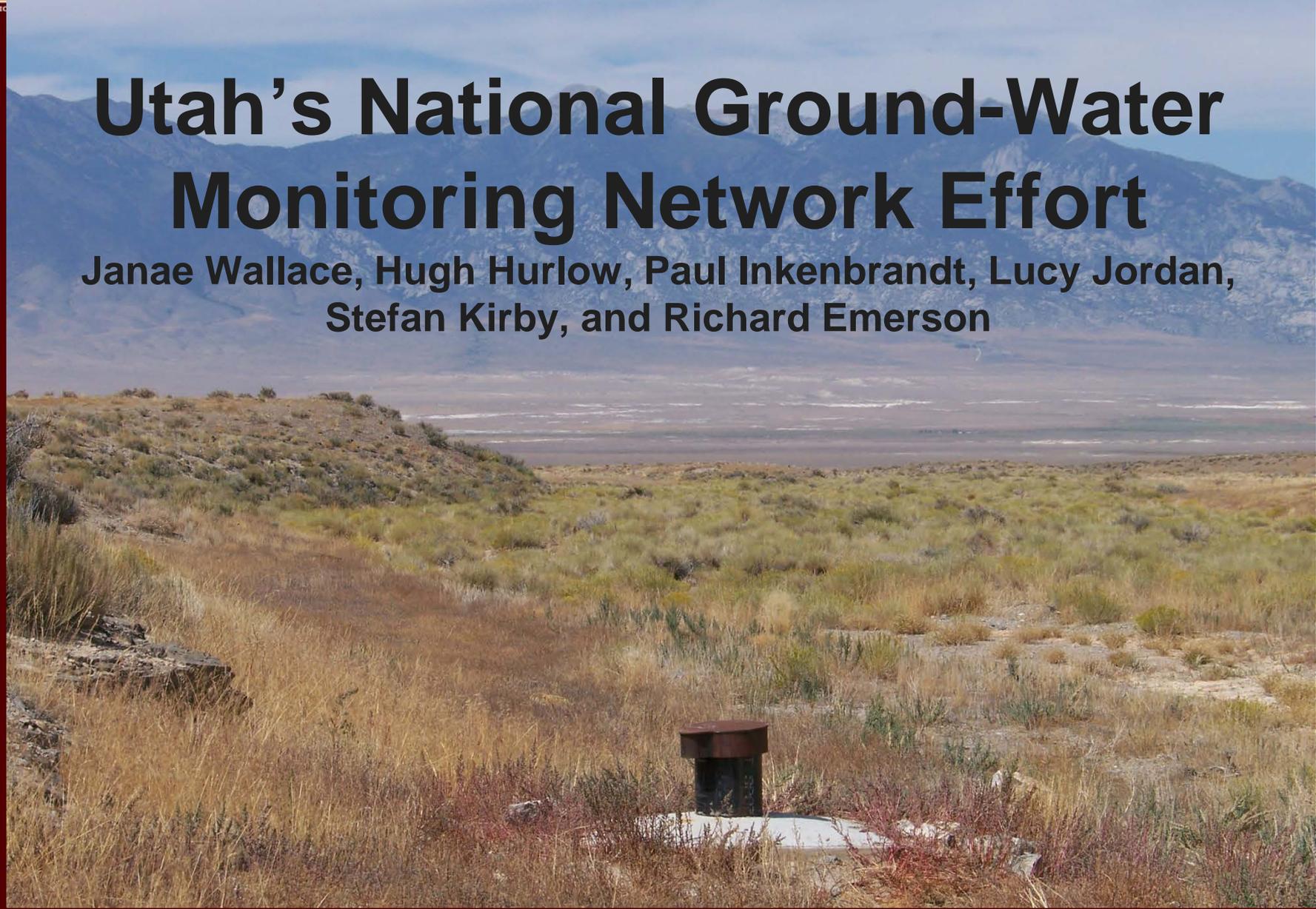


Utah's National Ground-Water Monitoring Network Effort

Janae Wallace, Hugh Hurlow, Paul Inkenbrandt, Lucy Jordan, Stefan Kirby, and Richard Emerson



