Application of the Lake Okeechobee Regulation Schedule (LORS2008) on 8/29/2016 (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 Neutral 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 (Aug-Jan)	N/A	N/A	1.75	Wet	2.29	Very Wet	2.92	Very Wet
Multi Seasonal (Aug-Apr)	N/A	N/A	1.77	Normal	2.32	Normal	2.99	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.

Tributary Hydrologic Conditions Graph:

498 cfs 14-day running average for Lake Okeechobee Net Inflow through 8/29/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Dry.

-1.29 for Palmer Index on 8/27/2016.
According to the classification in Tributary Hydrologic Conditions table, this condition is Normal.

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

LORS2008 Classification Tables:

Lake Okeechobee Stage on 8/29/2016

Lake Okeechobee Stage: **14.71 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		16.42	
Operational Band	High sub-band	16.02	
	Intermediate sub-band	15.62	
	Low sub-band	13.83	← 14.71
Base Flow sub-band		12.60	
Beneficial Use sub-band		12.32	
Water Shortage Management 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 450 cfs and S-80 up to 200 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 8/29/2016 (ENSO Neutral Condition):

Status for week ending 8/29/2016:

District wide, Raindar rainfall was 1.52 inches for the week. Lake stage on 8/29/2016 was 14.71 ft, down 0.01 ft from last week.

The updated August 2016 SFWMM Dynamic Position Analysis percentile graph for Lake Okeechobee show that the current lake stage is in the Low Operational Sub-Band.

The LORS2008 tributary indices 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
LOK	Projected LOK Stage for the next two months	Low Sub-Band	L
	Palmer Index for LOK Tributary Conditions	-1.29 (Dry)	M
	CPC Precipitation Outlook	1 month: Normal	L
		3 months: Normal	L
	LOK Seasonal Net Inflow Forecast	2.29 ft (Normal to Extremely Wet)	L
	ENSO Neutral Years		
	LOK Multi-Seasonal Net Inflow Forecast	2.32 ft (Normal)	M
	ENSO Neutral Years		
WCAs	WCA 1: Site 1-7, Site 1-8T, & Site 1-9 Average	Above Line 1 (16.23 ft)	L
	WCA 2A: Site 2-17 HW	Above Line1 (12.77 ft)	L
	WCA-3A: 3 Station Average (Site 63, 64 and 65)	Above Line 1 (10.20 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 forecasts use slightly different classification intervals than those used by the 2008-LORS.

