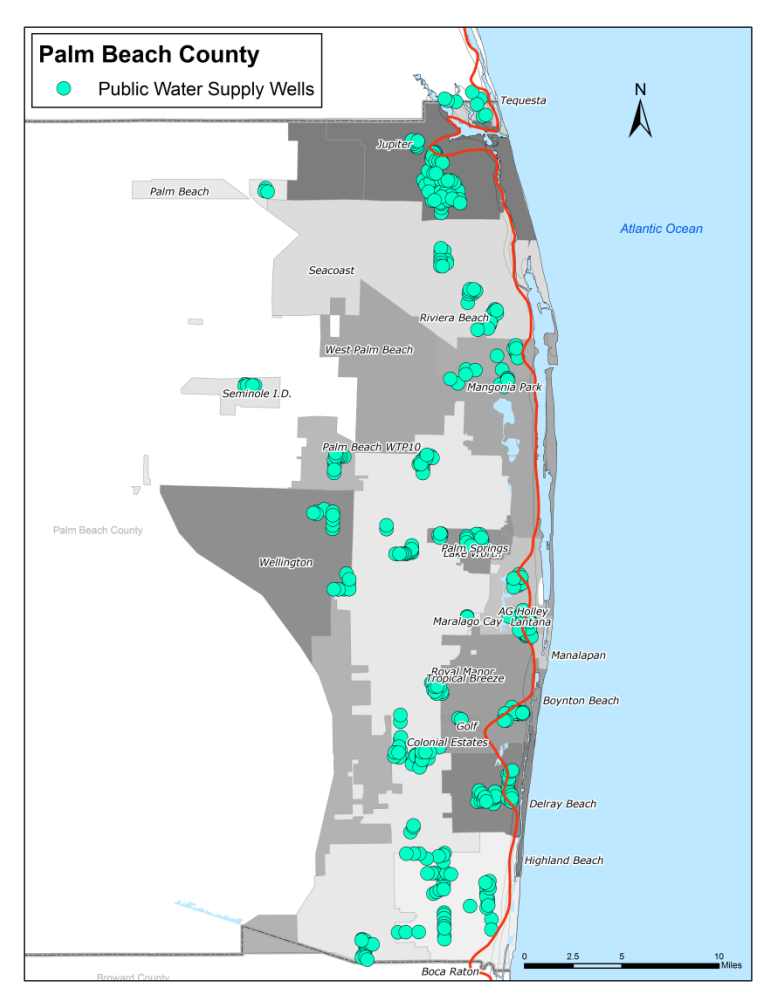
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

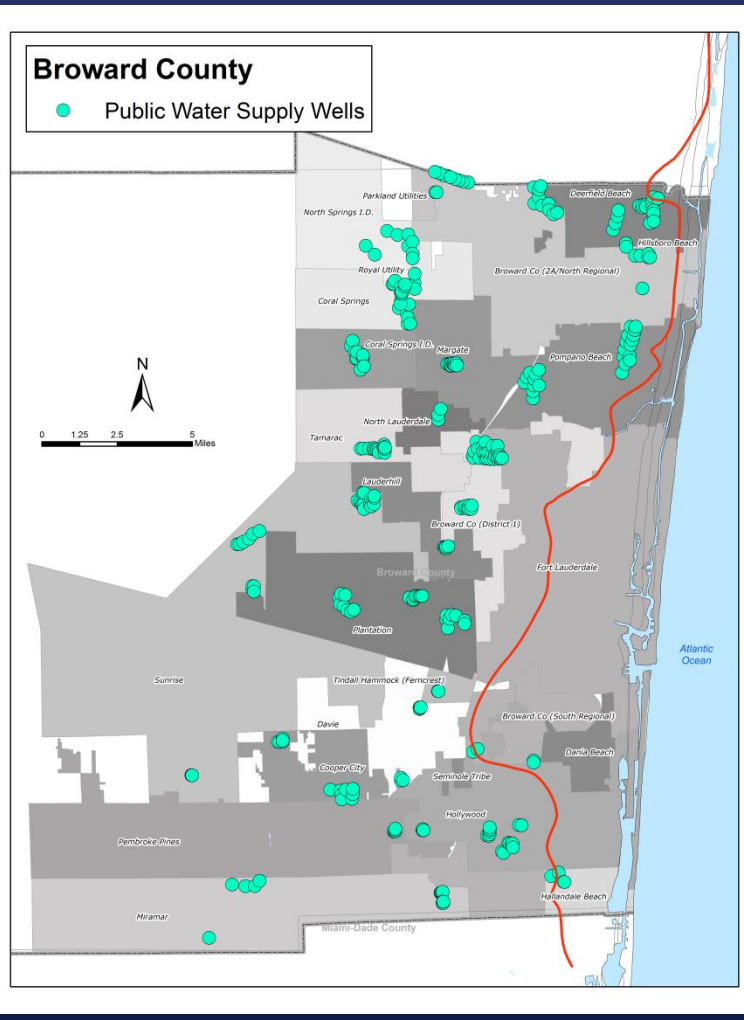
Municipal Wellfields and Saltwater Intrusion – Response to Recent Water Shortages in South Florida

Meeting
April 17, 2013

Peter J. Kwiatkowski, P.G., Section Administrator
Resource Evaluation Section
South Florida Water Management District

Municipal Wellfields and Saltwater Interface Position





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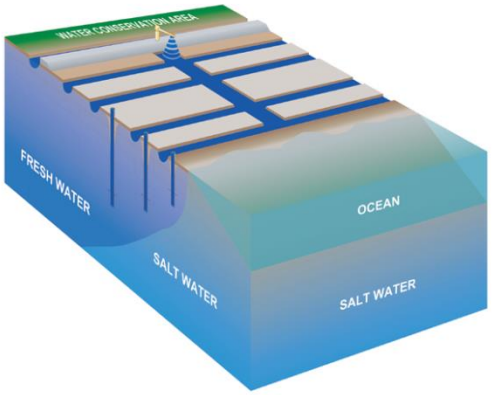
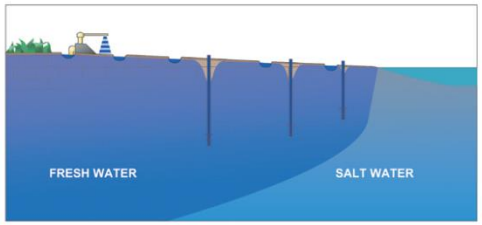
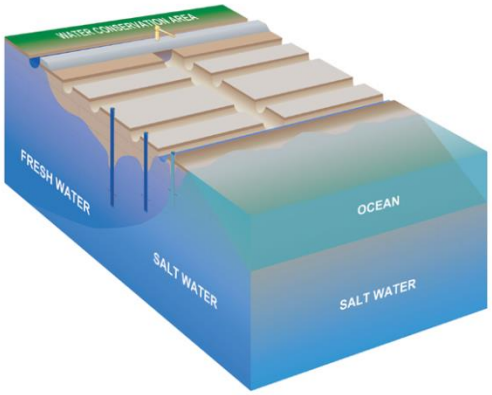
SALTWATER INTRUSION