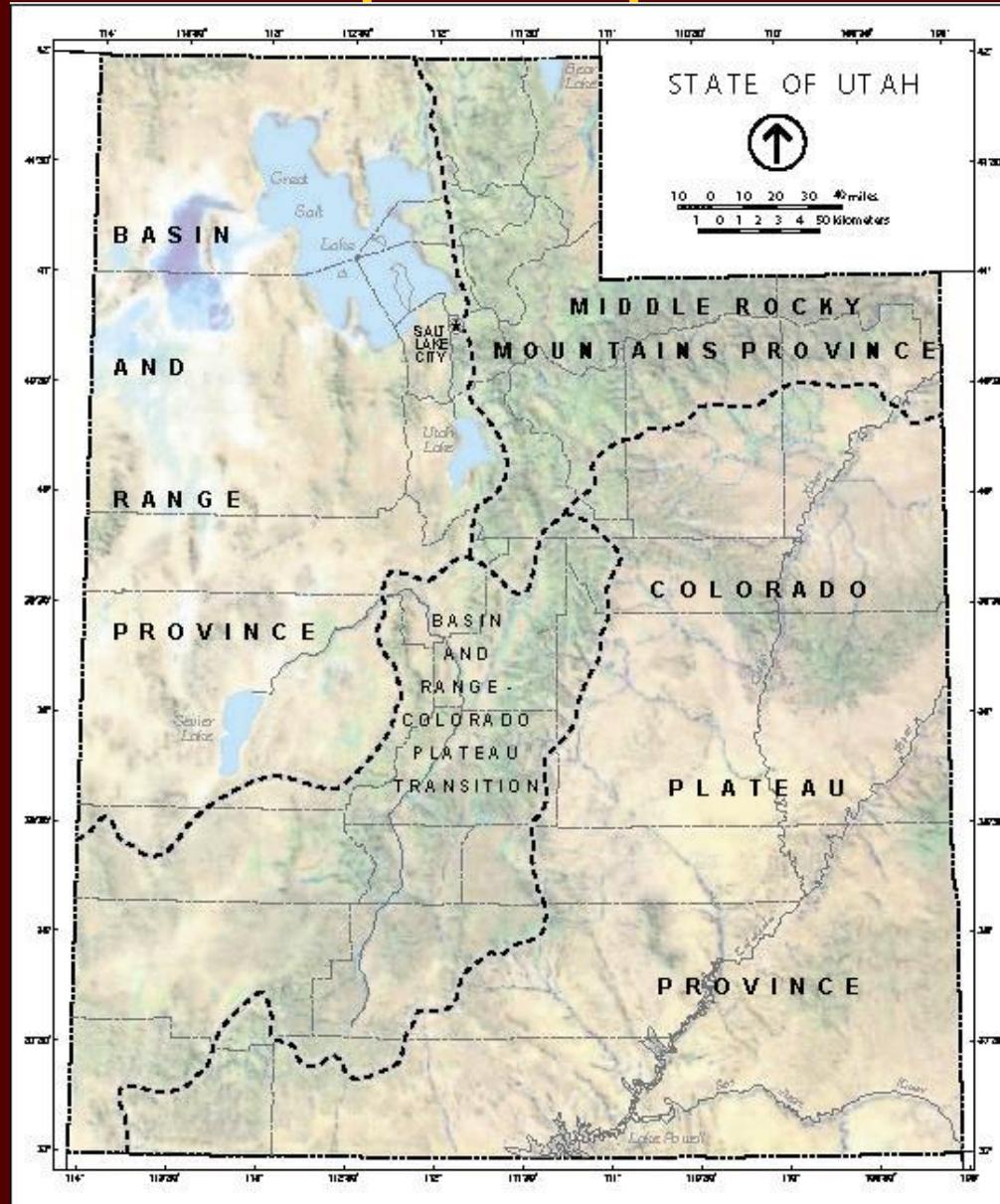
BACKGROUND

- Samplers and data collectors: 7 geologists from UGS Groundwater Group
- Data portal: 4 staff from Groundwater Group and 1 IT specialist
- Site selection – previous studies with regularly monitored wells (Snake Valley and Castle Valley; Uinta Basin); additional sites selected to fill in gaps in Utah aquifers and geographically, most previously sampled wells from prior research
- Financial support of lab analysis by U.S. EPA

Selection Criteria

- USGS Principle Aquifer (e.g., Basin & Range Carbonate, Basin Fill, Colorado Plateau, Middle Rocky Mountains, and local aquifers)- wells and springs
- Prior Sampling Data augmented by new sites
- Accessibility
- Geographic Spread
- Aquifer Importance

USGS Principal Aquifers in Utah



UGS network and goals

under development*

- Consists of ~100 sites of wells and springs
- Samples are collected April through October for chemistry analyzed by EPA Region 8 Lab for anions, cations, ammonia (earlier nitrate, no longer)
- Some sites have stable isotope data
- Maintain a trend network for the lifetime of the Portal, filling in gaps if/where a site is no longer viable for sampling

Progress Report

- How UGS uses data from our network- establishes baseline for future studies; used to advise regulatory sister agencies
- How UGS has used chemistry data to help management questions- e.g., septic tank density maps; groundwater quality classification maps

Progress Report

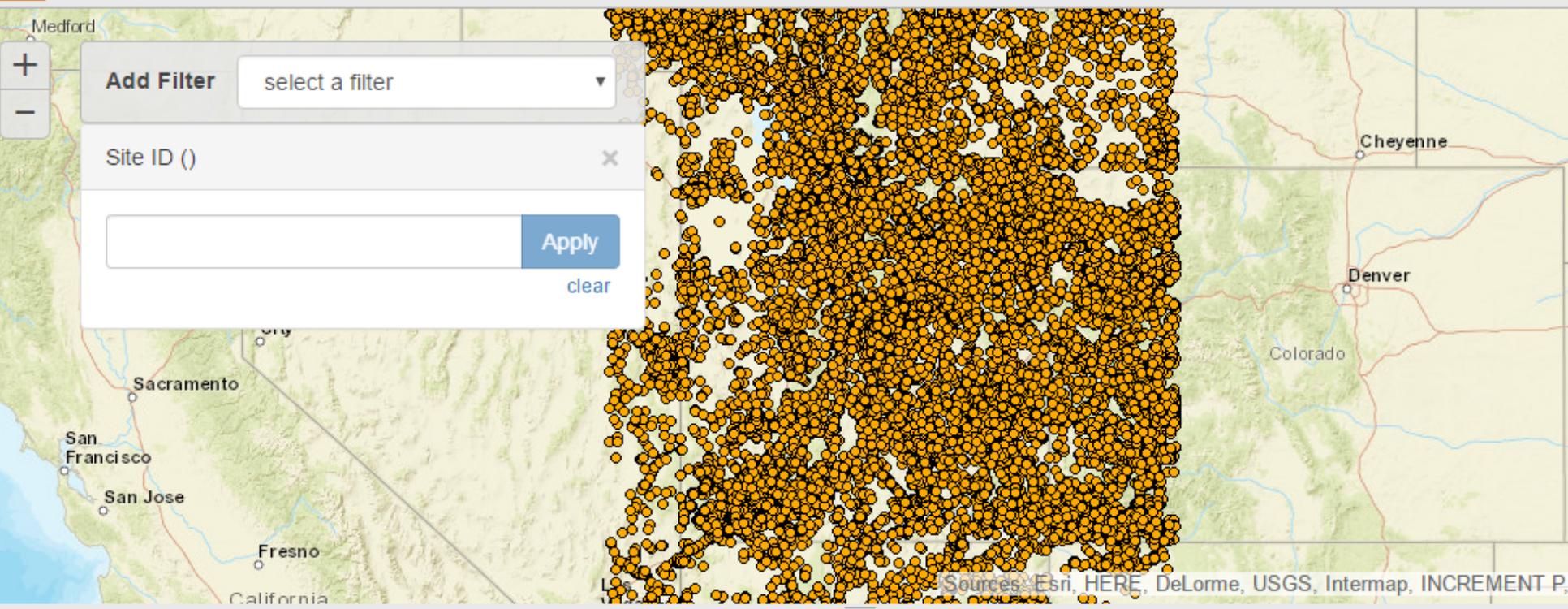
- UGS history of NGWMN participation- began sampling statewide 2014, 3 seasons collecting samples, 2 years of data on Portal, this year pending EPA data analysis
- Differences between UGS and NGWMN data collection protocols- we follow the SOGW protocol as outlined in the Framework Document (approved QAPP by EPA)

