Photo by Tyler Knudsen (UGS)

"The Utah Geological Survey provides timely scientific information about Utah's geologic environment, resources and hazards"

UTAH DNR GEOLOGICAL SURVEY

UTAH GEOLOGICAL SURVEY

geology.utah.gov

Geologic Issues Impact the Lives of Every One of Utah's Citizens and Visitors

Mineral & Energy Resources

Metals, sand and gravel, oil, gas, coal, geothermal

Recreation & Tourism

National Parks, State Parks, Recreation Areas

Urban Growth & Community Resilience

85% of Utah's population lives within 15 miles of the Wasatch fault

Groundwater & Surface Water Resources

Utah is the 2nd driest state in the U.S.

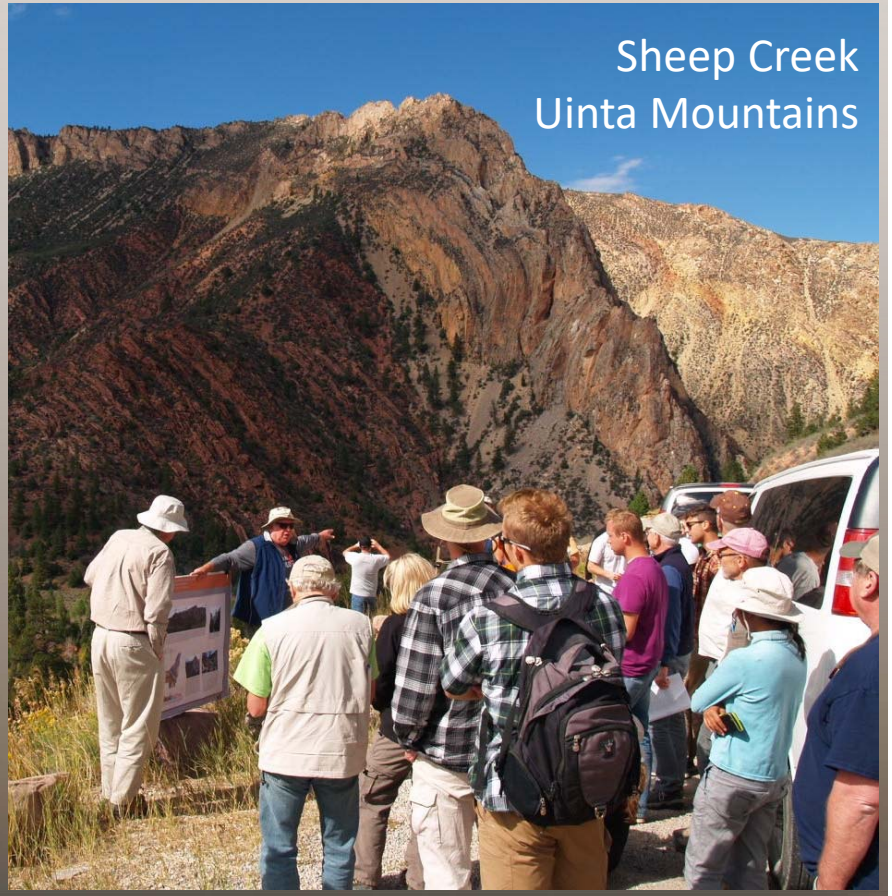
Utah Geological Survey – Division Overview

Applied scientific agency (non-regulatory)

- Conduct research
- Provide objective information to enable informed decision-making
- Act as a centralized repository for geology-related information in Utah

5 technical programs:

- Geologic Information and Outreach
- Geologic Mapping and Paleontology
- Geologic Hazards
- Groundwater and Wetlands
- Energy and Minerals

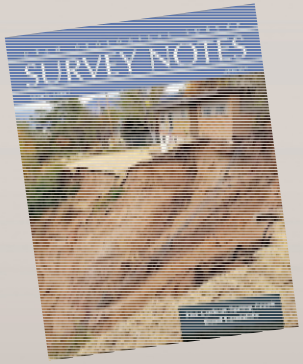


Geologic Information and Outreach

There is high demand for geologic information in a variety of forms

Tri-annual Newsletter

- Online
- 2,000 recipients of hard copy



Traditional Scientific Reports & Maps

- 35/year published by UGS
- 50/year published outside UGS

Educational Outreach

- Presentations to schools, businesses, civic groups
- K-12 teacher workshops
- Earth Science Week (700 students annually)