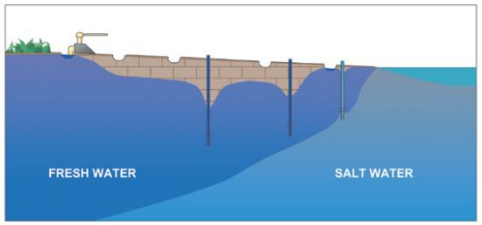
NORMAL WATER DELIVERY



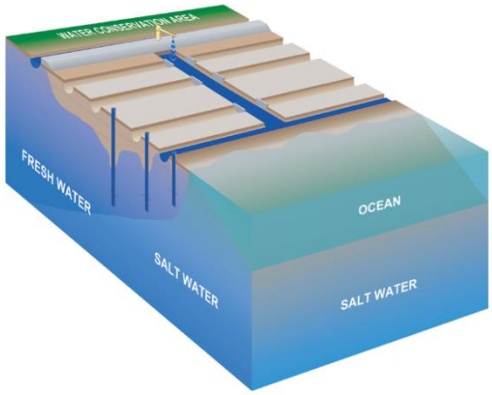


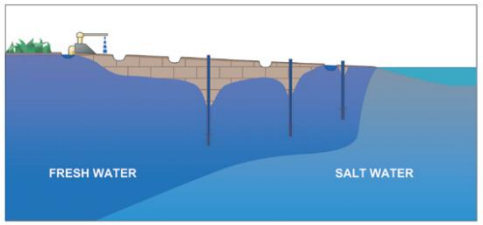
NO WATER DELIVERY



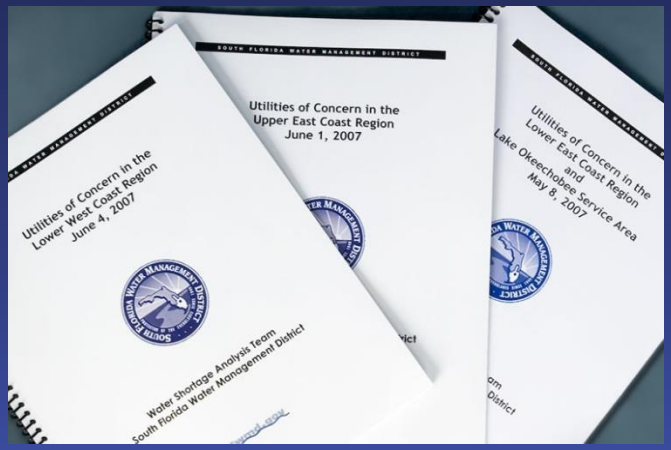


STRATEGIC WATER DELIVERY





"Utilities of Concern" or "at Risk"

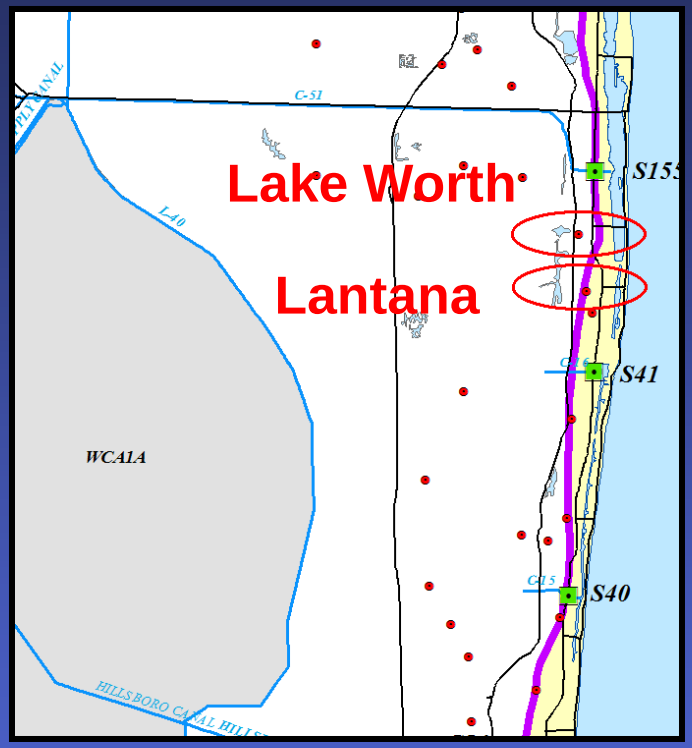


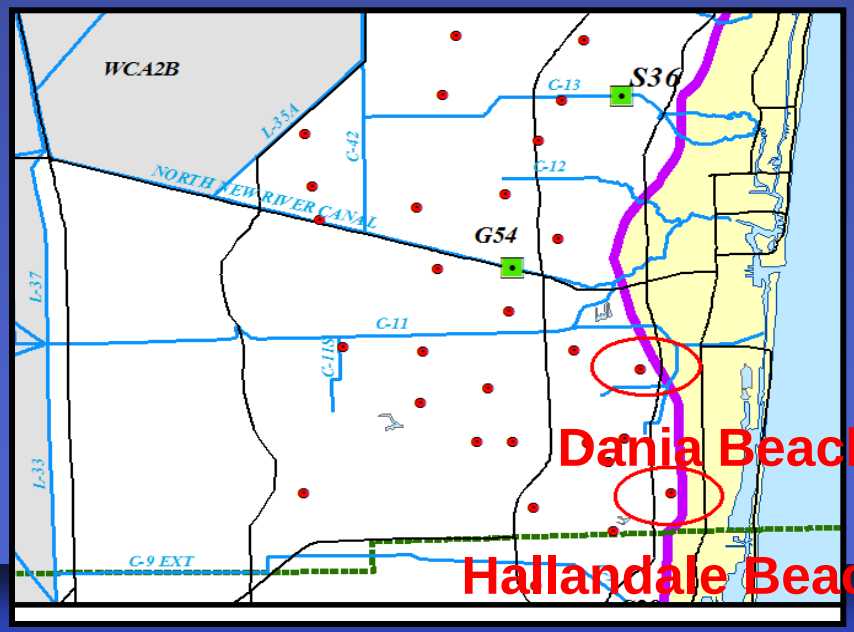
***"Utilities of Concern"*: wellfields near saltwater interface, but also have a western wellfield, AWS or interconnects**

***"Utilities at Risk":* wellfields near saltwater interface, but with no western wellfields, and/or limited Alternative Water Supplies or interconnects with other utilities**

Utilities at Risk
Lake Worth, Lantana, Dania Beach, Hallandale

- WMD Emergency Orders limiting or prohibiting pumpage of eastern wells
- Phase III water restrictions (one day a week irrigation)





