

# RBDMS-Environmental: A Foundation for Water Budgets and Shaping Policy in Alabama

## Ground Water Protection Council 2019 Annual Forum

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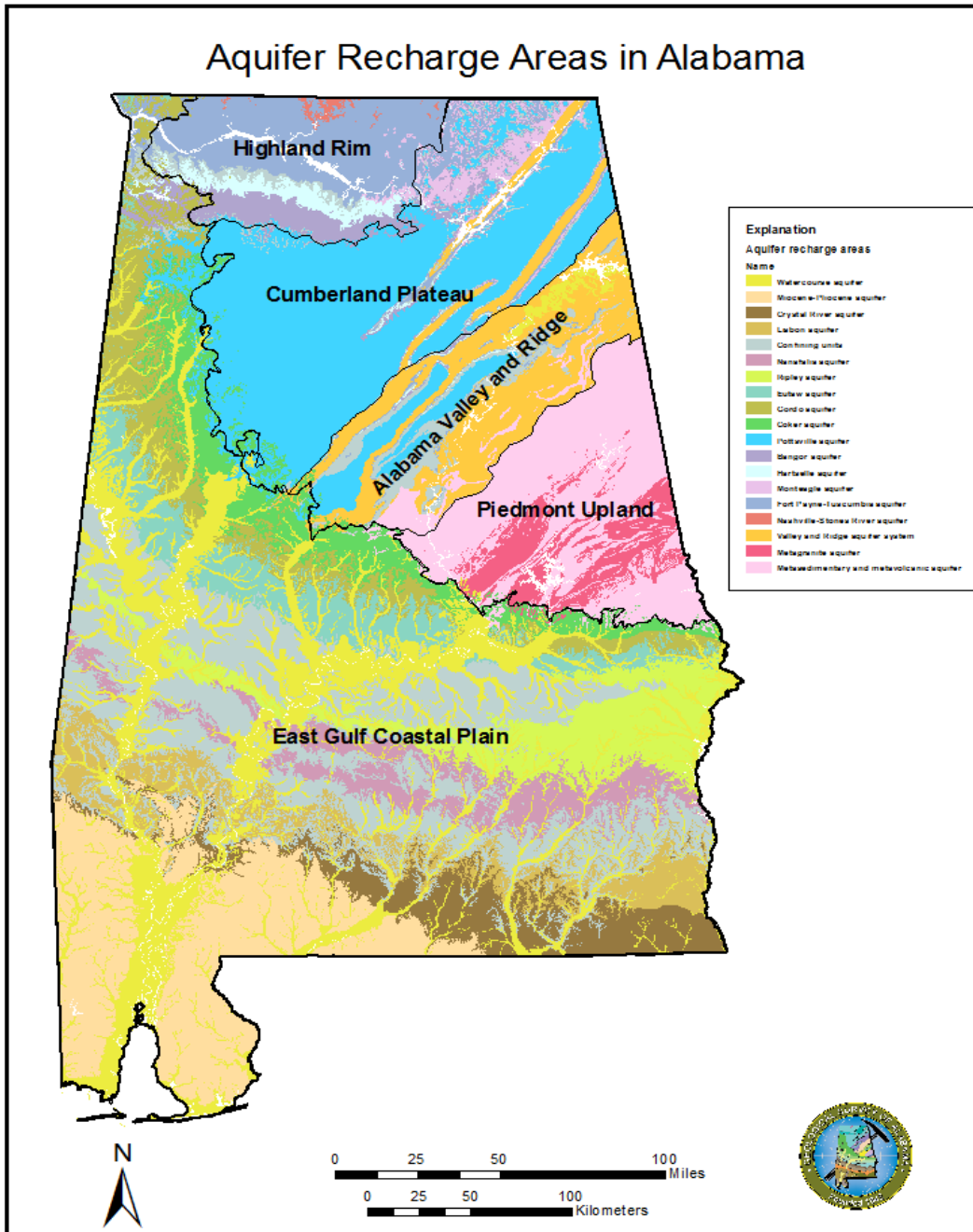
# ALABAMA GEOLOGY

Alabama geology controls hydrologic flow regimes.

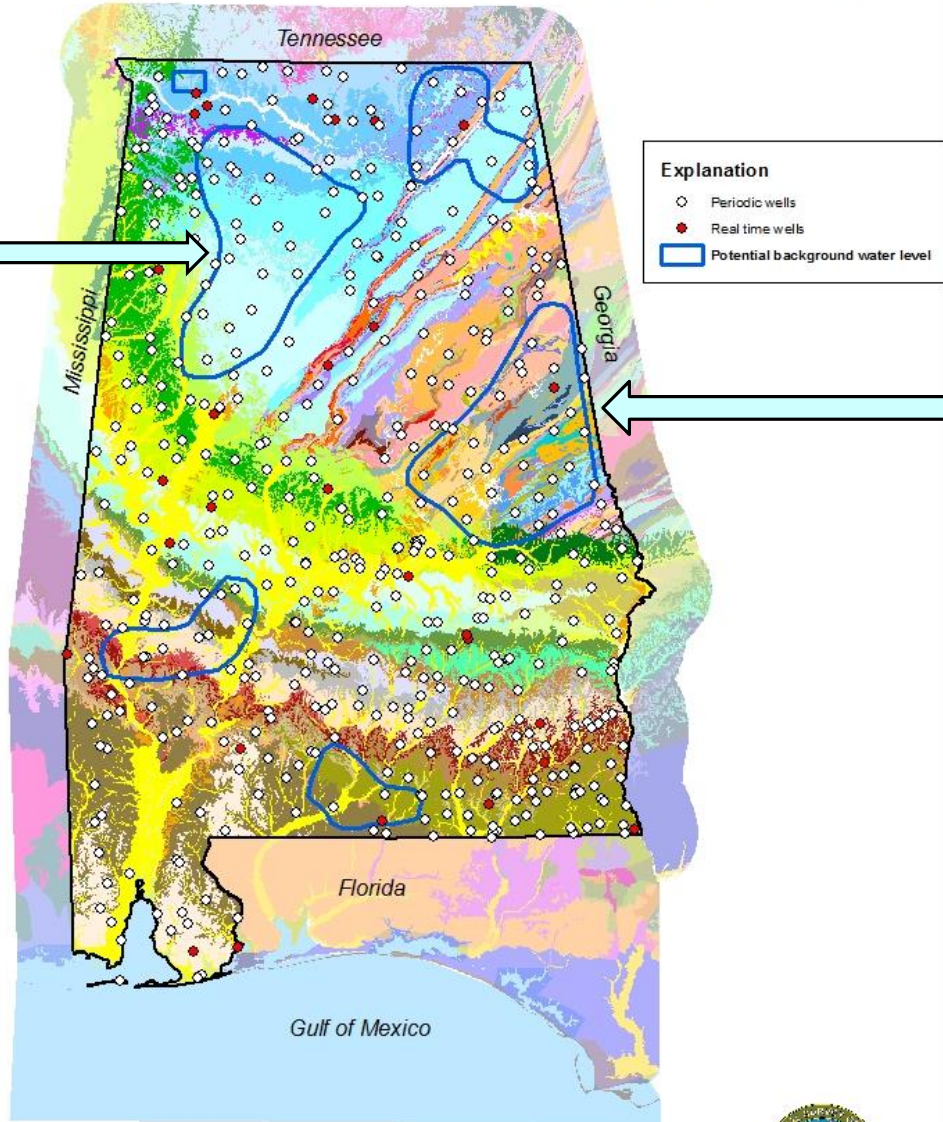
Alabama is divided into several **distinctive**

**GEOLOGIC PROVINCES** on AL Geologic Map.

- **EAST GULF COASTAL PLAIN** (Cretaceous-Tertiary Sedimentary rocks); large Unconfined & Confined aquifers
- **PIEDMONT UPLAND** (Crystalline & Metamorphic Rocks: Paleozoic, some Precambrian); *\*Surface Water primary*
- **VALLEY & RIDGE** (Paleozoic folded, faulted sedimentary rocks); Aquifers mostly in limestone units
- **CUMBERLAND PLATEAU** (Paleozoic sedimentary rocks); *\*Surface Water primary*
- **HIGHLAND RIM** (Paleozoic limestone); **Karstic** conduit Unconfined prolific aquifers (hit or miss); *\*Strong surface water - groundwater interconnection*



## Periodic and Real Time Monitoring Wells in Alabama



## Alabama Groundwater Well Networks:

- PERIODIC (Spring & Fall)
- REAL-TIME (Continuous)

**BACKGROUND** Observation Wells  
Not likely influenced by GW Pumping

Piedmont and Plateau provinces are not prolific groundwater producing regions. \* These 2 geologic regions RELY mostly on surface water sources.

