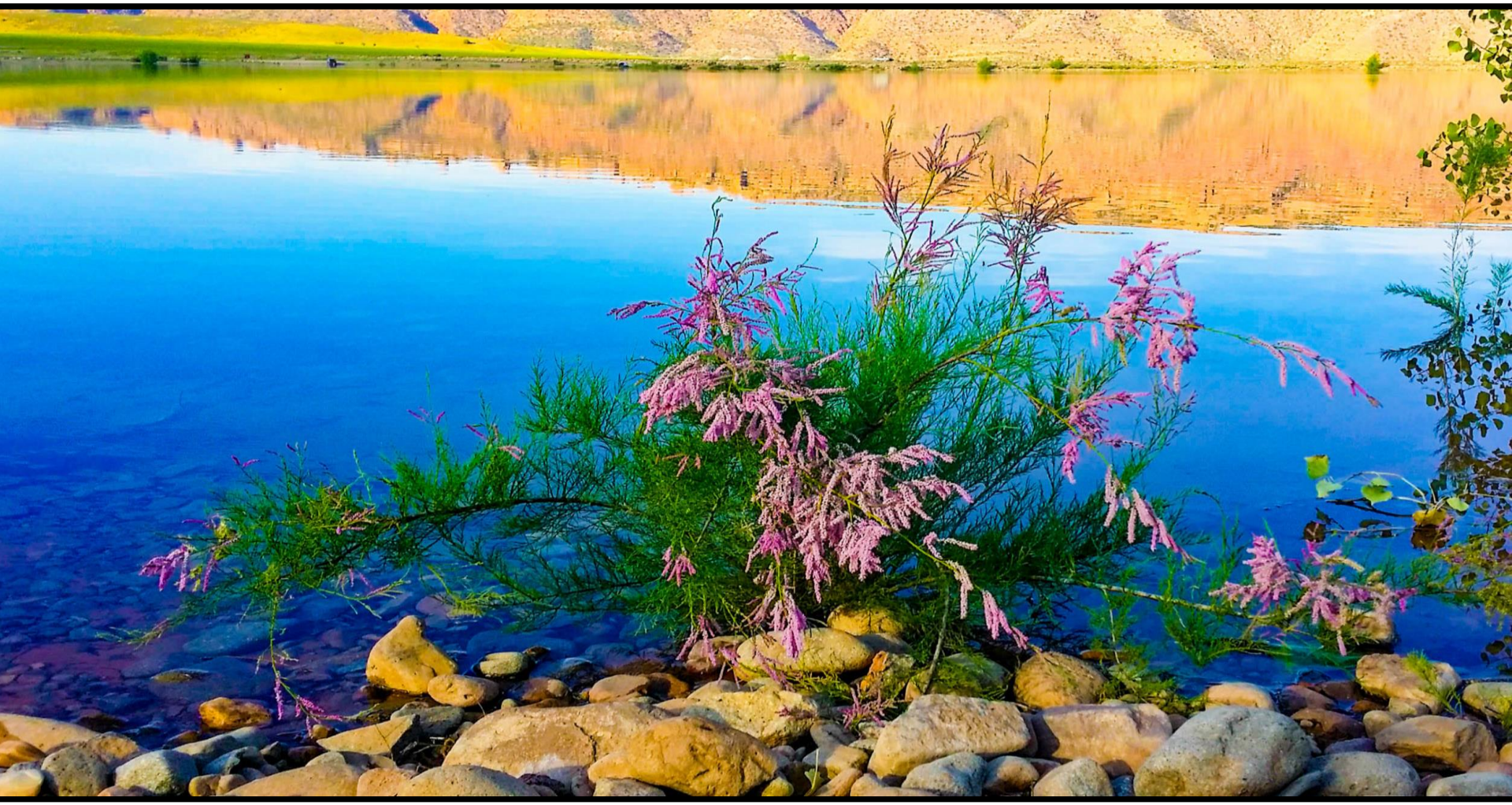
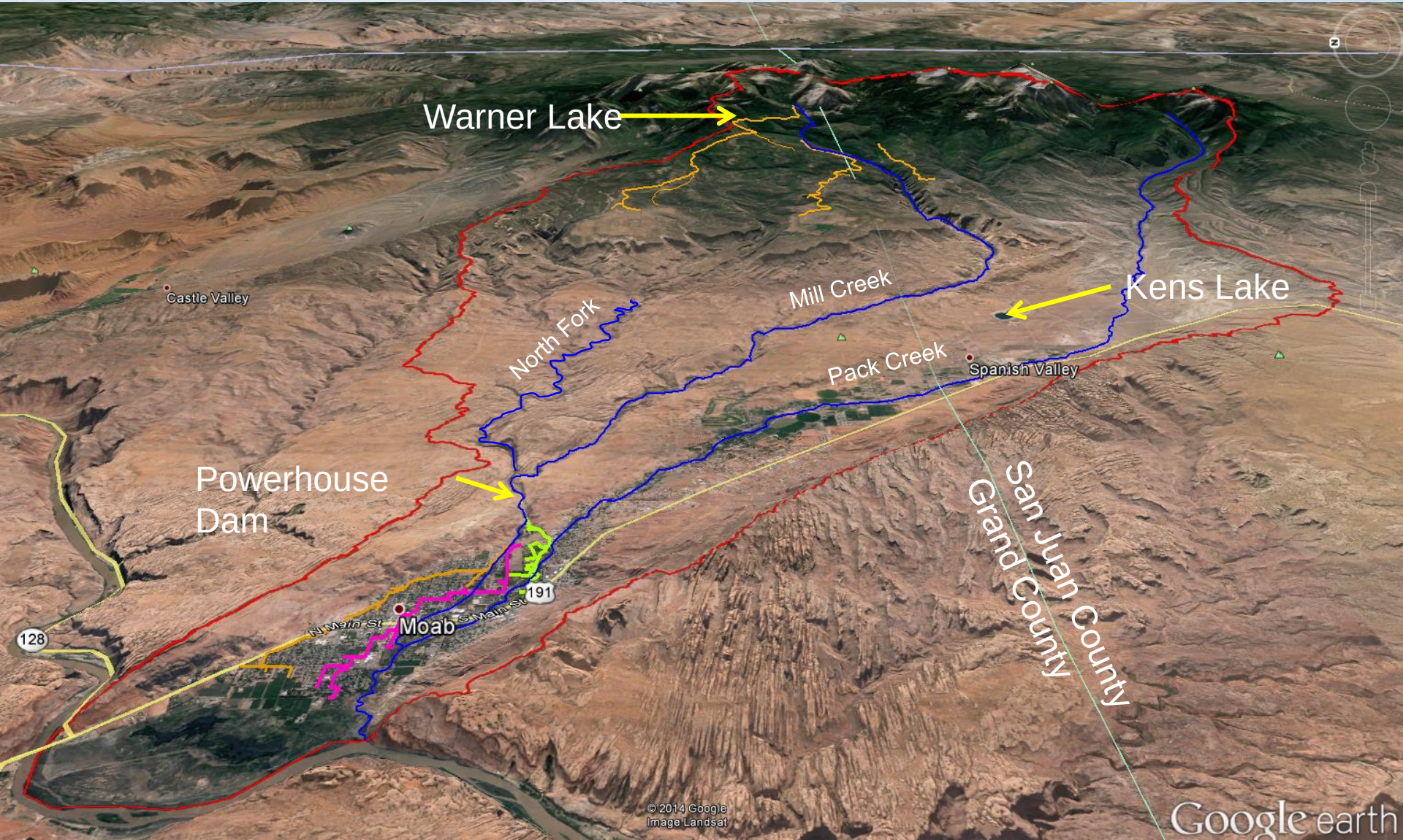
Utah Division of Water Rights



REVIEW OF GROUNDWATER MONITORING
MOAB / SPANISH VALLEY - SOUTH

Moab / Spanish Valley Watershed



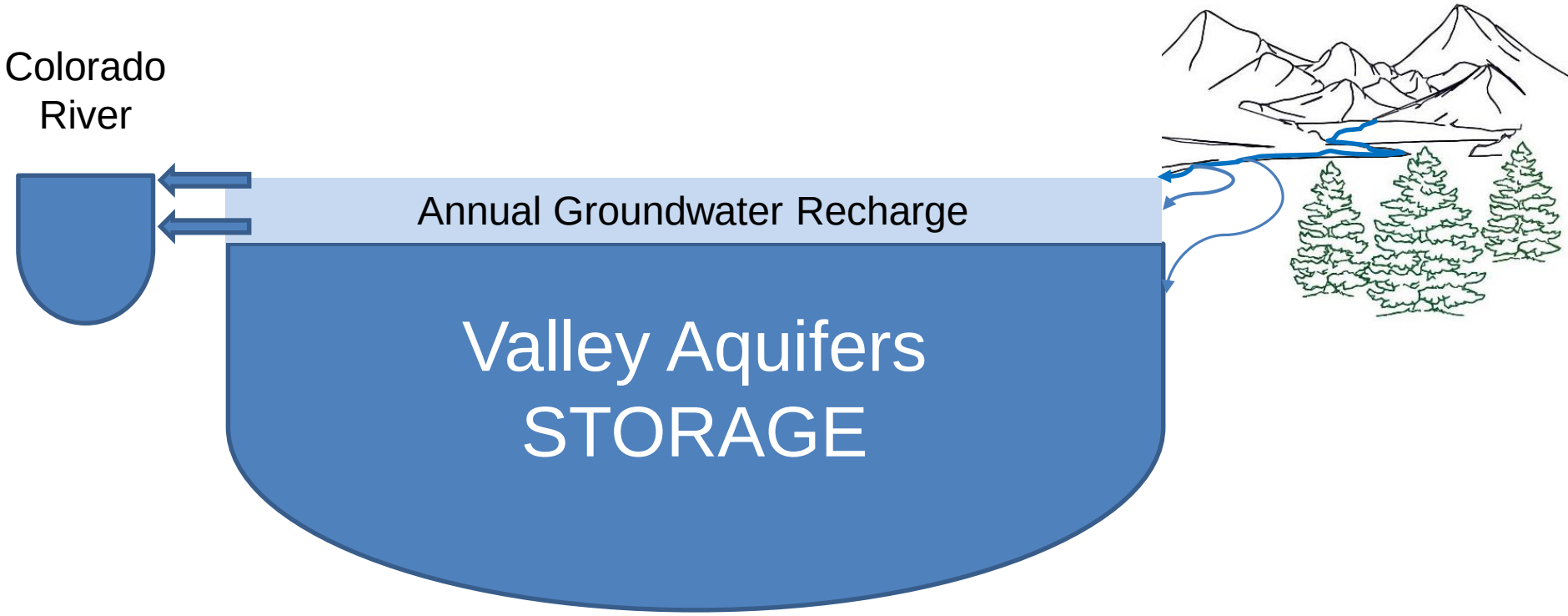
Groundwater Management Plans

- Est. in Section 73-5-15 Utah Code

Objectives:

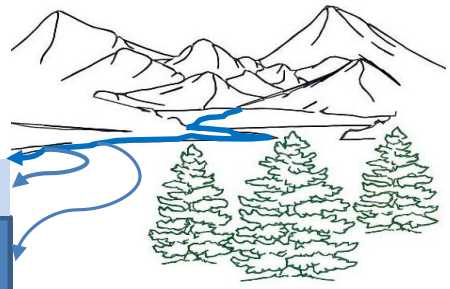
- Limit groundwater withdrawals to safe yield.
- Protect physical integrity of the aquifer.
- Protect water quality.

"Safe Yield" means the amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.



