

Water Conditions Summary

*Governing Board Meeting
June 12, 2008*

*Cal Neidrauer, P.E.
Operations Control and Vegetation
Management Department*

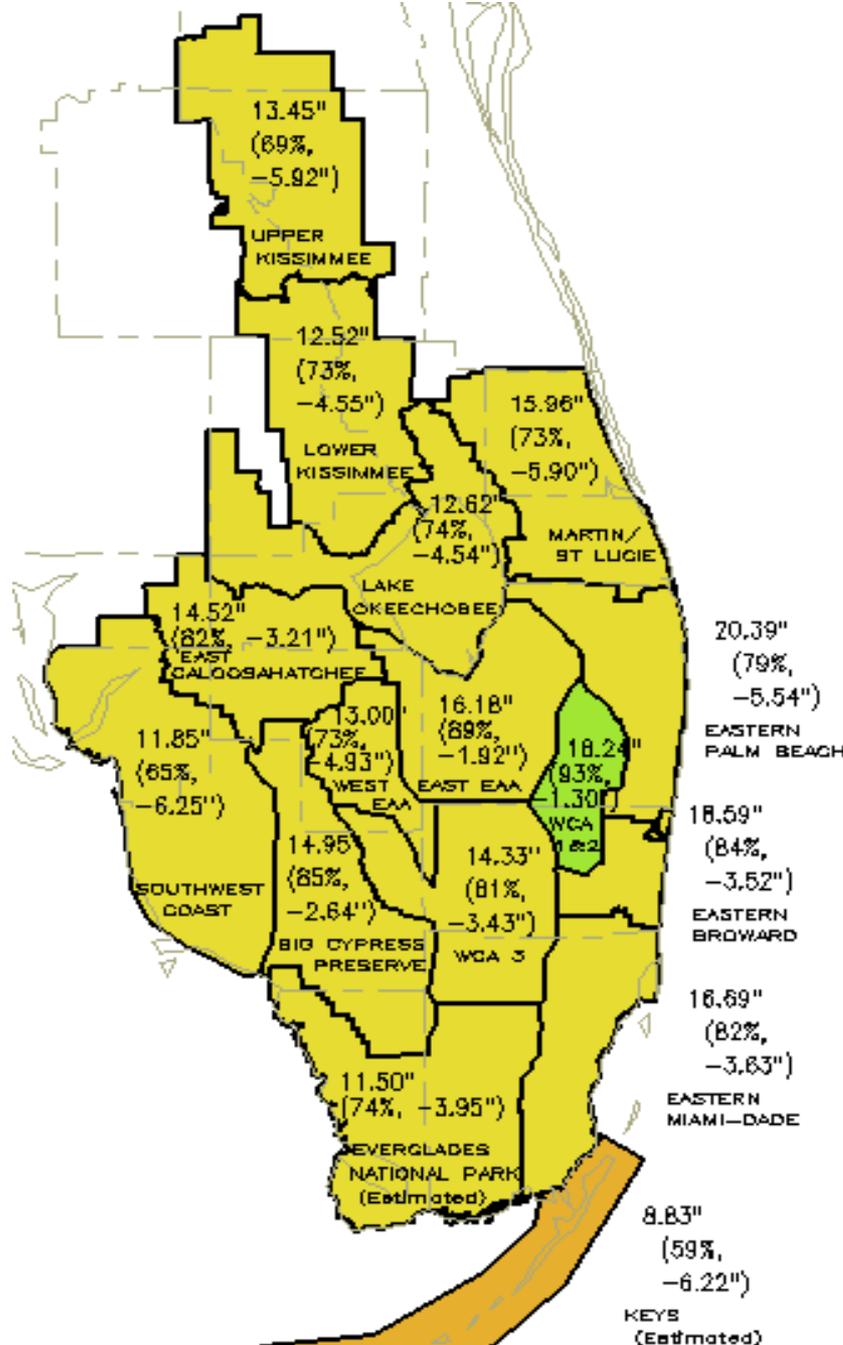
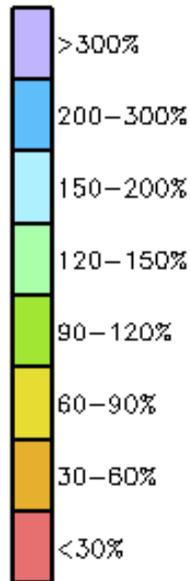
SFWMD 2007-08

Dry Season Rainfall

02-Nov-07 to 26-May-08

DISTRICT-WIDE:
14.57" (77%, -4.3")

Average (Nov-May)
Dry Season = 18.8"



- ~4"-6" rainfall deficit for:
 - Lake O & north
 - NE and SW coasts
- near-average:
 - WCA-1 & 2
- no basin with above-average
- May was first below-avg month since January (2.4" below avg)
 - Feb, Mar, Apr each had above-average rainfall - unprecedented during a La Niña year

Measured
 (% of Avg,
 Diff From Avg)

KEYS
 (Estimated)

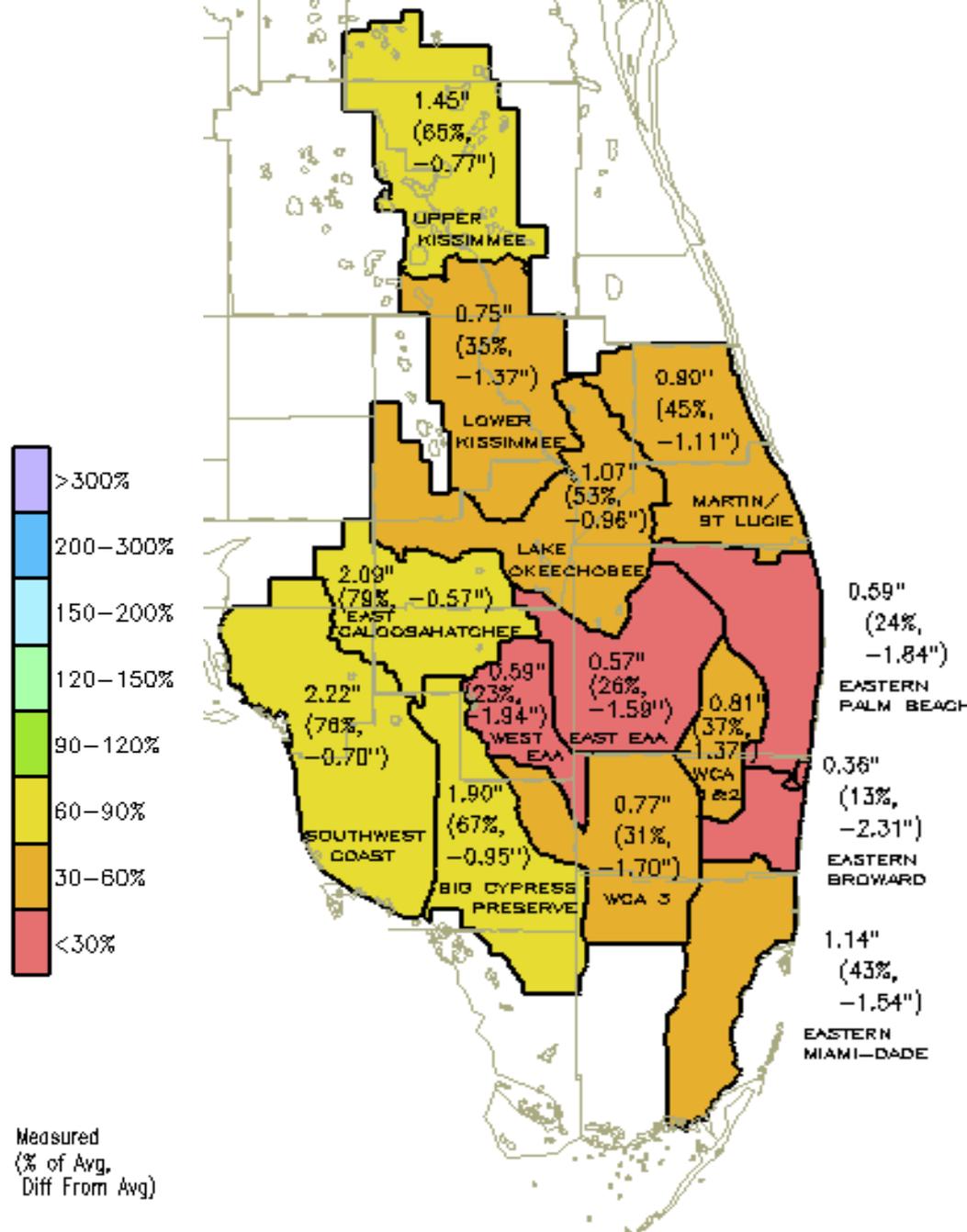
SFWMD 2008 June Rainfall June 2nd – 10th

**DISTRICT-WIDE:
1.21" (50%, -1.20")**

**Average June
= 8.03"**

As of 10-June-2008:

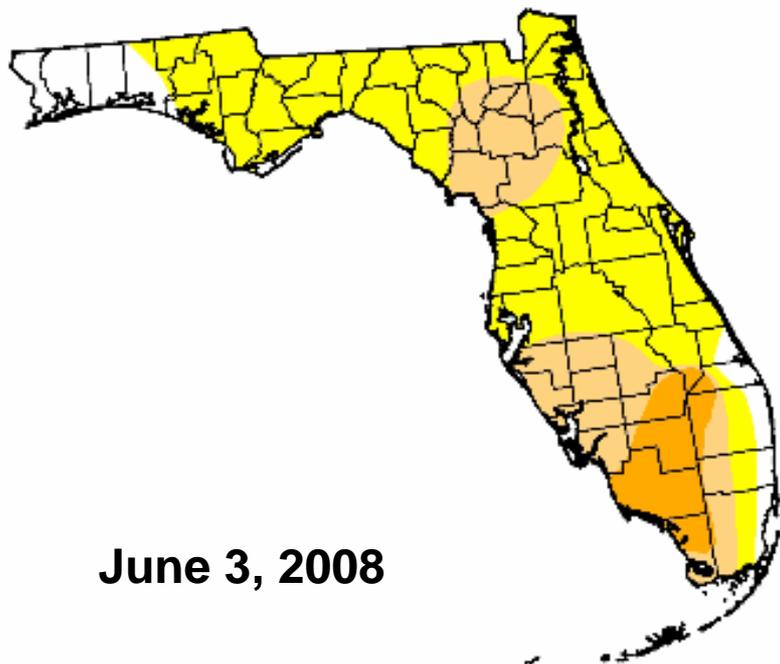
- All basins < average
- 20% of annual rainfall between Memorial Day weekend and Independence Day weekend
- Slow start to the wet season



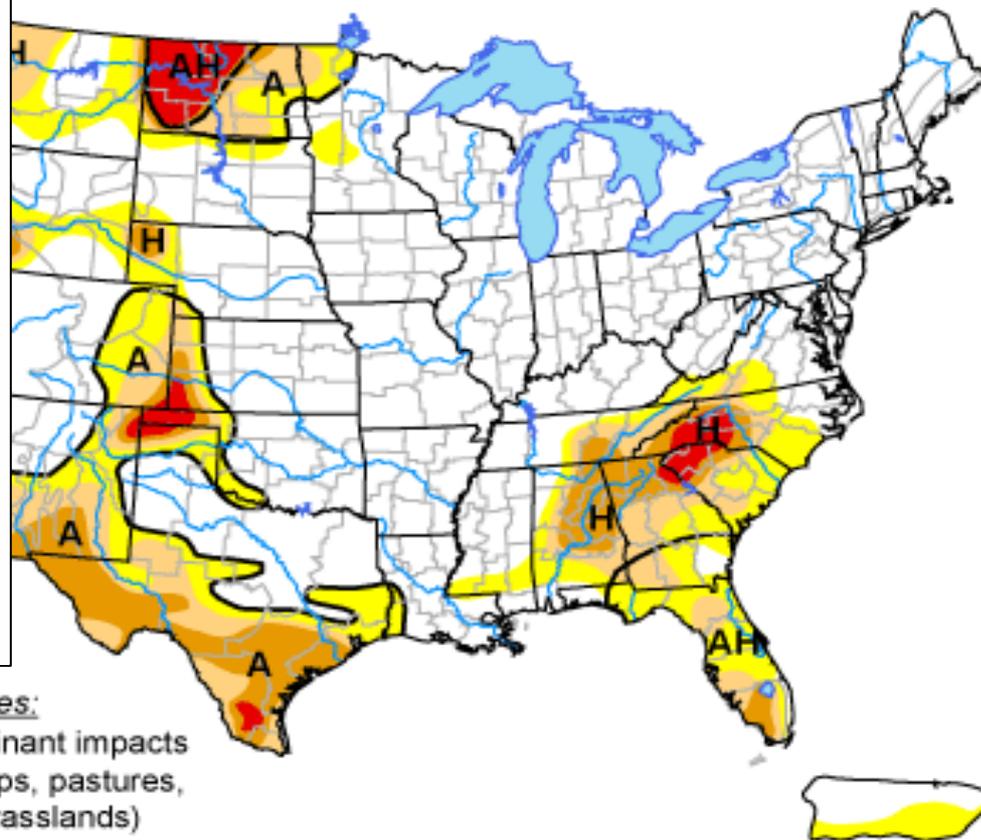
U.S. Drought Monitor

June 3, 2008

Valid 8 a.m. EDT



June 3, 2008



Intensity:

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

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

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



Released Thursday, June 5, 2008

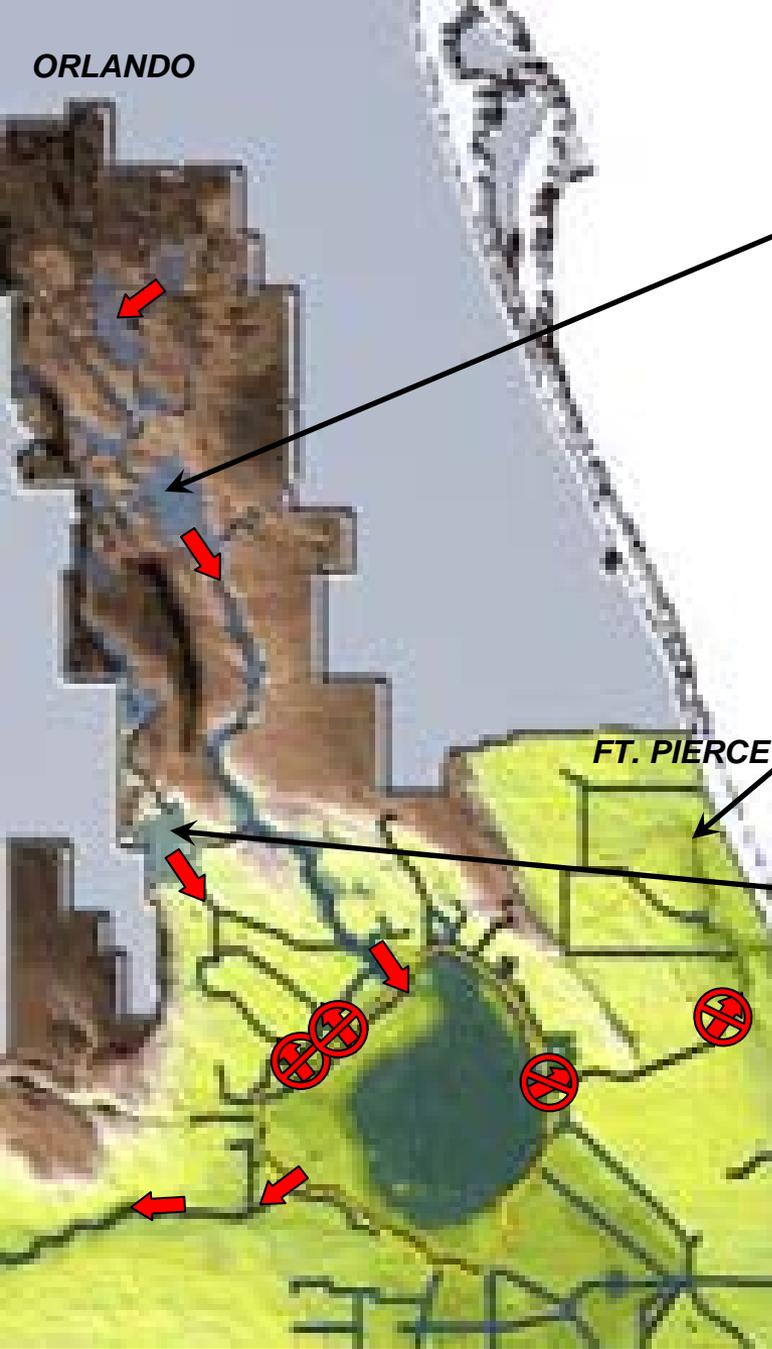
Author: Mark Svoboda, National Drought Mitigation Center

<http://drought.unl.edu/dm>

<http://www.drought.unl.edu/dm/monitor.html>

sfwmd.gov

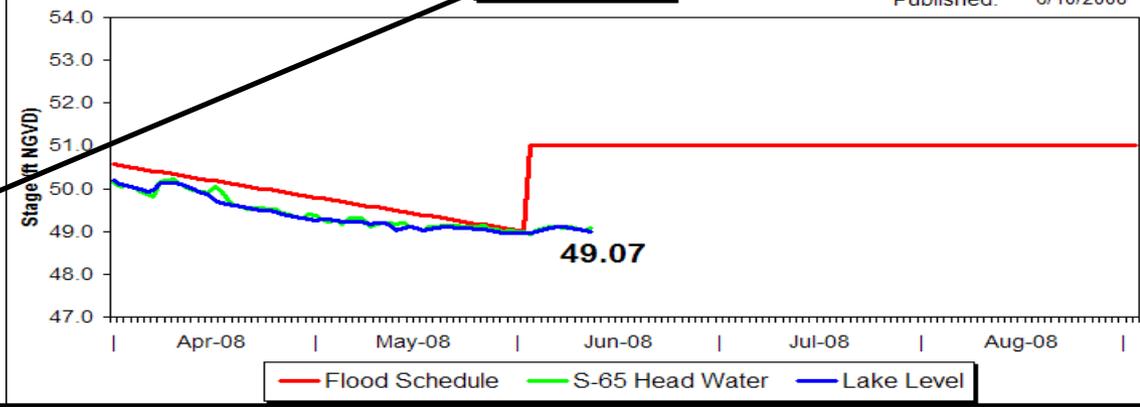
ORLANDO



FT. PIERCE

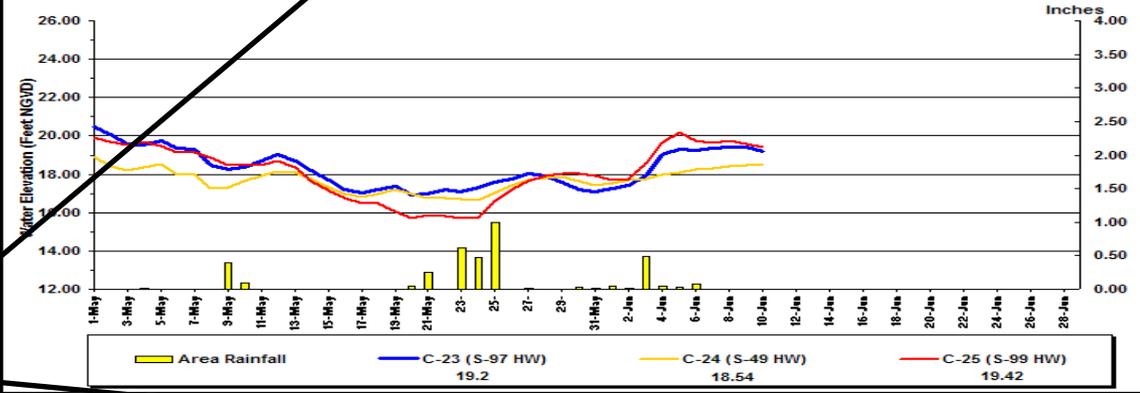
Lake Kissimmee

Published: 6/10/2008



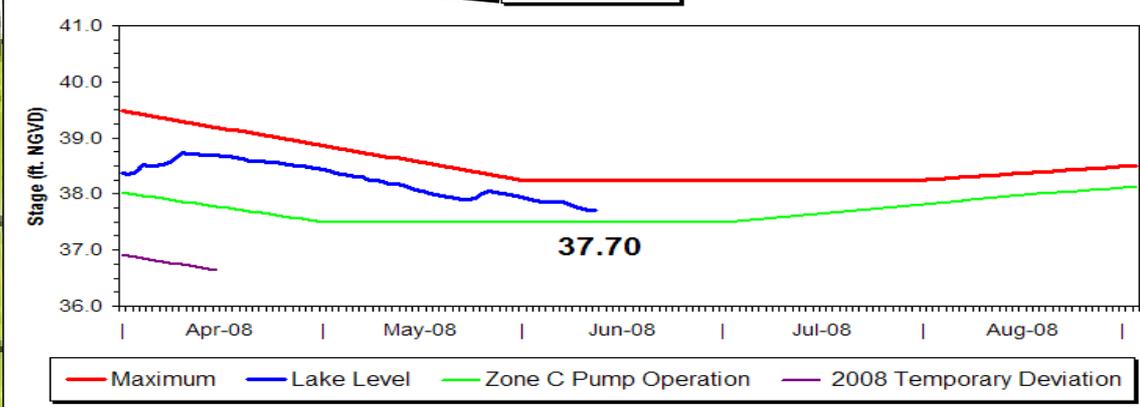
St Lucie Structures on C23, C24 & C25 Canals

