Mapping the base of the moderately saline aquifer

moderately saline water

3,000 to 10,000 mg/l TDS
(total dissolved solids)

Rw ~2.1 to 0.66 (NaCl) @ 68°

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Consulting Geologist
Contractor

Main Task

- Re-map the base of the moderately saline aquifer in the Uinta Basin, Utah

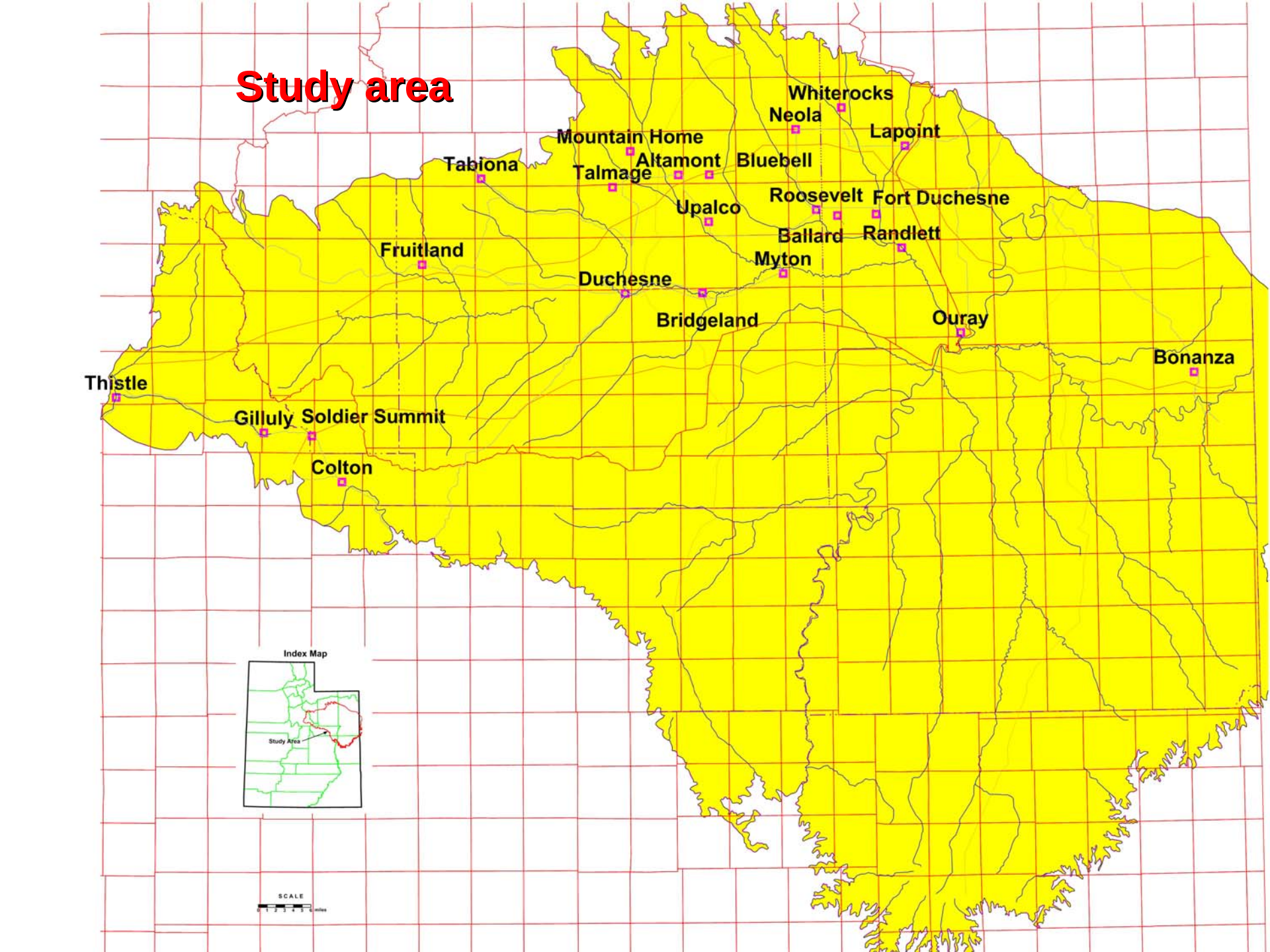
Why?

