Apalachicola-Chattahoochee-Flint (ACF) River Basin DEWS

Puneet Srivastava
Director, Water Resources Center
aaes.auburn.edu/wrc
Apalachicola-Chattahoochee-Flint (ACF) River Basin DEWS

- Engaging Preparedness Community
  - ACF Stakeholders
  - Tri-State Row Crop Group
  - Florida Water Climate Alliance

- ACF River Basin Drought Assessment Webinars

- Social science research to assess awareness, perception, use, and barriers and opportunities for using climate information by water managers

- DEWS related research
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 from all three states
  - USGS South Atlantic Climate Science Center
  - Southeast River Forecast Center
  - Army Corps of Engineers
  - Apalachicola National Estuarine Research Reserve
Apalachicola-Chattahoochee-Flint (ACF) River Basin DEWS

(a) 180-day cumulative rainfall deficit (yellow and red colors show deficit)
(b) 7-day cumulative rainfall totals
(c) 5-day precipitation forecast
(d) Real-time streamflows compared to historical average
(e) Lake inflows (black line) with percentile classes (colored areas)
(f) 3-month streamflow forecast (red dots represent below normal streamflows)
(g) ACF River Basin composite conservation and flood storage (of all major reservoirs)
(h) ACF River Basin groundwater status depicted by one representative groundwater well in southwest Georgia
(i) U.S. drought monitor
(j) U.S. seasonal drought outlook
Apalachicola-Chattahoochee-Flint (ACF) River Basin DEWS

Unique features

- State climatologists from all three states engaged
- More than just drought assessment webinars
- Driver for the State of Alabama to develop its state drought plan
- Covers a larger area
- Educates participants on a variety of climate concepts
- Conduct research to improve the drought indicators used for the webinars
2016 Blowing Records Away
Year-to-date average global temperature anomalies (°C)

- 2016: +1.2°
- 2015: +0.8°
- 2014: +0.6°
- 2010: +0.4°

Source: NASA GISS

Houston Flooding

Climate Central
El Niño on the decline

La Niña on the Way?

Monthly sea surface temperature Niño 3.4 Index Values

Sea surface temperature forecast for Sep–Nov 2016
Apalachicola-Chattahoochee-Flint (ACF) River Basin DEWS

ENSO Forecast

Early-Apr CPC/IRI Official Probabilistic ENSO Forecast

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5°C to 0.5°C

Climatological Probability:
- El Nino
- Neutral
- La Nina

Mid-Mar 2016 Plume of Model ENSO Predictions

Dynamical Model:
- NASA GMAO
- NCEP CFSv2
- JMA
- SCRIPPS
- LSEO
- AUS/POAMA
- ECMWF
- UKMO
- KMA SNU
- IOCAS IGM
- COLA CCSM4
- MetFRANCE
- CSHL-MM
- GFDL CM2.1
- CMC CAN/IPS
- GFDL FLOR

Statistical Model:
- CPC MRRV
- CDC ULM
- CPC CA
- CPC CCA
- CSU CLIPR
- UBC NIW
- FSU REGR
- UCLA-TCD
Reducing drought risks for small- to mid-size communities
Can groundwater levels be used as a drought indicator in the Apalachicola-Chattahoochee-Flint (ACF) River Basin?

- Shallow and moderately deep well respond to climate variability – can be used as drought indicators
- Recovery times (from droughts) can be more than two years
Point Source Discharge Permitting to Manage Water Quality
How other climate variability phenomena modulate the effect of ENSO?
How other climate variability phenomena modulate the effect of ENSO?

The diagram shows the percentage change in baseflow for different stations under El Niño, La Niña, and AMO conditions. The x-axis represents the stations labeled A to F, while the y-axis indicates the percentage change in baseflow. The bars on the left side of the diagram represent negative conditions, and the right side represents positive conditions.
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