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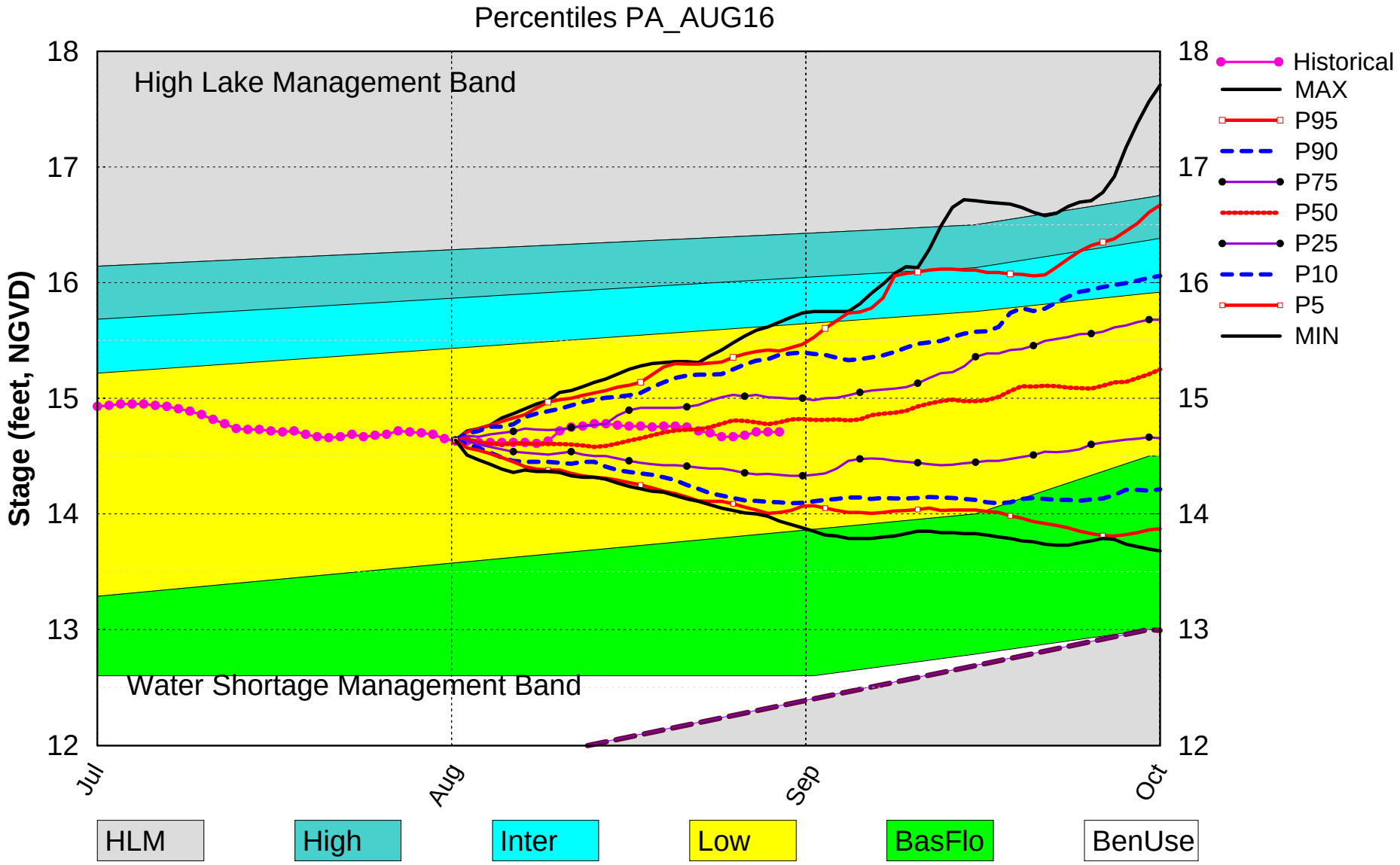
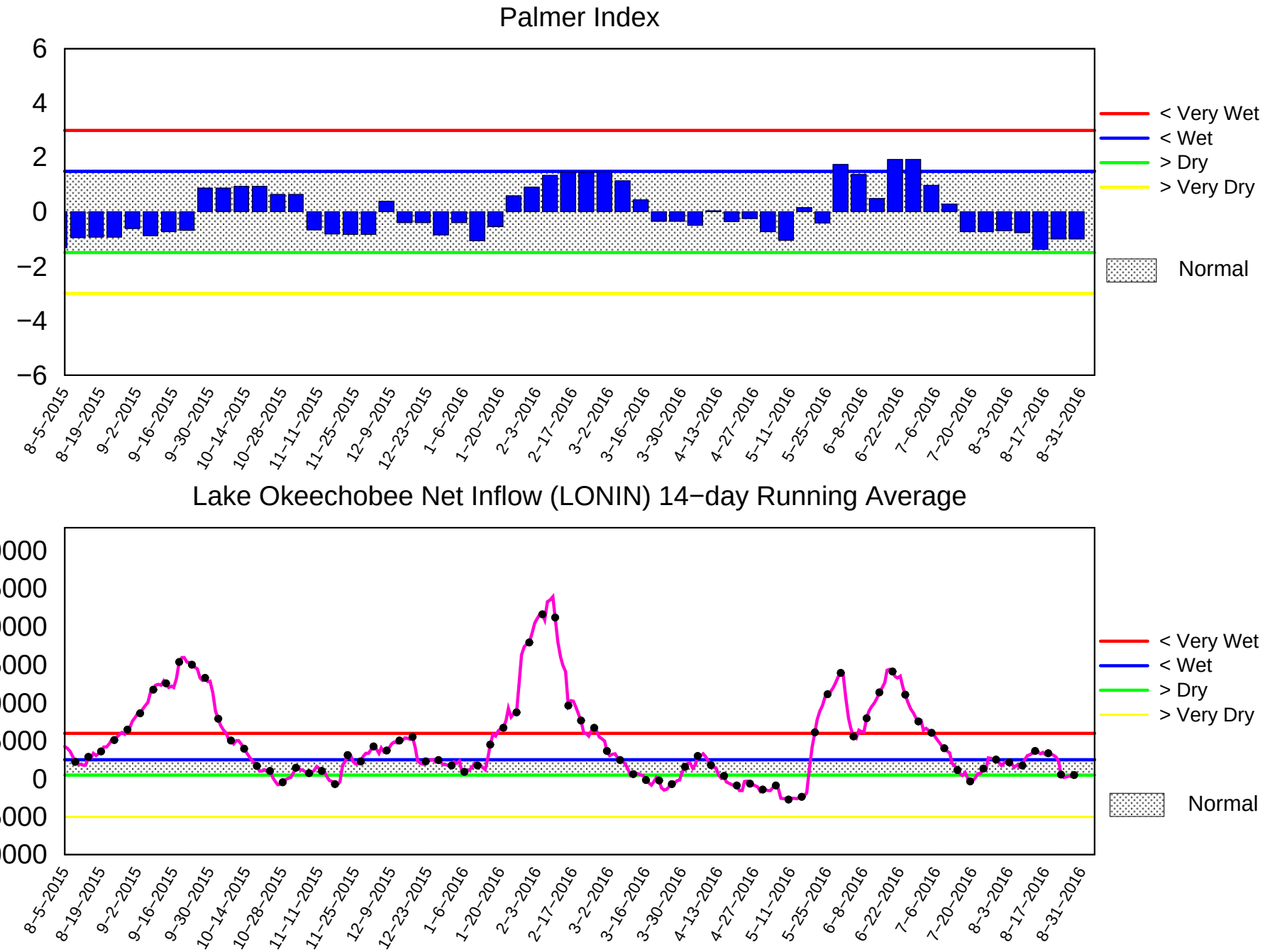
Lake Okeechobee SFWMM August 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Aug 29 12:10:41 2016