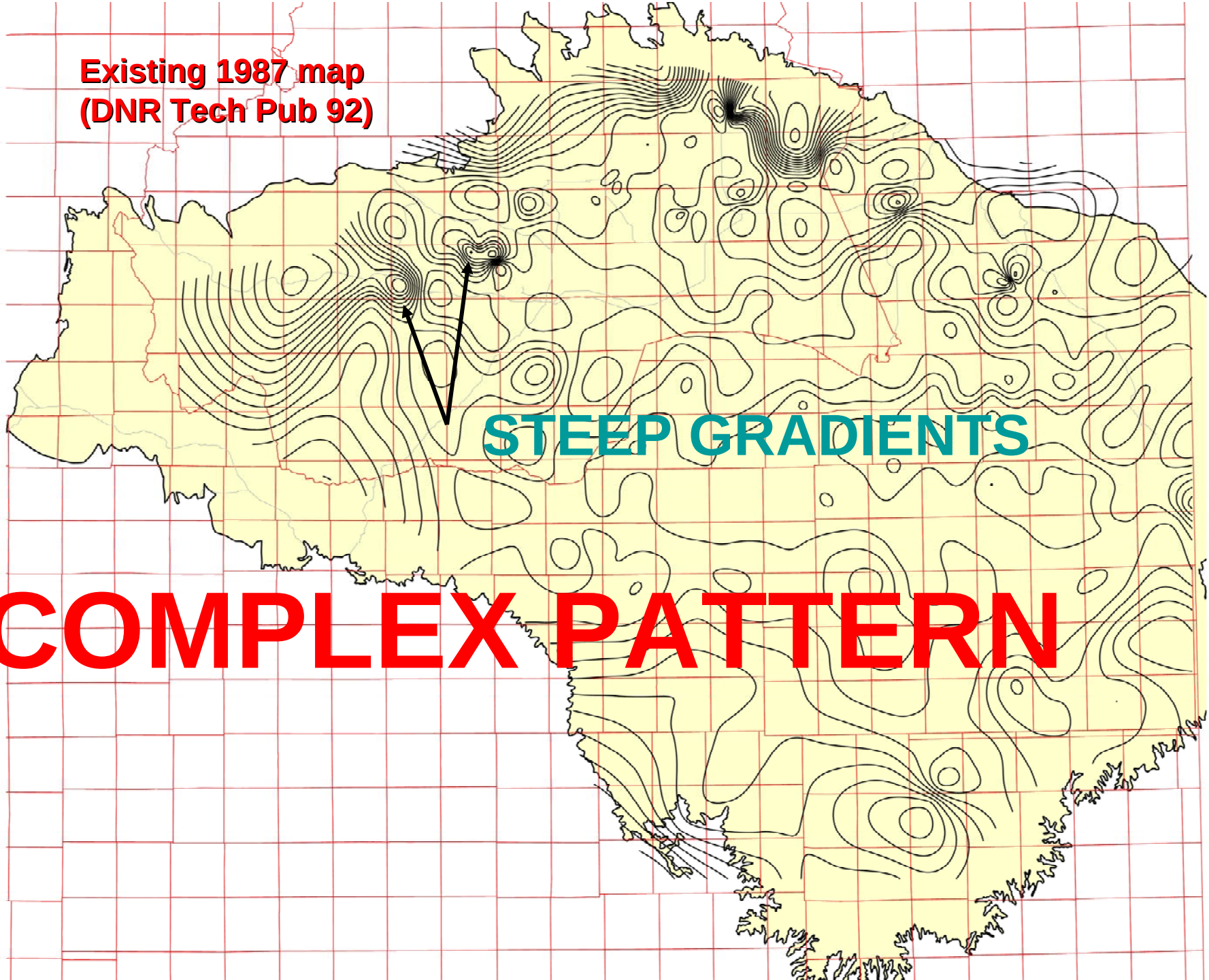
New drilling - improved mapping accuracy

New water quality data

New zones for water disposal

Detect water quality changes through time


Study area
Whiterocks
Neola
Lapoint
Mountain Home
Altamont
Bluebell
Tabiona
Talmage
Roosevelt
Fort Duchesne
Upalco
Ballard
Randlett
Fruitland
Myton
Duchesne
Bridgeland
Ouray
Bonanza
Thistle
Gilluly
Soldier Summit
Colton
Index Map
Study Area
SCALE