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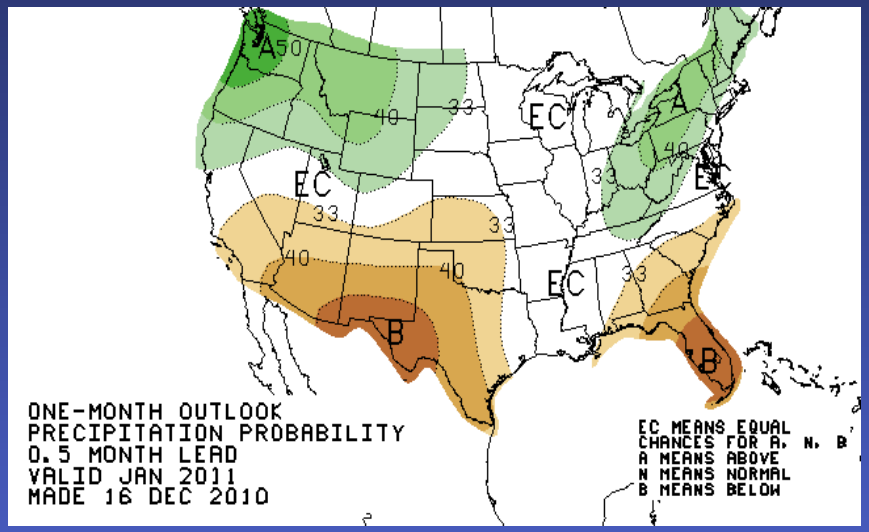
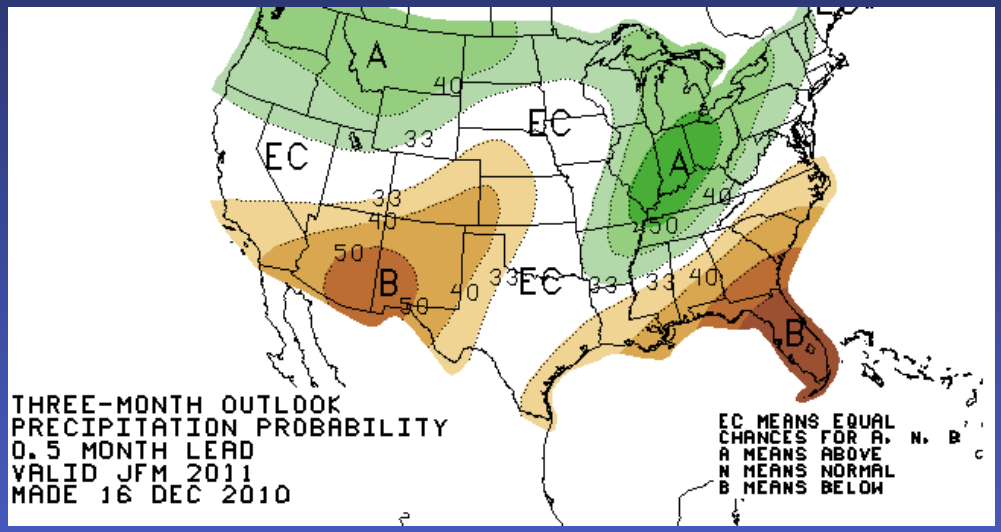
U. S. Seasonal Precipitation Outlook

National Climate Prediction Center (CPC)

January



Jan-March



La Nina conditions are expected to continue into 2010-2011 dry season

The current precipitation outlook for central and southern Florida is:

- increased chance of below-normal (B) rainfall for January.
- increased chance of below-normal (B) rainfall for Jan-March
- increased chance of below-normal (B) rainfall for the entire 2010-11 dry season

sfwmd.gov

http://www.cpc.ncep.noaa.gov/products/predictions/30day/

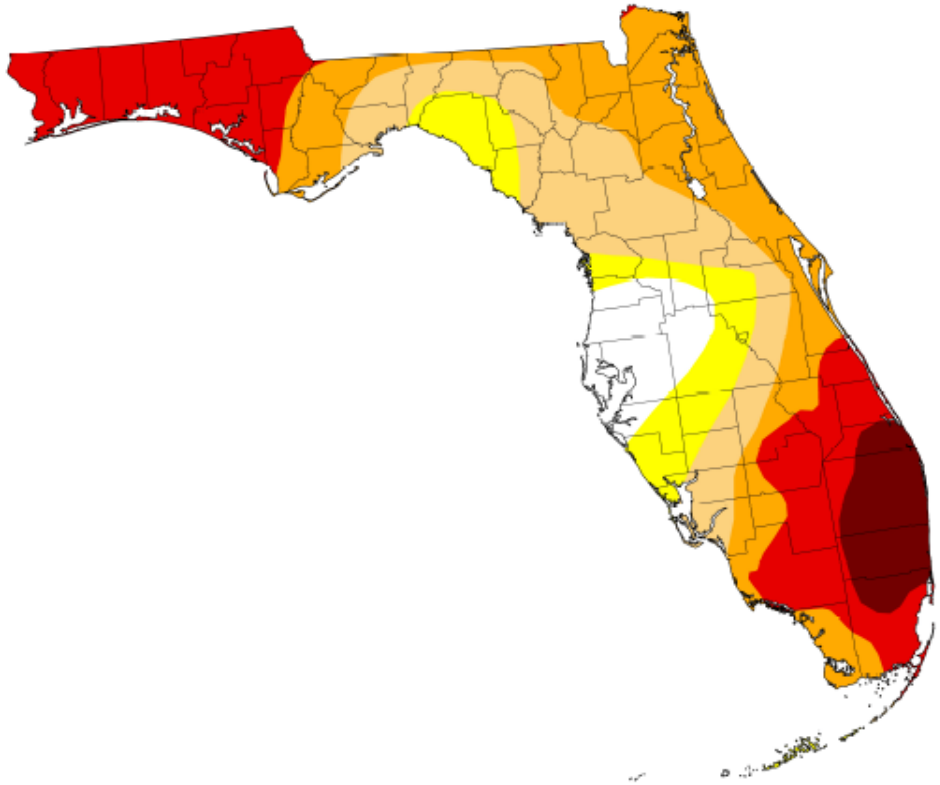
U.S. Drought Monitor

Florida

June 7, 2011
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.11	92.89	81.58	59.37	32.45	7.08
Last Week (05/31/2011 map)	9.79	90.21	76.31	56.50	31.10	2.32
3 Months Ago (03/08/2011 map)	0.87	99.13	91.30	56.10	14.99	0.00
Start of Calendar Year (12/28/2010 map)	0.18	99.82	86.04	50.84	20.21	0.00
Start of Water Year (09/28/2010 map)	54.97	45.03	18.02	4.22	0.00	0.00
One Year Ago (06/01/2010 map)	100.00	0.00	0.00	0.00	0.00	0.00



Intensity:

- *D0 Abnormally Dry*
- *D1 Drought - Moderate*
- *D2 Drought - Severe*
- *D3 Drought - Extreme*
- *D4 Drought - Exceptional*

