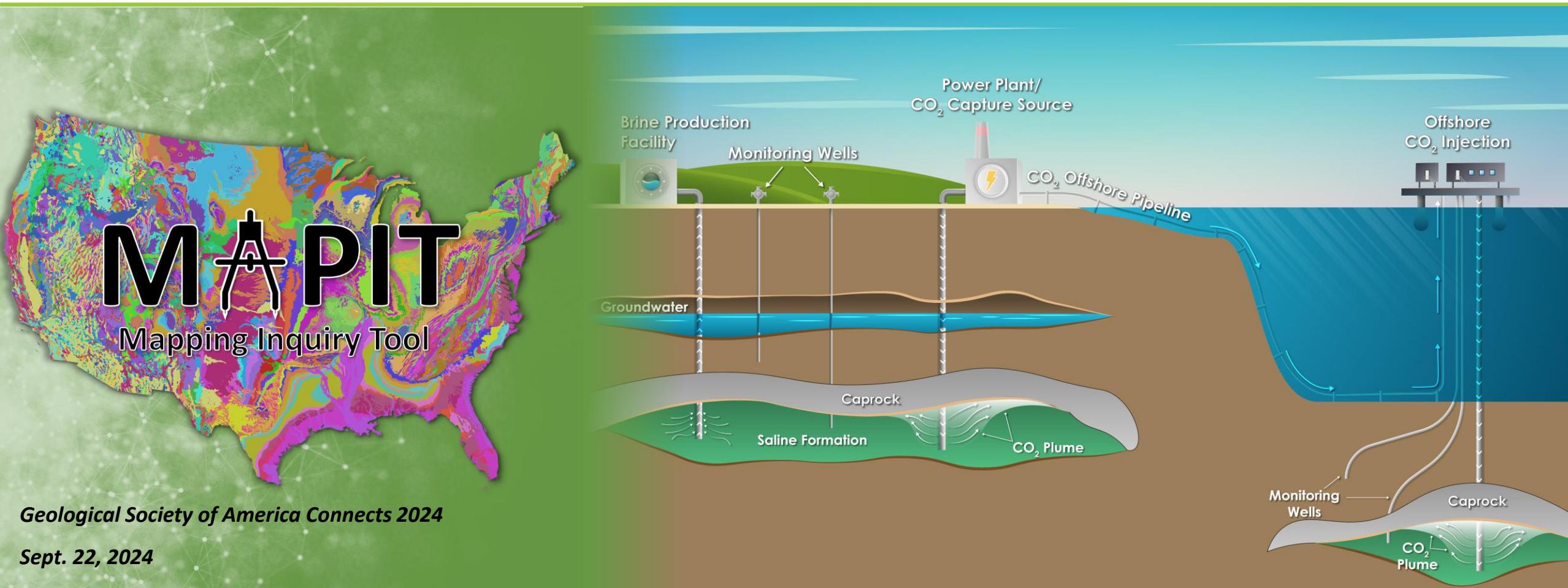


# Carbon Storage Site Mapping Inquiry Tool (MapIT)

**Paige Morkner**  
Geologist/Geo-Data Scientist



# Disclaimer



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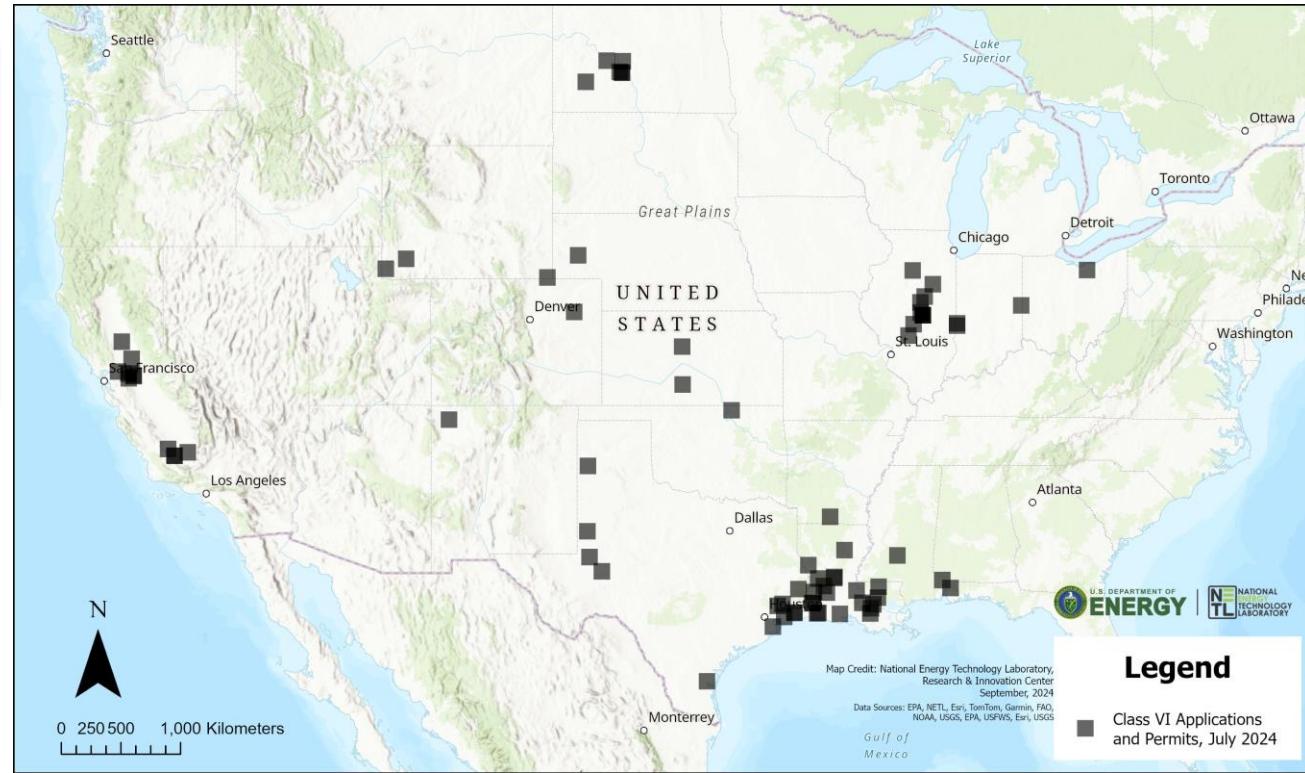
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# Purpose

**Challenge:** Current and increasing CCS deployment in coming years will require application for Class VI permitting with the EPA or state regulators to drill injection wells, which requires **vast amounts of data**.

**Objective:** Develop a comprehensive, user-friendly tool that provides a way for regulators, industry, researchers, and other stakeholders to find, query, and download relevant data related to carbon storage projects to support Class VI permitting processes.



