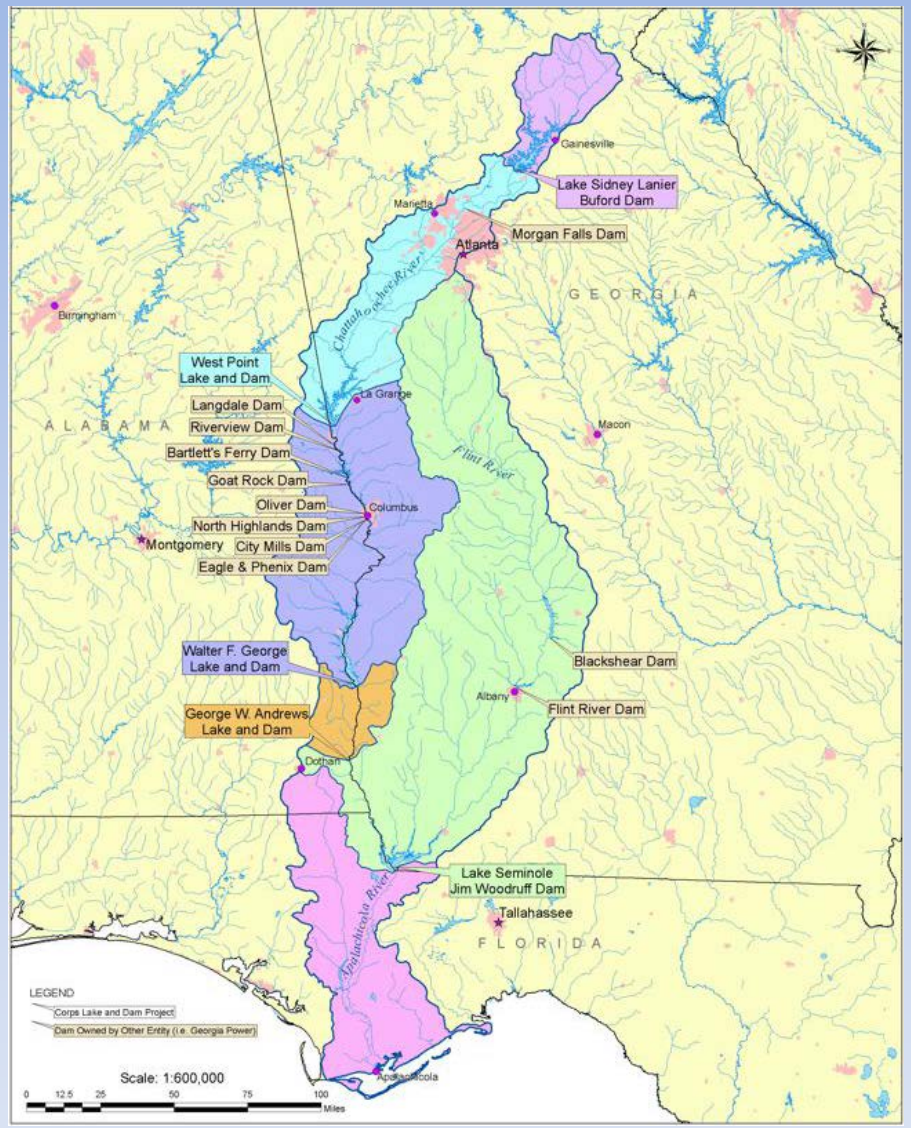
National Integrated Drought Information System

# Drought Early Warning for the Apalachicola-Chattahoochee-Flint River Basin

14 April 2015

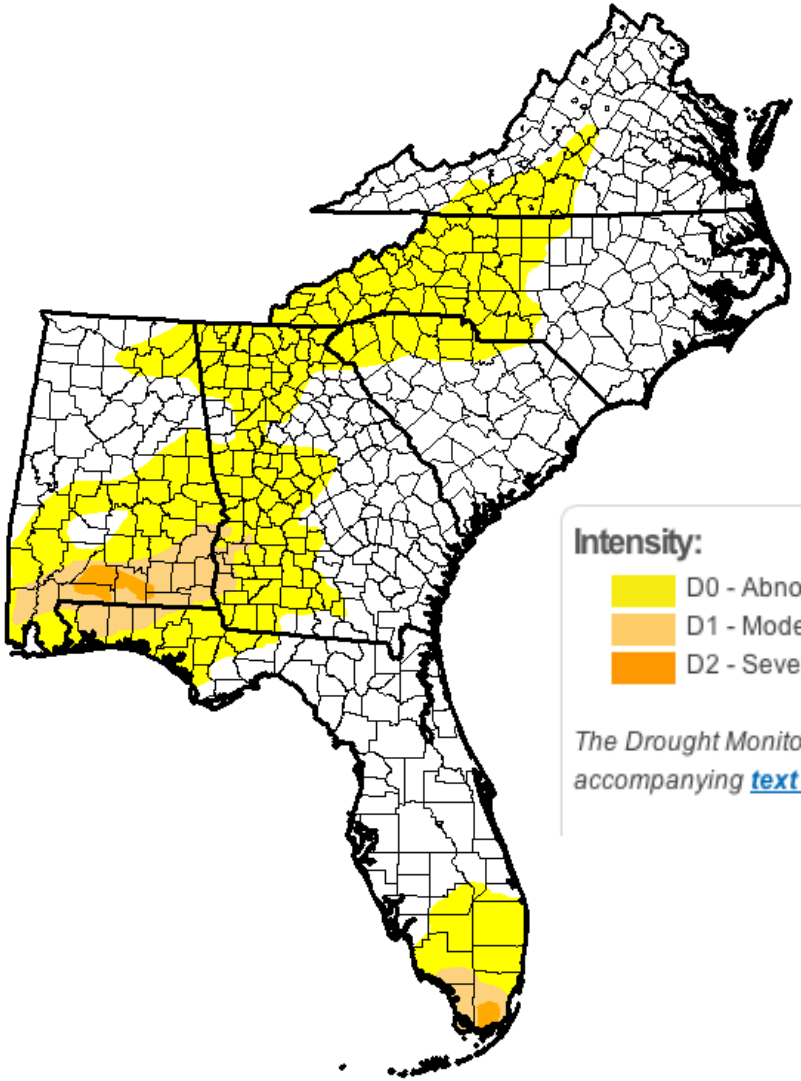


# Outline

Welcome – Eric Reutebuch, AU Water Resources Center

- Current drought status, seasonal forecasts and outlooks – David Zierden, Florida Climate Center, FSU
- Streamflows and groundwater – Tony Gotvald, USGS
- Streamflow forecasts – Jeff Dobur, SERFC
- ACF reservoir conditions – Bailey Crane, United States Army Corps of Engineers
- Summary and Discussion

# Current drought status



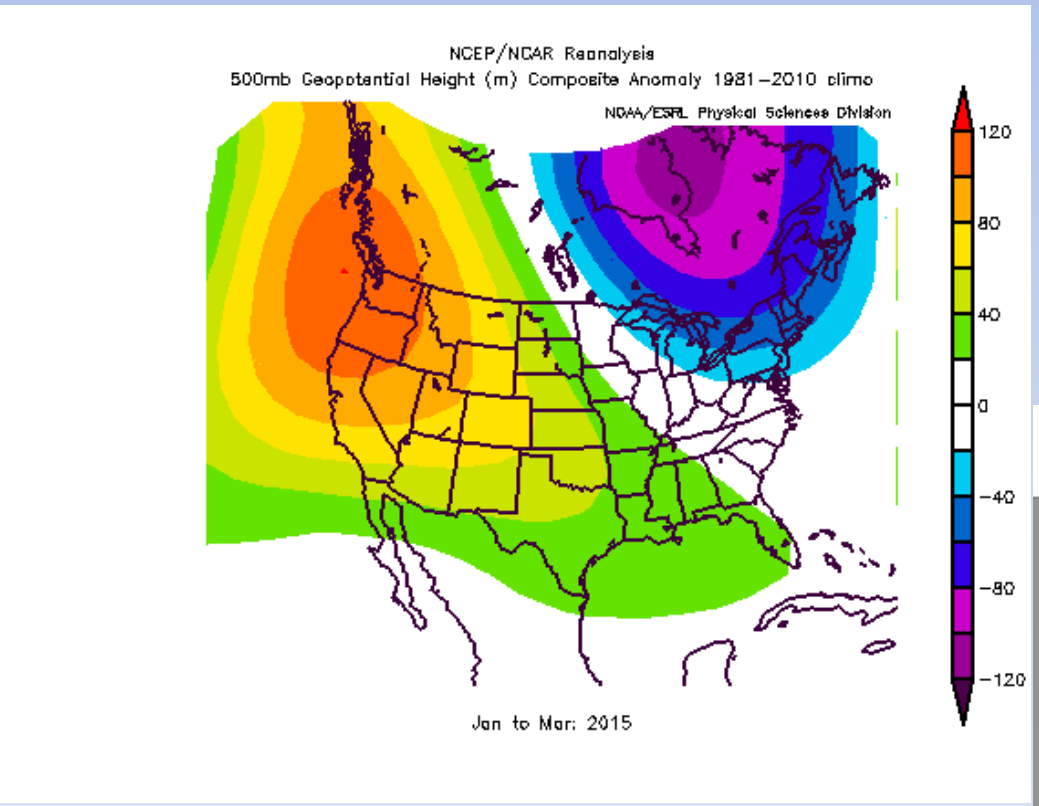
**Intensity:**

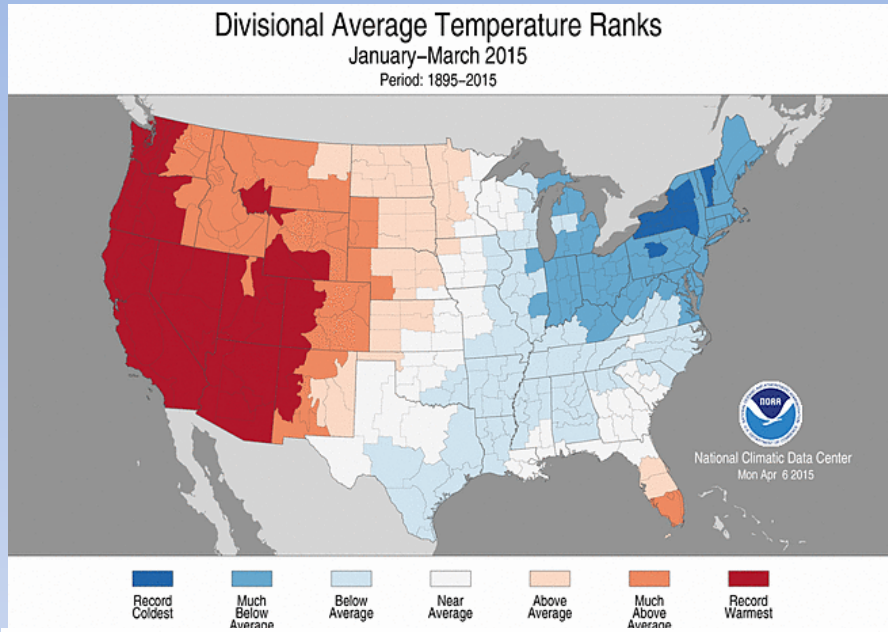
- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

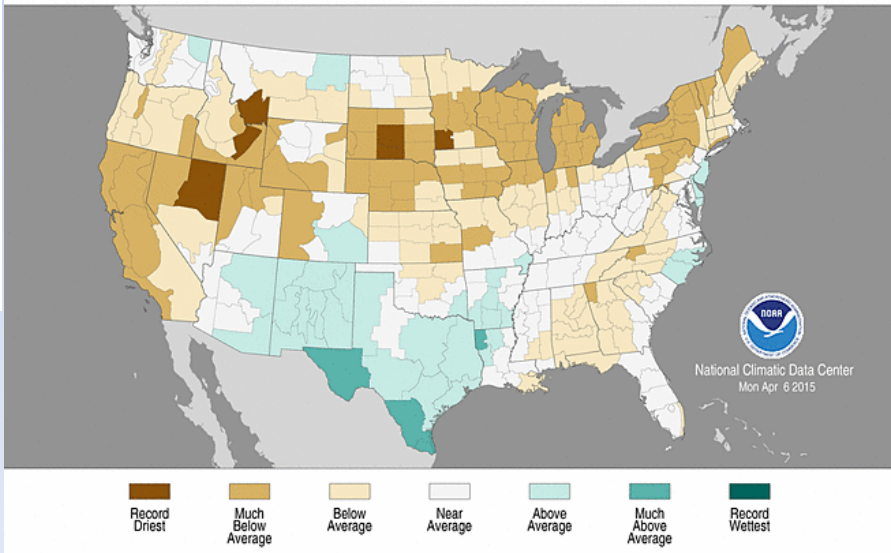
*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying **text summary** for forecast statements.*

David Zierden

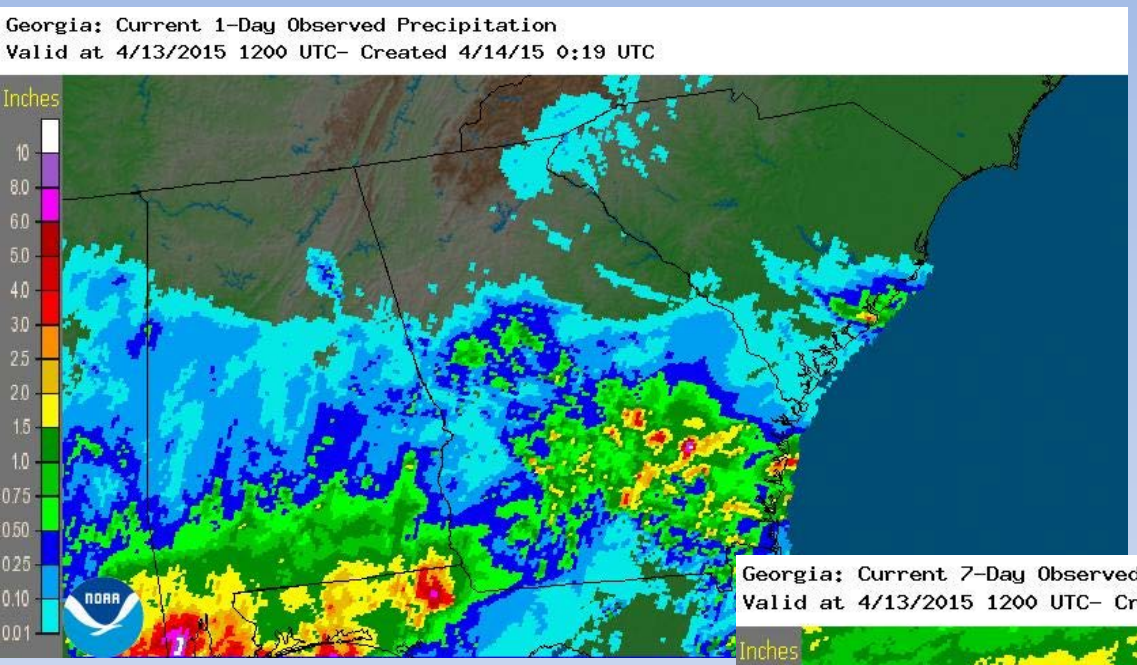
# Large Scale Pattern (Jan. – Mar.)