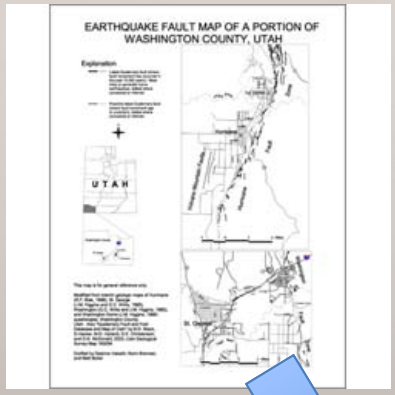
Website

FY18:

- 465,000 visitor sessions – ⬆ 21%
- 841,000 page views – ⬆ 23%

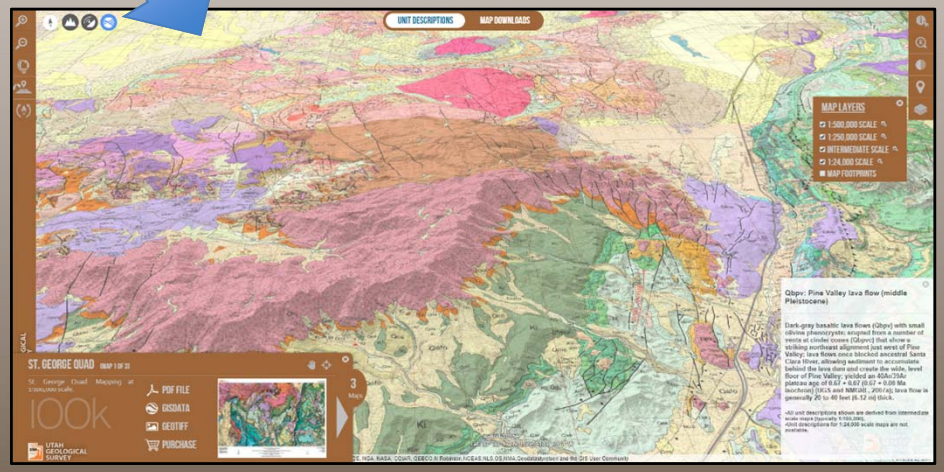
Geologic Information and Outreach

There is high demand for interactive maps



Broad user base:

- Government officials/decision makers
- Private sector/industry
- University researchers
- Educators & students
- General public



Geologic Map Portal – 3D view of Pine Valley Mountains area, Washington Co.

Geologic Information and Outreach

There is high demand for interactive maps

Currently Available Interactive Maps

Geologic/Topographic Maps

- Geologic Map Portal
- 7.5’ Map Index
- 30’x60’ Map Index
- 1°x2° Map Index
- Topographic Map Index
- Geologic Overlays & Virtual Field Guides

Energy Resources

- Geothermal Wells & Springs
- Utah Core Research Center Inventory

Geologic Hazards

- Active Faults
- Geochronology Database
- Aerial Imagery Collection

Popular Geology

- Rock & Mineral Collecting
- Fossils & Dinosaurs in Utah
- Building Stone of Salt Lake City
- Landscape Rock Collecting
- Wasatch Front Canyons Geologic Tour
- GeoSights

