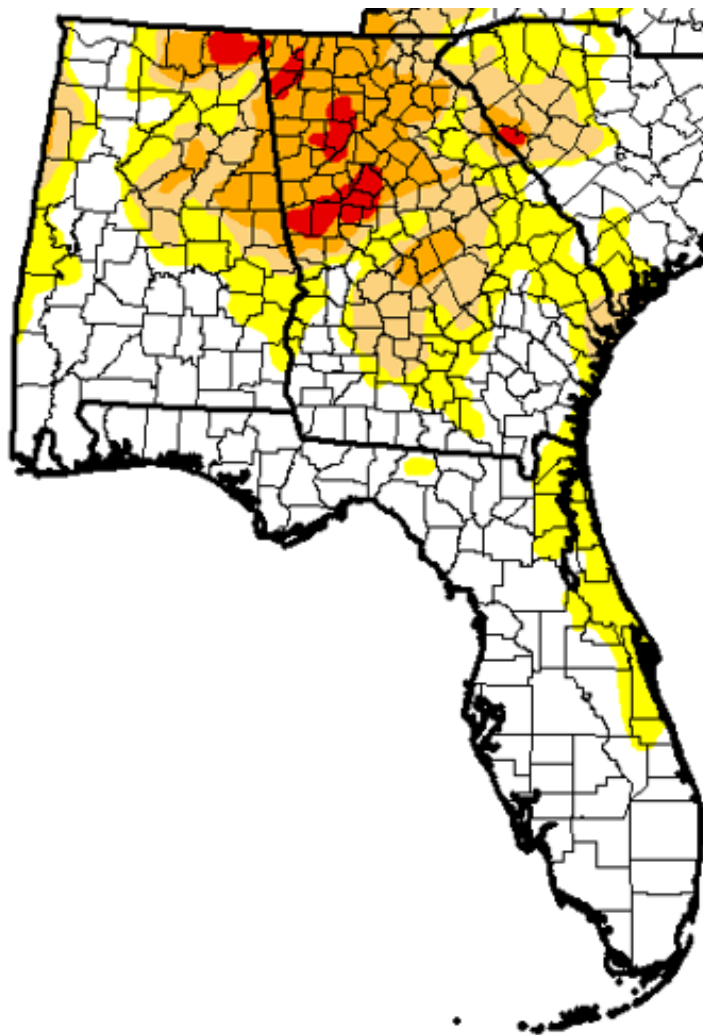


# Developing Drought Early Warning System (DEWS) for the Southeast

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Center

[aaes.auburn.edu/wrc](http://aaes.auburn.edu/wrc)



AUBURN UNIVERSITY

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EXPERIMENT STATION

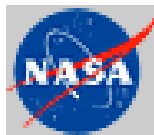
WATER RESOURCES CENTER

# What is NIDIS?

- National Integrated Drought Information System (NIDIS) is congressionally authorized with specific mandates (Public Laws 109-430 and 113-86)
- Brings drought information, research, education, policy and networking together
- NOAA program that operates on an inter-agency level



**US Army Corps  
of Engineers.**



# History of the National Integrated Drought Information System (NIDIS)

## Authorized in 2006

- **Why:**
  - Recognition that better informed and more timely drought-related decisions lead to reduced impacts and costs.
  - **Goal:** *“Enable the Nation to move from a reactive to a more proactive approach to managing drought risks and impacts”* PL 109-403



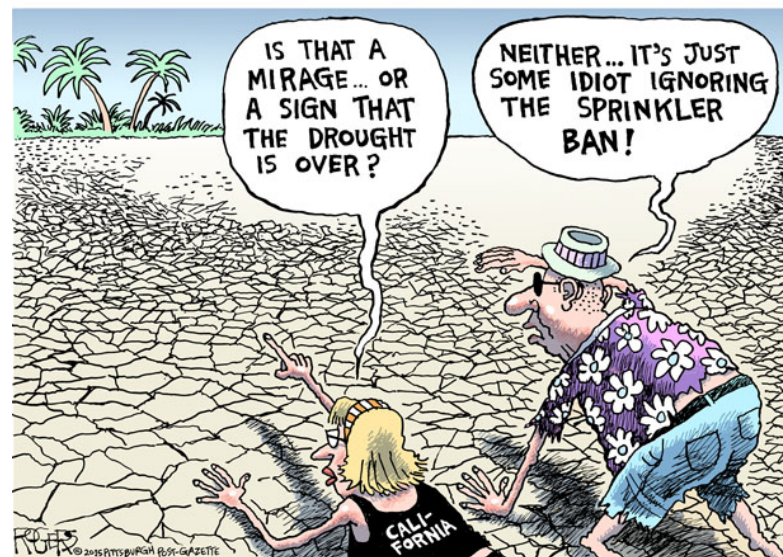
## Reauthorized in 2014

- Authorizes the appropriation of funds (via NOAA) through FY2018
- Builds off the President's Climate Action Plan
- Develop and expand the Regional Drought Early Warning Systems



# NIDIS Goals

- Leadership and networking among all sectors of the economy and services **to monitor, forecast, plan for and cope with the impacts of drought**
- Support drought research- including indicators, risk assessment and resilience
- Develop educational resources, interactive systems, and tools to promote sound decision making, drought awareness, and response

