

Water Conditions Summary

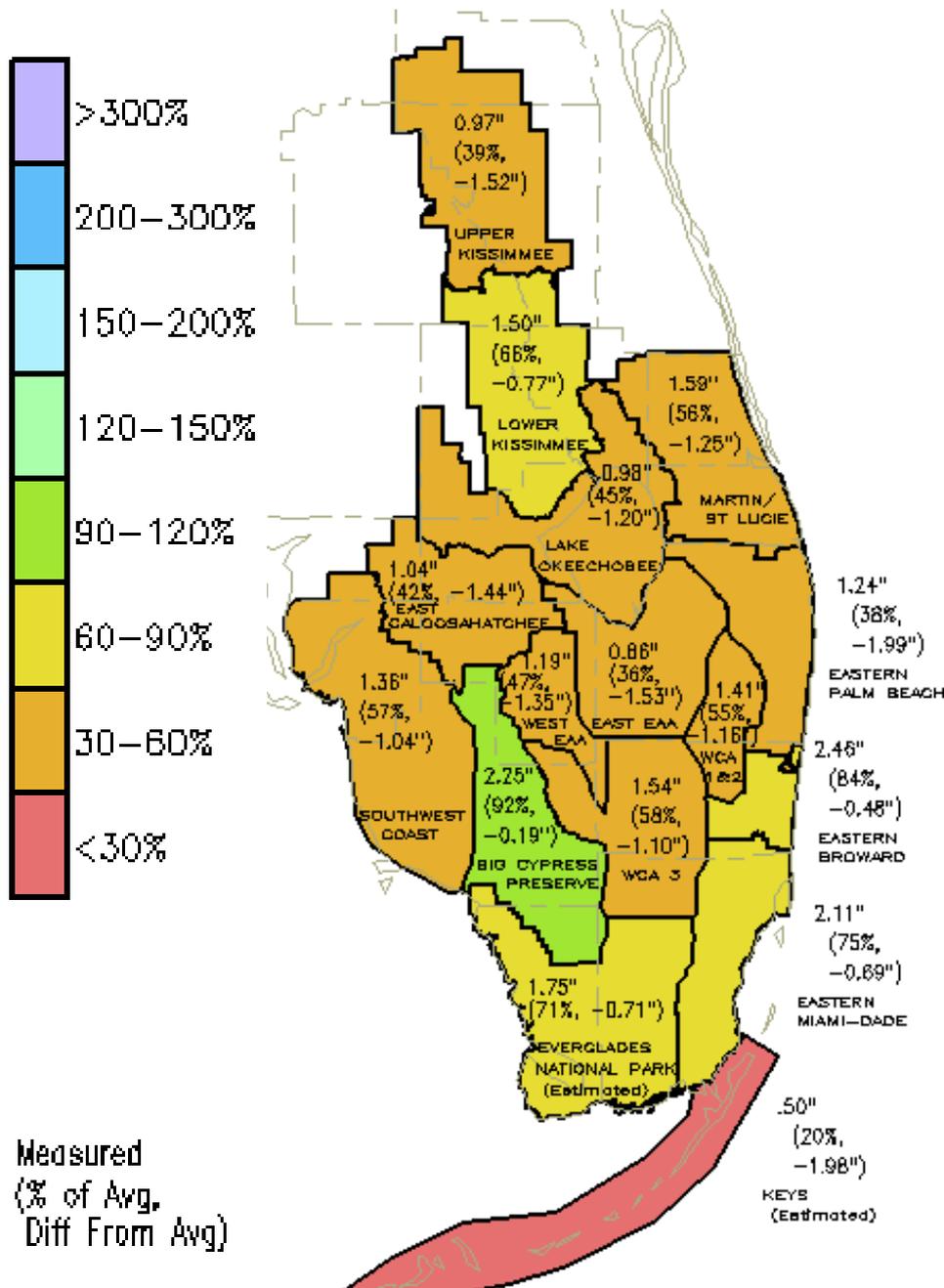
May 12, 2011

Matahel Ansar, Ph.D., P.E.
Deputy Department Director
Operations Control & Hydro Data Management Department
South Florida Water Management District

SFWMD 2011 April Rain Apr 2 – May 01

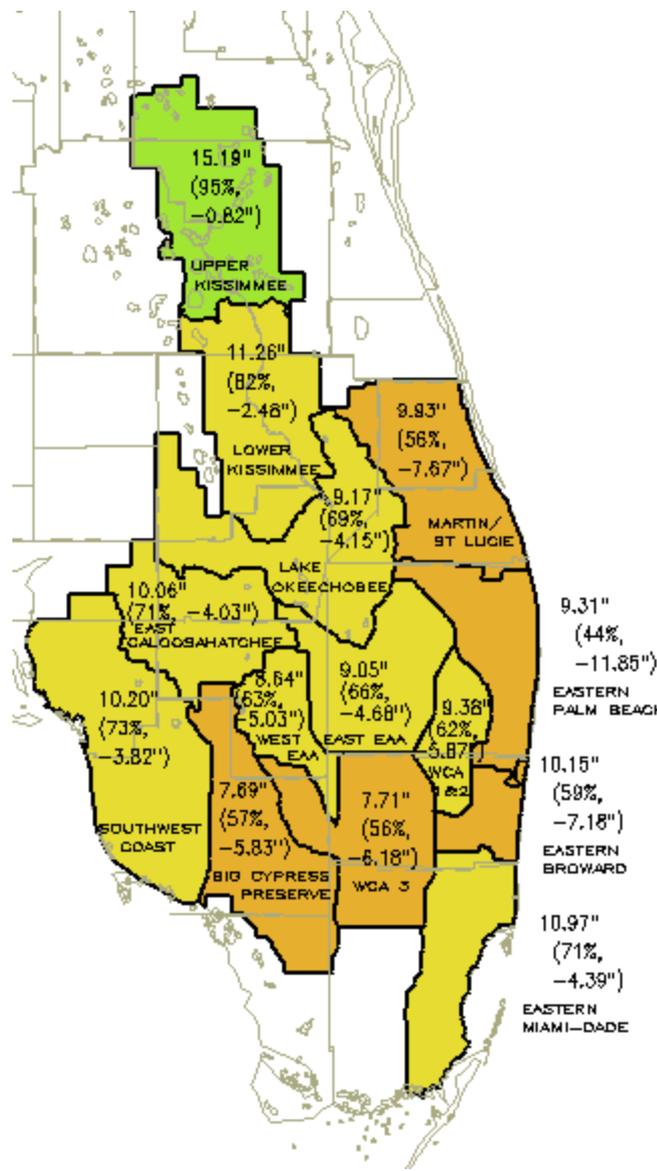
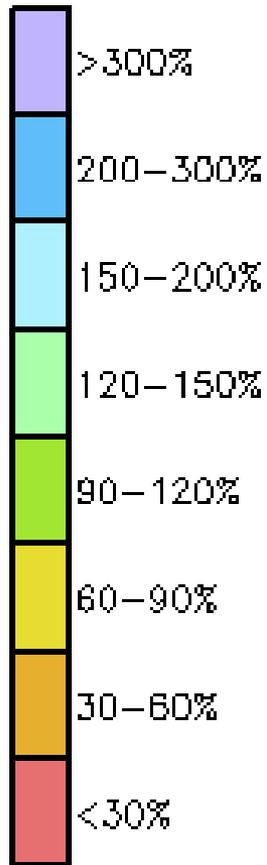
**DISTRICT-WIDE: 1.41"
(56% of Avg, or -1.11")**

- All basins received less than normal rainfall
- Most basins received less than 60% normal
- Few exceptions include:
Lower Kissimmee (66%);
Big Cypress Preserve (92%);
Eastern Broward (84%) and
Eastern Miami Dade (75%)