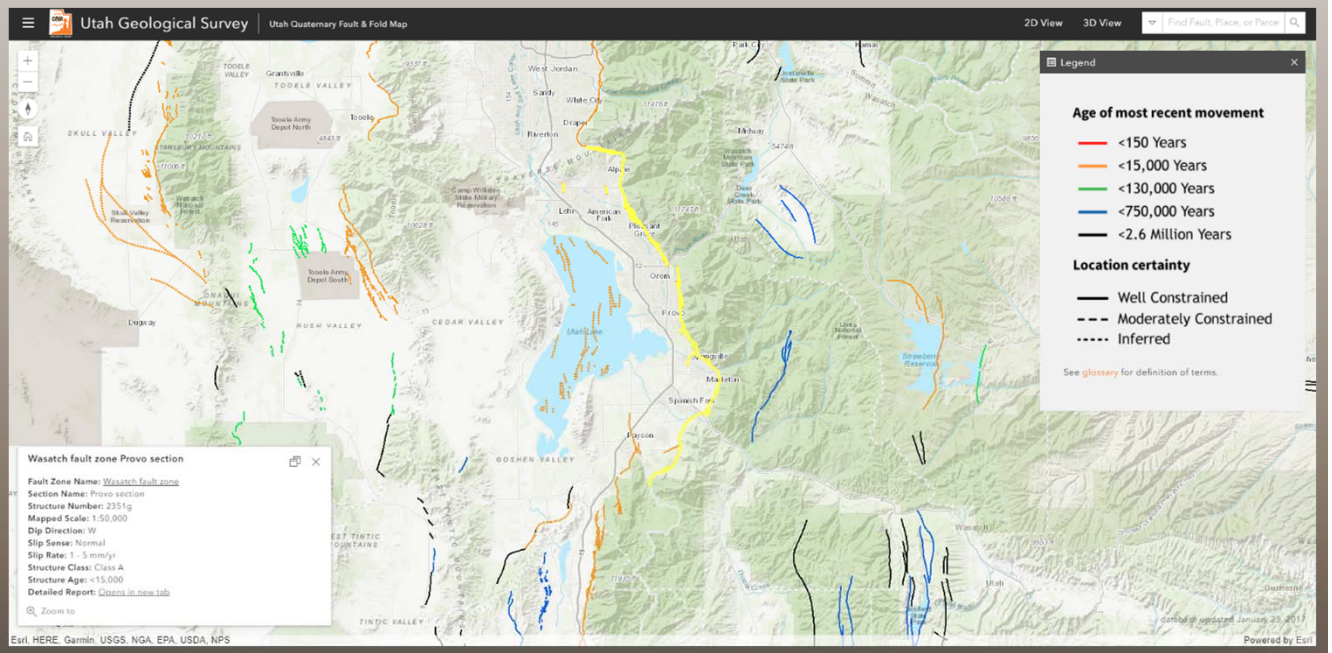
Minerals & Mining

- Utah Mining Districts
- Utah Mineral Occurrence System
- Utah Mineral Resource NI Tech Reports
- Abandoned Coal Mine Maps
- Non-petroleum Well Data

Groundwater & Wetlands

- Utah Wetlands
- Groundwater Monitoring Data Portal

Utah Active Faults Map – Centered on Utah County



Digital Transformation

Maps, research articles, geohazards, etc.

Prior to 2006

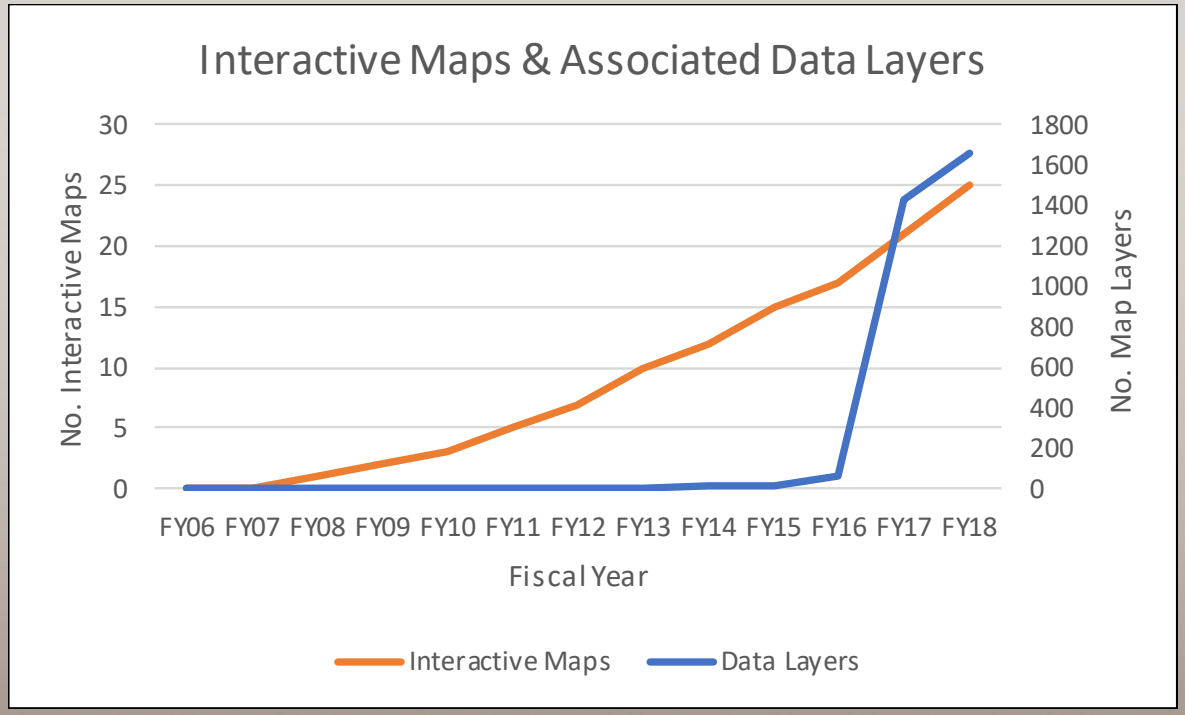
- 0 Interactive Maps
- 0 Layers to Manage

