

# Streamflow Monitoring Workshop

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South Carolina Department of Natural Resources

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Columbia, SC



# Workshop Agenda

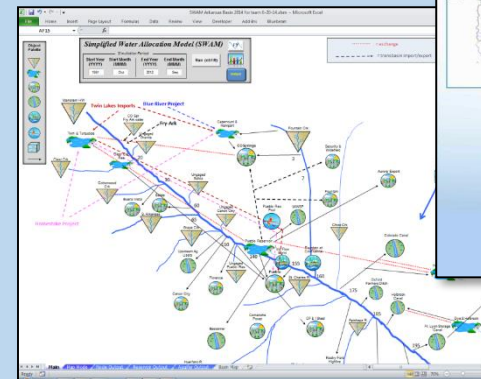
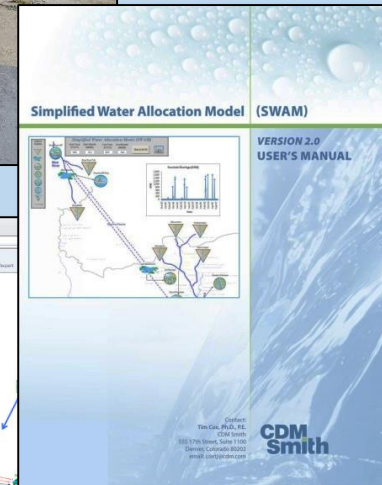
- 10:00 – 10:10 Welcome and Introductions – Ken Rentiers and Scott Harder, SCDNR
- 10:10 – 11:40 Presentations
- 10:10 – 10:30 *“Workshop Goals and How SCDNR uses Streamflow Data”*  
Scott Harder, SCDNR
  - 10:30 – 11:00 *“An Overview of High- and Low-flow Statistics and Why Record Length Matters”*  
Toby Feaster, USGS
  - 11:00 – 11:20 *“Coastal gaging – Monitoring the effects of Riverine and Tidal Forces”*  
Paul Conrads, USGS
  - 11:20 – 11:40 *“SERFC Operations - Forecasting in South Carolina”*  
Todd Hammill, NOAA – Southeast Regional Forecast Center
- 11:40 – 12:15 Input from other State/Federal agencies on how they use streamflow data
- 12:15 – 12:45 Lunch
- 12:45 – 13:00 *“Overview of preliminary SCDNR Recommendations”*  
Scott Harder, SCDNR
- 13:00 – 14:45 Group discussion on monitoring needs and site selection
- 14:45 – 15:00 Wrap up and next steps

# Background/Motivation

- Main Drivers:
  - October 2015 Floods
  - Surface Water Availability Assessments (SCDNR and SCDHEC)
- List of Proposed Sites:
  - Produced internally with some feedback from the USGS
  - SCDNR recognized the need for additional input on the State's monitoring needs