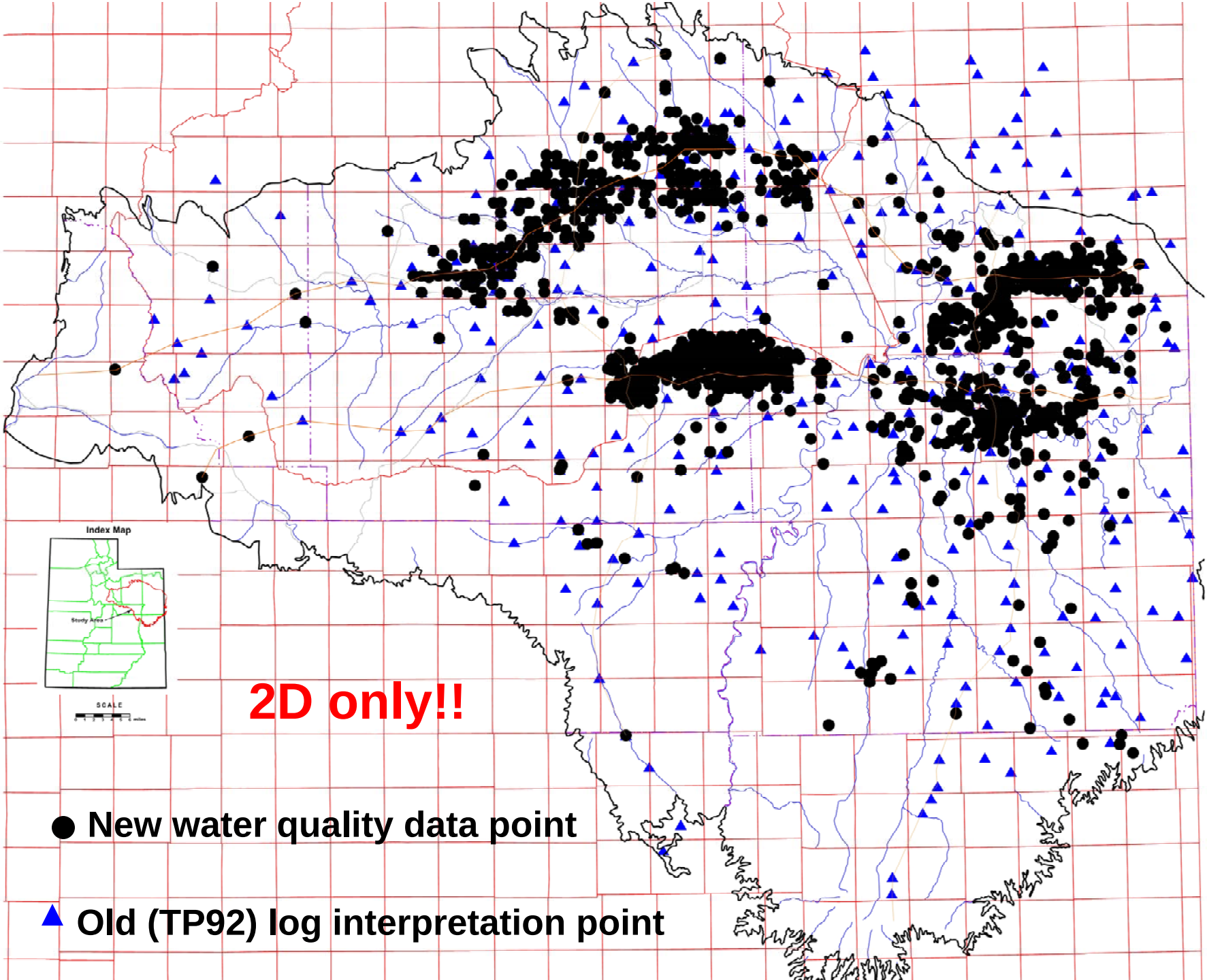

Existing 1987 map
(DNR Tech Pub 92)
STEEP GRADIENTS
COMPLEX PATTERN

Methods

- Integrate old data into digital databases

- Compile water analyses of formation water

- Map water data


Index Map
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2D only!!
New water quality data point
Old (TP92) log interpretation point

