Geological Survey of Alabama
Real-Time Groundwater Monitoring System

Sophia M. Rutledge

GIS Specialist

Groundwater Division

Thanks to Neil Moss and Amye Hinson!

Outline

- Overview
- Technology
- Distribution
- Hydrographs and Data Analysis
- Drought Indicators
- Statewide Groundwater Assessment
- Questions

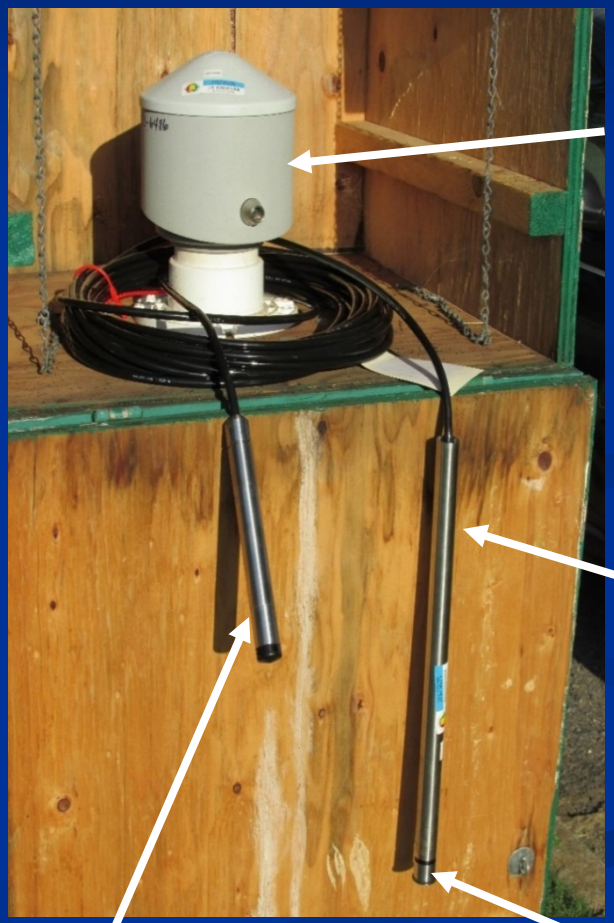
Real-Time Wells

http://www.gsa.state.al.us/gsa/water/Realtime_wells.html

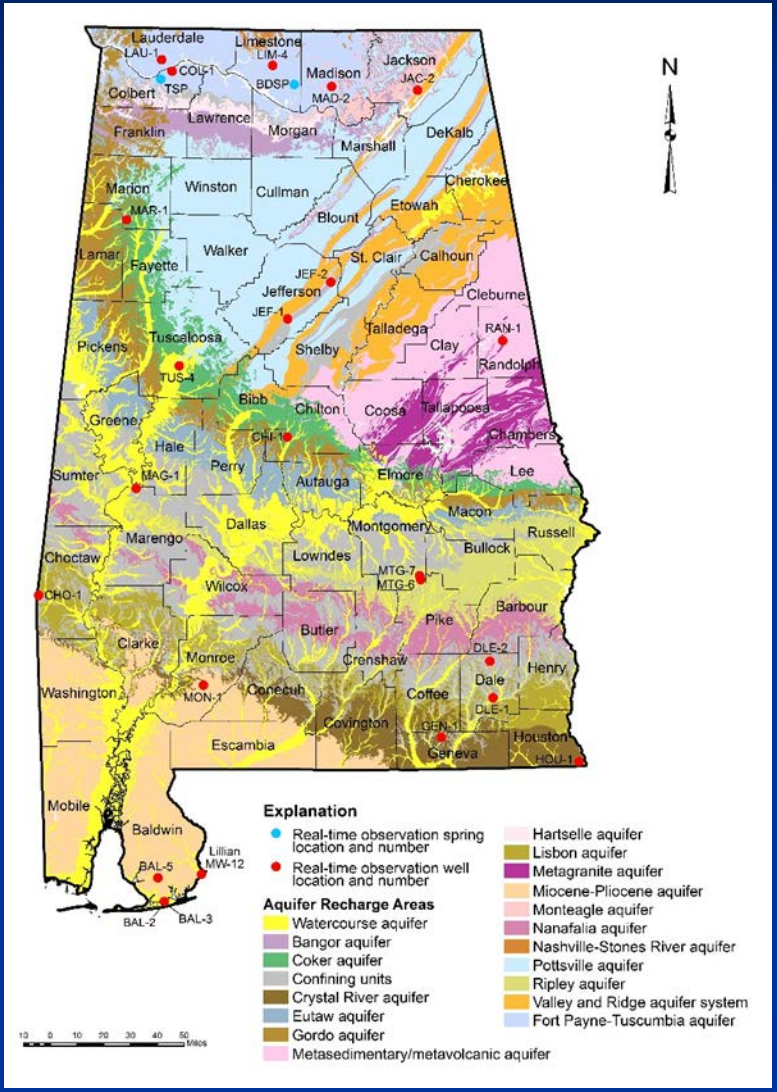
- Installation began in November 2010 in wells that were already part of the GSA continuous monitoring program
- Currently have 24 real-time monitoring wells across the state
- Water levels measured every 2 hours and transmitted to the GSA office daily
- Data linked to online hydrographs