# USGS National Ground Water Network

## NGWMN PLANS ARE BIG FOR 2019... AND BEYOND

- Currently GSA operates 32 Real-Time monitoring wells across the State
- Plan to add 5 more continuously measured wells (FY 2019). If integrated 3G units are not feasible, will install pressure transducers that can be downloaded every 6 mos.
- Water levels measured every 2 hours, transmitted office daily
- Data linked to online hydrographs
- Existing data available to USGS National Ground Water Network by August 2020



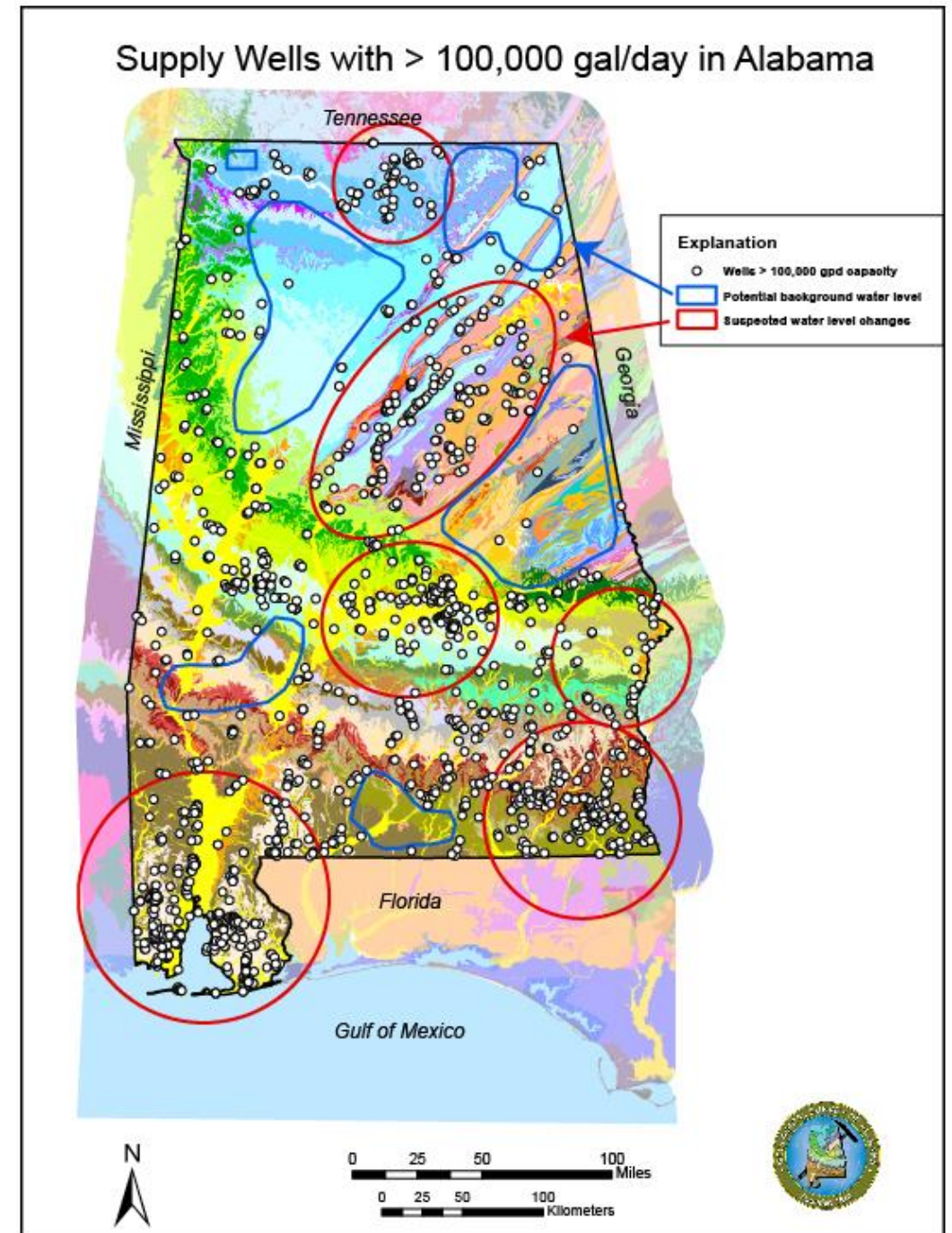
# Site selection for groundwater monitoring to evaluate USE:

First, look at groundwater use. Then assess current observation monitoring points, to select network classification. AL OWR maintains Certificates of Use (COU). These are self-reported, no metered data.

**Red Circles:** Areas of potential impact due to groundwater withdrawal.

**Blue Polygons:** Potential Background Areas, with less anthropogenic influence due to groundwater withdrawal.

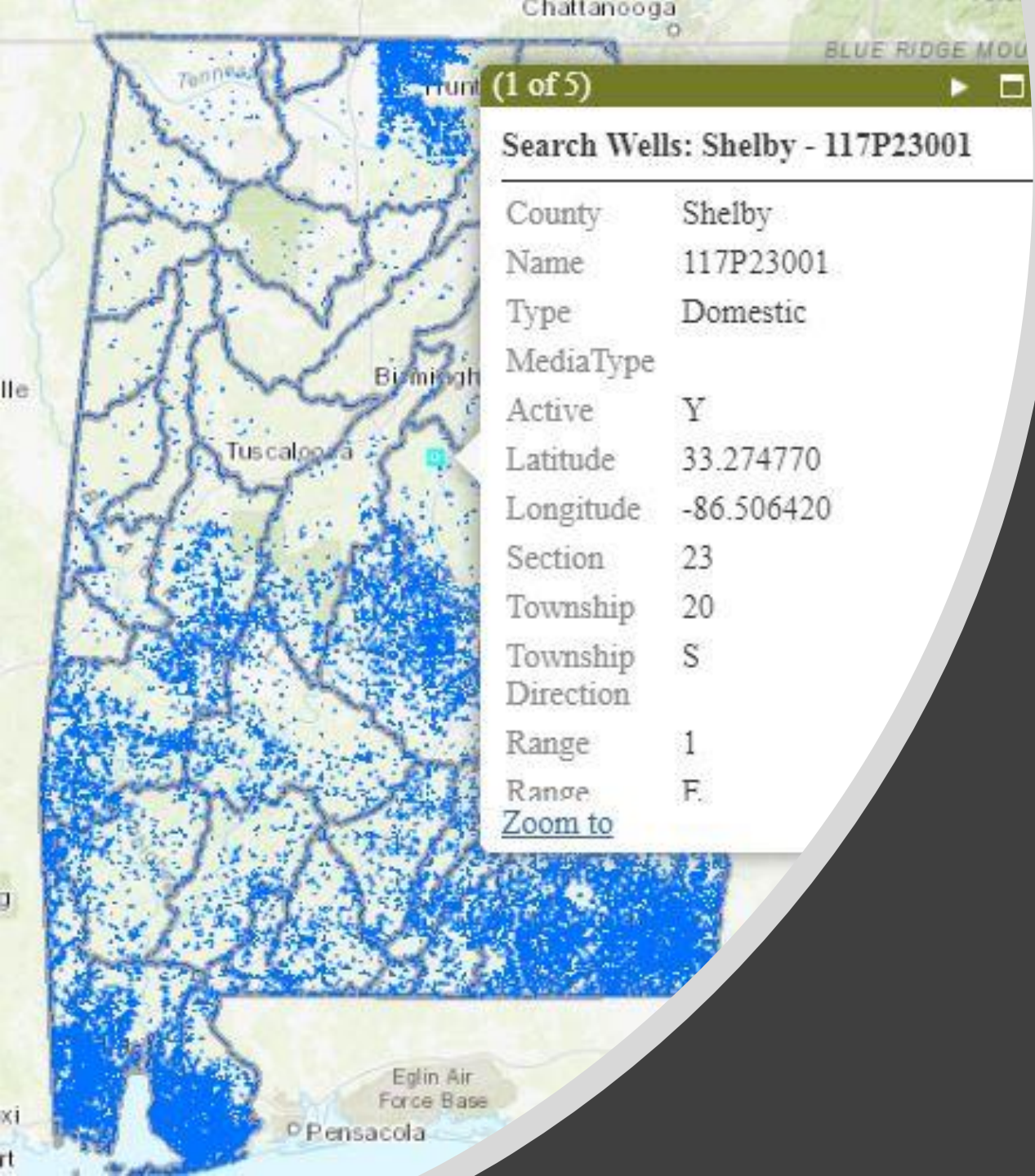
NGWMN classification will be based on hydrograph analyses.