*Locations of Submitted and Granted EPA Class VI permits as of July, 2024*

**EIDX SPATIAL**

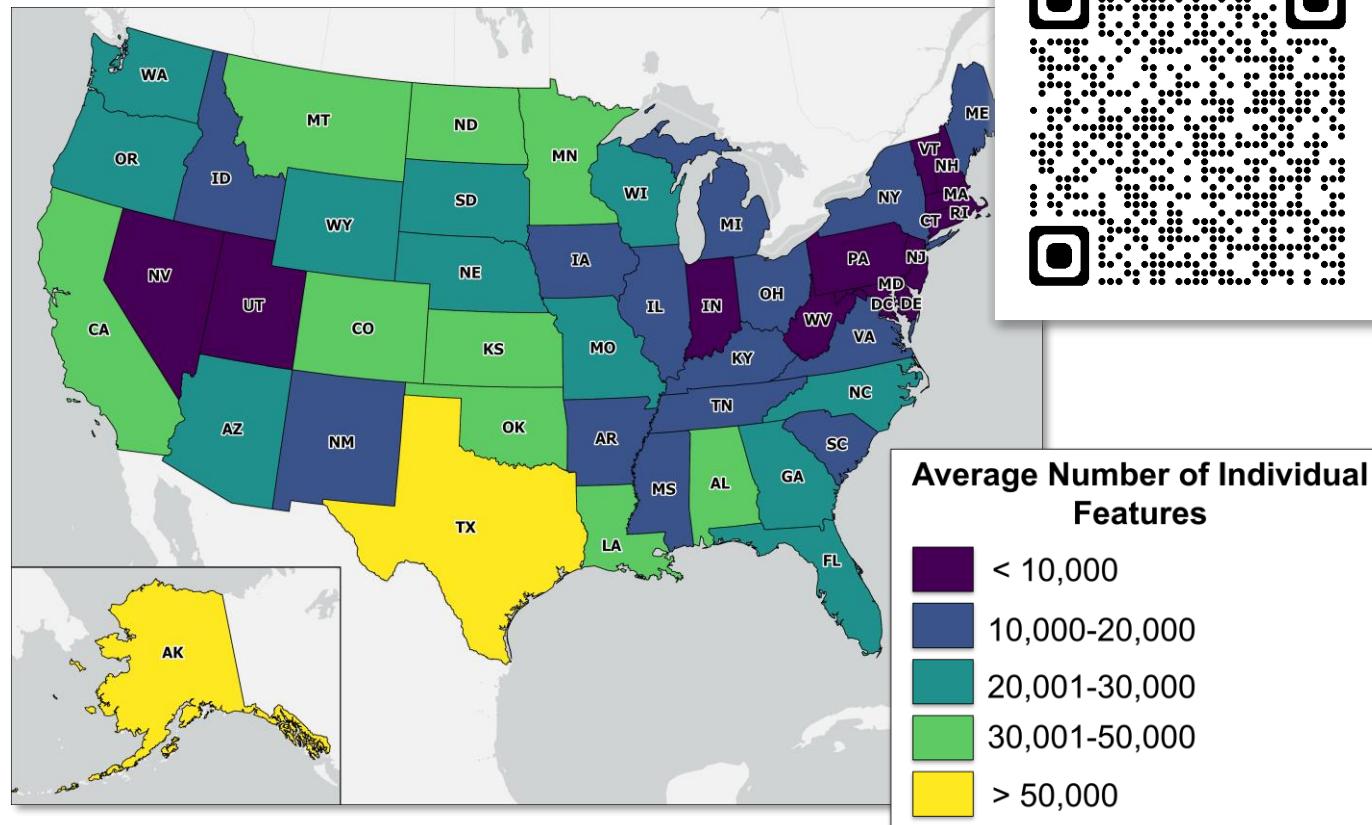
# Building a Data Catalog and Database was the First Step in Creating MapIT



- Data needs were determined through **review of the EPA Class VI Permit Guidance**
- Data sources were chosen based on **authority, completeness, and credibility**
- Consists of over **600 data resources** with description and **links to original data sources**
- **Covering the whole of the US:**
  - Hydrology, Wetlands, Lakes, Rivers, groundwater wells
  - Elevation maps
  - Geologic Maps
  - Faults and structural data
  - Sedimentary basins
  - Class VI applications submitted to EPA
  - Current CCS injection well and project locations
- **Formation level:**
  - Major saline formation property data
  - Aerial extent, depth contours, thickness contours, top seal formation, temperature, pressure, mineralogy



<https://edx.netl.doe.gov/dataset/mapit-database>



# The Carbon Storage Mapping Inquiry Tool (MapIT)



- **Tool allow users to:**
  - Explore data in mapping application
  - View links to additional data and resources
  - Understand what data is publicly available and how to access for further use
  - User Documentation also available as a “Start Here”
- **Data is pulled in dynamically** from the source for anything externally published
  - In some cases, users need to download from the original published source

Mapping Inquiry Tool (MapIT)

The Carbon Storage Site Mapping Inquiry Tool (MapIT) is an online web mapping tool designed to help users discover available public-sourced data to facilitate data exploration in support of Underground Injection Control (UIC) Program Class VI Well Site permitting for the geologic sequestration of carbon dioxide. MapIT serves only as a data exploration tool to support characterization of geologic carbon storage sites and does not replace or replicate the EPA GSDT tool for submitting a UIC Class VI permit. Please review the [official EPA site](#) to access the GSDT and other resources related to the Class VI permitting process.

There is no guarantee of completeness or appropriateness for individual user's requirements. Use of this tool is solely at the discretion of the user. See full [Federal Disclaimer](#).

Data have been collected from authoritative national, state, and local sources and made available in this tool. It is also available as an Esri Geodatabase and data catalog on [EDX®](#).