By 2016

- 17 Interactive Maps
- 70 Layers to Manage
- 4.5 Million User Requests

At present

- 25 Interactive Maps
- 1,665 Layers to Manage
- 5.3 Million User Requests

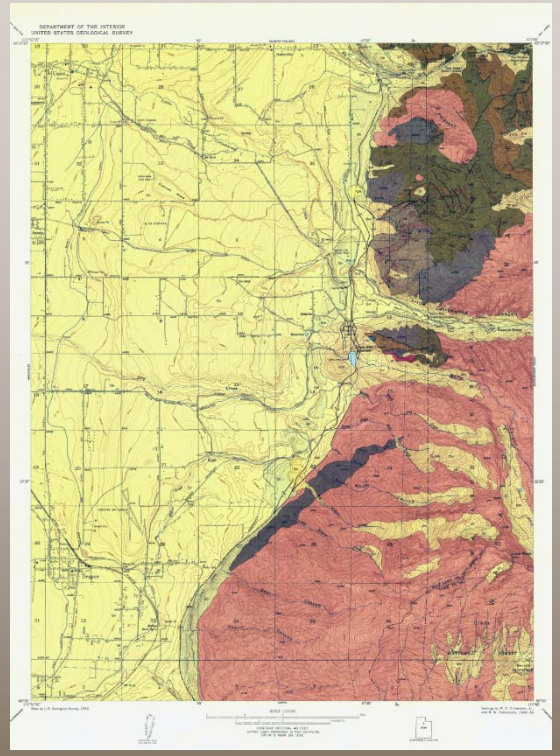


Geologic Mapping

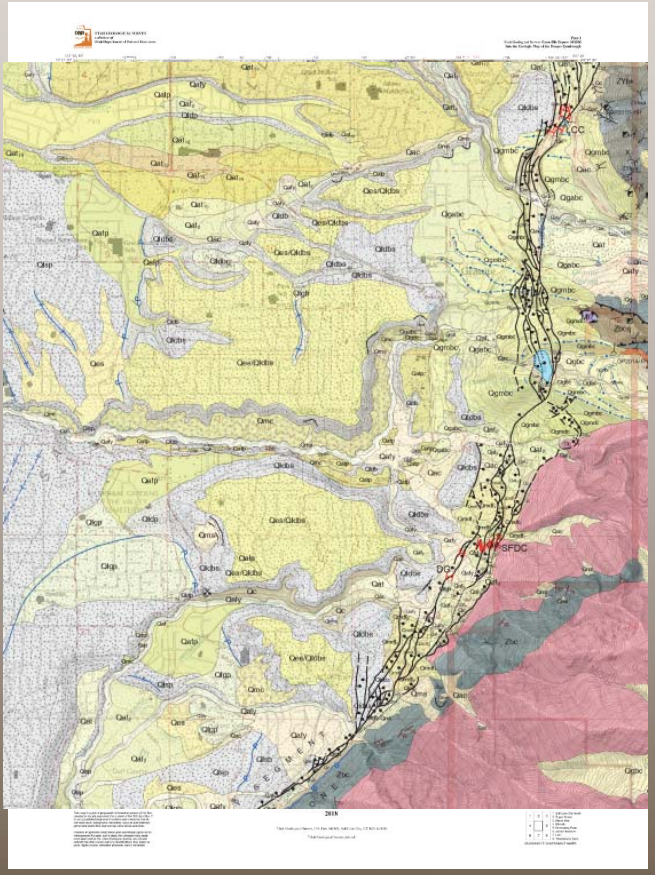
The "bedrock" of sound land-use decisions

- Yes, it's already been mapped, but…
- Priorities set by State Mapping Advisory Committee
- Critical information for land managers, geotechnical consultants, resource specialists, etc.