RBDMS-Environmental provides simple organization for detailed well information.

### BENEFITS:

- Relational database for water wells, accessible via a desktop
- Verify data quality before it is uploaded
- Multiple people using the system can be granted different level of access privileges (ie: 5 users can edit; 2 can approve prior to upload)
- Useful data architecture for storage, retrieval and future needs, especially for outside agency data



# Alabama Water Wells: a work-in-progress













Alabama Wells: entered by county

No. 1 public info request is “how many wells & detail within a given radius?”

# RBDMS SEARCH BY PROJECT: REAL-TIME WELLS

## Browse Facilities ▼

Facility List   Reports   Map   Help

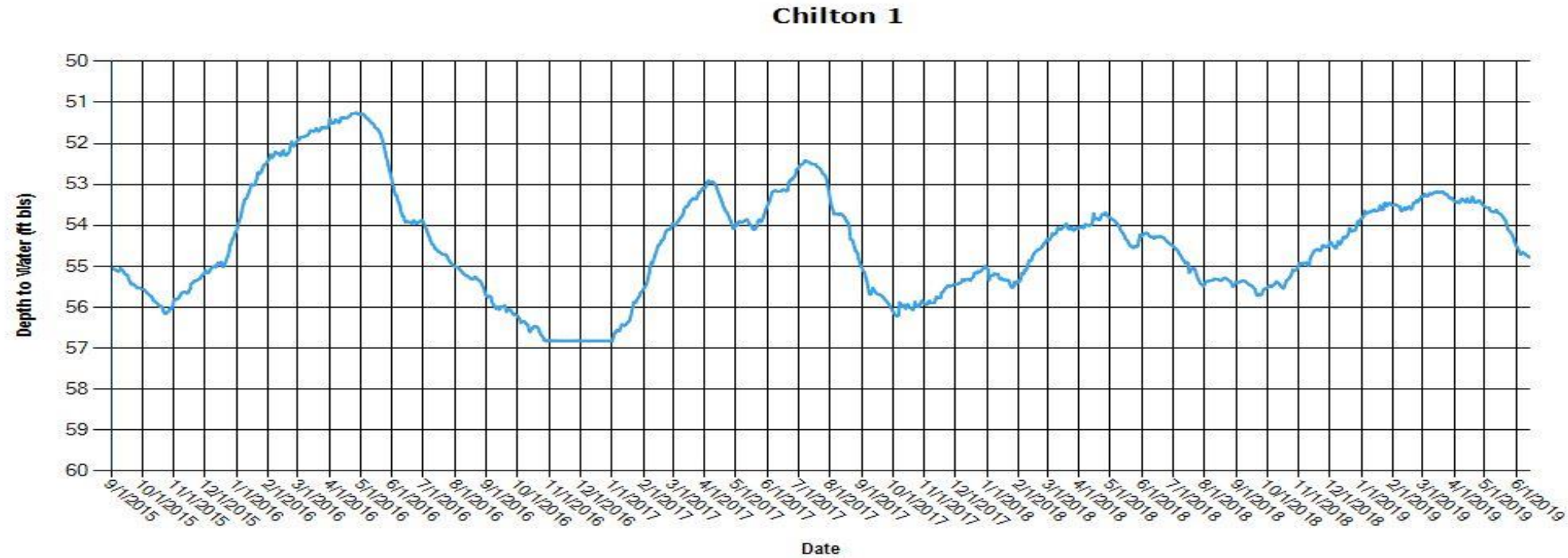
Select	RBDMS ID	GSA ID	County	Owner	Facility Type	Latitude27	Longitude27	Section	Township
<input type="checkbox"/>	92278 	BAL-2	Baldwin	Gulf State Park (GSA Real...	Observation	30.2803	-87.6498	11	9
<input type="checkbox"/>	92272 	BAL-3	Baldwin	Gulf State Park (GSA Real...	Observation	30.2802	-87.6499	11	9
<input type="checkbox"/>	92197 	BAL-5	Baldwin	Riviera Utilities (GSA Real ...	Observation	30.4079	-87.6846	29	7
<input type="checkbox"/>	144915 	BAL-6	Baldwin	Geological Survey of Alab...	Observation	30.4308	-87.4172	13	7
<input type="checkbox"/>	125648 	BDSP	Limestone	Geological Survey of Alab...	Observation	34.7028	-86.8296	10	4
<input type="checkbox"/>	93871 	CHI-1	Chilton	Town of Maplesville	Public	32.7958	-86.8769	16	21
<input type="checkbox"/>	119719 	CHO-1	Choctaw	Pranks	Observation	31.9329	-88.4576	11	11
<input type="checkbox"/>	119833 	COL-1	Colbert	Occidental Chemical	Observation	34.7731	-87.6312	30	3
<input type="checkbox"/>	144914 	COV-1	Covington	Bailey	Agricultural	31.0853	-86.5527	4	1
<input type="checkbox"/>	96800 	DLE-1	Dale	GSA Real-Time Well	Observation	31.3772	-85.5805	30	5
<input type="checkbox"/>	96244 	DLE-2	Dale	Pleasant Ridge Church	Domestic	31.5761	-85.5976	13	7
<input type="checkbox"/>	97994 	GEN-1	Geneva	Coffee Springs	Observation	31.1670	-85.9101	11	2
<input type="checkbox"/>	119684 	GRE-3	Greene	USGS	Observation	32.8356	-87.8892	33	22