USGS "Evaluation of Groundwater Resources in the Spanish Valley Watershed, Grand and San Juan Counties, Utah"
Scientific Investigations Report 2019-5062, pg. 55

- Recharge: 9,550 – 30,000 acre-feet
- Discharge: 14,000 – 16,000 acre-feet



Colorado River

Well & Spring Development

Annual Groundwater Recharge

Valley Aquifers STORAGE

Ground Surface

Water Table Elevation

Zero Development

Annual Recharge

Water Table Elevation

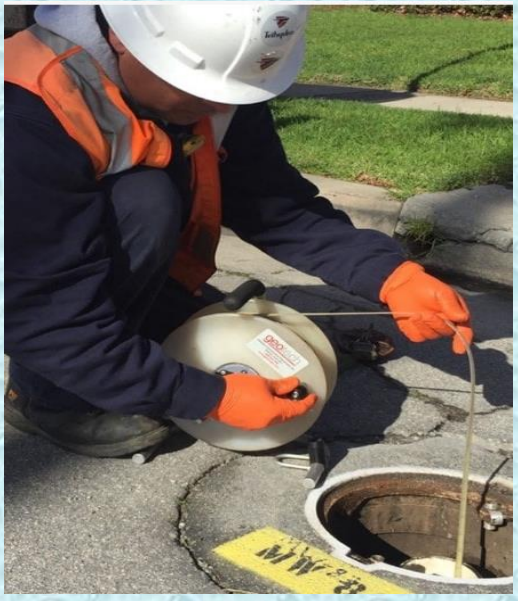
Maximum Development Allowed Under Utah Law

Valley Aquifers STORAGE

Groundwater Mining / Overdraft

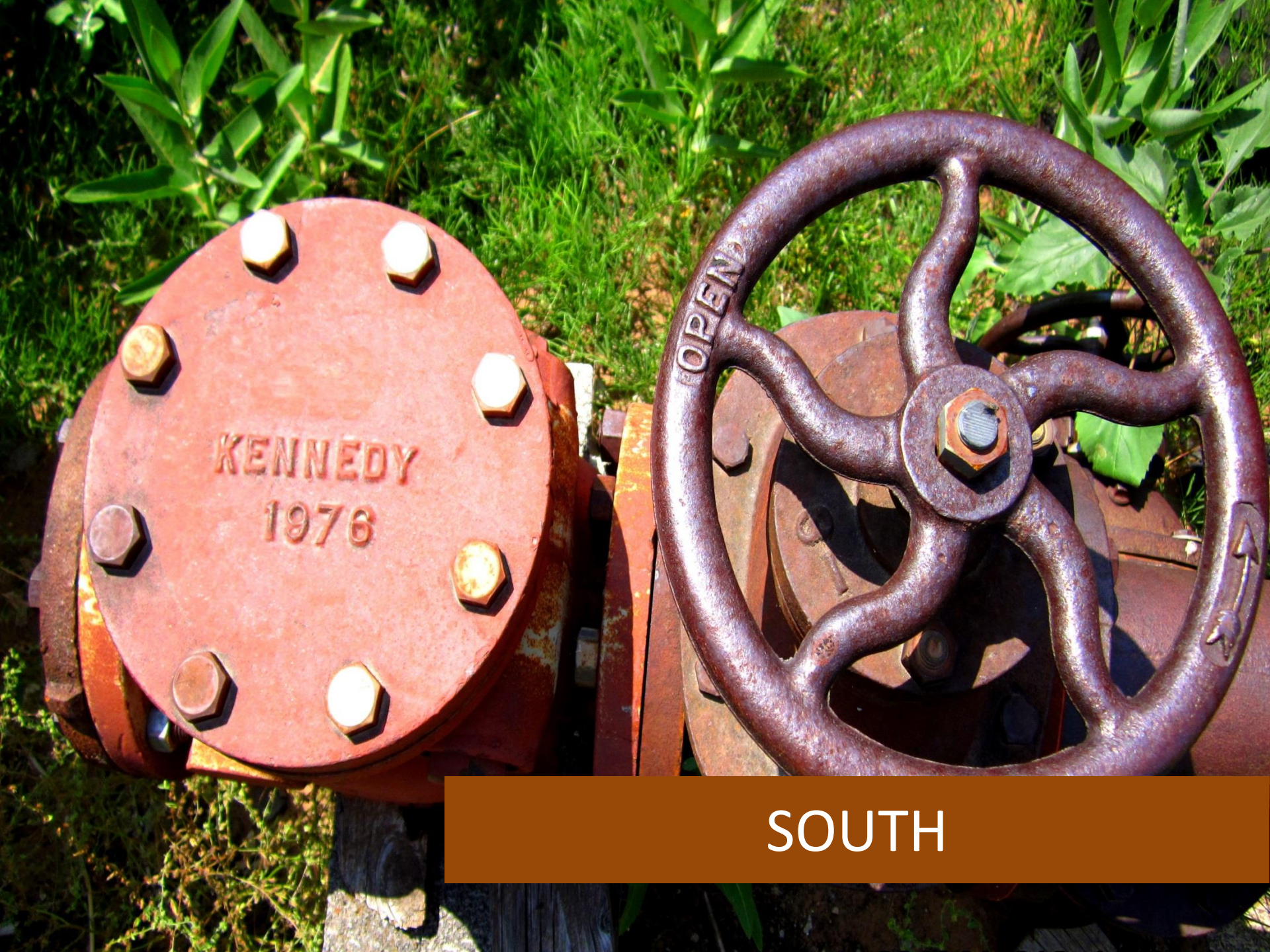
What Should Be Measured?

- Spring Flows
- Stream Flows
- Water Quality
- Water Table Elevations



Who's collecting the Data?

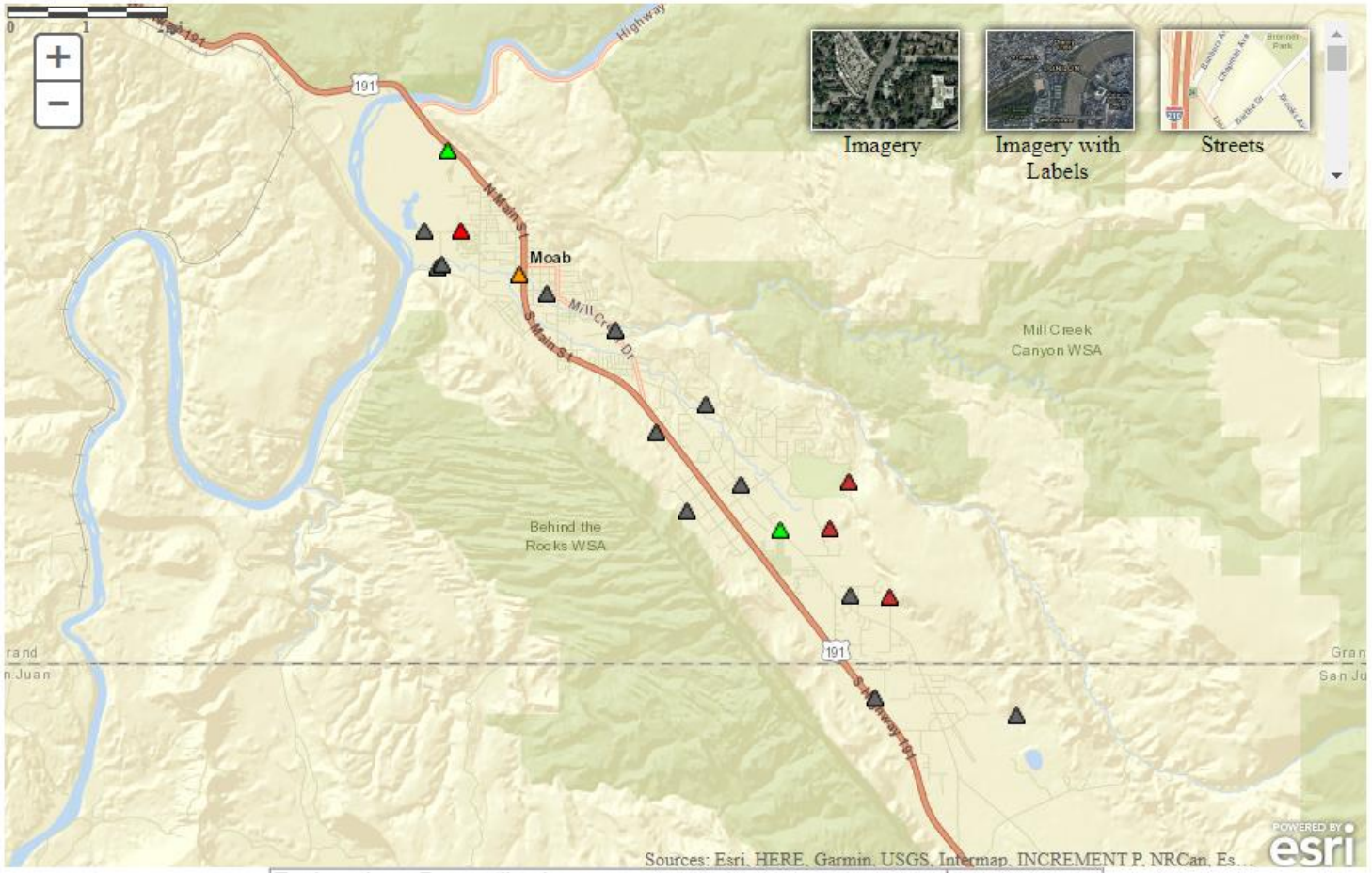
- USGS
- Moab City
- Moab Irrigation Company
- Grand Water & Sewer SA
- San Juan Spanish Valley SSD
- Division of Water Quality
- Division of Water Rights



SOUTH

Utah Active Water Level Network

Click site symbol to open information pop-up. Click Station ID in pop-up for county information and site selection.
Map loading slowly? Try a different browser. Web browser performance varies significantly.



Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	Not Ranked

Wells	Springs
Real-Time	
Continuous	
Periodic Measurements	

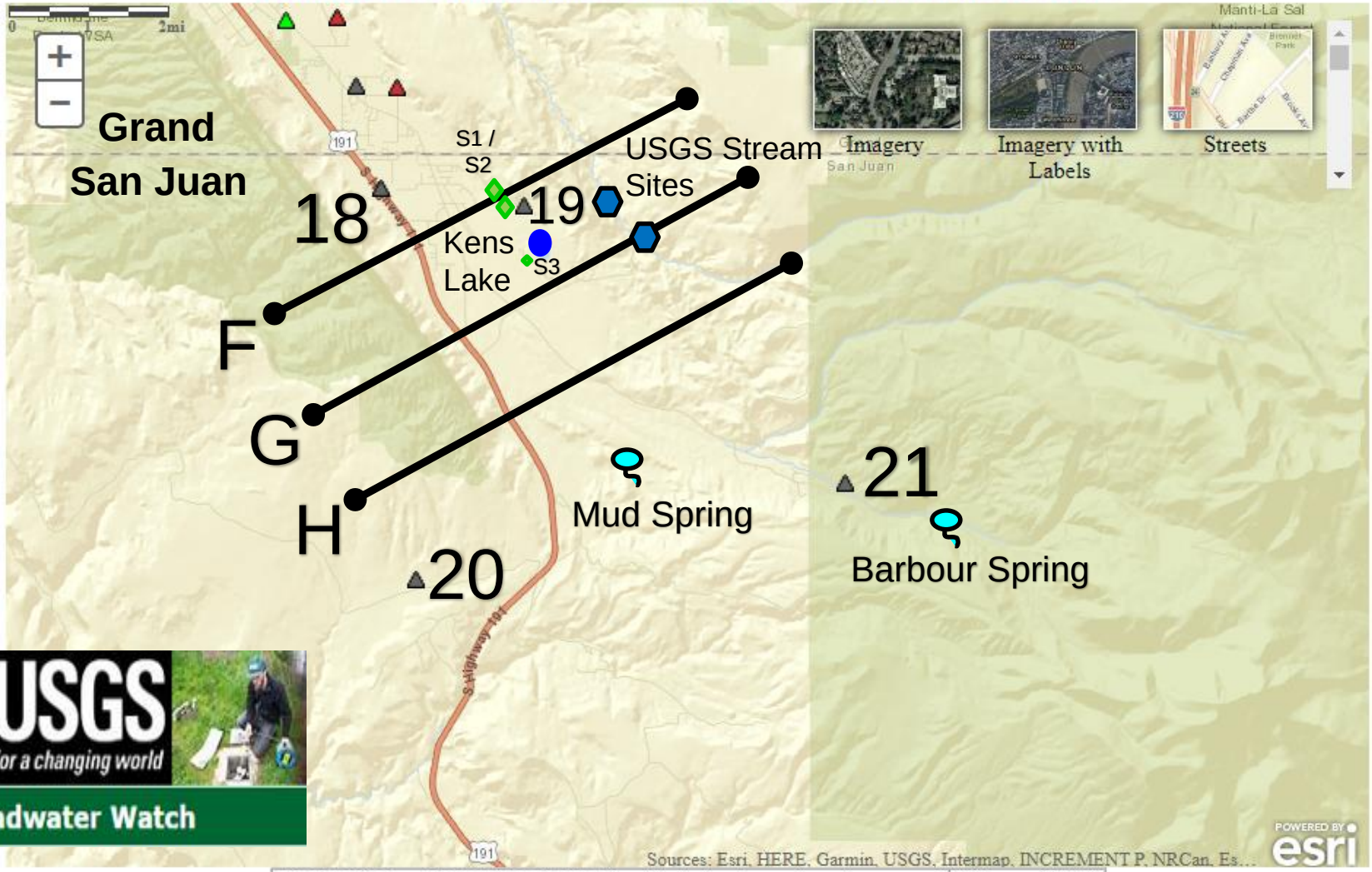
Map generated 11/7/2019 2:29:19 PM

Groundwater Watch Latest News...

Golf Course Springs

Utah Active Water Level Network

Click site symbol to open information pop-up. Click Station ID in pop-up for county information and site selection.
Map loading slowly? Try a different browser. Web browser performance varies significantly.