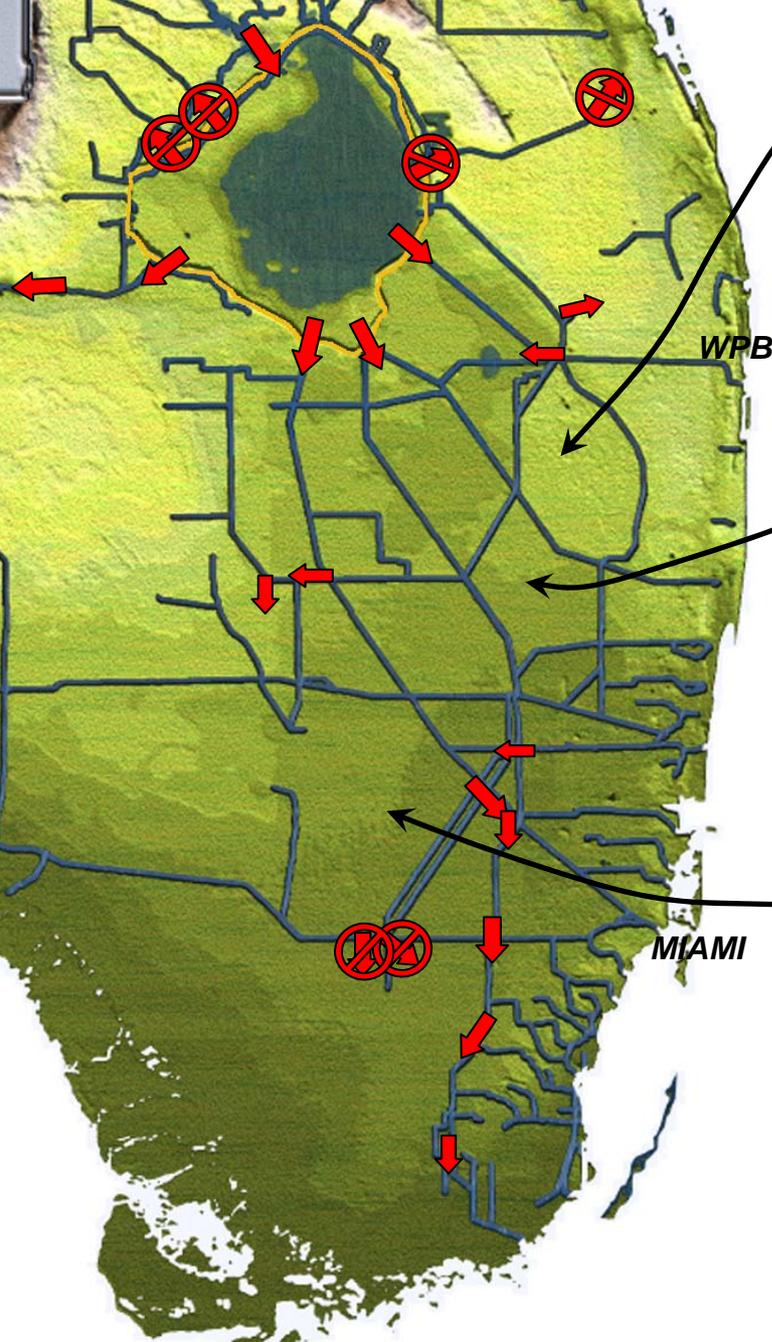
Published: 06/10/08



Lake Istokpoga

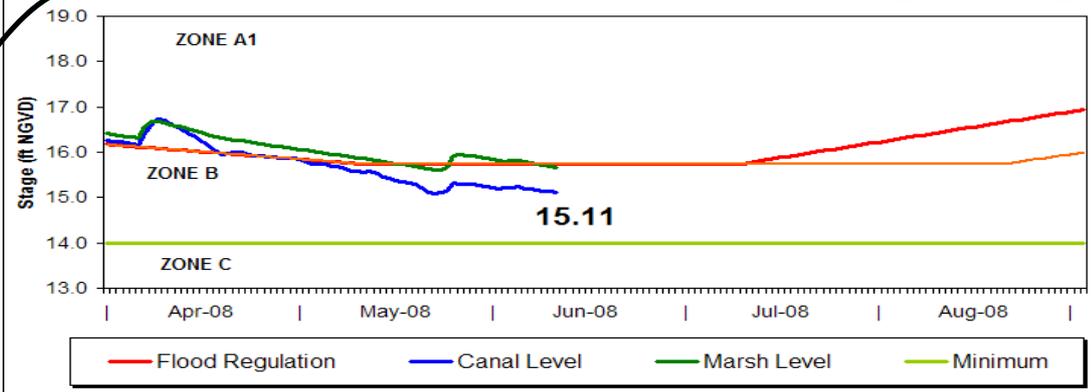
Published: 6/10/2008





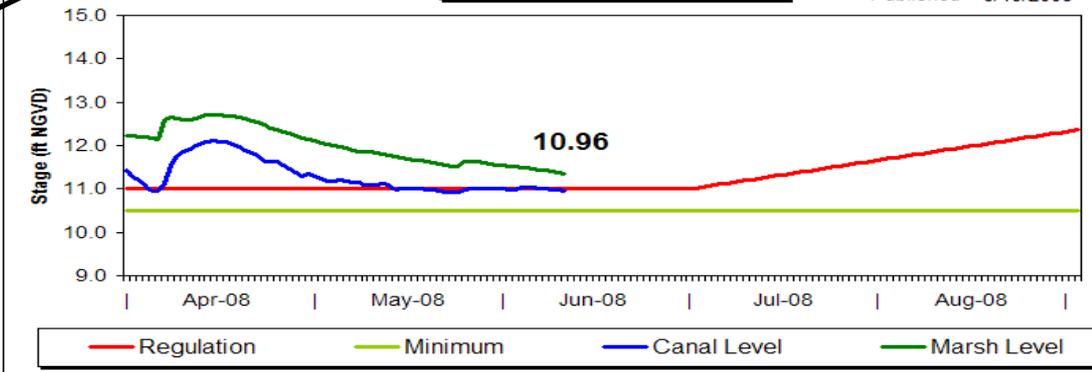
Water Conservation Area 1

Published: 6/10/2008



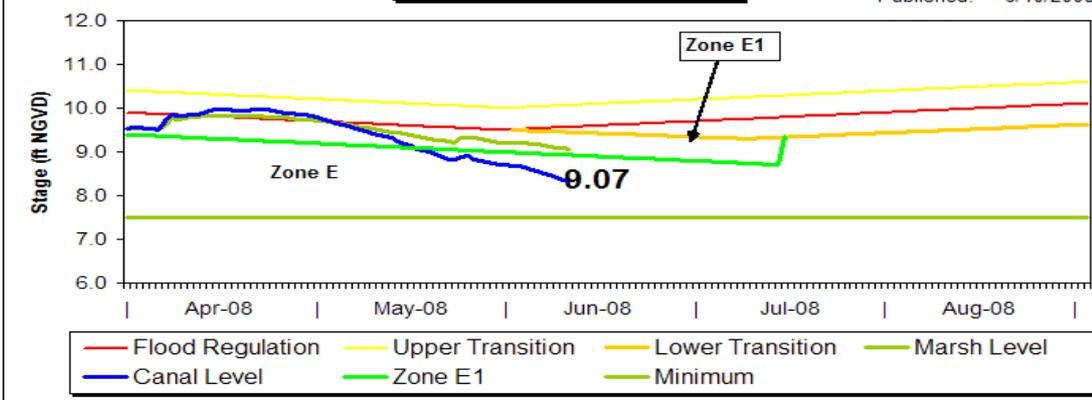
Water Conservation Area 2A

Published: 6/10/2008



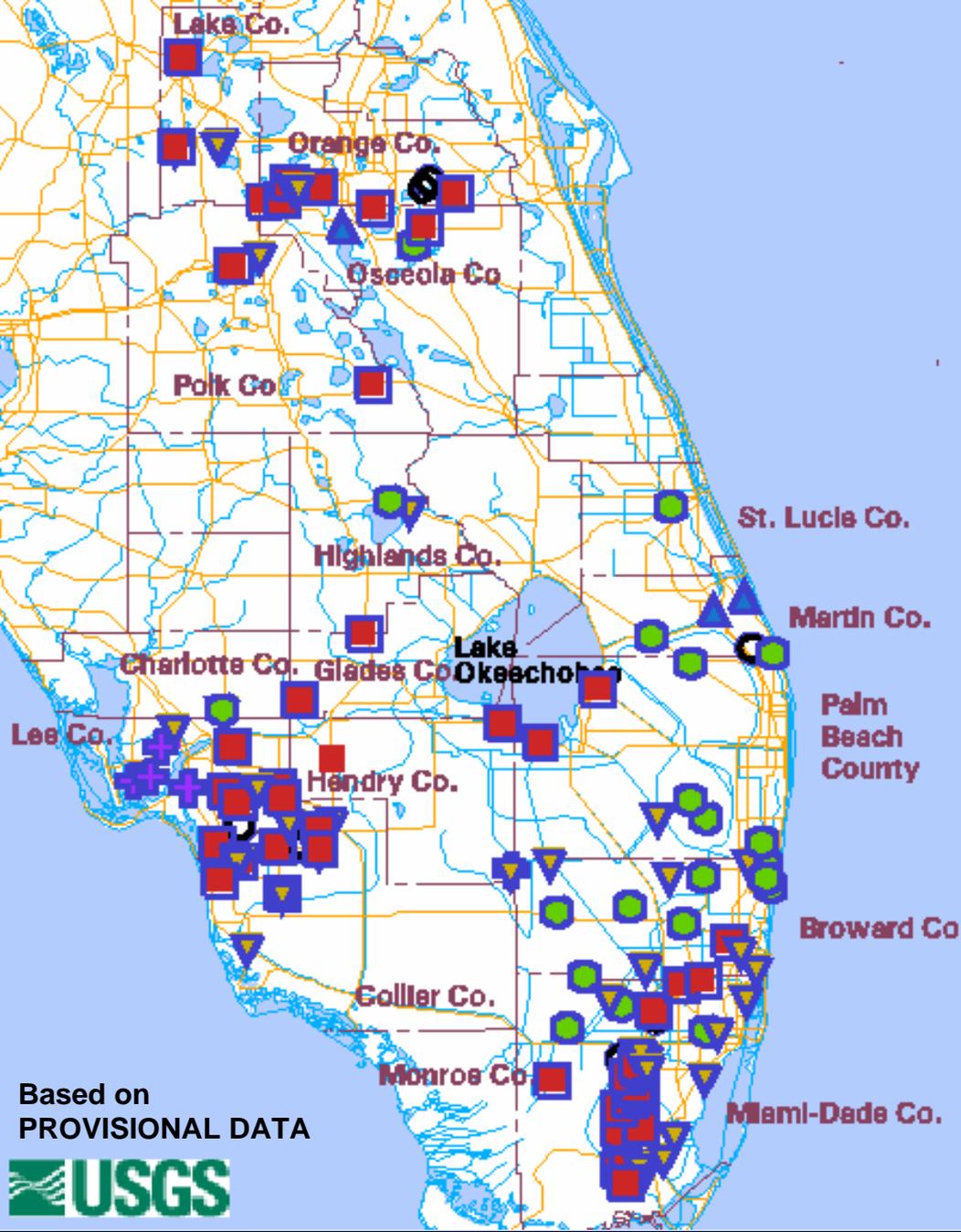
Water Conservation Area 3A

Published: 6/10/2008



WATER LEVELS AT SELECTED MONITORING SITES

as of June 10, 2008



CLASS BASED ON PAST WATER
ELEVATIONS FOR THIS TIME OF YR

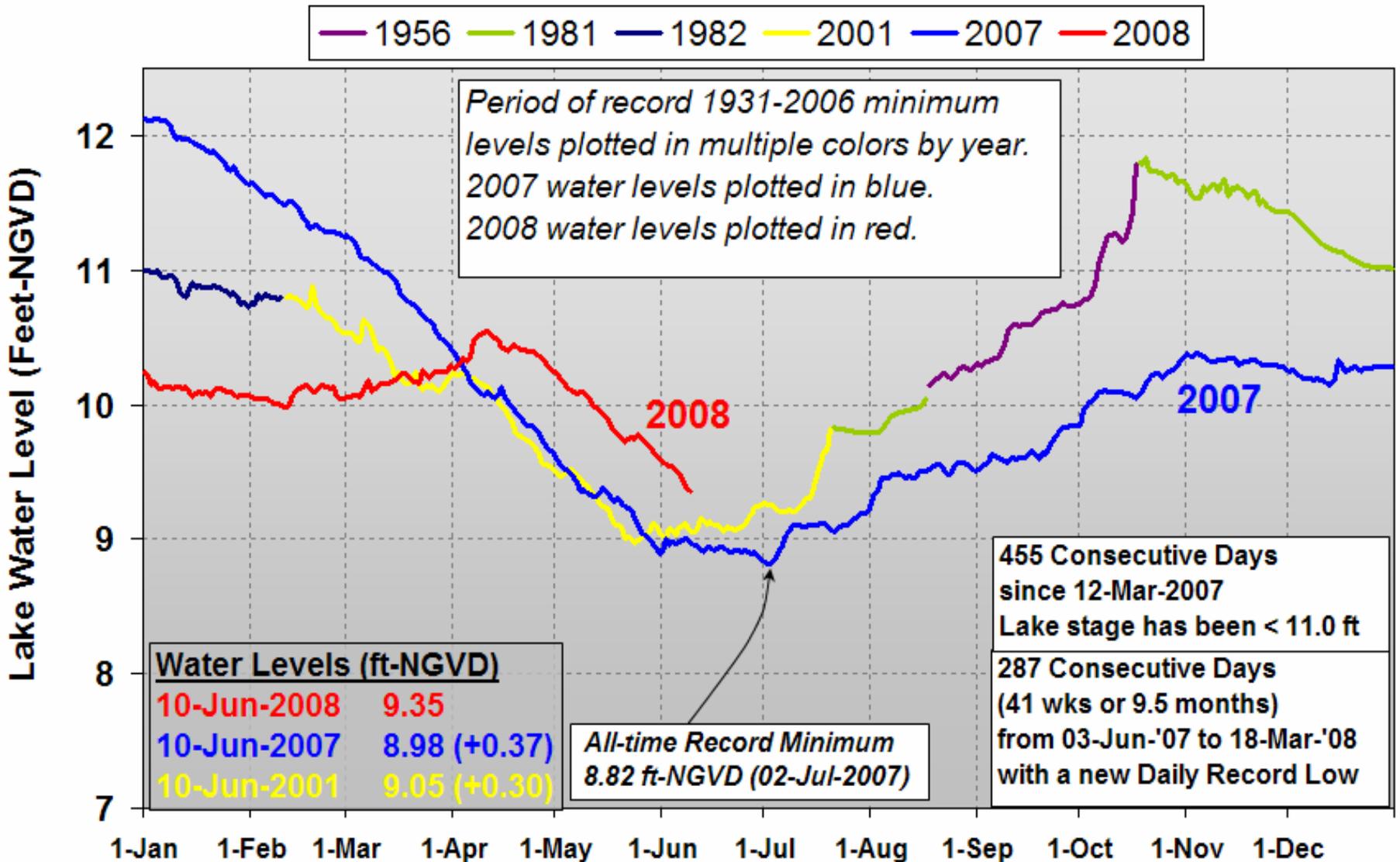
-  In highest 10%
-  Within highest 10-30%
-  Within 20% of the median
-  Within lowest 10-30%
-  In lowest 10%
-  Insufficient information

Based on
PROVISIONAL DATA



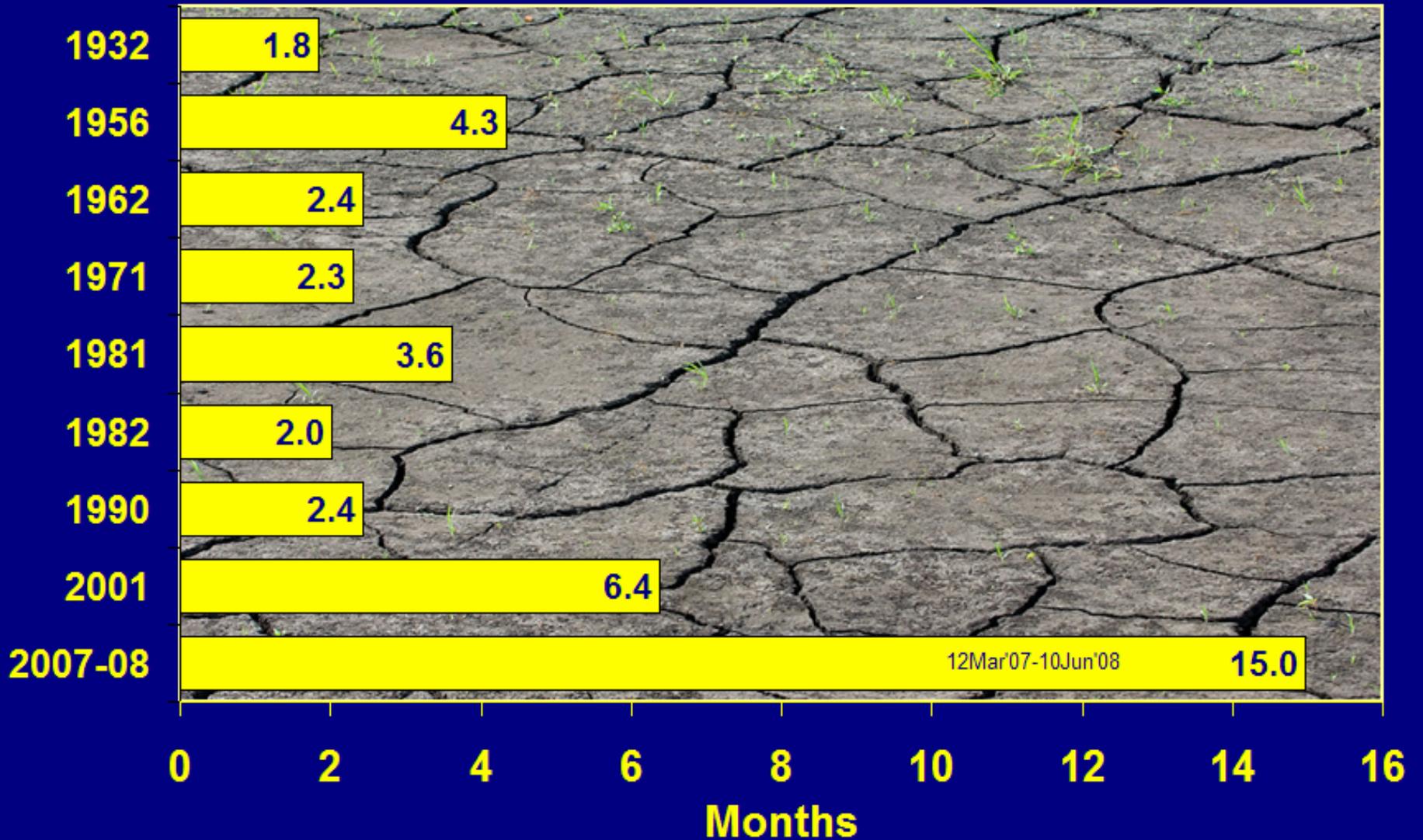
Lake Okeechobee

Period of Record 1931-2006 Minimum Water Levels



Lake Okeechobee

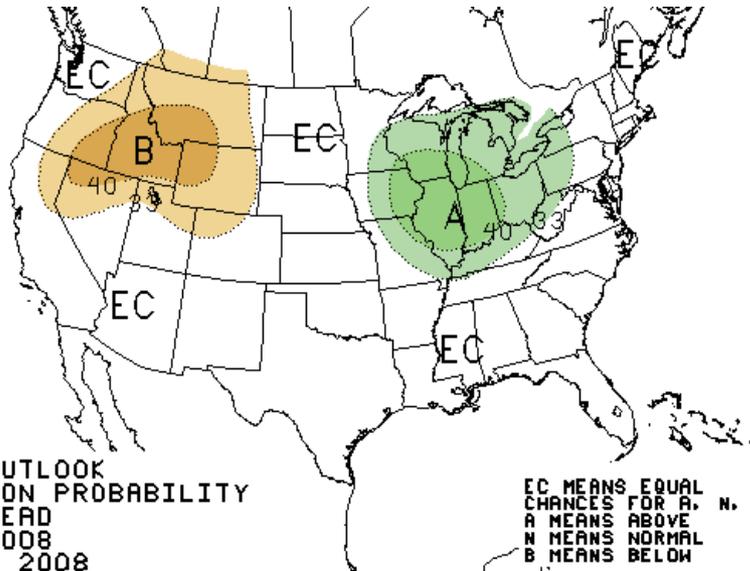
Duration Water Level was below 11.0 feet, NGVD



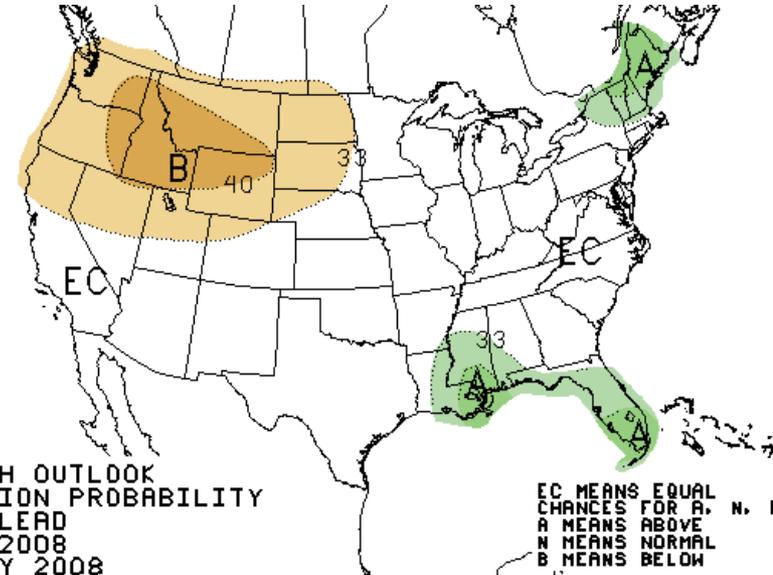
U. S. Seasonal Precipitation Outlook

National Climate Prediction Center (CPC)