Facility Filter



# Hydrograph of Real-Time Well Chilton 1



Location: Chilton County

Aquifer: Coker

Depth of Well: 253 feet BLS














Land Surface Elevation: 379 feet AMSL



# RBDMS SEARCH BY COUNTY, SHOW AQUIFER

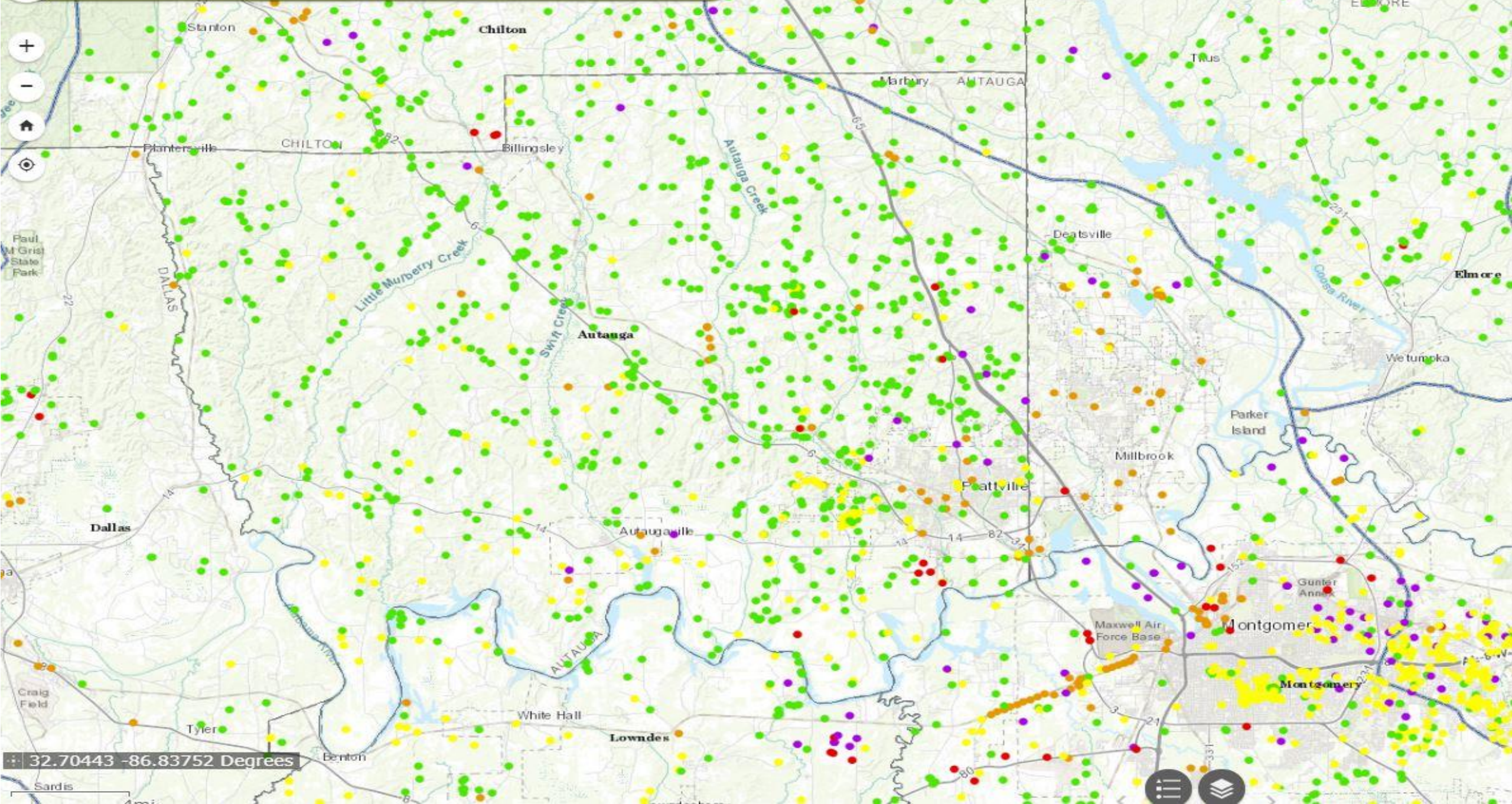
## Browse Facilities ▼

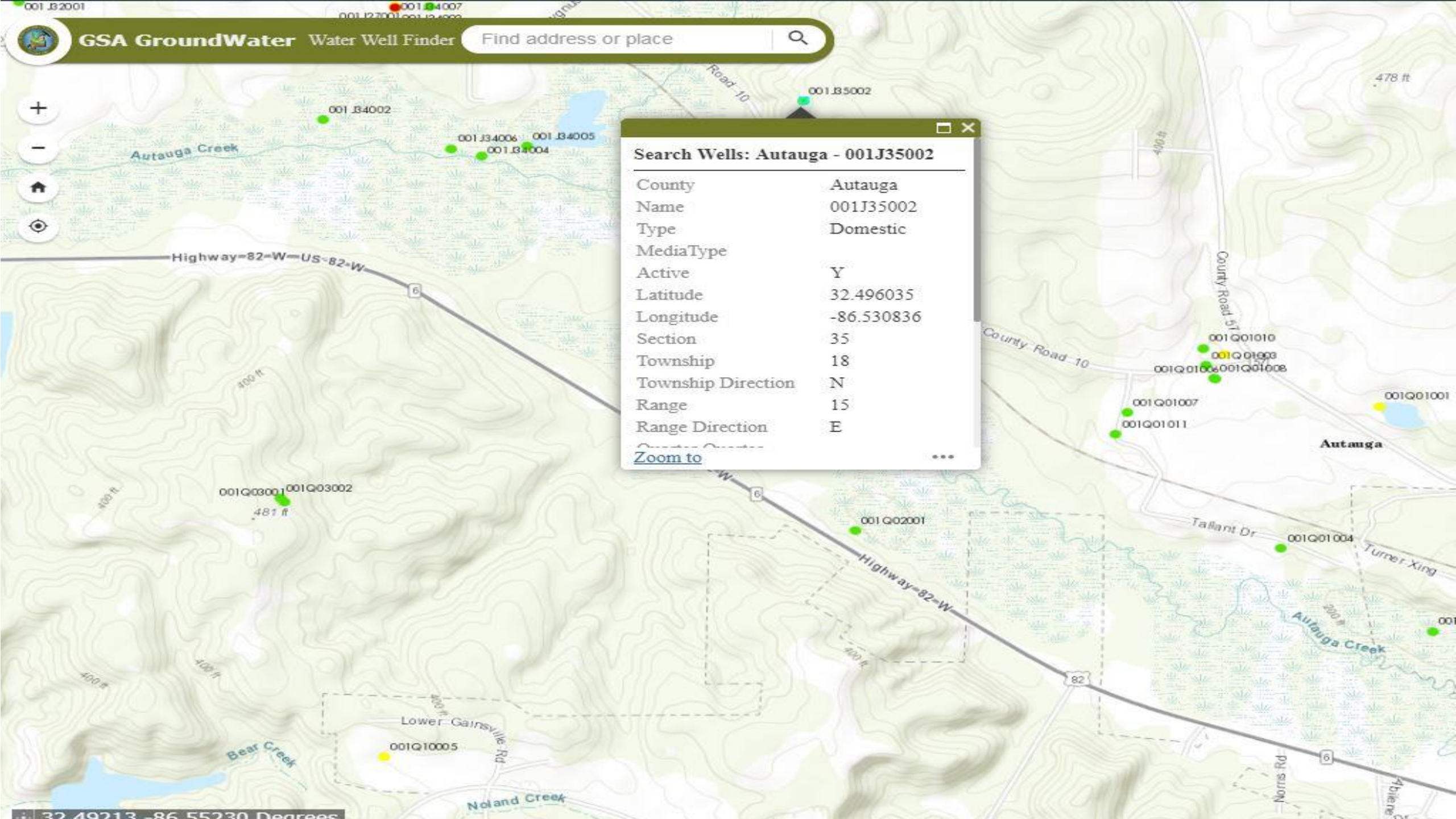
Facility List Reports Map Help

Select	RBDMS ID	GSA ID	County	Owner	Section	Township
<input type="checkbox"/>	93219 	021A33001	Chilton	Leigh		
<input type="checkbox"/>	93220 	021A33002	Chilton	Stewart		
<input type="checkbox"/>	93249 	021B27001	Chilton	Coonrod		
<input type="checkbox"/>	93257 	021B31001	Chilton	Gleen		
<input type="checkbox"/>	93250 	021C00001	Chilton	Tew		
<input type="checkbox"/>	93251 	021C00002	Chilton	Holt		
<input type="checkbox"/>	93252 	021C00003	Chilton	Morrison		
<input type="checkbox"/>	93253 	021C14001	Chilton	Holcombe		
<input type="checkbox"/>	93254 	021C15001	Chilton	Wooten		
<input type="checkbox"/>	93255 	021C15002	Chilton	Lee		
<input type="checkbox"/>	93240 	021C19001	Chilton	Hamilton		
<input type="checkbox"/>	93227 	021C20001	Chilton	Horton		
<input type="checkbox"/>	93239 	021C22001	Chilton	L and N Railroad		

Search Clear

- Bangor Limestone
- Bibb Dolomite
- Brierfield Dolomite
- Chepultepec Dolomite Undifferentiated
- Chickamauga Limestone
- Chilhowee Group Undiff.
- Citronelle Formation
- Clayton Formation
- Coker Formation





**Search Wells: Autauga - 001J35002**

County	Autauga
Name	001J35002
Type	Domestic
Media Type	
Active	Y
Latitude	32.496035
Longitude	-86.530836
Section	35
Township	18
Township Direction	N
Range	15
Range Direction	E

[Zoom to](#) ...