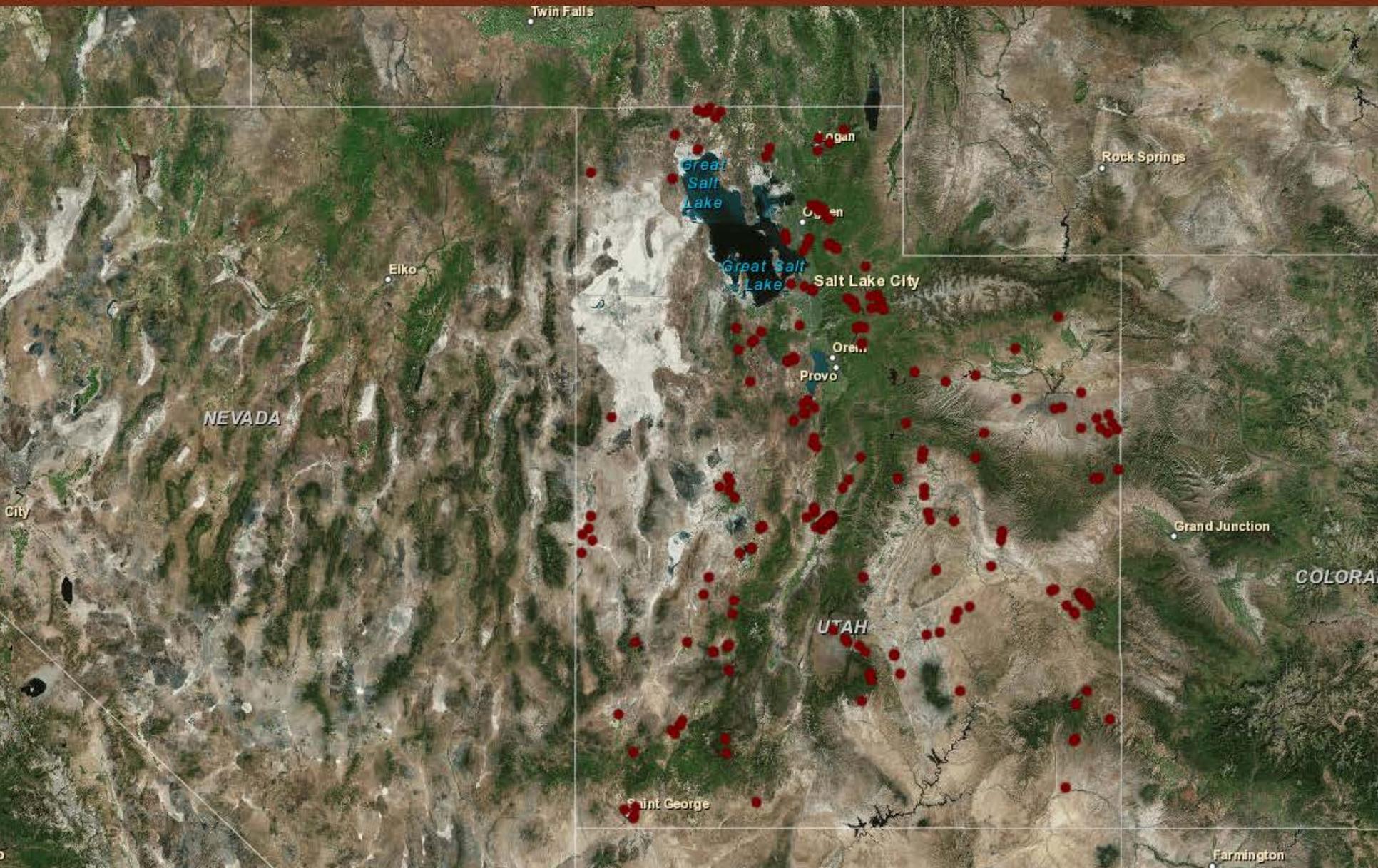
Progress Report

- Other data we show on our website- All Snake valley data (water level, transducer info hourly; water quality app <http://geology.utah.gov/apps/waterchem/>)
- Current NGWMN projects that enhance the network –Groundwater and Streamflow Information Program (Round I and II) continuing data flow to the Portal