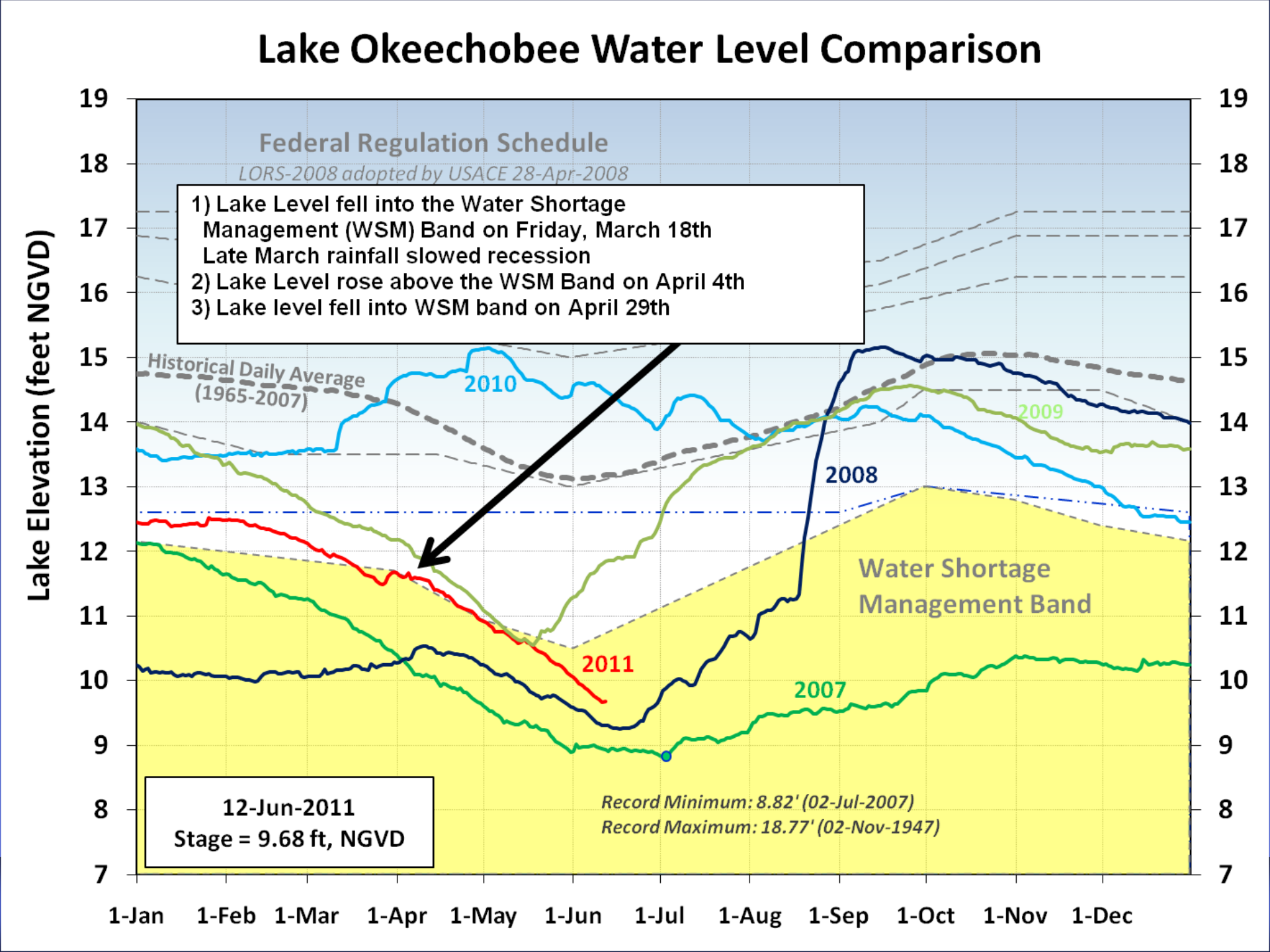
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, June 9, 2011