# WHY ALABAMA WANTS TO EXPAND USE OF RBDMS

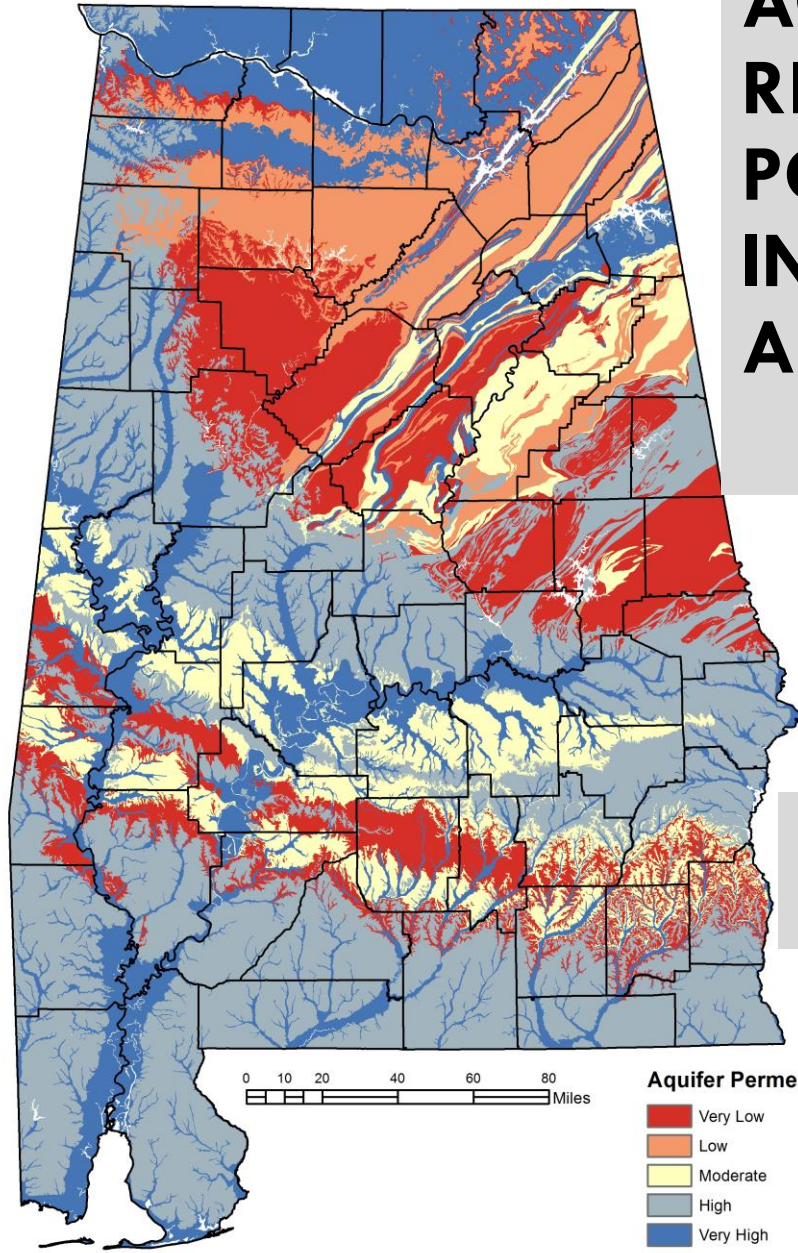
Why flexible report production and data management are so important in real-time:

- **DROUGHTS**
- **FLOODS**
- **STORMS:** especially Hurricane impacts along coast

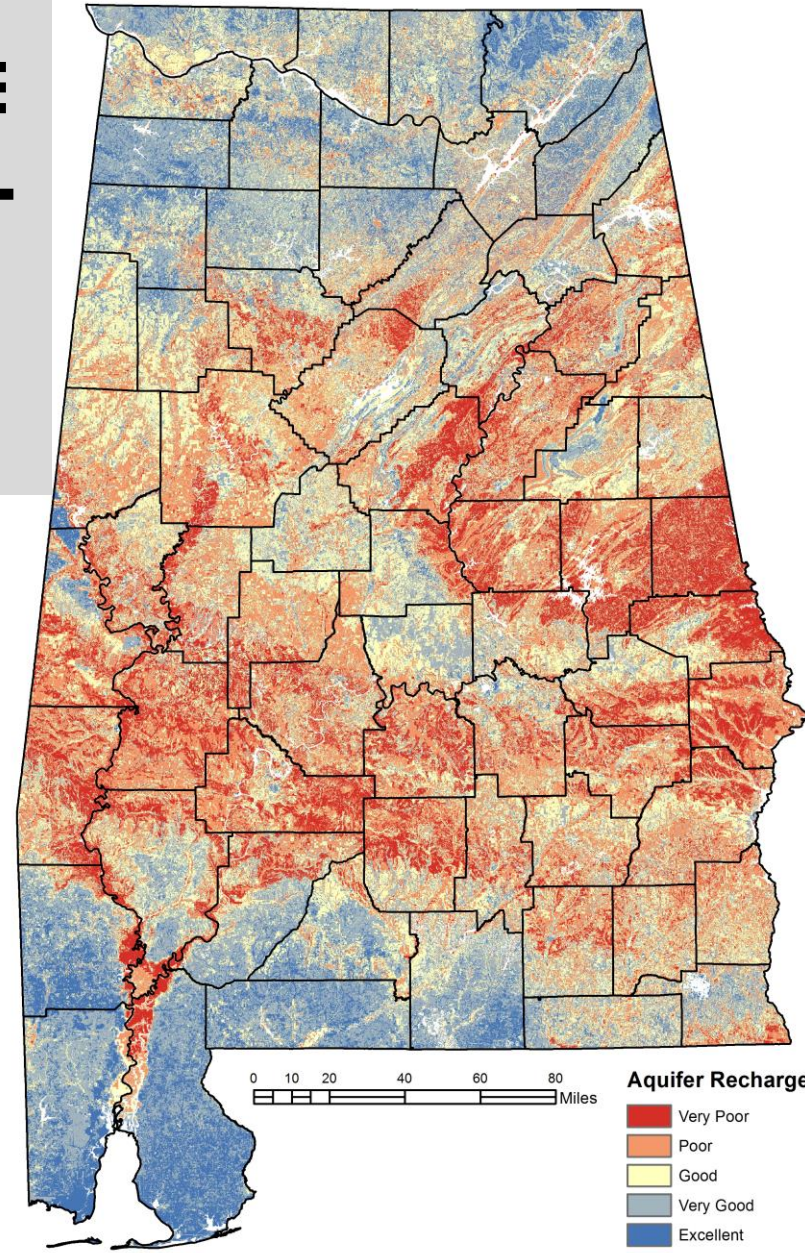
Where work needs development:

- Improved report compilation.
- Need for data conformity, since we may add other agencies data