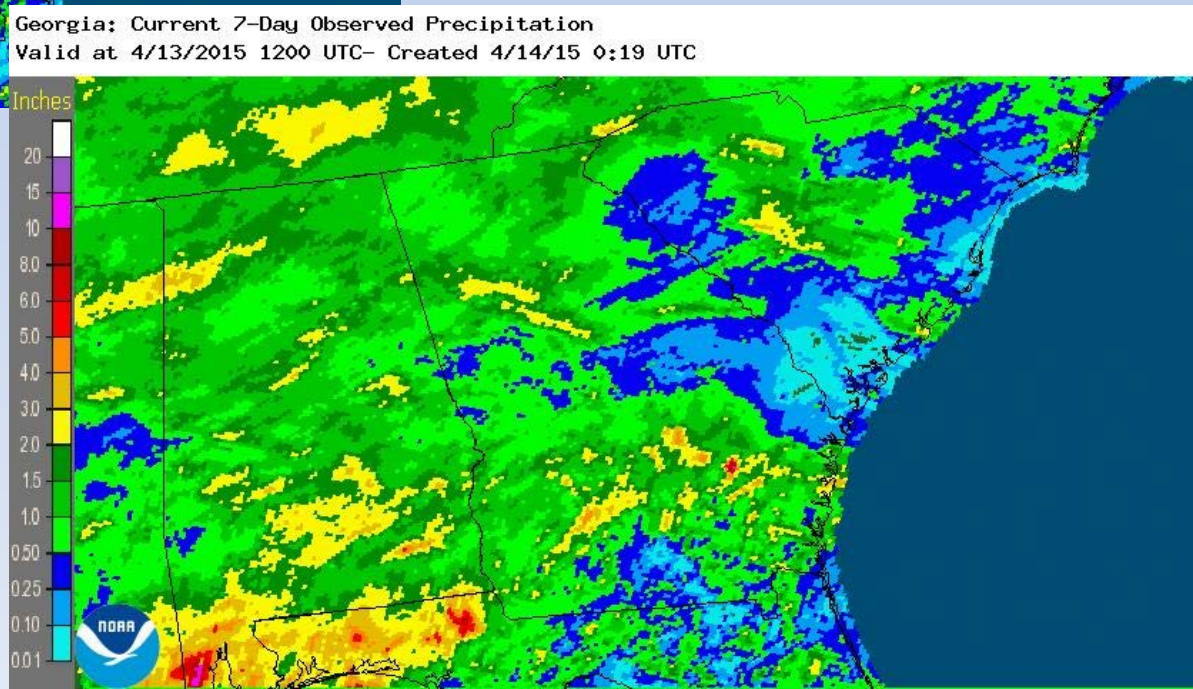


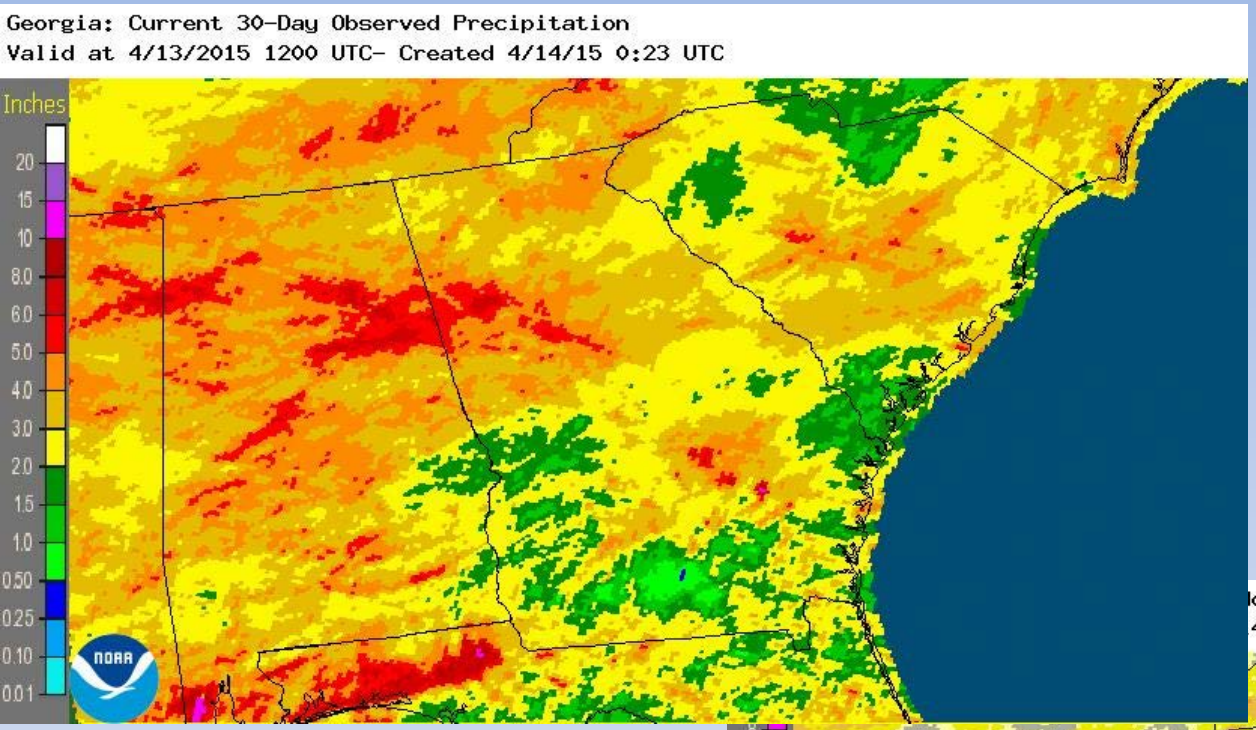



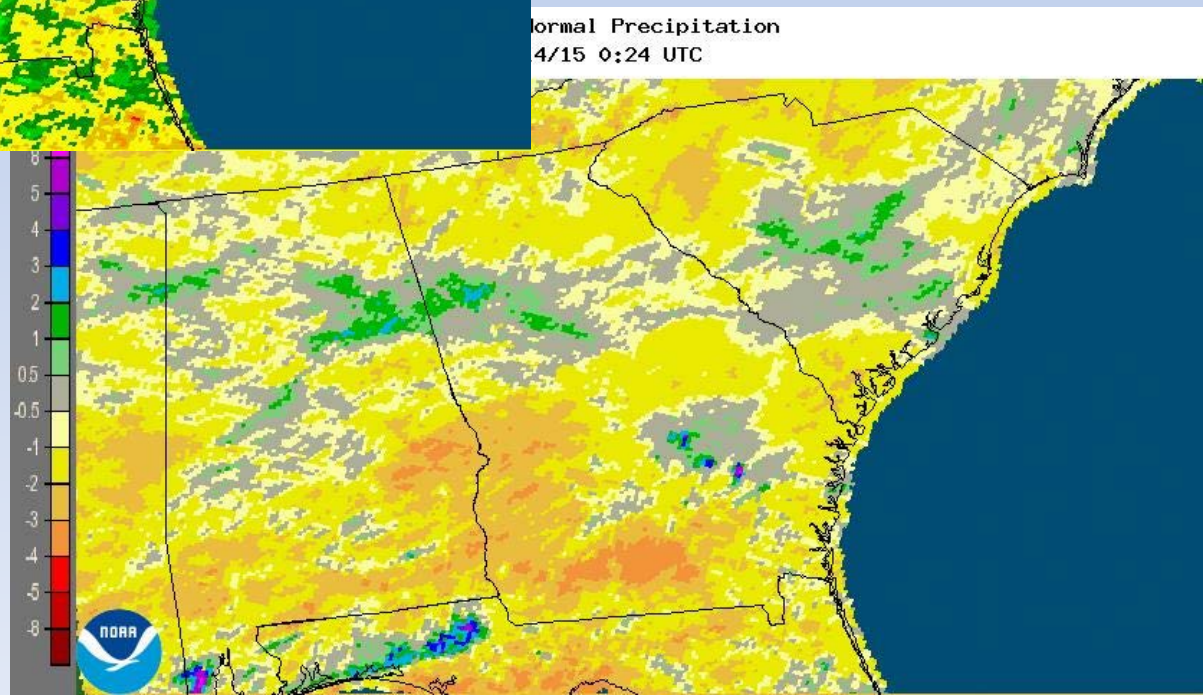
# Rainfall – Last 7 Days



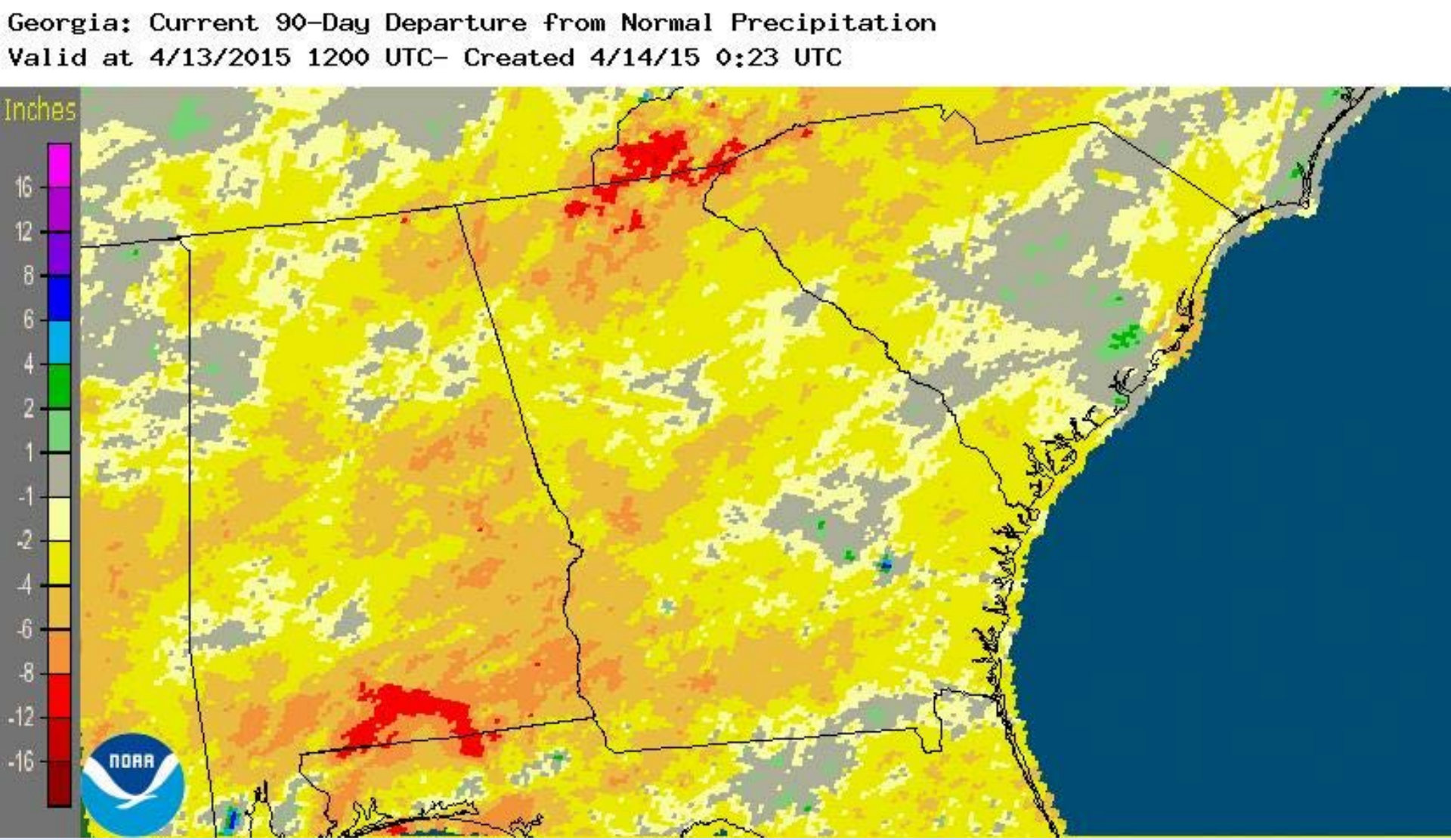



# 30-Day Rainfall

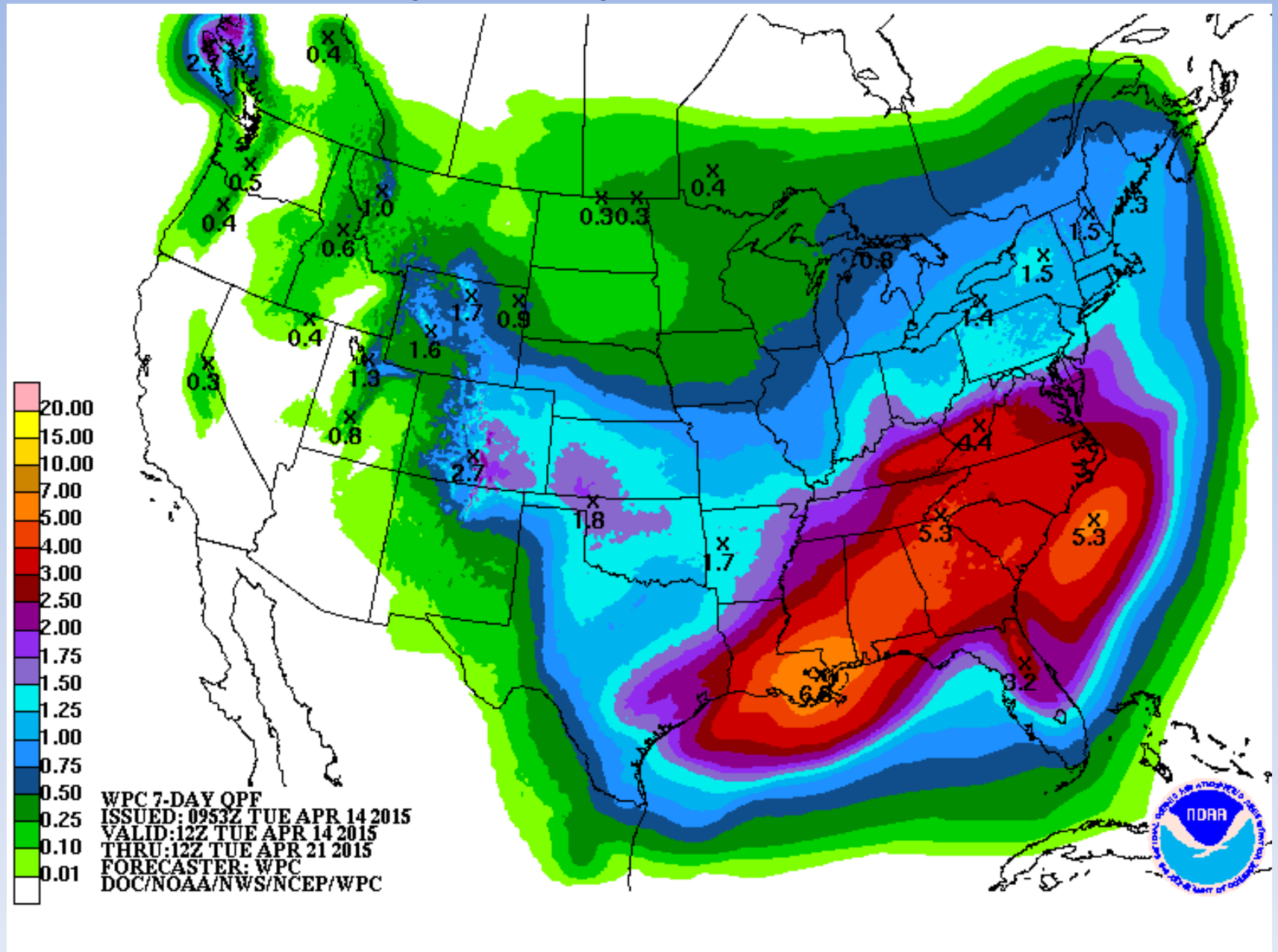


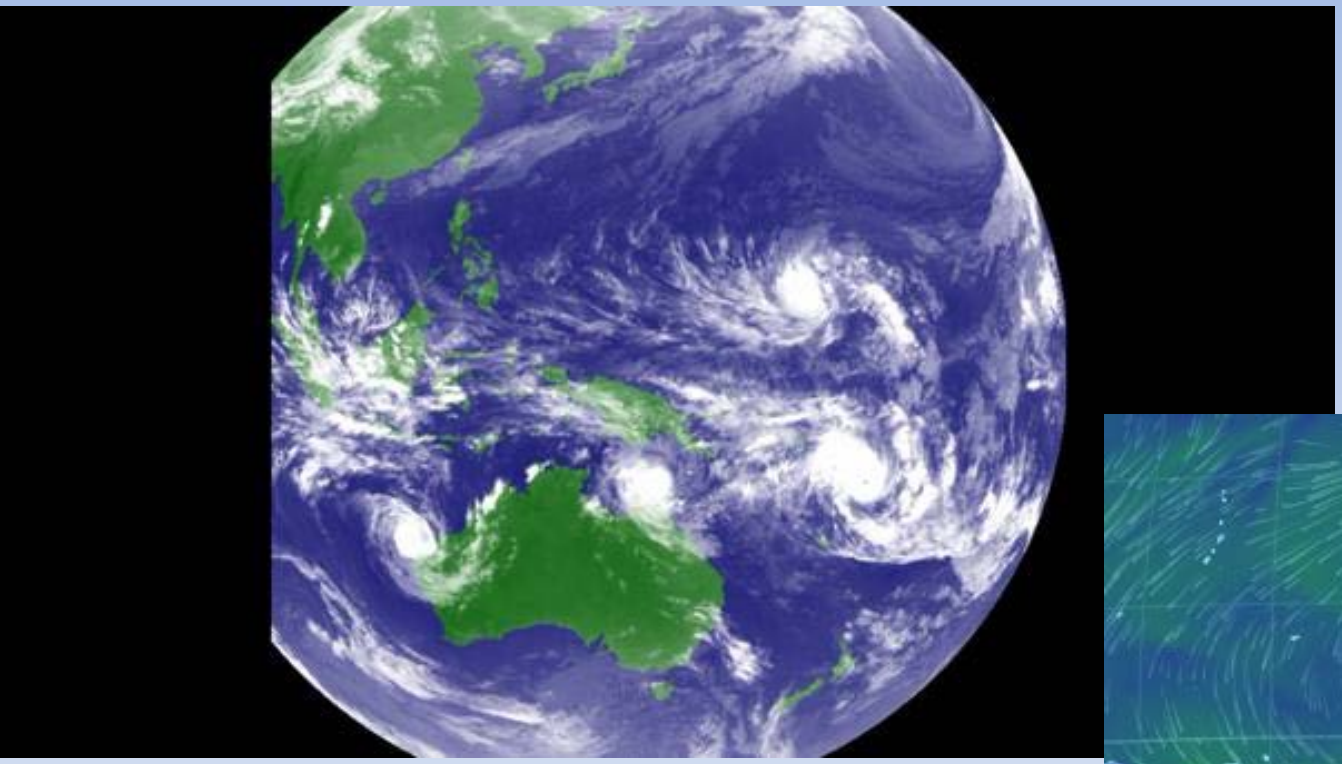
# 90-day Rainfall Departures

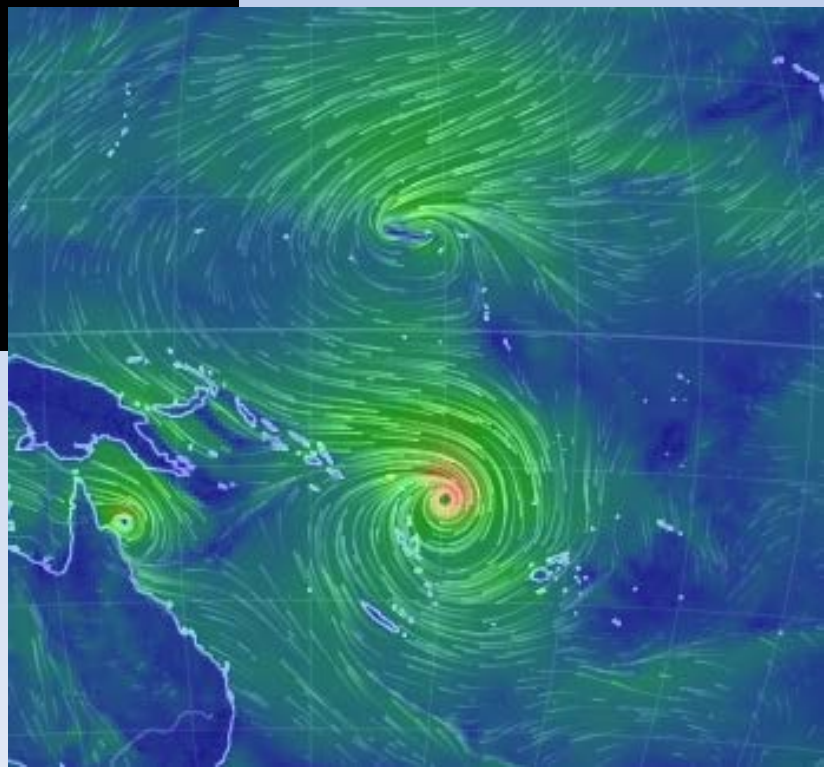


# 7-Day Precipitation Forecast

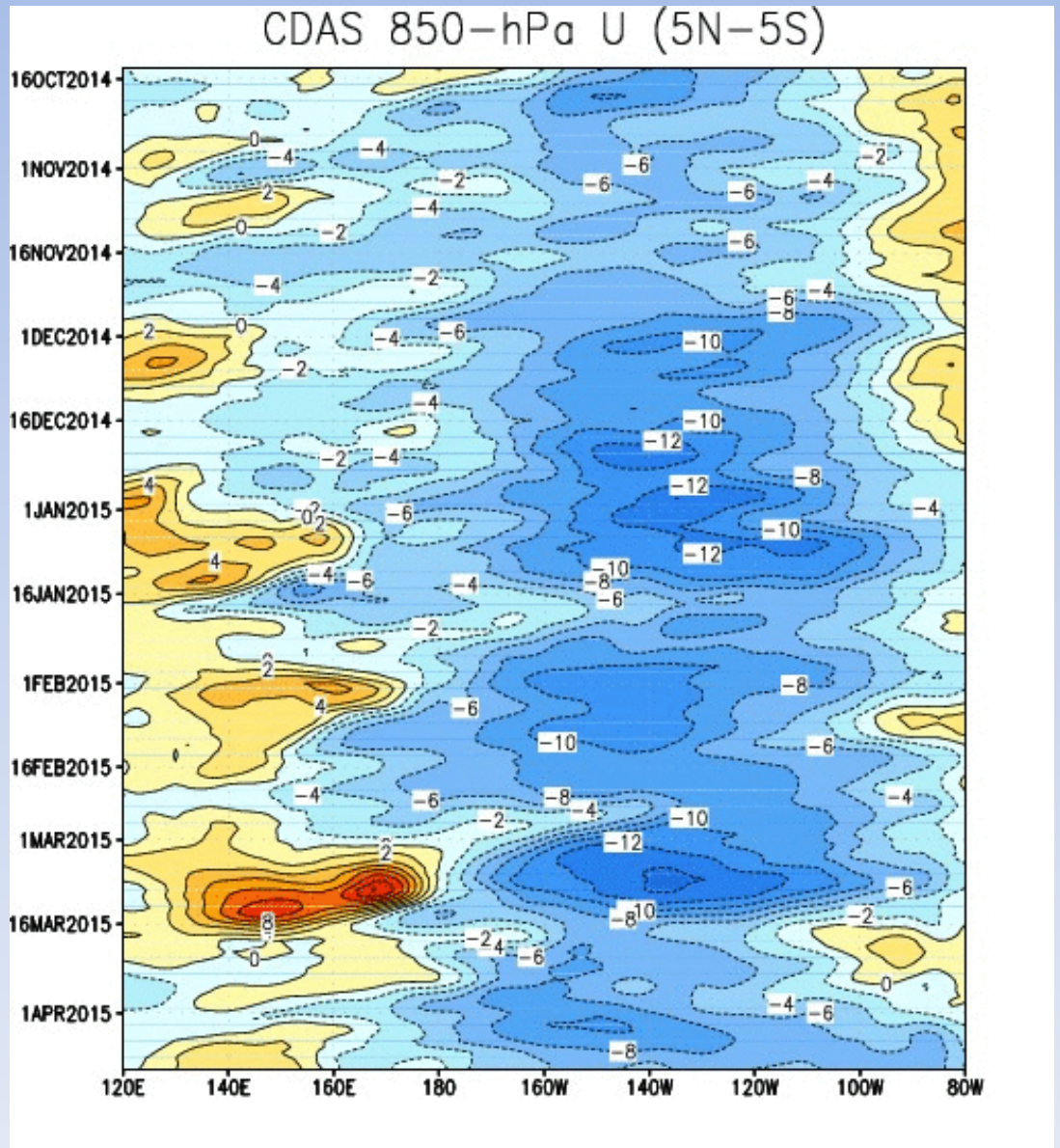


# Tropical Cyclone Pair

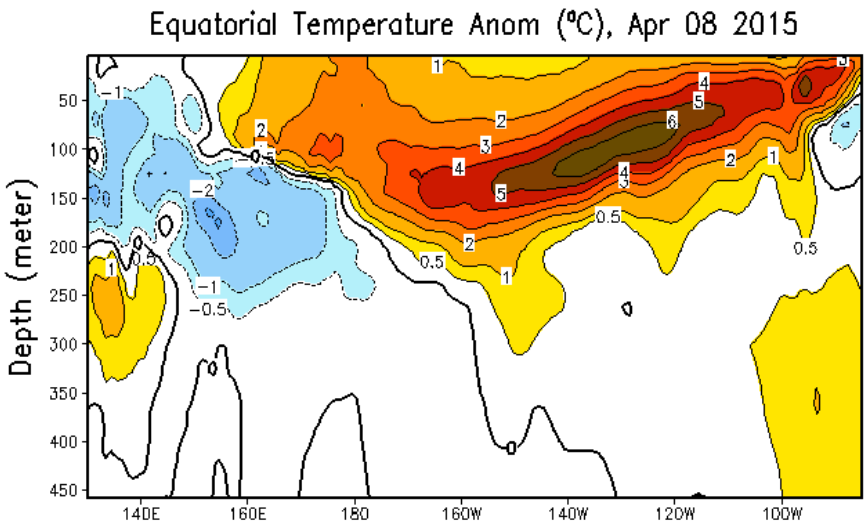