Matthew Rosencrans, NOAA/NWS/NCEP/CPC

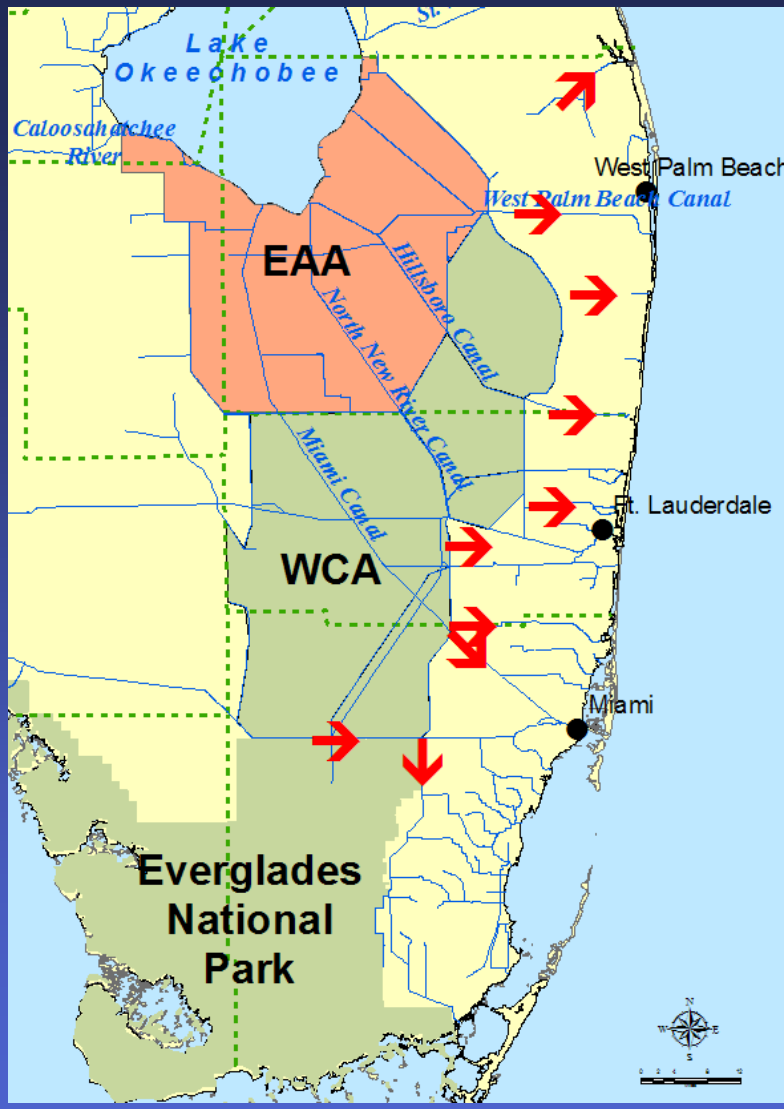
Lake Okeechobee Water Level Comparison

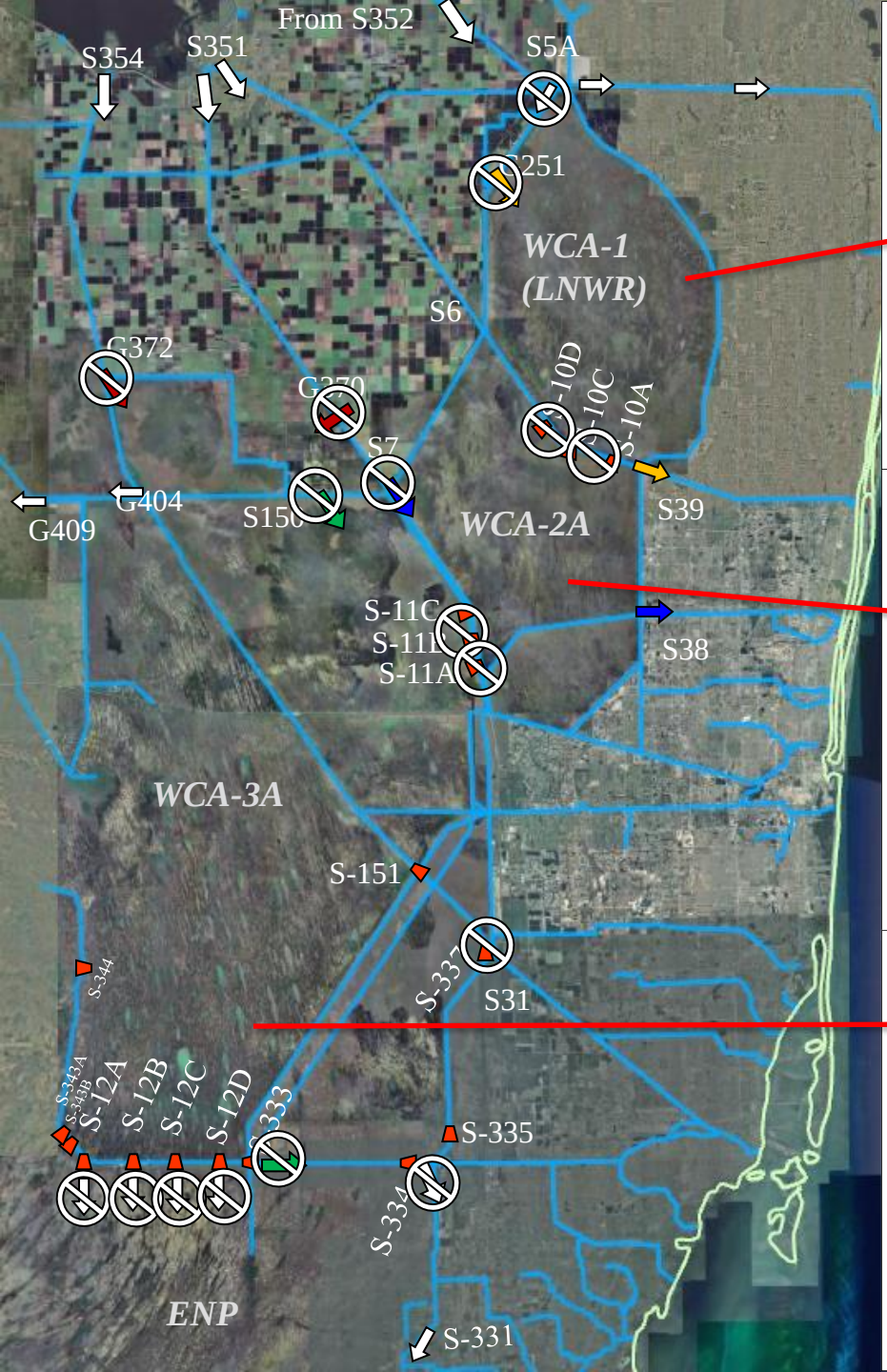


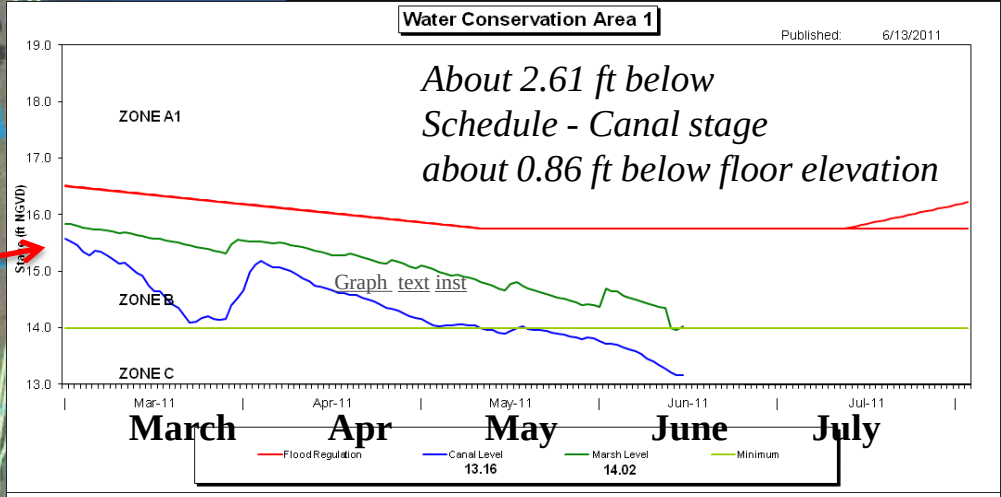
Water Deliveries from WCAs to Lower East Coast Urban Areas

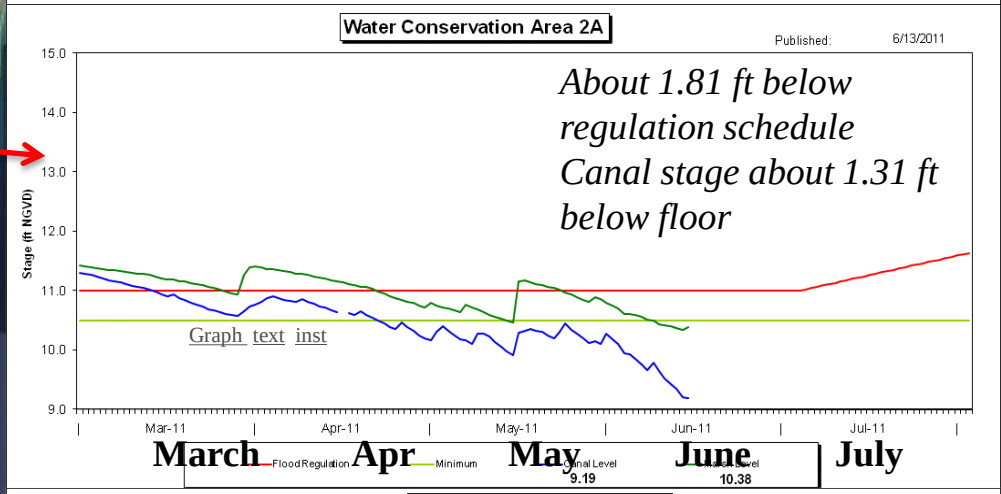
Water deliveries to maintain high groundwater levels during the dry season and recharge wellfields