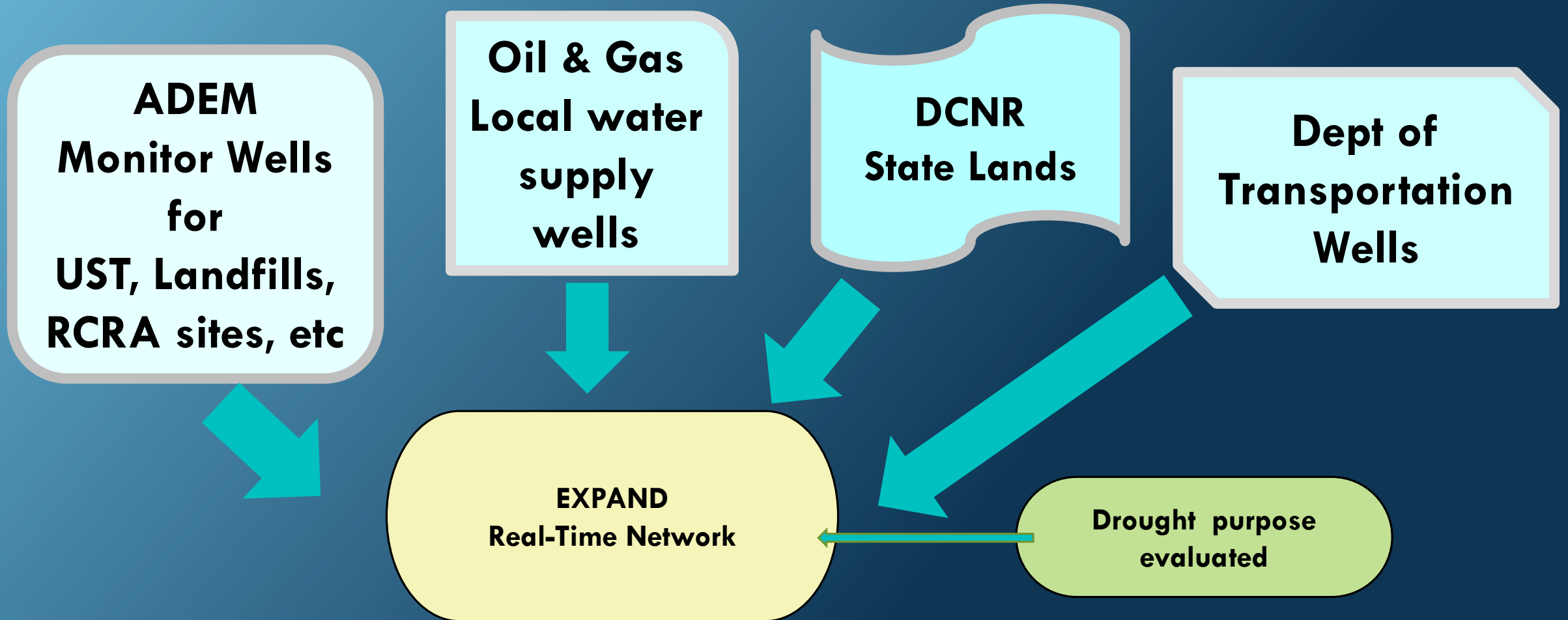
# AQUIFER RECHARGE POTENTIAL IN ALABAMA



**BLUE = HIGH**  
**RED = LOW**

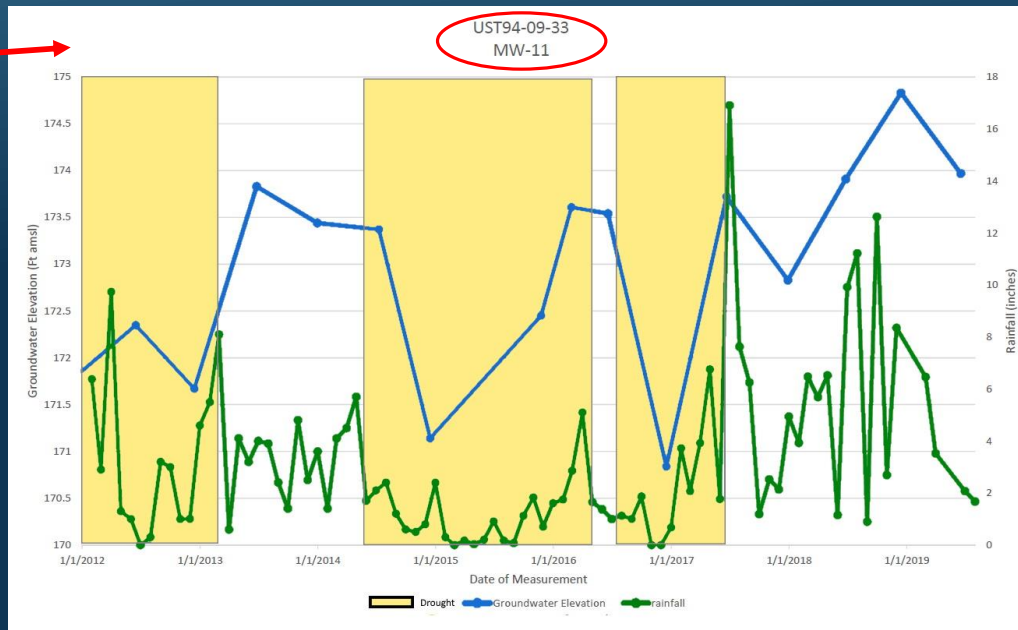
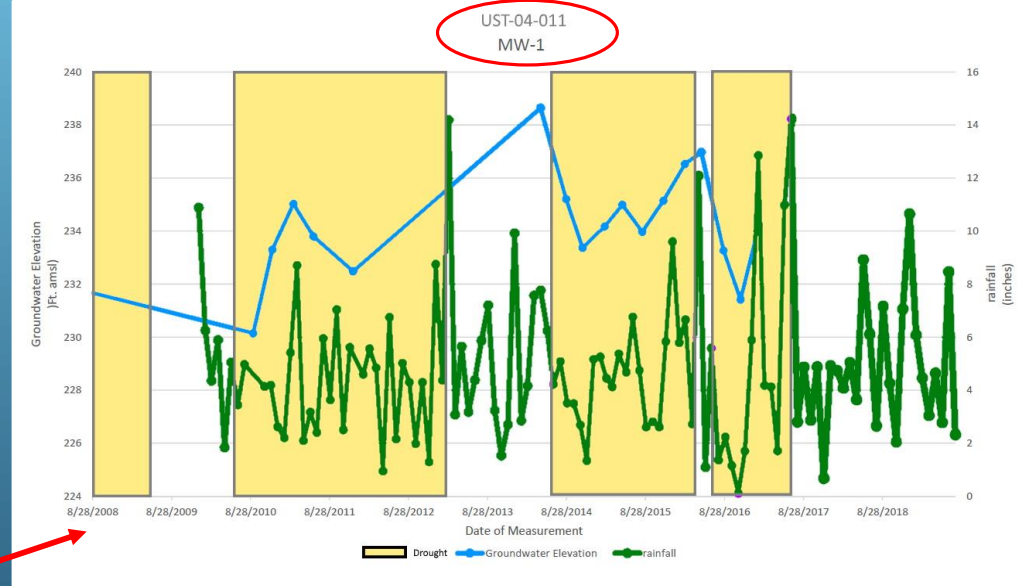
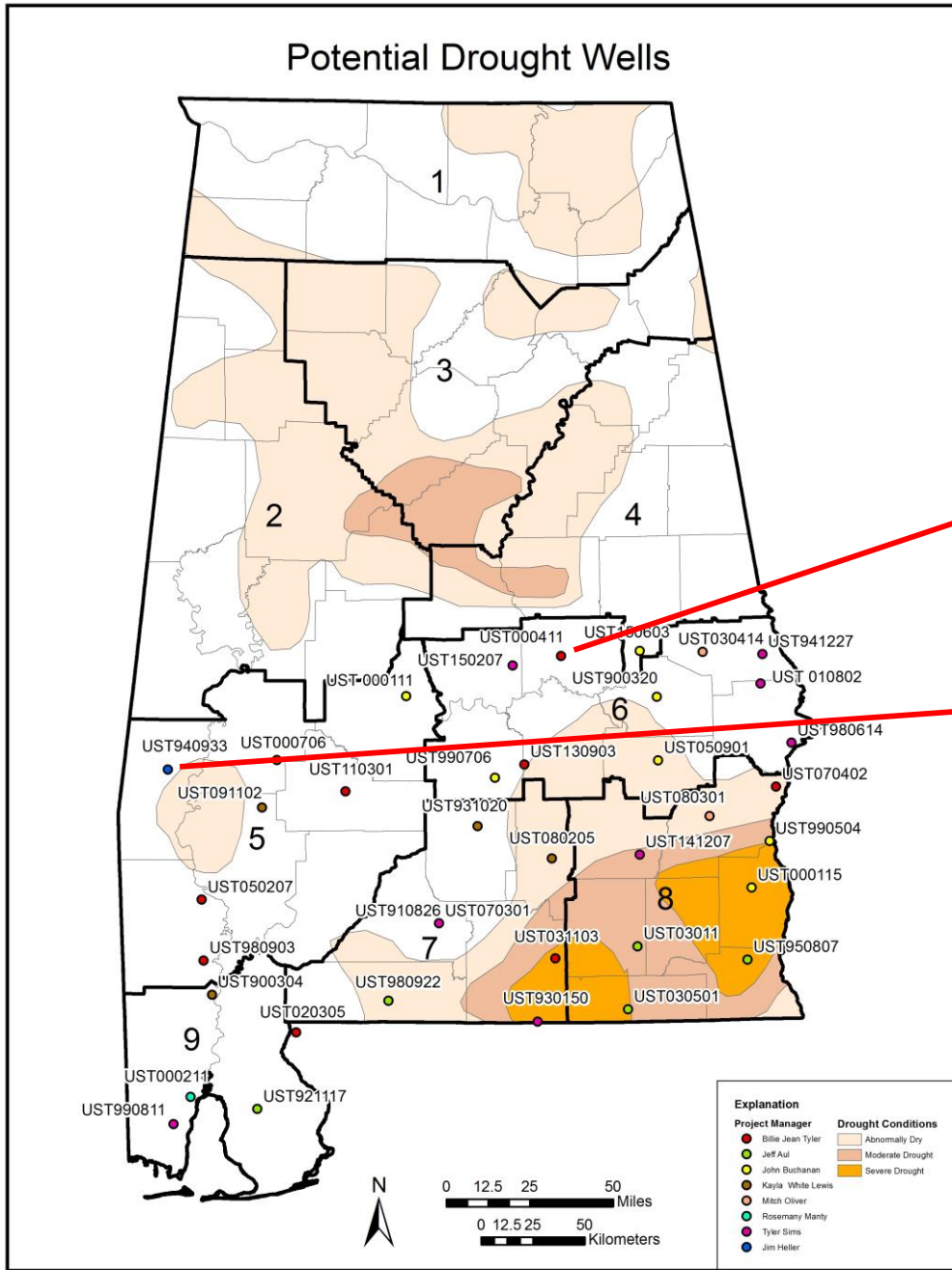


# LOOKING FOR SELECT WELLS/DATA ON PUBLIC LANDS TO EXPAND REAL-TIME NETWORK



**AL Real-Time Wells: more frequent measurements (daily averages) over a longer term, Assess shorter-term affects, seasonal variation, and long-term TRENDS**