Utah Water Chemistry Database 1.1.0

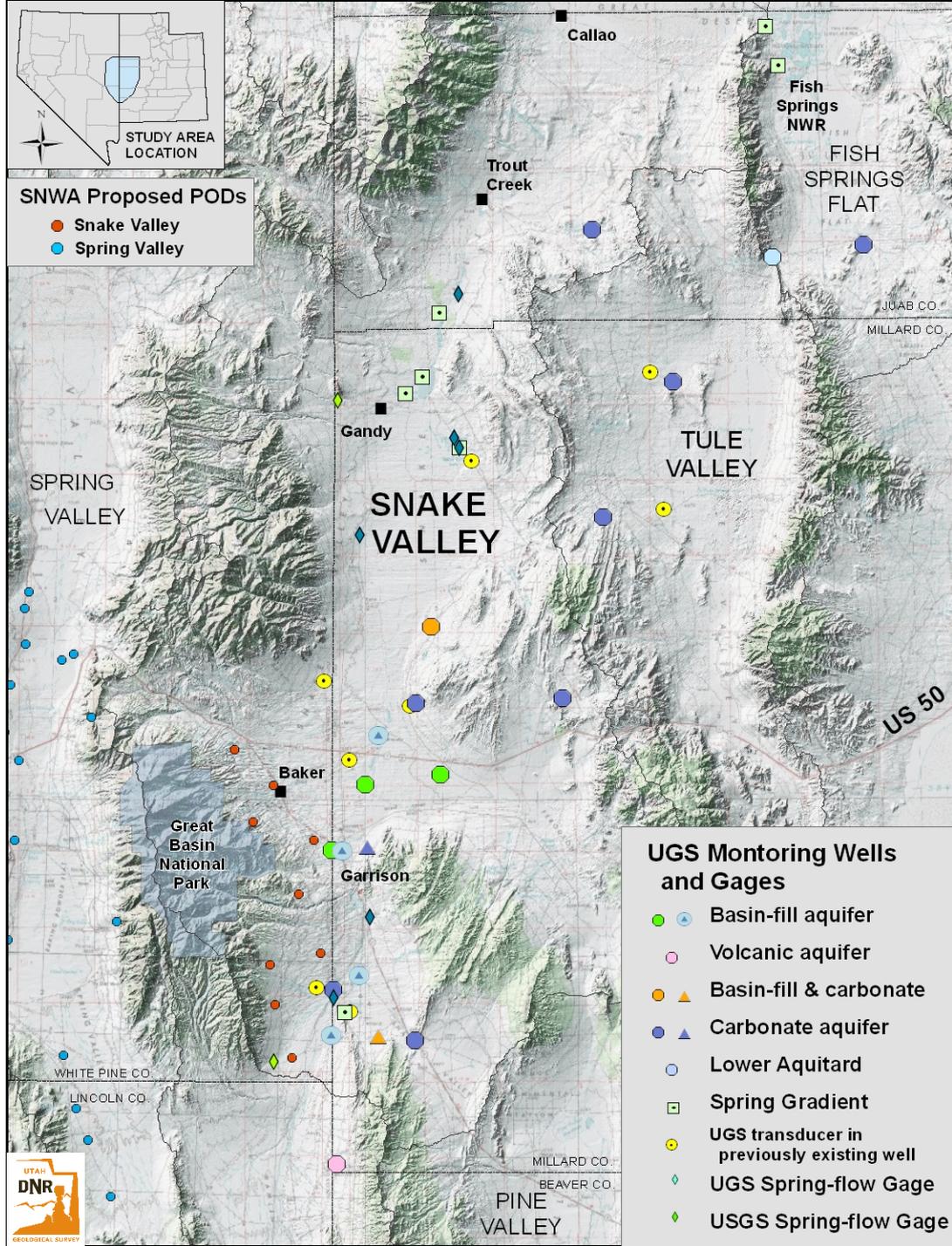






SNWA Proposed PODs

- Snake Valley
- Spring Valley



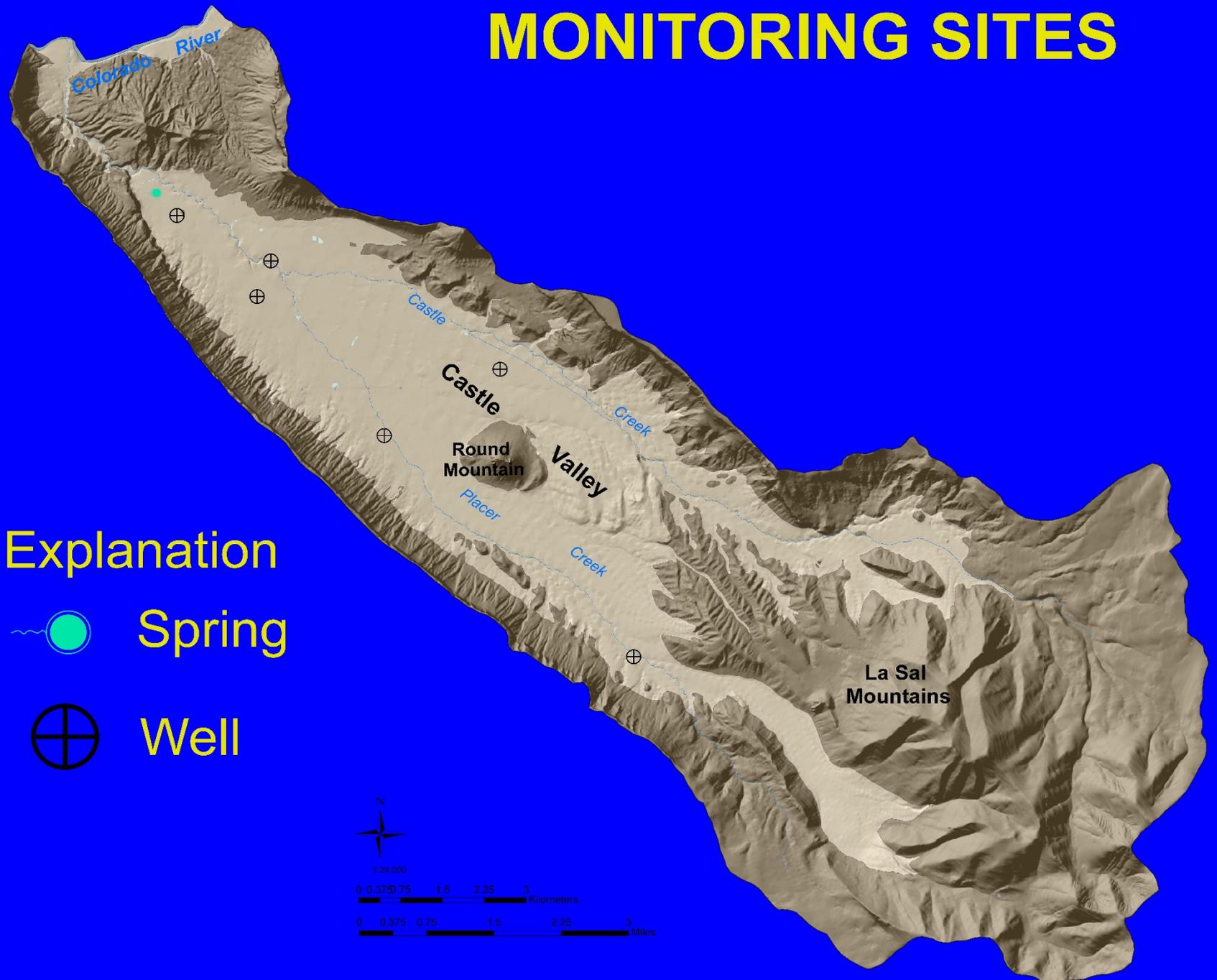
UGS Montoring Wells and Gages

- Basin-fill aquifer
- Volcanic aquifer
- Basin-fill & carbonate
- Carbonate aquifer
- Lower Aquitard
- Spring Gradient
- UGS transducer in previously existing well
- ◆ UGS Spring-flow Gage
- ◆ USGS Spring-flow Gage

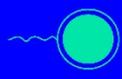