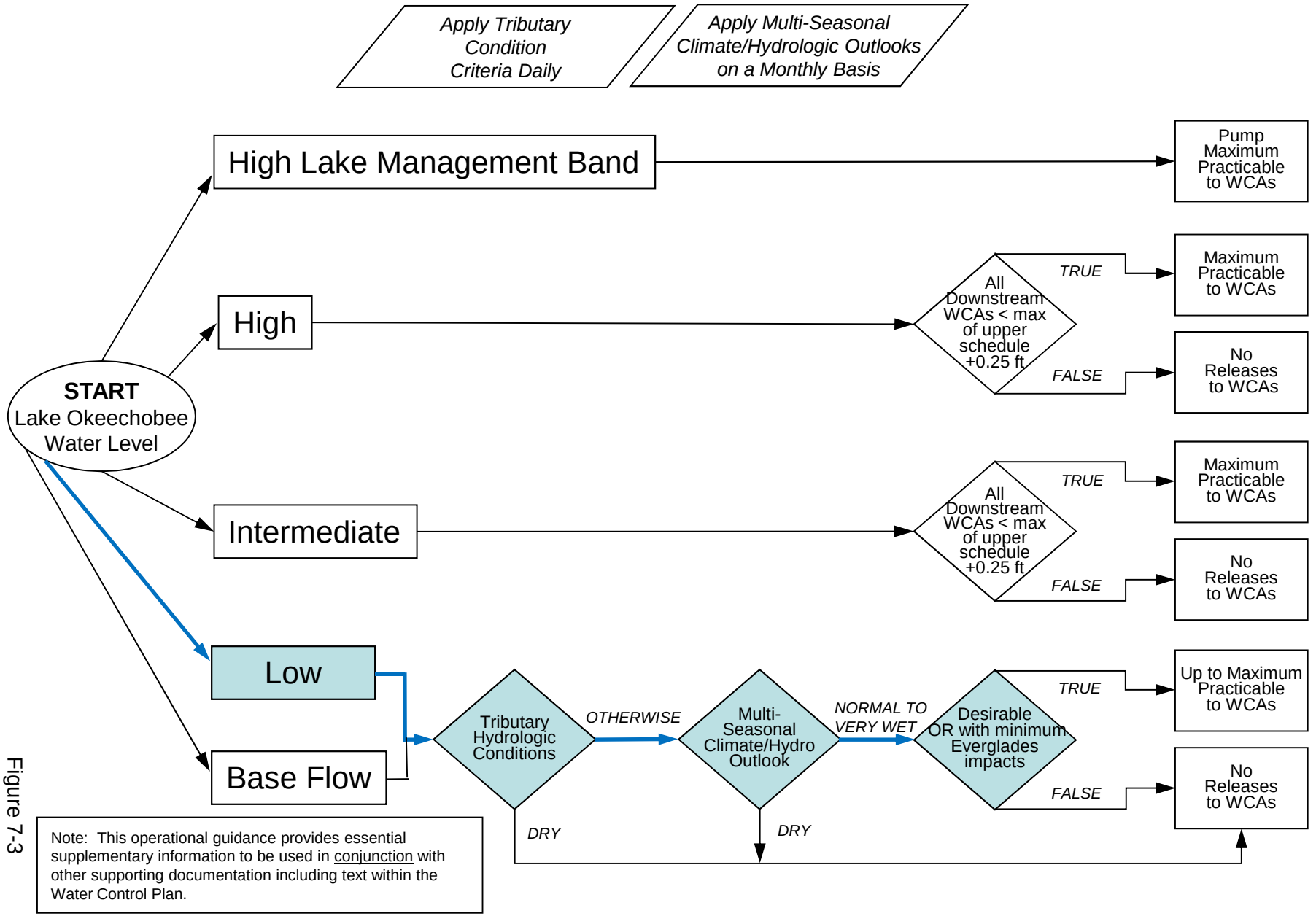
Tributary Basin Condition Indicators as of August 29 2016



Mon Aug 29 11:58:59 EDT 2016

2008 LORS

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



Note: This operational guidance provides essential supplementary information to be used in conjunction with other supporting documentation including text within the Water Control Plan.