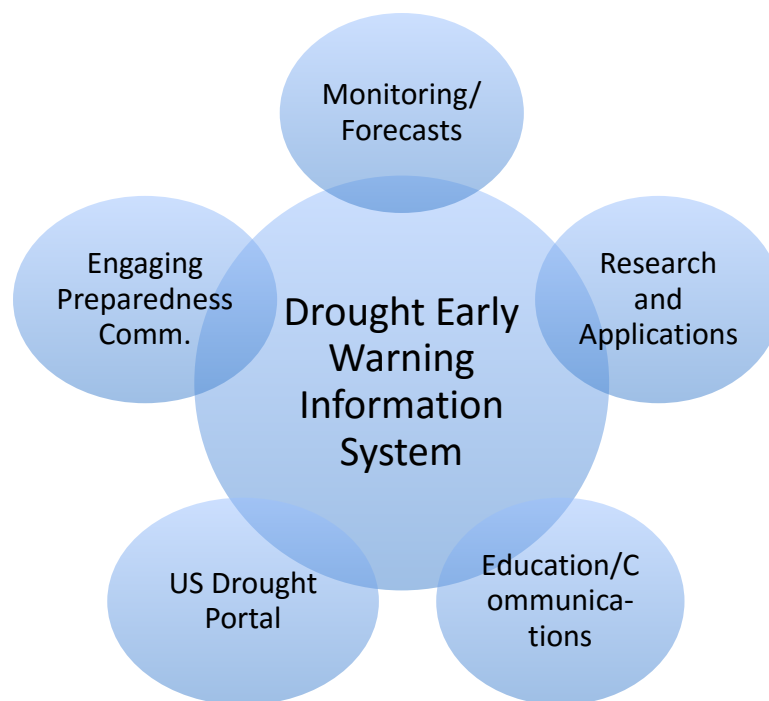


**How?** Development of Early Drought Warning Systems



# What is Drought Early Warning?

**International Strategy for Disaster Reduction: “Provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response”**



# From Risk to Resilience: Research-based Integrated Information Systems

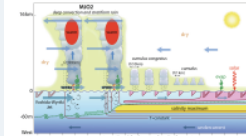


- Develop and coordinate partnerships: networks of practitioners public-private: map decision-making arrangements
- Advance earth system observations and prediction capabilities
  - Construct risk profiles: the role of rates of change in trends, frequency, and magnitude of extremes at different scales
- Capacity and Coordination: Integrate Research, Observations, and Assessments into early warning information on critical transitions and capacity for response
- Overcoming impediments
  - Do this for a long time

## Science for Resilience

NOAA Climate Program Office's research programs and expertise help the nation understand, anticipate and respond to climate-related changes in water resources and water-related hazards.

### Prediction Skill

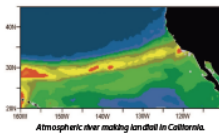


NOAA works to advance understanding and modeling of the climate system to improve forecast reliability—and usability—for droughts and floods.

#### LINKS AND RESOURCES

- CPO's Climate Observations and Monitoring Program: <http://bit.ly/ClimateObs>
- CPO's Climate Variability & Predictability Program: <http://bit.ly/ClimateVar>
- Modeling, Analysis, Predictions, & Projections Projects: <http://bit.ly/NOAIPredict>
- Madden-Julian Oscillation: <http://bit.ly/ExplainingMJO>
- North American Multi-Model Ensemble: <http://bit.ly/NAO-MME>

### Better Understanding

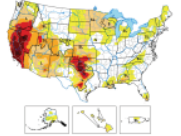


NOAA aims to improve understanding of the role precipitation events and land surface conditions have on amplifying or reducing drought and flood impacts.

#### LINKS AND RESOURCES

- Report: Origins of the 2012 Great Plains Drought: <http://bit.ly/2012Drought>
- SARP Case Studies: Water Resource Strategies and Information Needs in Response to Extreme Weather and Climate Events: <http://bit.ly/ExtremeEventsCaseStudies>
- Pacific Northwest RISAs: [powerinc.org/projects](http://powerinc.org/projects)

### Communication Tools



NOAA is developing timely, accessible communication tools to inform preparedness and adaptation

#### LINKS AND RESOURCES

- U.S. Drought Monitor: [droughtmonitor.noaa.gov](http://droughtmonitor.noaa.gov)
- Managing Drought Risk on the Ranch: <http://bit.ly/RanchDrought>
- Colorado Floods: Western Water Assessment: <http://bit.ly/ColoradoFloods>
- Climate and Water Resources Data in the Klamath Basin: <http://bit.ly/KlamathClimate>
- SECC: Climate of the Southeast United States: <http://bit.ly/SECC-2014Report>

### Improved Coordination



NOAA coordinates across multiple partners, sectors, and regions to inform drought and flood risk management from watersheds to the nation's coasts.