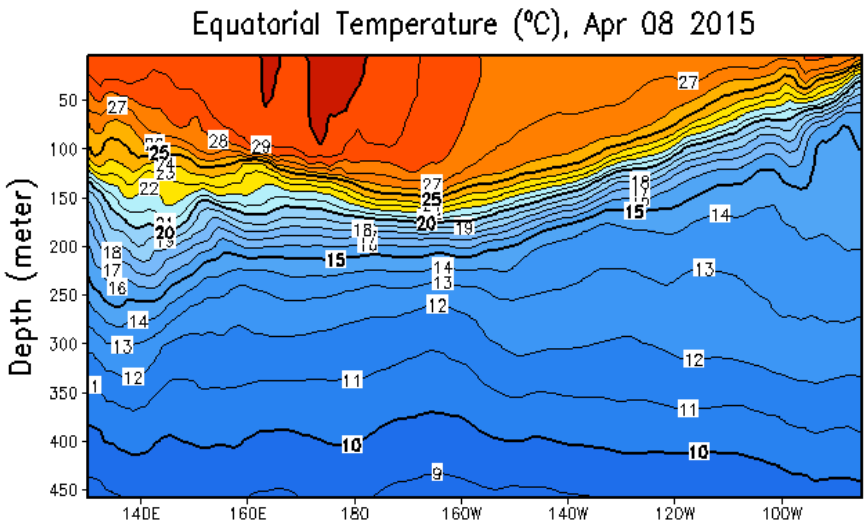


# Winds over the Pacific

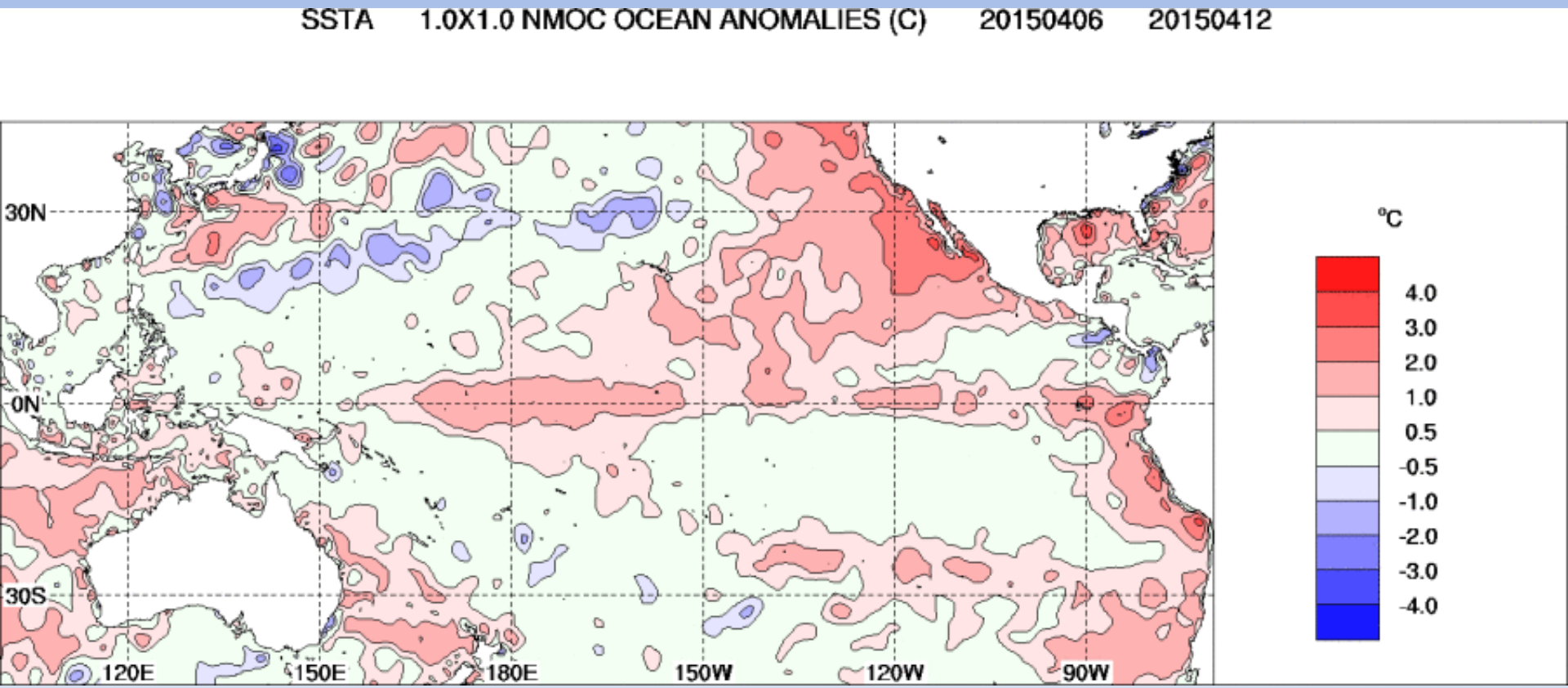


# Subsurface Temperatures

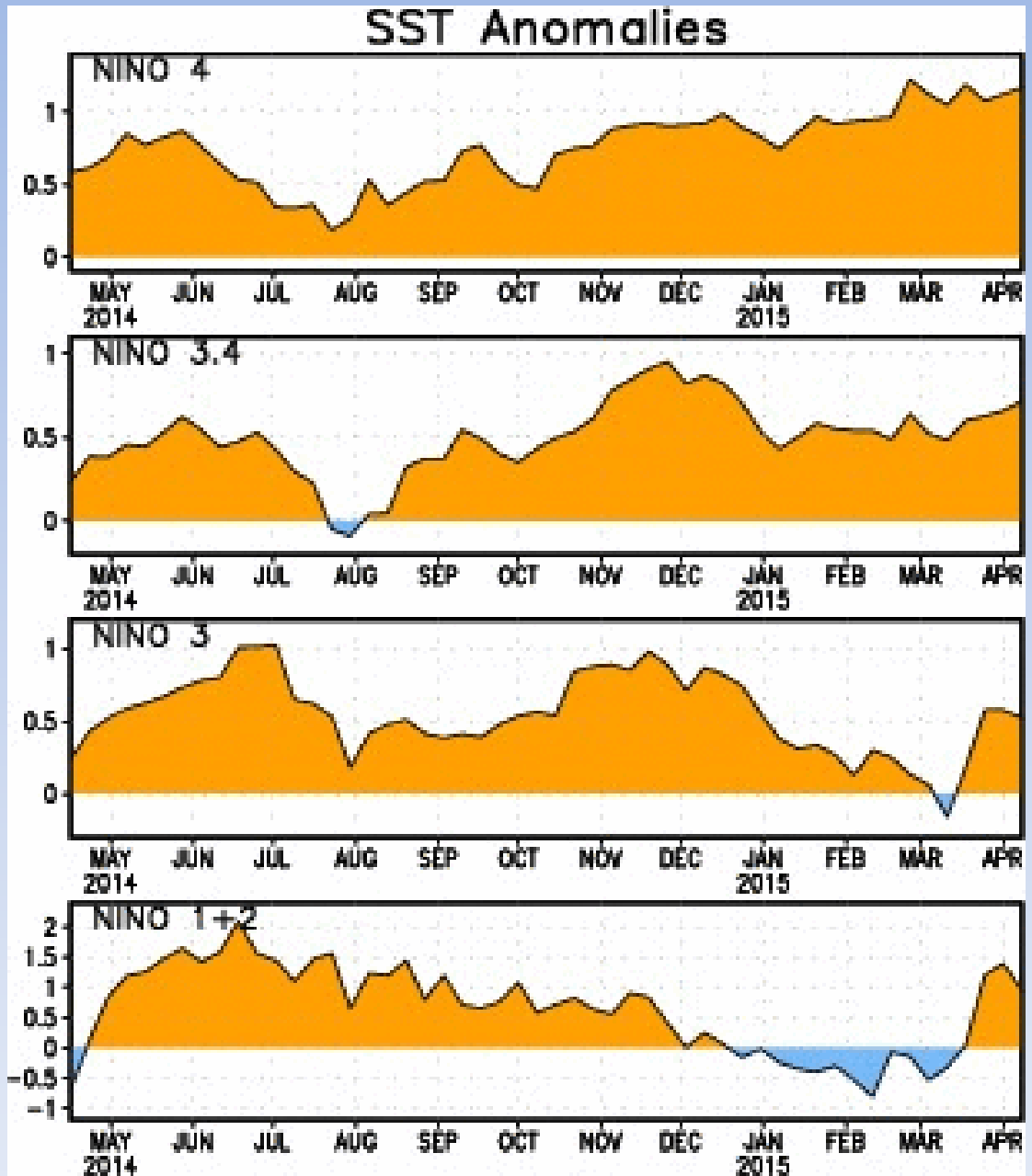


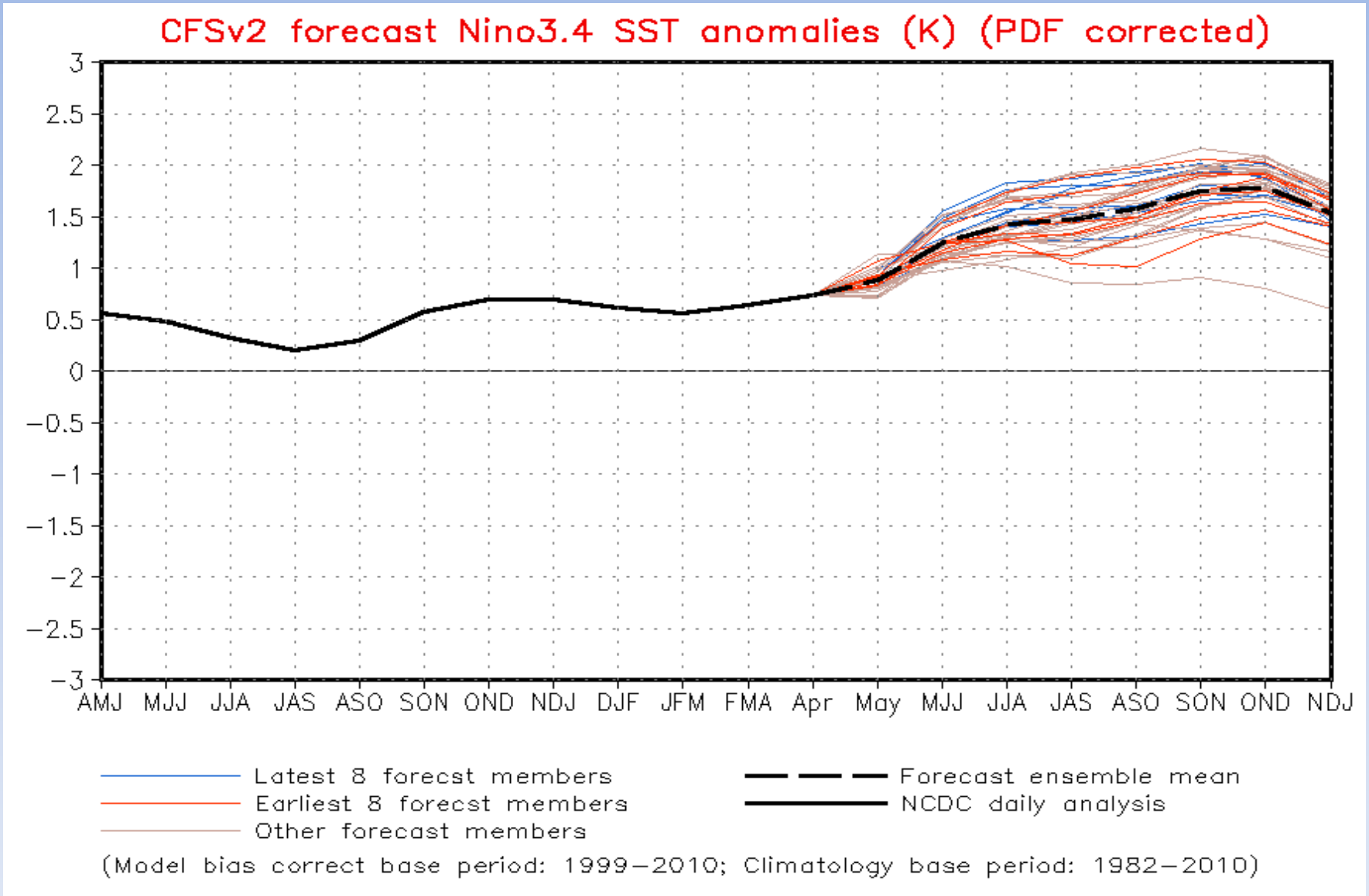
# Current SST Anomalies



# Nino Indices

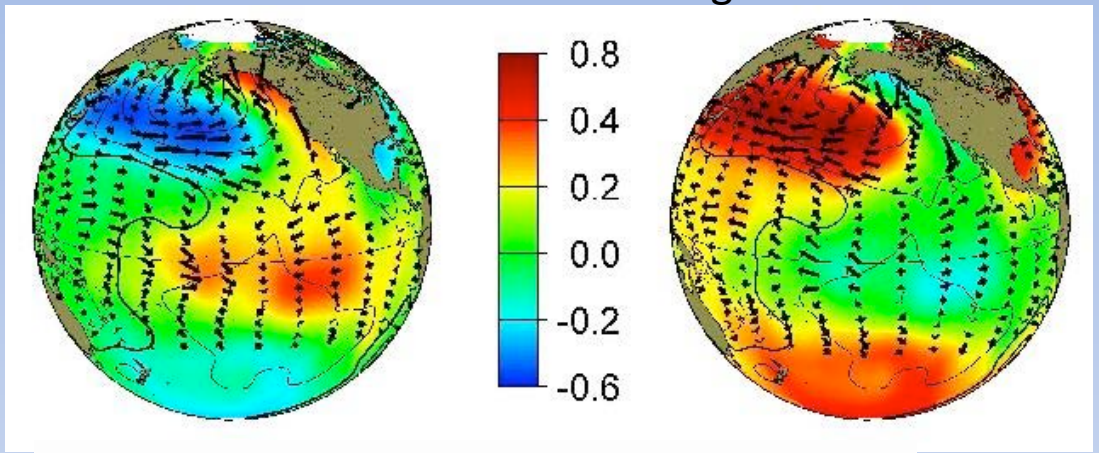


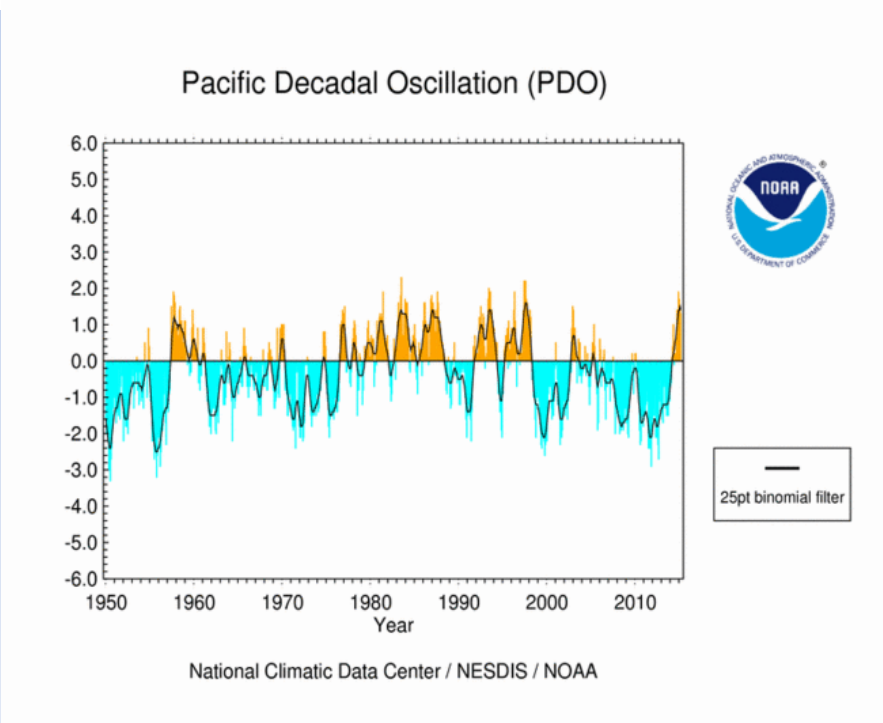
# El Nino Forecast



# Pacific Decadal Oscillation

Pos. Phase Neg. Phase



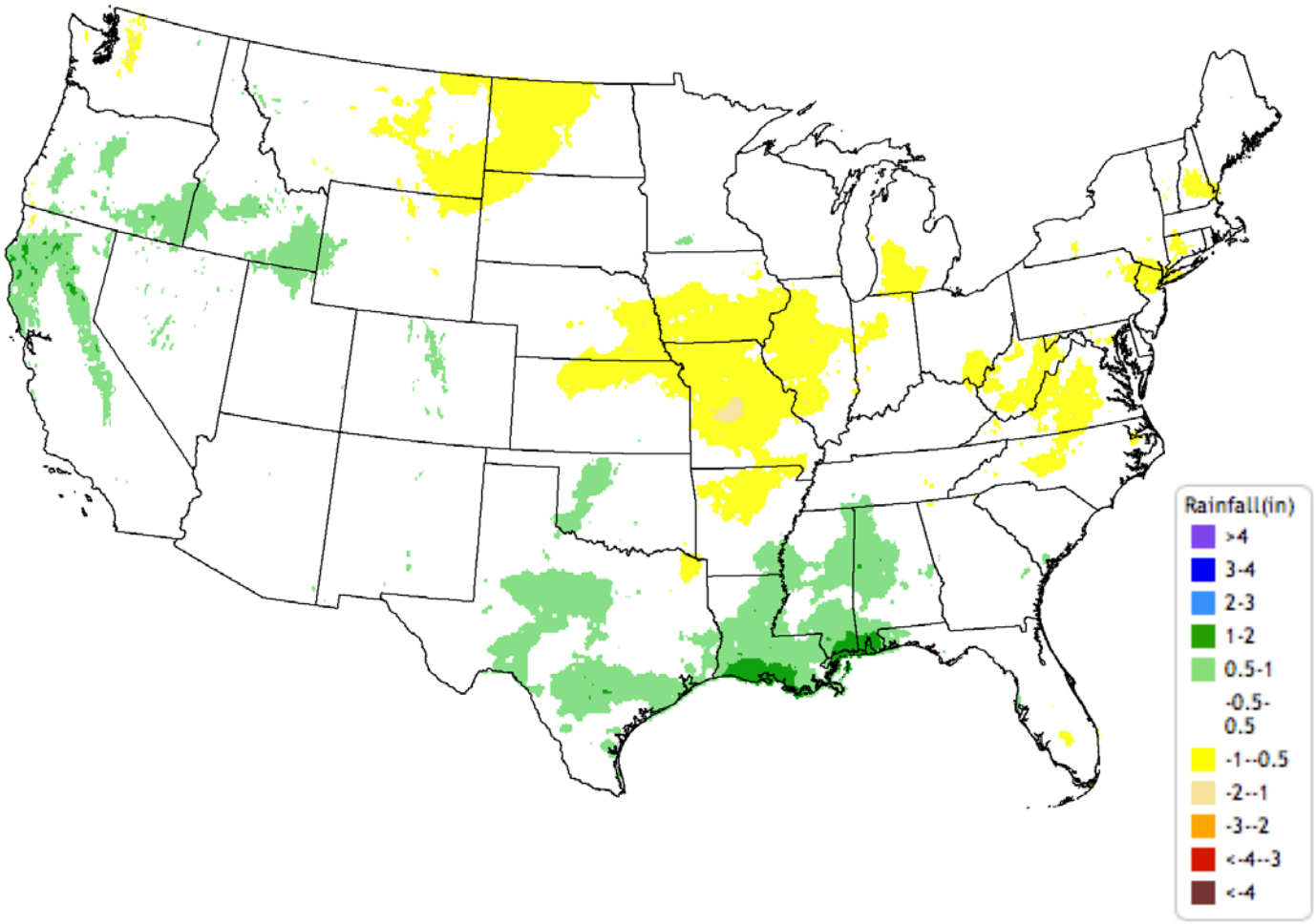




PDO has been positive for 9 months now.