Methods

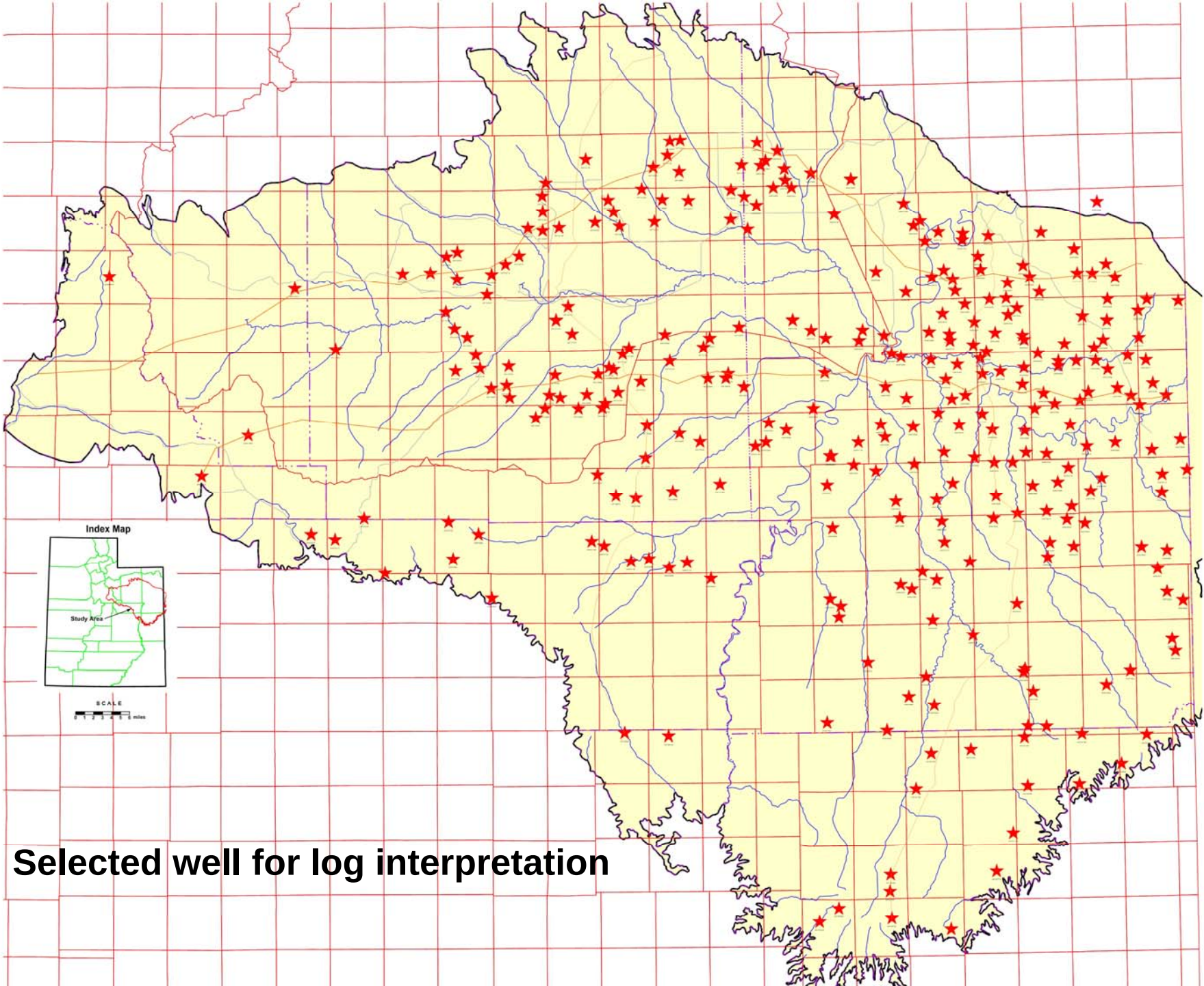
- Integrate old data into digital databases