Figure 7-3

2008 LORS

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

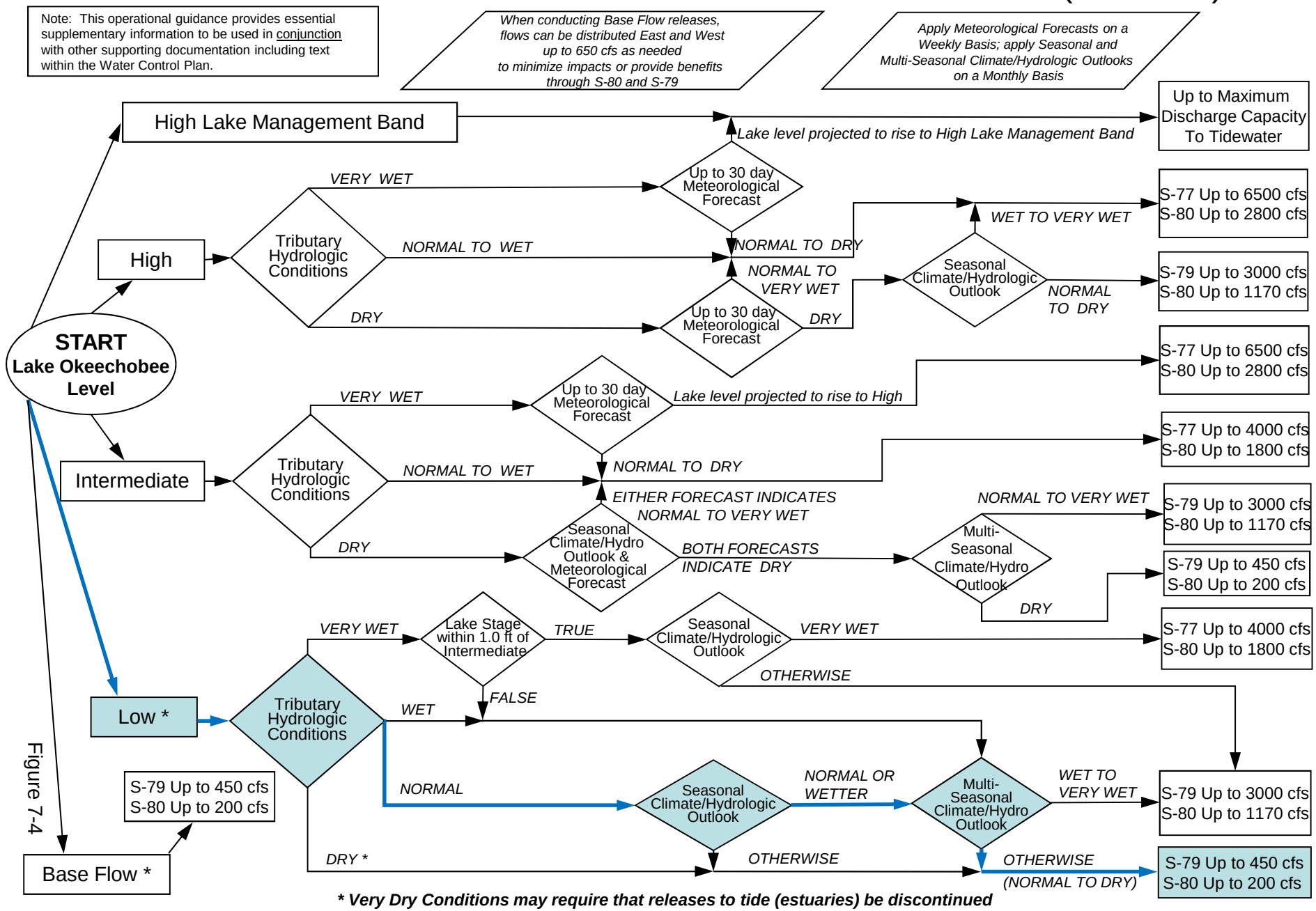
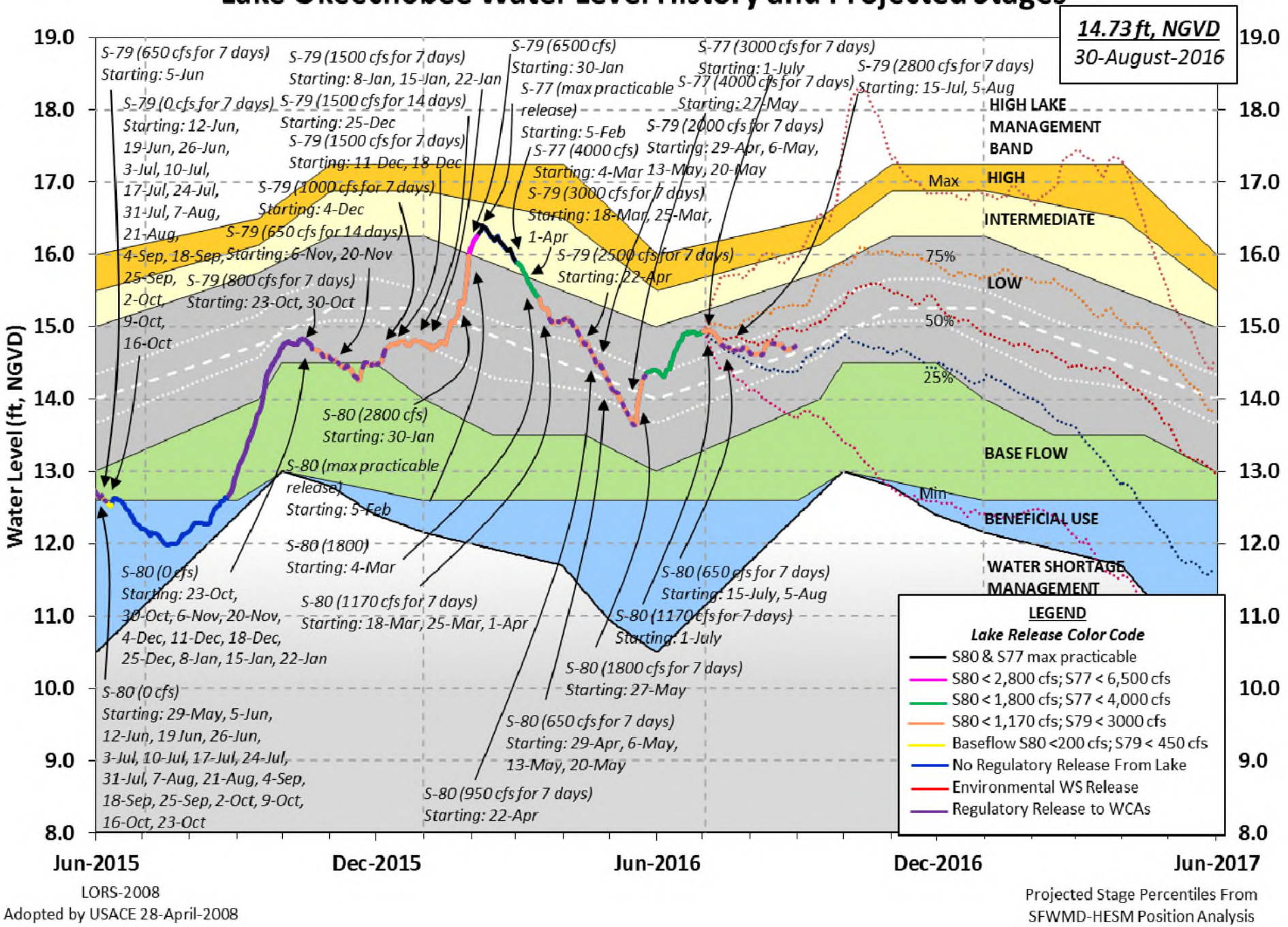