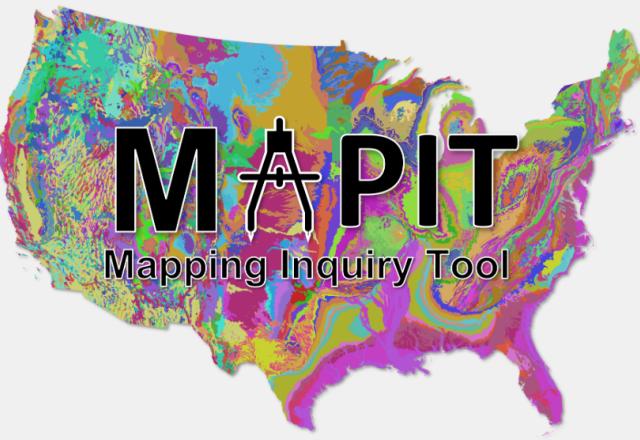
Please review the [How-To Documentation](#) to understand how to use this tool.

Data are available in the following sections of the tool as part of MapIT:

- All Data
- General Map
- Geologic Narrative/Site Characterization Maps and Cross Sections of the AoR and Region
- Information on Faults and Fractures
- Data on the Injection and Confining Zones
- Hydrologic Information/Maps and Cross Sections of the USDWs
- Geomechanical and Petrophysical Information about the Confining Zone
- Baseline Geochemical Data

Access each section of the tool by using the menu (three horizontal lines) in the upper right-hand corner or clicking on the sections below. Each section will open in its own tab in your browser.