# Potential Drought Wells

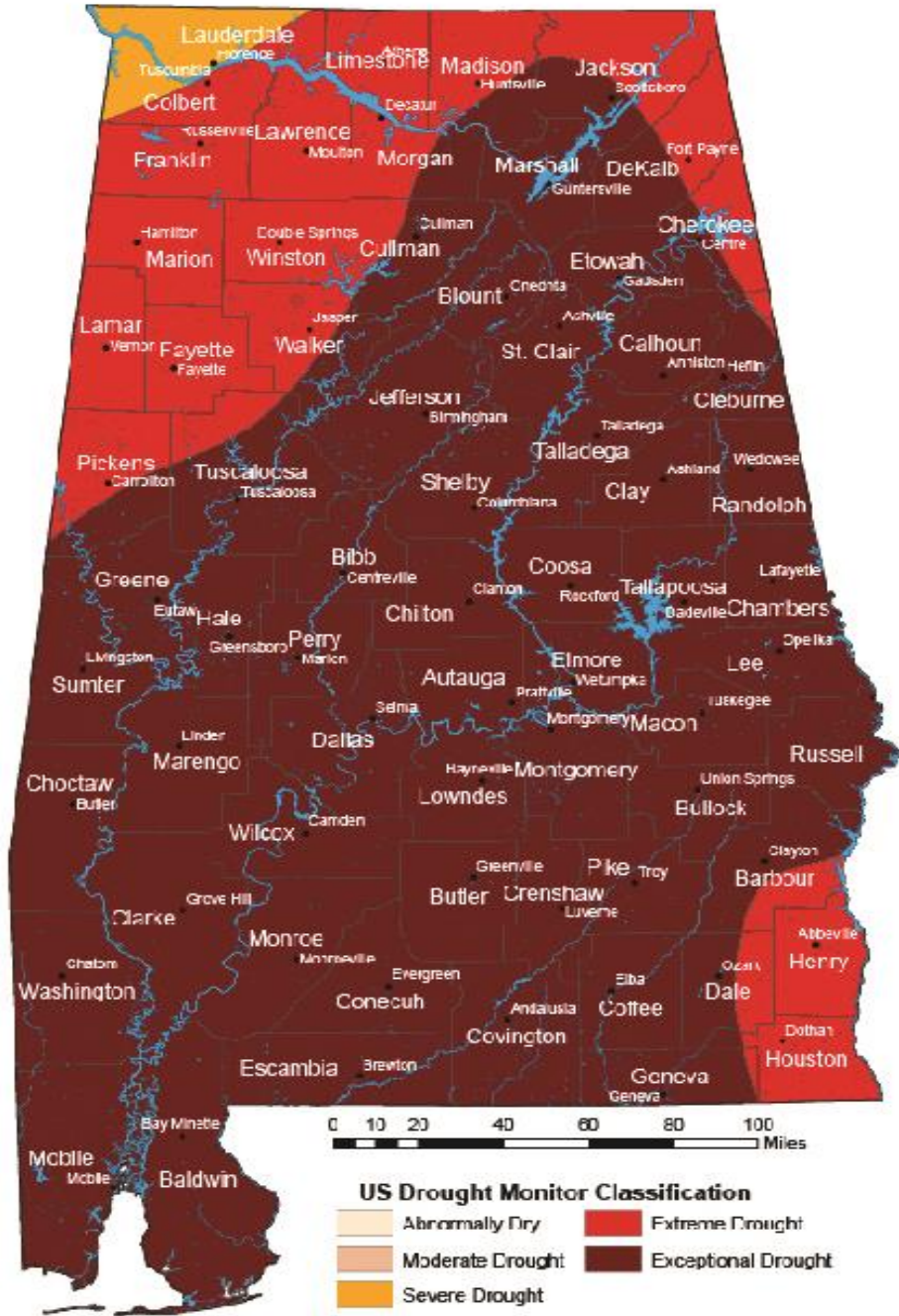


**ADEM  
UST  
Wells:  
public  
data**

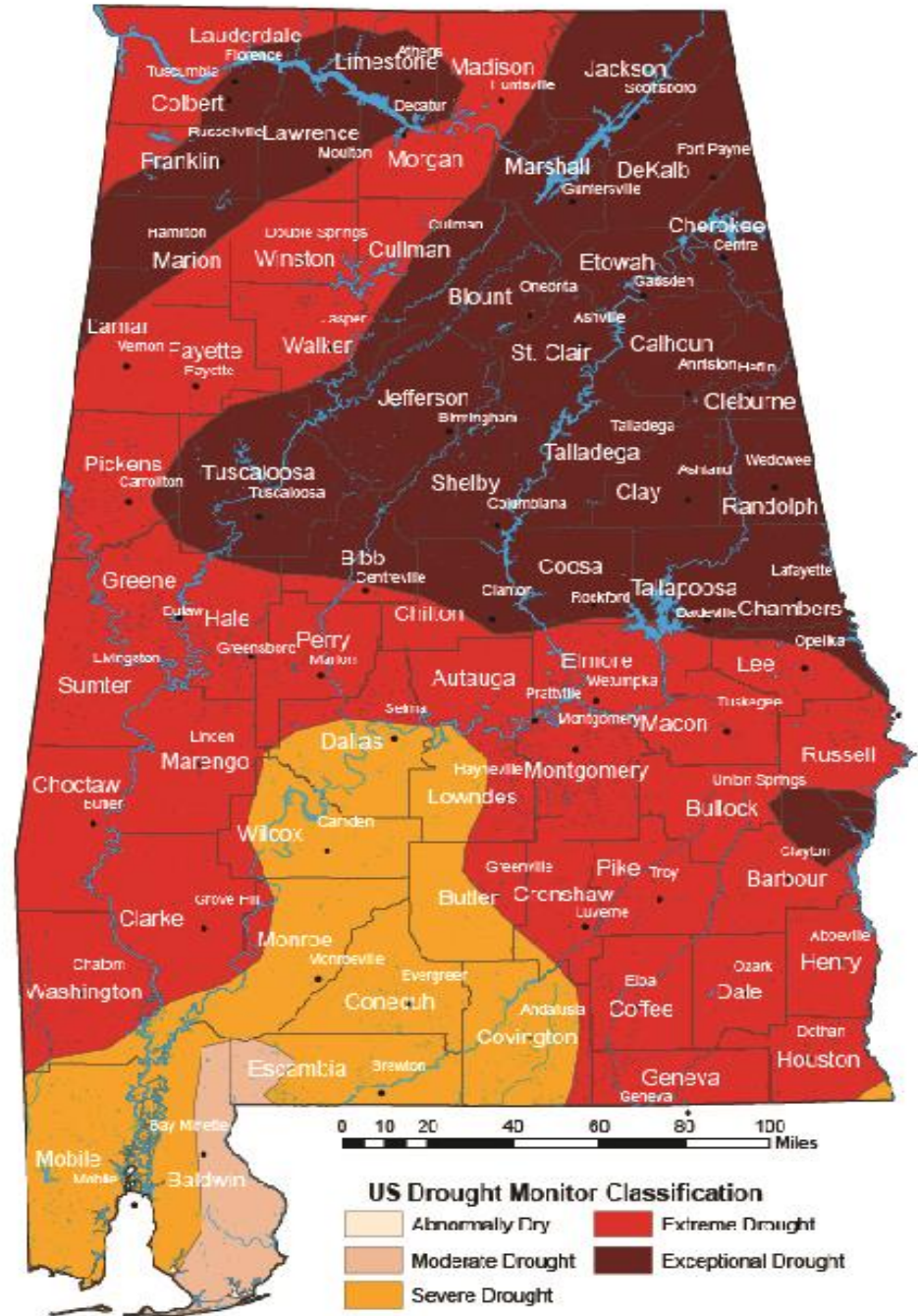




# Year 2000 Drought



# Year 2016 Drought



DROUGHT IN ALABAMA IS NOT A WATER SUPPLY PROBLEM. IT IS A WATER MANAGEMENT PROBLEM.

ALABAMA HAS ONE WATER MANAGEMENT DISTRICT IN SOUTHEAST PART OF STATE.