Figure 7-4

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 28 AUG 2016

Okeechobee Lake Regulation	Elevation (ft-NGVD)	Last Year (ft-NGVD)	2YRS Ago (ft-NGVD)
*Okeechobee Lake Elevation	14.71	12.79	14.46 (Official Elv)

Bottom of High Lake Mngmt= 16.42 Top of Water Short Mngmt= 12.32
Currently in Operational Management Band

Simulated Average LORS2008 [1965-2000] 13.18
Difference from Average LORS2008 1.53

28AUG (1965-2007) Period of Record Average 14.18
Difference from POR Average 0.53

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

++Navigation Depth (Based on 2007 Channel Condition Survey) Route 1 ÷ 8.65'
++Navigation Depth (Based on 2008 Channel Condition Survey) Route 2 ÷ 6.85'
Bridge Clearance = 50.12'

---

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

L001	L005	L006	LZ40	S4	S352	S308	S133
14.56	14.87	14.71	14.70	14.87	14.79	14.59	14.61

*Combination Okeechobee Avg-Daily Lake Average = 14.71 (*See Note)

Okeechobee Inflows (cfs):

S65E	924	C5	-92	Fisheating Cr	119
S154	12	S191	307	S135 Pumps	178
S84	432	S133 Pumps	96	S2 Pumps	0
S84X	807	S127 Pumps	14	S3 Pumps	0
S71	79	S129 Pumps	0	S4 Pumps	0
S72	121	S131 Pumps	0		