How They Work

- The OTT Orpheus Mini – an integrated pressure sensor and datalogger – takes readings and sends to the office using a 2G network
- Problem: 2G is being phased out, in the progress of upgrading to 3G compatible technology
- Old equipment that cannot be updated can be used, but we will have to go manually download data.
- It CAN measure in areas without cell service.



Distribution of Wells

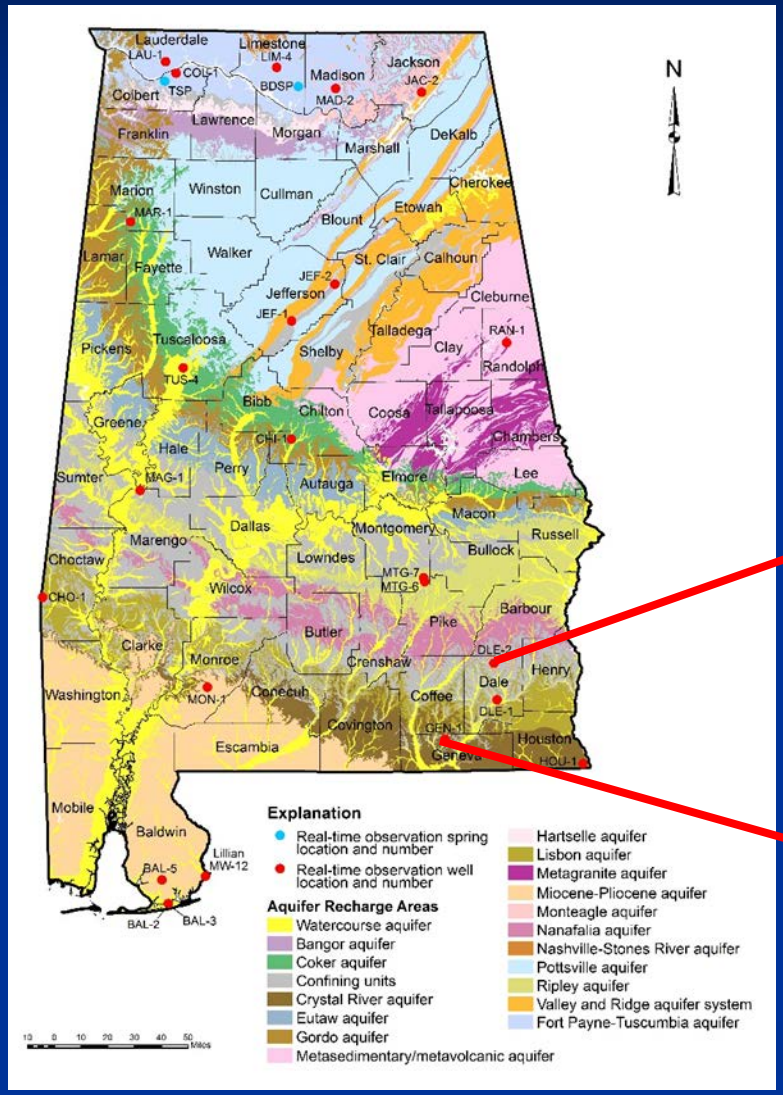


- Real-time wells located in major aquifers across the state
- Should be located so they are not influenced by pumping from nearby wells to exhibit the natural groundwater conditions
- End goal: have one well in the recharge and one at the downdip limit of each Coastal Plain aquifer, and at least one well in every other aquifer