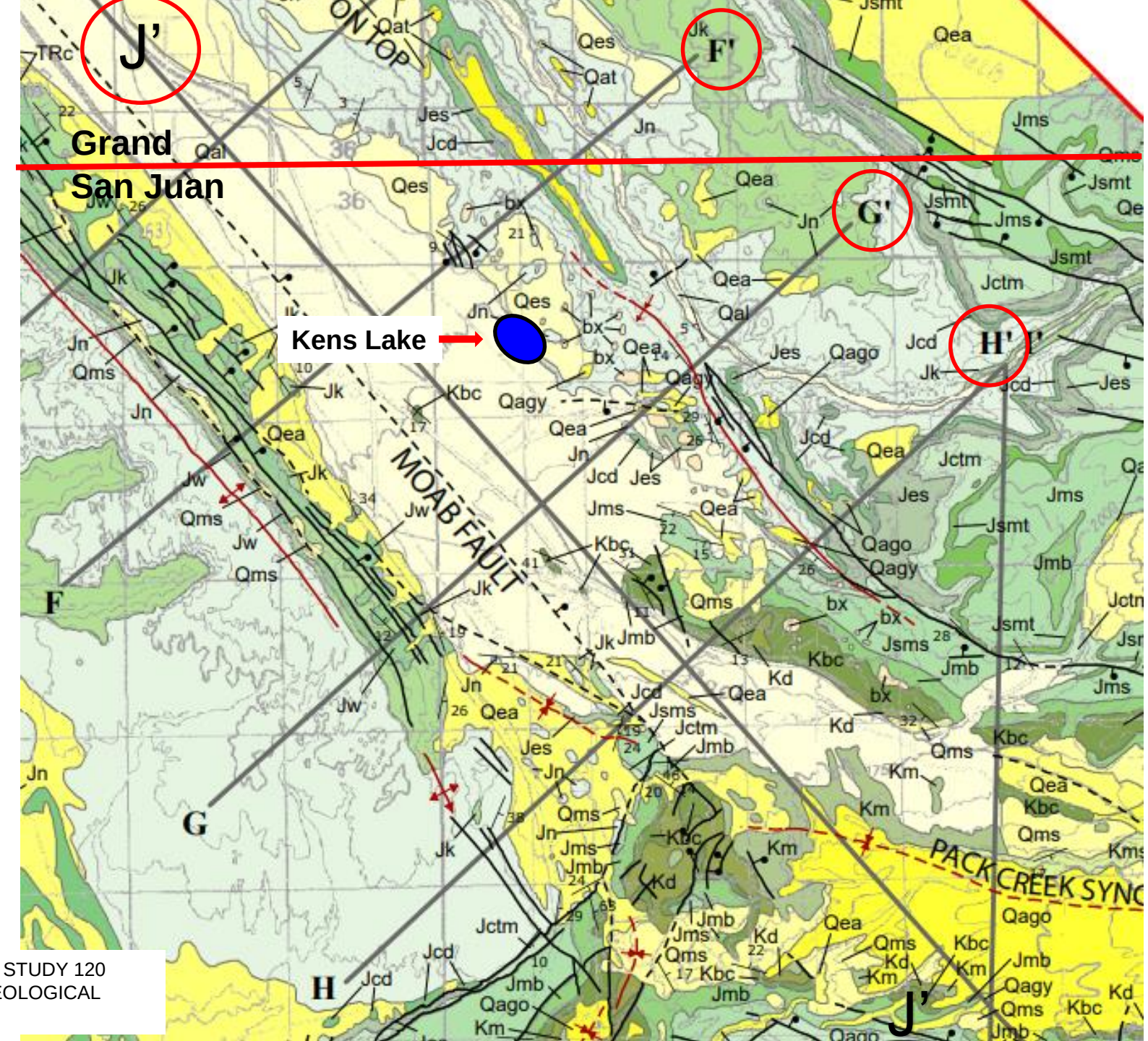


USGS science for a changing world

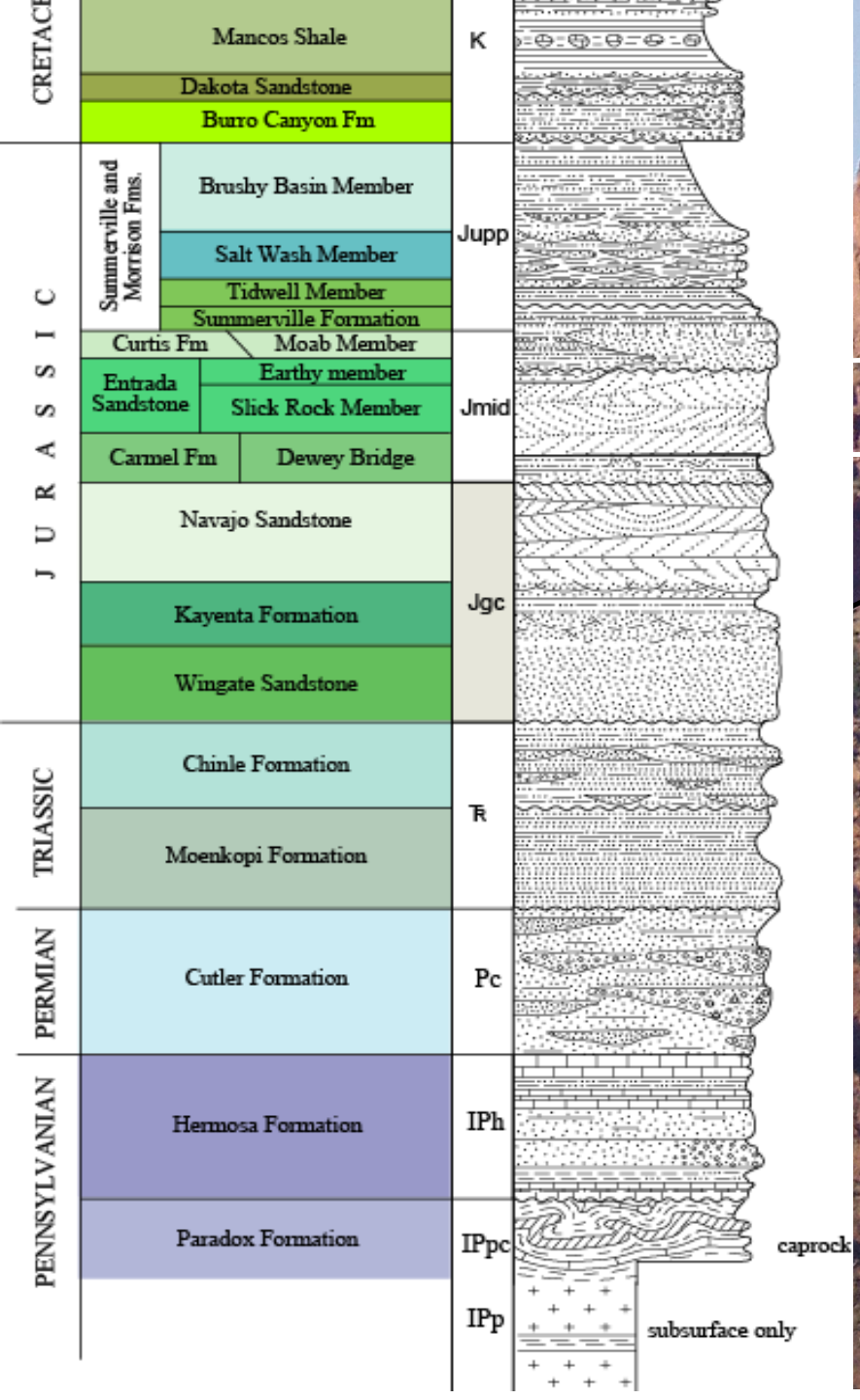
Groundwater Watch

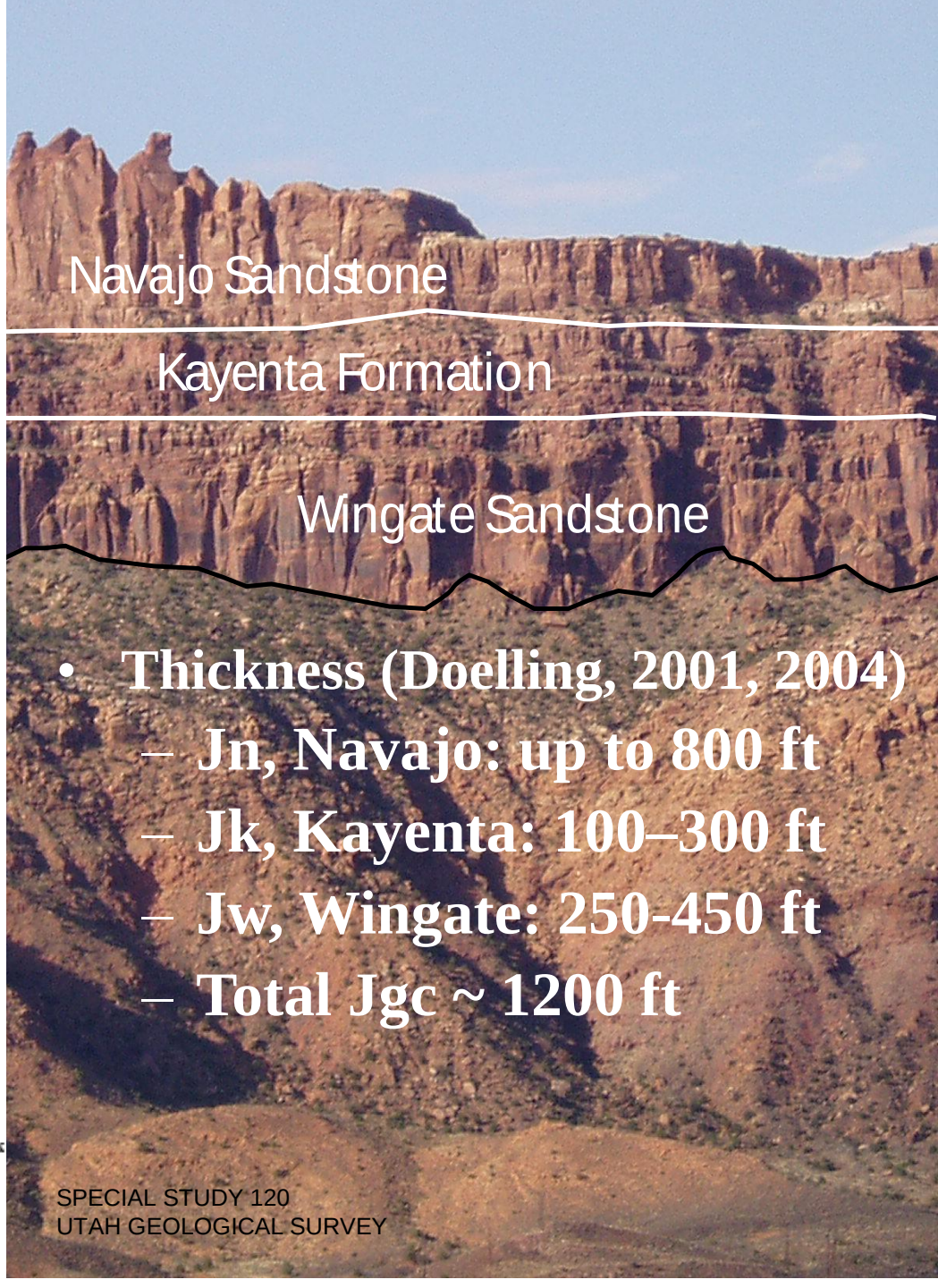
Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	Not Ranked

Wells	Springs
Real-Time	
Continuous	
Periodic Measurements	



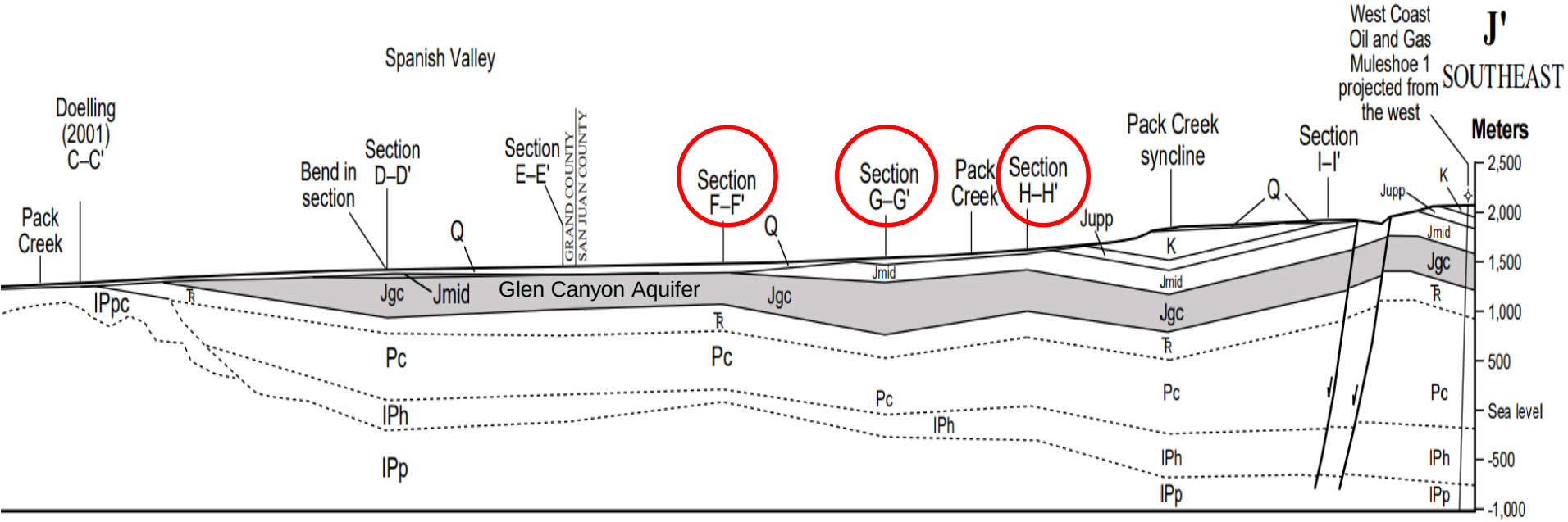
SPECIAL STUDY 120
UTAH GEOLOGICAL
SURVEY