Total Inflows: 2997

Okeechobee Outflows (cfs):

S135 Culverts	0	S354	0	S77	(Not Used)
S127 Culverts	0	S351	531	S77Below	344 (USED)
S129 Culverts	0	S352	425	S308	(Not Used)

```
  S131 Culverts     0      L8 Canal Pt       6      S308Below       545
(USED)
Total Outflows:   1851

****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            0.28      S308           0.26
  Average Pan Evap x 0.75 Pan Coefficient =  0.20" =  0.02'

Lake Average Precipitation using NEXRAD: =  0.05" =  0.00'

Evaporation - Precipitation:             =  0.15" =  0.01'
Evaporation - Precipitation using Lake Area of 730 square miles
  is equal to   2993 cfs out of the lake.
Lake Okeechobee (Change in Storage) Flow is      0 cfs or      0 AC-FT
```

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

	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:	13.35	14.74	96	58	0	12	0	24	(cfs)		
S193:											
S191:	19.35	14.73	307	0.5	0.5	0.5					
S135 Pumps:	13.38	14.53	178	31	44	44	62		(cfs)		
S135 Culverts:			0	0.0	0.0						
North West Shore											
S65E:	21.17	14.51	924	0.4	0.4	0.4	0.4	0.4	0.4		
S127 Pumps:	13.27	14.75	14	0	11	0	0	0	(cfs)		
S127 Culvert:			0	0.0							
S129 Pumps:	12.77	14.83	0	12	0	0			(cfs)		
S129 Culvert:			0	0.0							
S131 Pumps:	12.77	15.04	0	0	0				(cfs)		
S131 Culvert:			0								
Fisheating Creek nr Palmdale	30.78		119								
Fisheating Creek nr Lakeport											
C5:	14.93	14.98	-92	5.3	5.2	5.2					

```
South Shore
  S4 Pumps:    10.88     14.82       0      0    0    0            (cfs)
  S169:        14.83     10.87       0    0.0  0.0  0.0
  S310:        14.75                11
  S3 Pumps:    10.18     14.73       0      0    0    0            (cfs)
  S354:        14.73     10.18       0    0.0  0.0
  S2 Pumps:     9.73     14.64       0      0    0    0    0       (cfs)
  S351:        14.64      9.73     531    0.0  0.0  0.0
  S352:        14.79     10.01     425    0.8  0.7
  C10A:         -NR-     12.80           0.0   0.0   8.0   0.0   0.0
  L8 Canal PT            12.62       6
```

S351 and S352 Temporary Pumps/S354 Spillway

```
  S351:         9.73     14.64     531  -NR--NR--NR--NR--NR--NR-
  S352:        10.01     14.79     425  -NR--NR--NR--NR-
  S354:        10.18     14.73       0  -NR--NR--NR--NR-
```

```
Caloosahatchee River (S77, S78, S79)
  S47B:        14.38     10.82           0.0  0.5
  S47D:        10.88     10.87      23   6.0
  S77:
    Spillway and Sector Flow:
               14.87     10.94     344   0.0  2.0  0.0  0.0
    Flow Due to Lockages+:            2

  S77 Below USGS Flow Gage          344

  S78:
    Spillway and Sector Flow:
               10.98      2.83     743    2.5  0.0  0.0  0.0
    Flow Due to Lockages+:            4

  S79:
    Spillway and Sector Flow:
                2.95      0.73    1658    0.1  0.0  1.0  1.0  1.0  0.0  0.0
0.1
    Flow Due to Lockages+:            3
    Percent of flow from S77         30%
    Chloride             (ppm)     57


St. Lucie Canal (S308, S80)
  S308:
    Spillway and Sector Flow:
               14.56     13.38     545  0.5  0.7  0.7  0.5
    Flow Due to Lockages+:            1

  S308 Below USGS Flow Gage         545
  S153:        19.22     13.15      40    0.0  0.0
  S80:
    Spillway and Sector Flow:
               13.34      1.51     868    0.0  0.5  0.5  0.0  0.5  0.5  0.0
    Flow Due to Lockages+:            5
    Percent of flow from S308        52%
```

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)	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:	0.24	0.81	1.00	125	2
S78:	0.02	0.48	0.49	80	7
S79:	0.17	0.71	0.90	158	6
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:	0.00	0.67	2.12	46	1
S80:	0.00	0.69	1.90	163	1
Okeechobee Average (Sites S78, S79 and S80 not included)	0.12	0.11	0.24		
Oke Nexrad Basin Avg	0.05	0.42	1.35		