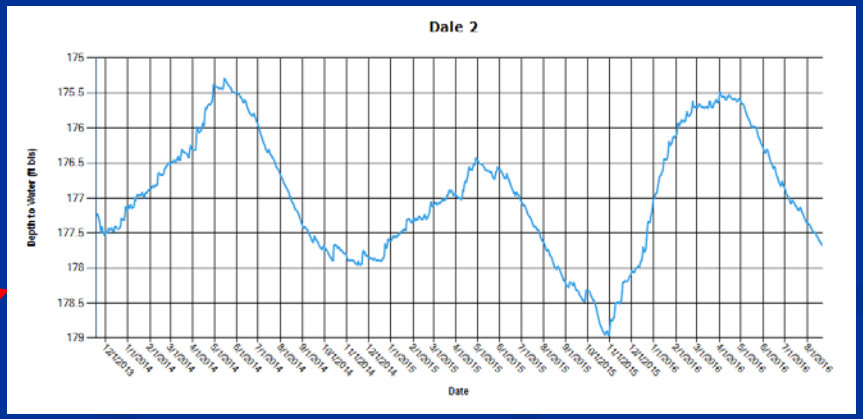
Hydrographs

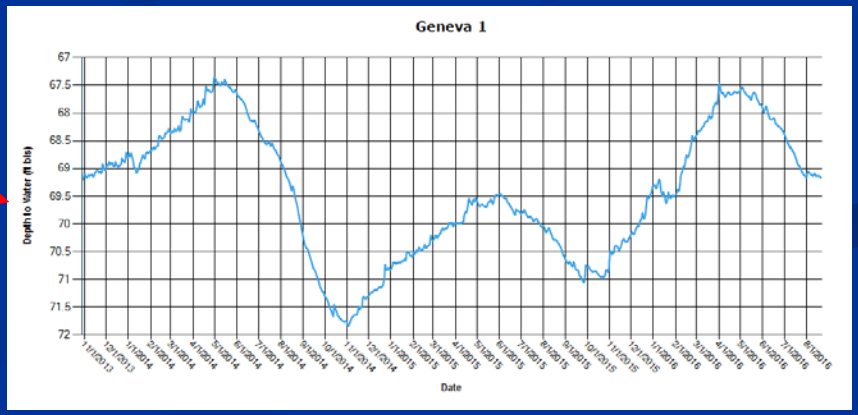
- Long term hydrographs from the monitoring wells provide an indicator of water level fluctuations.
- Fluctuations can be affected by groundwater withdrawals, land use, variations in weather conditions, and climate changes.
- Hydrographs of wells in both the recharge area and downdip of the recharge area can help us understand the relationship between unconfined and confined aquifers in respect to recharge and storage of the confined aquifer.