New Geologic Mapping
Draper Quadrangle
Salt Lake County



1965 USGS Mapping

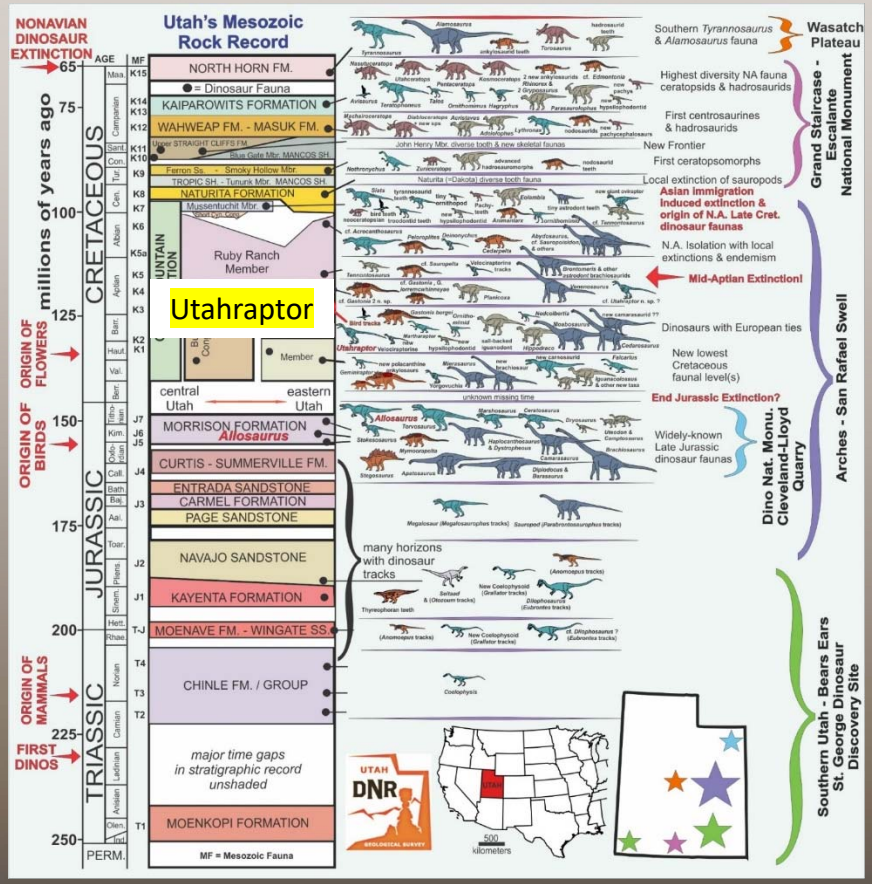


2018 UGS Mapping

Paleontology

Utah preserves the most complete dinosaur-bearing sequence of rocks in the world

- Science – Insights into global change over time
- Public interest – Tourism (Dinosaur National Monument, Cleveland-Lloyd Dinosaur Quarry, Dinosaur Diamond Scenic Byway, etc.)
- Challenge in researching Utah's paleontology before vandalism, theft occur on unprotected sites



Geologic Hazards

Dynamic geology can lead to threatened public health, safety, and welfare

Spring Creek Road Landslide, Riverdale, Weber County

- At request of City of Riverdale, ongoing UGS investigations to develop a scientific understanding of the landslide
- Geologic evidence points to long history of landsliding along bluff
- Highlights societal and economic benefit to incorporating good geologic information early in the planning process for new development

Bottom of Landslide

Top of Landslide

Groundwater and Wetlands

Responsible water use requires understanding the geologic occurrence of water resources

- At request of Division of Water Rights, conducted a multi-disciplinary study to understand groundwater and surface-water resources in Ogden Valley*
- Developed new groundwater budgets to guide Division of Water Rights' decisions on exchange applications
- Updated septic-system density recommendations for Weber-Morgan Health Department

Hydrogeologic Study
Ogden Valley
Weber County

*Projected population growth:
- 8,822 (2020)
- 21,038 (2050)

Source: Ogden Valley General Plan (2016)