SFWMD 2010-11 Dry Season* Rainfall Nov 2 – May 07

**DISTRICT-WIDE: 10.10"
(68% of Avg, or -4.76")**

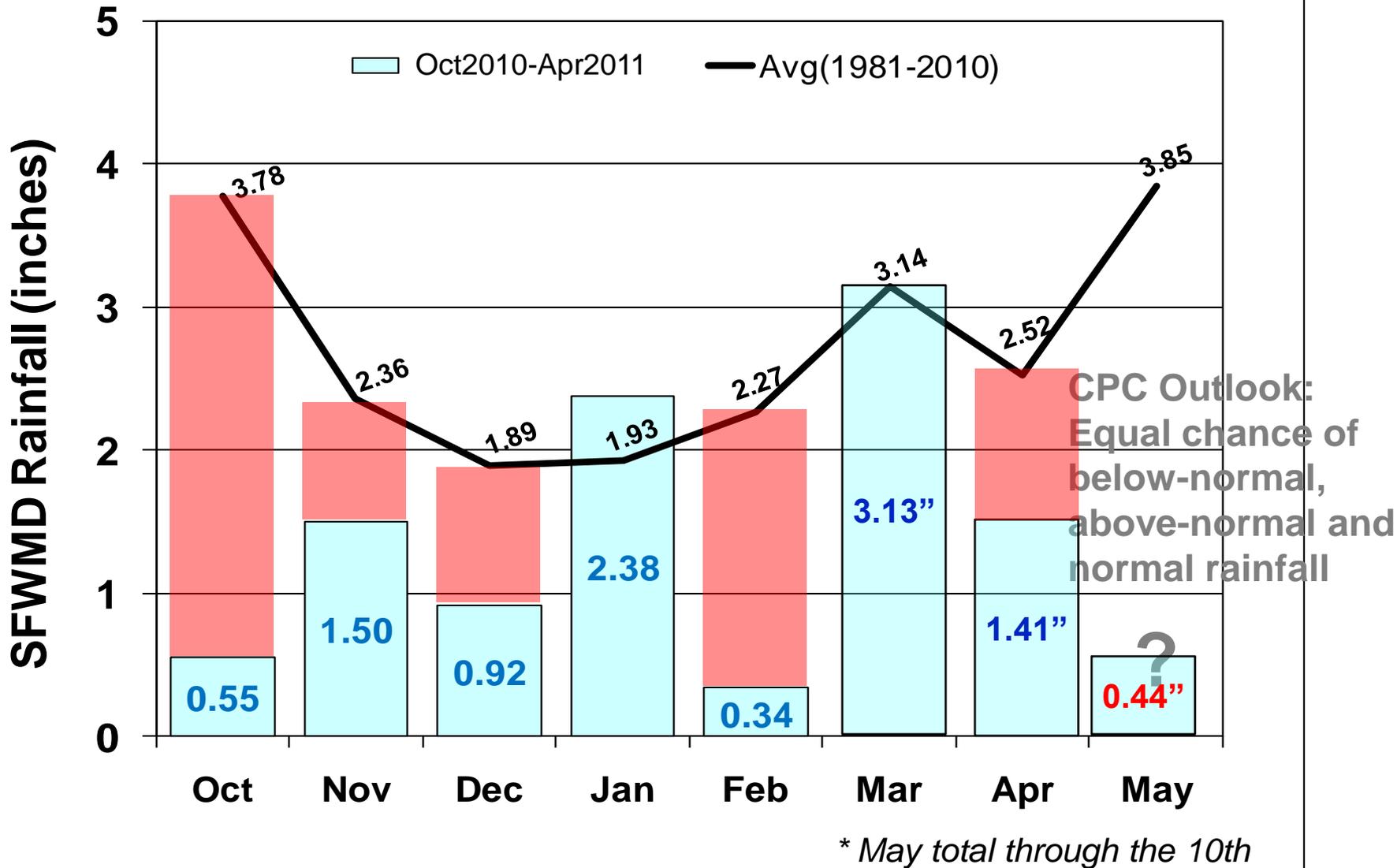


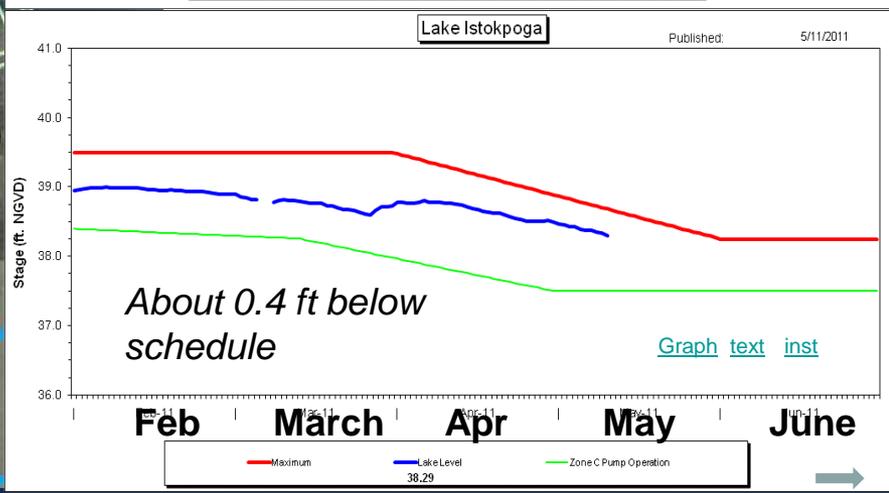
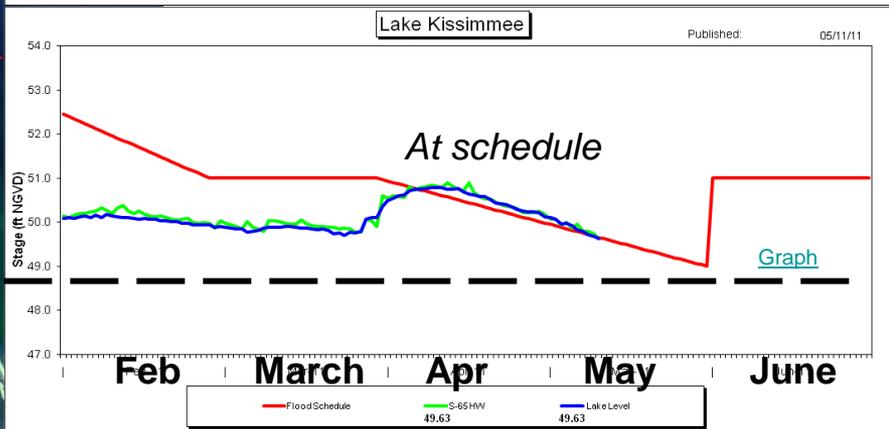
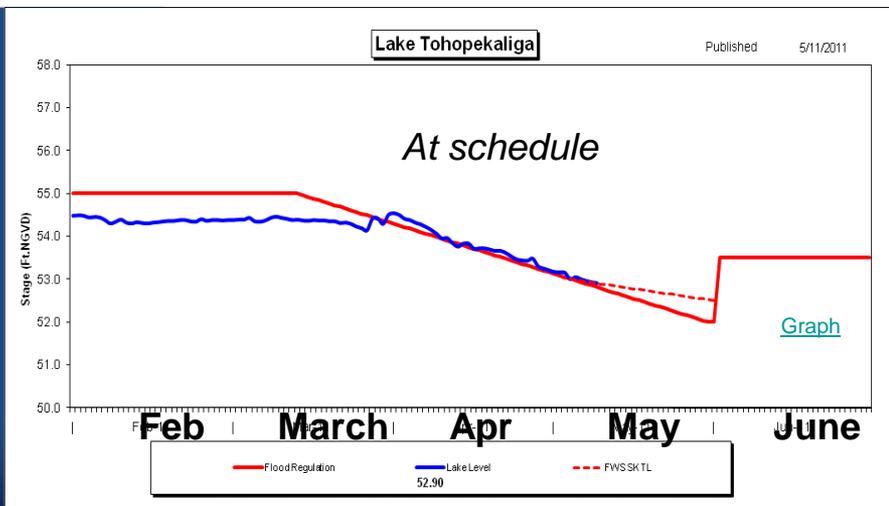
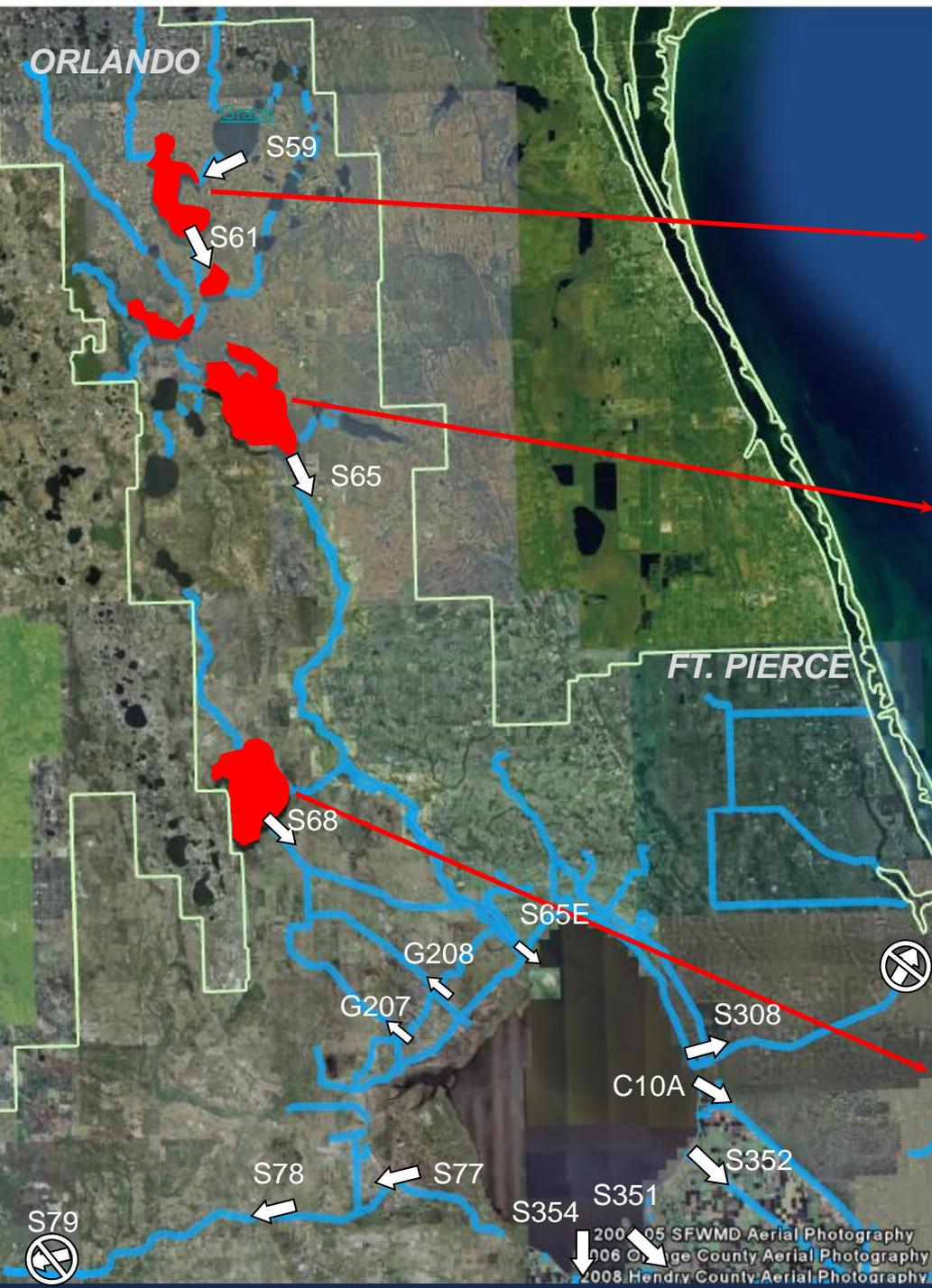
Measured
(% of Avg,
Diff From Avg)

- All basins received below normal rainfall
- Upper Kissimmee Basin received near normal rainfall, at 95% of normal
- The dry season started early with a record rainfall deficit in October
- October-Feb rainfall was less than half the average. A record low since recordkeeping began in 1932
- Oct-Feb rain: 5.7" (46% of Avg, or 6.5" deficit)

* 2010-11 Dry season started in October

SFWMD Rainfall Distribution Comparison (October-May)

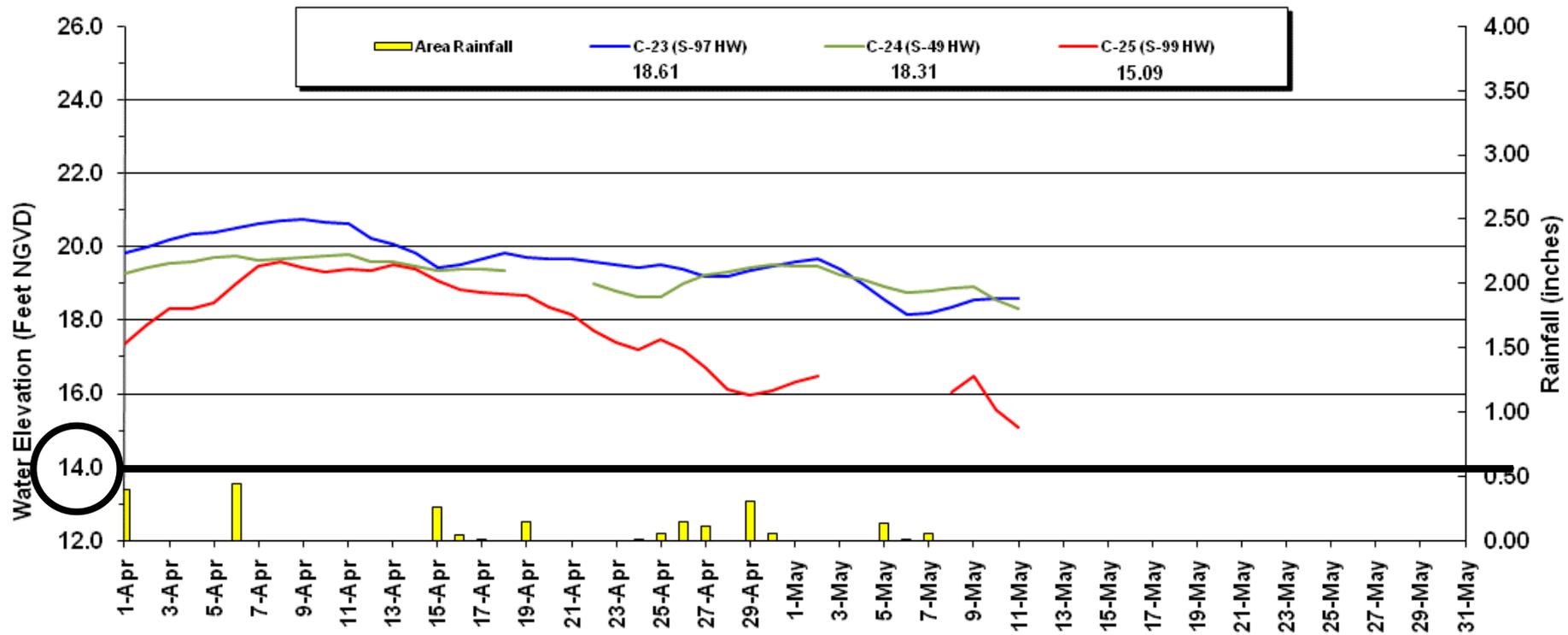


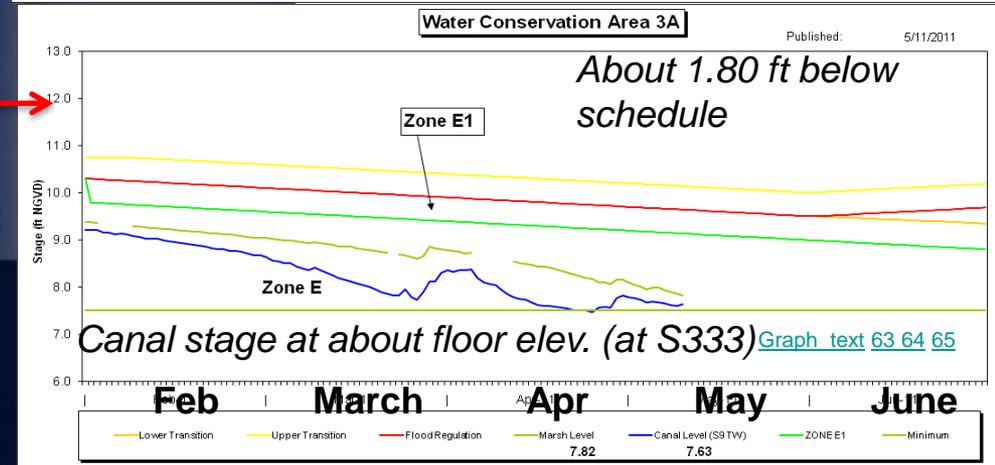
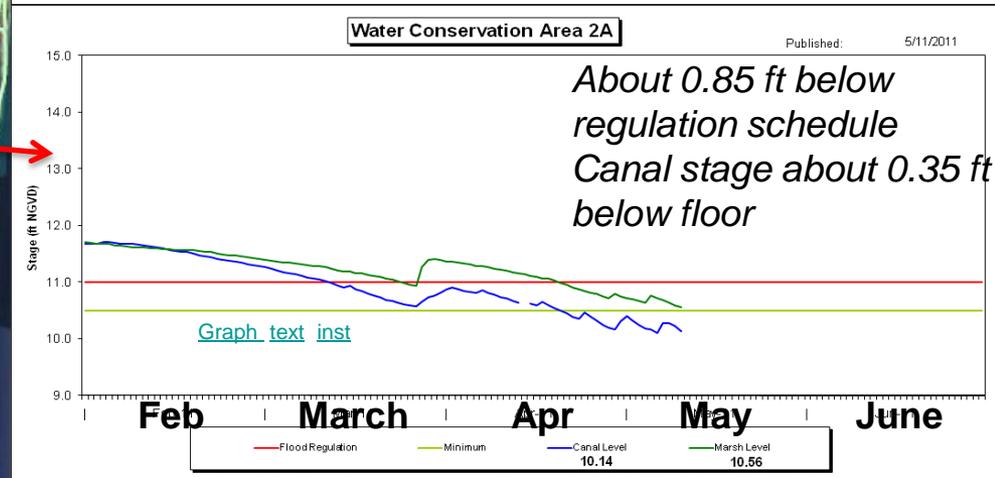
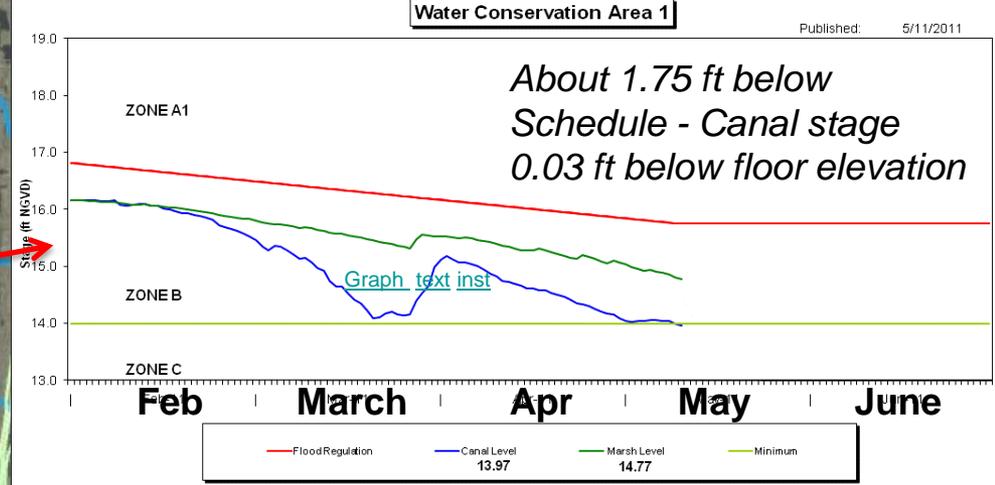
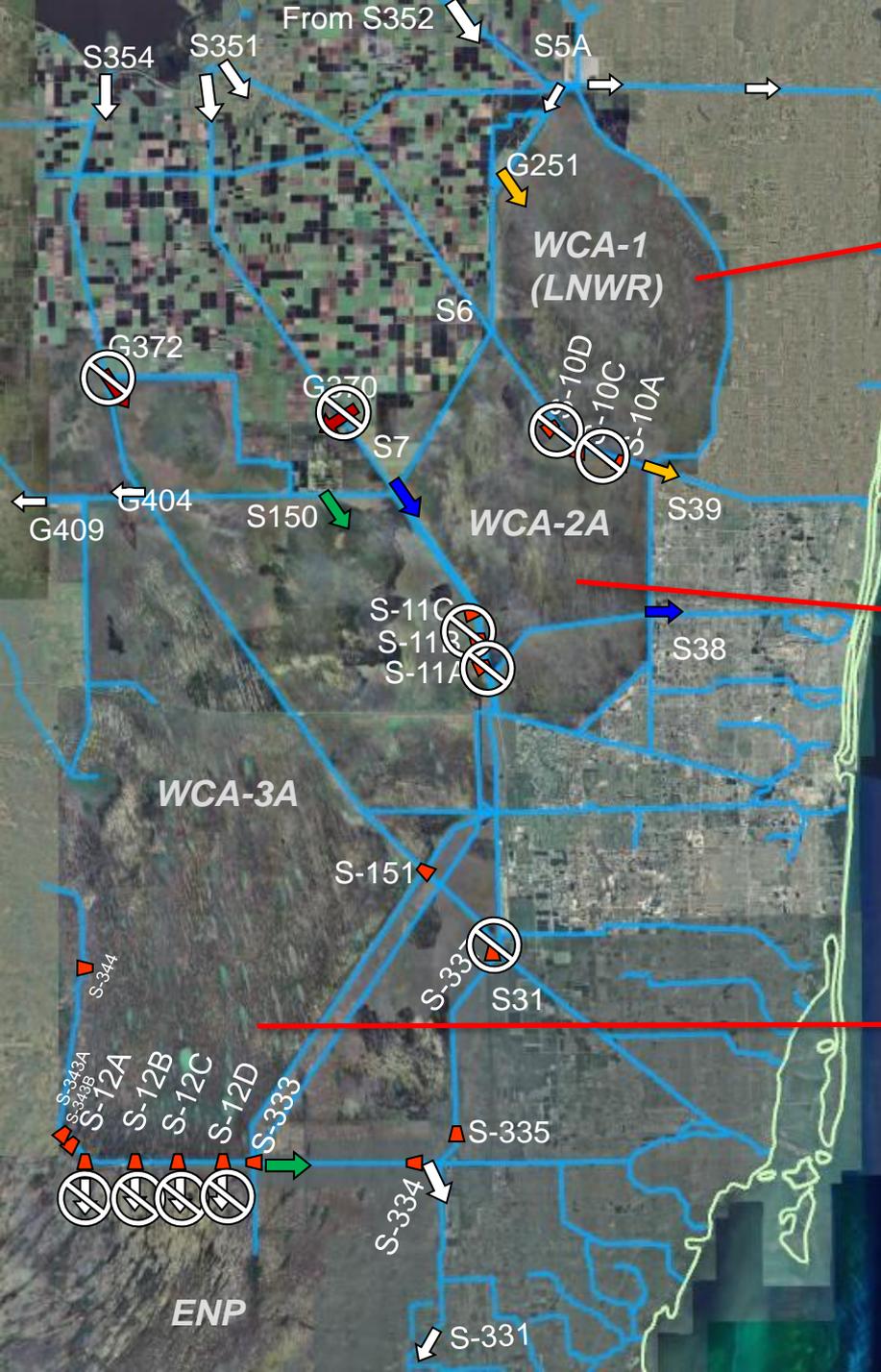