Okeechobee Lake Elevations	28 AUG 2016	14.71	Difference from 28AUG16
28AUG16 -1 Day =	27 AUG 2016	14.71	0.00
28AUG16 -2 Days =	26 AUG 2016	14.71	0.00
28AUG16 -3 Days =	25 AUG 2016	14.68	-0.03
28AUG16 -4 Days =	24 AUG 2016	14.67	-0.04
28AUG16 -5 Days =	23 AUG 2016	14.67	-0.04
28AUG16 -6 Days =	22 AUG 2016	14.70	-0.01
28AUG16 -7 Days =	21 AUG 2016	14.72	0.01
28AUG16 -30 Days =	29 JUL 2016	14.69	-0.02
28AUG16 -1 Year =	28 AUG 2015	12.79	-1.92
28AUG16 -2 Year =	28 AUG 2014	14.46	-0.25

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
28AUG16	Today =	28 AUG 2016	608	MON	1851
28AUG16	-1 Day =	27 AUG 2016	407	SUN	969
28AUG16	-2 Days =	26 AUG 2016	441	SAT	7066
28AUG16	-3 Days =	25 AUG 2016	308	FRI	3165
28AUG16	-4 Days =	24 AUG 2016	270	THU	1348
28AUG16	-5 Days =	23 AUG 2016	684	WED	-4459
28AUG16	-6 Days =	22 AUG 2016	2548	TUE	-1331
28AUG16	-7 Days =	21 AUG 2016	3153	MON	-2873
28AUG16	-8 Days =	20 AUG 2016	3455	SUN	1234
28AUG16	-9 Days =	19 AUG 2016	3602	SAT	-NR-
28AUG16	-10 Days =	18 AUG 2016	3449	FRI	2604
28AUG16	-11 Days =	17 AUG 2016	3301	THU	-1623
28AUG16	-12 Days =	16 AUG 2016	3464	WED	1064
28AUG16	-13 Days =	15 AUG 2016	3332	TUE	-1114

S65E

		Average Flow over previous 14 days			Avg-Daily Flow
28AUG16	Today=	28 AUG 2016	1120	MON	1055
28AUG16	-1 Day =	27 AUG 2016	1133	SUN	1166
28AUG16	-2 Days =	26 AUG 2016	1136	SAT	1060
28AUG16	-3 Days =	25 AUG 2016	1143	FRI	988
28AUG16	-4 Days =	24 AUG 2016	1163	THU	983
28AUG16	-5 Days =	23 AUG 2016	1194	WED	1011
28AUG16	-6 Days =	22 AUG 2016	1215	TUE	994
28AUG16	-7 Days =	21 AUG 2016	1244	MON	1029
28AUG16	-8 Days =	20 AUG 2016	1263	SUN	1145
28AUG16	-9 Days =	19 AUG 2016	1245	SAT	1364
28AUG16	-10 Days =	18 AUG 2016	1236	FRI	1197
28AUG16	-11 Days =	17 AUG 2016	1240	THU	1175
28AUG16	-12 Days =	16 AUG 2016	1230	WED	1261
28AUG16	-13 Days =	15 AUG 2016	1214	TUE	1248

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)
28 AUG 2016		683	1480	3294
27 AUG 2016		947	1767	3840
26 AUG 2016		1217	2517	4580
25 AUG 2016		1577	2547	4090
24 AUG 2016		1892	2571	4715
23 AUG 2016		1894	2585	4939
22 AUG 2016		2906	3061	6293
21 AUG 2016		3895	4397	7948
20 AUG 2016		3331	4065	7281
19 AUG 2016		499	1846	5607

DATE				
18 AUG 2016	-326	793	3730	
17 AUG 2016	-2833	826	4023	
16 AUG 2016	803	1468	6142	
15 AUG 2016	557	1995	6198	

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)
28 AUG 2016	21	1053	843	0	11
27 AUG 2016	13	333	234	0	13
26 AUG 2016	-22	0	0	0	17
25 AUG 2016	-0	196	16	107	10
24 AUG 2016	26	0	293	153	164
23 AUG 2016	22	0	496	178	398
22 AUG 2016	-16	0	440	704	393
21 AUG 2016	6	0	0	0	402
20 AUG 2016	-10	0	0	0	405
19 AUG 2016	-NR-	0	0	0	-NR-
18 AUG 2016	20	0	0	0	374
17 AUG 2016	-2	0	0	0	318
16 AUG 2016	-66	0	0	0	229
15 AUG 2016	-167	0	0	0	219