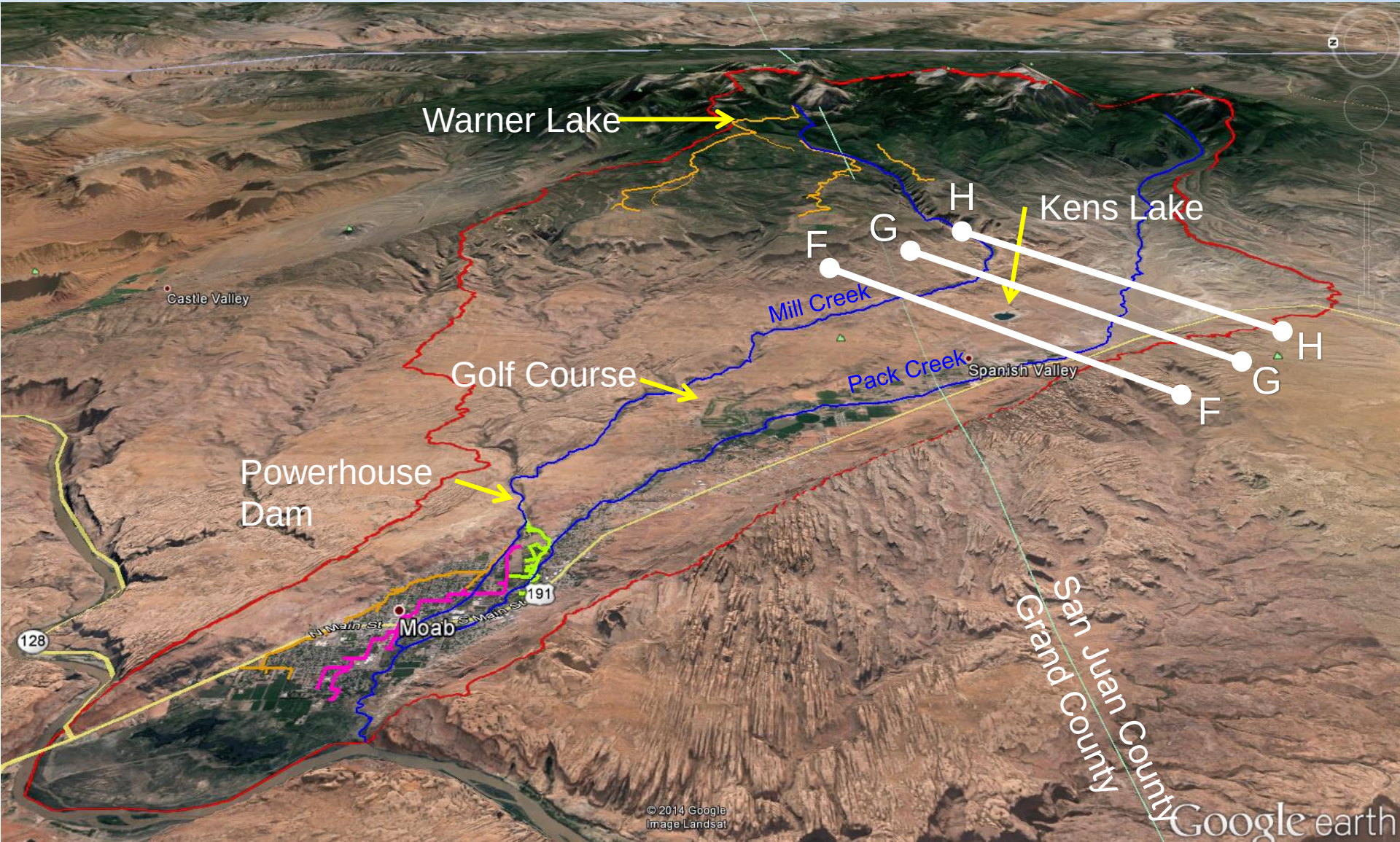
- **Thickness (Doelling, 2001, 2004)**
  - **Jn, Navajo: up to 800 ft**
  - **Jk, Kayenta: 100–300 ft**
  - **Jw, Wingate: 250-450 ft**
  - **Total Jgc ~ 1200 ft**

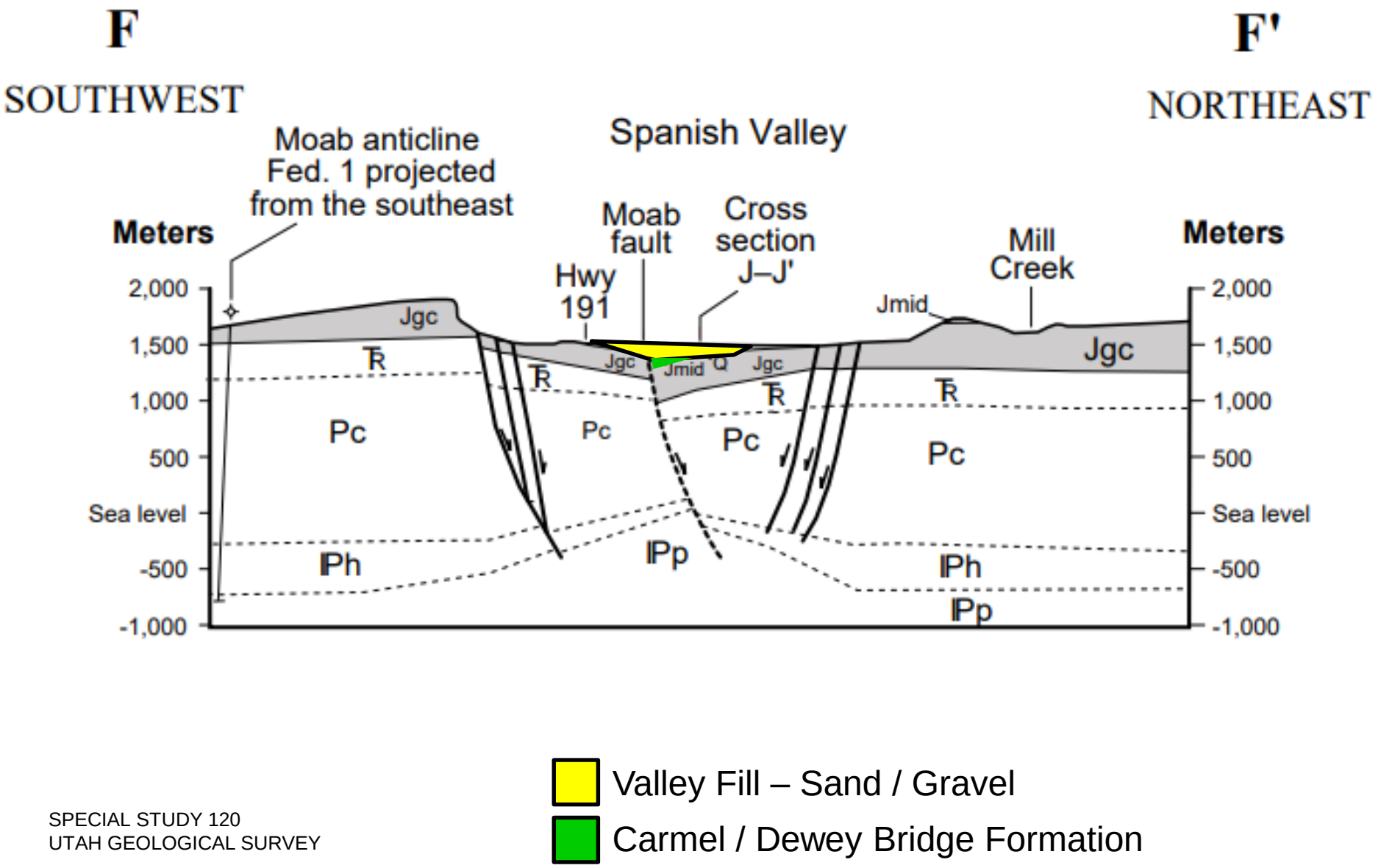
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY



SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

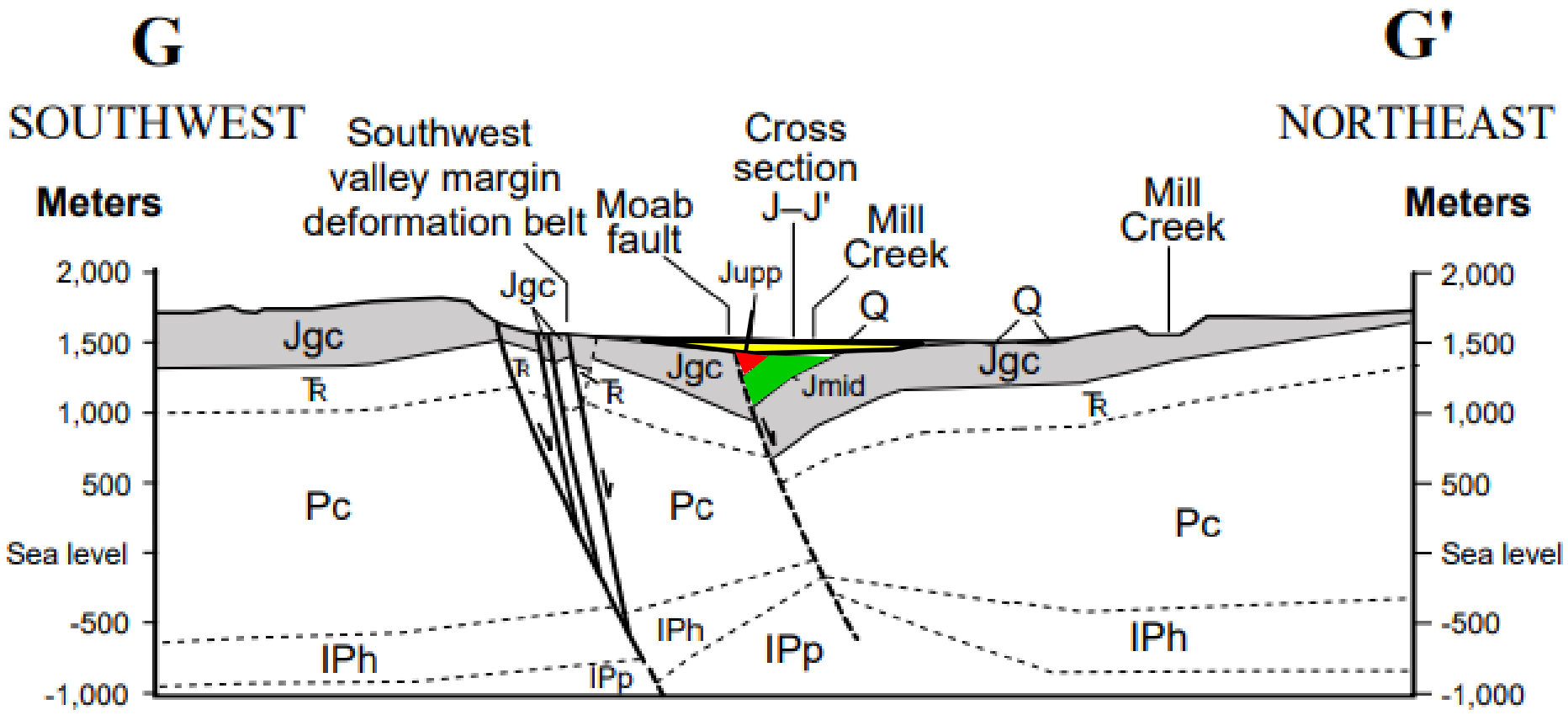
Moab / Spanish Valley Watershed





Valley Fill – Sand / Gravel

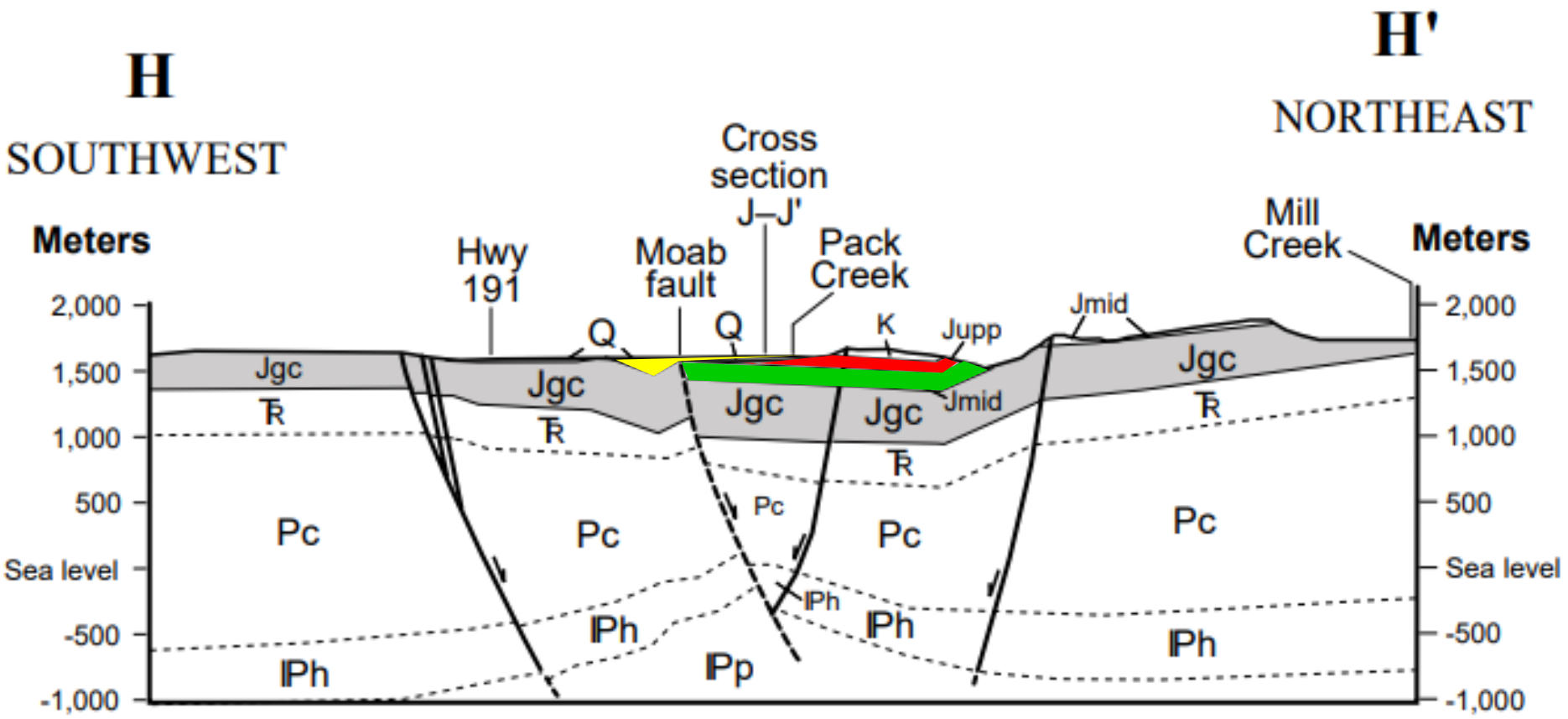
Carmel / Dewey Bridge Formation



Valley Fill – Sand / Gravel

Morrison Formation

Carmel / Dewey Bridge Formation

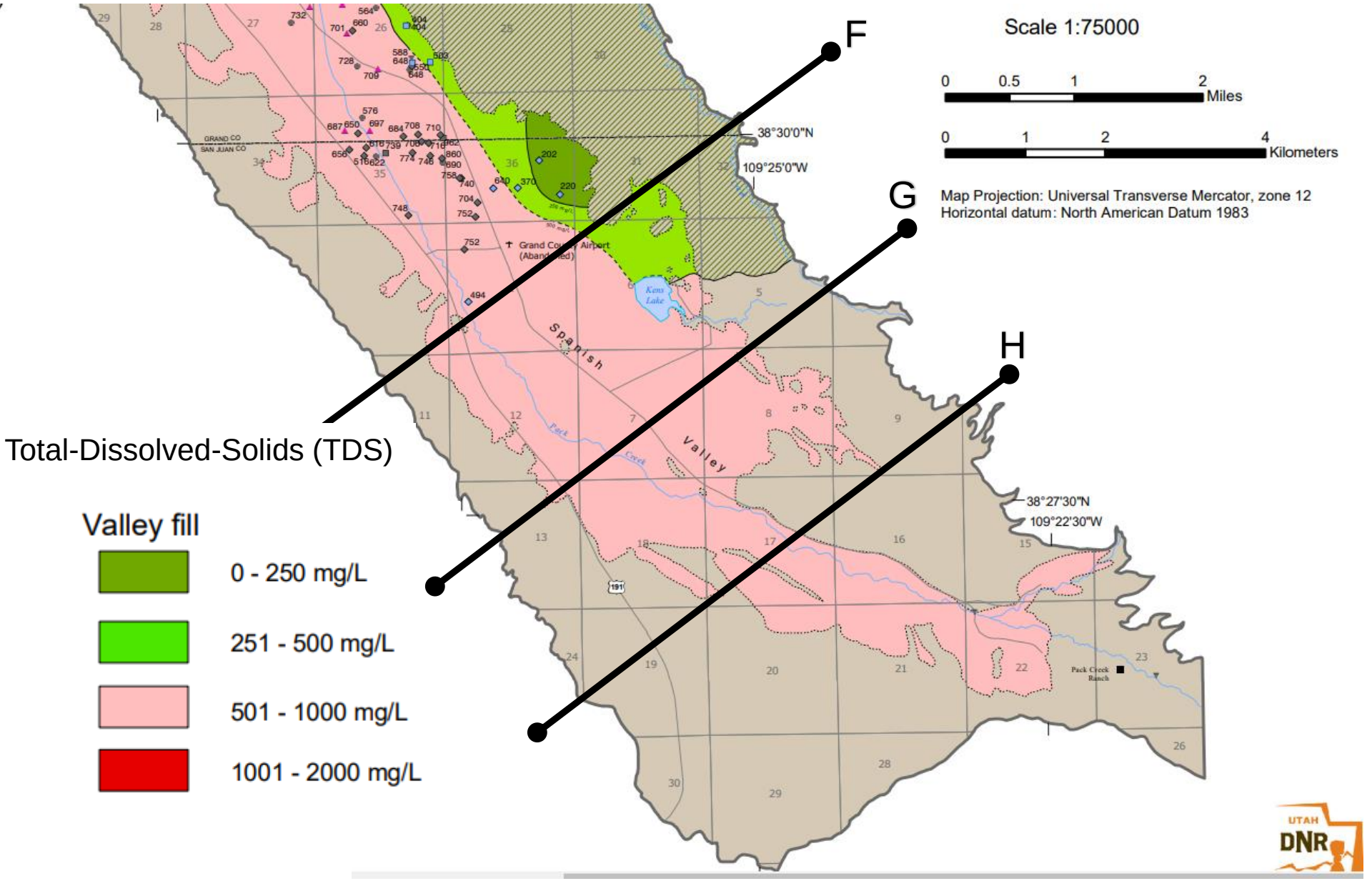


Valley Fill – Sand / Gravel

Morrison Formation

Carmel / Dewey Bridge

SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY



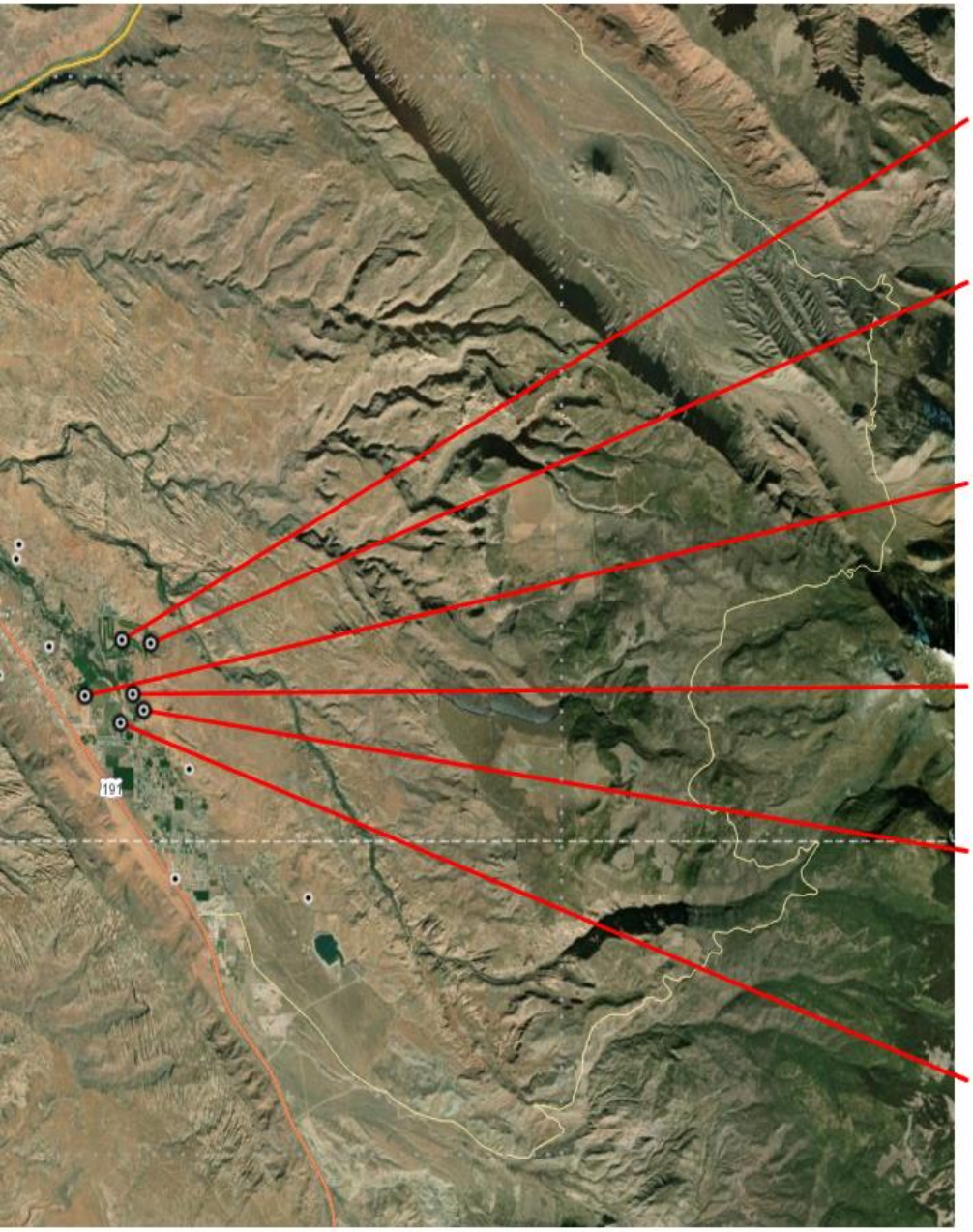
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