- Compile water analyses of formation water

- Map water data

- Map boundary of object aquifer using geophysical logs / calculate Rw

  · Select wells for analysis



★ **Selected well for log interpretation**

Methods

- Integrate old data into digital databases

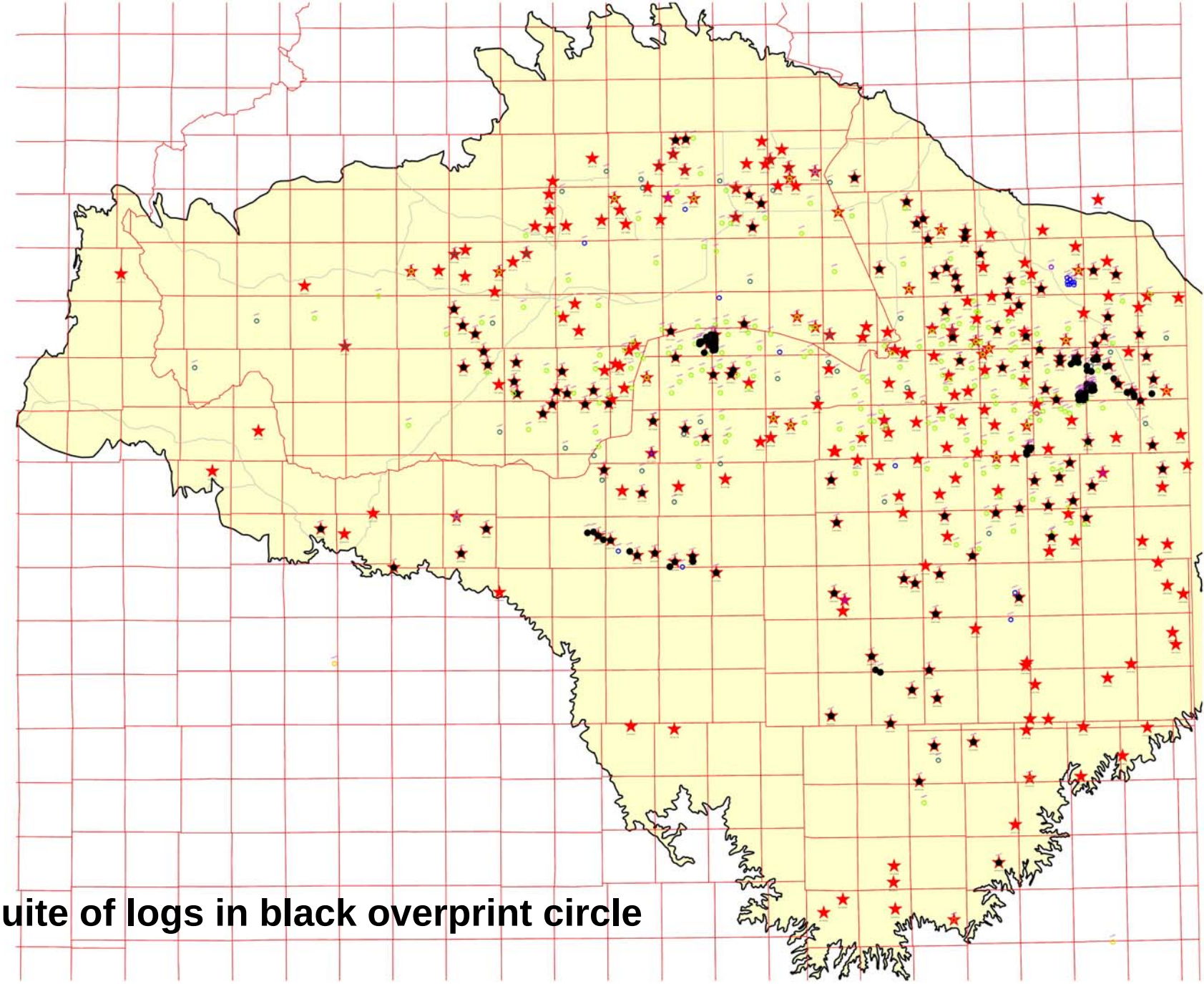
- Compile water analyses of formation water