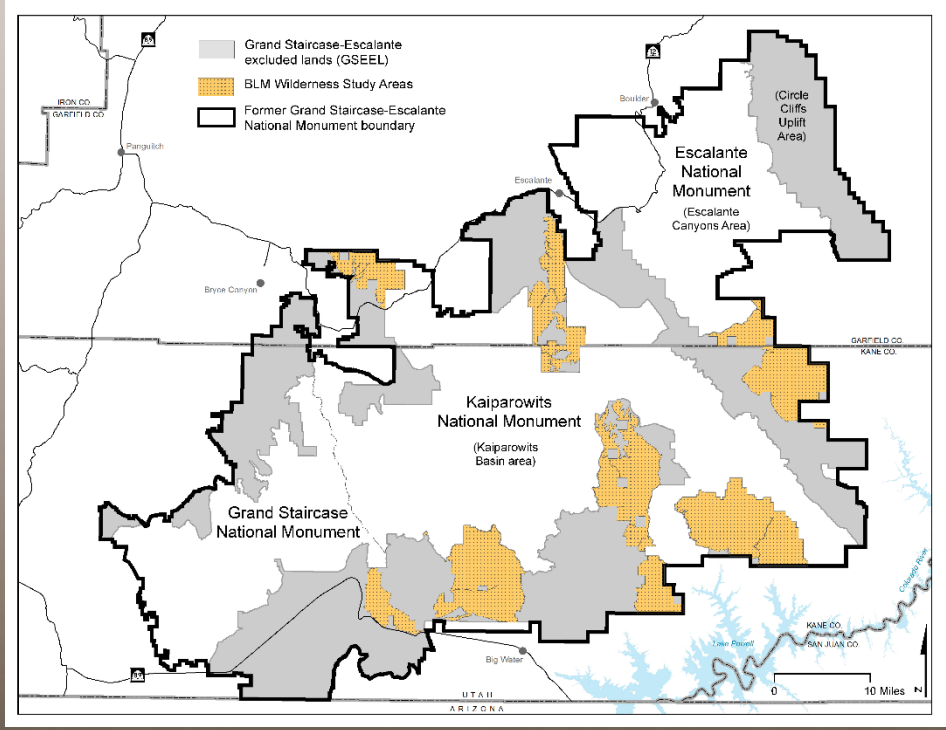
Energy and Minerals

Geologic information is necessary for prudent development of Utah's energy and mineral resources

- At request of BLM, developed Mineral Potential Report as part of Resource Management Plan
- Evaluated occurrence and development potential of all extractable commodities (oil/gas, coal, uranium, metals, industrial minerals, etc.)
- Essential for developing future management policies

Grand Staircase – Escalante National Monument

Mineral Potential Report
GSENM Excluded Lands
Garfield & Kane Counties

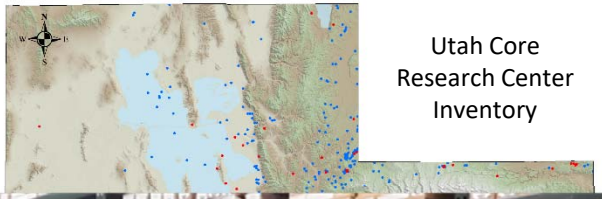


Excluded lands shown in gray

Energy and Minerals – Utah Core Research Center

UGS houses region's largest "geologic library" of geologic core and cuttings from Utah

- Drill core totaling 400,000 feet of material (75 miles)
- Drill cuttings representing over 57 million feet of subsurface data (11,000 miles)
- Estimated collection value = $5-10 billion
- Hosted 400+ scientists from all over the world in 2018