**Water Shortage
Bulletins Issued Daily
- Withdrawals prohibited
when stages fall below
elevation 14.0 ft, NGVD**

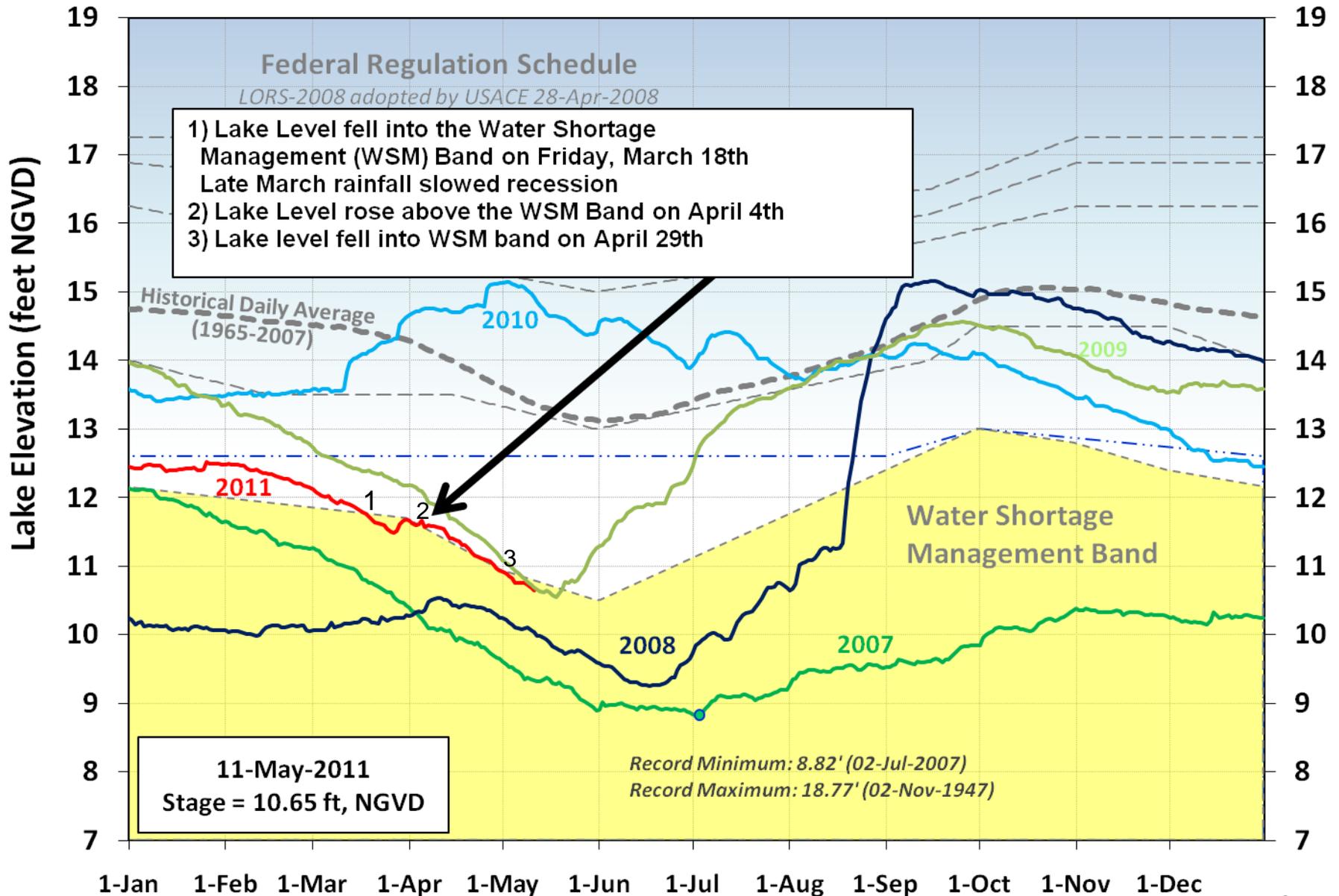


Published 05/09/11 **St Lucie Structures on C23, C24 & C25 Canals**





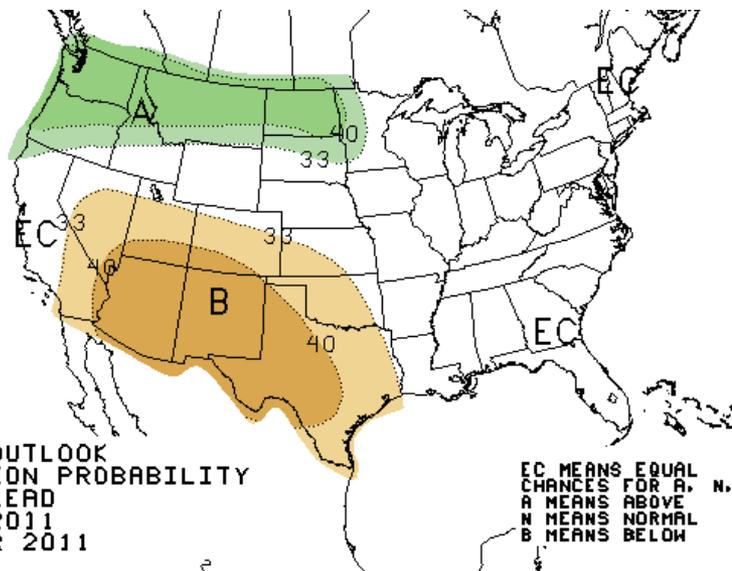
Lake Okeechobee Water Level Comparison



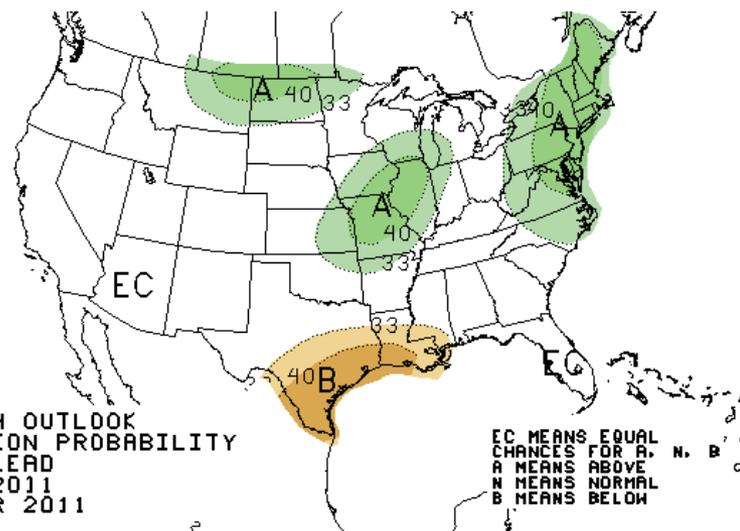
U. S. Seasonal Precipitation Outlook

National Climate Prediction Center (CPC)

May 2011



May-June-July 2011



The current precipitation outlook for central and southern Florida is:

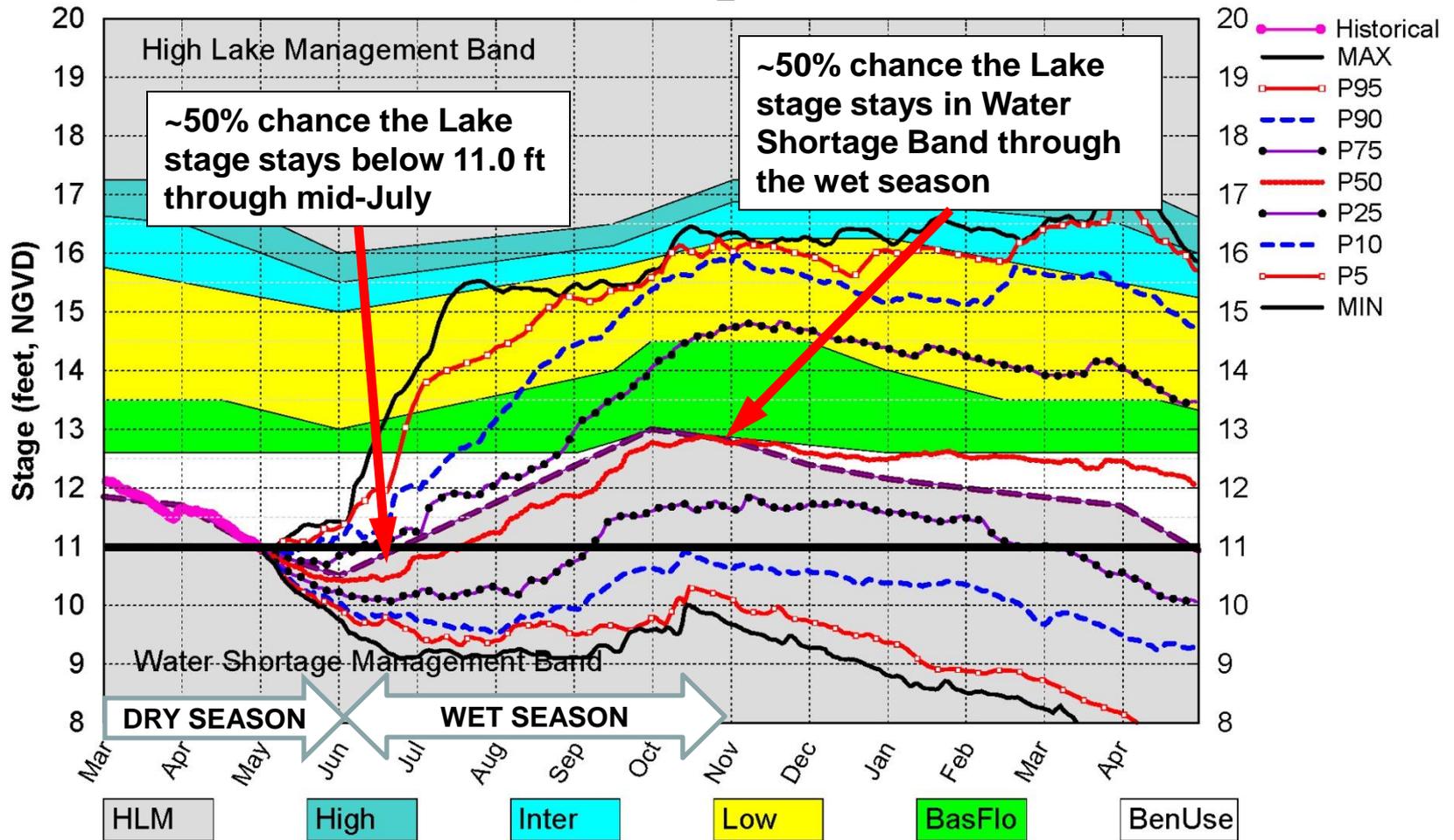
- Equal chance of above-normal (A), below-normal (B) and normal (N) rainfall for May.
- Equal chance of above-normal (A), below-normal (B) and normal (N) rainfall for May-June-July 2011
- A transition to ENSO-neutral conditions is expected by June 2011

Lake Okeechobee Stage Forecast

- **Future Lake stage depends on future rainfall**
- **Projections provided monthly by SFWMD Hydrologic and Environmental Systems Modeling (HESM) Department**
 - Don Ketprakong, Paul Trimble, Danielle Morancy, Jayantha Obeysekera*
- **Position Analysis**
 - **Each year starts with current hydrologic conditions**
 - **41 1-yr simulations of system response to historical rainfall conditions**
 - **Statistical summaries used to display projections**