June



Jun-Aug



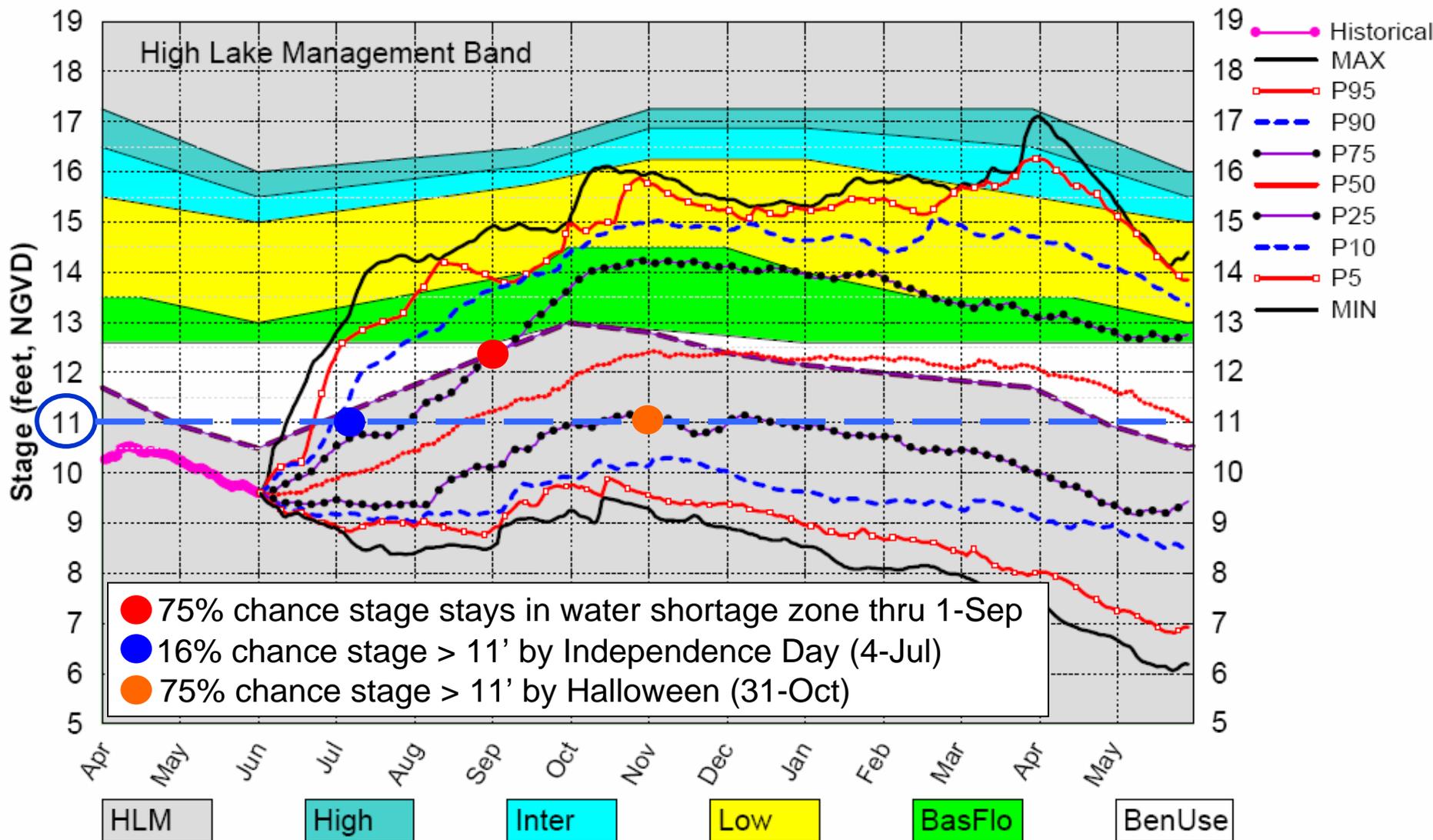
- The CPC outlook for June shows equal chances of below-normal (B), normal (N), or above-normal (A) rainfall.
- The outlook for June-Aug & for the 2008 wet season shows increased chances of above-normal rainfall.
- La Niña fading and an El Niño forecasted to form mid-summer.
(NCEP Climate Forecast System (CFS) Model)

How will Lake Okeechobee stages behave during 2008?

- **Depends on rainfall**
- **Projections provided monthly by SFWMD Hydrologic and Environmental Systems Modeling (HESM) Department**
- **Position Analysis**
 - Each year starts with current hydrologic conditions
 - 41 1-yr simulations of system response to historical rainfall conditions
 - Statistical summaries used to provide projections

Lake Okeechobee SFWMM June 2008 Position Analysis

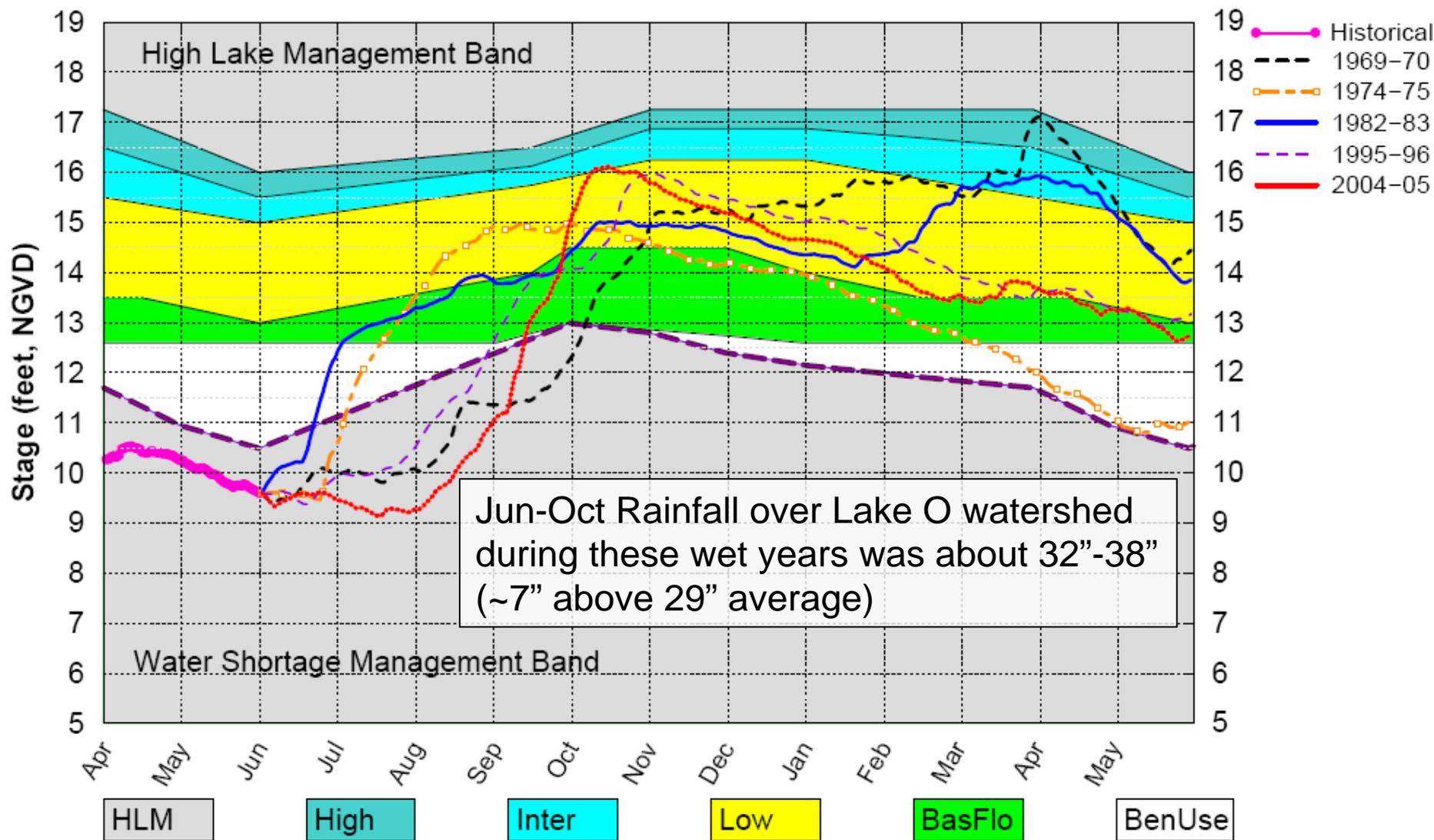
Percentiles PA



(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM June 2008 Position Analysis

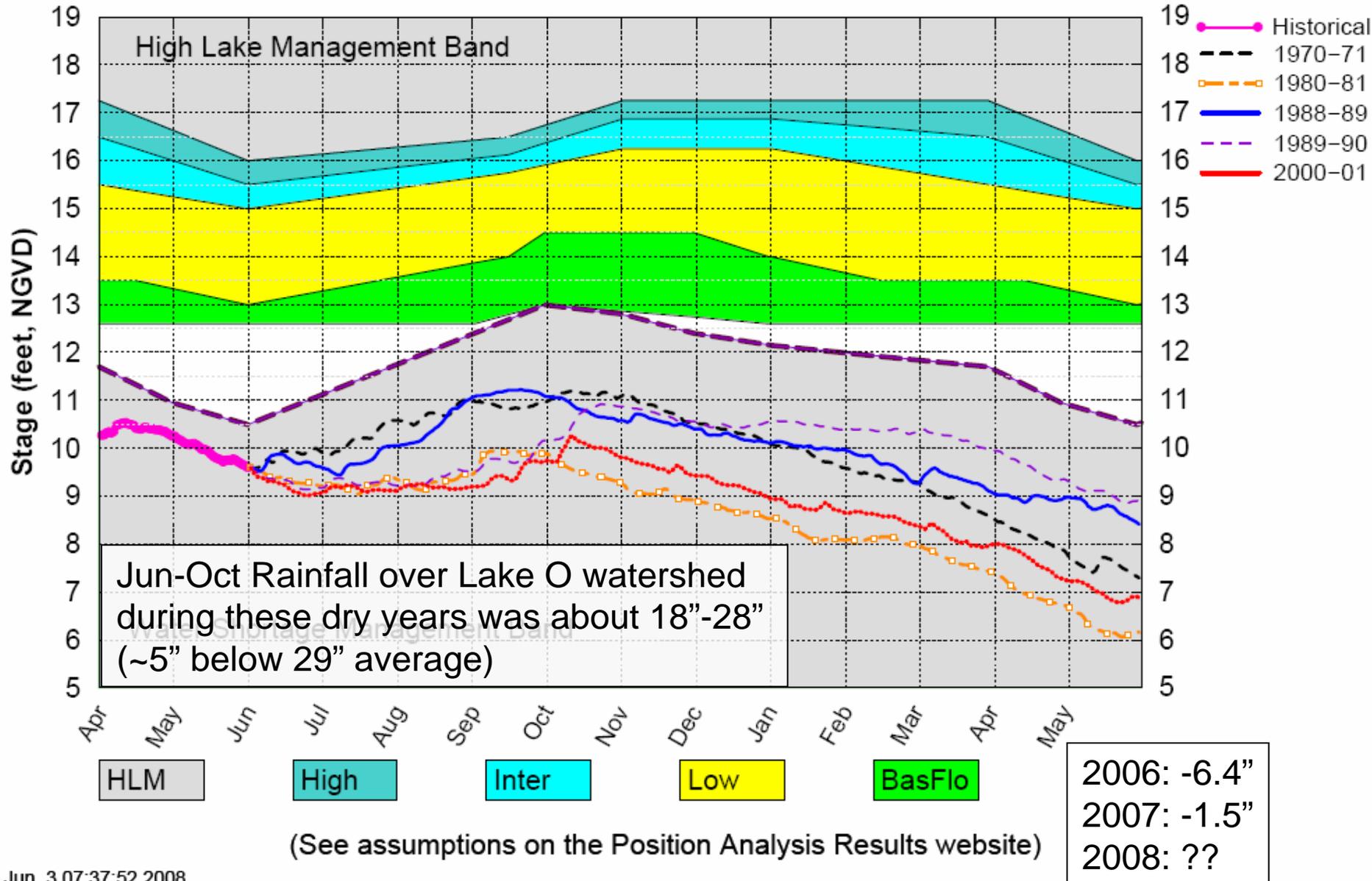
Wet Years Plot PA



(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM June 2008 Position Analysis