#### LINKS AND RESOURCES

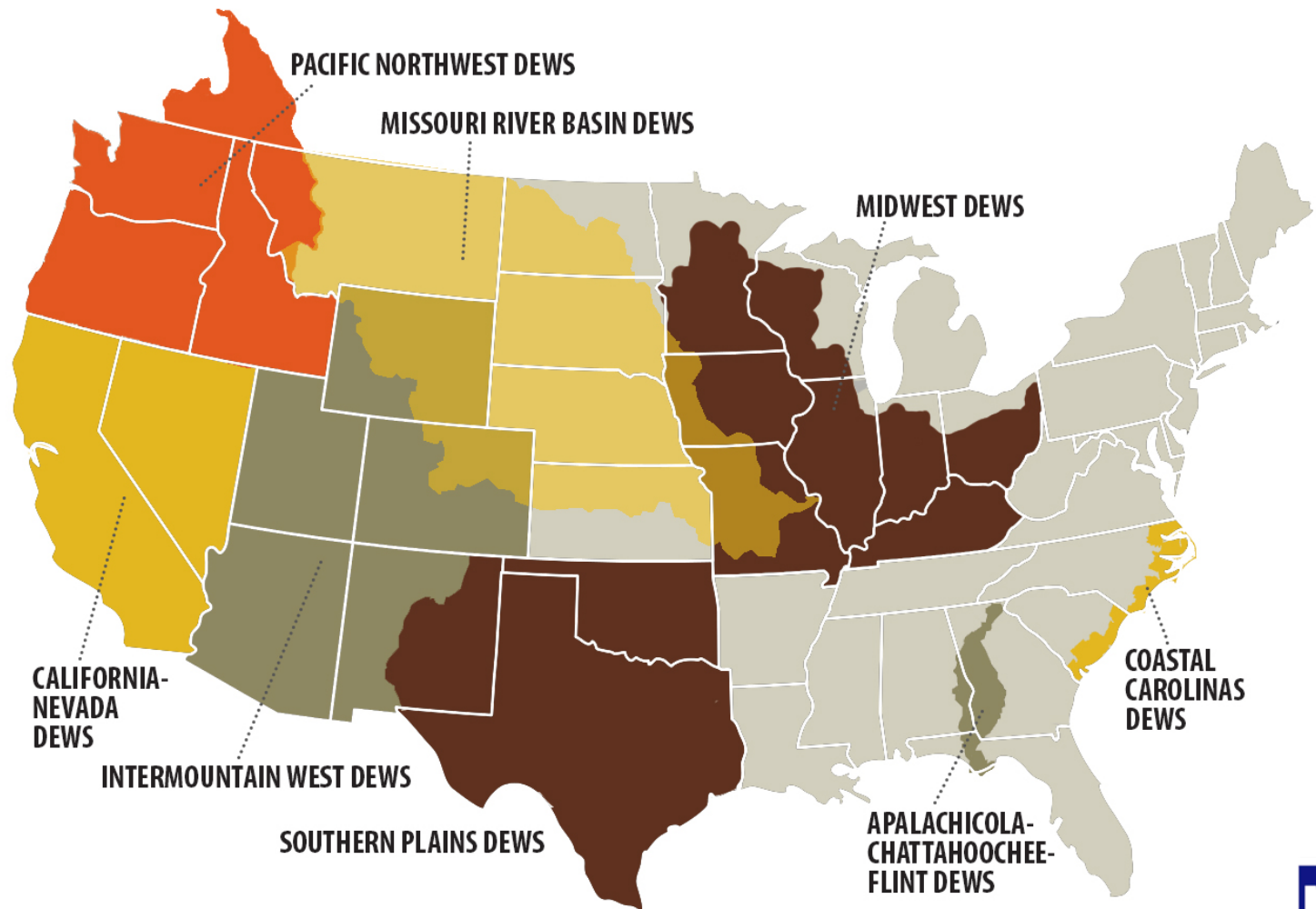
- Floodplains by Design: [www.floodplainsbydesign.org/partnerships](http://www.floodplainsbydesign.org/partnerships)
- Regional Integrated Sciences and Assessment (RISA): <http://bit.ly/RISAS>
- Weekly Colorado Drought Assessment Webinars: <http://bit.ly/ColoradoDroughtWebinars>
- Drought Impacts Reporter: [droughtreporter.noaa.gov/](http://droughtreporter.noaa.gov/)
- NDIS portal: [www.ndis.gov](http://www.ndis.gov)