Lake Okeechobee SFWMM May 2011 Position Analysis

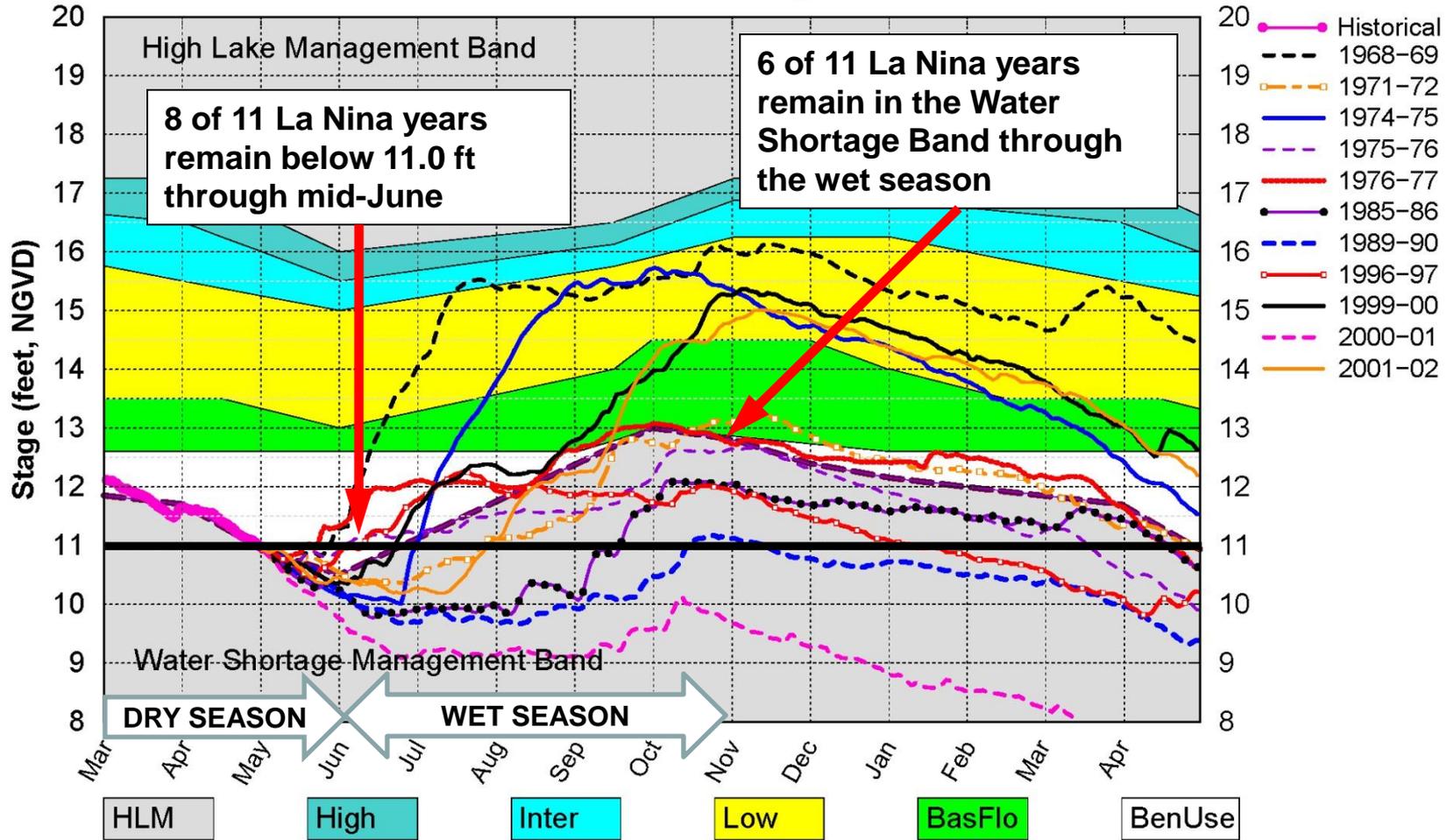
Percentiles PA_V3



(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM May 2011 Position Analysis

All La Nina Years Plot PA_V3



(See assumptions on the Position Analysis Results website)

Questions??

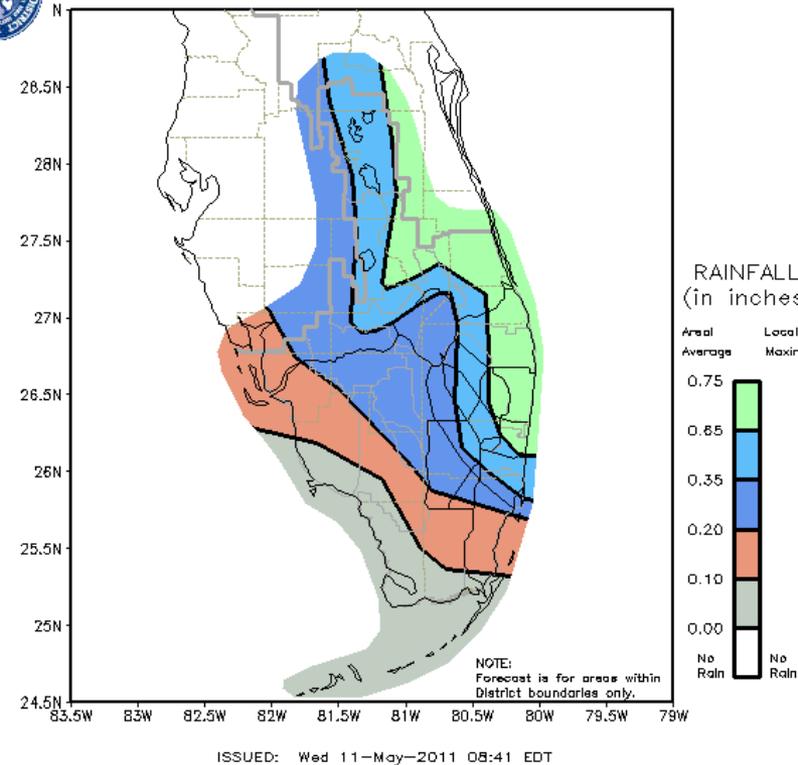


<http://www.youtube.com/watch?v=xM7BRP7uzFk>

Light at the end of the Culvert ?



SFWMD QUANTITATIVE PRECIPITATION FORECAST
Day 5 24-Hour Period Beginning 7am EST SUN



“In the case of our drought,
that would be water gushing through this culvert”

Water Conditions Summary

Lake Okeechobee - Lake Okeechobee is at 10.65 ft NGVD (-0.14 ft from WSM band) 4.27 ft below last year level; 2.71 ft below Period of records Average LOK level dropped below water shortage management band on Friday March 18, and rose above it on April 04, and dropped below it again on April 29th

April Rainfall = 1.41" (56% of Ave.; -1.11"); Dry season rain = 10.10" (68%;-4.76")

Feb rainfall is 0.34" (15% normal, - 1.93"). March rainfall is 2.72" (90%, -0.32"). April rainfall is 1.41" (56%, -1.11") – Equal chance of below, above and normal rainfall for May and May-June-July

WCA1, WCA2 are below floor elevation –WCA3 is at about floor elevation

Lake Kissimmee outflows are about 1100 cfs.

Water supply deliveries to EAA at S351, S352 and S354

Limited releases to the East Coast from WCA1 (S39) and WCA2 (S38) - Releases from WCA3 to NESRS/SDCS (S333 at about 280 cfs) – and releases to SDCS from WCA3 at S334 (about 275 cfs)

2004-05 SFWMD Aerial Photography
2009 Monroe County Aerial Photography

© 2007

May 2011 Position Analysis

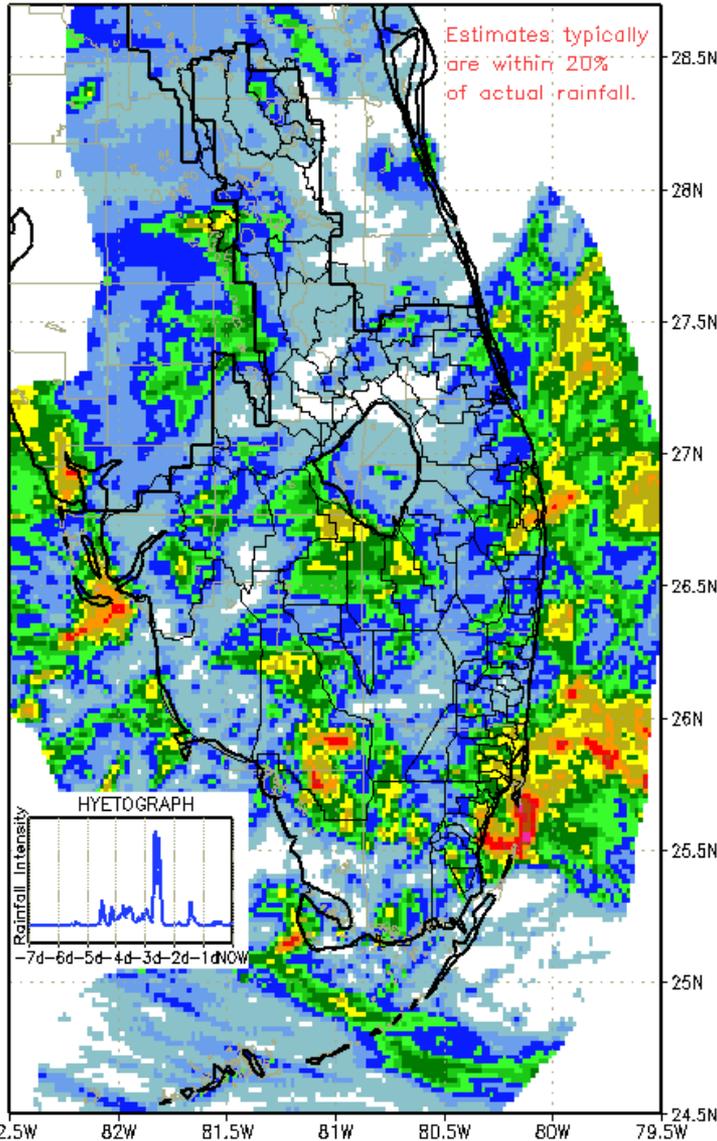
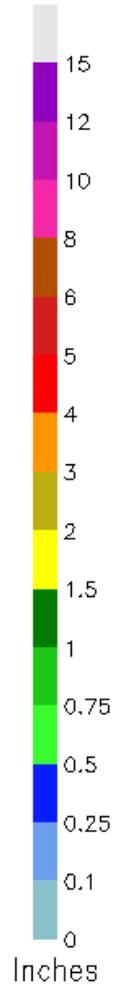
Modeling Assumptions

- The May 2011 Position Analysis (PA) simulation is based on historical climatic conditions spanning the period 1965-2005. This PA posting is made with the South Florida Water Management Model (SFWMM Rel. 6.5.1).
- The May 2011 PA resets the initial stages for Lake Okeechobee and the Water Conservation Areas on May 1st of each year of the PA simulation.
- The Lake Okeechobee operations follow the Lake Okeechobee Regulation Schedule (LORS2008).
- LOK Temporary Forward Pump operations will be in place, whenever necessary, to improve water supply deliveries from the Lake under low Lake stages.
- STA surface area values are modified to reflect current flowways under operation. STA depths are maintained to a minimum of 6 inches using Lake Okeechobee releases .
- Lake Okeechobee Water Shortage Management (LOWSM) is included in the simulation which reflects the currently approved 40E-21 and 40E-22 water shortage rules.
- No BMP Makeup water deliveries to the WCAs are included in the simulation.
- Adaptive Protocol releases from the Lake to the Caloosahatchee Estuary are not included in the simulation.
- La Niña years are selected by the Climatic Prediction Center. The 2010-2011 La Niña event is expected to end within the next several weeks. If this occurs, a new classification of ENSO years will be required. In the mean time the La Nina years are useful for the 2011 transition from the dry season to the wet season while the La Nina conditions persist.



SFWMD RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0515 EST, 05/02/2011 THROUGH: 0515 EST, 05/09/2011



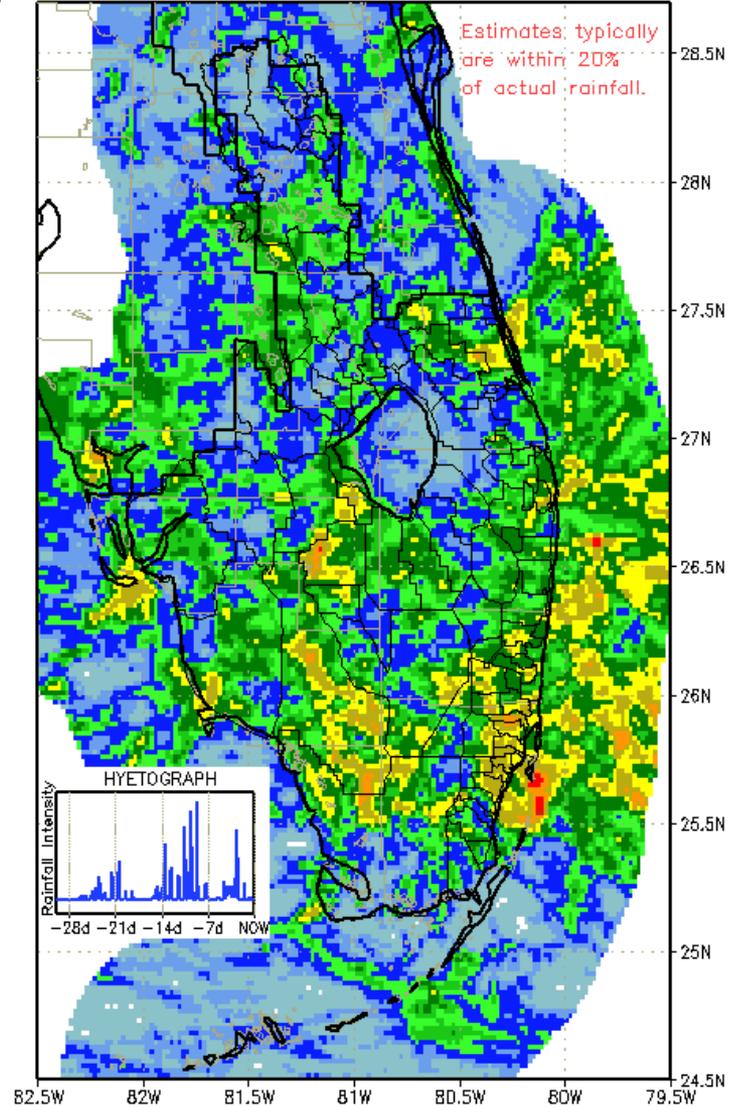
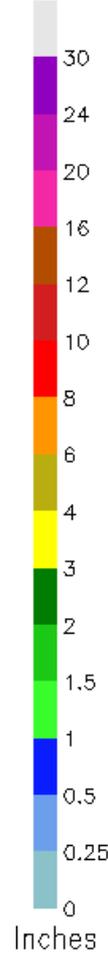
Estimates, typically are within 20% of actual rainfall.