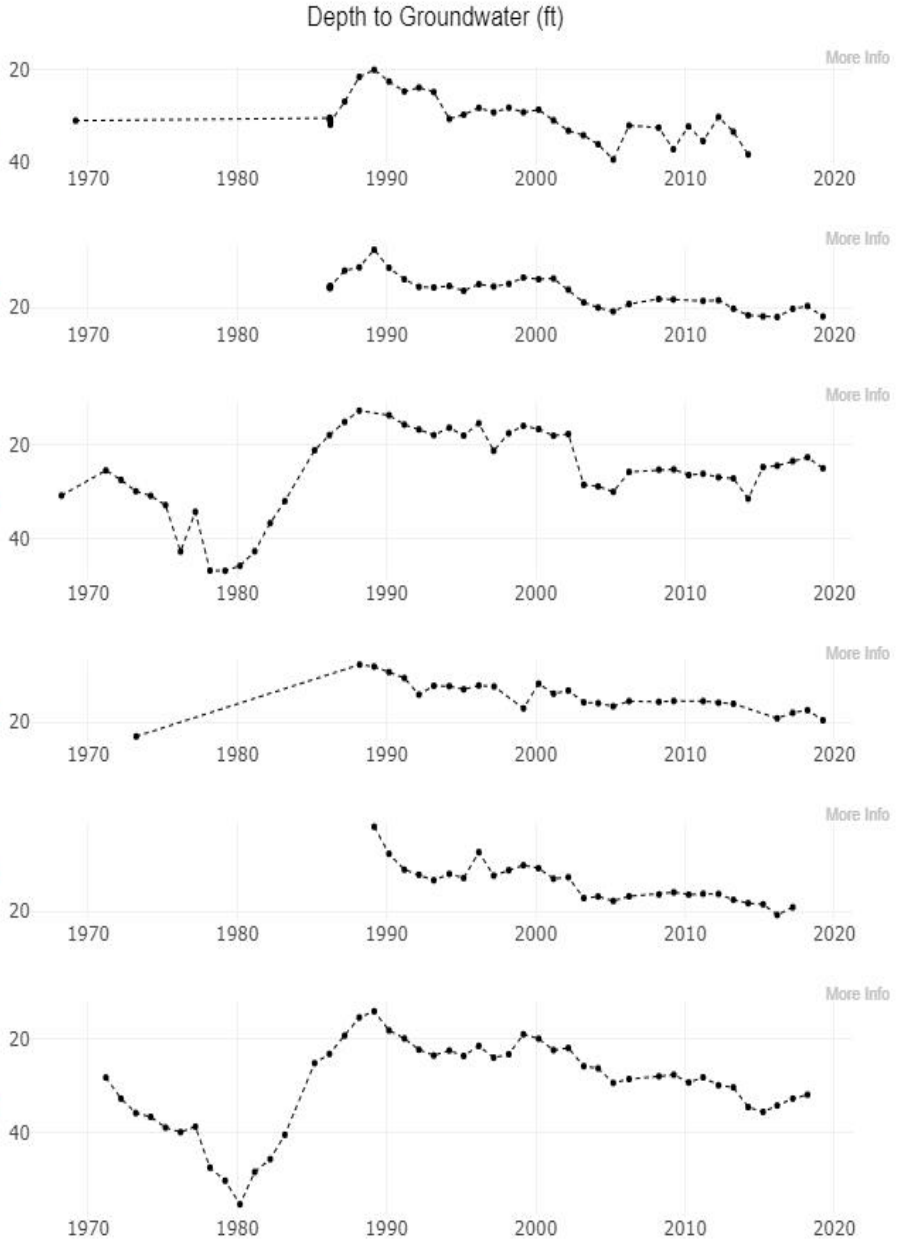
Utah Division of Water Rights

Groundwater Level Trend Viewer | Region: | Options | Map Options

Areas in Utah

- Beaver Valley
- Beryl-Enterprise
- Bothwell Area
- Cedar City Valley
- Curlew Valley
- Cache Valley
- Delta Area
- East Shore (Bountiful)
- East Shore (Weber-Delta)
- Goshen Valley
- Juab Valley
- Milford Valley
- Moab Area
- Pahvant Valley
- Parowan Valley
- Rush Valley
- Salt Lake Valley
- Snake Valley
- Tooele Valley
- Utah Valley (Southern)
- Utah Valley (Northern)

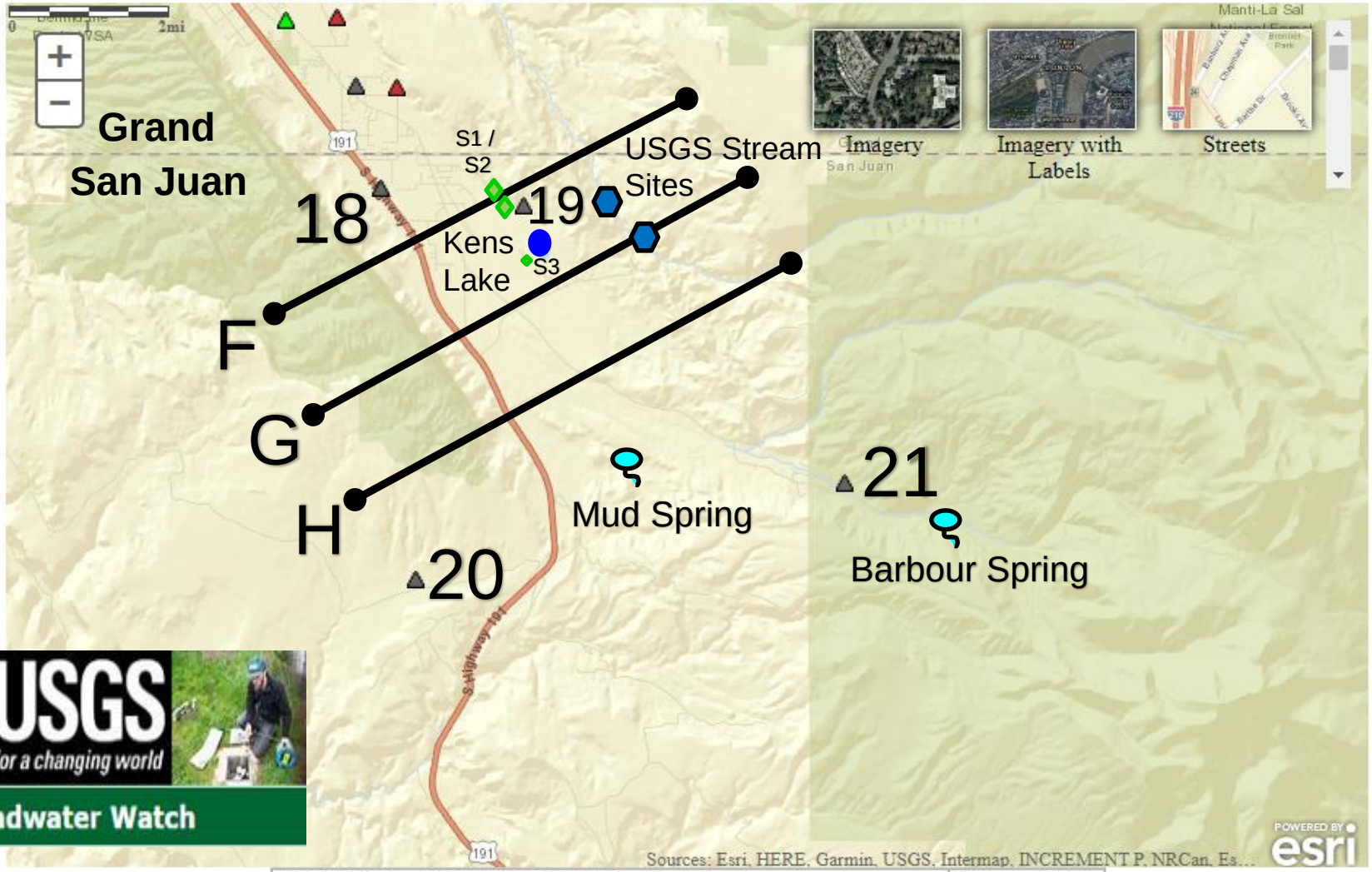

191


Depth to Groundwater (ft)
More Info
20
40
1970
1980
1990
2000
2010
2020

Golf Course Springs

Utah Active Water Level Network

Click site symbol to open information pop-up. Click Station ID in pop-up for county information and site selection.
Map loading slowly? Try a different browser. Web browser performance varies significantly.

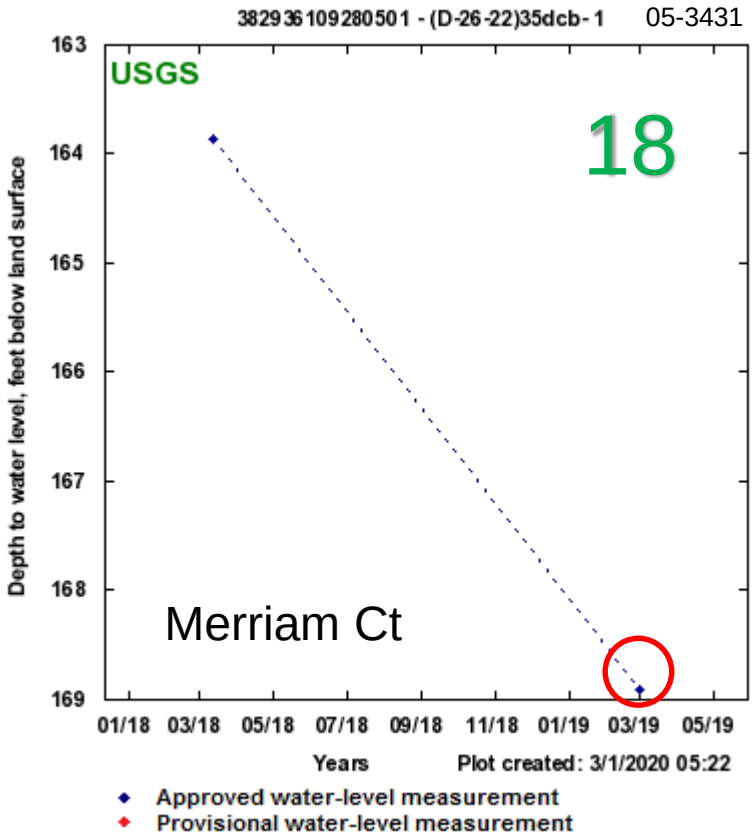


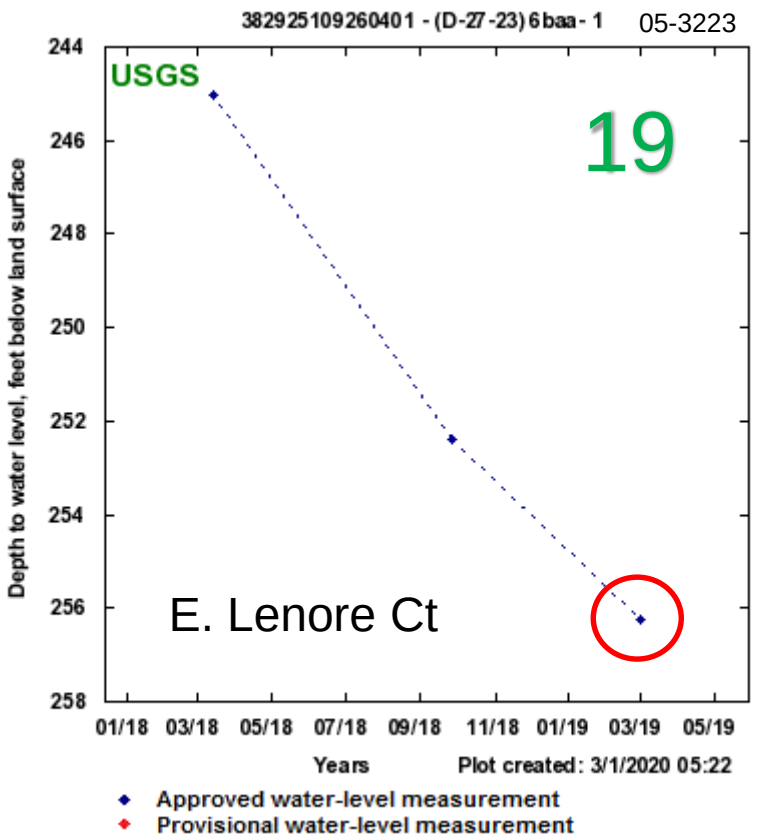
USGS science for a changing world

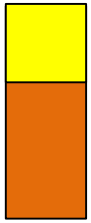
Groundwater Watch

Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	Not Ranked

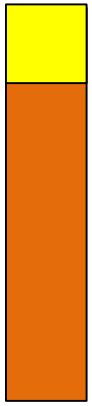
Wells	Springs
Real-Time	
Continuous	
Periodic Measurements	