Over +2.0 since Dec.

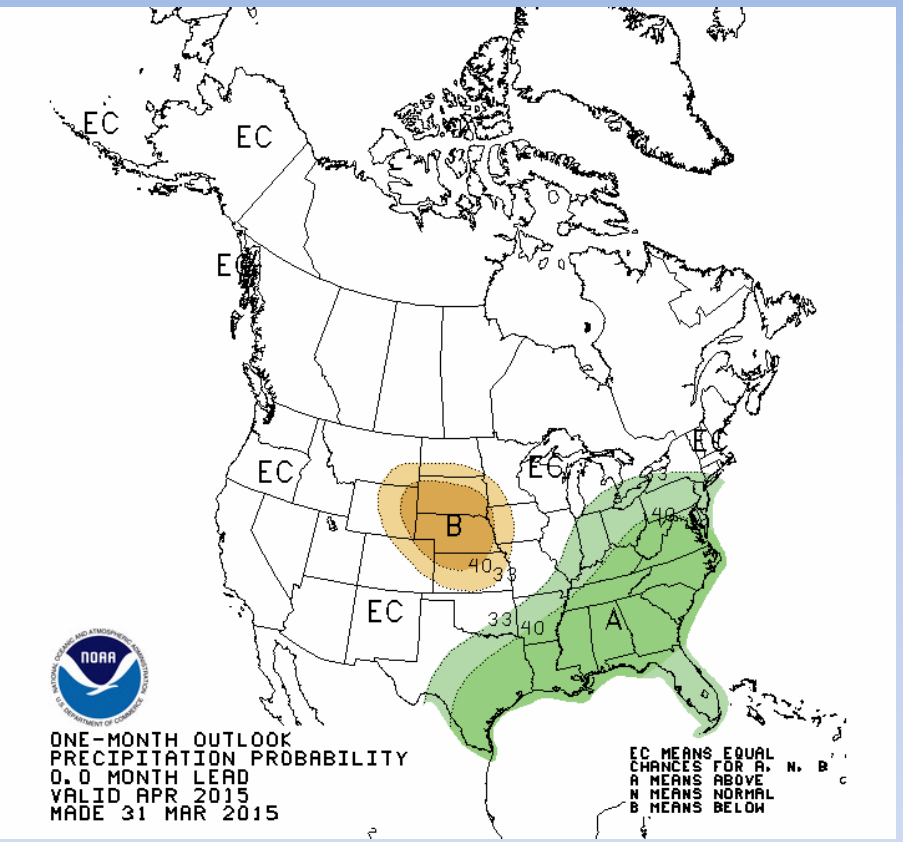
Positive PDO associated with more/stronger El Nino's

# El Niño Spring Patterns (May)

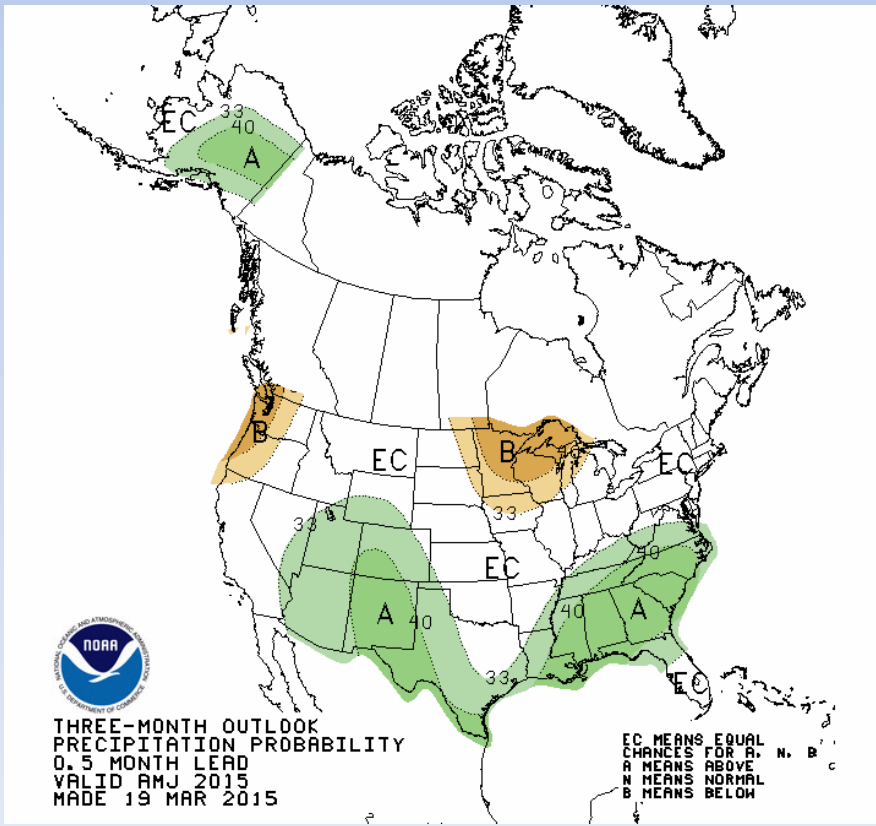


# 1-3 Month Precipitation Outlook

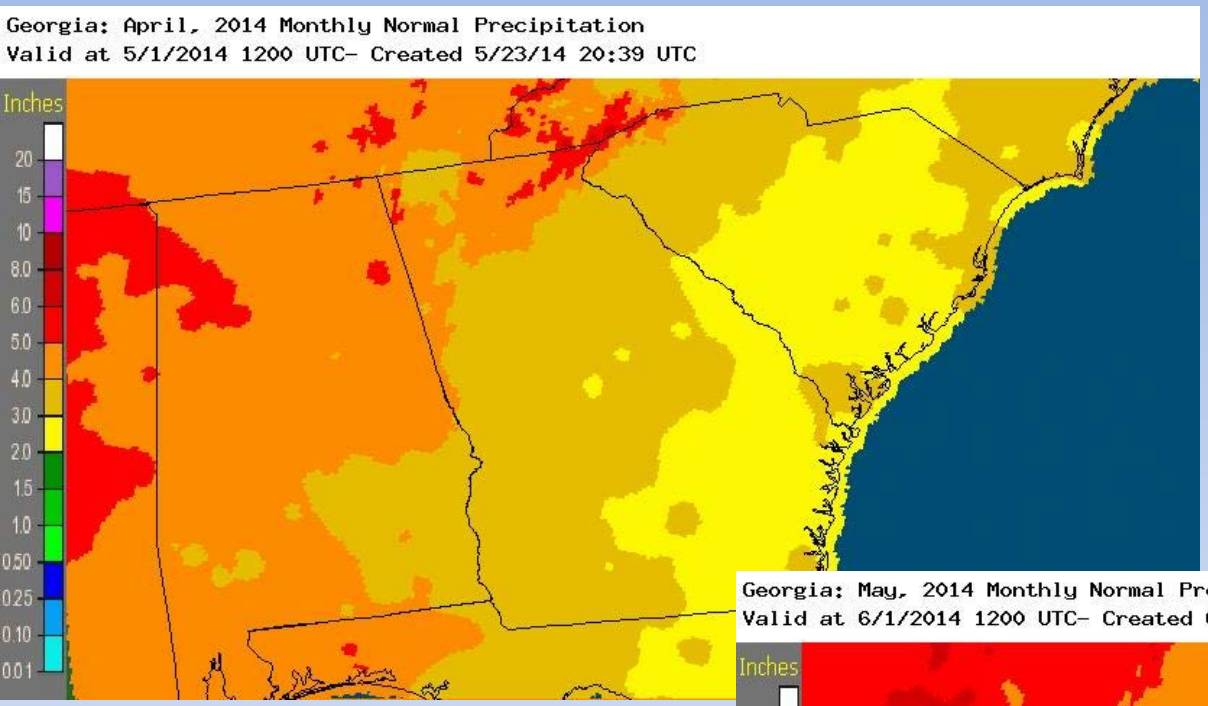
1 Month

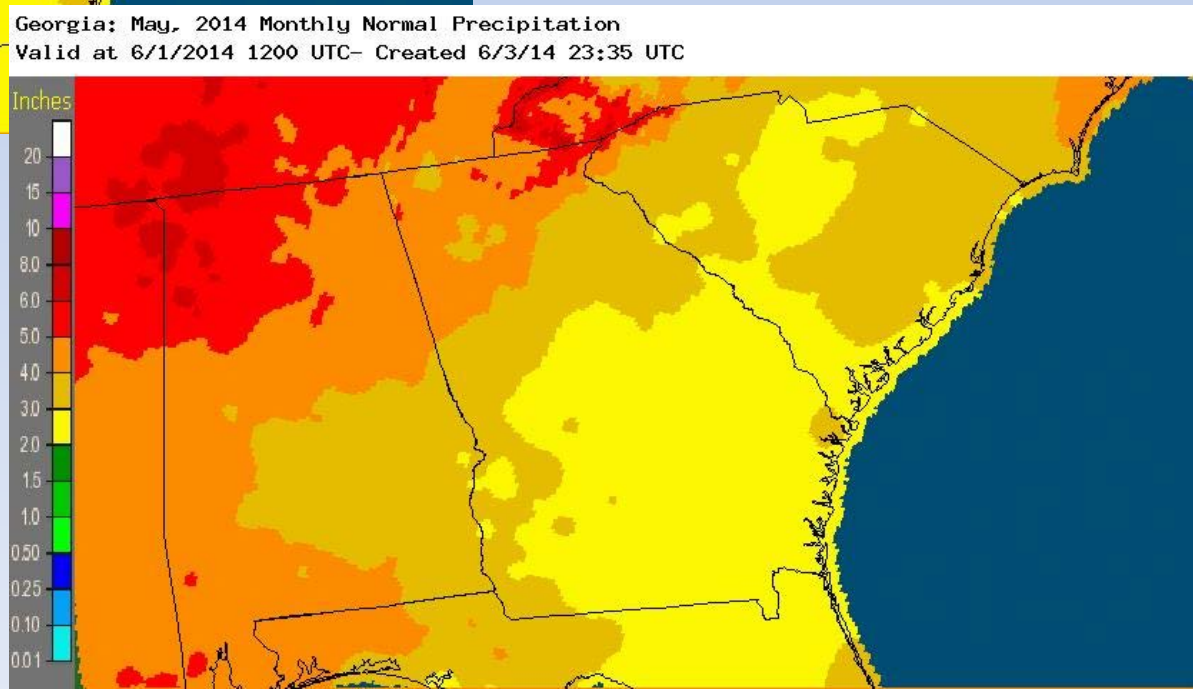



3 Month

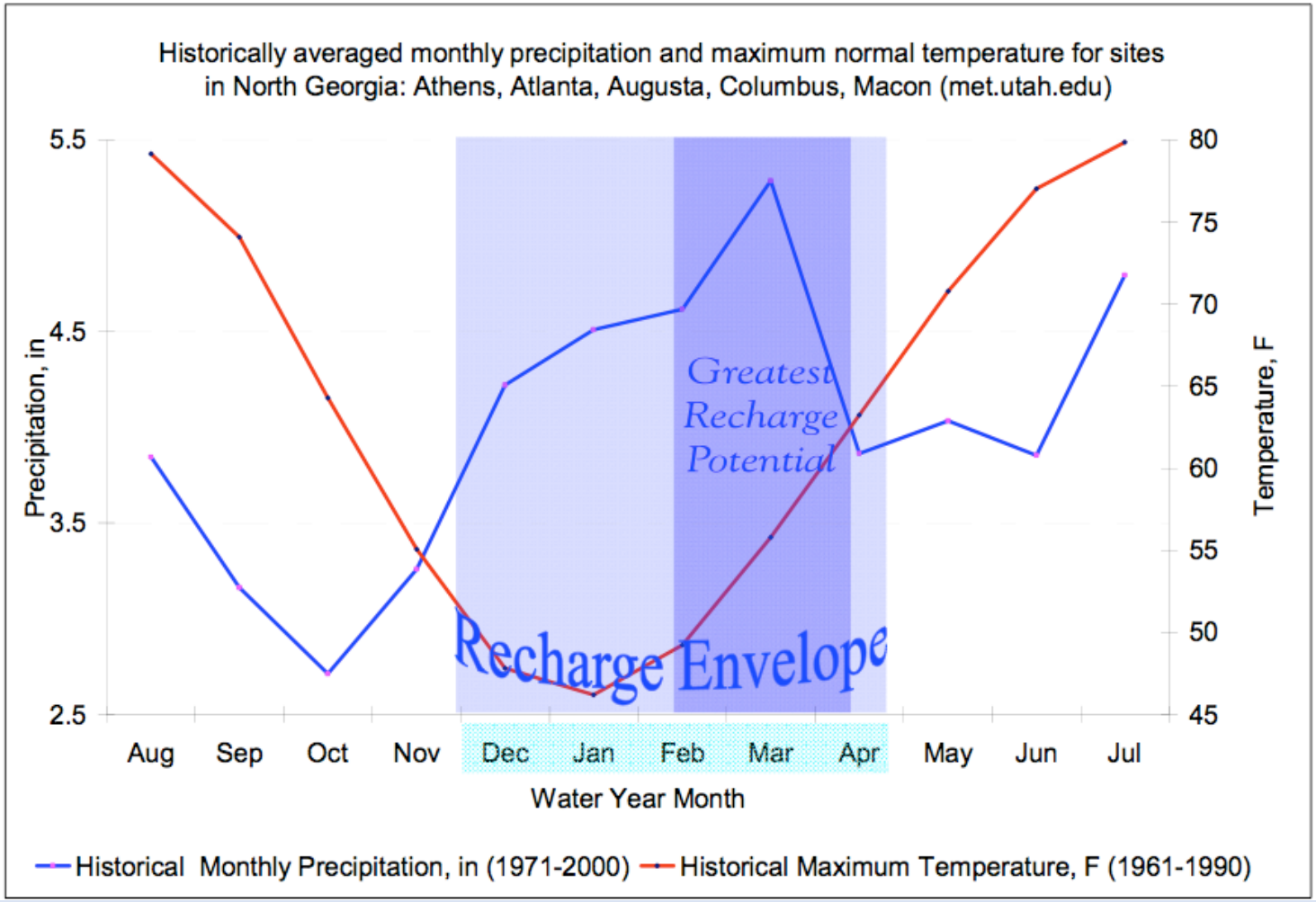


# Spring Rainfall Climatology

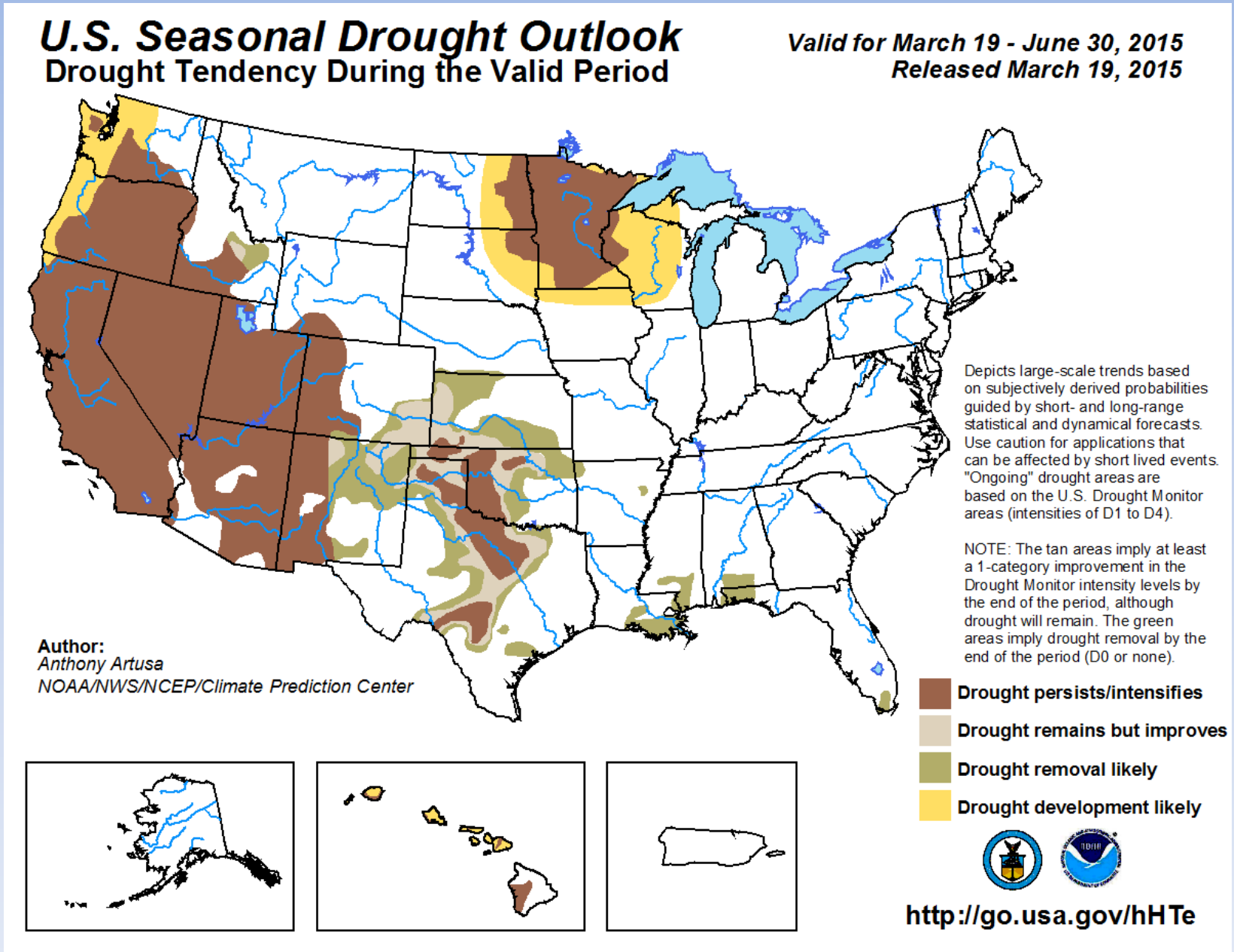


# Winter/Spring Recharge – North Georgia



# U.S. Drought Outlook

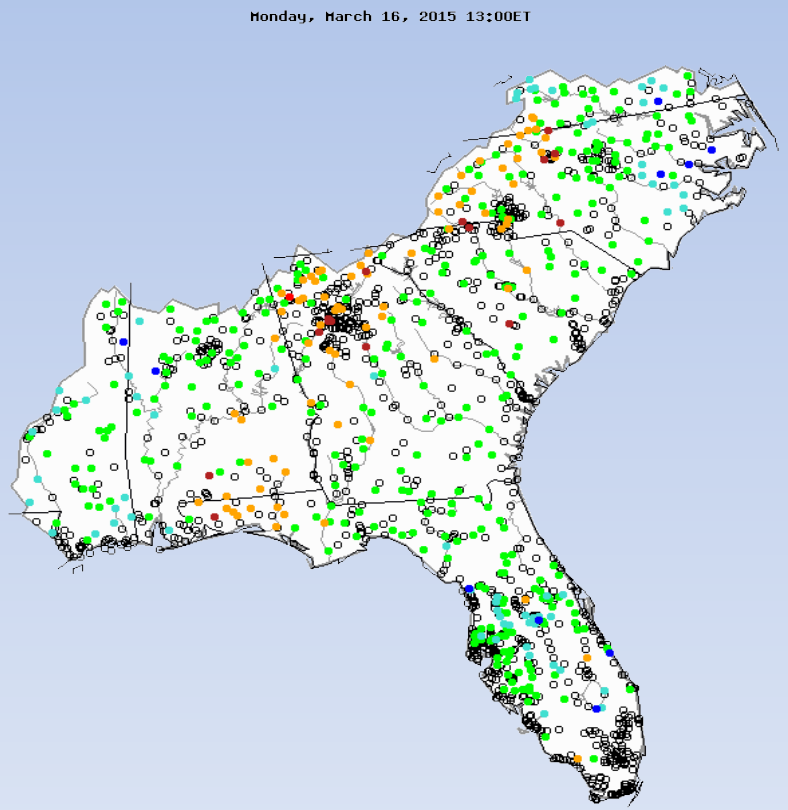


# Streamflows and Groundwater

Tony Gotvald

# Realtime stream flow compared with historical monthly averages

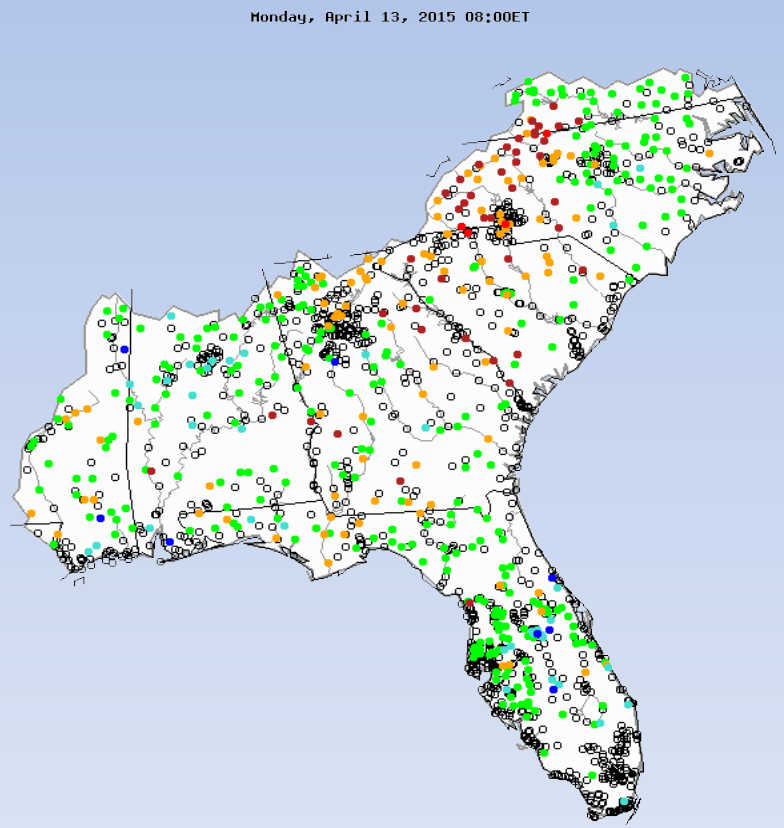
## Previous Brief:




USGS

| Explanation - Percentile classes | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| Low | <10 | 10-24 | 25-75 | 76-90 | >90 | High |
| | Much below normal | Below normal | Normal | Above normal | Much above normal | |

## Current:

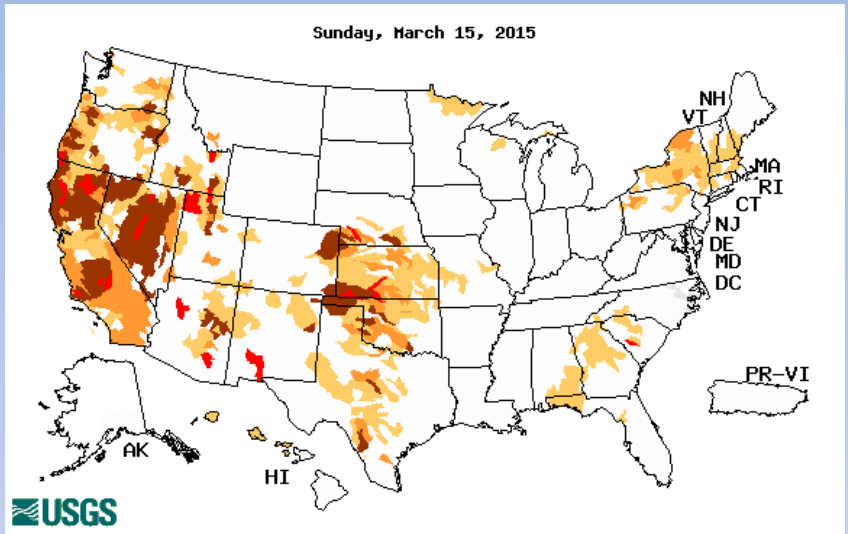



USGS

http://waterwatch.usgs.gov

# Below Normal 7-day Average Streamflows

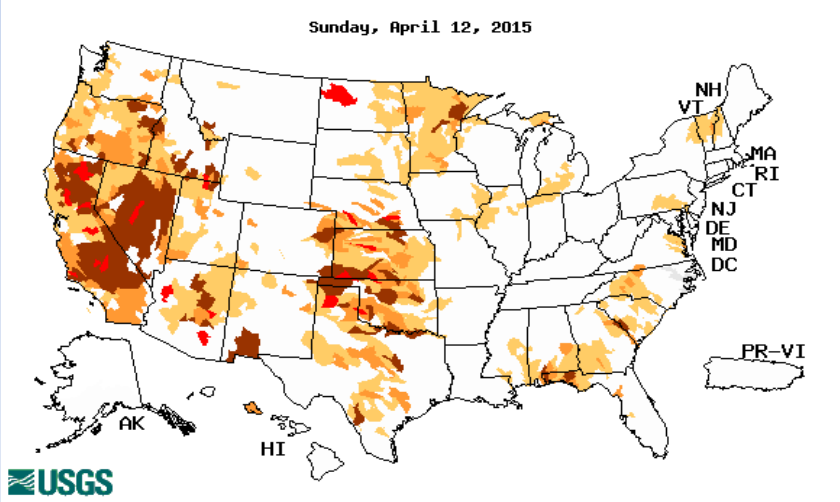
## Previous brief:




Below normal 7-day average streamflow as compared with historical streamflow for day shown

| Explanation - Percentile classes | | | | |
|---|---|---|---|---|
| Low | <=5 | 6-9 | 10-24 | |
| Extreme hydrologic drought | Severe hydrologic drought | Moderate hydrologic drought | Below normal | Insufficient data for a hydrologic region |

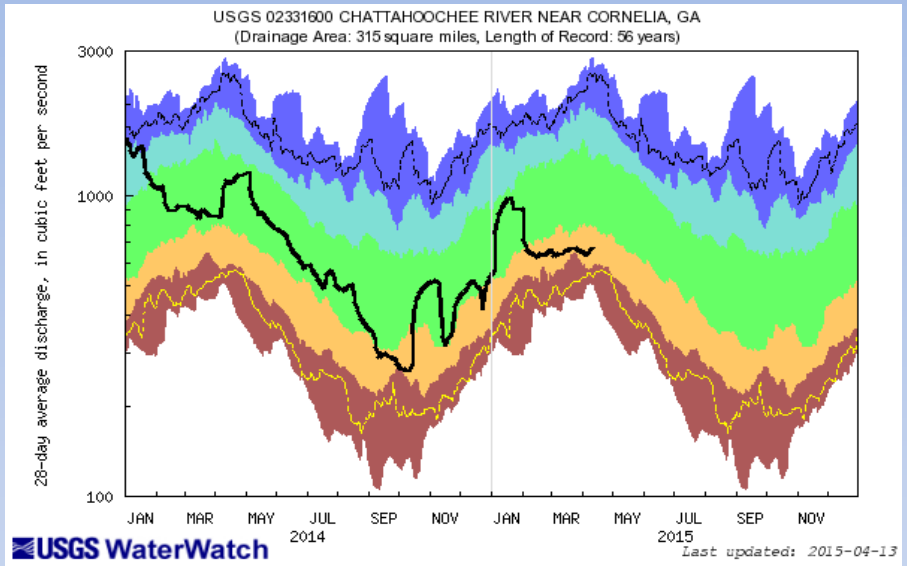
## Current:




http://waterwatch.usgs.gov

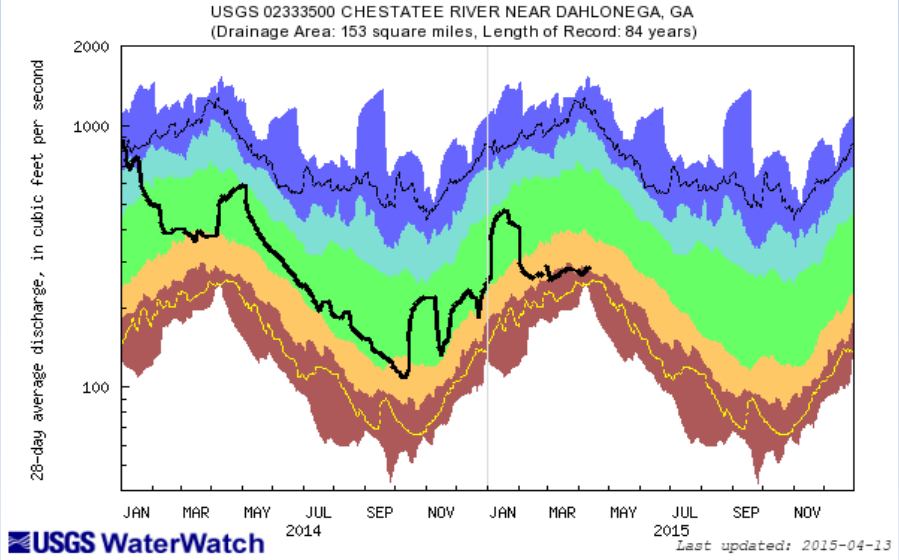
# Lake Lanier Inflows

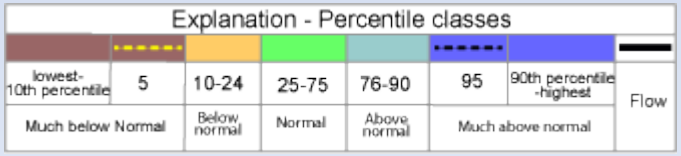
Chattahoochee near Cornelia (02331600)




http://waterwatch.usgs.gov

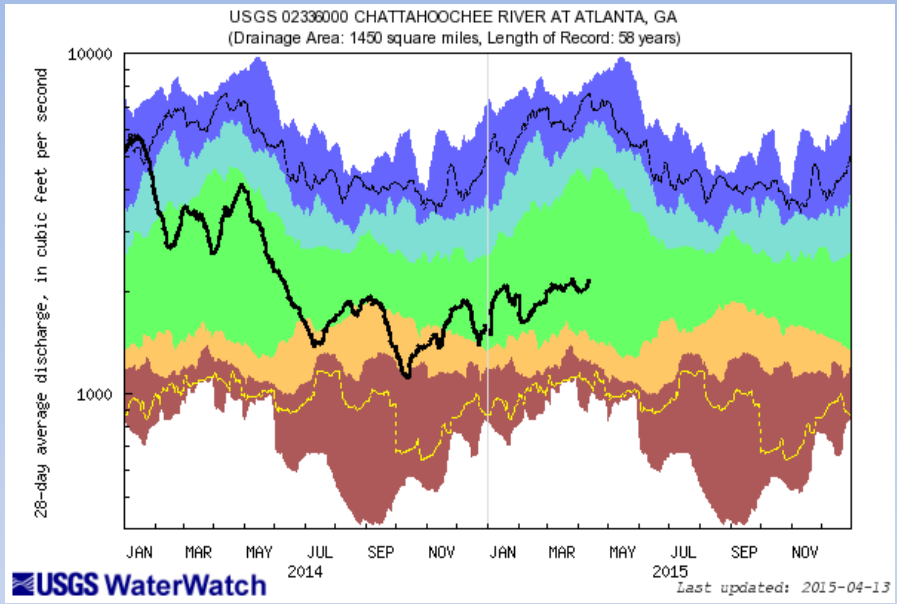
Chestatee near Dahlonega (02333500)



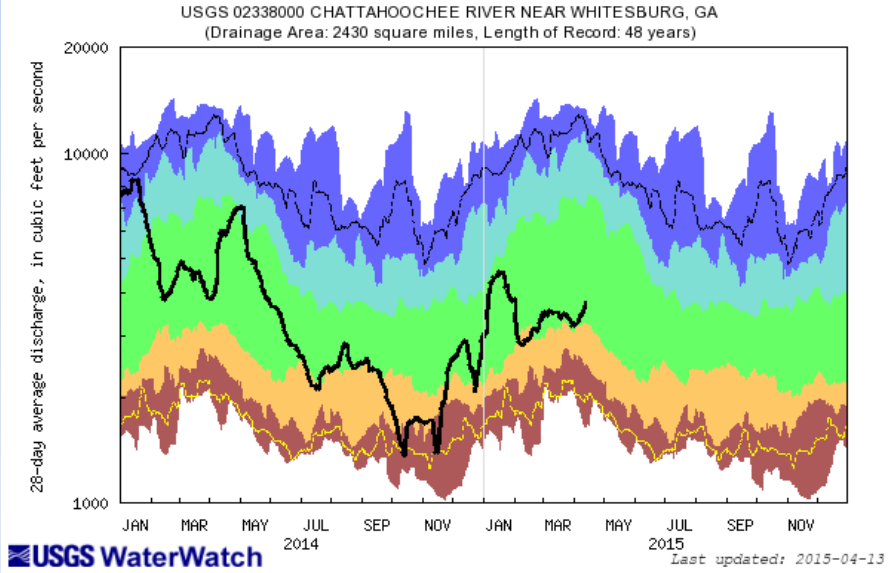
# Current Streamflows

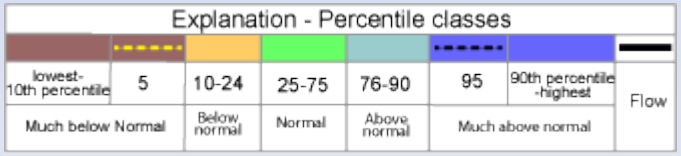
Chattahoochee at Atlanta (02336000)




http://waterwatch.usgs.gov

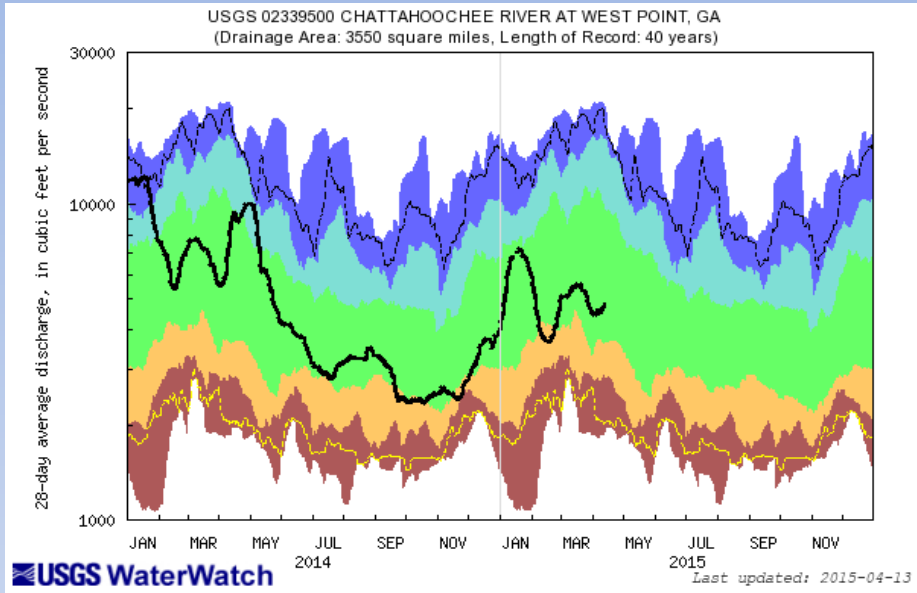
Chattahoochee near Whitesburg (02338000)



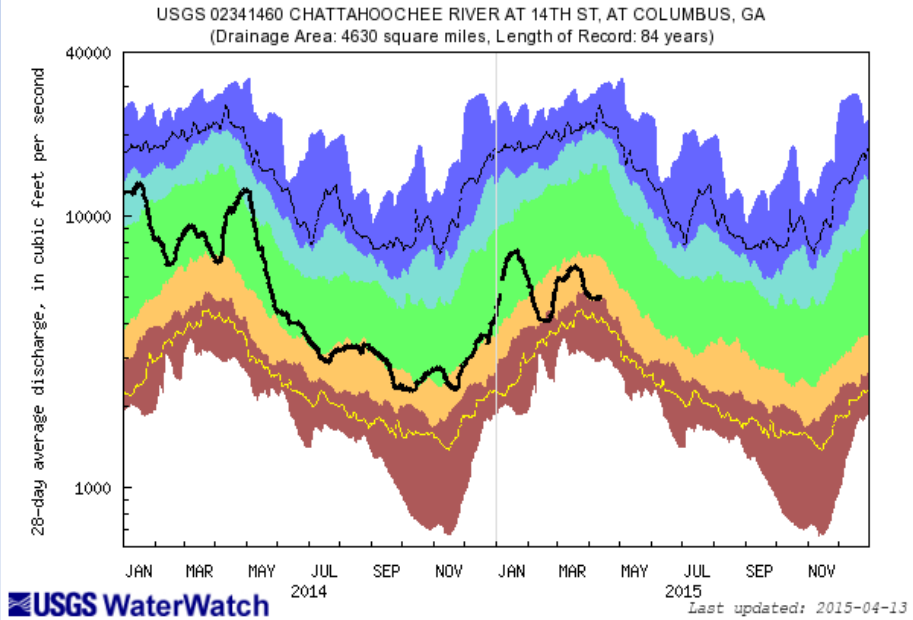
# Current Streamflows

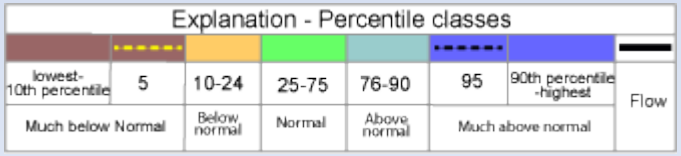
Chattahoochee at West Point (02339500)




http://waterwatch.usgs.gov

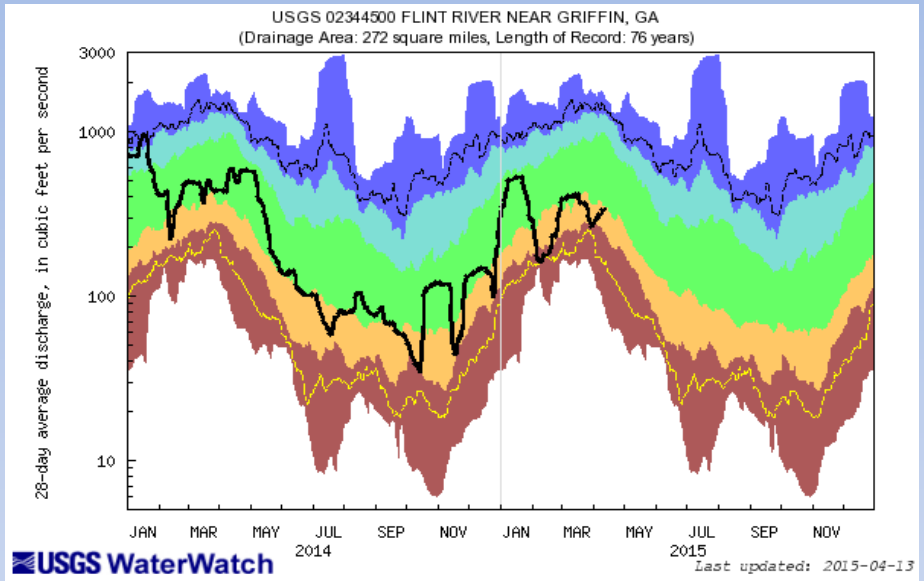
Chattahoochee at Columbus(02341460)



# Current Streamflows

Flint River near Griffin (02344500)