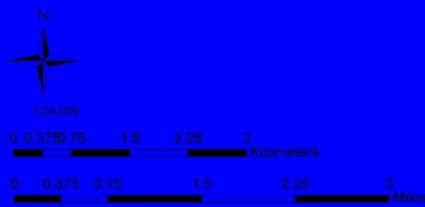
MONITORING SITES



Explanation

 Spring

 Well





Explanation

Total Dissolved Solids

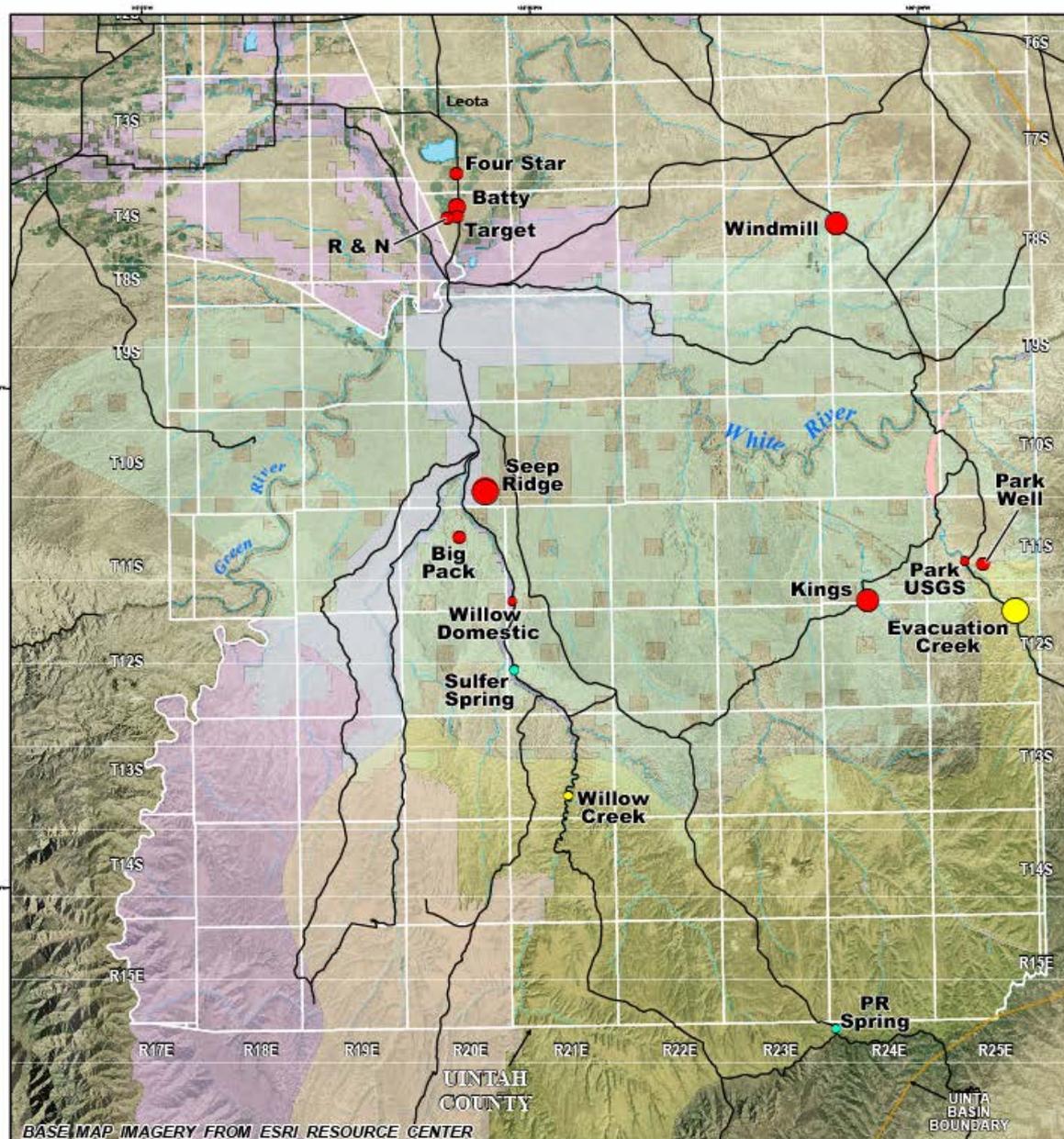
- well ● spring ● creek
- 0 - 1000 mg/L
- 1001 - 1500 mg/L
- 1501 - 2000 mg/L
- 2001 - 2500 mg/L
- 2501 mg/L or greater
- Uinta Basin Boundary
- ~ River
- ~ Roads
- Water Body
- Douglas Creek Aquifer
- Birds Nest Aquifer
- BLM UT (oil shale lease area)
- Tribal Lands