DISTRICT-WIDE RAINFALL ESTIMATE: 0.420"



SFWMD RAINDAR 30-DAY RAINFALL ESTIMATES

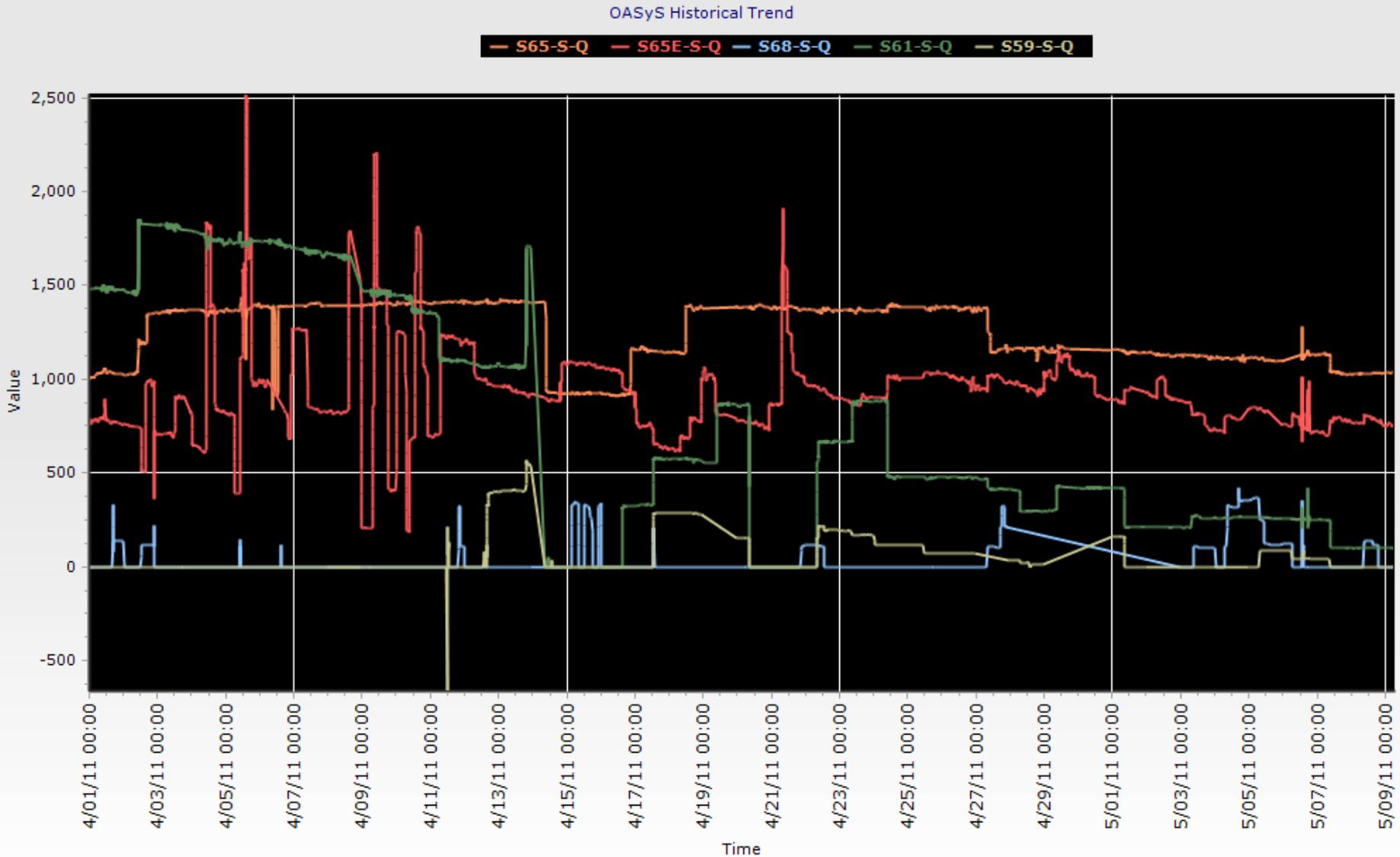
FROM: 0500 EST, 04/09/2011 THROUGH: 0500 EST, 05/09/2011



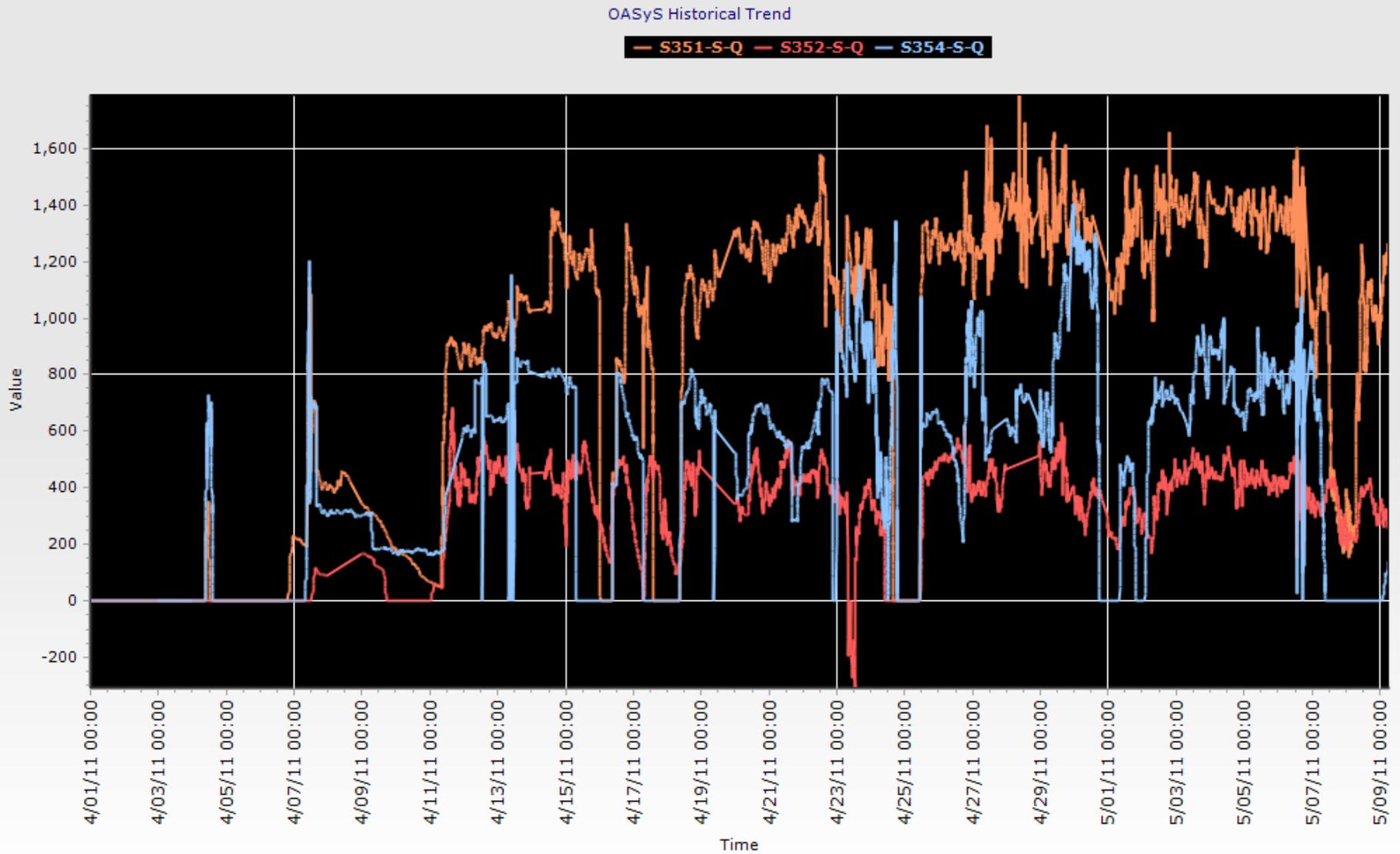
Estimates, typically are within 20% of actual rainfall.

DISTRICT-WIDE RAINFALL ESTIMATE: 1.569"

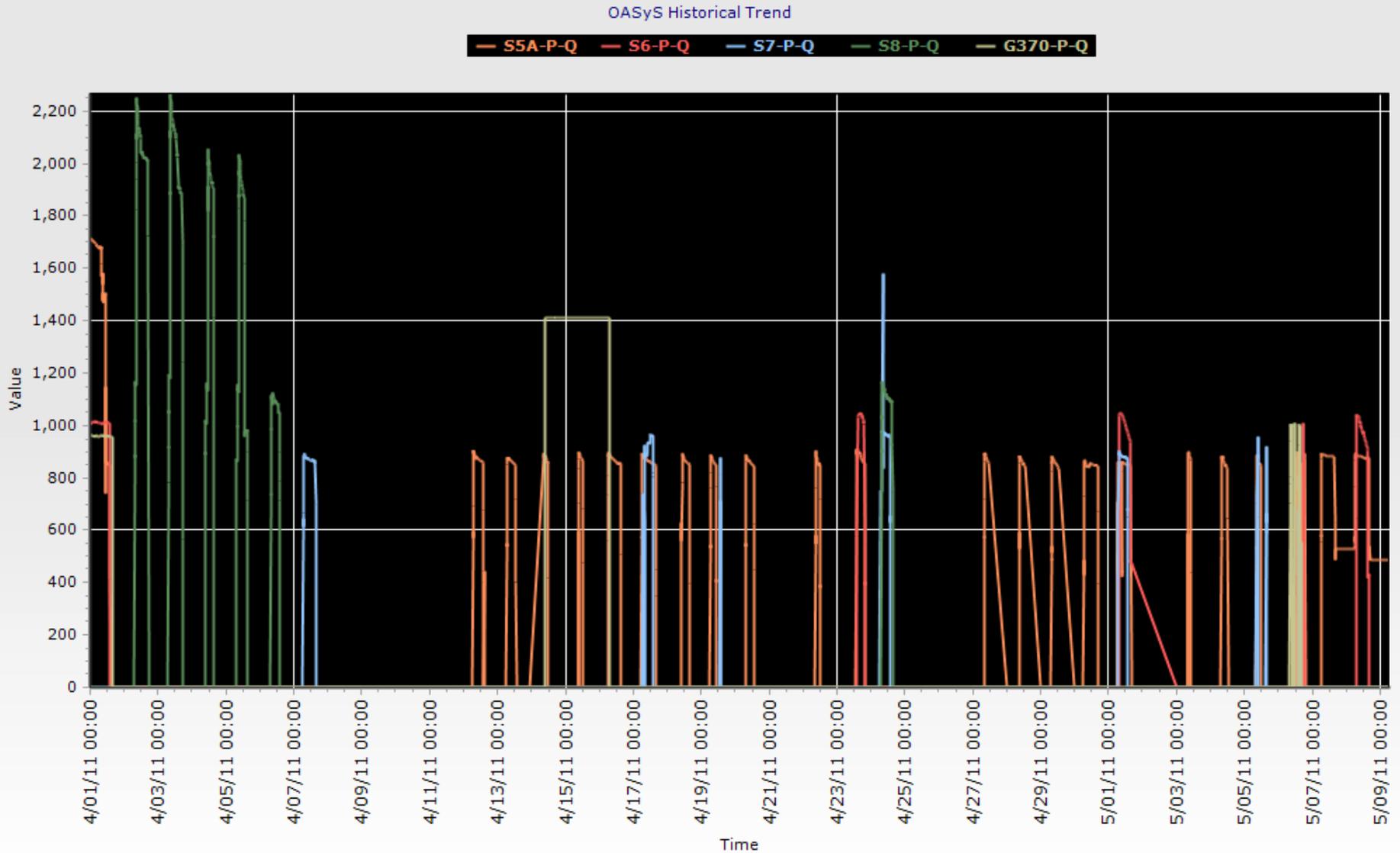
Water Supply Deliveries to Kissimmee River and Istokpoga Basins



