History and Projected Stages



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 01 MAY 2016 Okeechobee Lake Regulation Elevation Last Year 2YRS Ago (ft-NGVD) (ft-NGVD) (ft-NGVD) *Okeechobee Lake Elevation 14.15 13.84 13.05 (Official Elv) Bottom of High Lake Mngmt= 16.64 Top of Water Short Mngmt= 10.94 Currently in Operational Management Band Simulated Average LORS2008 [1965-2000] 12.36 Difference from Average LORS2008 1.79 01MAY (1965-2007) Period of Record Average 13.57 Difference from POR Average 0.58 Today Lake Okeechobee elevation is determined from the 4 Int & 4 Edge stations ++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.09' ++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.29' Bridge Clearance = -NR-' 4 Interior and 4 Edge Okeechobee Lake Average (Avg-Daily values): L001 L005 L006 LZ40 S4 S352 S308 S133 14.05 14.29 14.22 14.12 14.18 14.18 -NR- 14.12 *Combination Okeechobee Avg-Daily Lake Average = 14.15 (*See Note) Okeechobee Inflows (cfs): S65E 1060 C5 -128 Fisheating Cr -NR-0 S154 0 S191 S135 Pumps 0 0 S84 0 S133 Pumps S2 Pumps 0 0 0 0 S84X S127 Pumps S3 Pumps 0 0 S71 0 S129 Pumps S4 Pumps 0 S72 0 S131 Pumps Total Inflows: 932 Okeechobee Outflows (cfs): S135 Culverts 0 S354 -NR-S77 (Not Used) S127 Culverts 0 S351 1294 S77Below 2777 (USED) S129 Culverts -NR- S352 830 S308 (Not Used)

S131 Culverts -NR- L8 Canal Pt 246 S308Below 734 (USED) Total Outflows: No Report Due To Missing S77 or S308 Discharge Data ****S77 Structure outflow is being used to compute Total Outflow. ****S308 Structure outflow is being used to compute Total Outflow. Okeechobee Pan Evaporation (inches): S77 0.24 S308 -NR-Average Pan Evap x 0.75 Pan Coefficient = -NR-" = -NR-' Lake Average Precipitation using NEXRAD: = 0.00" = 0.00' Evaporation - Precipitation: = -NR-" = -NR-' Evaporation - Precipitation using Lake Area of 730 square miles is equal to -NR-Lake Okeechobee (Change in Storage) Flow is -12957 cfs or -25700 AC-FT

Note: Headwater, tailwater, and stage values below are instantaneous values unless otherwise specified.

	Headwater	Tailwater				Gat	te Pos	sition	ns	
	Elevation	Elevation	Disch	#1	#2	#3	#4	#5	#6 #	7
#8										
	(ft-msl)	(ft-msl)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft) (f	t)
(ft)		(-	- 、							
North Fact Ch	aaro	()	.) see r	iote at	DOLI	LOW				
S133 Pumps	: 13.37	14.05	0	0	0	0	0	0	(cfs)	
S191:	18.07	14.04	0	0.0	0.0	0.0				
S135 Pumps	:	-NR-	0	0	0	0	0		(cfs)	
S135 Culver	rts:		0	-NR-	-NR-					
North West Sh	nore									
S65E:	21.09	13.82	1060	0.0	0.6	0.6	0.6	0.6	0.0	
S127 Pumps	: 13.11	14.15	0	0	0	0	0	0	(cfs)	
S127 Culve	rt:		0	0.0						
S129 Pumps	: 12.99	14.26	0	0	0	0			(cfs)	
S129 Culver	rt:		-NR-	-NR-						
S131 Pumps	: 12.81	14.51	0	0	0				(cfs)	
S131 Culver	rt:		-NR-							
Fisheating	Creek									
nr Palmda nr Lakepo	ale		-NR-							
C5:	14.28	14.23 -	-128	5.2 5	5.3 5	5.3				

South Shore								
S4 Pumps:	10.97	14.18	0	0	0	0		(cfs)
S169:	14.19	10.96	107	0.0	0.0	0.0		
S310:	14.11		98					
S3 Pumps:	11.61	14.14	0	0	0	0		(cfs)
S354:	14.14	11.61	-NR-	1.8	2.0			
S2 Pumps:	11.46	14.07	0	0	0	0	0	(cfs)
S351:	14.07	11.46	1294	2.4	2.2	2.5		
S352:	14.15	11.31	830	1.8	1.8			
C10A:	-NR-	14.11		0.0	0.0	4.0	0.0	0.0
L8 Canal PT		13.91	246					