### Crafting an Integrated Information System

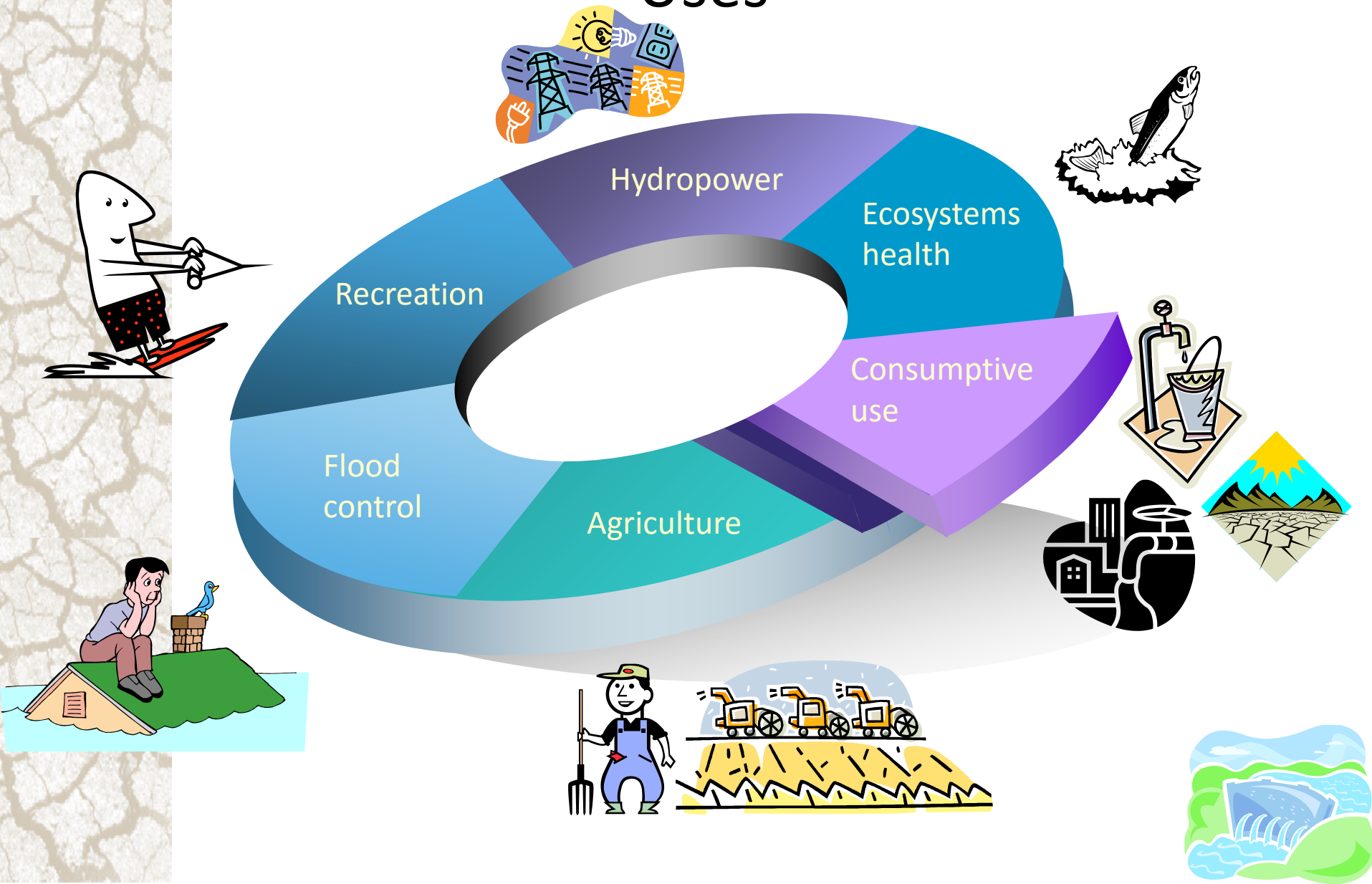


To make the best decisions, stakeholders need access to more than just one piece of the puzzle. Integrated Information Systems are designed to evolve over time, offer opportunities for diverse participation, and integrate what we learn through practice.

# NIDIS Regional Drought Early Warning Information Systems



# Multiple Competing Values & Water Uses



# Stakeholder Meetings

- Lake Blackshear, Dec 2009
- Apalachicola, April 2010
- Middle Chattahoochee and Flint, May 2010
- Upper Chattahoochee, Aug 2010
- Albany, Dec 2010
- Lake Lanier, Dec 2011

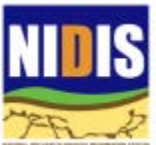
Meetings  
illuminated a  
need for  
communication  
and education  
around drought

“NIDIS is considered a trusted and unbiased source of information, the information was appropriate and useful covering the whole basin, benefits people’s awareness and communication, and the format of the information makes it easy to share and read later.”



# Common Sub-Basin Needs

- Drought education and enhance communication
- Forecast improvements
- Improved data sets and presentation of info in graphical format
- Consistency in drought planning among three states
- ACF Basin Webinars and Climate Outlooks
- Development of drought index
- Improved interactions with the Corps
- Resolve discrepancy in understanding of groundwater issues

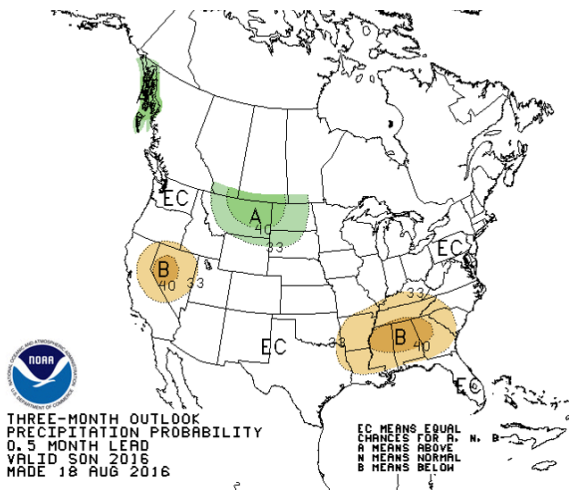
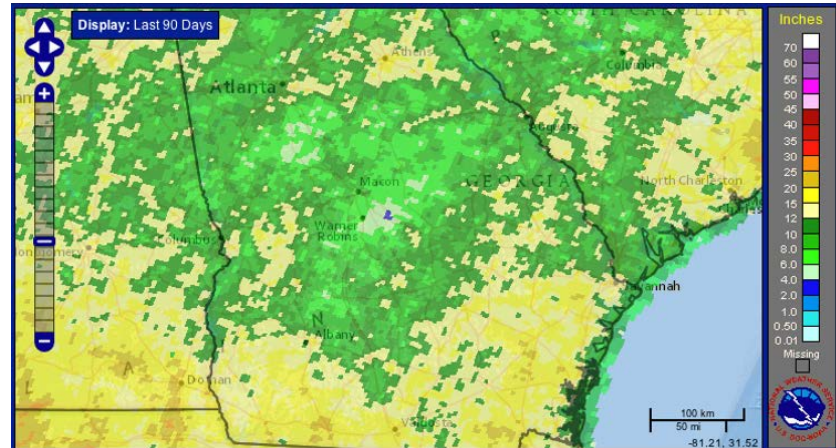
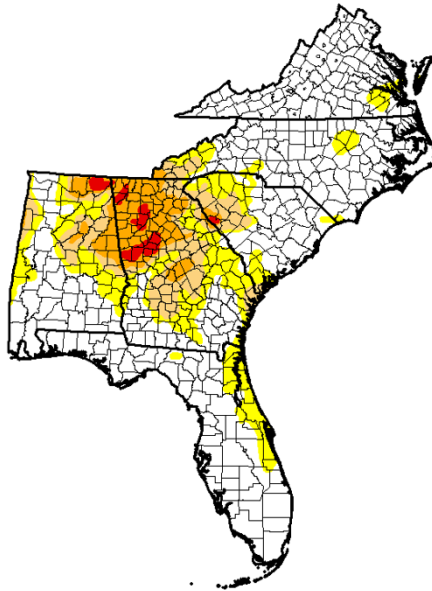