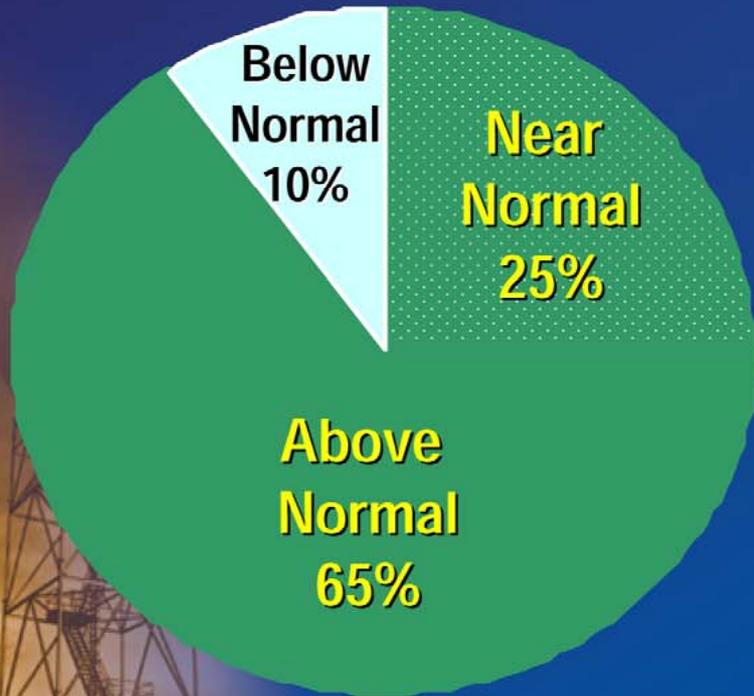
Dry Years Plot PA





2008 Atlantic Hurricane Outlook

90% Chance of Near Normal or Above Normal Season

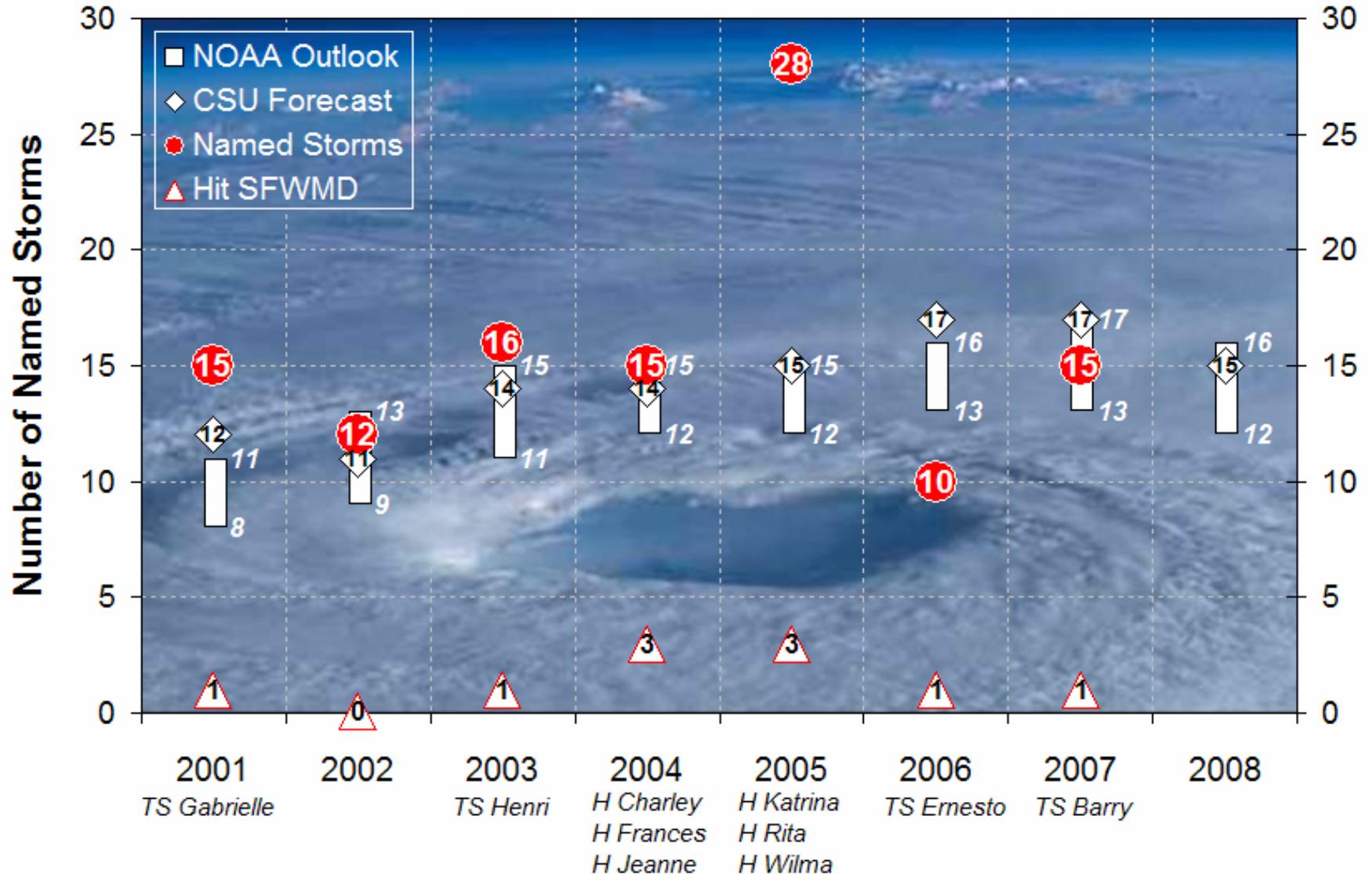


60% – 70% probability for each range

| | |
|-------------------------|----------------|
| Named Storms | 12 - 16 |
| Hurricanes | 6 - 9 |
| Major Hurricanes | 2 - 5 |

Atlantic Hurricane Season

Named Storms - Observed vs Pre-Season Outlooks



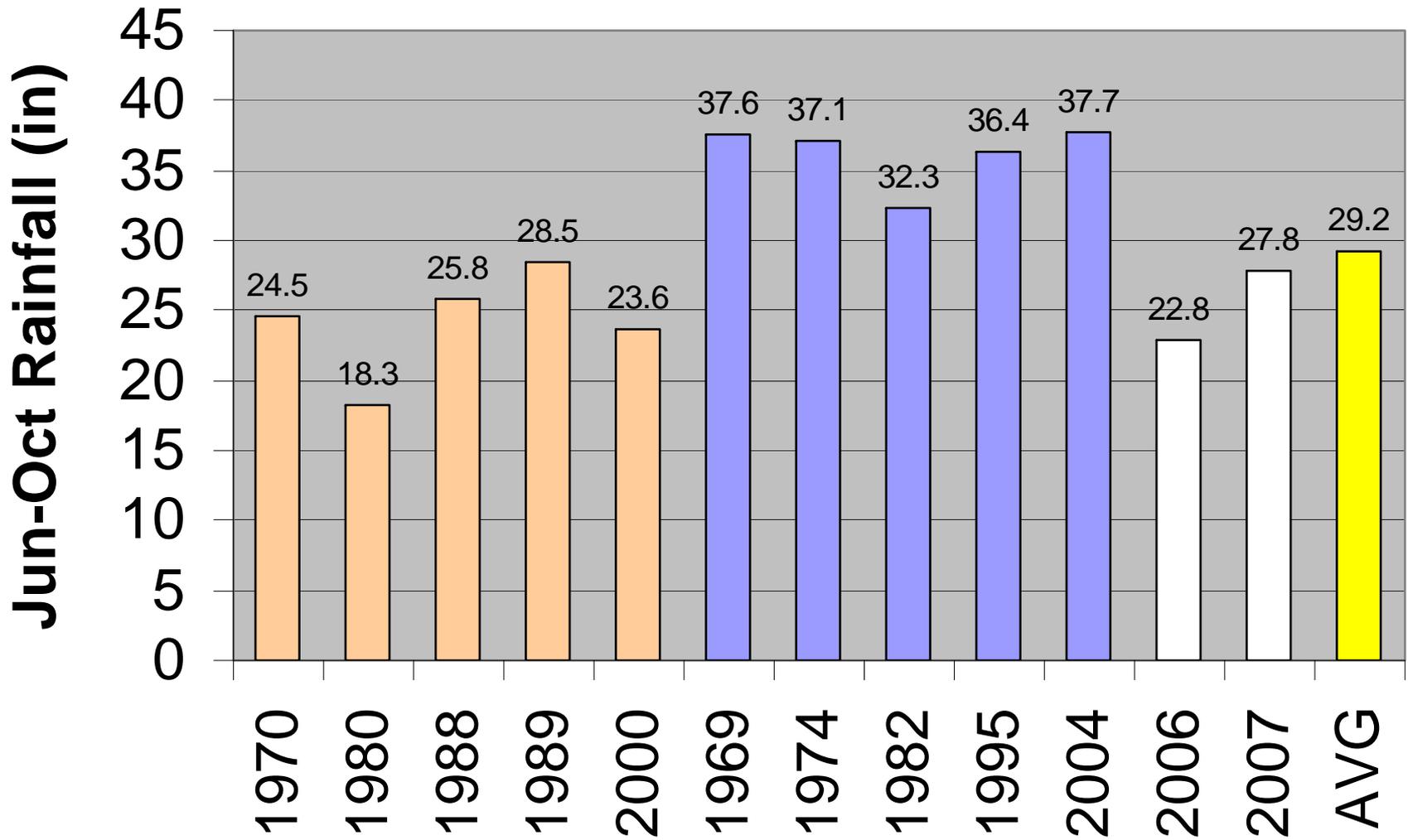
Questions?

January 19, 2003
Water Elevation =
16.3 feet, NGVD

June 23, 2007
Water Elevation =
8.9 feet, NGVD

NASA Jet Propulsion Laboratory
California Institute of Technology
NASA/GSFC/METI/ERSDAC/JAROS,
and U.S./Japan ASTER Science Team
<http://asterweb.jpl.nasa.gov/gallery-detail.asp?name=Okeechobee>

Wet Season Rainfall over the Lake Okeechobee Watershed



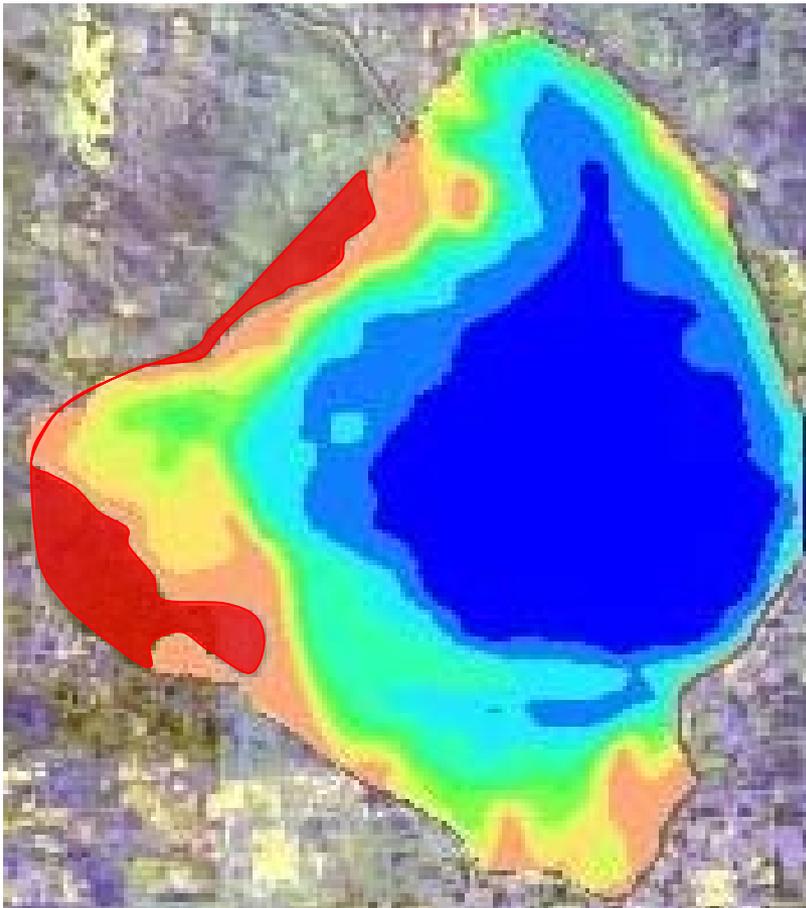
Questions?



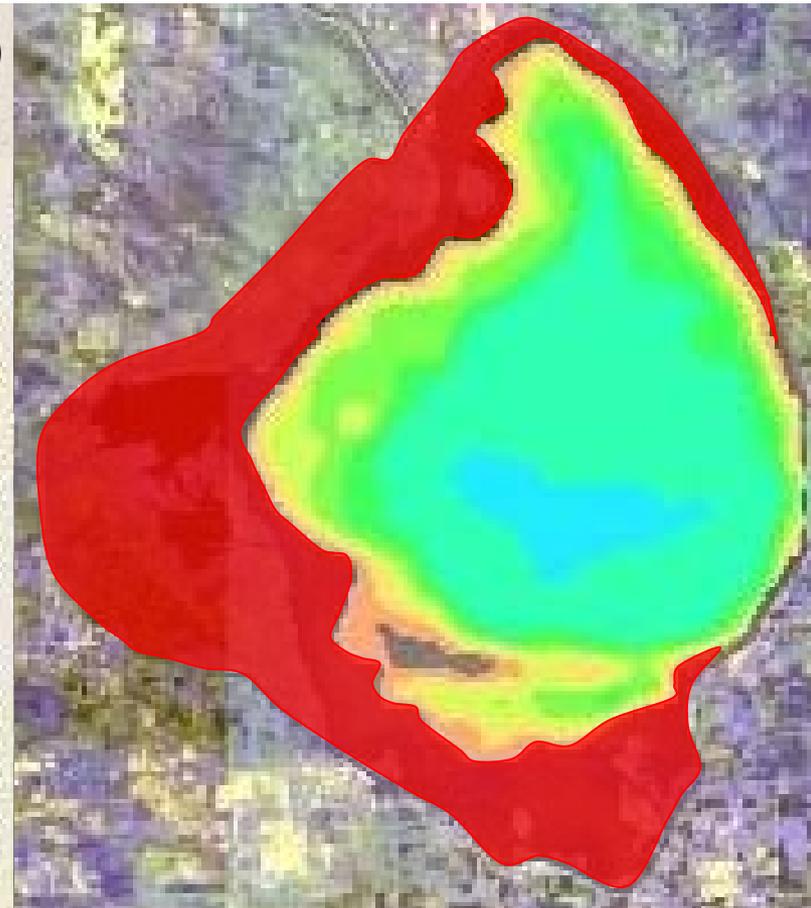
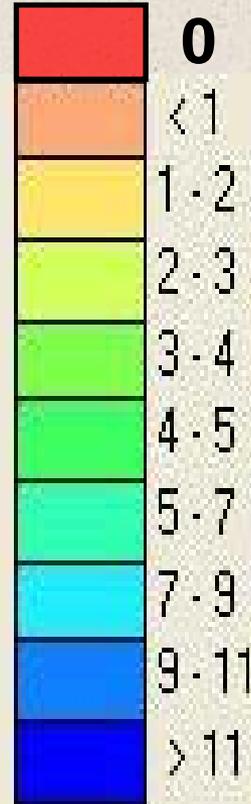
Lake Okeechobee Water Surface Area & Depths

Average end of dry season (May)
Lake Stage = 13.0 ft, NGVD

Possible end of 2008 dry season
Lake Stage = 7.0 ft, NGVD



Depth(feet)