		S351	and S352	2 Tempora	ary Pun	nps/S3	354 Sp	oillwa	У		
S3 S3	51: 52:	11.46 11.31	14.07 14.15	1294 830	-NR1 -NR1	NRNF NRNF	RNR- RNR-	-NR	NR-		
S3	54:	11.61	14.14	-NR-	-NR1	NRNF	RNR-				
~ 1											
Calc	osahatche	e River (S	77, S78,	S79)	0 0						
S4	/B:	13.82	10.88	1.0	0.0	0.0					
S4 S7	7D: 7:	10.96	10.96	12	4.9						
	Spillway	and Sector	Flow:								
		13.85	11.06	2777	3.0	3.5	3.5	3.0			
	Flow Due	to Lockage	s+:	7							
S7	7 Below U	JSGS Flow G	age	2777							
S7	8:										
	Spillway	and Sector	Flow:								
		11.03	2.87	2200	2.0	2.5	2.5	0.0			
	Flow Due	to Lockage	s+:	14							
S7	9:										
	Spillway	and Sector	Flow:								
1 0		2.96	2.52	2815	2.0	2.0	1.0	2.0	2.0	2.0	1.0
1.0	Flow Duo	to Toakago	a+.	Q							
	Percent c	to Lockage	5+• m 977	0 988							
	Chloride	JI IIOW IIO	(ppm)	63							
st. s3	Lucie Can 08:	al (S308, S	S80)								
	Spillway	and Sector	Flow:								
		-NR-	-NR-	734	5.2 5	5.2 5	5.2 5	.2			
	Flow Due	to Lockage	s+:	-NR-							
S3	08 Below	USGS Flow (Gage	734							
S1	53:	18.69	13.76	0	0.0	0.0					
S8	0:										
	Spillway	and Sector	Flow:								
		13.83	0.60	876	0.0	0.4	0.5	0.0	0.5	0.4	0.0
	Flow Due	to Lockage	s+:	28							
	Percent c	of flow from	m S308	-NR-%							

Steele	Point	Top Salinity	(mg/ml)	* * * *
Steele	Point	Bottom Salinity	(mg/ml)	* * * *
			, <u>,</u>	
Speedy	Point	Top 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.

				Wi	.nd
aily Precipitation Totals peed	1-Day	3-Day	7-Day	Directio	n
	(inches)	(inches)	(inches)	(Deqø)	
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	0.00	0.00	144	3
S78:	0.00	0.00	0.01	95	8
S79:	0.00	0.04	0.41	168	3
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:	-NR-	* * * * * * *	* * * * * * *	-NR-	-NR-
S80:	0.00	0.00	0.00	109	2
Okeechobee Average	0.00	3482.54	* * * * * * *		
(Sites S78, S79 and	S80 not in	cluded)			
Oke Nexrad Basin Avg	0.00	0.05	0.08		

Okeechobee Lake Elevations 01 MAY 2016 14.15 Difference from 01MAY16 14.21 01MAY16 -1 Day = 30 APR 2016 0.06 29 APR 2016 01MAY16 -2 Days = 14.25 0.10 01MAY16 -3 Days = 28 APR 2016 14.28 0.13 27 APR 2016 01MAY16 -4 Days = 14.33 0.18 26 APR 2016 01MAY16 -5 Days = 14.38 0.23 01MAY16 -6 Days = 25 APR 2016 14.42 0.27 01MAY16 -7 Days = 24 APR 2016 14.47 0.32 01 APR 2016 01MAY16 -30 Days = 15.11 0.96 01MAY16 -1 Year = 01 MAY 2015 13.84 -0.31 01MAY16 -2 Year = 01 MAY 2014 13.05 -1.10 Long Term Mean 30day Avearge ET for Lake Alfred (Inches) = -NR-

_											
				La	ake (Okeed	chobee	Net Inflo	ow (LONIN)		
			7	Average	Flow	v ove	er the	previous	14 days	Avg-Daily	Flow
	01MAY16		Today	=	01	MAY	2016	-1066	MON	-NR-	
	01MAY16	-1	Day	=	30	APR	2016	-1453	SUN	-NR-	
	01MAY16	-2	Days	=	29	APR	2016	-1814	SAT	-NR-	
	01MAY16	-3	Days	=	28	APR	2016	-1038	FRI	-2798	
	01MAY16	-4	Days	=	27	APR	2016	-865	THU	-3353	
	01MAY16	-5	Days	=	26	APR	2016	-674	WED	-1845	
	01MAY16	-6	Days	=	25	APR	2016	-576	TUE	-4722	
	01MAY16	-7	Days	=	24	APR	2016	-154	MON	-3498	
	01MAY16	-8	Days	=	23	APR	2016	-243	SUN	10982	
	01MAY16	-9	Days	=	22	APR	2016	-1610	SAT	1207	
	01MAY16	-10	Days	=	21	APR	2016	-1643	FRI	-4330	
	01MAY16	-11	Days	=	20	APR	2016	-876	THU	-1908	
	01MAY16	-12	Days	=	19	APR	2016	-883	WED	-655	
	01MAY16	-13	Days	=	18	APR	2016	-751	TUE	-802	