- Map water data

- Map boundary of object aquifer using geophysical logs / calculate Rw

  · Select wells for analysis

  · Collect LAS logs and/or digitize logs



Full suite of logs in black overprint circle

Methods

- Integrate old data into digital databases

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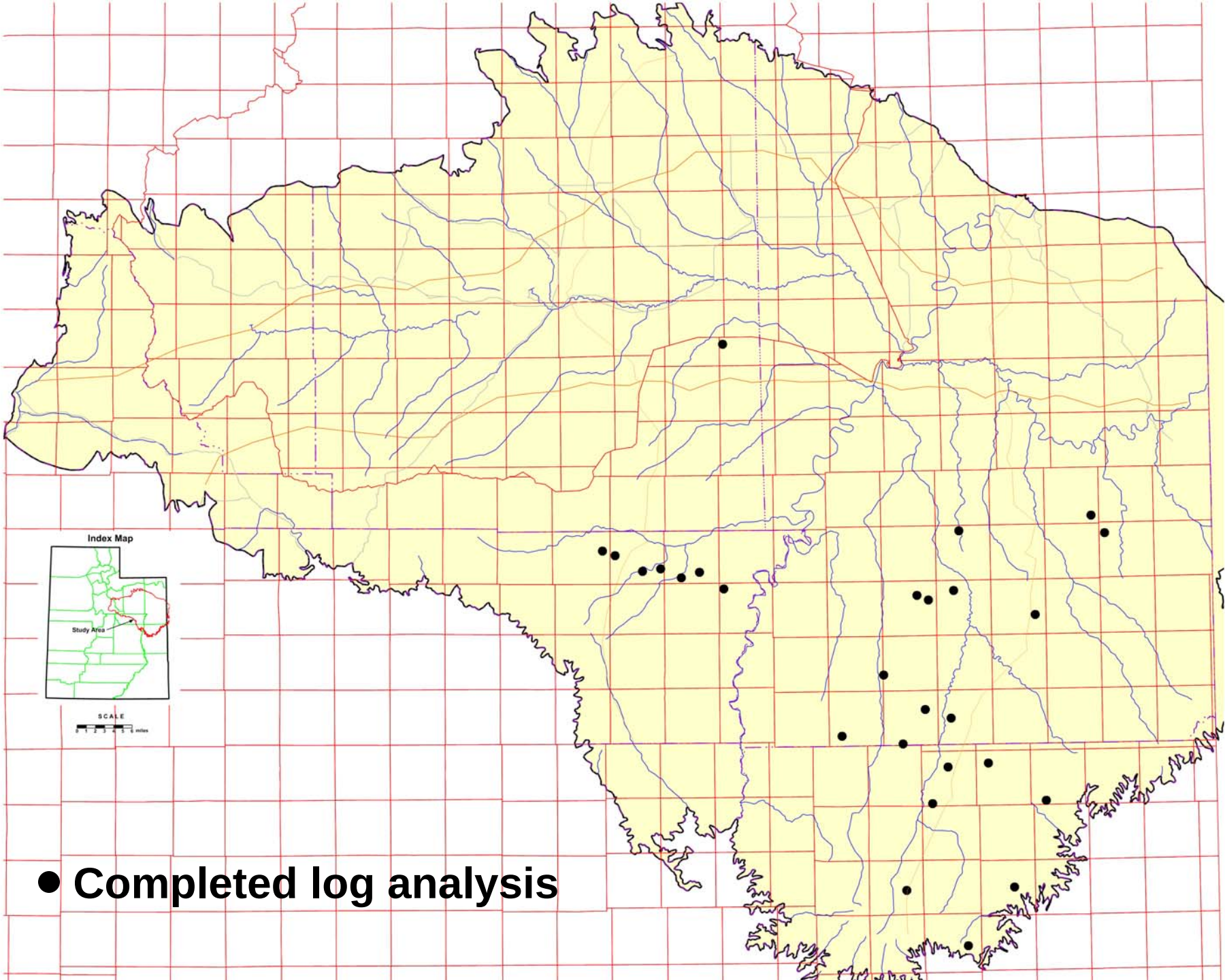
  · Select wells for analysis