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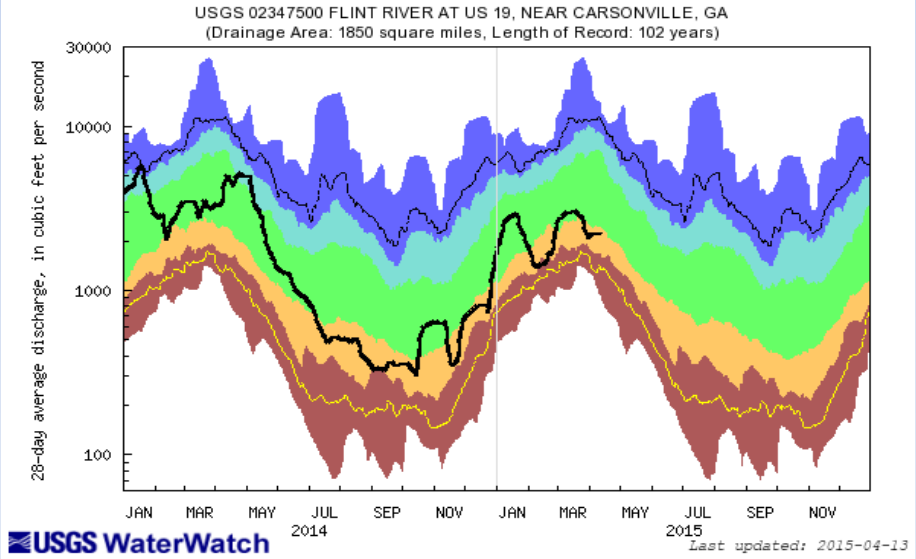
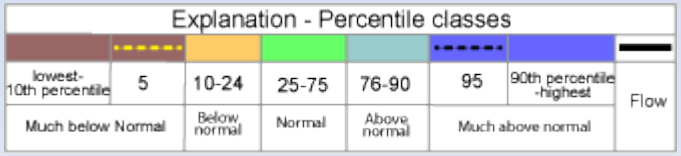
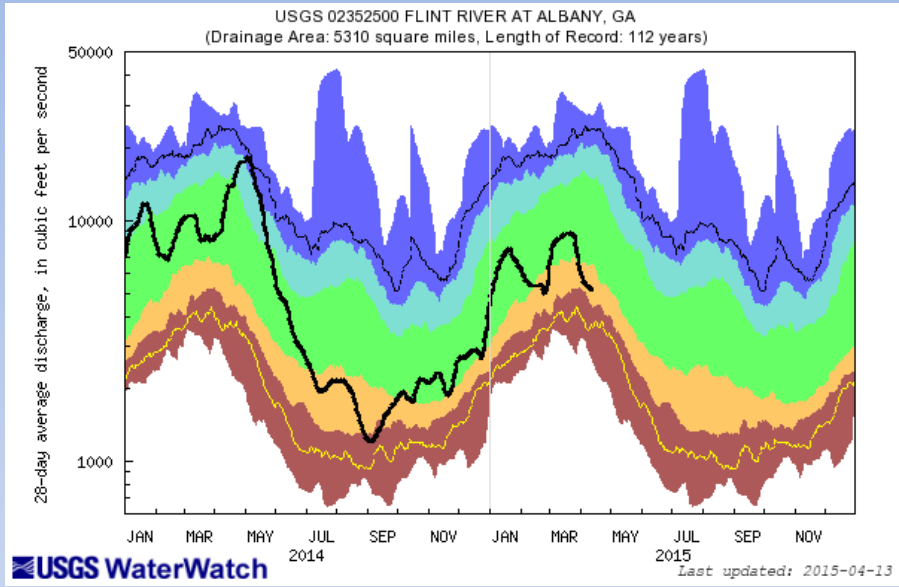
Flint River near Carsonville (02347500)



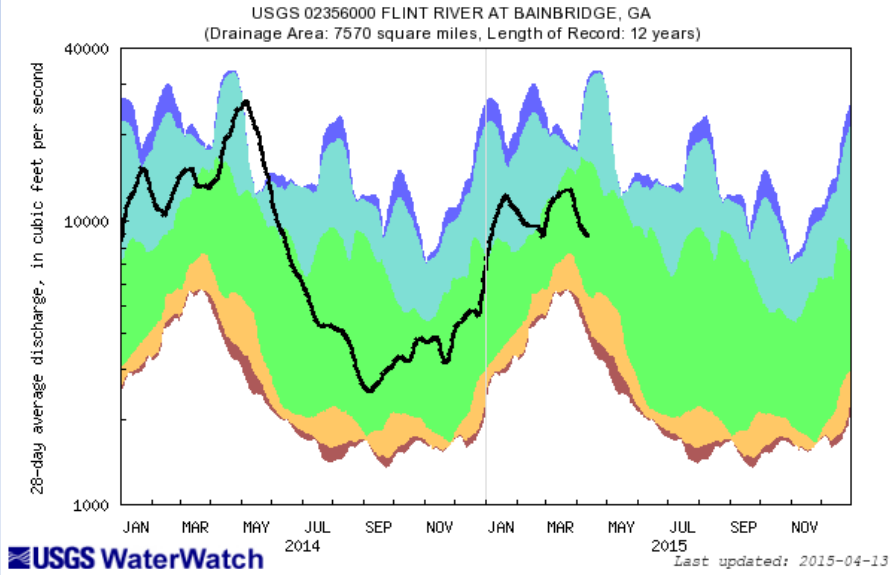
# Current Streamflows

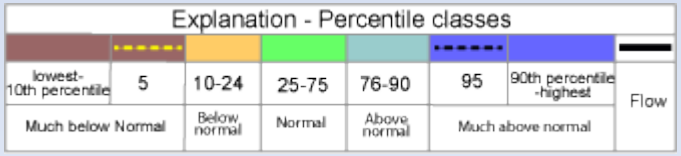
## Flint River at Albany (02352500)




http://waterwatch.usgs.gov

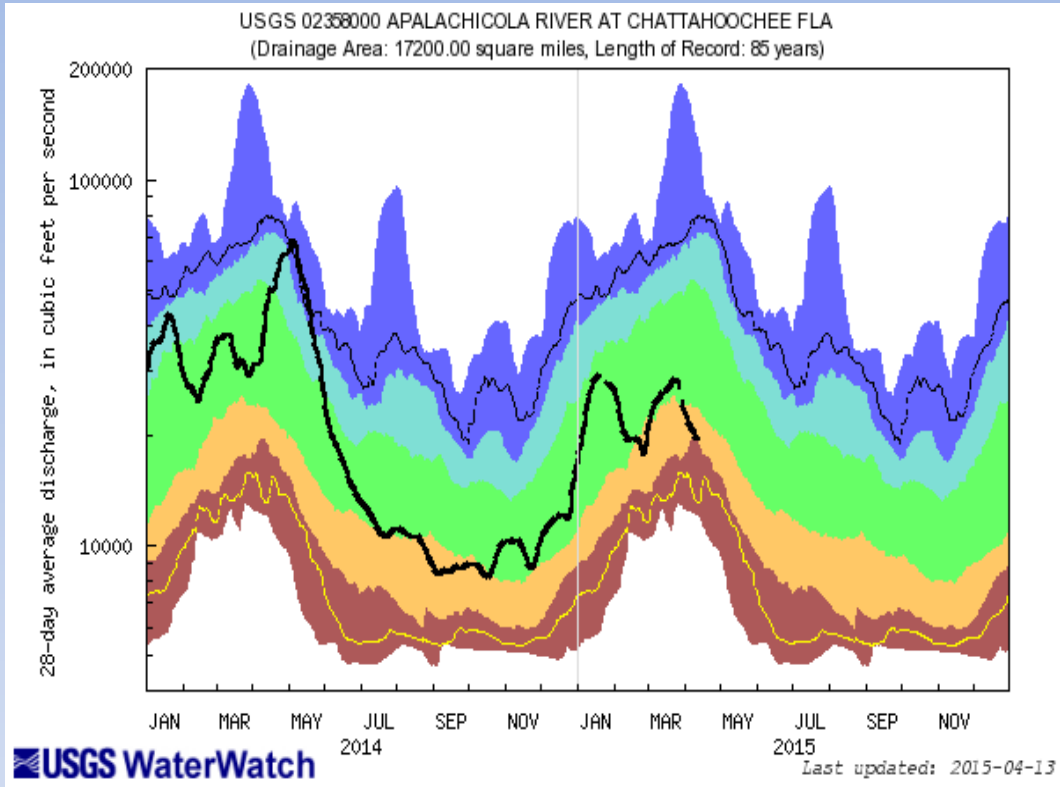
## Flint at Bainbridge (02356000)



# Streamflows

Apalachicola at Chattahoochee (02358000)

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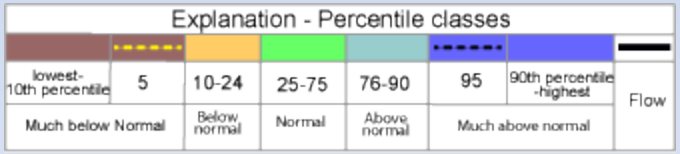
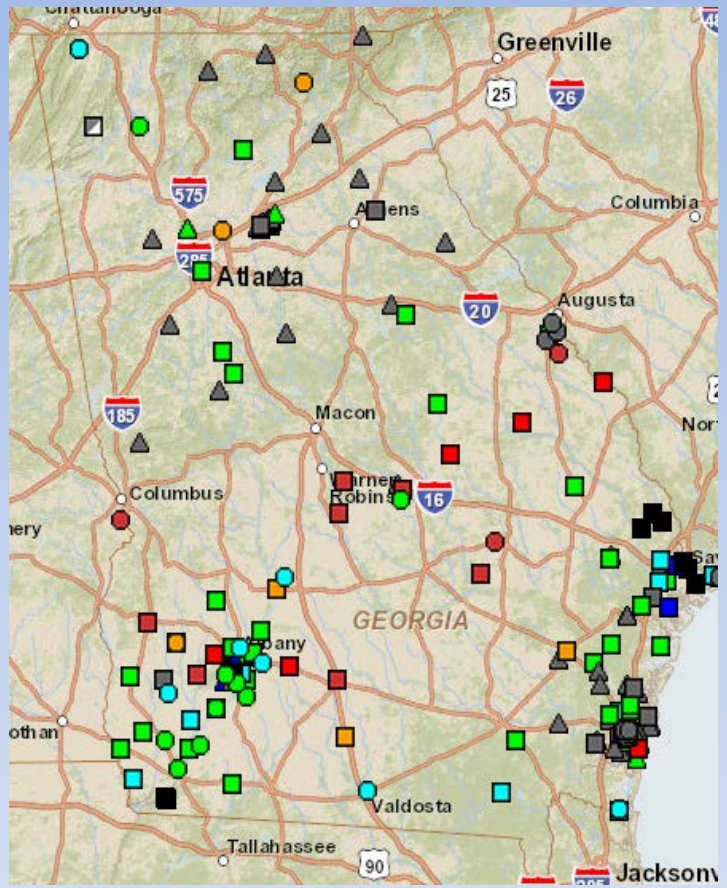
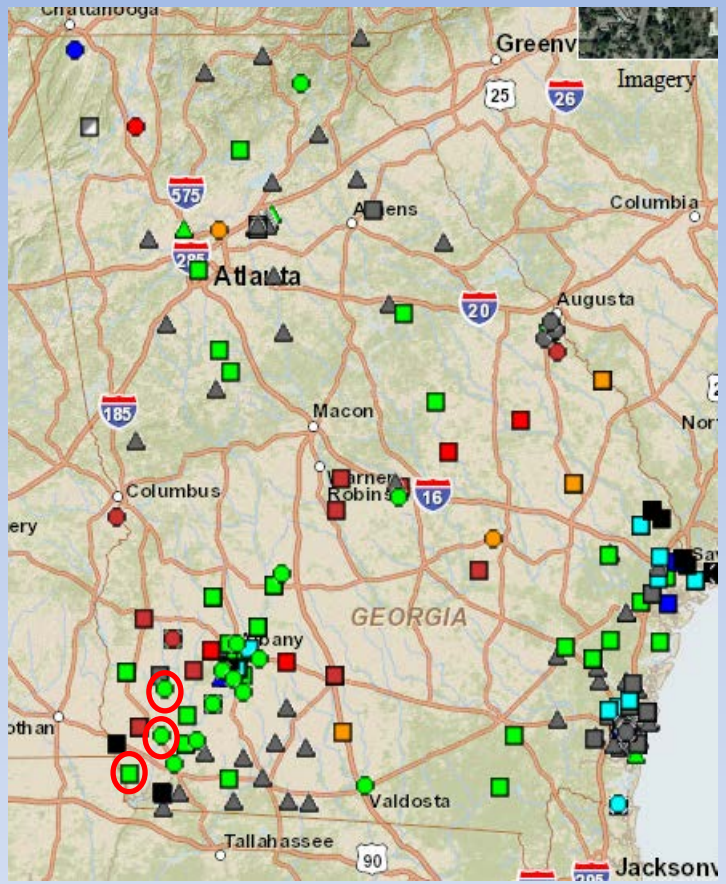


# Groundwater Conditions




Previous brief

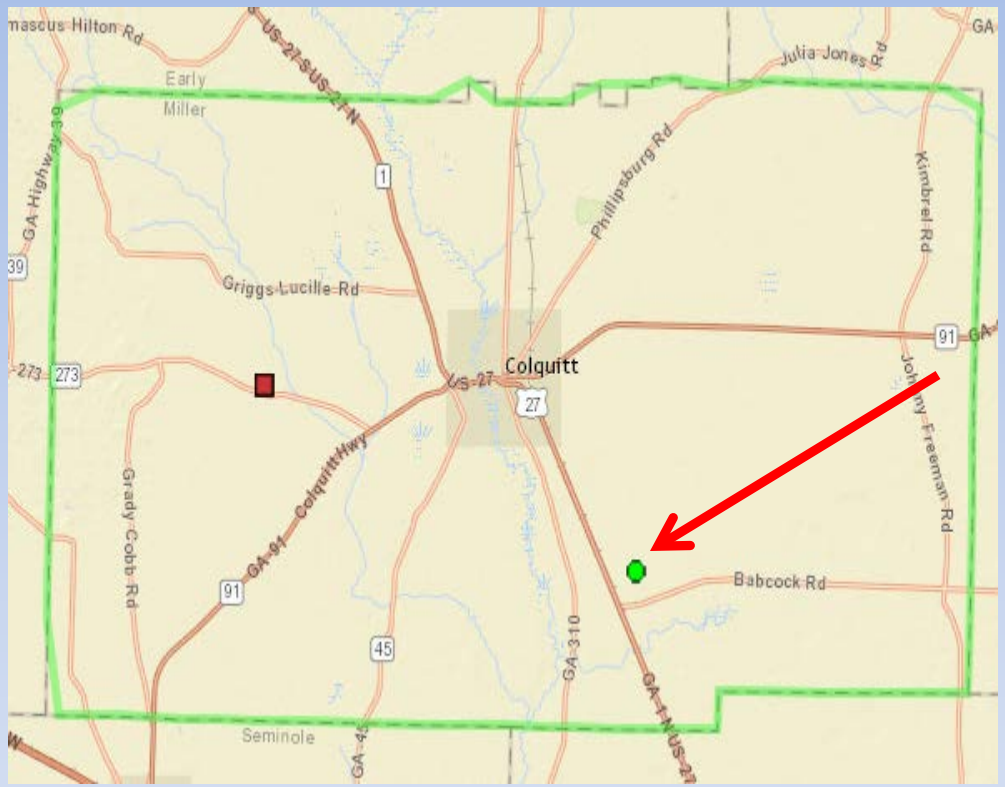


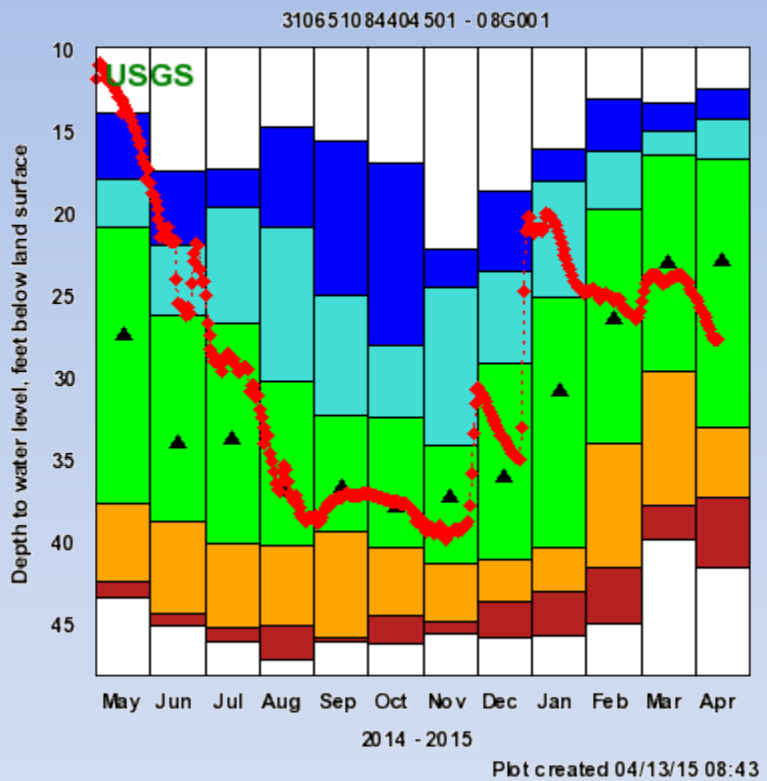

Current brief

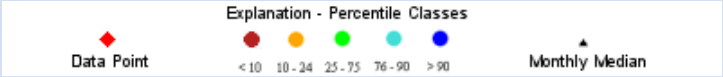
| Explanation - Percentile classes (symbol color based on most recent measurement) | | | | | | | | Wells / Springs |
|---|---|---|---|---|---|---|---|---|
| Low | <10 Much Below Normal | 10-24 Below Normal | 25-75 Normal | 76-90 Above Normal | >90 Much Above Normal | High | Not Ranked | Real-Time; Continuous; Periodic Measurements |

http://groundwaterwatch.usgs.gov

# Groundwater Status – Miller County 08G001

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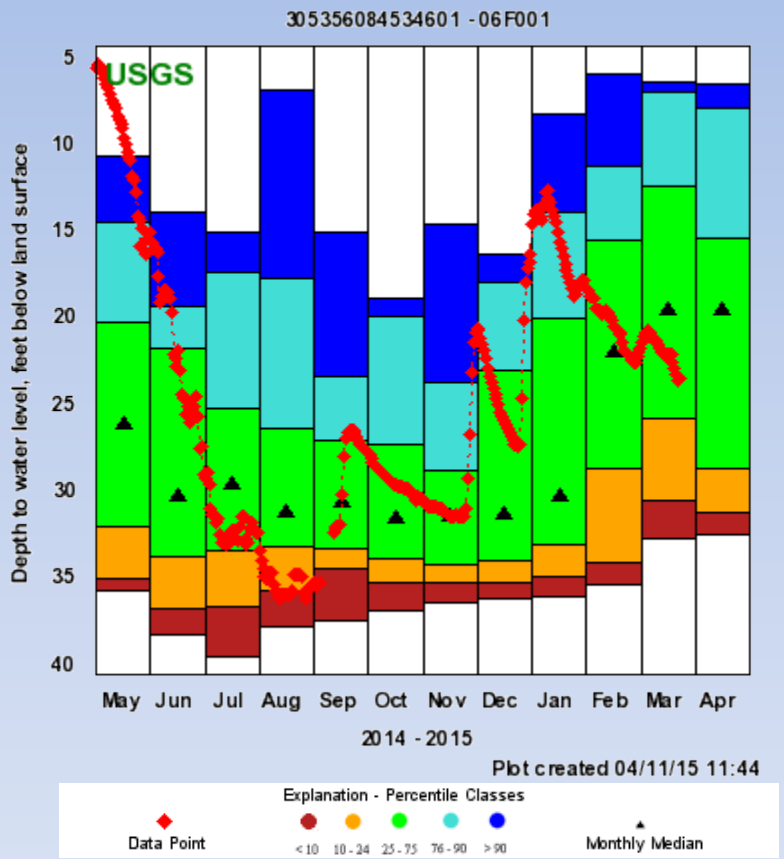
| Wells | Springs |
|---|---|
| Real-Time | |
| Continuous | |
| Periodic Measurements | |

(Upper Floridan Aquifer)