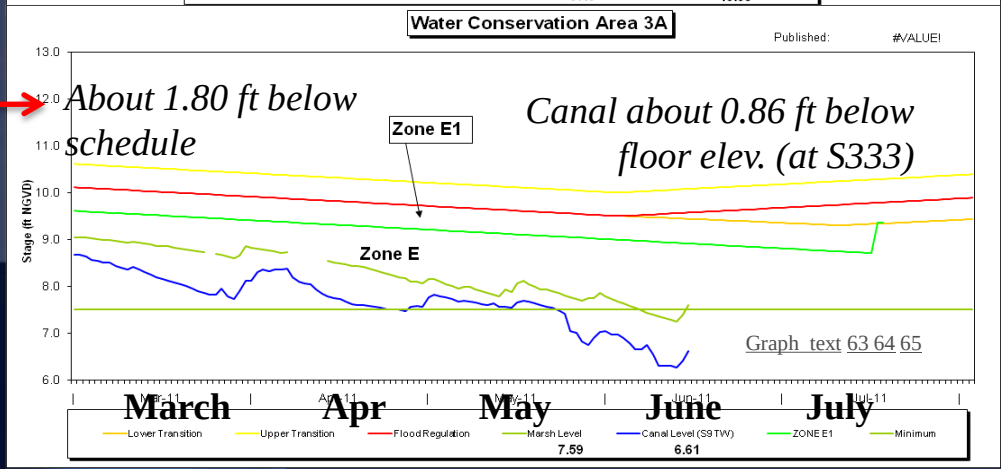
- SFWMD Canals
- Local/secondary Canals
- Regional Recharge (+/- 900 mgd)
- Limited Reuse and AWS in Lower East Coast




From S352
S354
S351
S5A
S251
WCA-1
(LNWR)
S6
G372
G370
S-10D
S-10C
S-10A
S7
G404
G409
S150
WCA-2A
S39
S-11C
S-11B
S-11A
S38
WCA-3A
S-151
S-344
S-337
S31
S-344A
S-344B
S-12A
S-12B
S-12C
S-12D
S-333
S-335
S-334
ENP
S-331


Water Conservation Area 1
Published: 6/13/2011
About 2.61 ft below
Schedule - Canal stage
about 0.86 ft below floor elevation
ZONE A1
ZONE B
ZONE C
Stage (ft NGVD)
Graph text inst
March
Apr
May
June
July
Flood Regulation
Canal Level
13.16
Marsh Level
14.02
Minimum


Water Conservation Area 2A
Published: 6/13/2011
About 1.81 ft below
regulation schedule
Canal stage about 1.31 ft
below floor
Stage (ft NGVD)
Graph text inst
March
Apr
May
June
July
Flood Regulation
Minimum
9.19
10.38

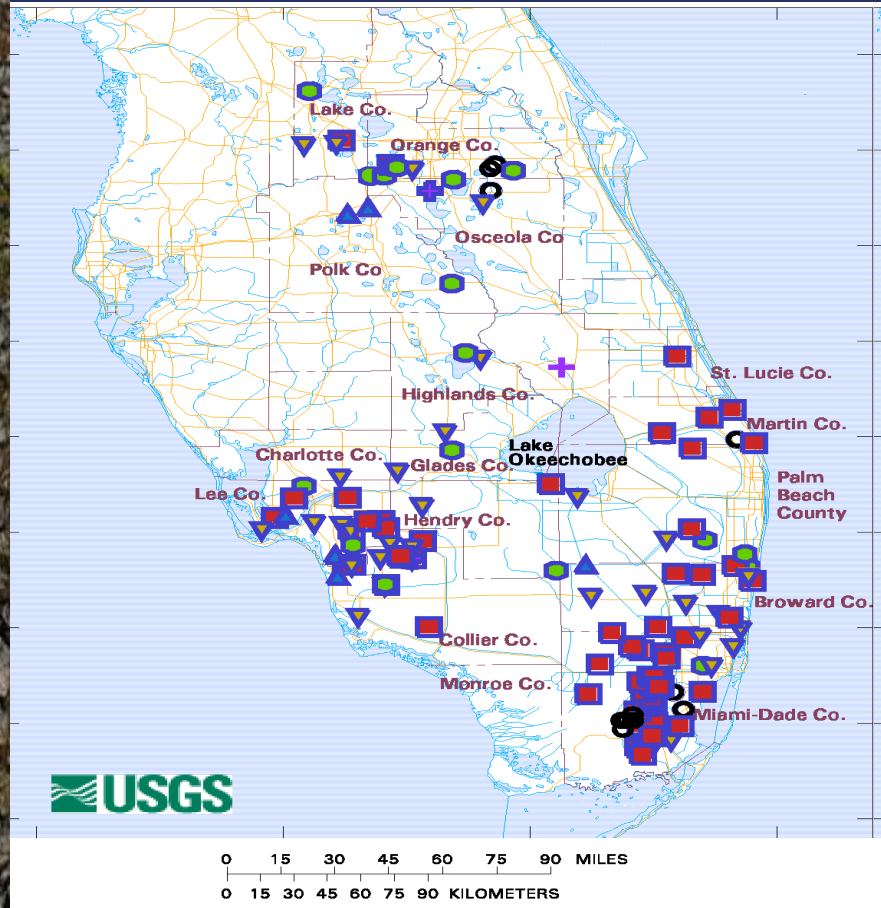

Water Conservation Area 3A
Published: #VALUE!
About 1.80 ft below
schedule
Canal about 0.86 ft below
floor elev. (at S333)
Zone E1
Zone E
Stage (ft NGVD)
Graph text 63 64 65
March
Apr
May
June
July
Lower Transition
Upper Transition
Flood Regulation
Marsh Level
7.59
Canal Level (S9TW)
6.61
ZONE E1
Minimum

WCA-2A, Northern 3A and ENP were Very Dry

- Water table in WCA-2A below ground (-0.5 to -1.5 ft) since early April
- No wading bird feeding areas remain in WCA-2A
- Muck fire risk rising everywhere