# ACF River Basin Drought Assessment Webinars

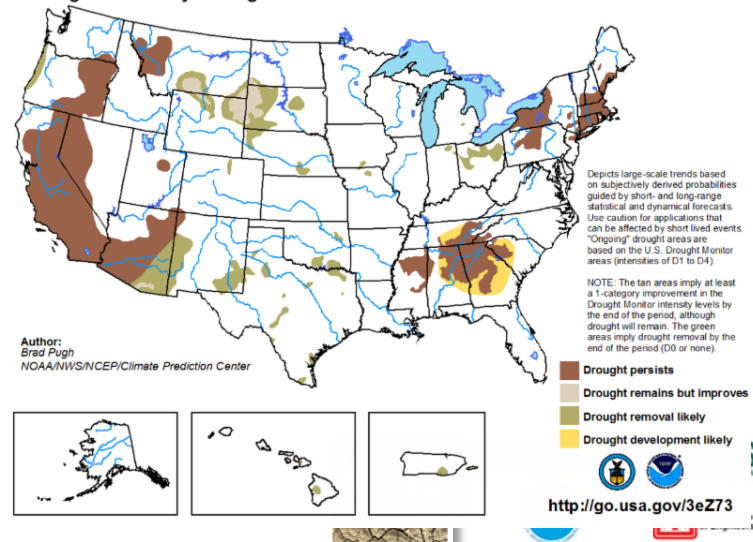
- Monthly webinars (weekly to bi-weekly during drought) conducted by SECC (now by Auburn) continuously since 2011.
- Presenters
  - State climatologists
  - USGS South Atlantic Water Science Center
  - Southeast River Forecast Center
  - Army Corps of Engineers
  - Apalachicola National Estuarine Research Reserve

# ACF River Basin Drought Assessment Webinars

Drought Status - David Zierden, Florida Climate Center, FSU



**U.S. Seasonal Drought Outlook** Valid for August 18 - November 30, 2016  
Drought Tendency During the Valid Period Released August 18, 2016

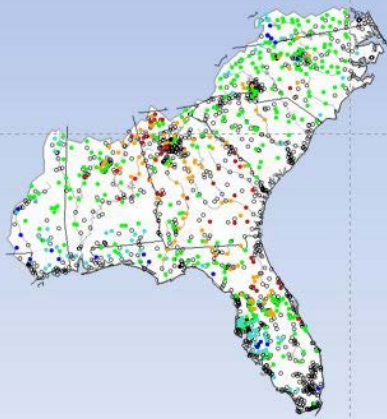


# ACF River Basin Drought Assessment Webinars

Streamflows and Groundwater – Paul Ankorn, USGS

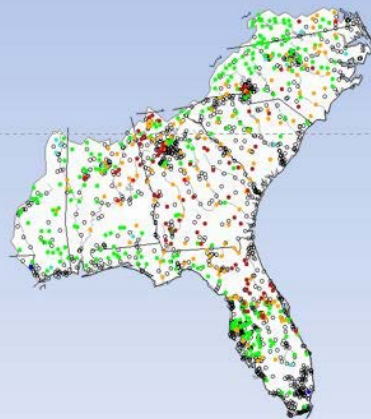
Previous Brief:

Monday, August 15, 2016 07:30ET



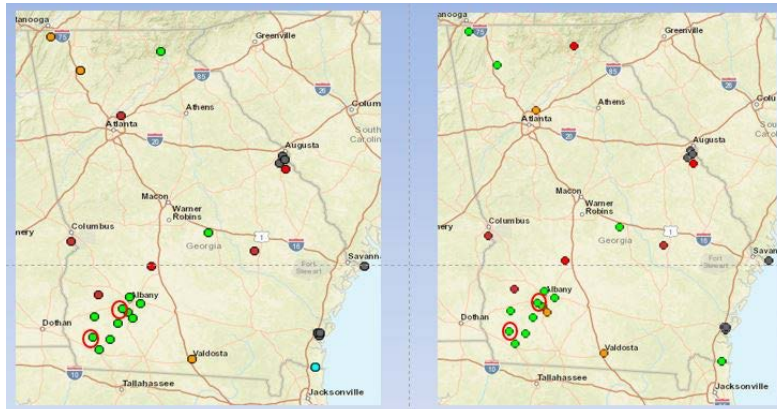
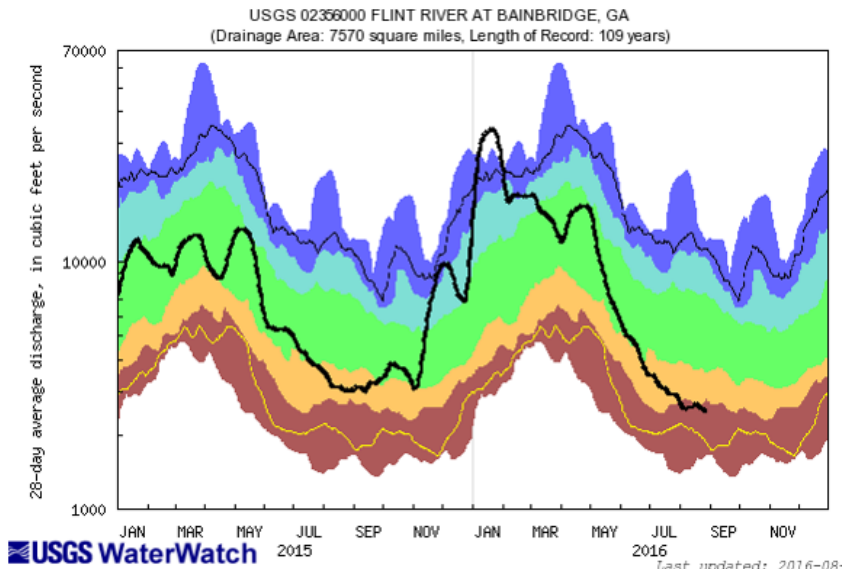
Current:

Monday, August 29, 2016 07:30ET



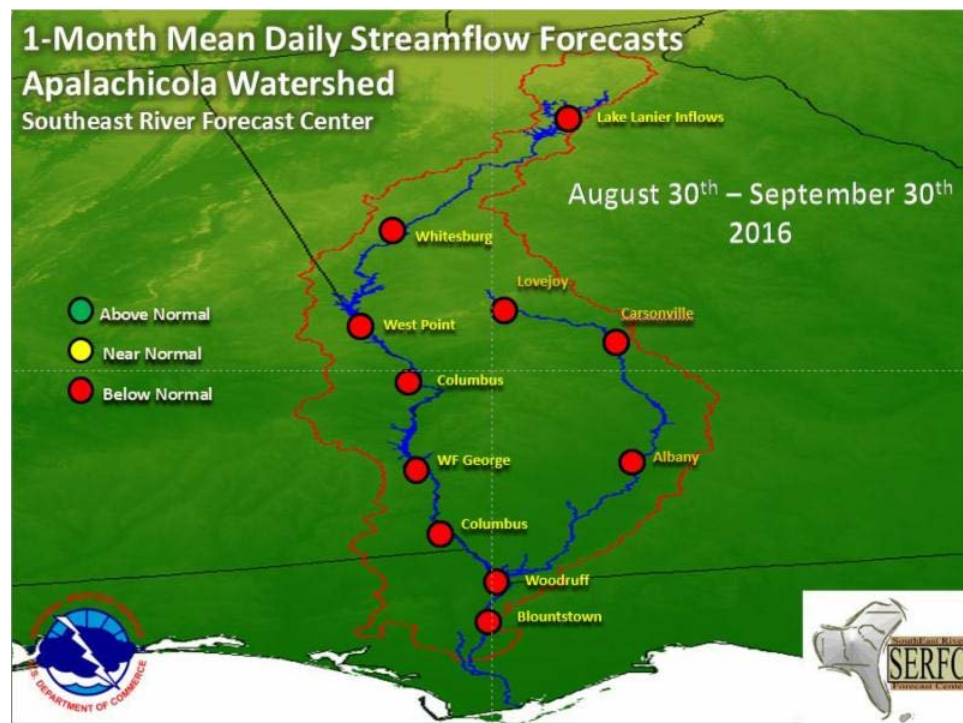
USGS		Explanation - Percentile classes	
Low	Red	<10	Below normal
	Orange	10-24	Below normal
	Yellow	25-75	Normal
	Green	76-90	Above normal
	Blue	>90	Much above normal
	Black		High

<http://waterwatch.usgs.gov>



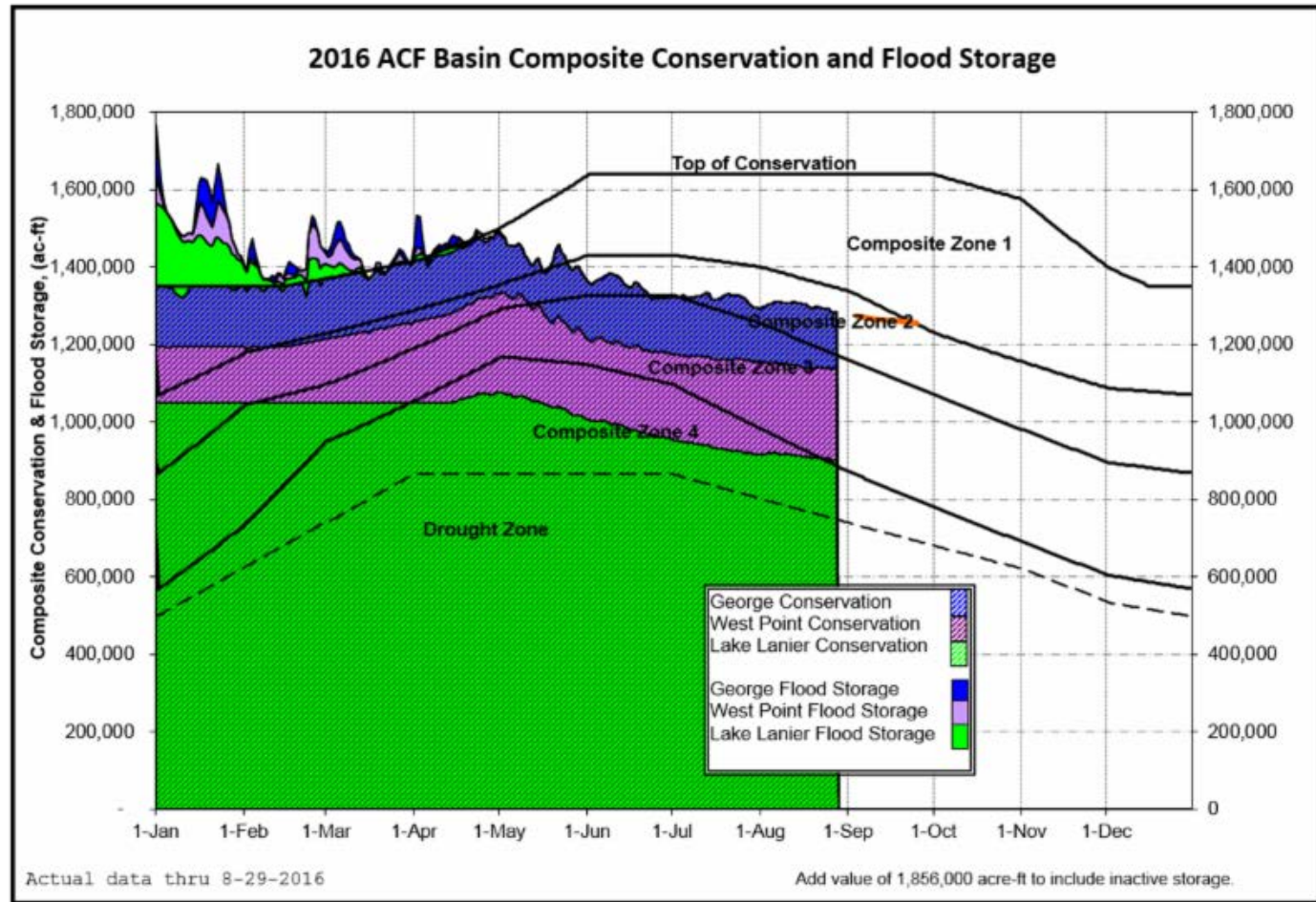
# ACF River Basin Drought Assessment Webinars