Water Supply Deliveries to EAA



Pumping from the EAA

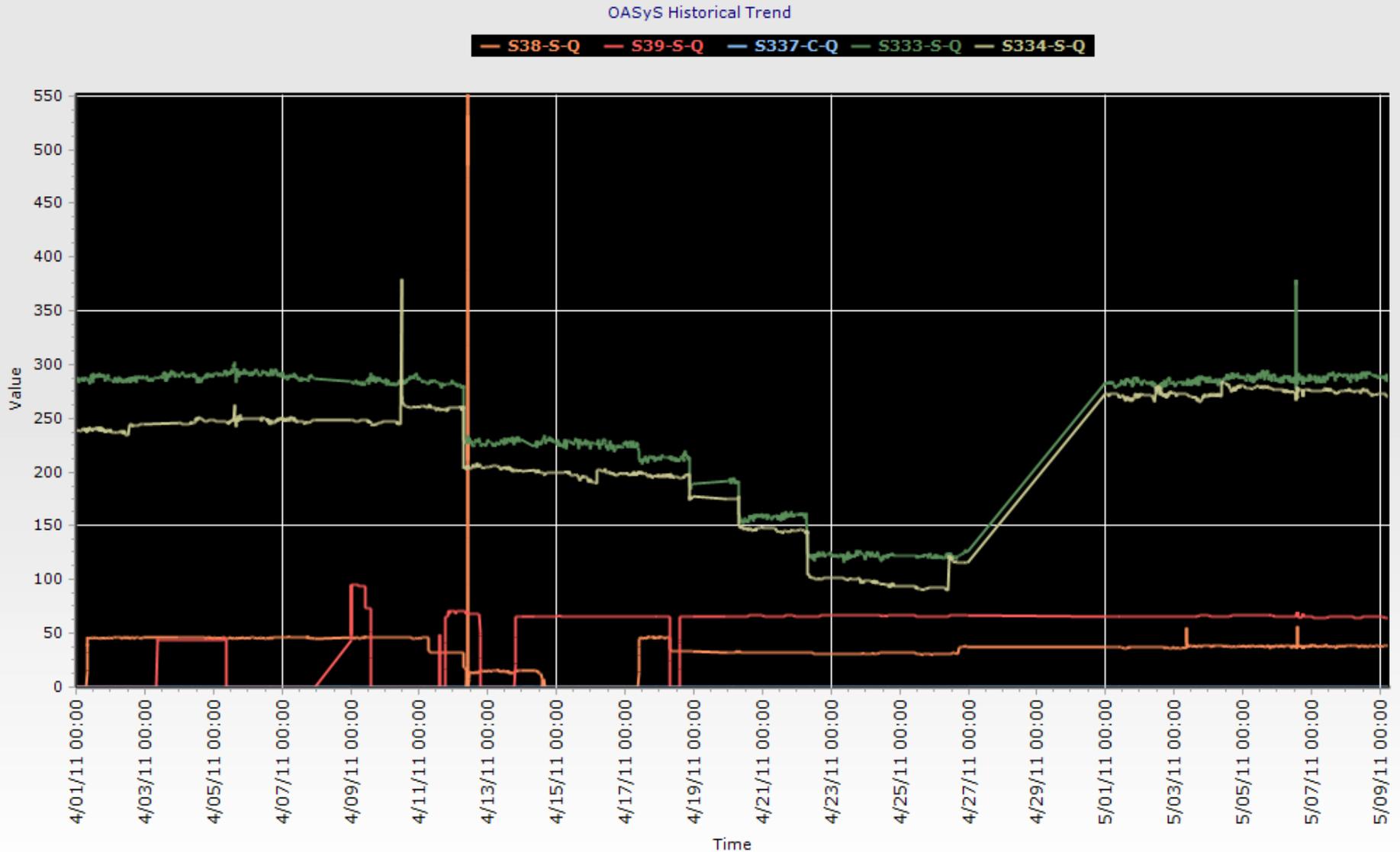


Inflows to WCAs

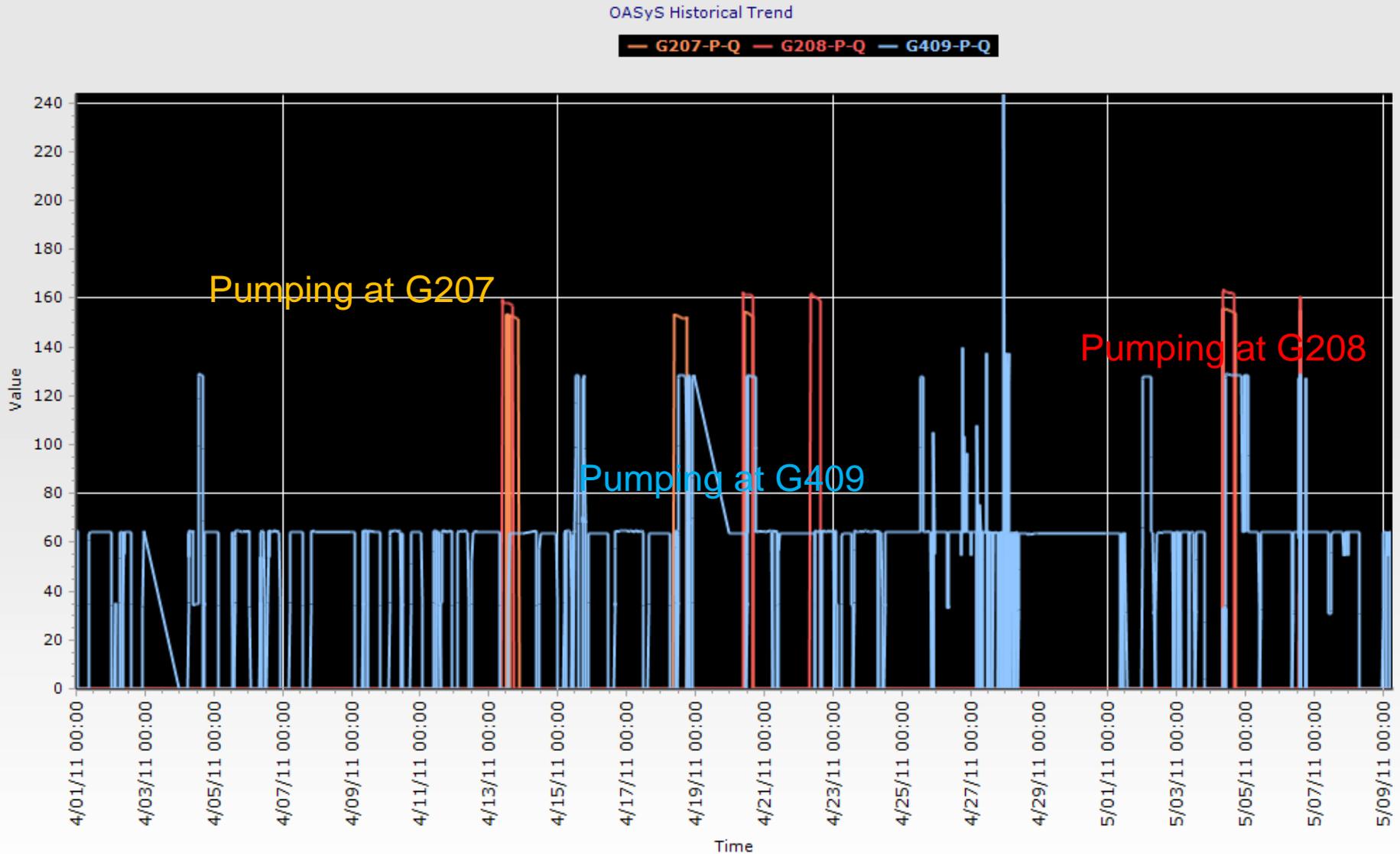
G251/G310 to WCA1; S7 to WCA2; S150 to WCA3



Water Supply Deliveries to East Coast (LWDD at S39; Broward at S38 and SDCS at S334)



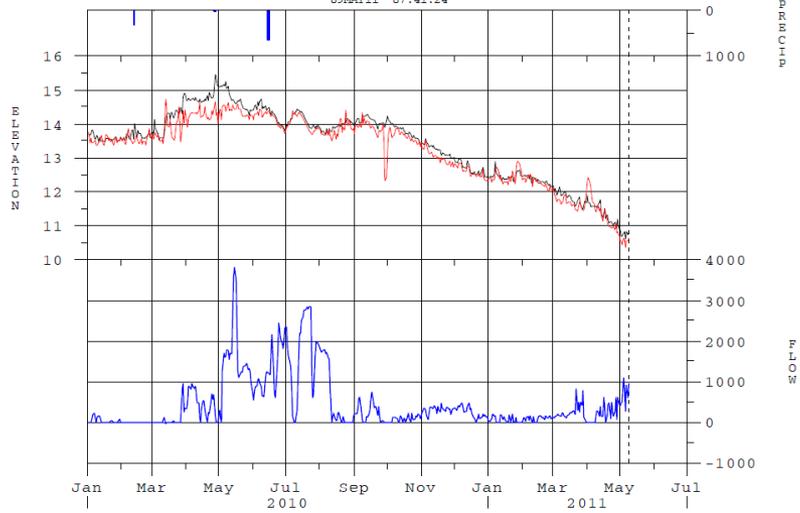
Water Supply Deliveries to Indian Prairies (G207/G208, at C40/C41) and Seminole Tribe (G409, W. of WCA3A)



St Lucie

S308 - Headwater, Tailwater, Flow & Rainfall

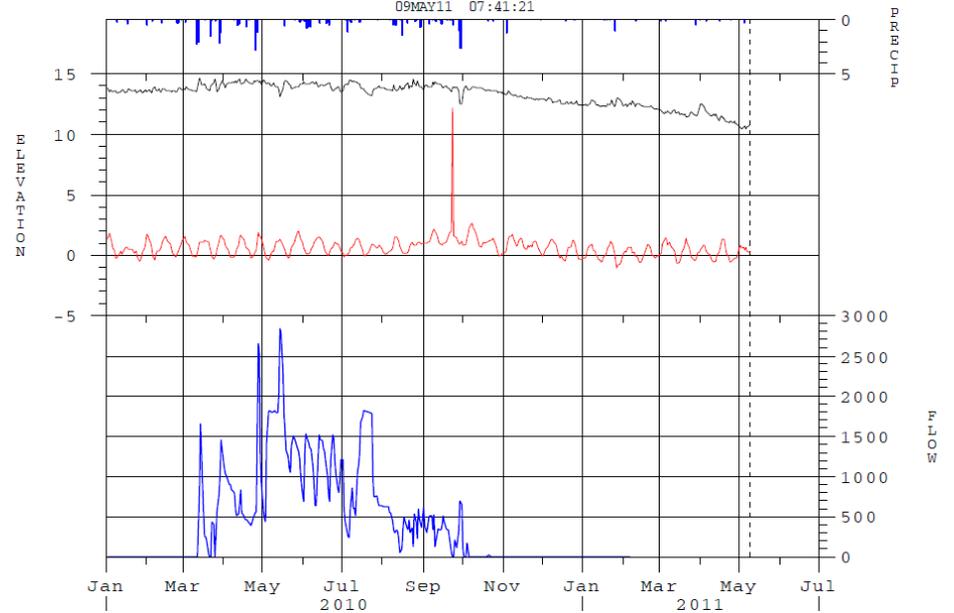
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- Discharge in CFS
- Headwater Elev in Ft-NGVD
- Tailwater Elev in Ft-NGVD
- Precip in Inches

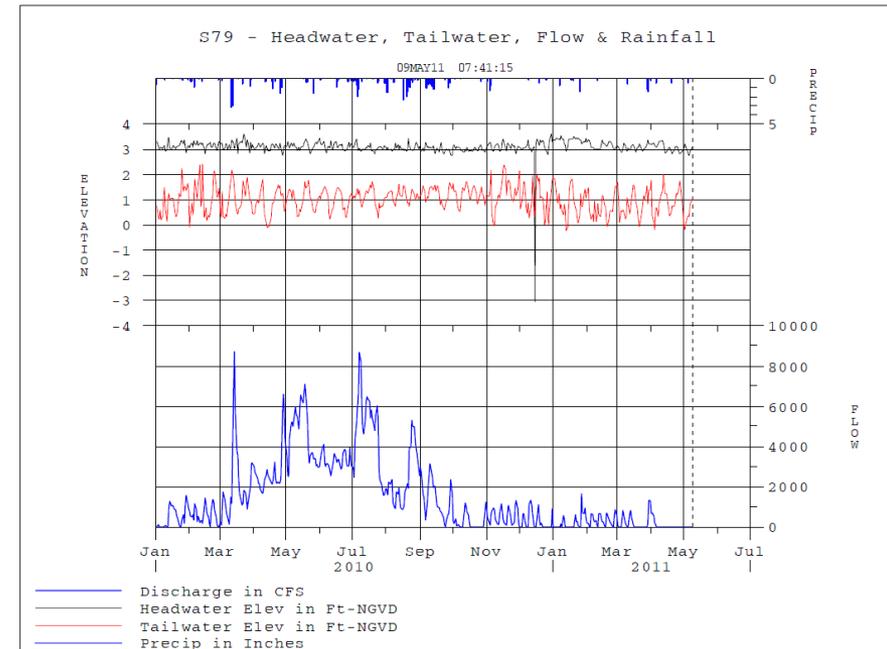
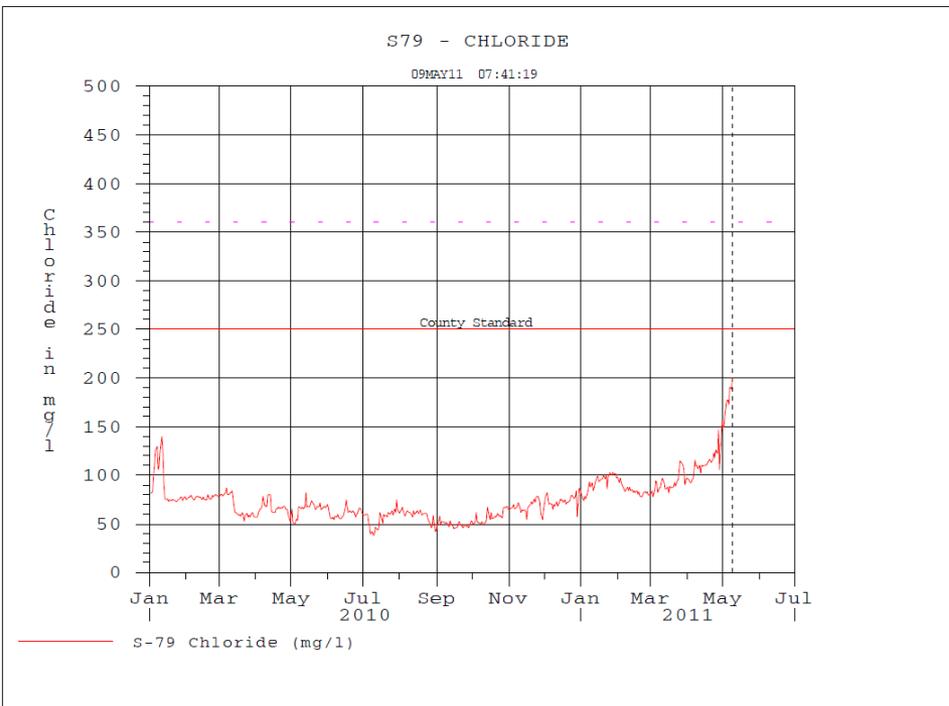
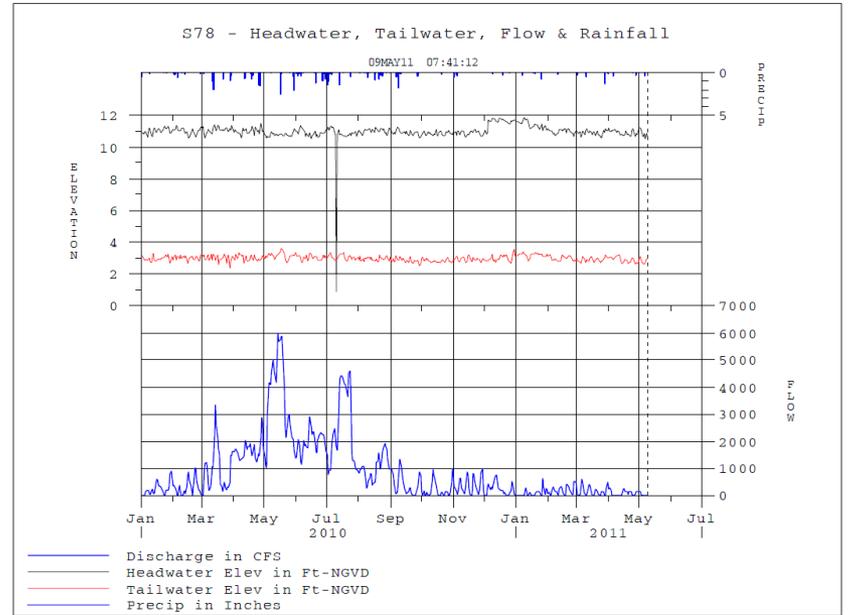
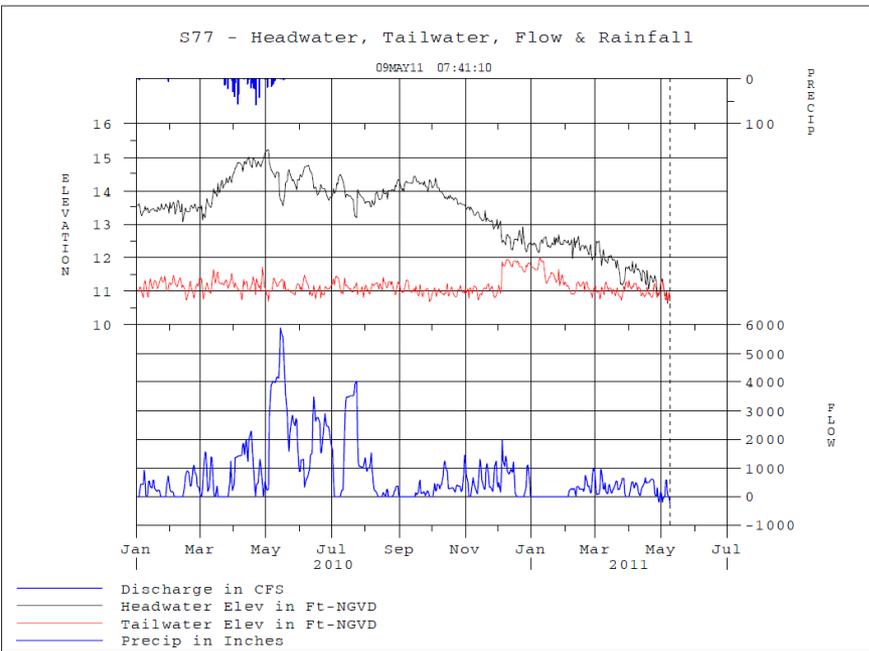
S80 - Headwater, Tailwater, Flow & Rainfall