Groundwater Levels

May 8, 2011



Rivers and canals
Roads and highways
County boundaries

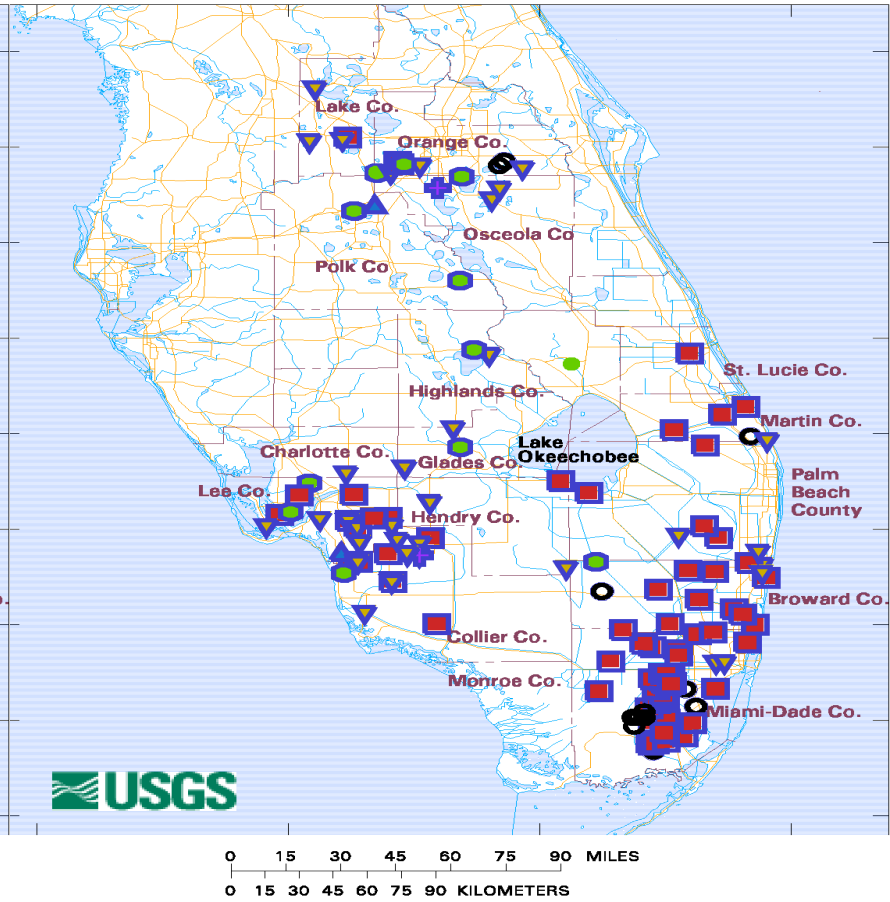
Telemetry site

Water level compared to historical data, after long-term trends are rem

- Insufficient information available to compute water-level statistics
- In lowest 10 percent of past water elevations
- Within lowest 10 to 30 percent of past water elevations
- Within 20 percent of the median of past water elevations
- Within highest 10 to 30 percent of past water elevations
- In highest 10 percent of past water elevations

Water levels at selected sites in South Florida,
Based on PROVISIONAL DATA, as of May 8, 2011.

May 31, 2011



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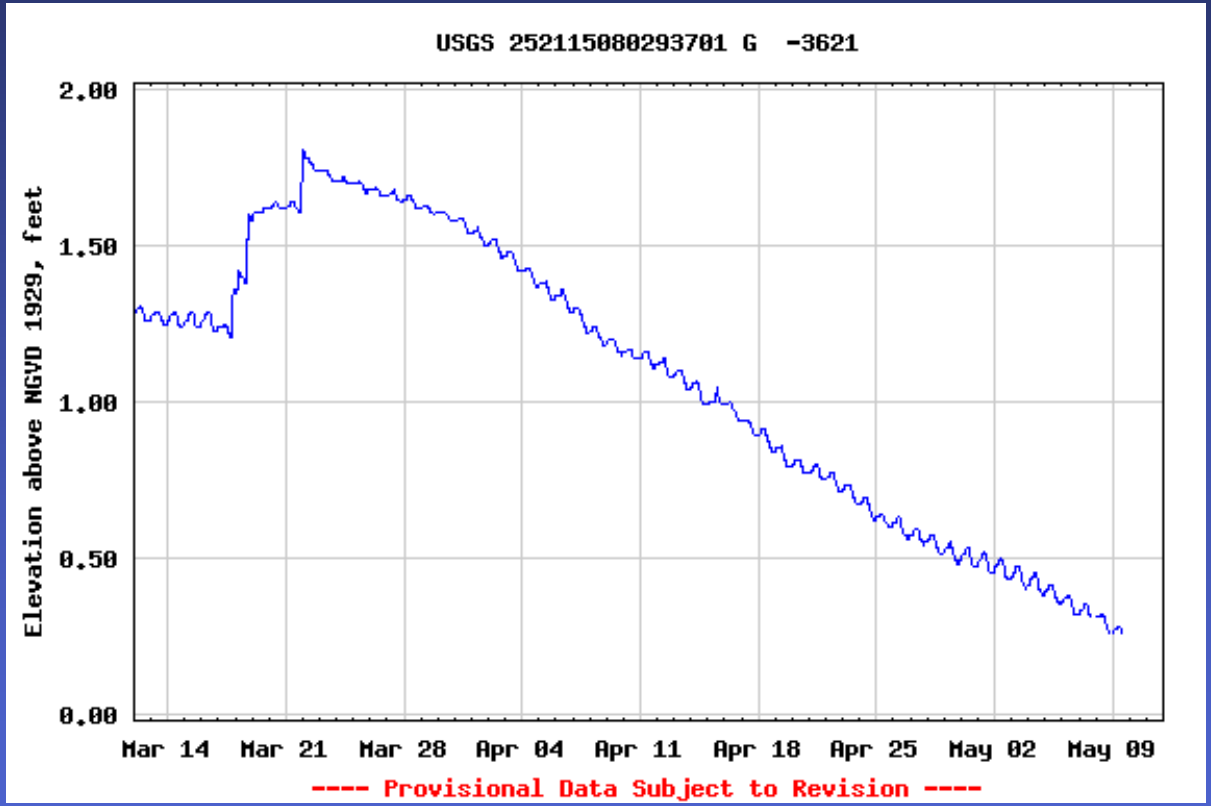
- Within 20 percent of the median of past water elevations
- Within highest 10 to 30 percent of past water elevations
- In highest 10 percent of past water elevations

Water levels at selected sites in South Florida,
Based on PROVISIONAL DATA, as of May 31, 2011.

South Miami-Dade and Monroe Counties

- Water levels at all-time lows (G-3621 at 0.26 feet)
- Four monitor wells – highest chloride concentrations ever recorded
- Modified Phase I (agriculture, nurseries, golf courses)
- Modified Phase III (landscape irrigation – 1 day per week)