Location Map



UGS 2009 TDS DATA IN THE UINTA BASIN



Sample sites for data collected during spring of 2009

USGS Monitor well 1970s-Uinta Basin

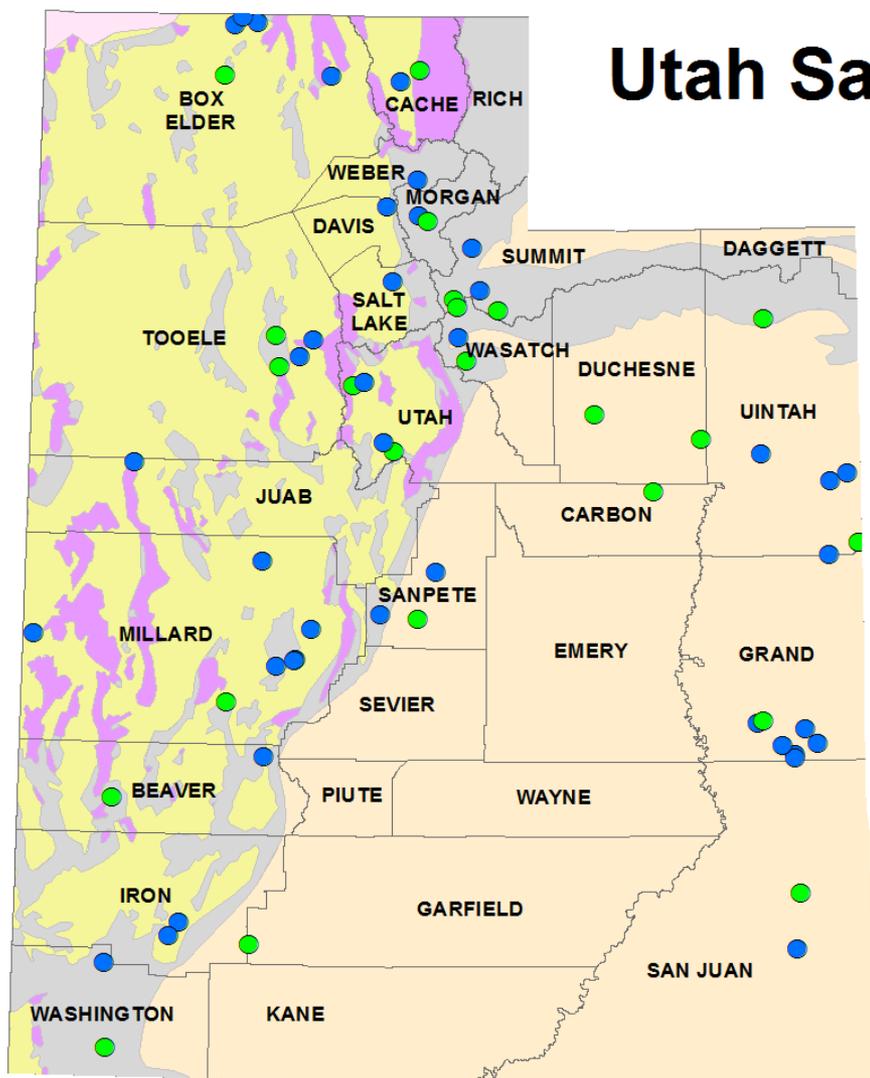




SITE STATISTICS-2014

- 40 wells
- 23 springs
- 2 Carbonate Aquifer
- 23 Basin and Range
- 21 Colorado Plateau
- 17 transition zone and other