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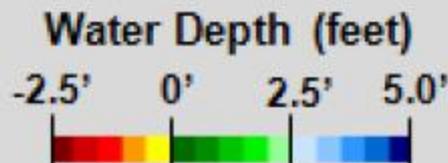
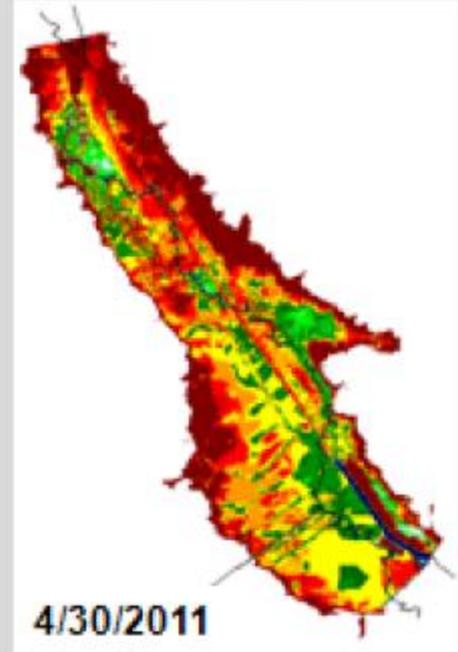
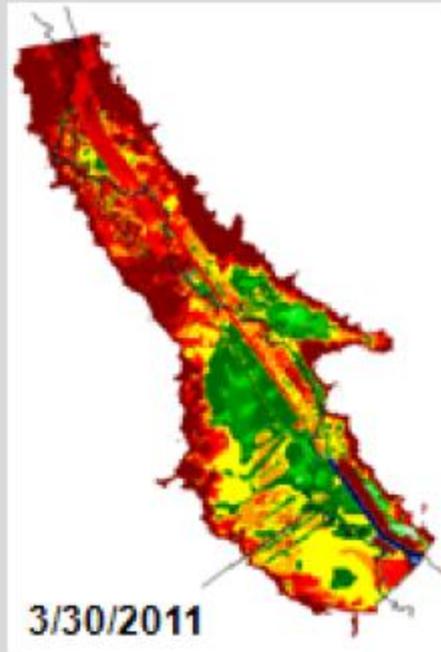
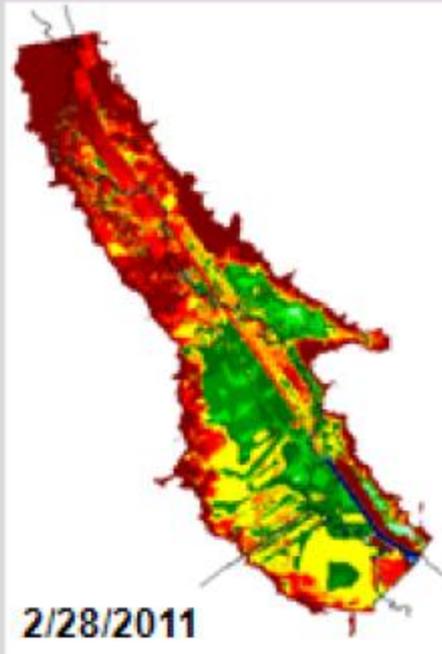
- Discharge in CFS
- Headwater Elev in Ft-NGVD
- Tailwater Elev in Ft-NGVD
- Precip in Inches

Caloosahatchee



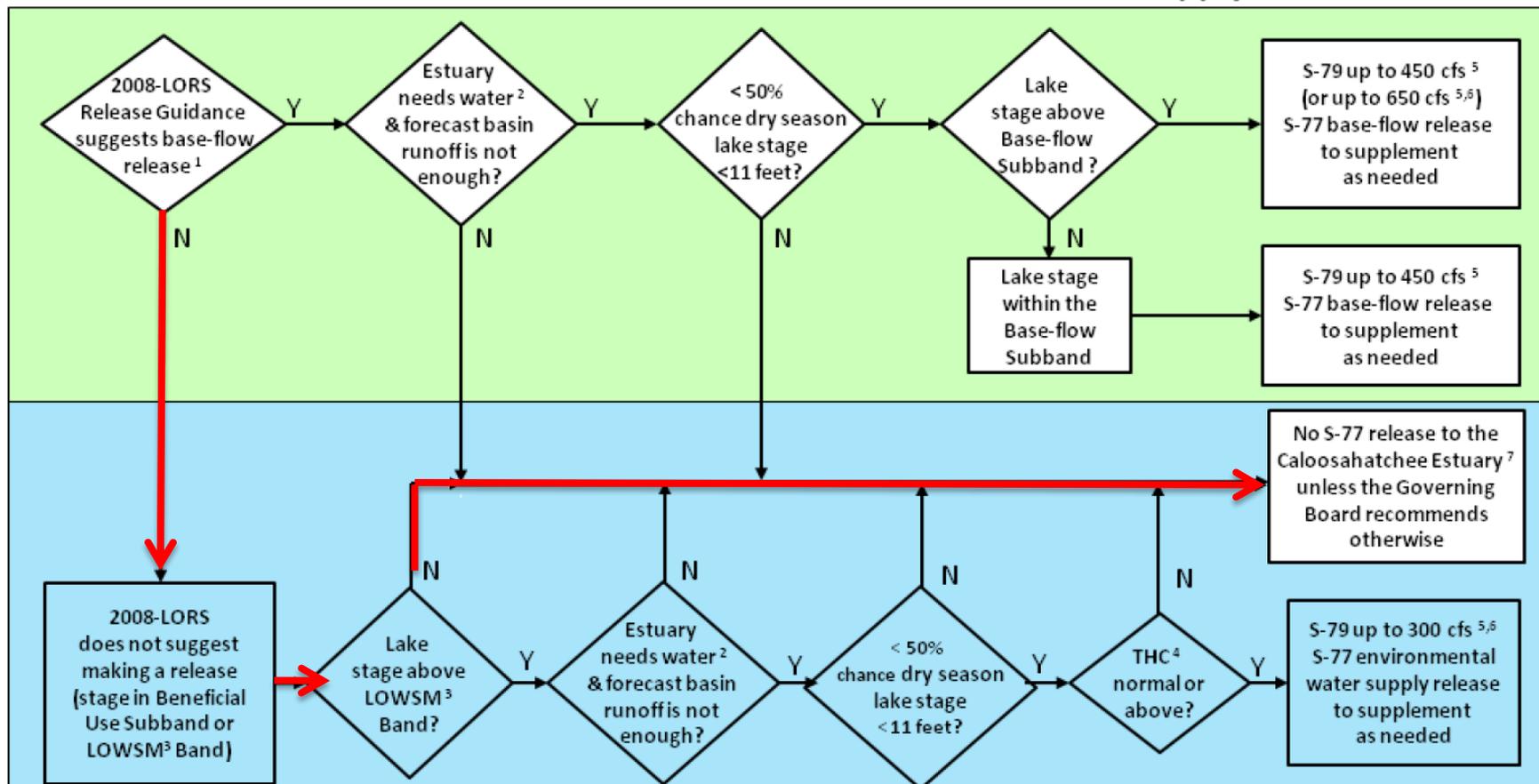


SFWDAT Kissimmee River (Pool C) Monthly Depth Maps



South Florida Water Depth Assessment Tool (SFWDAT)

Flowchart to Guide Recommendations for Lake Okeechobee Releases to the Caloosahatchee Estuary for 2008-LORS Base Flow & for Environmental Water Supply



¹The 2008-LORS Release Guidance (Part D) can suggest base-flow releases in the Intermediate, Low, or Base-flow 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.

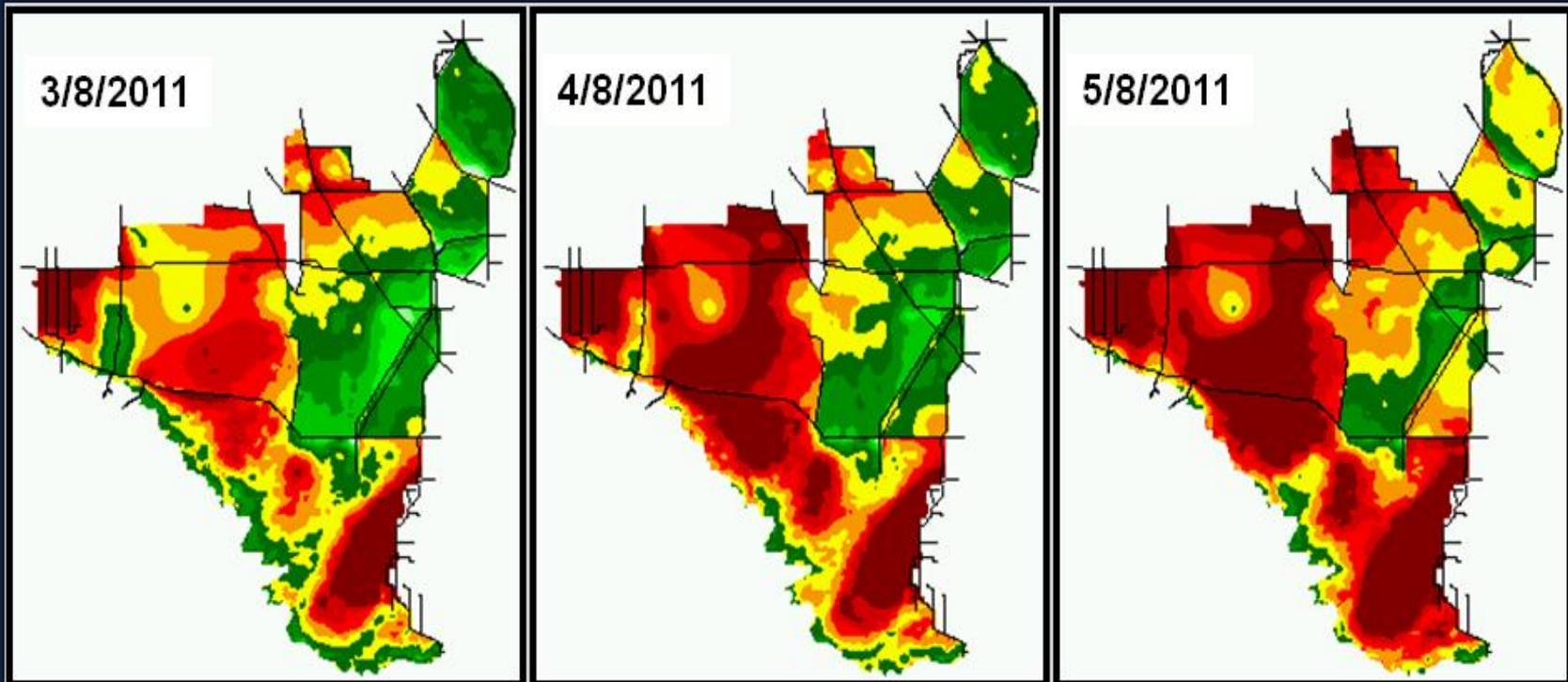
⁵Can release less than the "up to" limit if lower release is sufficient to reach or sustain desired estuary salinity; cfs = cubic feet per second.

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

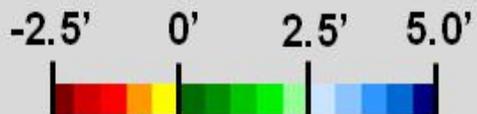
⁷Should this condition be reached, the Governing Board will be briefed at their next regularly scheduled meeting as part of the State of the Water Resources agenda item.