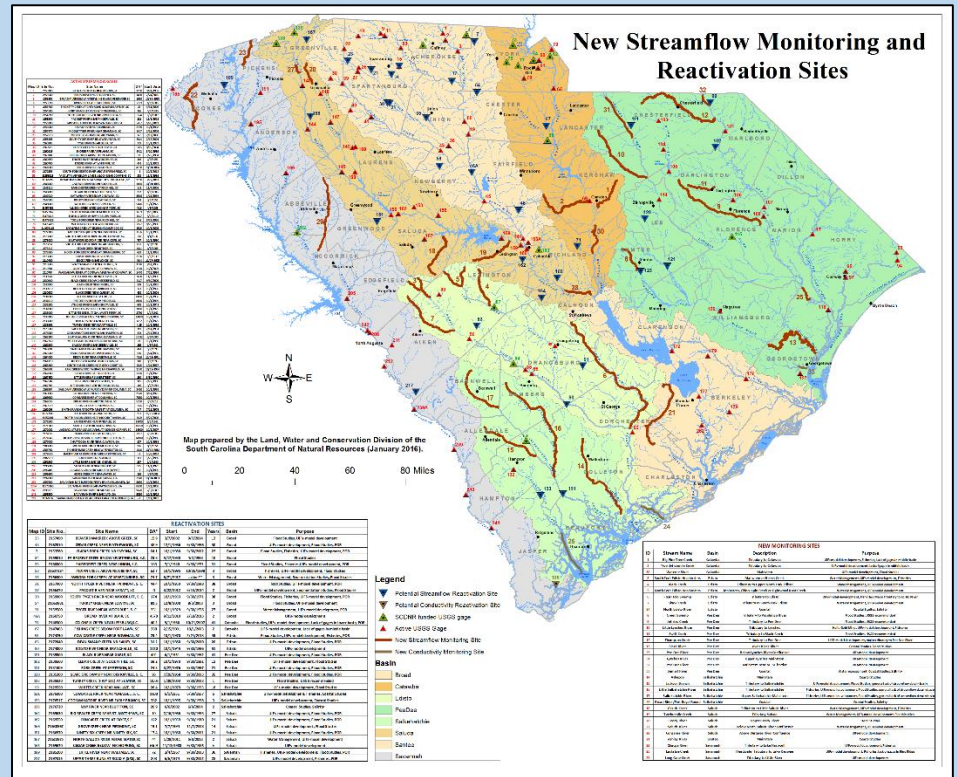


Photos from Wes Tyler



# Goals of Workshop

- Collect feedback on SCDNR's proposed list of new monitoring sites
- Acquire additional recommendations from other government agencies
- Produce an estimate on the number of gages (and their locations) needed to address water resource concerns in the State



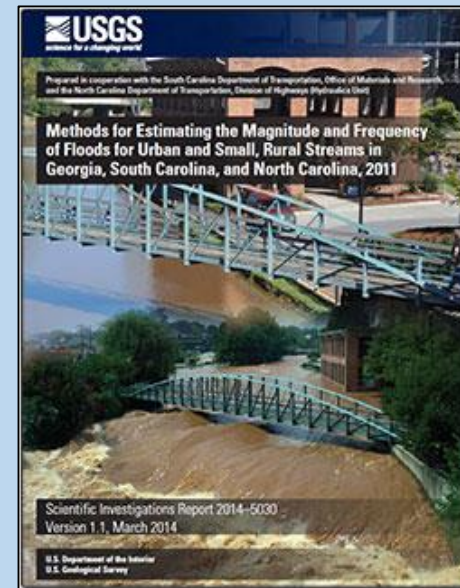
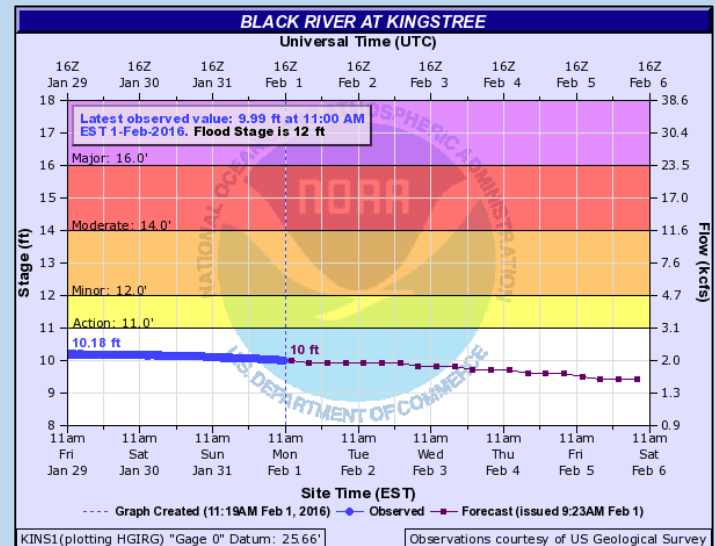
# How the SCDNR Uses USGS Streamflow Data

- Flood Evaluation/Risk
- Water Availability – State's Surface Water Assessments
- Drought Monitoring/Low flow studies
- Fisheries Studies/Monitoring

*(Not an exhaustive list, but does include our major applications)*

# Flood Evaluation/Risk

- River Forecasting
  - National Weather Service's Southeast River Forecast Center
- Magnitude and Frequency of floods
  - P-percent annual exceedance probabilities (1% annual exceedance probability = 100-year flood)
  - Rely heavily on USGS Reports
- SCDNR's Flood Mitigation Program
  - Responsible for developing Flood Insurance Rate Maps (FIRM)



# Surface Water Assessments



- Assessments will be made to determine how much surface water is available in each of the eight major river basins in the State.
- Intended to be an important tool for future statewide water planning efforts.