—

S65E									
				Average	Flov	v over	previous	14 days	Avg-Daily Flow
01MAY16		Today	/=	01	MAY	2016	1921	MON	1060
01MAY16	-1	Day	=	30	APR	2016	2018	SUN	1365
01MAY16	-2	Days	=	29	APR	2016	2099	SAT	1478
01MAY16	-3	Days	=	28	APR	2016	2190	FRI	1752
01MAY16	-4	Days	=	27	APR	2016	2269	THU	1766
01MAY16	-5	Days	=	26	APR	2016	2371	WED	2024
01MAY16	-б	Days	=	25	APR	2016	2467	TUE	2090
01MAY16	-7	Days	=	24	APR	2016	2594	MON	2043
01MAY16	-8	Days	=	23	APR	2016	2740	SUN	2325
01MAY16	-9	Days	=	22	APR	2016	2887	SAT	2096
01MAY16	-10	Days	=	21	APR	2016	3058	FRI	2319
01MAY16	-11	Days	=	20	APR	2016	3235	THU	2279
01MAY16	-12	Days	=	19	APR	2016	3439	WED	2119
01MAY16	-13	Days	=	18	APR	2016	3660	TUE	2175

______ Lake Okeechobee Outlets Last 14 Days

		S-77	S-77	Below S-77	S-78	S-78	S-79
		Discharge	Discharge	Discharge	Discharge	Discharge	Discharge
		(0700 - 2100)	(ALL DAY)	(ALL-DAY)	(0700 - 2100)	(ALL DAY)	(ALL DAY)
	DATE	(AC-FT)	(AC-FT)	(AC-FT)	(AC-FT)	(AC-FT)	(AC-FT)
01	MAY 202	16		5507	-NR-	4390	5598
30	APR 202	16		4011	-NR-	3707	4680
29	APR 202	16		4545	-NR-	3491	5212
28	APR 202	16		6457	-NR-	5502	6472
27	APR 202	16		6000	-NR-	5003	5992
26	APR 202	16		5312	-NR-	4678	5854
25	APR 202	16		5310	-NR-	4474	5143
24	APR 202	16		4300	-NR-	3795	4468
23	APR 202	16		2573	-NR-	3873	3159
22	APR 202	16		4541	-NR-	3017	3272

21 20 19 18	APR APR APR APR	2016 2016 2016 2016			7697 7906 6944 4836	- NR - - NR - - NR - - NR -	6066 6196 5662 4408	6288 8126 6639 5278
01 29 28 27 26 25 24 23 22 21	DATI MAY APR APR APR APR APR APR APR APR APR APR	2016 2016 2016 2016 2016 2016 2016 2016	S-310 Discharge (ALL DAY) (AC-FT) 194 209 230 272 200 94 32 8 50 76 245	S-351 Discharge (ALL DAY) (AC-FT) 2566 2784 2971 3024 3060 3008 2479 1816 2183 1896 2812	S-352 Discharge (ALL DAY) (AC-FT) 1646 1674 1721 1723 1705 1763 1600 1452 1495 1452 1614	S-354 Discharge (ALL DAY) (AC-FT) -NR- -NR- 1703 1307 1461 821 829 1259 1281 1547	L8 Canal Pt Discharge (ALL DAY) (AC-FT) 488 503 520 544 323 245 354 379 386 362 340	
20	APR	2016	267	3207	1678	1267	386	
19 18	APR ADR	2016	299	3018 2027	1093	1089 357	398 397	
01 30 29 28 27 26 25 24 23 22 21 20 19 18	DATH MAY APR APR APR APR APR APR APR APR APR APR	2016 2016 2016 2016 2016 2016 2016 2016	S-308 Discharge (ALL DAY) (AC-FT)	Below S-303 Discharge (ALL-DAY) (AC-FT) 1455 1666 1296 1995 1952 1548 1568 1384 1083 1460 2598 2768 2534 2298	8 S-80 Discharg (ALL-DAY (AC-FT) 902 943 -NR- 1337 1703 1337 1154 867 679 809 1756 2189 1724 1425	e)		
** Sed	* NG ctor)TE:	1) Discha Gate 1	arge from (0' Discharges f	700-2100) i rom 0700 hr	s computed s to 2100 h	using Spillway rs.	and
and	f		Locka	ges Discharge	es from 001	5 hrs to 24	00 hrs.	JI GALE
) – I	lows	preceede	d bv "I" sig	nifv an ins	tantaneous		

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 02MAY2016 @ 11:38 ** Preliminary Data - Subject to Revision **



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

<u>6-15 Day Precipitation Outlook Categories</u>

Table ?? in the Lake Okeechobee Water Control Plan

<u>Classification of Lake Okeechobee Net Inflow for Seasonal</u>

<u>Outlook</u>

 Table K-3 in the Lake Okeechobee Water Control Plan

<u>Classification of Lake Okeechobee Net Inflow for Multi-</u>

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	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
		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
[]	[1001]	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