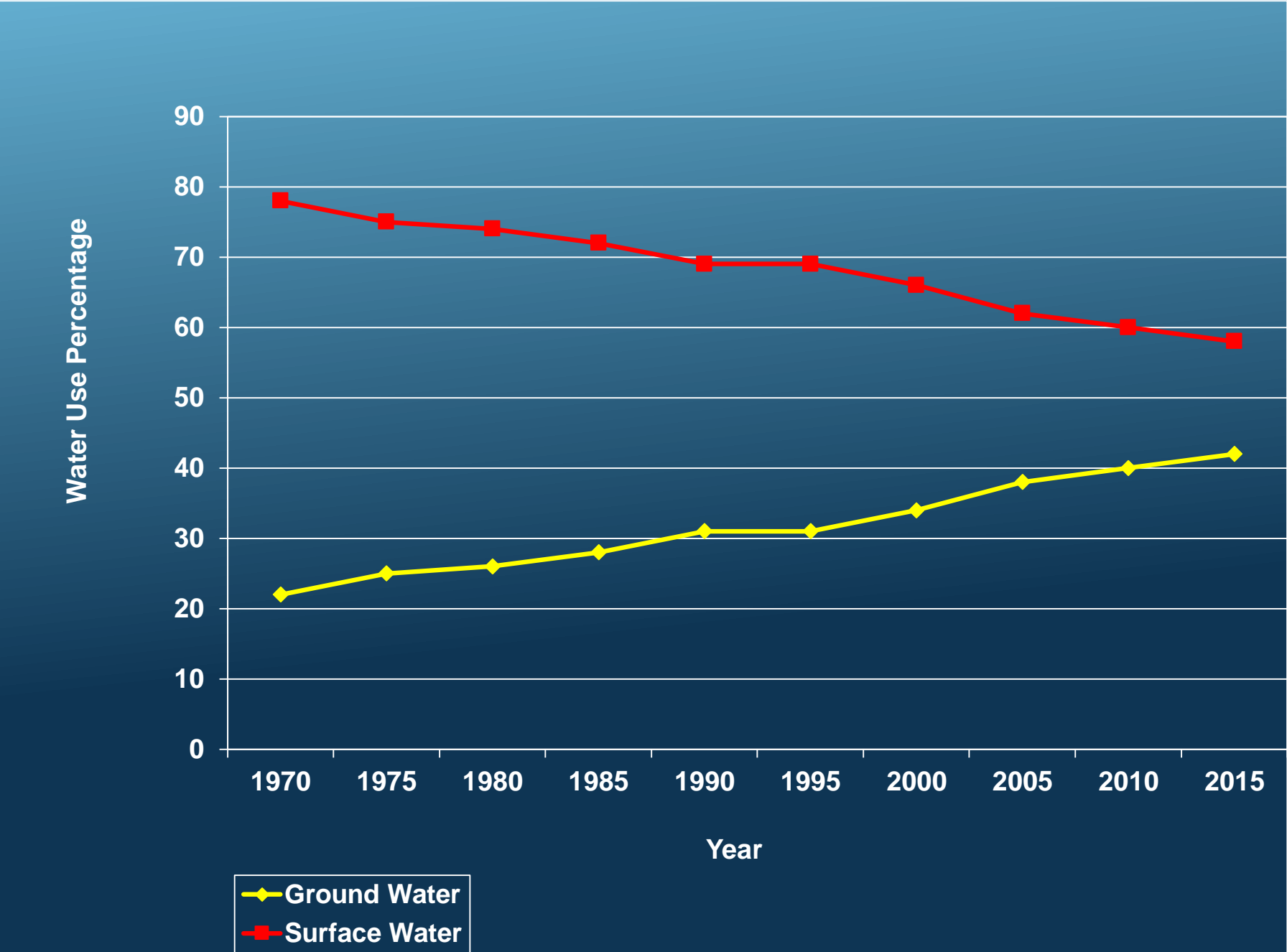
ALABAMA NEEDS TO CREATE LEGISLATION TO BECOME A REGULATED RIPARIAN STATE.

GSA'S GOAL IS TO BUILD & COMMUNICATE THE SCIENCE TO SUPPORT INFORMED SCIENCE-BASED POLICY-MAKING.

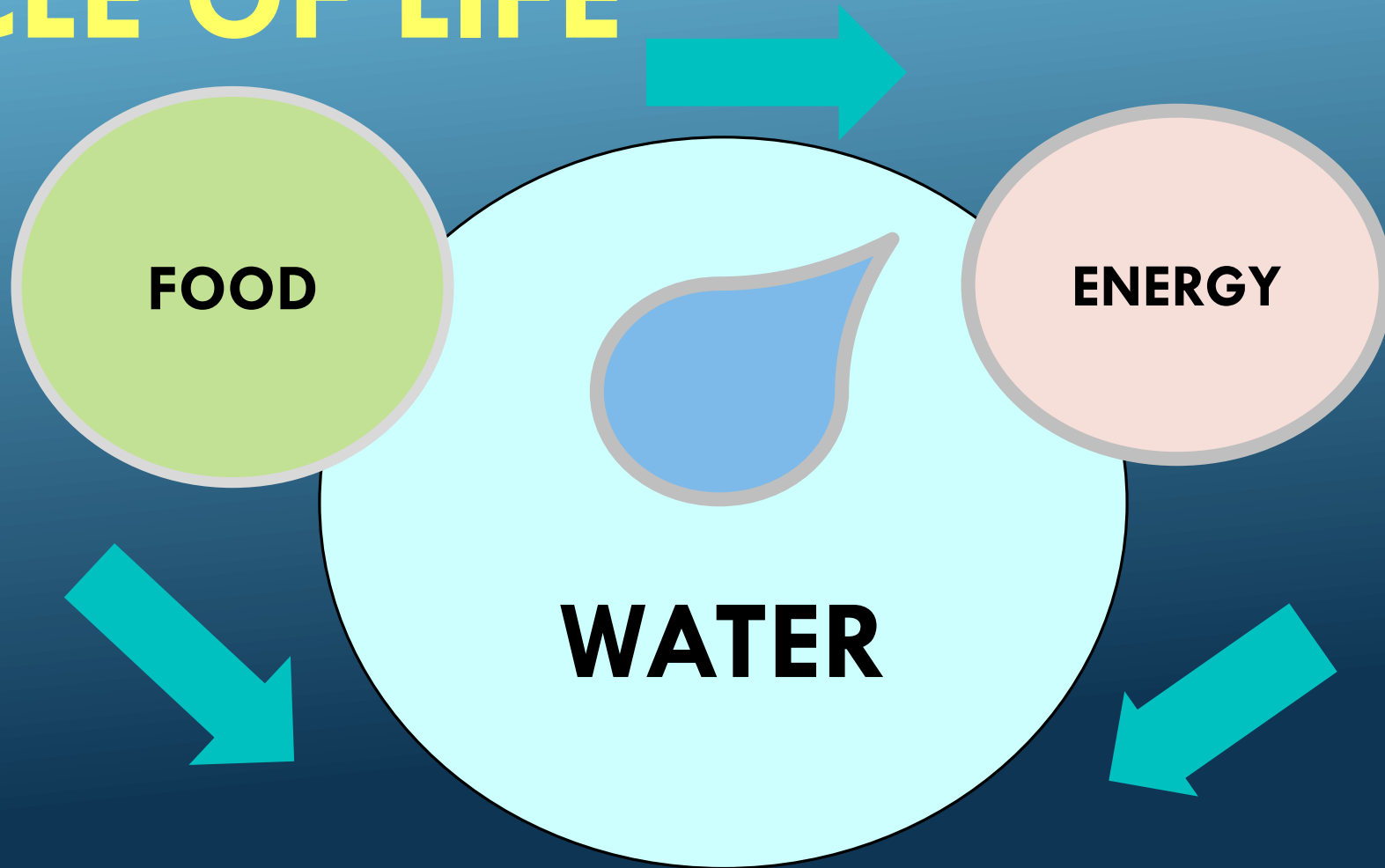
# Ground- and Surface-Water Use Percentages of Total Public Water Supply Use



Sources of water-use data,  
GSA, AOWR, USGS



# CIRCLE OF LIFE



**COMPETITION for RESOURCES: Need to Collaborate and Build Consensus**

## WRAP UP

- Alabama has water: rainfall, groundwater
- We **need to plan** for climate fluctuations.
- **Drought and flood** are big water issues **to manage**.
- In times of drought (water need), people will pump more, draining both groundwater and surface water bodies, that we know are interconnected. We want to **document connectivity with data**.
- **Water scarcity** is an issue that is **growing with the population growth**. Competition for use and legal development.

# RBDMS-Environmental: collaborate & finish strong

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**THANK YOU**

**QUESTIONS ?**