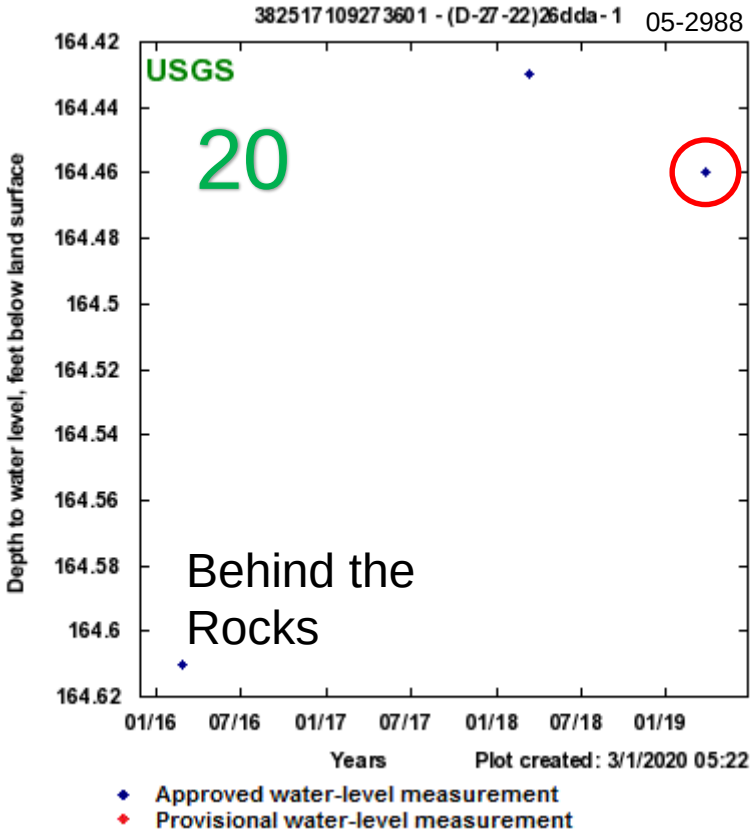


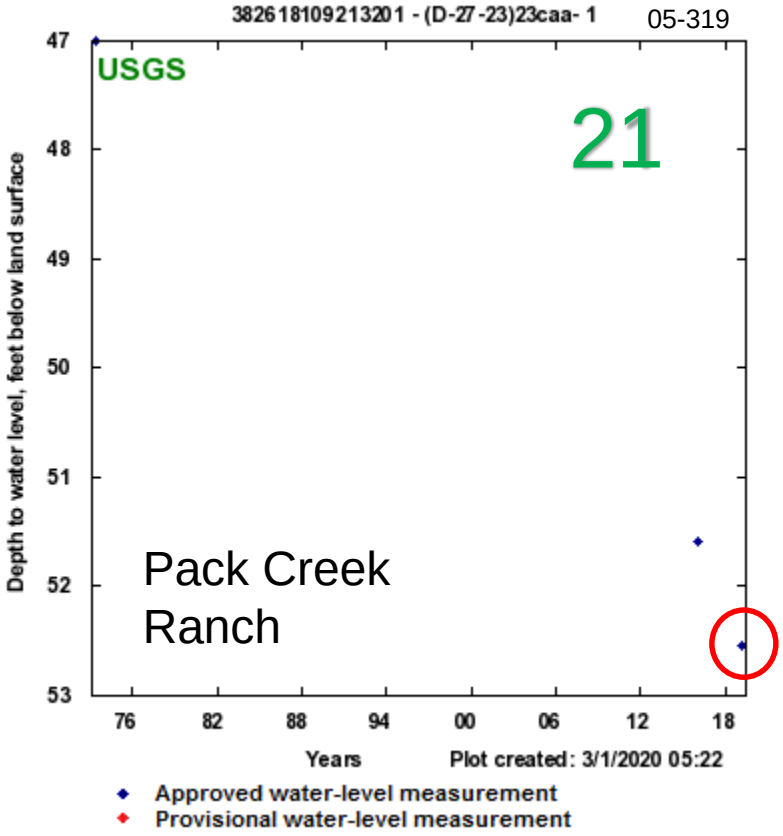
Valley Fill
0 - 110’ Sand & Gravel
Glen Canyon Group
110’ - 320’ Sandstone