DATE	S-308 Discharge (ALL DAY) (AC-FT)	Below S-308 Discharge (ALL-DAY) (AC-FT)	S-80 Discharge (ALL-DAY) (AC-FT)
28 AUG 2016		1081	954
27 AUG 2016		394	482
26 AUG 2016		180	794
25 AUG 2016		170	1314
24 AUG 2016		170	164
23 AUG 2016		790	593
22 AUG 2016		1316	902
21 AUG 2016		2603	1346
20 AUG 2016		2911	1746
19 AUG 2016		568	696
18 AUG 2016		590	20
17 AUG 2016		663	191
16 AUG 2016		1079	659
15 AUG 2016		1214	883

*** 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

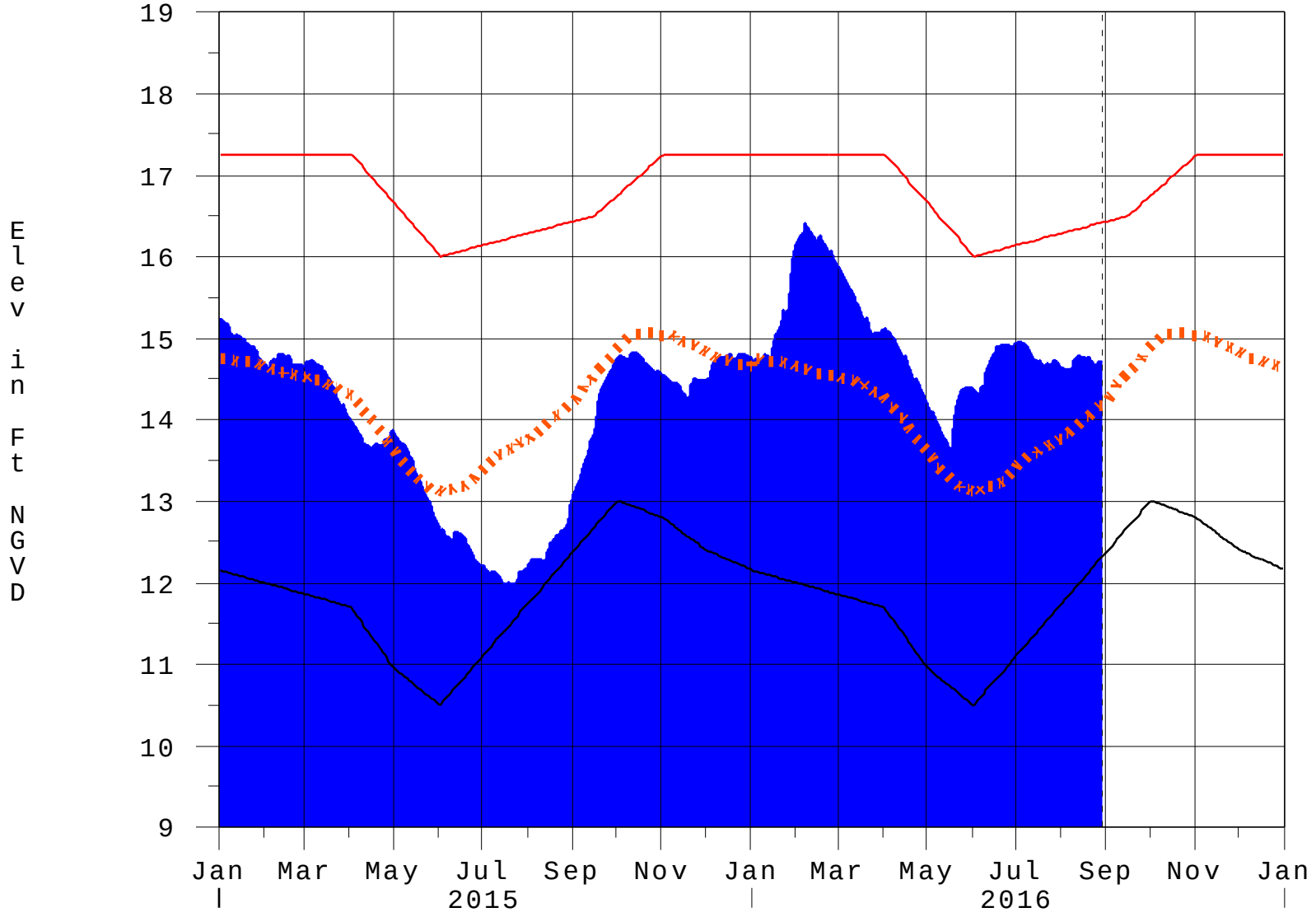
++ For more information see the Jacksonville District Navigation website at http://www.saj.usace.army.mil/

$ For information regarding Lake Okeechobee Service Area water restrictions
please refer to www.sfwmd.gov

Report Generated 29AUG2016 @ 10:39 ** Preliminary Data - Subject to Revision **

Lake Okeechobee

29AUG16 10:45:31



High Lake Management
Okeechobee Avg Elev
Average Elev [1965-2007]
Water Shortage Management

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