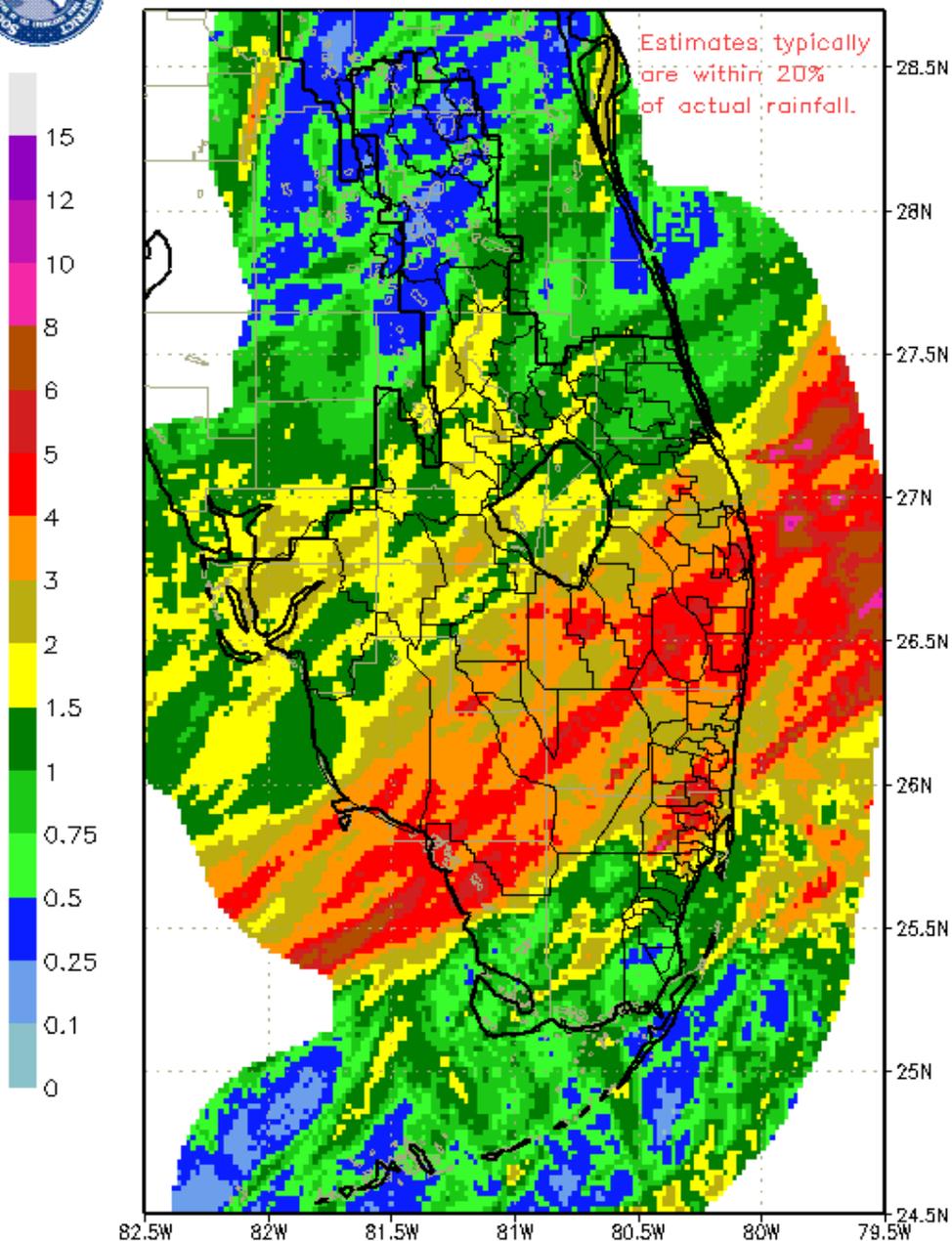
Lake Surface Area
652 sq.miles (90%)

Lake Surface Area
444 sq.miles (60%)



SFWMD RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 1645 EST, 02/06/2008 THROUGH: 1645 EST, 02/13/2008



SFWMD 2008 Past 7-day Rainfall

Feb 6th – 13th

**DISTRICT-WIDE:
2.3 inches**

- ~2" in the 30 hrs ending ~4pm on 13-Feb.
- Most rain in 30hrs since T.S. Barry 1-Jun-2007
- 0.25-0.75" over the Upper Kissimmee Basin
- 1"-2" over the southern Lake O Watershed
- 1.5"-2" over Lake O, west Caloosahatchee Basin, & ENP.
- 2"-4" over the EAA, WCA-2&3 and Big Cypress area.
- 4"-5" over WCA-1 & parts of E.Palm Bch & Broward Counties

DISTRICT-WIDE RAINFALL ESTIMATE: 2.265"

Water Supply Operation prior to Feb 12-13 Rainfall



- Temporary pumps at S-155A used to capture excess C-51 basin runoff helped to meet the EAA water supply allocation.
- LWDD pumped excess back to their system.
- Resulted in less discharge to tide & decreased supply from Lake Okeechobee.

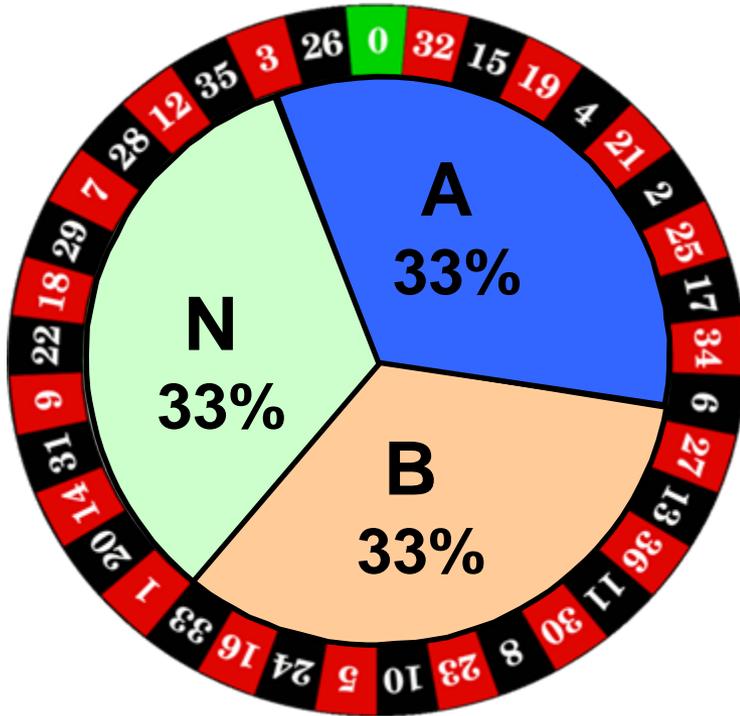
- Excess water in WCA-2A used to meet EAA water supply allocation & eastern Broward Co. (C-14)
- Discharge to WCA-3A continued per regulation.
- Resulted in decreased need for Lake O water supply.



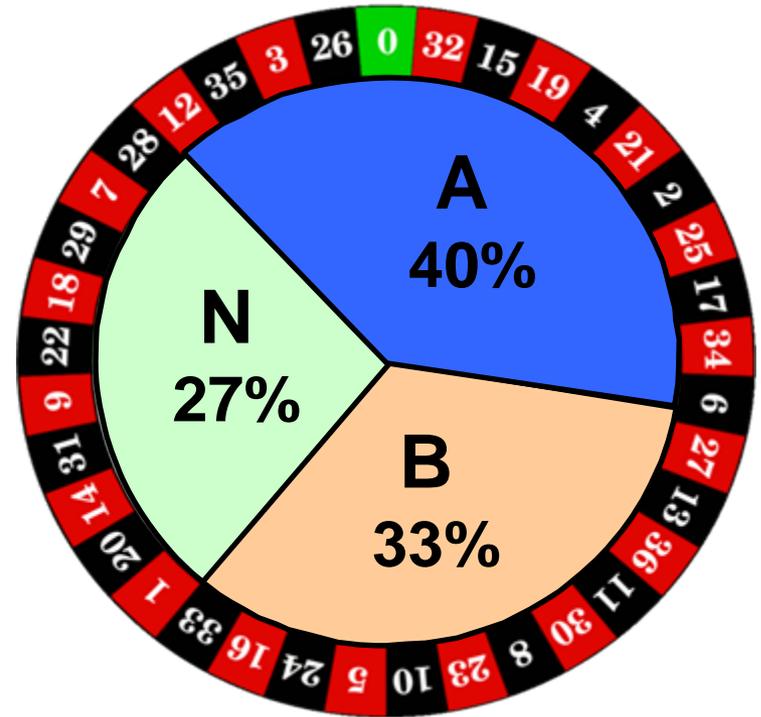
OCT 12 2007

Climate Outlook Probabilities

How to Interpret the CPC Precipitation Outlook



EC = Equal Chances of A, N, B



Increased Chance of Above-Normal

Storm Category

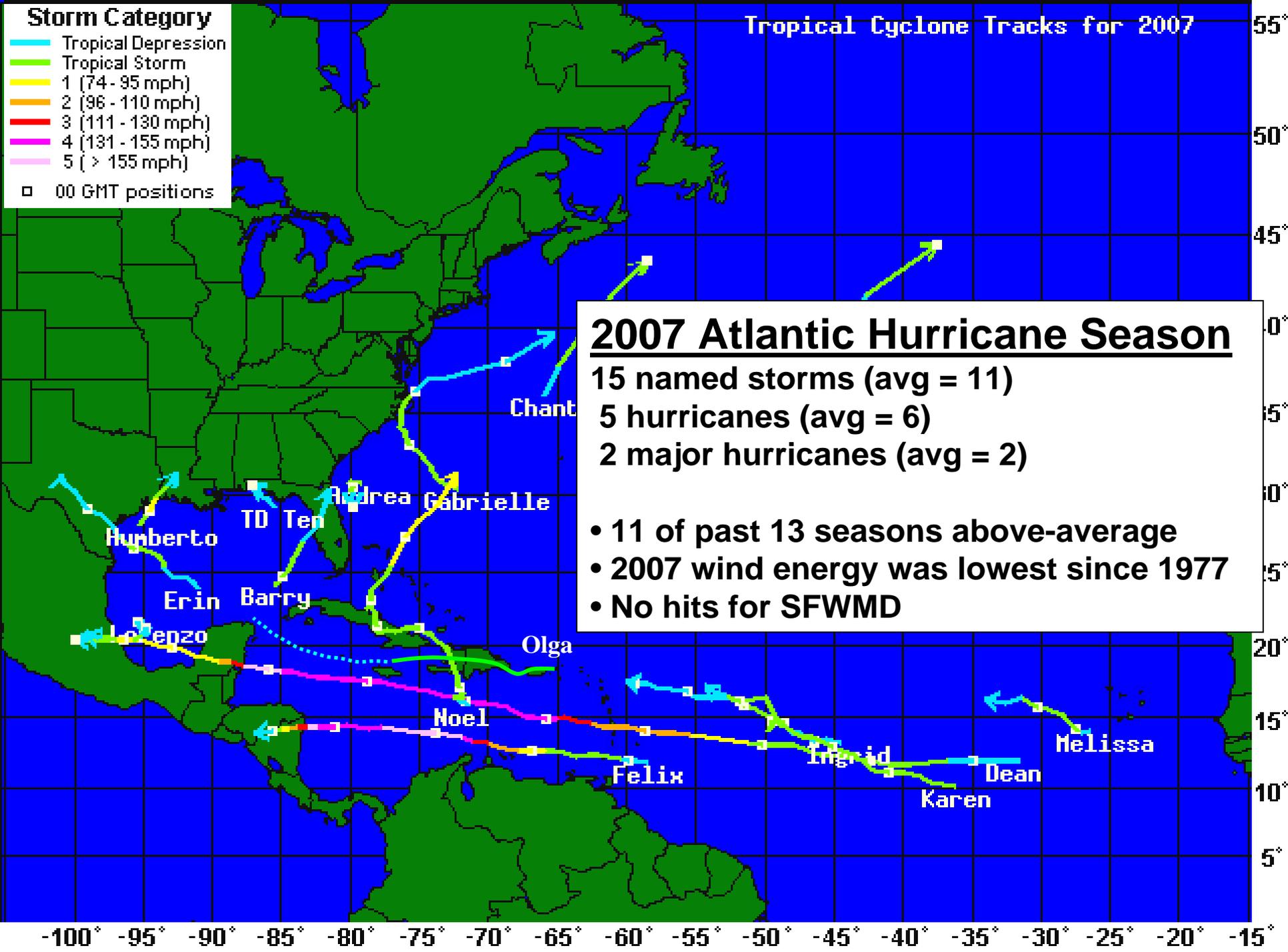
- Tropical Depression
- Tropical Storm
- 1 (74 - 95 mph)
- 2 (96 - 110 mph)
- 3 (111 - 130 mph)
- 4 (131 - 155 mph)
- 5 (> 155 mph)
- 00 GMT positions

Tropical Cyclone Tracks for 2007

2007 Atlantic Hurricane Season

15 named storms (avg = 11)
5 hurricanes (avg = 6)
2 major hurricanes (avg = 2)

- 11 of past 13 seasons above-average
- 2007 wind energy was lowest since 1977
- No hits for SFWMD