# Surface Water Assessments

- CDM Smith, Inc. was hired to do the assessments and to develop surface-water availability models of each basin (Summer – 2014).



- Models will be used to:
  - Determine surface water availability.
  - Predict where and when future water shortages might occur.
  - Test alternative water management strategies.
  - Evaluate impacts of future withdrawals on instream flow needs.
  - Evaluate surface water permits and interbasin transfers.
  - Help resolve water disputes.
  - Consolidate information and data.



# Surface Water Assessments – Unimpaired Flows (UIFs)

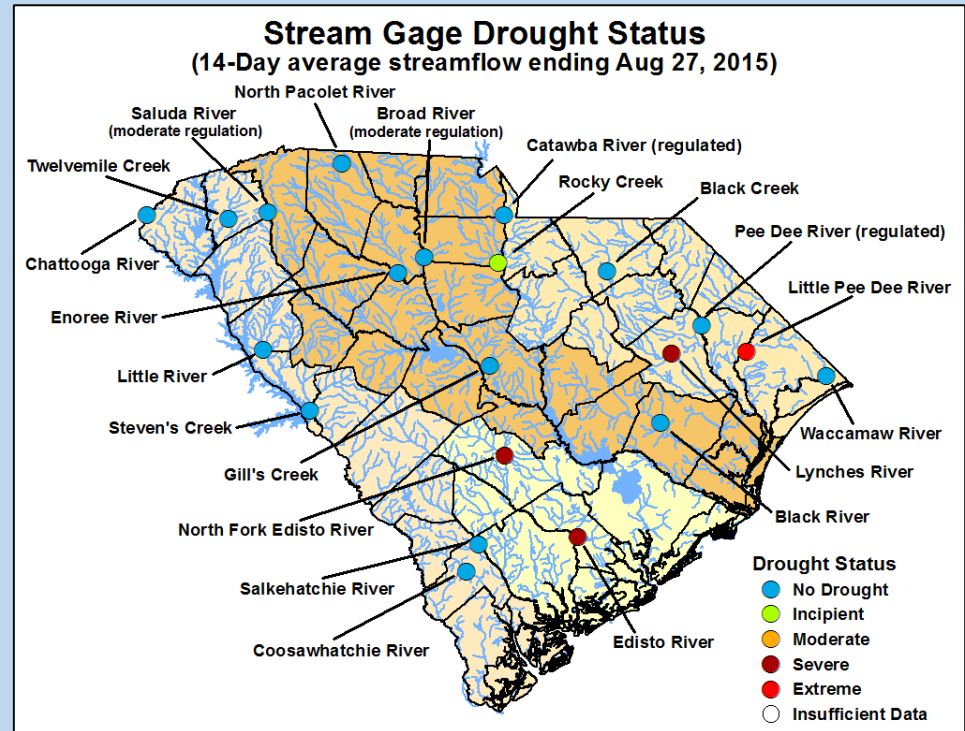
- The *Fundamental input to the surface water models is derived from the stream gage data*
- The UIFs represent the natural historic streamflow in the absence of human intervention

- Unimpaired Flow =

*Measured Gage Flow + River Withdrawals + Reservoir Withdrawals - Discharge to Reservoirs - Discharges + Reservoir Surface Evaporation - Reservoir Surface Precipitation + Change in Reservoir Storage*

# Drought Monitoring/Low Flow Studies

- Drought Designations:
  - Streamflow is one of several variables used by the State Drought Committee to designate drought levels



- Low-flow studies:
  - 7Q10 and other metrics (for water quality purposes and discharge permitting)
  - Often rely on USGS Low Flow Studies

# Fisheries Studies

## Broad River Basin Sediment Management Study

- Relating fish assemblage integrity to sediment
  - Which species/groups are most impacted by sediment?
  - At what levels of sediment loading do they decline?
- Flow data used to quantify sediment loading



## Modeling Aquatic Habitat Availability/Change

- e.g. Instream Flow Incremental Methodology (IFIM)



Notchlip Redhorse, *Moxostoma collapsum*

# SCDNR's Monitoring Needs

- Agency uses USGS streamflow data for a variety of purposes
- Gage sites often are used for more than one purpose
- Improving our ability to assess flood risk and/or to forecast the magnitude and timing of flood events is a major priority
- Improving the inflow datasets for our surface water planning efforts is also a high priority