# Groundwater Status – Seminole County 06F001

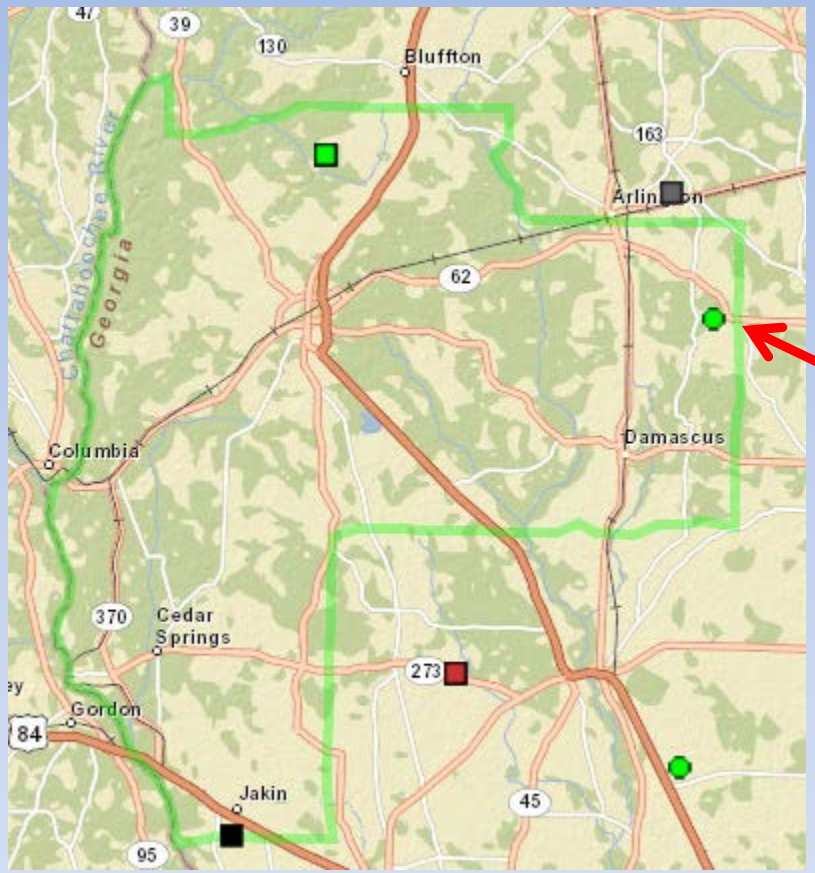


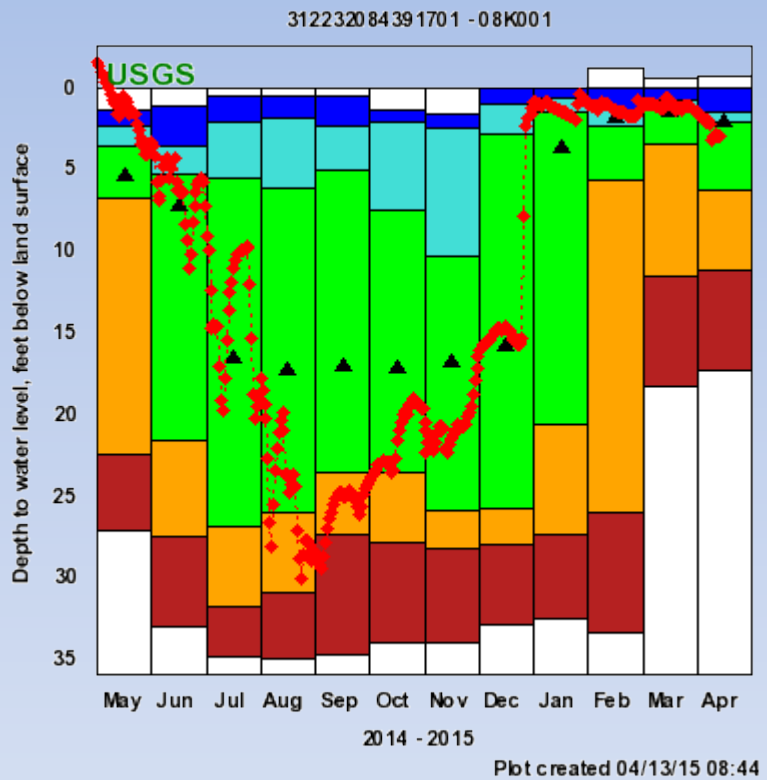

| Explanation - Percentile classes (symbol color based on most recent measurement) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Low | <10 Much Below Normal | 10-24 Below Normal | 25-75 Normal | 76-90 Above Normal | >90 Much Above Normal | High | Not Ranked |

| Wells | Springs |
|---|---|
| Real-Time | |
| Continuous | |
| Periodic Measurements | |

(Upper Floridan Aquifer)

# Groundwater Status – Early County 08K001




| Explanation - Percentile classes (symbol color based on most recent measurement) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Low | <10 Much Below Normal | 10-24 Below Normal | 25-75 Normal | 76-90 Above Normal | >90 Much Above Normal | High | Not Ranked |

| Wells | Springs |
|---|---|
| Real-Time | |
| Continuous | |
| Periodic Measurements | |

(Upper Floridan Aquifer)

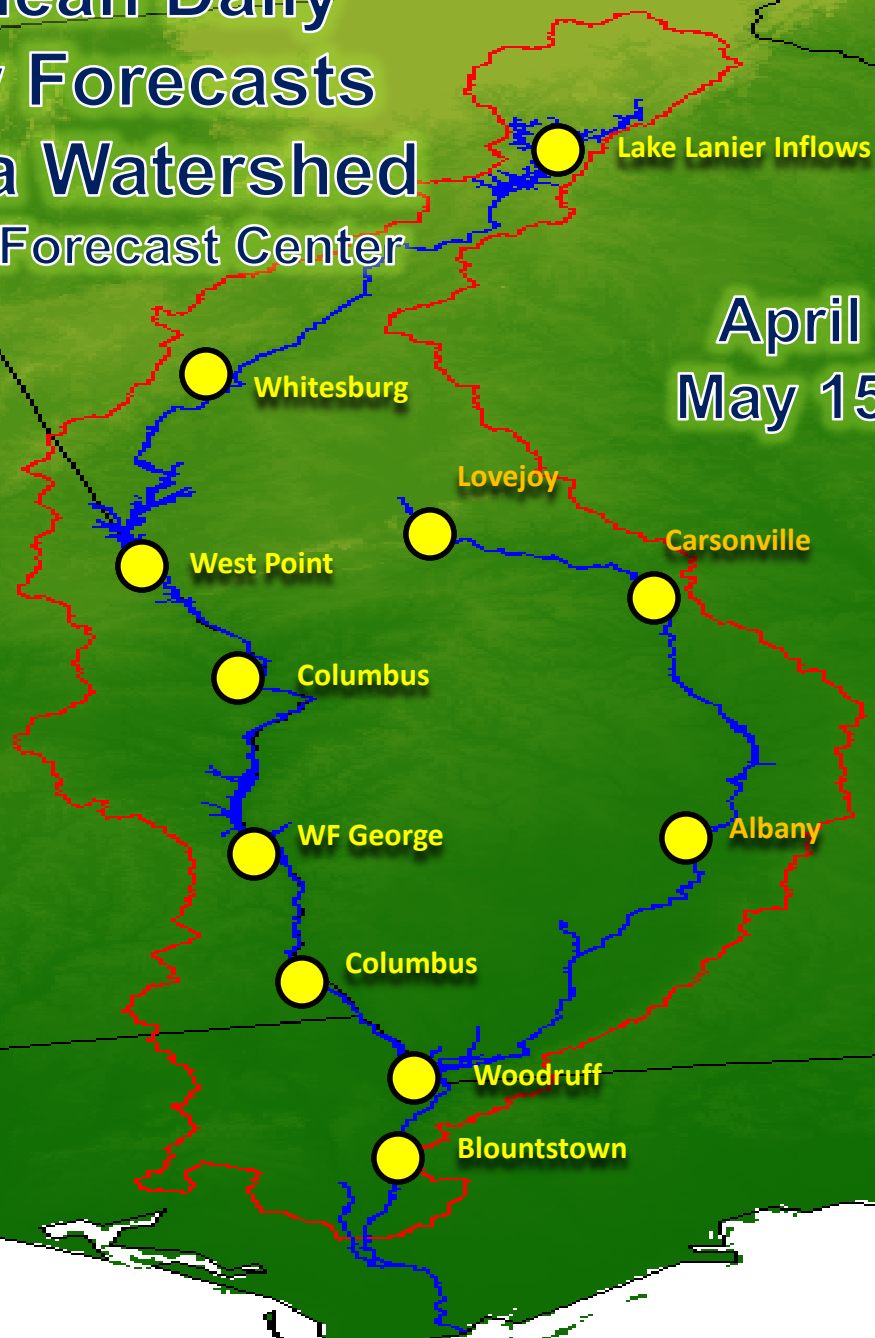
# Streamflow Forecasts

Jeff Dobur

# 1-Month Mean Daily Streamflow Forecasts Apalachicola Watershed

## Southeast River Forecast Center

April 15th – May 15th 2015




- Above Normal
- Near Normal
- Below Normal

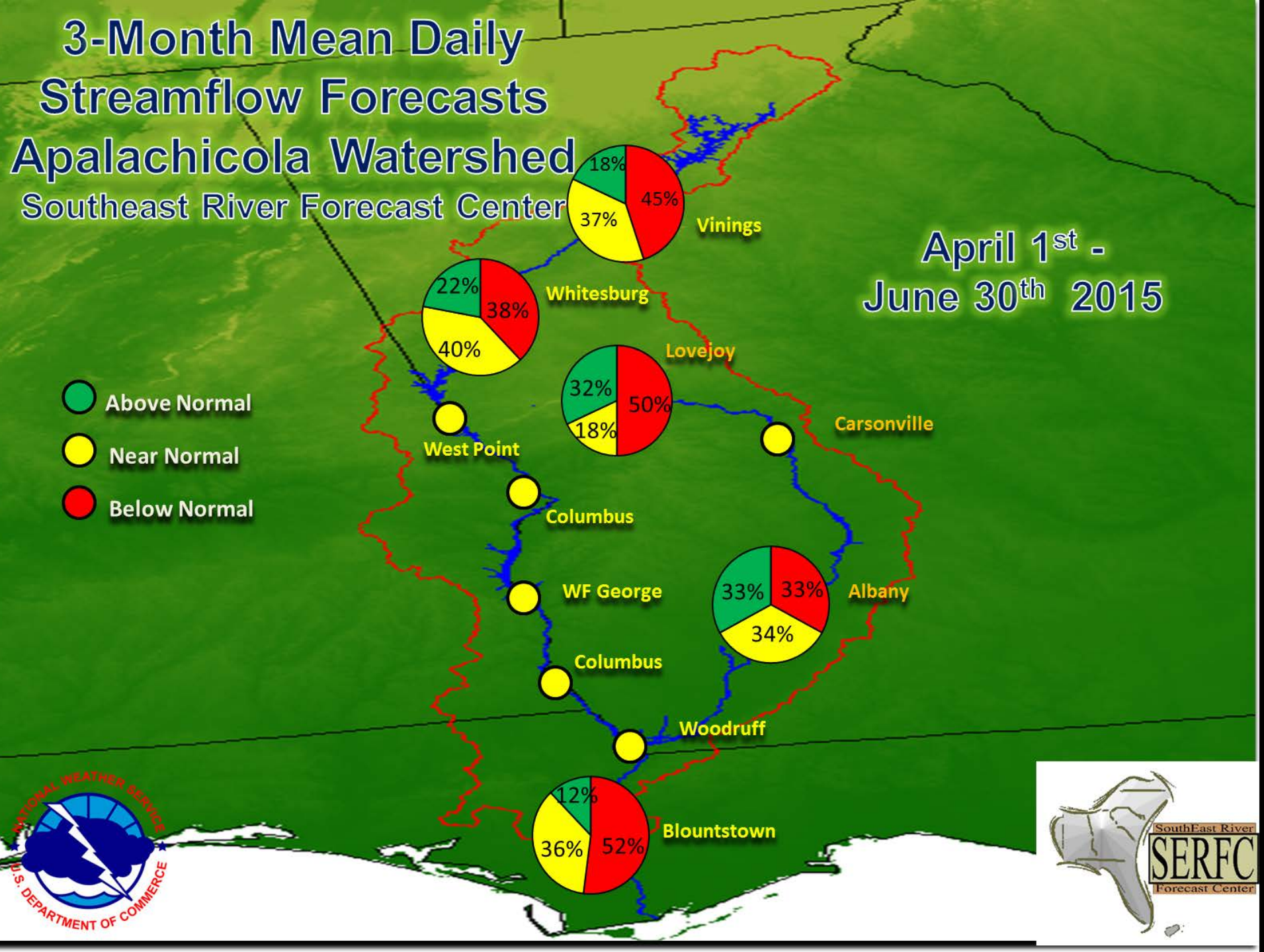
NATIONAL WEATHER SERVICE
U.S. DEPARTMENT OF COMMERCE

SouthEast River SERFC Forecast Center

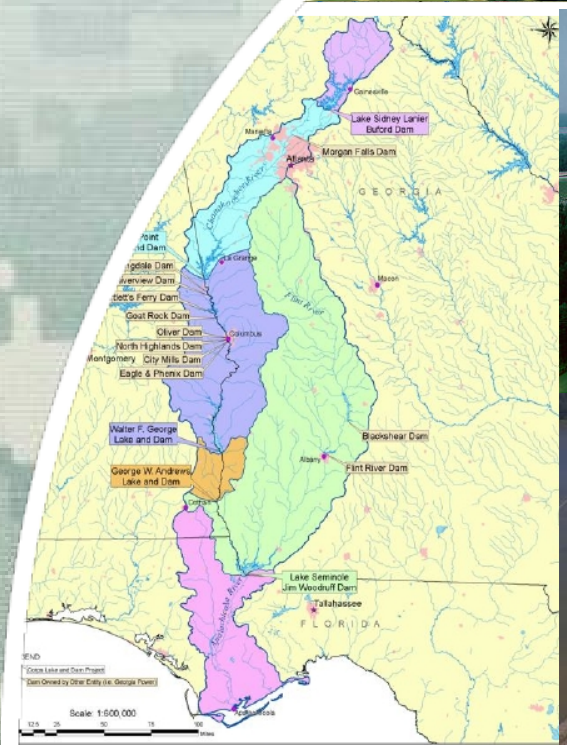
# 3-Month Mean Daily Streamflow Forecasts Apalachicola Watershed