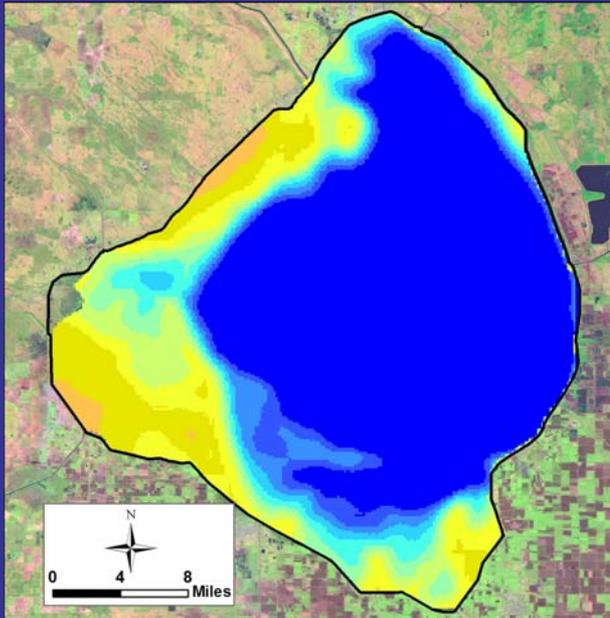
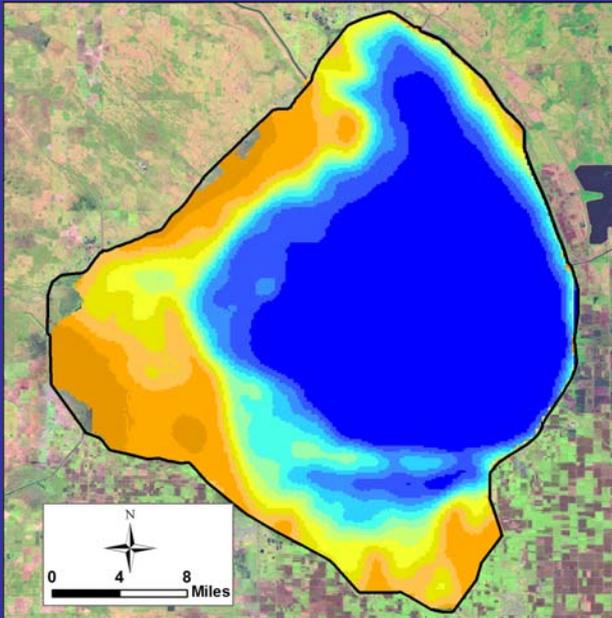
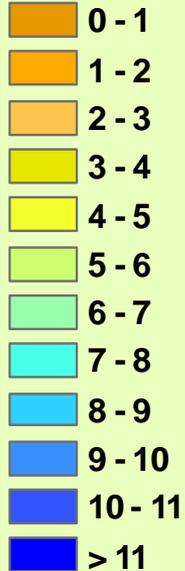


Lake Okeechobee Water Depth Comparison

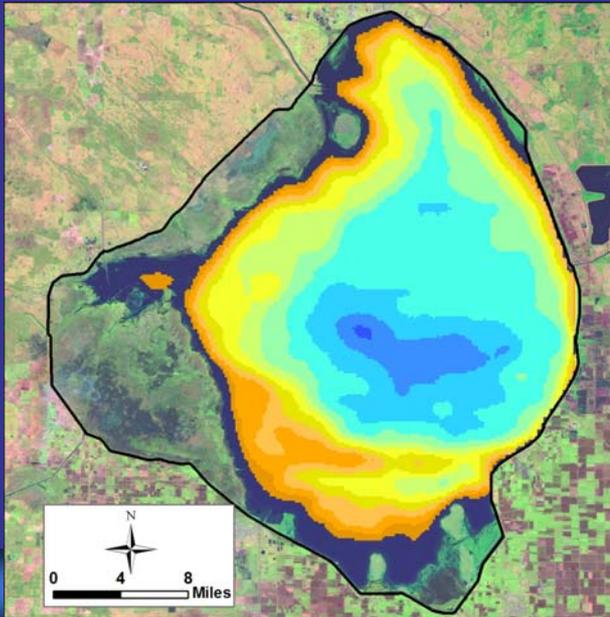
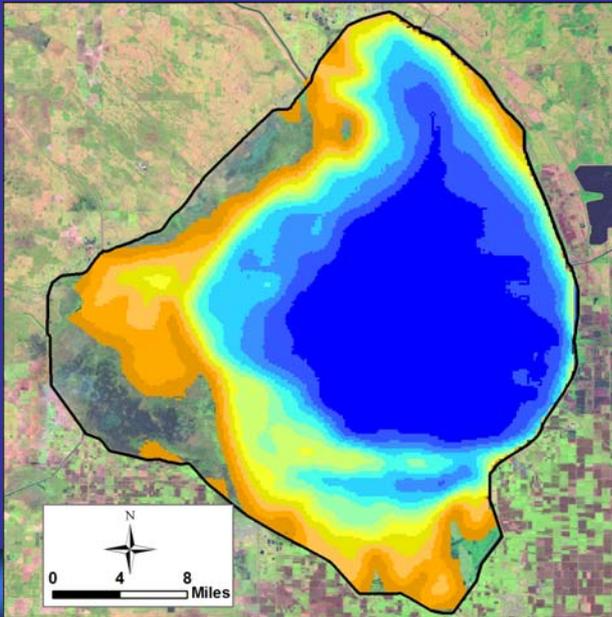
<http://spatial1.sfwmd.gov/losac/sfwmd.asp>

Elevation
14.3 ft, NGVD
Long-term
Average
(1965-2005)

Water Depth



Elevation
17.0 ft, NGVD
Hurricane
Wilma
Nov-2005



Elevation
8.82 ft, NGVD
Record Low
02-July-2007

Elevation
12.7 ft, NGVD
Start of '07
dry season
01-Nov-2007



2007 Atlantic Hurricane Season Outlook

| | August | May | Normal | Actual |
|-------------------|--------|-------|--------|---------------|
| Named Storms: | 13-16 | 13-17 | 11 | 15 |
| Hurricanes: | 7-9 | 7-10 | 6 | 5 |
| Major Hurricanes: | 3-5 | 3-5 | 2 | 2 |

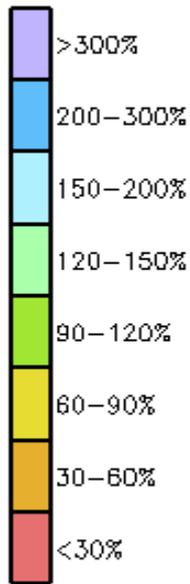
*2007 Outlook
Probability*



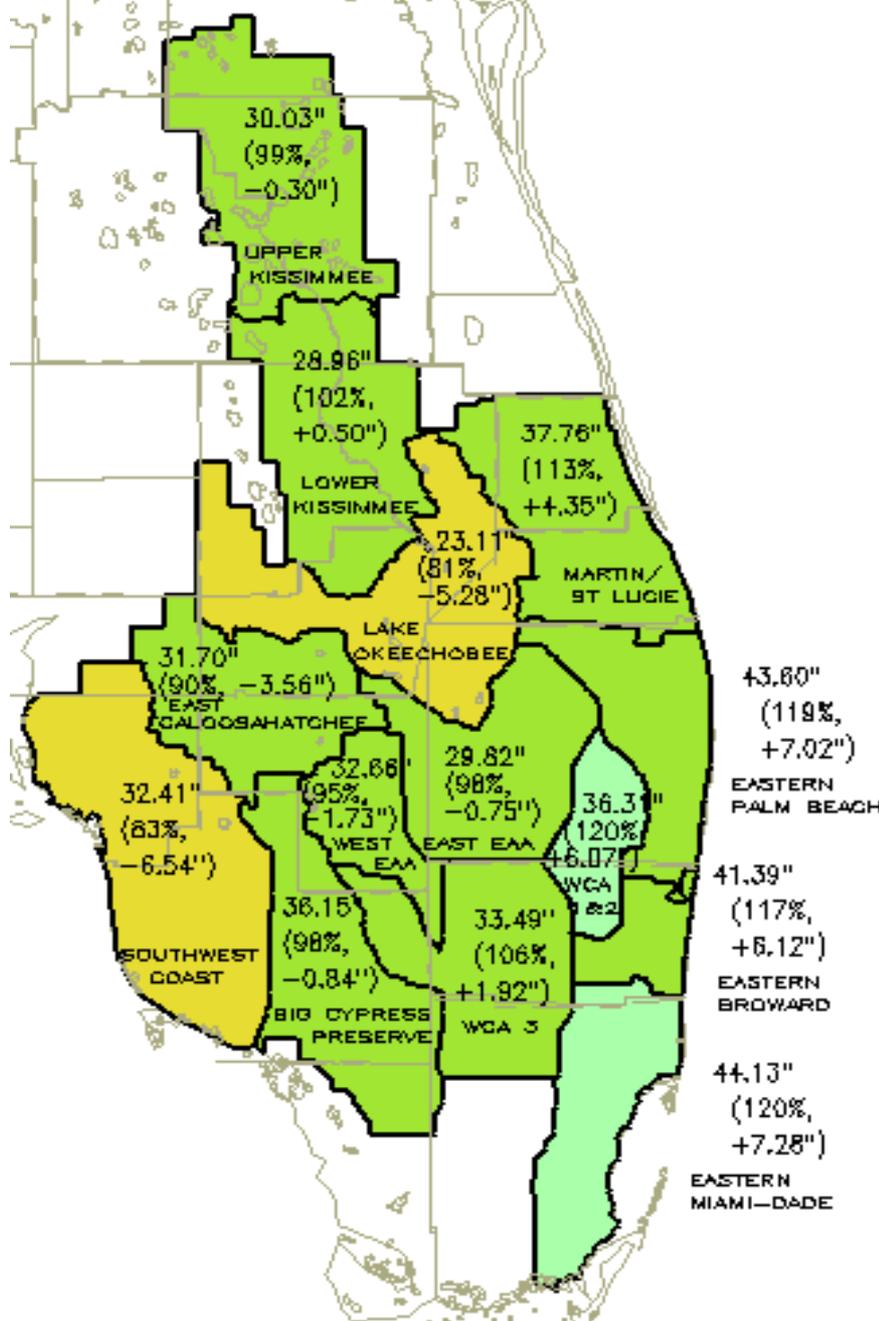
SFWMD 2007 Wet Season Rainfall 02-Jun to 30-Oct

**DISTRICT-WIDE:
33.23" (101%, +0.26")**

**Average Wet Season
= 33.2"**



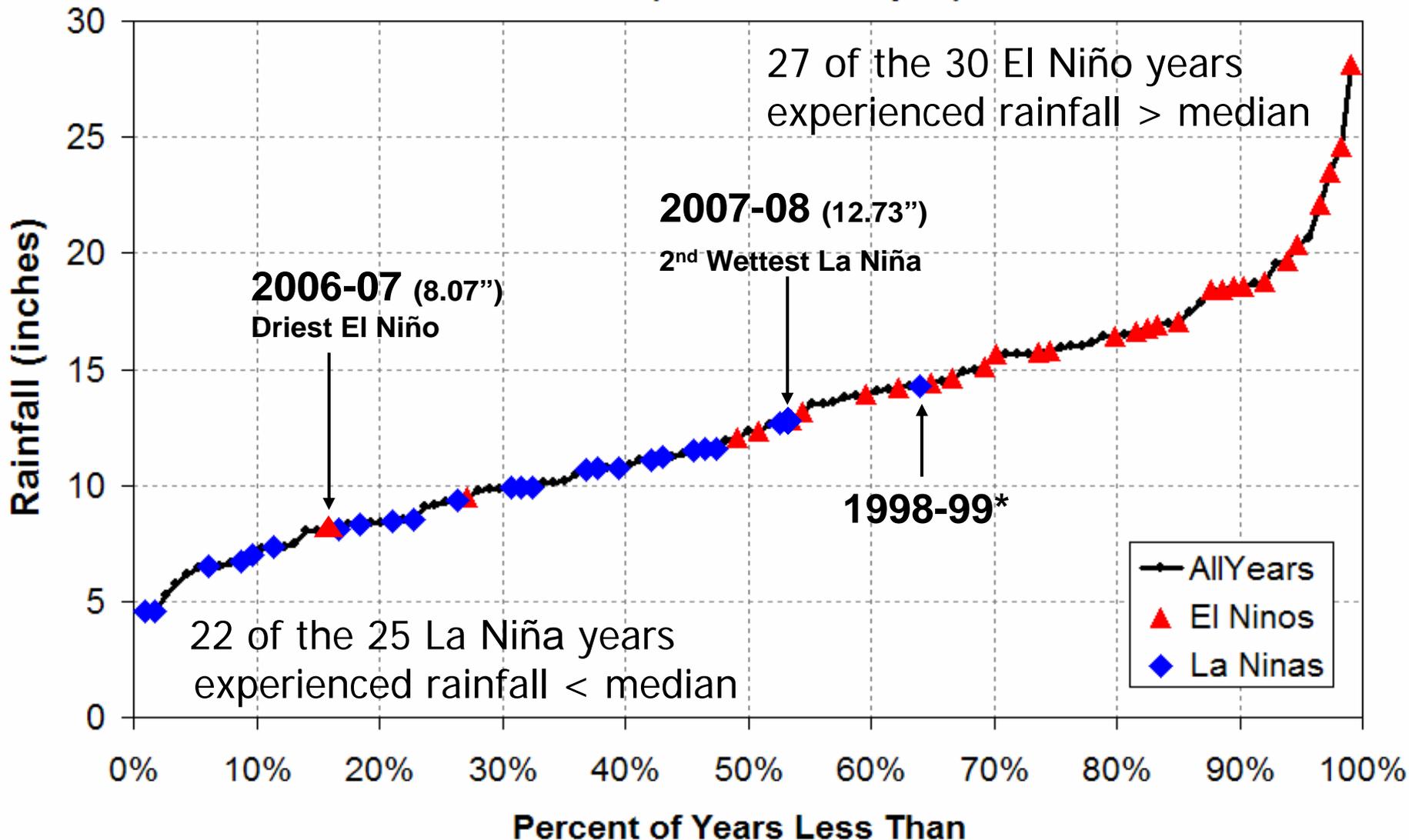
Measured
(% of Avg,
Diff From Avg)



- *Lake O. & Southwest Coast
5"-7" below-average*
- *Year-to-date
6.4" deficit District-wide*
- *Need ~50% of avg rain for
Nov-Dec (4.7") to avoid
breaking all-time record low
2-yr rainfall (1955-56: 84")*