Streamflow Forecasts – Jeff Dobur, SERFC



# ACF River Basin Drought Assessment Webinars

ACF Reservoir Conditions – Cynthia Donald, USACE



# ACF River Basin Drought Assessment Webinars

- More than just drought assessment webinars
- State climatologists from all three states engaged
- Covers a larger area
- Educates participants on a variety of climate concepts
- Conduct research to improve/develop drought indicators/information used for the webinars

# ACF River Basin Drought Assessment Webinars

## 2016 Blowing Records Away

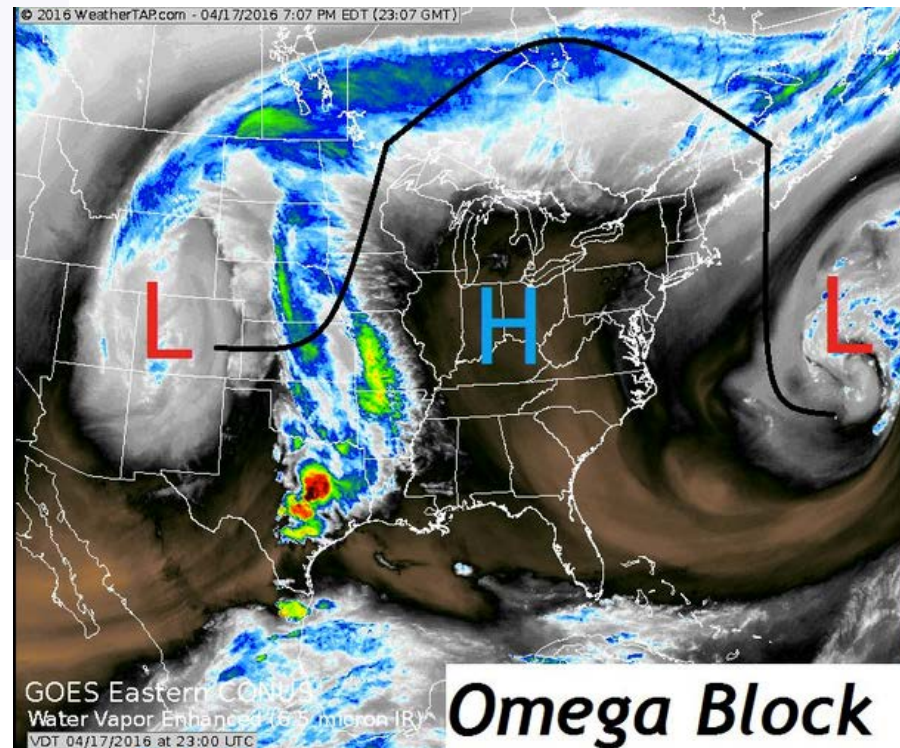
Year-to-date average global temperature anomalies (°C)



Source: NASA GISS

CLIMATE CENTRAL

## Houston Flooding

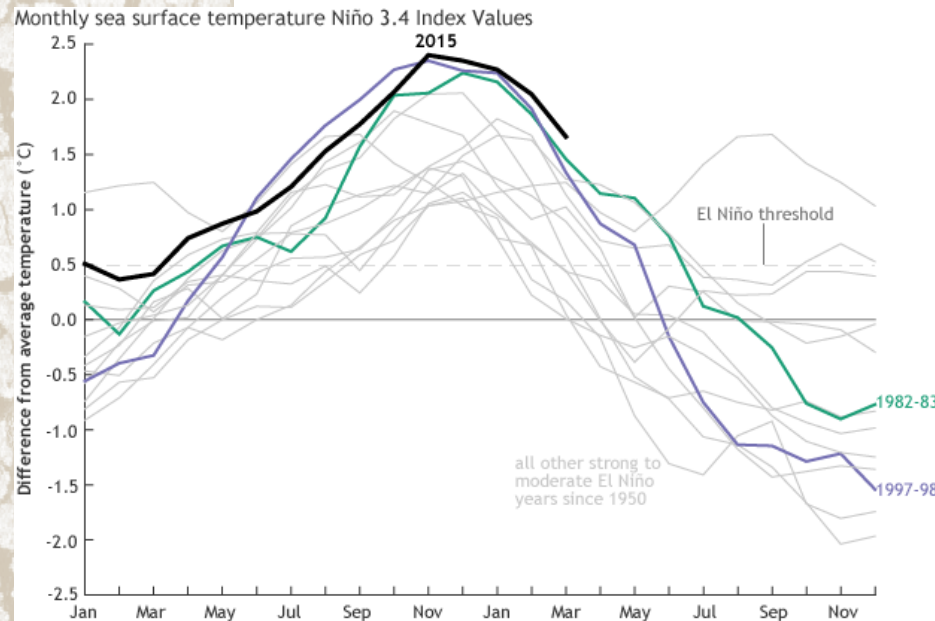
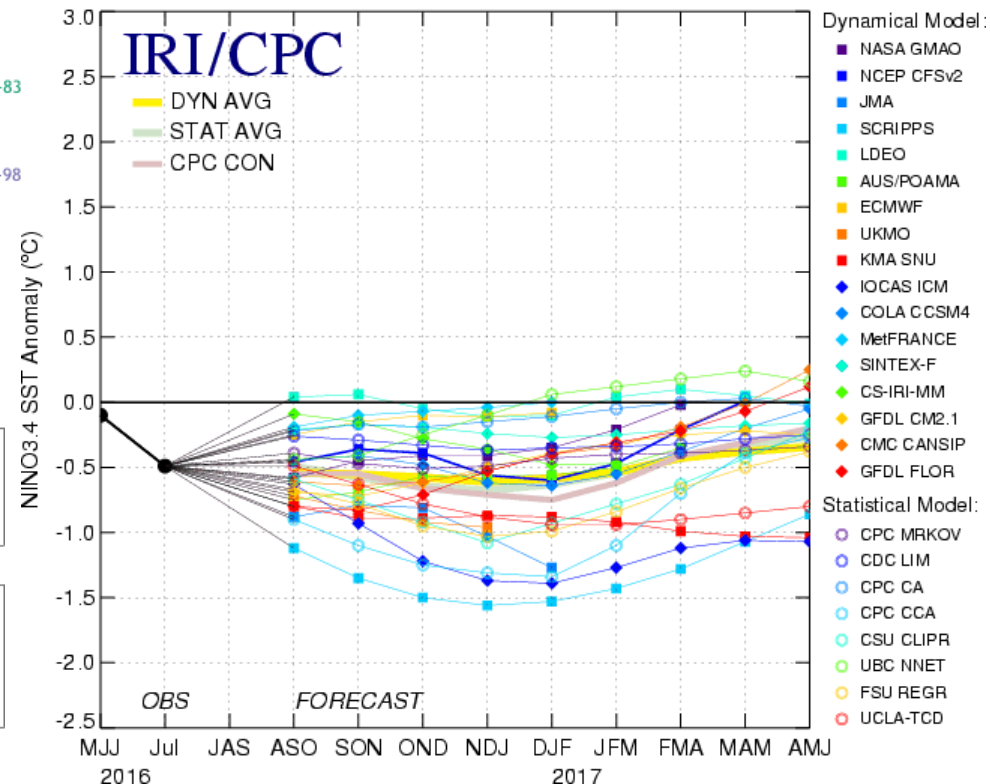