## Southeast River Forecast Center

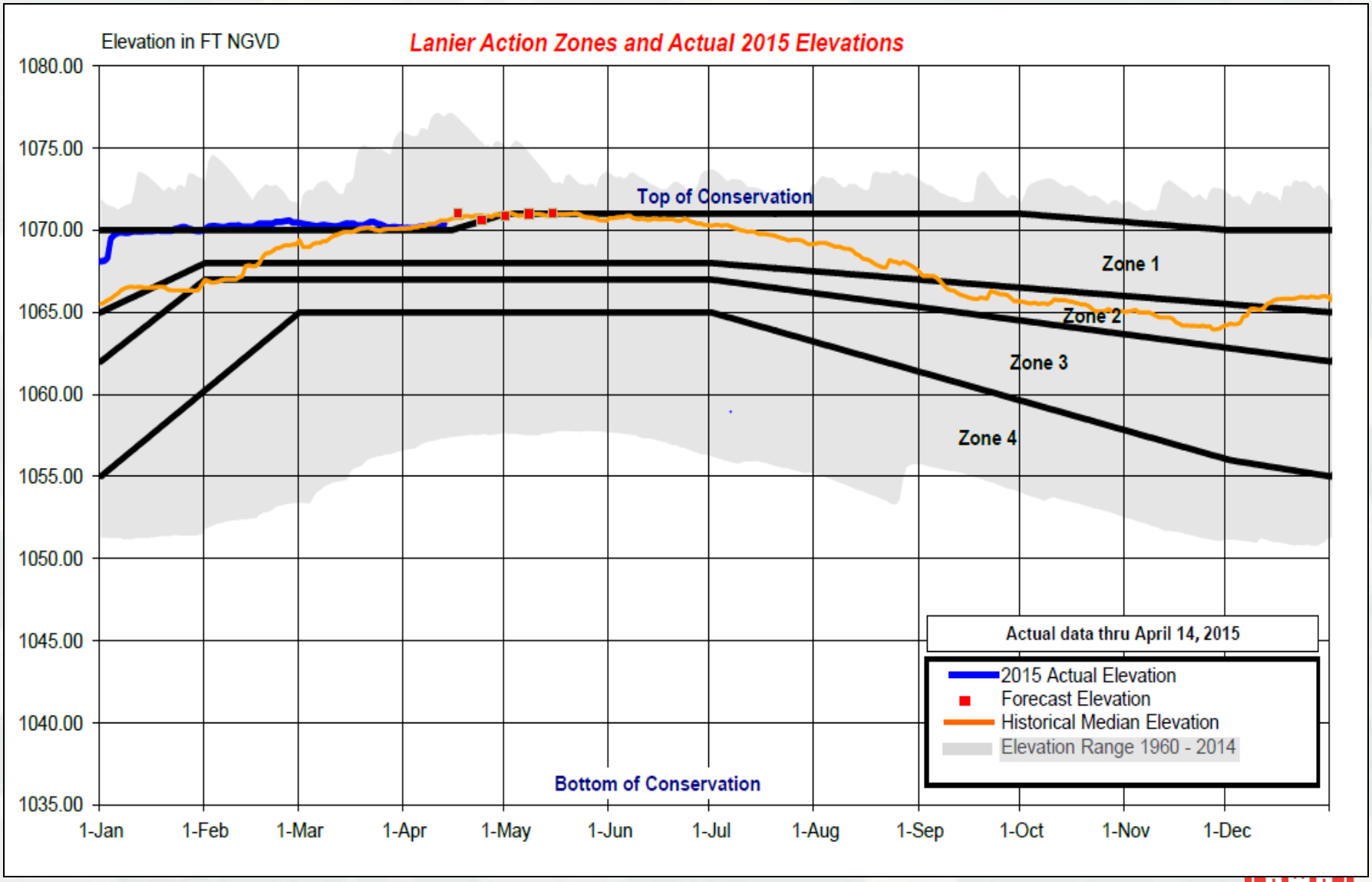
April 1st - June 30th 2015

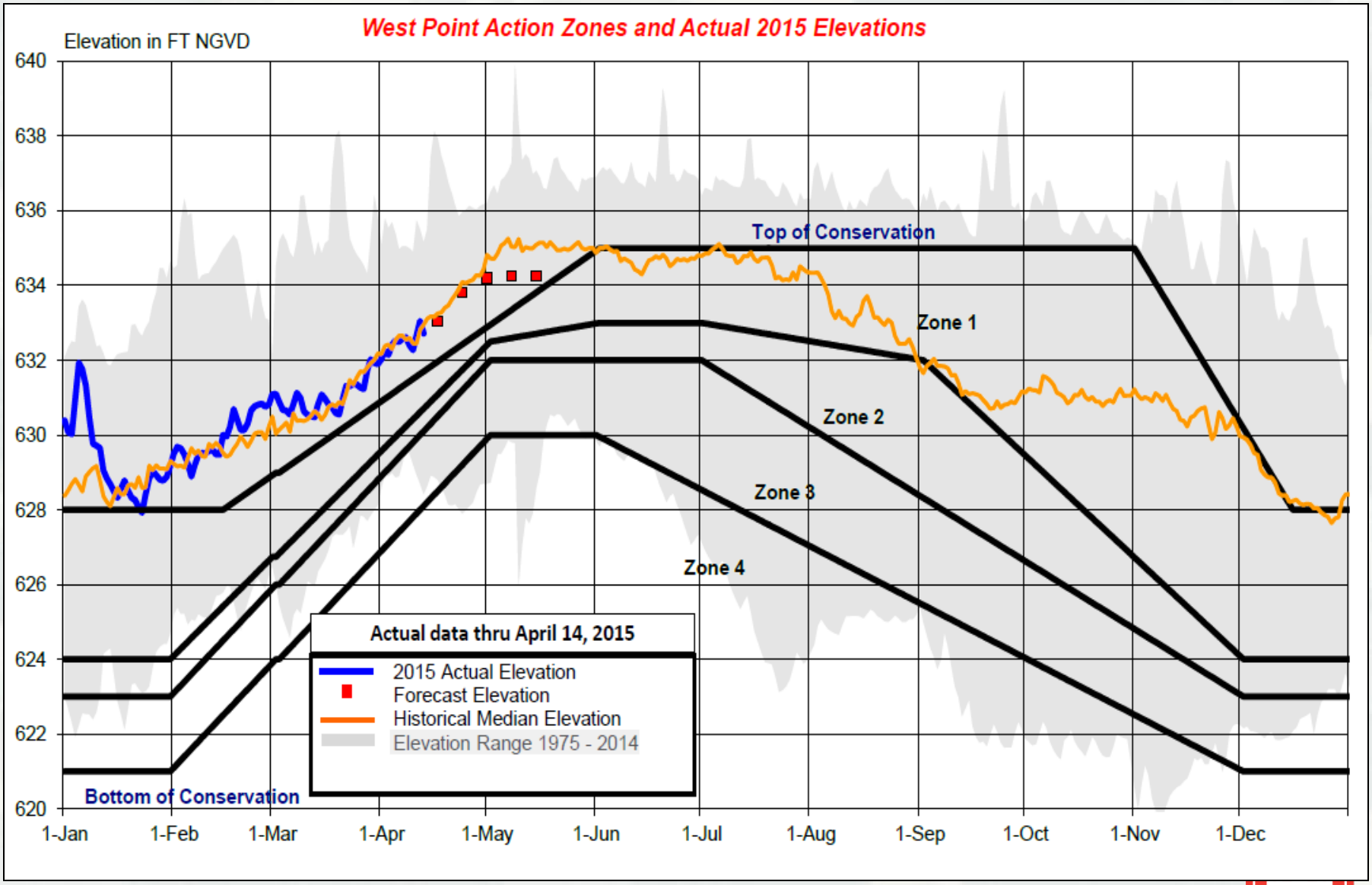


# USACE – ACF Reservoir Conditions April 14th 2015

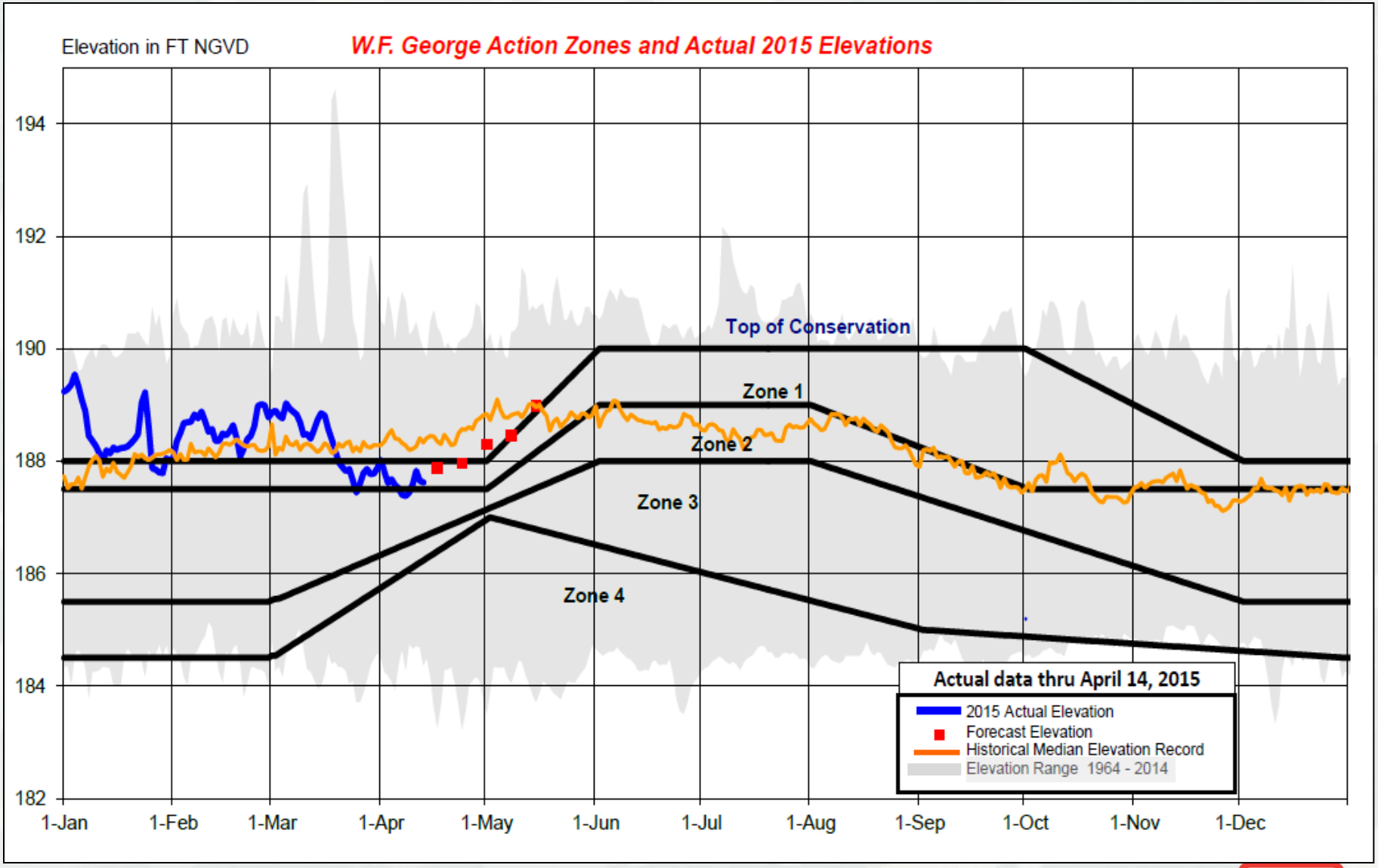


Bailey Crane

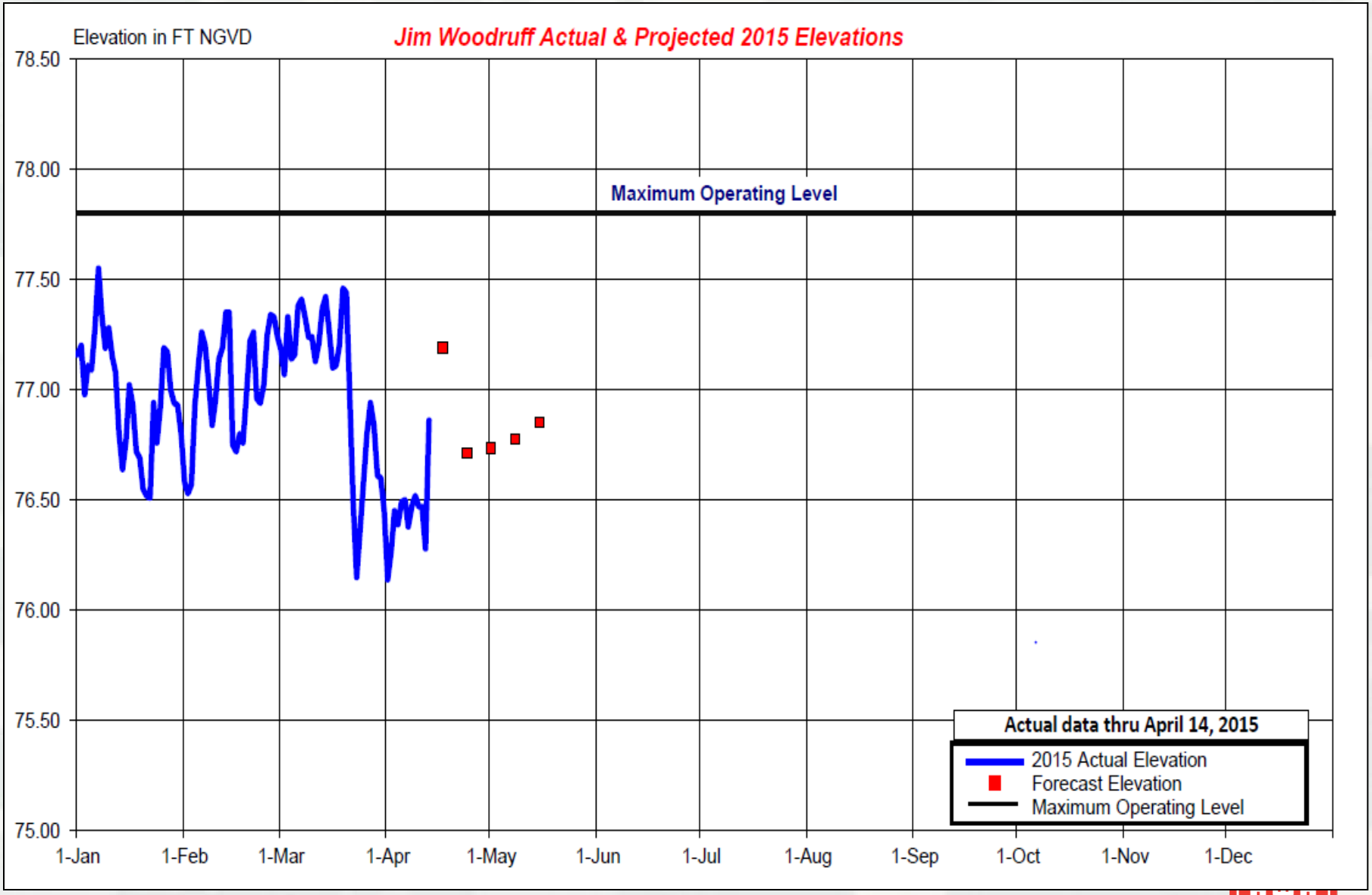

Elevation in FT NGVD
Lanier Action Zones and Actual 2015 Elevations
1080.00
1075.00
1070.00
1065.00
1060.00
1055.00
1050.00
1045.00
1040.00
1035.00
Top of Conservation
Zone 1
Zone 2
Zone 3
Zone 4
Bottom of Conservation
Actual data thru April 14, 2015
2015 Actual Elevation
Forecast Elevation
Historical Median Elevation
Elevation Range 1960 - 2014
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec



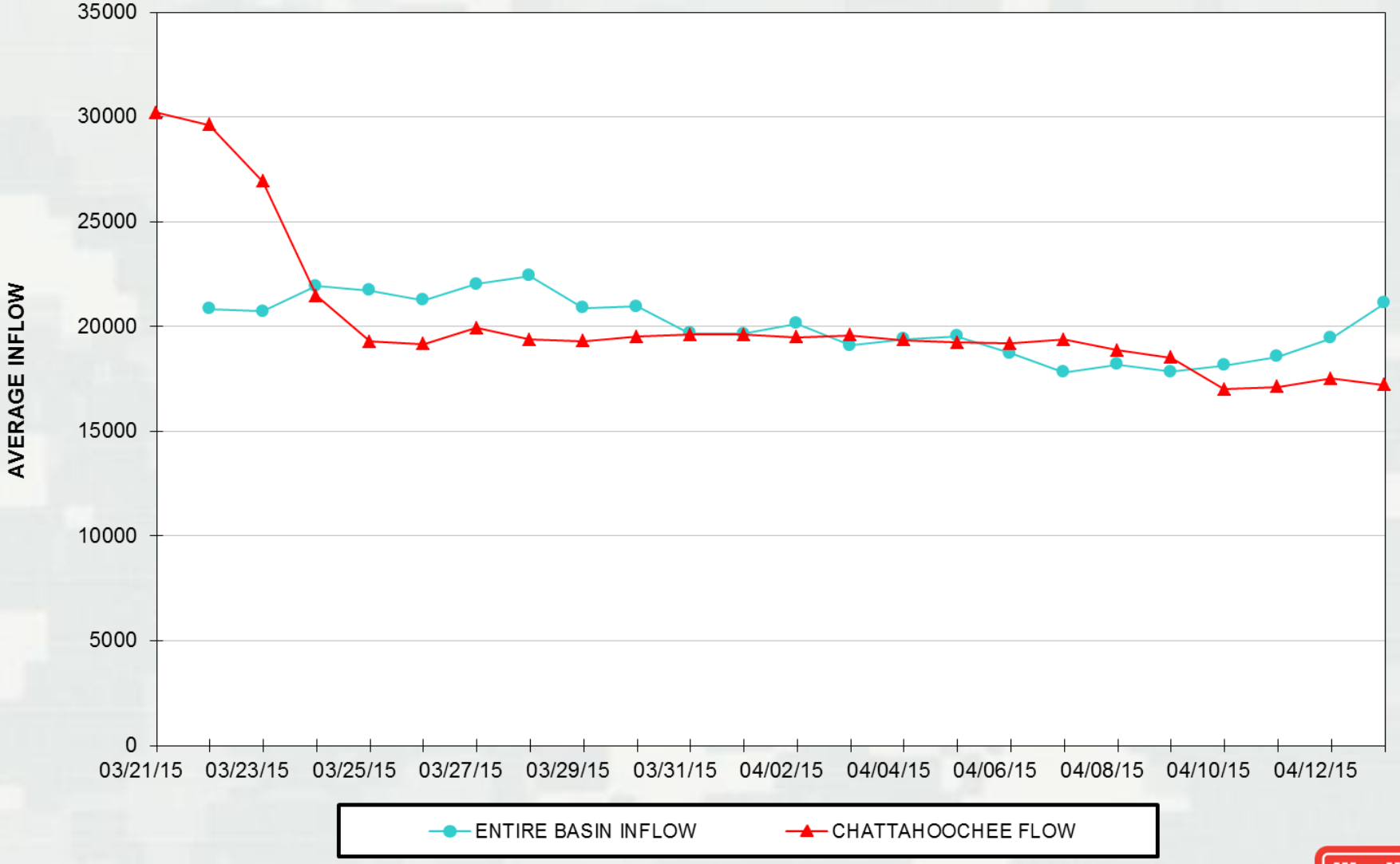

BUILDING STRONG®

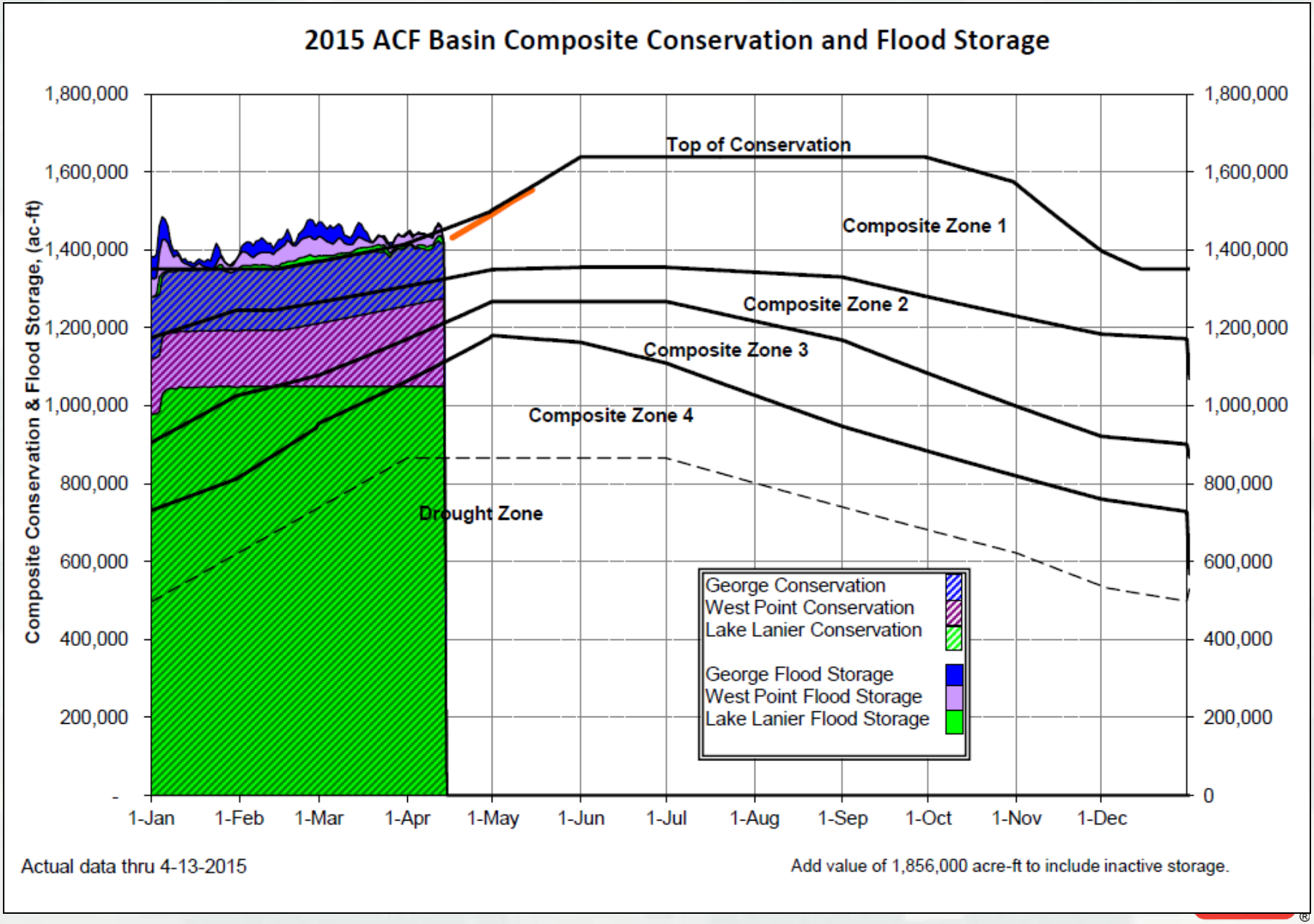



BUILDING STRONG®


Elevation in FT NGVD
Jim Woodruff Actual & Projected 2015 Elevations
78.50
78.00
77.50
77.00
76.50
76.00
75.50
75.00
Maximum Operating Level
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Actual data thru April 14, 2015
2015 Actual Elevation
Forecast Elevation
Maximum Operating Level

# 7-DAY MOVING AVERAGE INFLOW VERSUS 1-DAY CHATTAHOOCHEE FLOW




2015 ACF Basin Composite Conservation and Flood Storage
Composite Conservation & Flood Storage, (ac-ft)
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
-
0
Top of Conservation
Composite Zone 1
Composite Zone 2
Composite Zone 3
Composite Zone 4
Drought Zone
George Conservation
West Point Conservation
Lake Lanier Conservation
George Flood Storage
West Point Flood Storage
Lake Lanier Flood Storage
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Actual data thru 4-13-2015
Add value of 1,856,000 acre-ft to include inactive storage.

# Summary – David Zierden

- Large-scale pattern continued with ridging over the Western U.S and troughing over the Eastern U.S.
- In spite of recent rains, ACF mostly below normal over the last 30-90 days.
- ACF designated as Abnormally Dry/Moderate Drougth by the *US Drought Monitor.*
- NOAA declares El Nino Advisory in early March.
- Strong westerly winds and downwelling Kelvin wave results in further warming of SST's.
- Warm SST anomalies have now appeared at the S. American Coast.
- Possible shift to positive PDO has occurred.
- CPC Outlooks strongly favor pattern of above normal rainfall for Southern U.S. for the next 1-3 months

# Summary – Tony Gotvald

- Realtime streamflows are in the below normal range for most of the upper ACF basin and in the normal to below normal range for the lower ACF.
- Inflows into Lake Lanier are in the below normal range for the 28-day average flows.
- Streamflows are in the below normal range throughout the Flint River basin the 28-day average flows.
- Groundwater levels are in the normal range in Southwest Georgia.

# Summary- Jeff Dobur

- 1 Month Streamflow forecast -  Near Normal
- 3 Month Streamflow forecast – Maybe slightly better chances for below normal
- Pie Charts do not consider recent wet weather or any future forecast such as ENSO, CPC or other. Based on soil conditions relative to normal in concert with historical precipitation.

# Summary- Bailey Crane

- Reservoirs remain near full
- All reservoirs are expected to remain full and reach their summer pools by June 1st.
- System conservation storage is expected remain near the top of conservation storage(full) through the rest of spring. Typically begins falling in late June.
- Inflow into the USACE projects has fallen below average for this time of year.

Questions, Comments, Discussion

# References

## Speakers

David Zierden, FSU

Tony Gotvald, USGS

Jeff Dobur, SERFC

Bailey Crane, United States Army Corps of Engineers

## Moderator

Eric Reutebuch, AU WRC

## Additional information

- General drought information

  http://drought.gov
  http://www.drought.unl.edu

- General climate and El Niño information

  http://agroclimate.org/climate/

- Streamflow monitoring & forecasting

  http://waterwatch.usgs.gov
  http://www.srh.noaa.gov/serfc/

- Groundwater monitoring

  http://groundwaterwatch.usgs.gov

# Thank you!

Next briefing

May 19, 2015, 1:00 pm EDT

Moderator: Eric Reutebuch

Slides from this briefing will be posted at

http://drought.gov/drought/content/regional-programs/regional-drought-webinars

Please send comments and suggestions to:

reuteem@auburn.edu