Utah Sample Sites NGWMN 2014

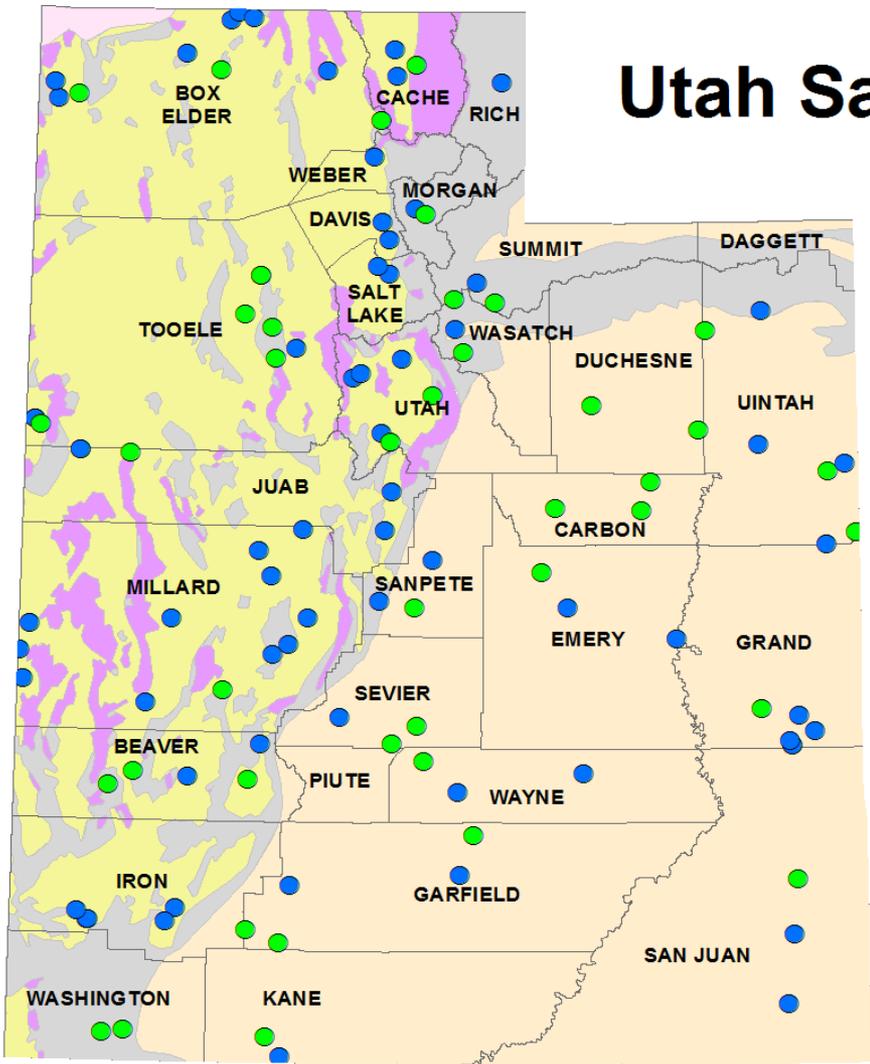


- Spring (23)
- Well (40)

NAWQA Aquifer

- Colorado Plateaus aquifers
- Basin and Range basin-fill aquifers
- Basin and Range carbonate-rock aquifers
- Other rocks
- Pacific Northwest basin-fill aquifers

Utah Sample Sites NGWMN 2015



- Spring (42)
- Well (68)

NAWQA Aquifer

- Colorado Plateaus aquifers
- Basin and Range basin-fill aquifers
- Basin and Range carbonate-rock aquifers
- Other rocks
- Pacific Northwest basin-fill aquifers

SITE STATISTICS-2015

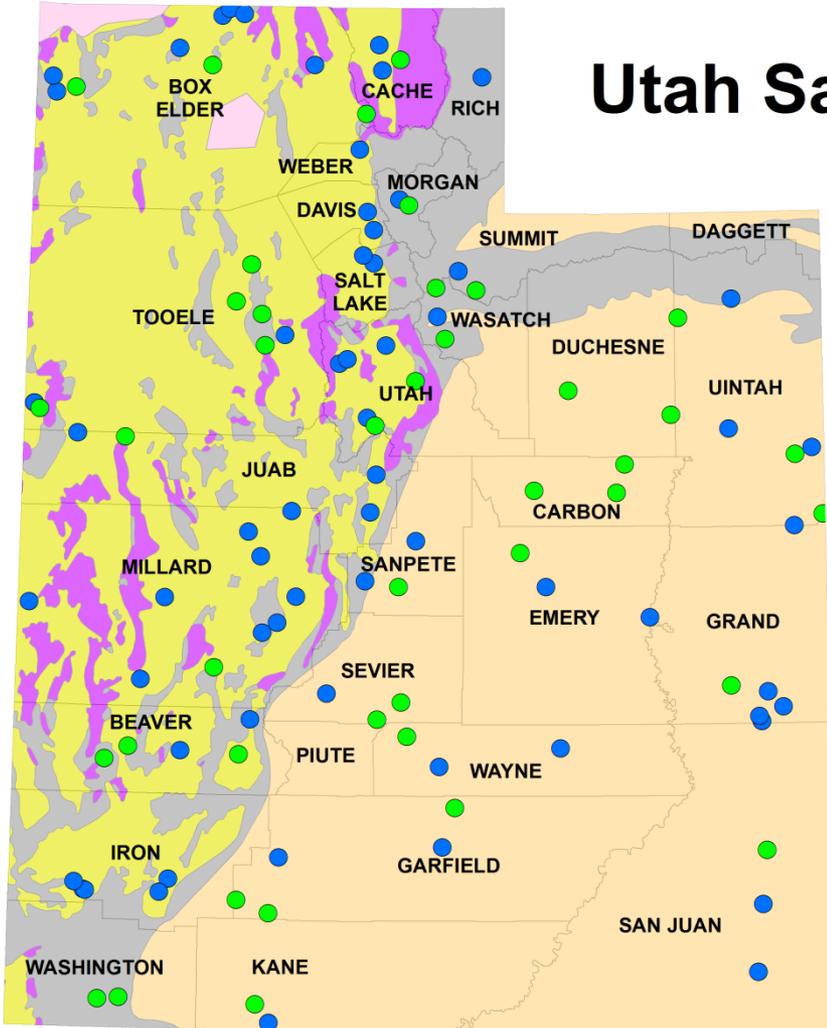
- 68 wells
- 42 springs
- 2 Carbonate Aquifer
- 52 Basin and Range
- 39 Colorado Plateau
- 17 transition zone and other