Water Shortage Strategy

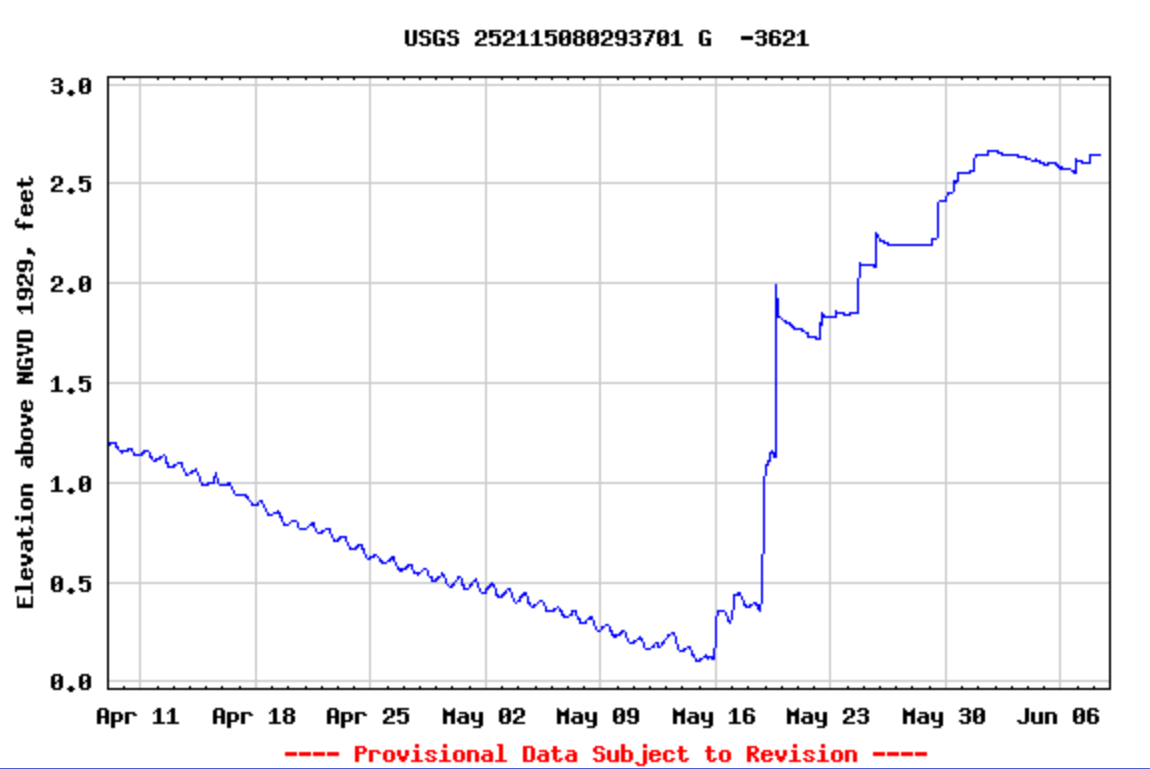
- Utilities obtain new water levels and chloride concentrations and began loading data into SFWMD web portal
- SFWMD reviews data and makes additional recommendations as needed
- Increased enforcement of residential irrigation restrictions by local governments and SFWMD
- Conduct briefings on restrictions for local code enforcement officers

Water Shortage Emergency Order Strategy

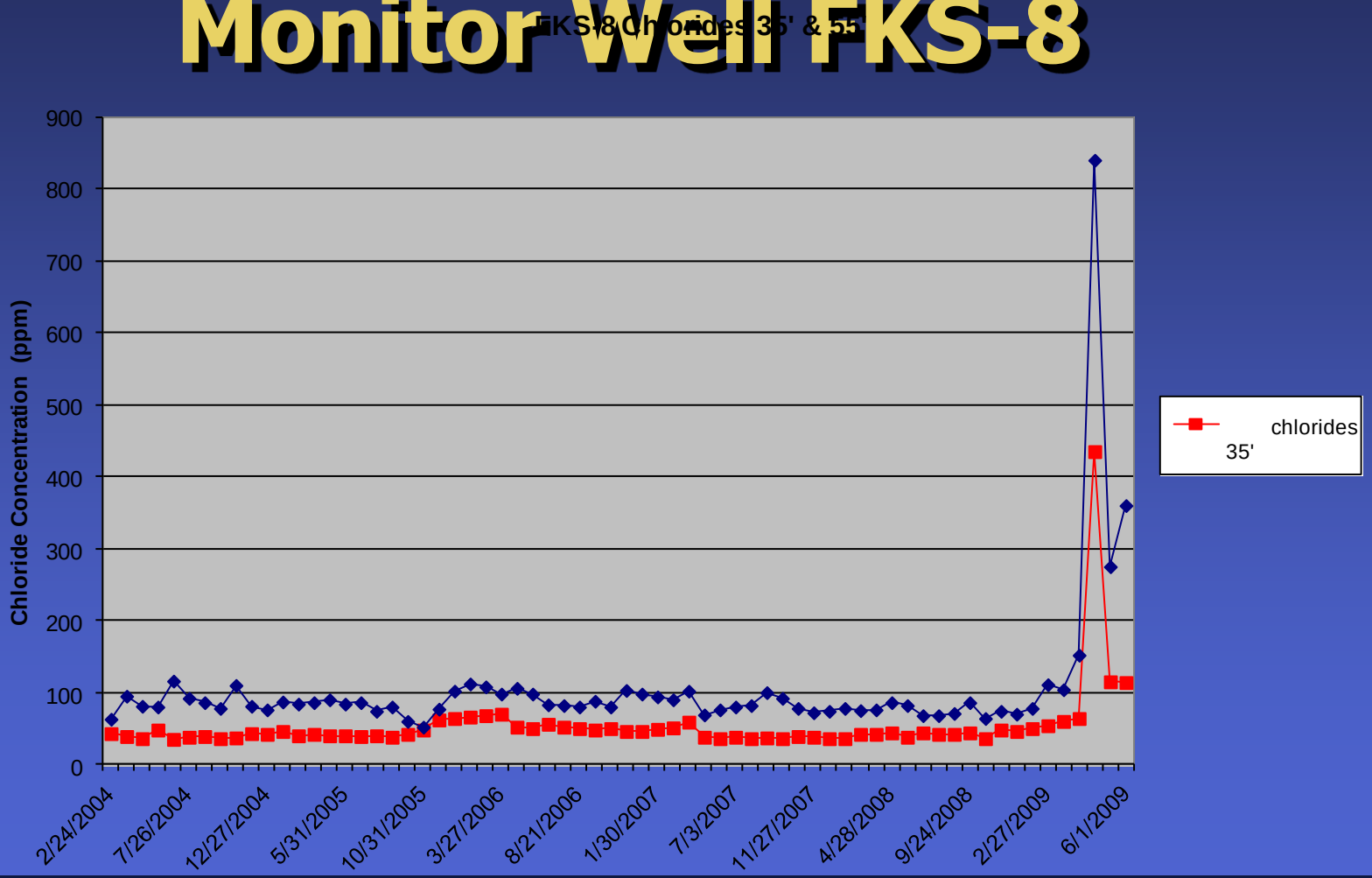
- Follow Water Shortage Rules (Ch. 40E-21 and 40E-22)
- Monitor water level conditions and identify areas of concern
- Advise permittees and local government officials of worsening conditions
- Balance resource and economic impacts
- Target increased restrictions into focused areas that benefit resource
- Develop orders for consideration by Executive Director and Governing Board
- Media releases regarding orders

Water Levels, South Miami-Dade and Monroe Counties

- Water levels at all-time lows (USGS Well G-3621 at 0.26 feet)
- Record May rainfall
- Water levels significantly above average
- Staff Recommendation: Rescind Modified Phase I (agriculture, nurseries, golf courses) and Modified Phase III (landscape irrigation – 1 day per week) Orders



Chloride Concentrations, South Miami-Dade County, Monitor Well FKS-8




Questions?