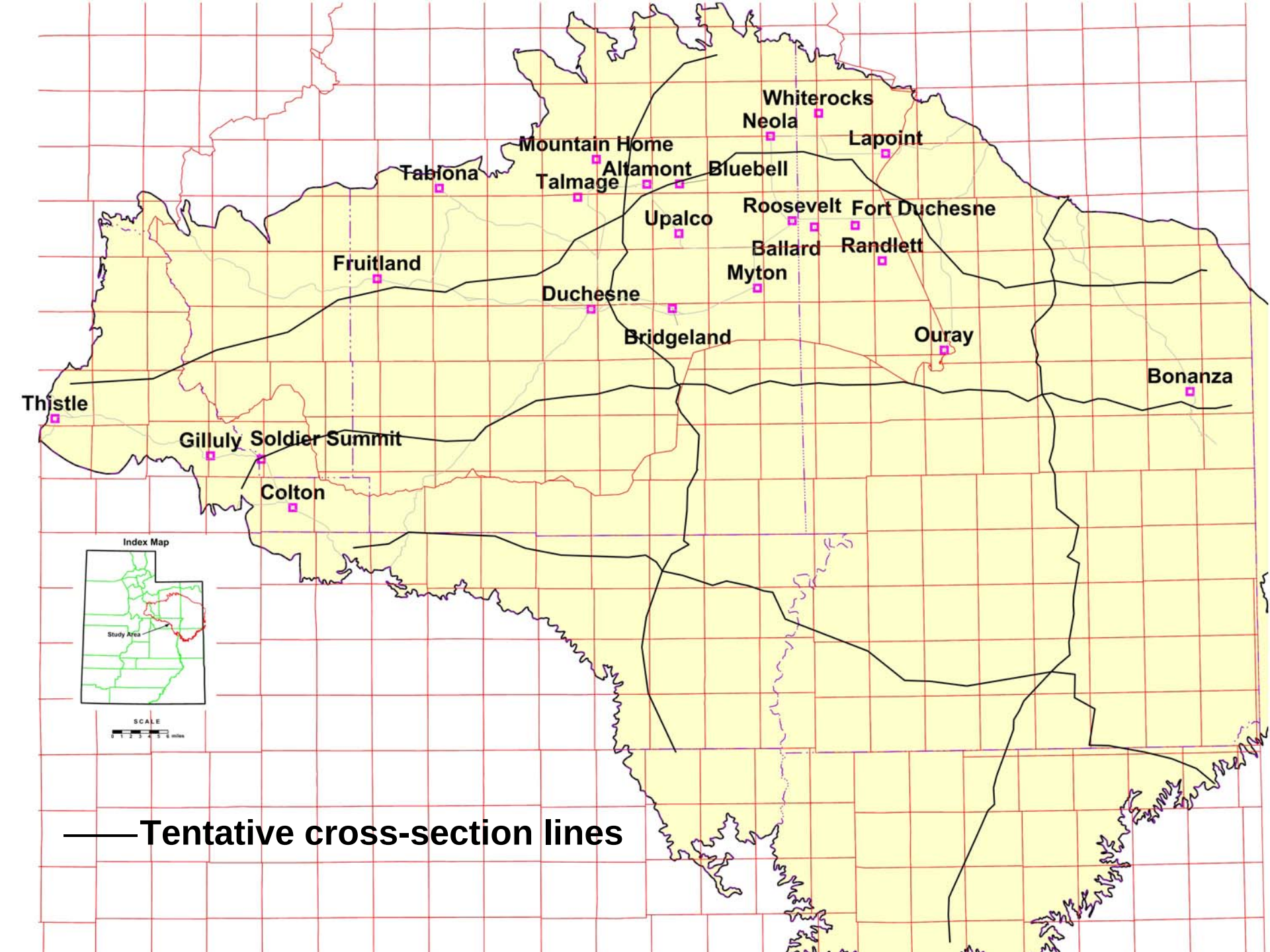
  · Collect LAS logs and/or digitize logs

  · Log interpretation



- **Completed log analysis**

- Integrate water chemistry data into log interpretation
- Construct databases
- Integrate more geology into the product by building geologic cross sections - adding the third dimension.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——Tentative cross-section lines

Deliverables

- Database of log interpretation parameters and water quality information

- New map of the base of the moderately saline aquifer – elevation and depth

- Geologic cross sections showing the saline water transition with identified seals and disposal zones

- Comparative study to evaluate the changes in the aquifer transition over the last 20 years – net change map

How can you help?

Glad you asked!!

- Formation water analyses:

  DST, IP tests, production water
- LAS logs
- Rw values for fields, areas, formations
- Tips and pitfalls in log analysis you can share