Hydrograph Example

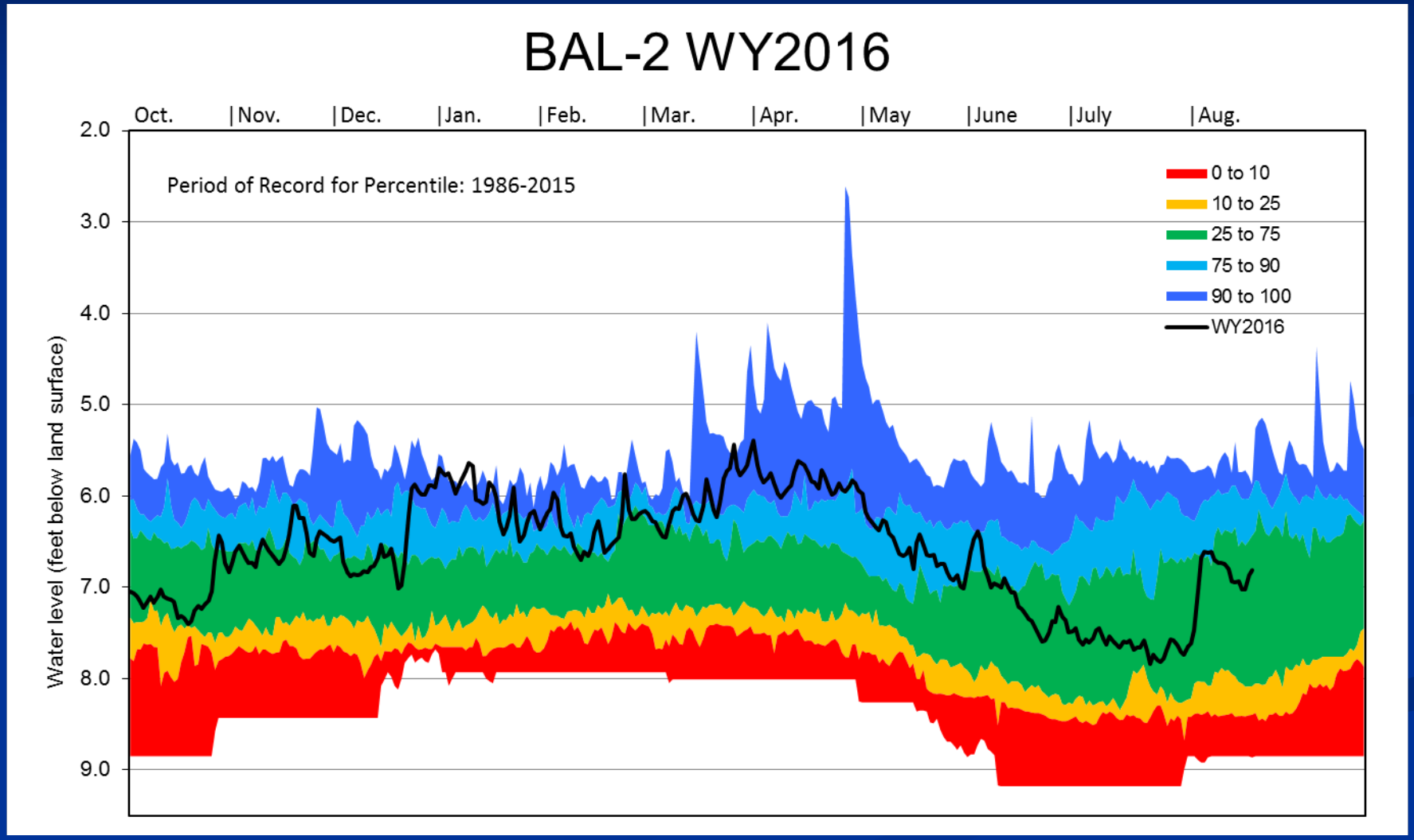


*DAL-2 and GRE-1 were co-sponsored by the Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority under the direction of Barbara Gibson

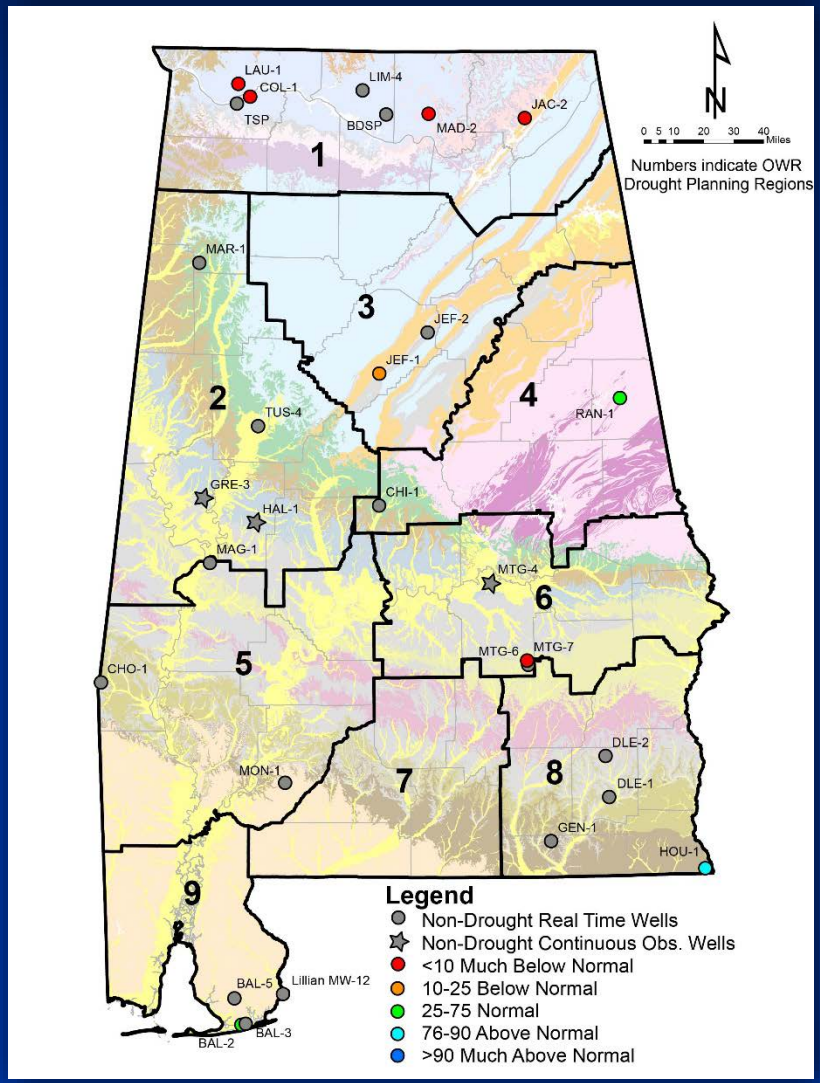




Statistical Analysis of Well Data



Drought Indicators



- Shallow, unconfined wells can be used as drought indicators
- Groundwater responds to a meteorological drought more slowly than other indicators and can provide information related to drought duration and intensity
- We are using OWR's drought areas and need wells in area 5 and are 7

We Need Wells!!!

Looking for shallow, unconfined wells without a pump in them.

Statewide Groundwater Assessment

- Assessing groundwater availability in the state
- Mapping water levels for 20 aquifers throughout the state and analyzing drawdown and fluctuations.
- The initial project report is due at the end of the year, but we intend to make it a long term, continuous project in which we update the water levels and maps regularly.

Questions?

Sophia M. Rutledge
srutledge@gsa.state.al.us
205-247-3567