How To Documentation



# Data Catalog and Tool are Organized into Groups for Improved Comprehensibility and Exploration

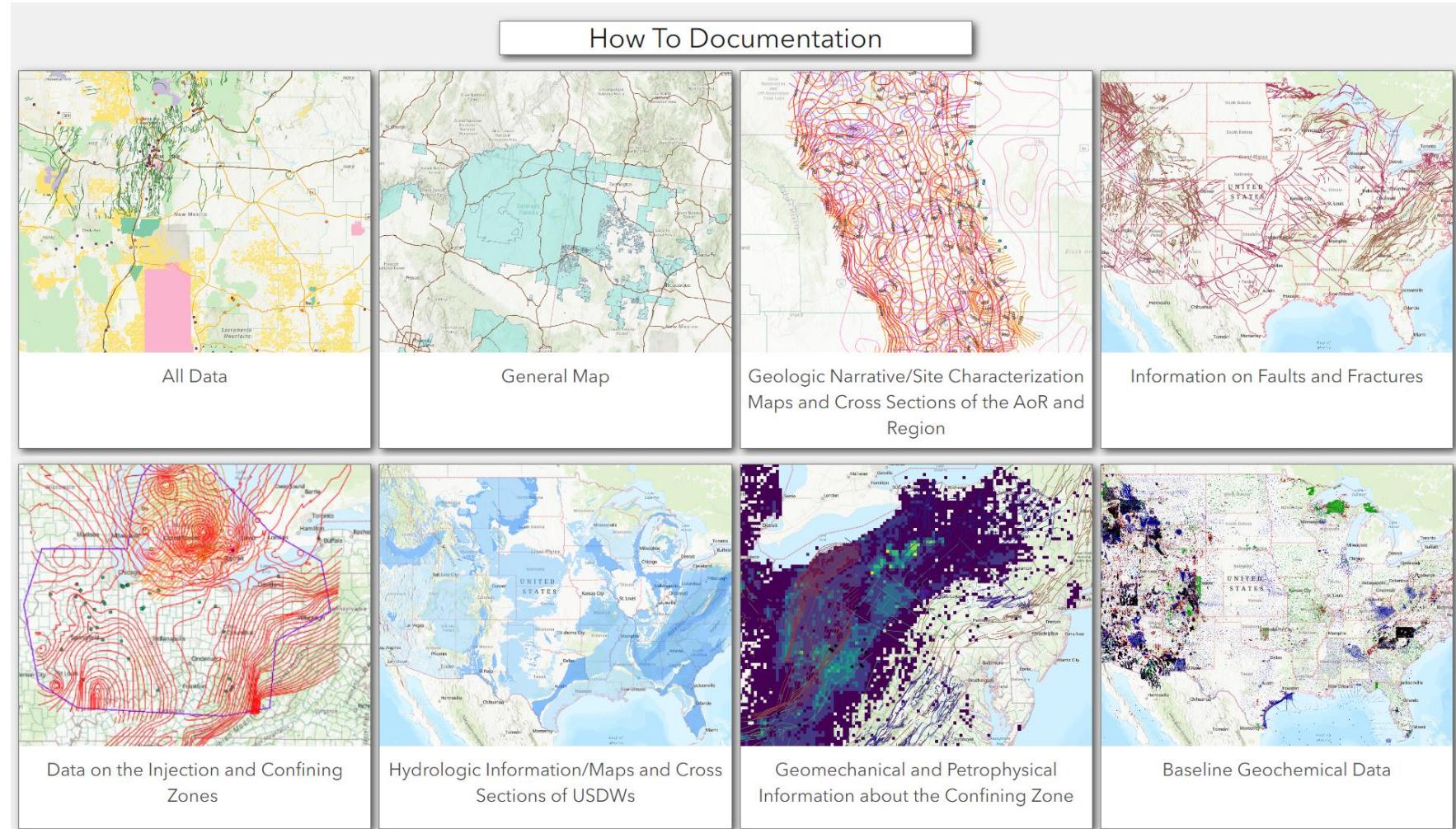


Categories	Data Examples	Authoritative Data Sources
General	Roads, Wells, EJSJ, Boundaries	DOE, FEMA, DOE, HIFLD
Geologic Site Characterization Maps and Cross Sections	Depth, Salinity, Pressure	NETL, USGS
Information on Faults and Fractures	Faults, Fractures, Geologic Structure	States, USGS
Data on the Injection and Confining Zones	Depth to top, Geologic Contours	States, USGS
Hydrologic Information/Maps and Cross Sections of the USDWs	Aquifers, Surface Hydrology, Water Wells	USGS, States
Geomechanical and Petrophysical Information about the Confining Zone	Well Locations, Well Logs, Well Density	NETL, States
Baseline Geochemical Data	Sample Locations	USGS

# Each Module within MapIT has its own Page to Improve Utility and Increase Accessibility



- Module themes were adapted from the **Class VI UIC program documentation**
- Breaks data up into **logical categories**
- **Improves performance**



## Standardized Layout Across Sections Creates a User-Friendly Experience that is Easy to Navigate



# The Near Me Widget enables exploration of data within an area of interest



General Map Beta  
Mapping Inquiry Tool (MapIT)

Class VI Data Support Geodatabase EPA Class VI Permitting Information

About Additional Information Links

**About:**  
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Data have been collected from authoritative national, state, and local sources and made available in this tool. The data is also available as an [Esri Geodatabase on EDX®](#).