Historical SFWMD Dry Season Rainfall

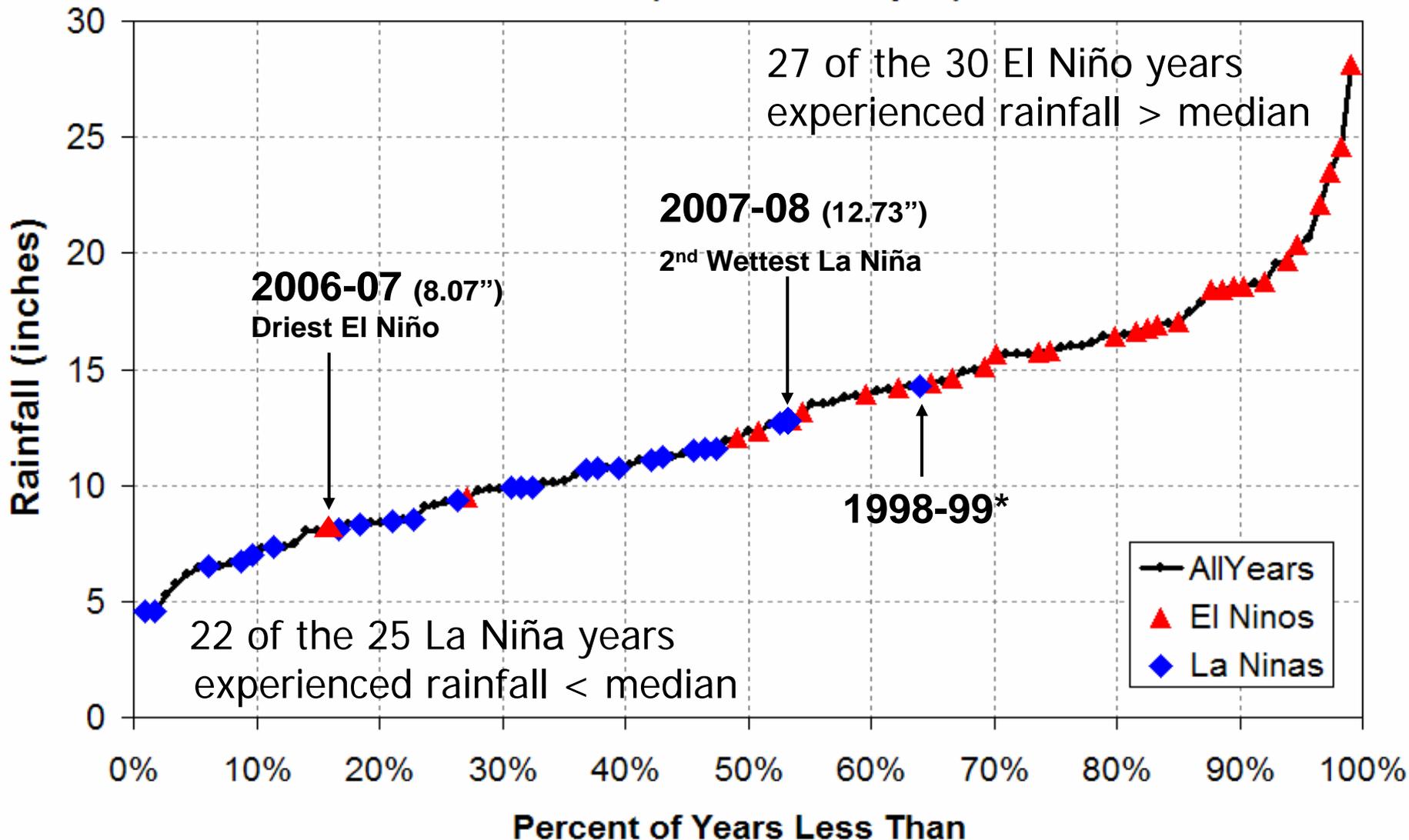
1896-2008 (November-April)



* Heavily influenced by T.S. Mitch in Nov 1998 (5.6")

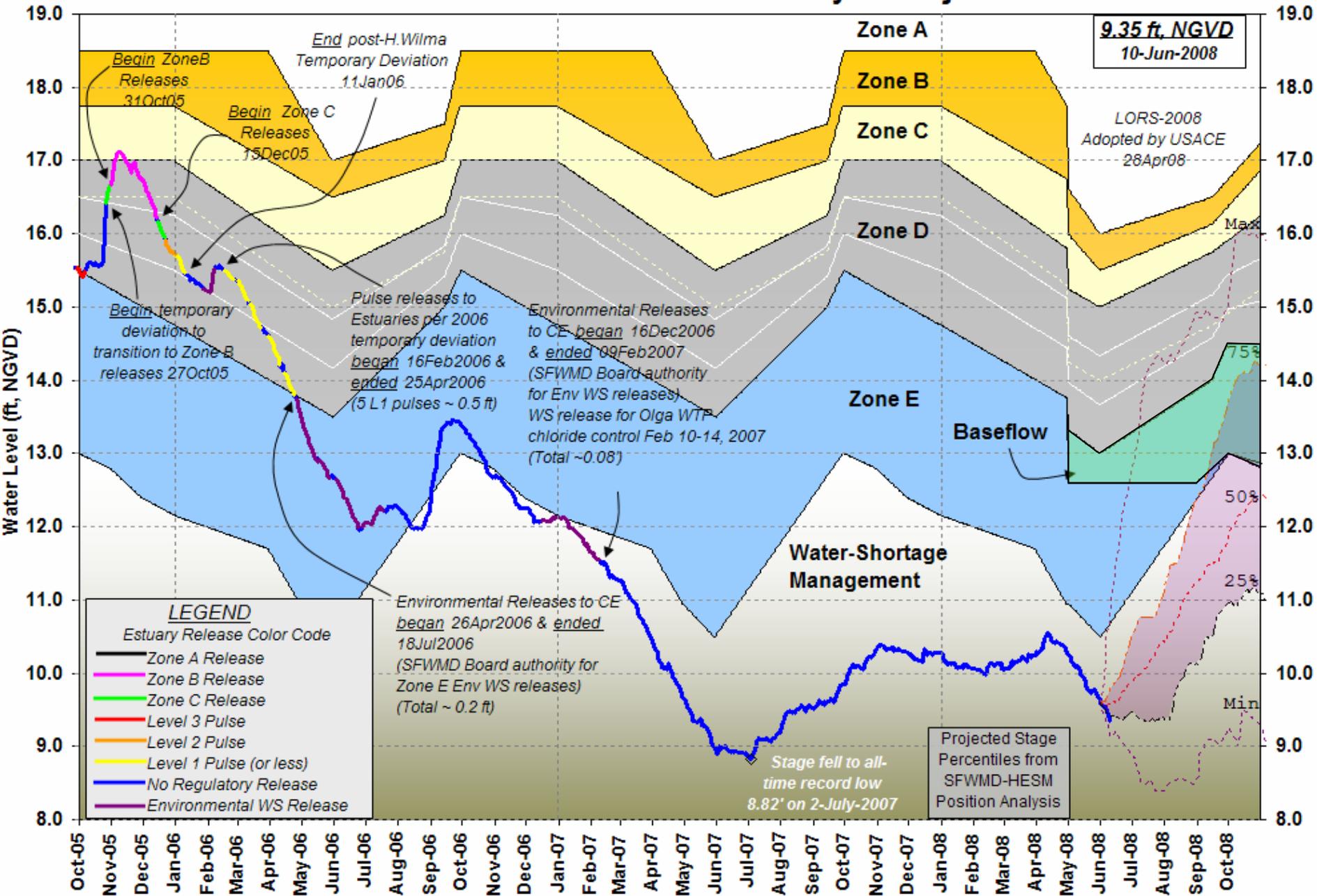
Historical SFWMD Dry Season Rainfall

1896-2008 (November-April)



* Heavily influenced by T.S. Mitch in Nov 1998 (5.6")

Lake Okeechobee Water Level History & Projection



SFWMD AVERAGE RAINFALL (30 YEAR: 1976-2005)

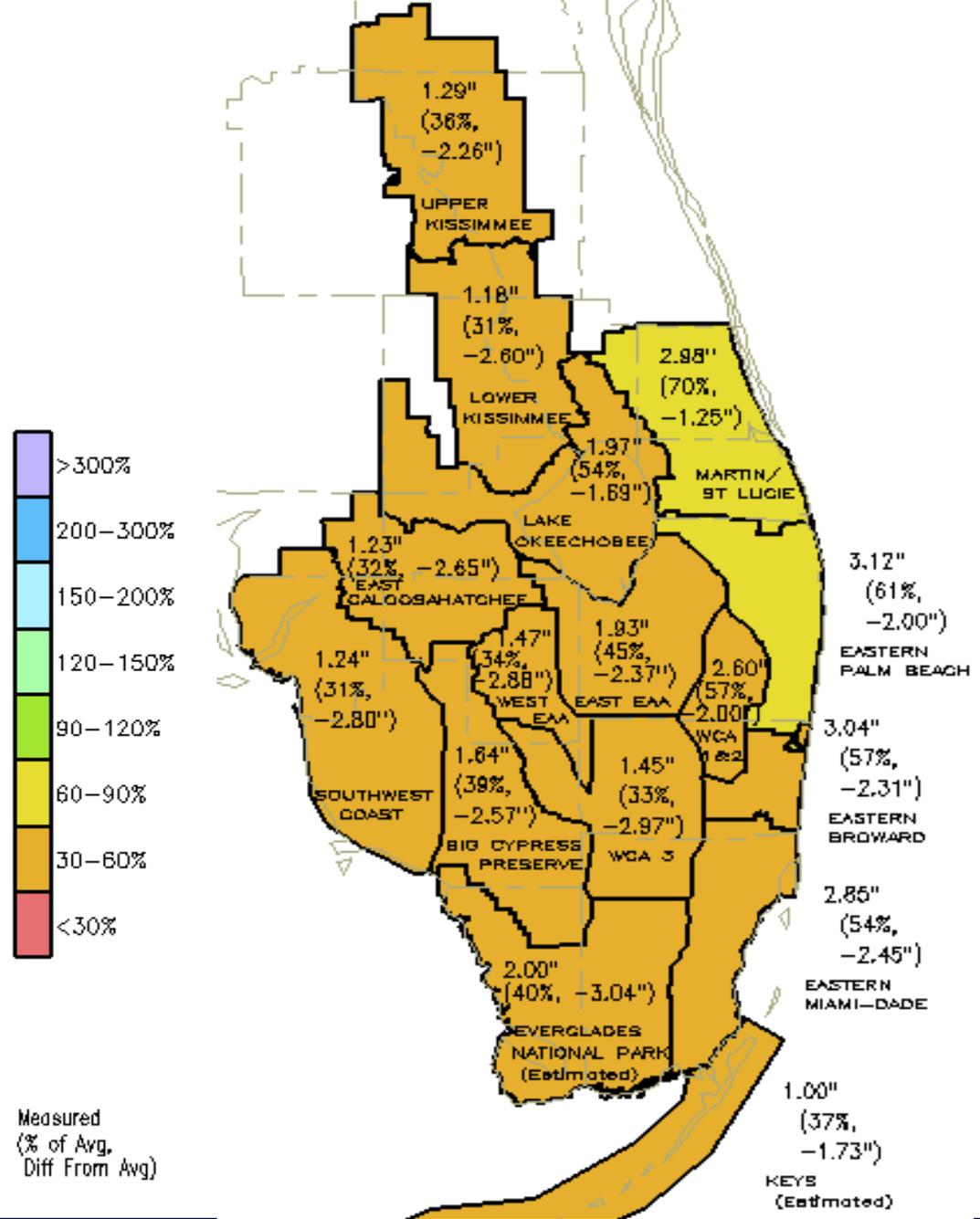
http://www.sfwmd.gov/org/omd/ops/weather/30yr_rain.html

| NORMAL | Upper Kiss | Lower Kiss | Lake O | East EAA | West EAA | Conserv _1_2 | Conserv Area_3 | Martin/ St. Lucie | Palm Beach | Broward | Dade | East Caloos | BCP | SW Coast | District |
|--------|------------|------------|--------|----------|----------|--------------|----------------|-------------------|------------|---------|-------|-------------|-------|----------|----------|
| JAN | 2.38 | 1.86 | 2.12 | 2.19 | 2.17 | 2.20 | 1.91 | 2.48 | 3.29 | 2.34 | 1.97 | 2.20 | 2.21 | 2.43 | 2.23 |
| FEB | 2.44 | 2.18 | 2.06 | 1.92 | 1.97 | 2.34 | 1.98 | 2.51 | 2.82 | 2.47 | 2.04 | 2.04 | 2.04 | 2.28 | 2.19 |
| MAR | 3.35 | 2.98 | 2.93 | 2.80 | 2.85 | 2.68 | 2.56 | 3.80 | 3.79 | 2.78 | 2.66 | 2.97 | 2.68 | 2.86 | 3.01 |
| APR | 2.33 | 2.18 | 2.22 | 2.35 | 2.42 | 2.56 | 2.58 | 2.84 | 3.24 | 3.32 | 3.18 | 2.39 | 2.39 | 2.40 | 2.50 |
| MAY | 3.55 | 3.78 | 3.66 | 4.30 | 4.35 | 4.60 | 4.42 | 4.23 | 5.12 | 5.35 | 5.30 | 3.88 | 4.21 | 4.04 | 4.19 |
| JUN | 7.41 | 7.07 | 6.77 | 7.21 | 8.44 | 7.28 | 8.22 | 6.69 | 8.10 | 8.91 | 8.94 | 8.85 | 9.49 | 9.72 | 8.03 |
| JUL | 6.88 | 6.35 | 5.96 | 6.38 | 7.34 | 6.08 | 6.48 | 6.50 | 6.38 | 6.04 | 6.13 | 7.58 | 8.09 | 8.76 | 6.83 |
| AUG | 7.21 | 6.48 | 6.66 | 7.09 | 8.10 | 6.60 | 7.12 | 7.58 | 7.74 | 7.41 | 8.29 | 8.30 | 8.35 | 8.90 | 7.54 |
| SEP | 6.15 | 6.01 | 6.29 | 6.73 | 7.02 | 6.37 | 6.13 | 7.80 | 9.07 | 7.70 | 8.34 | 7.31 | 7.54 | 8.23 | 7.05 |
| OCT | 2.86 | 2.73 | 2.90 | 3.38 | 3.73 | 4.18 | 3.87 | 5.17 | 5.66 | 5.57 | 5.50 | 3.44 | 3.76 | 3.57 | 3.76 |
| NOV | 2.48 | 2.18 | 2.28 | 2.61 | 2.37 | 3.16 | 2.59 | 3.59 | 4.61 | 3.55 | 3.14 | 2.37 | 2.18 | 2.17 | 2.66 |
| DEC | 2.65 | 1.83 | 1.82 | 1.86 | 1.73 | 1.92 | 1.65 | 2.32 | 2.96 | 2.21 | 1.96 | 1.81 | 1.81 | 1.84 | 2.01 |
| YEAR | 49.69 | 45.63 | 45.67 | 48.82 | 52.49 | 49.97 | 49.51 | 55.51 | 62.78 | 57.65 | 57.45 | 53.14 | 54.75 | 57.20 | 52.00 |

SFWMD 2008 May Rainfall May 2nd – June 1st

**DISTRICT-WIDE:
1.84" (44%, -2.35")**

**Average May
= 4.19"**



- All basins < average
- First below-average month since January
- Feb, Mar, Apr each had above-average rainfall - unprecedented during a La Niña year

Measured
(% of Avg,
Diff From Avg)

KEYS
(Estimated)

I will not try to forecast the wet season rainfall total.
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