Slope Overburden
0 - 35’ Sand / Gravel

Glen Canyon Group
35’ – 320’ Sandstone

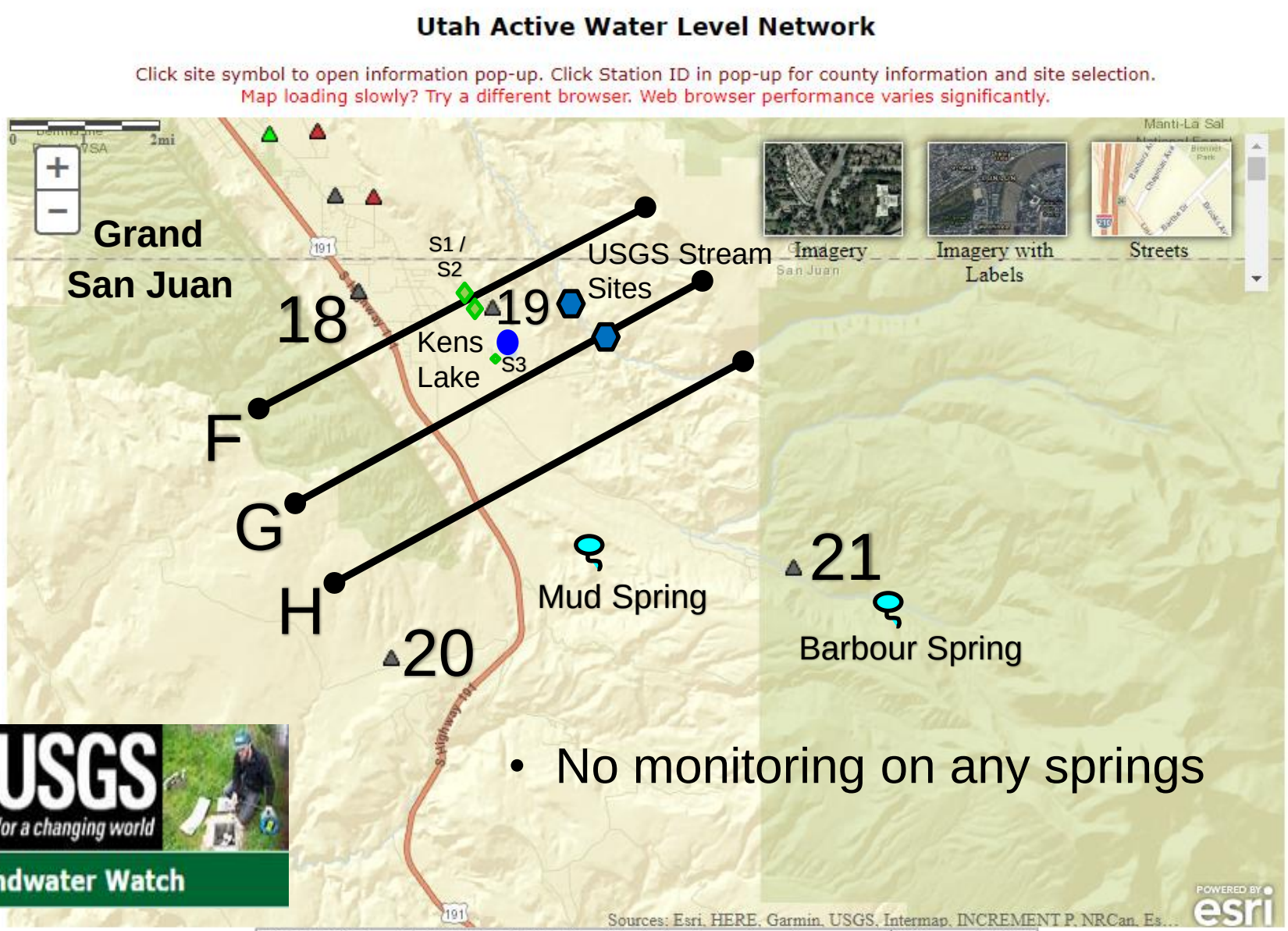




No Well Log

No Well Log

Golf Course Springs



USGS science for a changing world

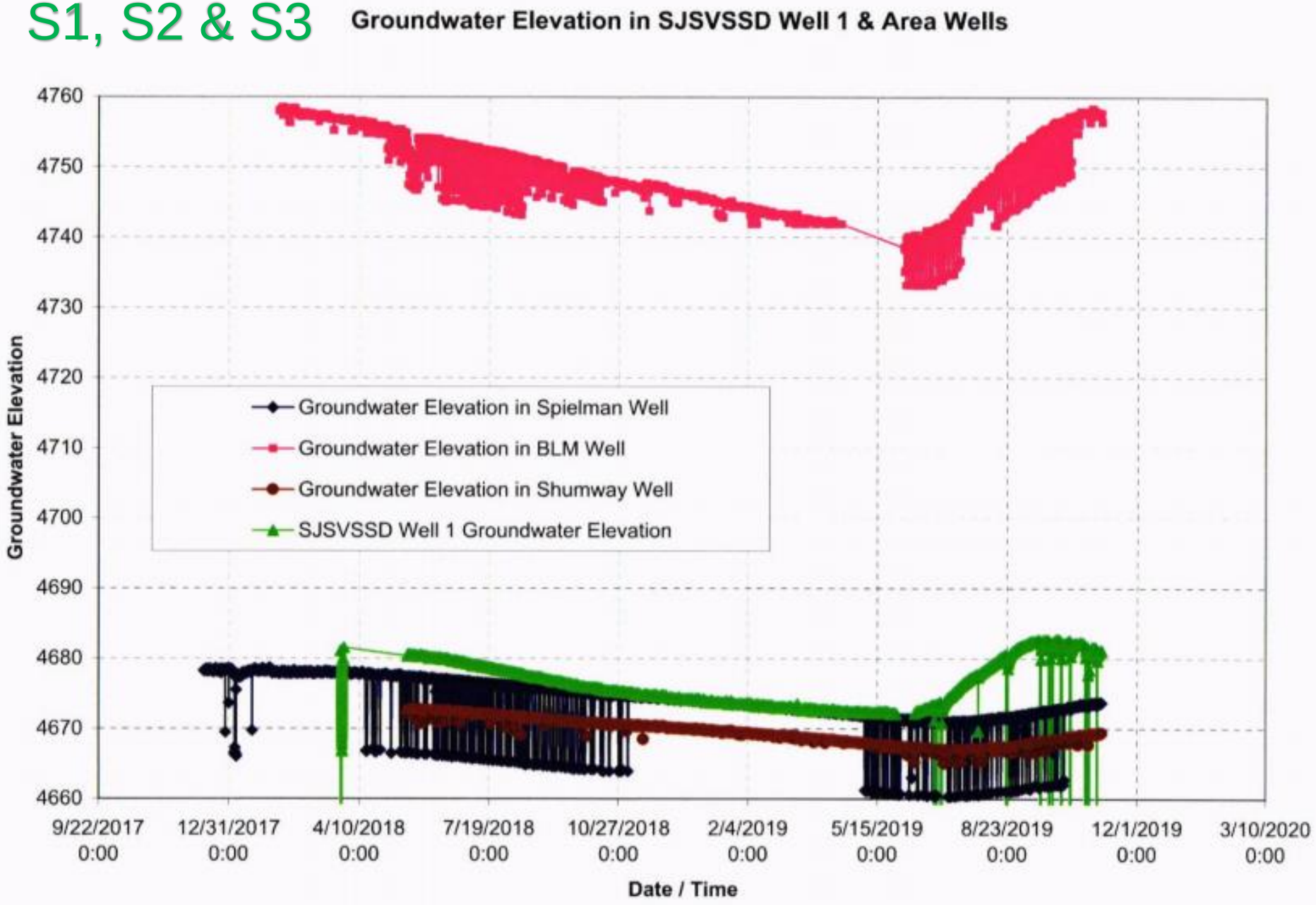
Groundwater Watch

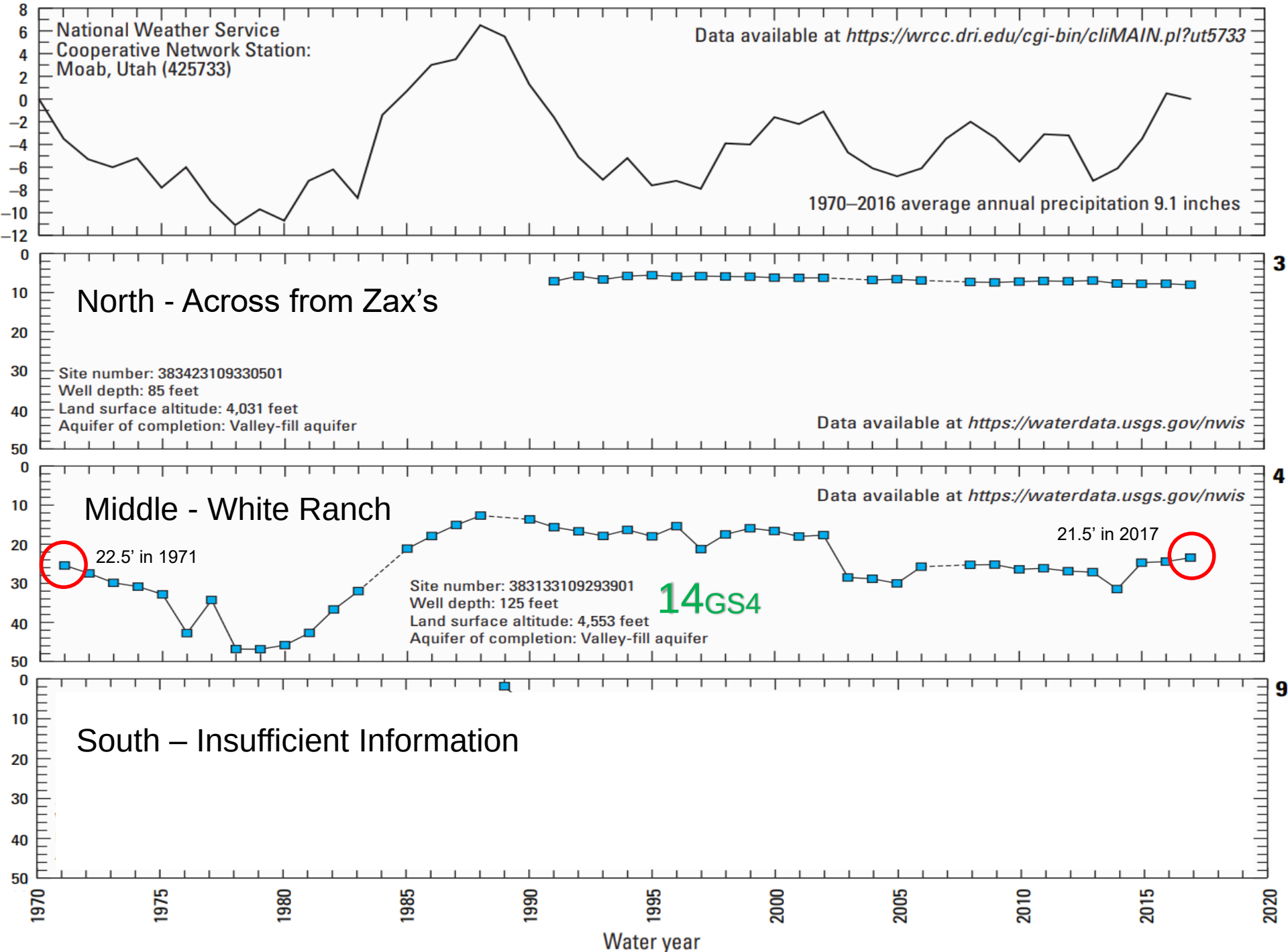
- No monitoring on any springs

Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	Not Ranked

Wells	Springs
Real-Time	
Continuous	
Periodic Measurements	

S1, S2 & S3

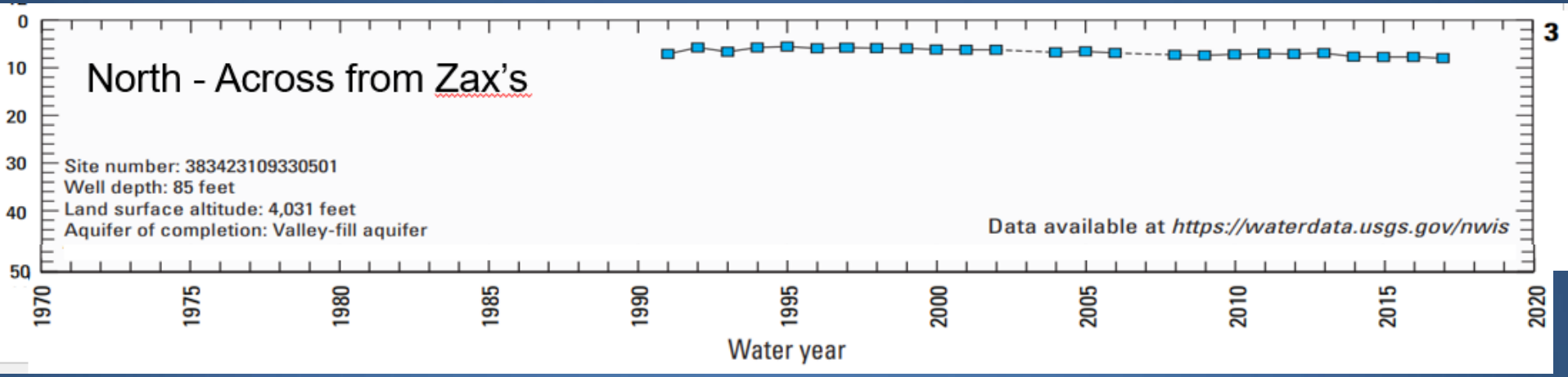

Groundwater Elevation in SJSVSSD Well 1 & Area Wells
Groundwater Elevation
4760
4750
4740
4730
4720
4710
4700
4690
4680
4670
4660
Groundwater Elevation in Spielman Well
Groundwater Elevation in BLM Well
Groundwater Elevation in Shumway Well
SJSVSSD Well 1 Groundwater Elevation
9/22/2017 0:00
12/31/2017 0:00
4/10/2018 0:00
7/19/2018 0:00
10/27/2018 0:00
2/4/2019 0:00
5/15/2019 0:00
8/23/2019 0:00
12/1/2019 0:00
3/10/2020 0:00
Date / Time


National Weather Service
Cooperative Network Station:
Moab, Utah (425733)
Data available at https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ut5733
1970–2016 average annual precipitation 9.1 inches
North - Across from Zax's
Site number: 383423109330501
Well depth: 85 feet
Land surface altitude: 4,031 feet
Aquifer of completion: Valley-fill aquifer
Data available at https://waterdata.usgs.gov/nwis
Middle - White Ranch
Data available at https://waterdata.usgs.gov/nwis
22.5' in 1971
21.5' in 2017
Site number: 383133109293901
Well depth: 125 feet
Land surface altitude: 4,553 feet
Aquifer of completion: Valley-fill aquifer
14GS4
South – Insufficient Information
Water year

Overall Summary

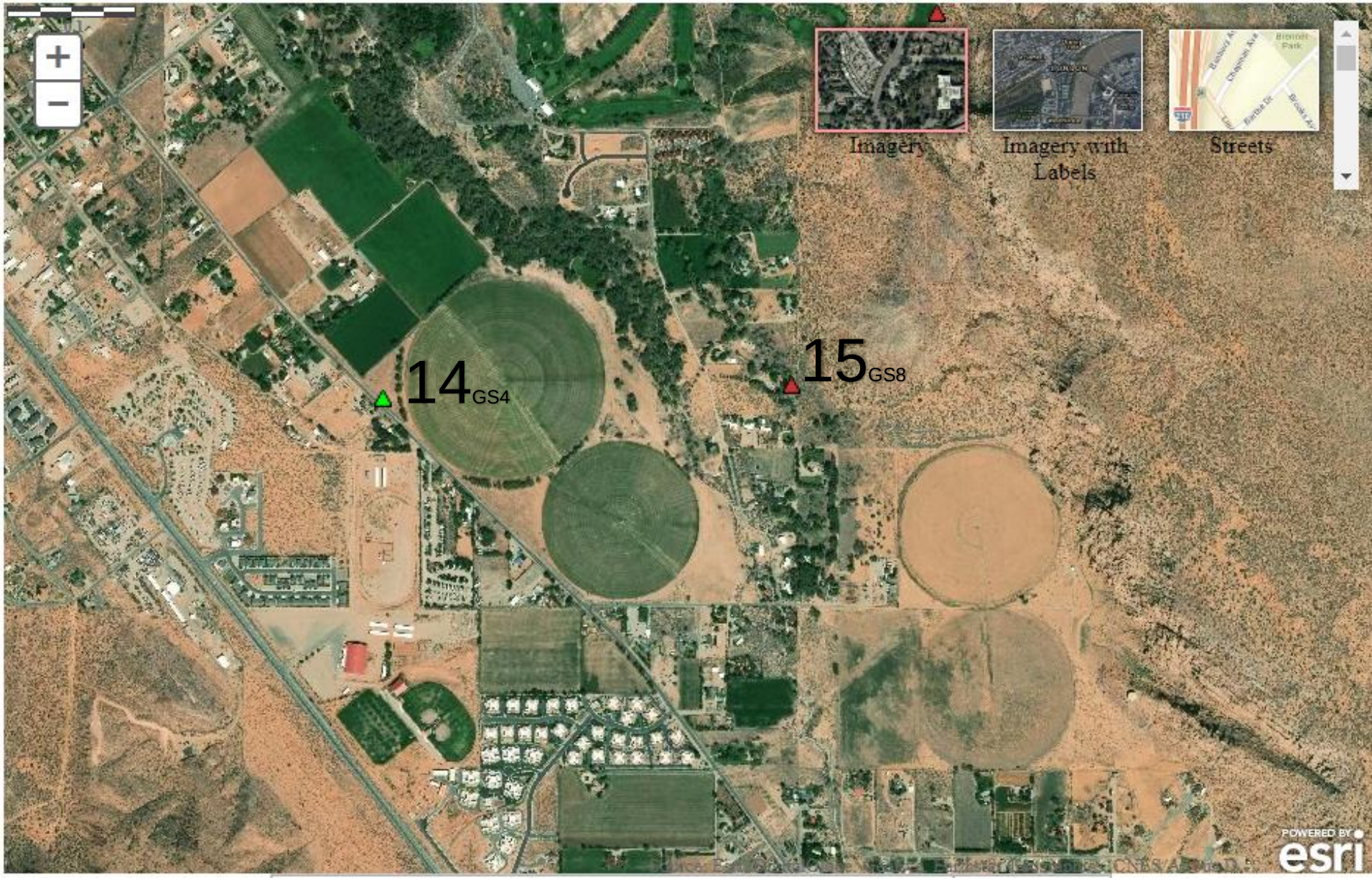
Northern

- **Small Decline in Water Table Elevation**



- **Insufficient information / analysis on Spring Flows to determine trend.**

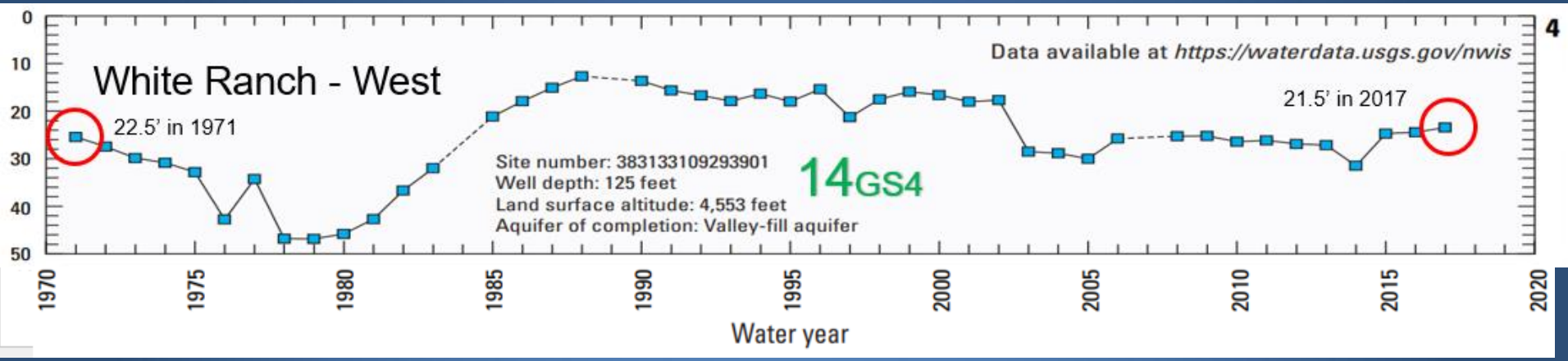
- **Insufficient information on outflow to Colorado River & interaction between Brine & Freshwater Layers**


Imagery
Imagery with Labels
Streets
14GS4
15GS8
POWERED BY esri

Overall Summary

Central

- Large Decline in 1970's followed by even Larger Recharge in the 1980's
- Moderate Decline since 1990
- Water Table Elevations at about same level as 1970



- Insufficient information / analysis on Spring Flows to determine trend.

Overall Summary

Southern

- Insufficient Information to determine trends in groundwater table and spring flows

Recommendations

USGS 2017

- Install Lower Mill Creek Gage – **COMPLETED** (measure discharge)
- Install Upper Pack Creek Gage (better quantify recharge)
- Monitor Spring Flows – (seasonal v. long term changes)
- Continuous or Quarterly Water Level Monitoring (see SJSVSSD)
- Numerical Model (test conceptual model)

Division of Water Quality (Hultquist)

- 3 Dedicated Monitoring Wells w/ continuous monitoring
- Monitor Spring Flows
- Dedicated Monitoring Well in Glen Canyon Group aquifer
- Dedicated Monitoring Well in Valley Fill aquifer
- Additional Stream Gages on Mill (North Fork) and Pack Creek
- Dedicated Monitoring Well above Kens Lake

Recommendations

Division of Water Rights

- **Ditto USGS & DWQ Recommendations**

- **Commission a Study of Existing Groundwater Monitoring Program**
  - **Determine Quality of Current Monitoring Wells (condition of wells, which aquifer is being monitored, reliability of data, interference issues, water quality issues)**
  - **Determine if there are Gaps in the Current System (i.e. brine layer)**
  - **Identify Critical Flow Pathways – Spring Flows (faults / joints)**
  - **Determine Best Placement of Resources and Monitoring Equipment**

Recommendations

Division of Water Rights

- **More Detailed Hydrologic Study of Three Key Areas:**
  - **Matheson Wetlands Area – outflow to Colorado River / interaction between brine and freshwater layers / movement of brine layer**
  - **Central Valley – interaction between the GCG & Valley Fill aquifers, interaction between Mill Creek & GCG/VF aquifers**
  - **Upper Valley – interaction between Kens Lake & GCG/VF aquifers / interaction between Pack Creek and VF aquifer**
- **Development of a Web Based Interface that provides Greater Transparency and Access for the public to the Data across all levels of Government reporting**

Thank You… Any Questions?

Utah Division of Water Rights