## Omega Block

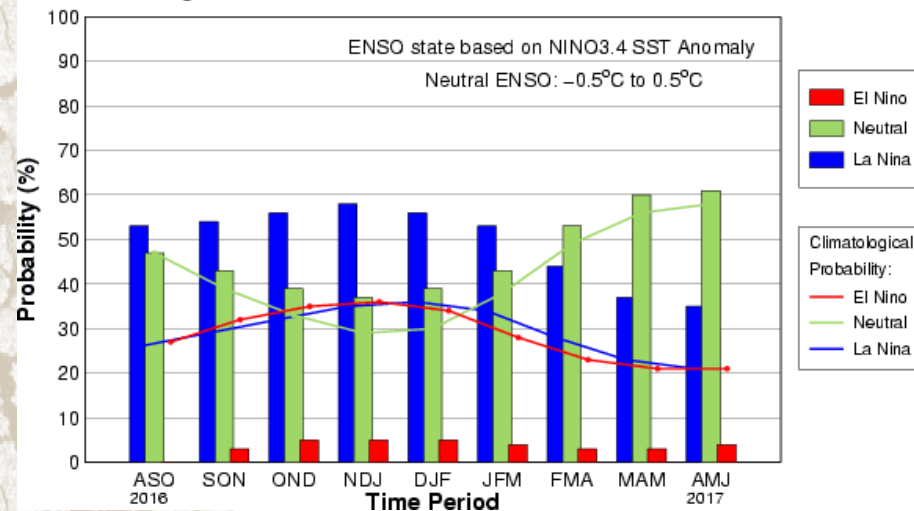
# ACF River Basin Drought Assessment Webinars

## ENSO Forecast

Mid-Aug 2016 Plume of Model ENSO Predictions



Mid-Aug IRI/CPC Model-Based Probabilistic ENSO Forecast



# ACF River Basin DEWS

## Planned Activities

- Add more indicators (e.g. soil moisture and coastal) to the suite of indicators
- Engage wider community - state and local governments, regional commissions of counties, state agencies, fisheries management councils, water management districts, extension, master gardeners, NRCS, utilities, and agricultural producers
- Develop educational products for stakeholders
- Continue to refine the content of the webinars for the stakeholders

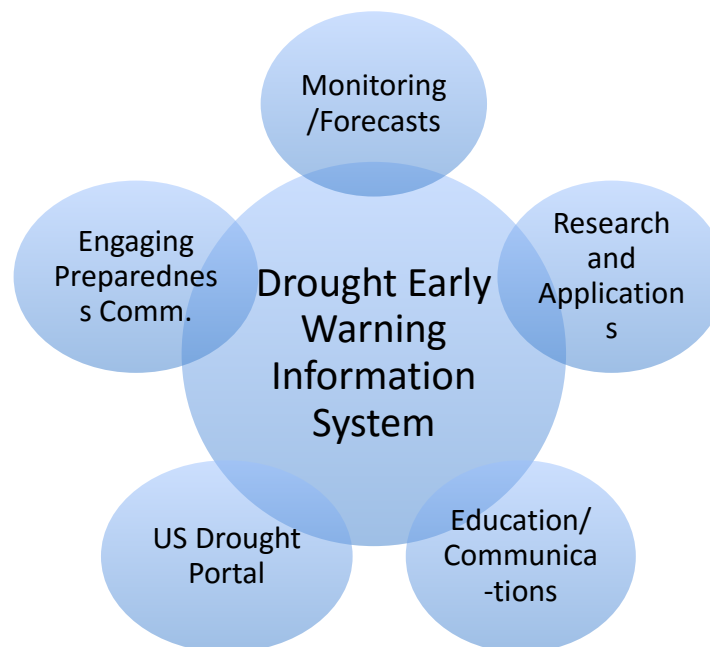
# ACF DEWS Strategic Plan

## MISSOURI RIVER BASIN DEWS WORK PLAN



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**Drought.gov**  
U.S. Drought Portal



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