SFWDAT Water Depth Monthly Snapshots



Water Depth (feet)



ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2011

Forecast Parameter and 1950-2000 Climatology (in parentheses)	Issue Date 8 December 2010	Issue Date 6 April 2011
Named Storms (NS) (9.6)	17	16
Named Storm Days (NSD) (49.1)	85	80
Hurricanes (H) (5.9)	9	9
Hurricane Days (HD) (24.5)	40	35
Major Hurricanes (MH) (2.3)	5	5
Major Hurricane Days (MHD) (5.0)	10	10
Accumulated Cyclone Energy (ACE) (96.1)	165	160
Net Tropical Cyclone Activity (NTC) (100%)	180	175

PROBABILITIES FOR AT LEAST ONE MAJOR (CATEGORY 3-4-5) HURRICANE
LANDFALL ON EACH OF THE FOLLOWING COASTAL AREAS:

- 1) Entire U.S. coastline - 72% (average for last century is 52%)
- 2) U.S. East Coast Including Peninsula Florida - 48% (average for last century is 31%)
- 3) Gulf Coast from the Florida Panhandle westward to Brownsville - 47% (average for last century is 30%)

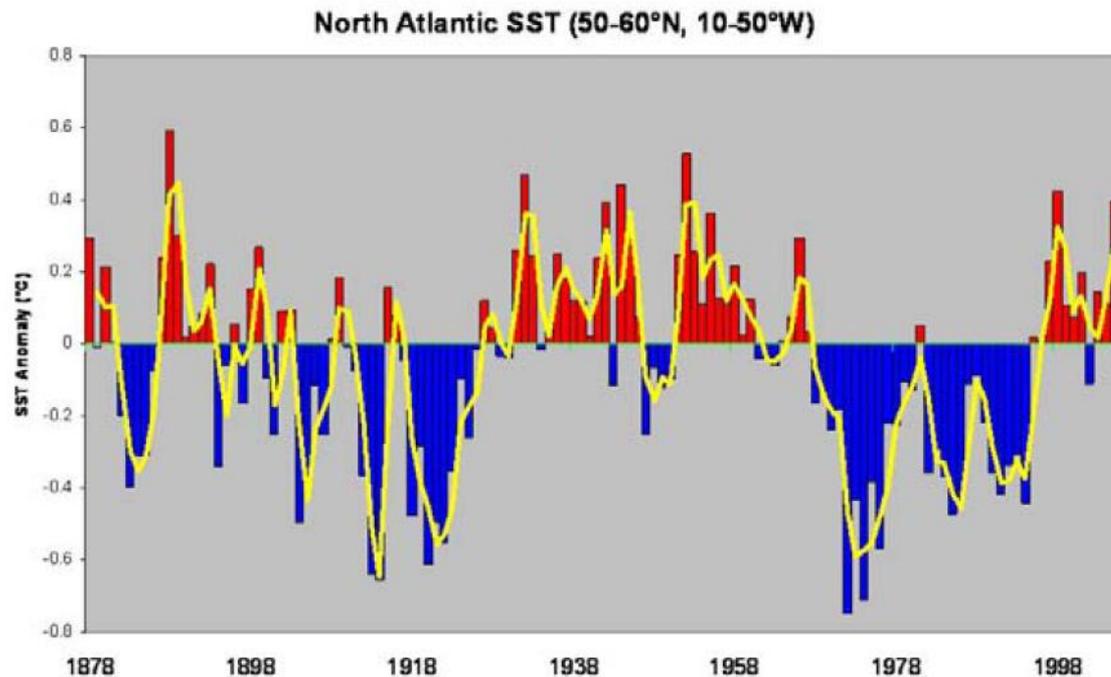


Figure 19: Long-period portrayal (1878-2006) of North Atlantic sea surface temperature anomalies (SSTA). The red (warm) periods are when the THC (or AMO) is stronger than average and the blue periods are when the THC (or AMO) is weaker than average.

2008 LORS

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

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

When conducting Base Flow releases, flows can be distributed East and West up to 650 cfs as needed to minimize impacts or provide benefits through S-80 and S-79

Apply Meteorological Forecasts on a Weekly Basis; apply Seasonal and Multi-Seasonal Climate/Hydrologic Outlooks on a Monthly Basis

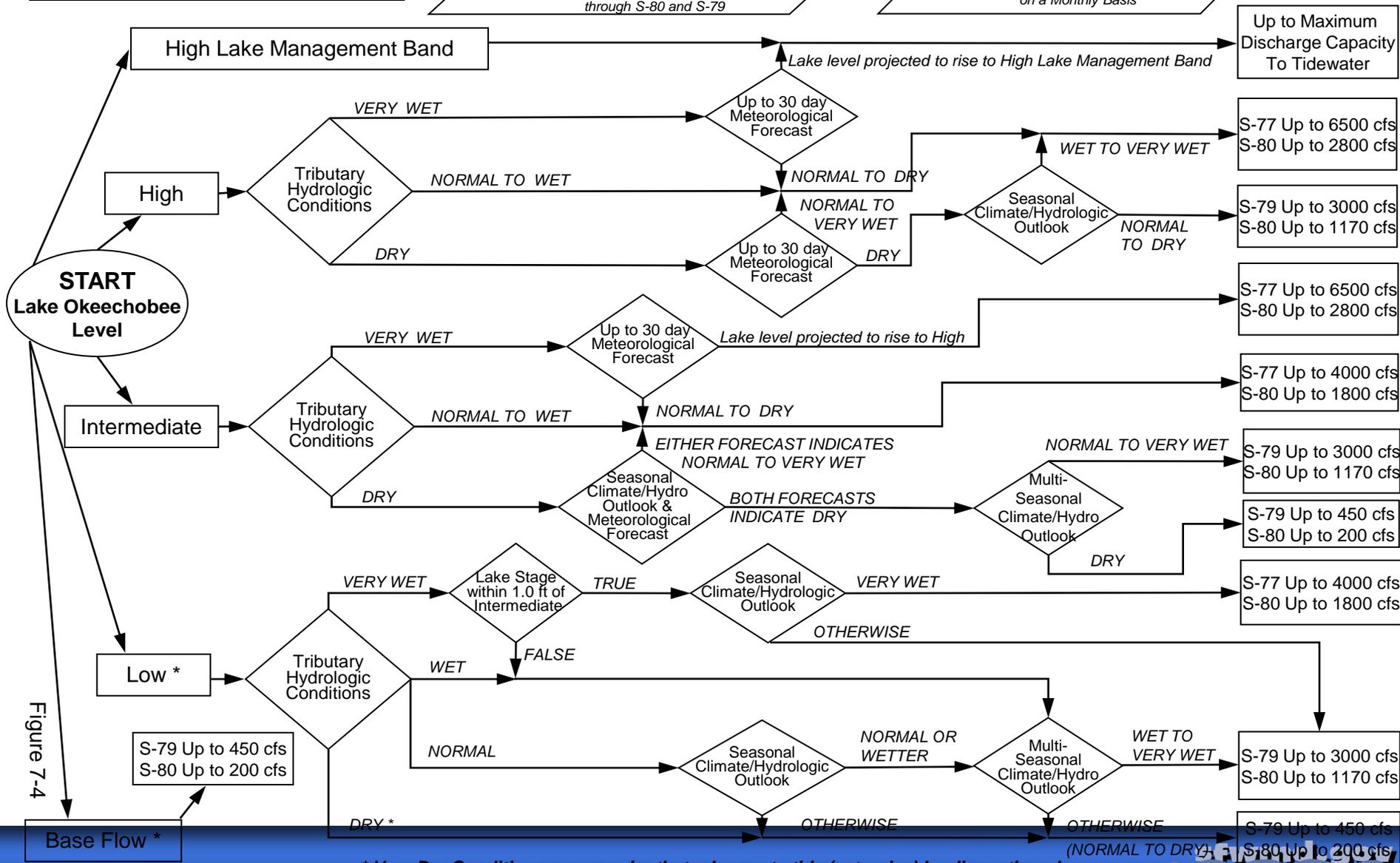


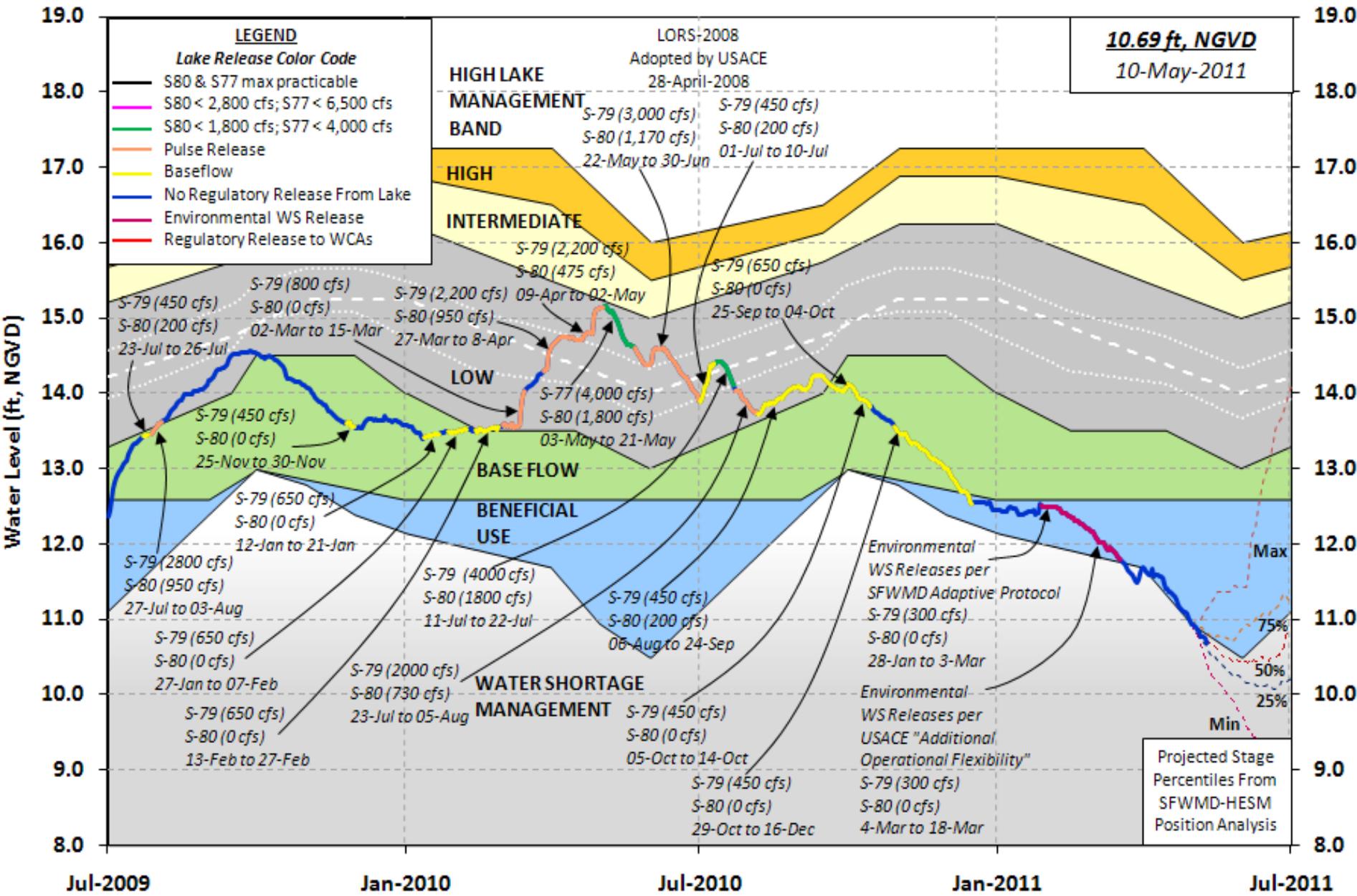
Figure 7-4

* Very Dry Conditions may require that releases to tide (estuaries) be discontinued

STA Weekly Summary (05/03 – 05/10/11)

	STA	Cells	Average Ground	Target Stage	Minimum Stage	Average Stage (NGVD 29)				Current Water Levels (ft)
						4/19/2011	4/26/2011	5/3/2011	5/10/2011	
Drought Contingency Stage	STA-1E	1	16.8	18.25	16.8	15.3	15.2	15.2	15.2	-1.62
		2	15.69	18.25	15.6	16.8	16.6	16.3	16.2	0.91
		3	15.25	16.5	15.8	15.8	15.6	15.5	15.5	1.30
		4N	14.16	15.41	14.7	14.0	13.9	13.7	13.6	1.21
		4S	12.43	13.68	12.9	14.2	14.0	13.8	13.7	0.28
		5	13.39	14.64	13.9	13.4	13.3	13.2	13.2	1.33
		6	11.85	13.1	12.4	14.1	14.0	13.8	13.5	1.74
Target Stage	STA-1W	1A	10.1	11.3	10	11.7	11.6	12.1	12.2	2.05
		1B	10.1	11.3	10	11.5	11.3	11.8	11.9	1.83
Minimum Target Stage	STA-1W	3	10.4	11.3	10	11.5	11.4	11.9	11.8	1.44
		2A	9.45	11	10	11.3	11.1	11.0	10.9	1.44
		2B	9.45	11	10	11.3	11.2	11.0	10.9	1.46
		4	9.7	11	10	11.2	11.0	10.9	10.8	1.07
		5A	9	10.5	9.5	10.8	10.6	10.6	10.5	1.50
		5B	9	10.5	9.5	10.8	10.6	10.6	10.5	1.46
		25% Dry	STA-2	1	11.8	13.1	12.3	13.0	12.8	12.7
2	10.3			12.1	10.7	12.2	12.0	11.9	11.8	1.53
3	9.6			10.9	10.1	11.2	11.1	11.1	11.0	1.42
4	8.7			10.5	9.2	9.1	9.3	9.1	9.2	0.47
50% Dry	STA-3/4	1A	9.2	10.6	9.7	9.2	9.2	8.9	8.6	-0.65
		1B	9.4	10.6	9.9	10.5	10.3	10.3	10.2	0.85
		2A	9.4	10.65	9.9	10.9	10.7	10.5	10.4	1.02
		2B	9.4	10.65	9.9	10.7	10.5	10.5	10.5	1.06
		3A	9.8	11.05	10.3	10.6	10.4	10.1	10.1	0.29
		3B	9.7	10.95	10.2	10.7	10.7	10.3	10.2	0.52
75% Dry	STA-5	1A	12.7	14	13.3	11.9	11.7	11.3	11.2	-1.46
		1B	11.5	13	12	12.7	12.5	12.4	12.7	1.15
		2A	12.7	14	13.3	11.7	11.6	11.5	11.5	-1.22
		2B	11.5	13	12	12.7	12.4	12.4	12.3	0.75
		3A	14	15.3	14.5	12.1	11.7	11.5	11.3	-2.74
		3B	12.5	14	13	12.0	11.7	11.0	11.0	-1.53
100% Dry	STA-6	3	12.5	14.2	11.9	11.9	11.6	11.2	10.9	-1.60
		5	12.4	14.2	11.9	11.8	11.7	11.4	11.3	-1.09
		Section 2	12.4	14.5	13	11.4	11.1	10.6	10.5	-1.92

Lake Okeechobee Water Level History and Projected Stages



Lake Okeechobee Service Area (LOSA)