Utah Core Research Center Inventory

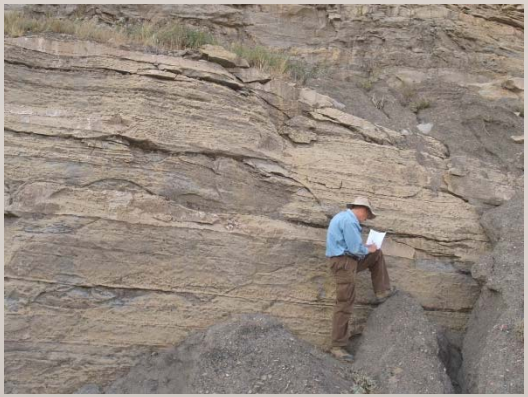
The challenge: **It's full!**

FY20 Building Block Request

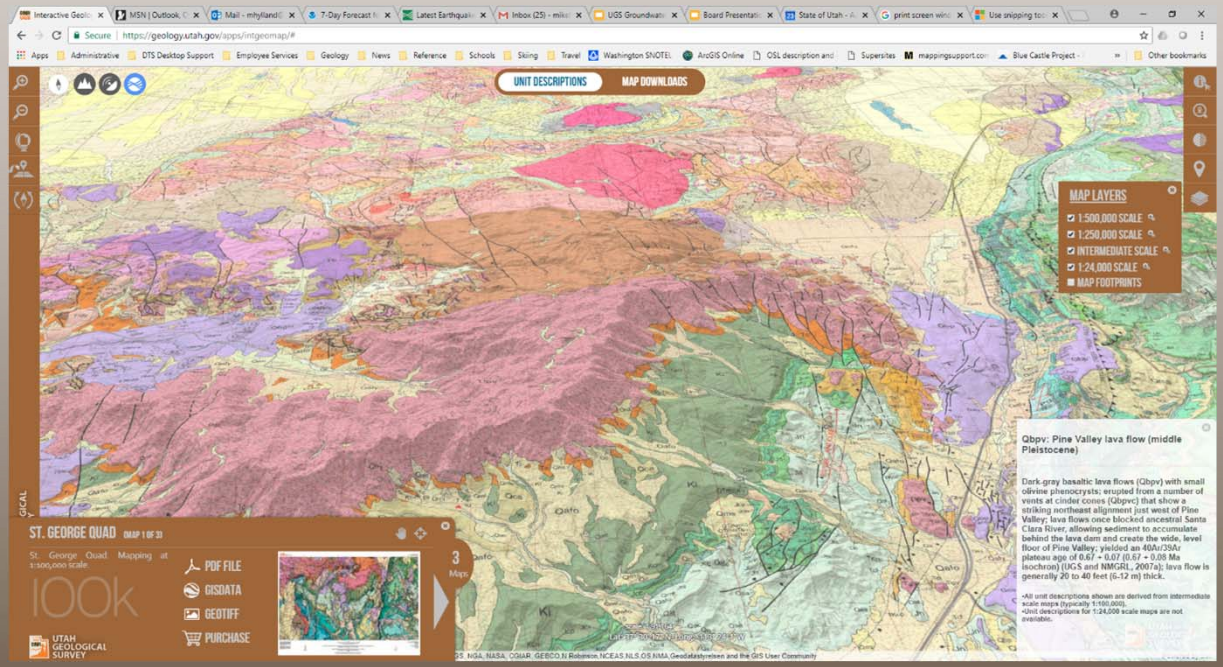
The Need: Ongoing funding for data management

= ***Timely Scientific Information***

Data Management



Data Collection



Interactive Map

FY20 Building Block Request

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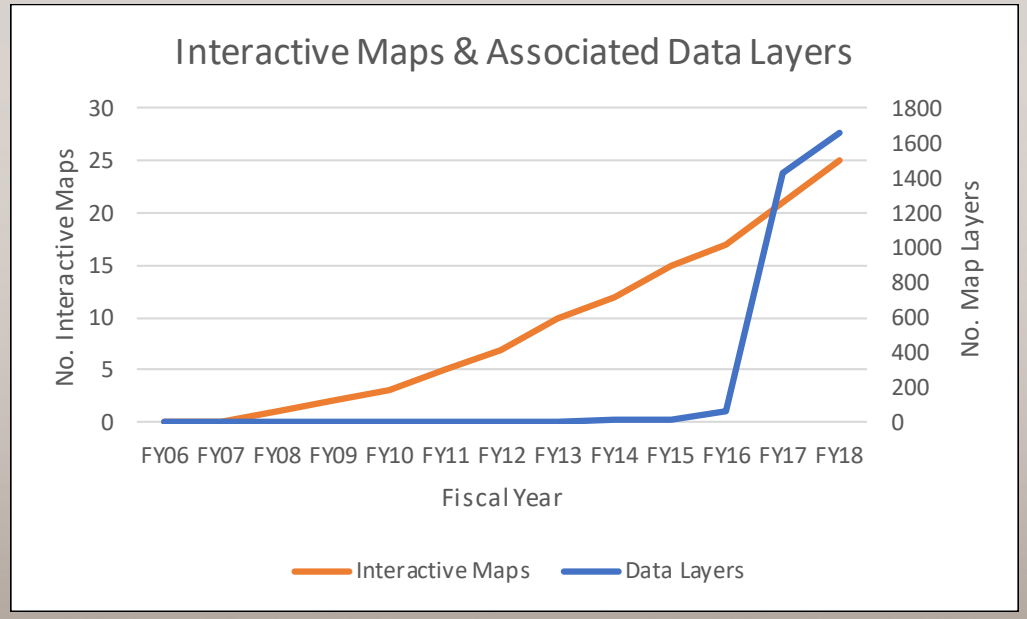