SITE STATISTICS-2016

- 68 wells
- 42 springs
- 2 Carbonate Aquifer
- 52 Basin and Range
- 39 Colorado Plateau
- 17 transition zone and other

Utah Sample Sites NGWMN 2016



● Spring (42)

● Well (68)

NAWQA Aquifer

- Colorado Plateaus aquifers
- Basin and Range basin-fill aquifers
- Basin and Range carbonate-rock aquifers
- Other aquifers
- Pacific Northwest basin-fill aquifers

TASKS 2015-2016

triggered by USGS funding

- QAPP establishment (adopted and modified from previous UGS investigations)
- Added sites to those collected in 2014
- Develop and maintain database
- Flow of UGS water quality data to NGWMN



STATUS –data transfer

- Our stations are uploaded into the NGWMN (portal)
- QA/QC our station list to remove misplaced points, duplicate sites, and inactive stations
- Some stations still have to be added as we continue monitoring
- Elevation and coordinates should be updated for the stations
- Well maintenance via periodic pumping wells (Snake Valley, Uinta Basin, Castle Valley)

Castle Valley





National Ground-Water Monitoring Network

NGWMN NETWORKS

Water level:

- Subnetwork:
- All
 - Background
 - Suspected Changes
 - Documented Changes

Monitoring Category:

- All
- Surveillance
- Trend
- Special

Water quality:

- Subnetwork:
- All
 - Background
 - Suspected Changes
 - Documented Changes

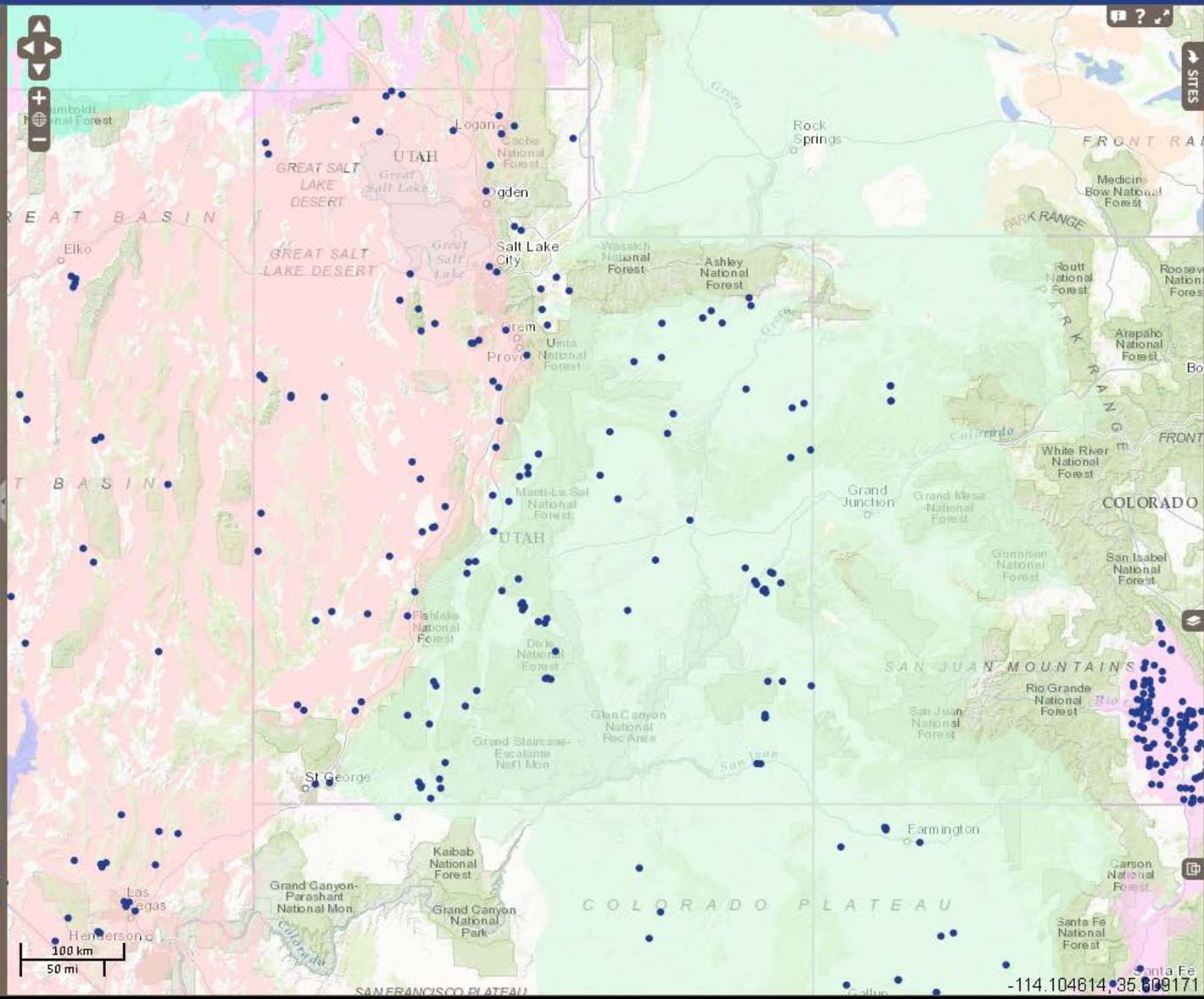
Monitoring Category:

- All
- Surveillance
- Trend
- Special

>>> FILTER MAP DATA

CURRENT STATUS

318 Sites mapped
 4269 Sites matching filter
 237 Water-level network wells
 108 Water-quality network wells



SITES

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QUESTIONS?

- <http://geology.utah.gov/apps/waterchem/>