Current constraints:

- Information in existing maps becoming out-of-date
- Development of new interactive maps being delayed

Utah Geological Survey Budget

Issues and Challenges

Federal Funds and Dedicated Credits (Contracts)

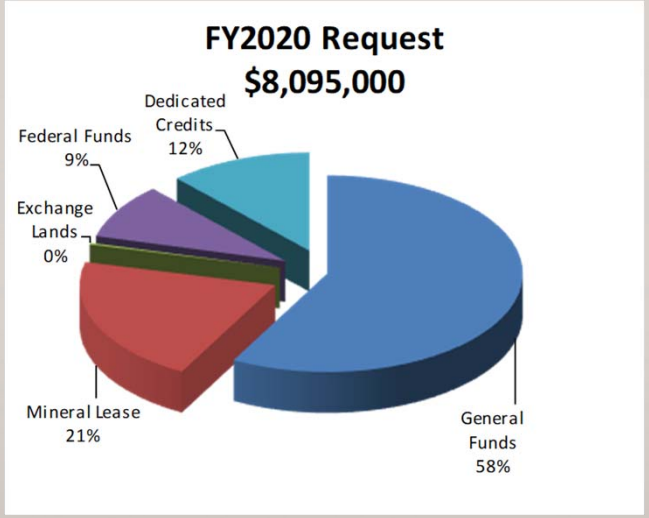
- Ongoing volatility in outside agency priorities and funding levels

Mineral Lease Revenue

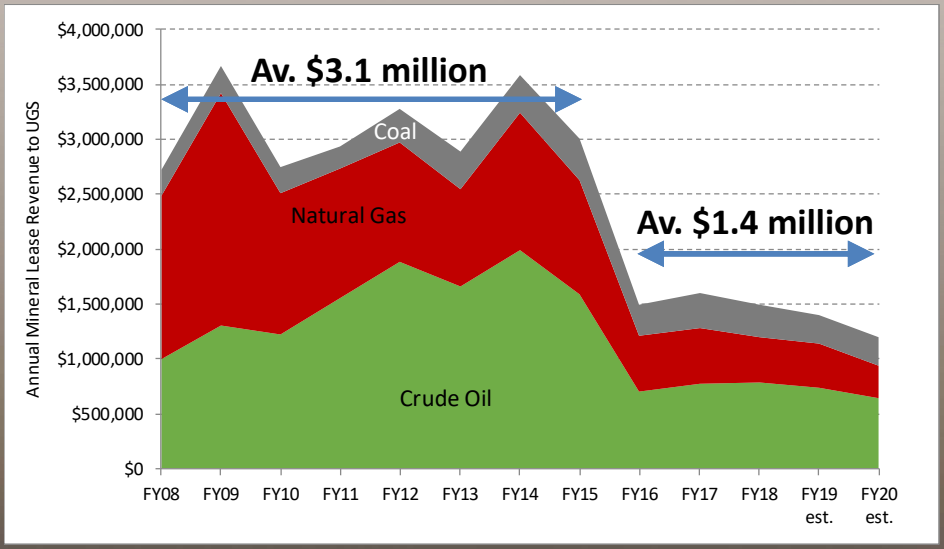
- Current revenue to UGS less than half pre-FY15 levels
- Measures taken:
  - 20% reduction in staff (15 FTEs)
  - $1 million ongoing increase in General Funds
- Continuing challenge:
  - Continued projected low oil & gas prices
  - Low levels of production on Federal lands

Oil production on Federal lands (% of total Utah production):

- 50% (2009)
- 20% (2019)



Mineral Lease Revenue to UGS (From Production on Federal Lands)



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