**General Map Information:**  
This section of the tool provides information that can be used to explore general information for your area of review (AoR). It is also built to allow you to export a general map of the area, applicable for the EPA UIC Class VI permit process, ([EPA Class VI Application Completeness Checklist](#)). The data supports developing maps that include:

- Injection wells
- Producing wells

**Near Me**

Search for an address or locate on map  
Welcome, Louisiana

Show results within 20 Miles

Public Oil and Gas Wells (100) >

EPA Class VI Permits (4) >

Sand and Gravel Operations (1) >

USA Structures (100) >

Secondary Roads (6) >

Primary Roads (6) >

10mi >

Find address or place

Legend MapIT Basemap Gallery Add Data

**Public Oil and Gas Wells**

- Active
- Producing
- Plugged and/or Abandoned
- Inactive
- Unknown
- Well Development
- Storage Well/Maintenance Well/Observation Well
- Drilling
- Orphan Well
- Shut-in
- Other

**Sand and Gravel Operations**

**Secondary Roads**

USGS PubConnect Filter

Please click on the map to load new data from USGS:  
A new window will open showing any USGS data near your chosen location.  
The latitude and longitude for that point will display below:  
Latitude:   
Longitude:

Export Map Export Report Extract Data

Map title: C6 MapIT Map Export  
Layout: Letter ANSI A Landscape  
Format: PDF

Advanced Print

All quariable data within search area



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# Custom Widgets Connect Users with Additional USGS Resources – PDFs, seismic data, etc.



Mineral Resources / Online Spatial Data

Scientific data near [38.63765,-121.71683]

Search area extends approximately 22.3 km east-west and 28.5 km north-south.

Geographic context
Counties, states, countries
Yolo
California
United States
North America
Land
Map quadrangles, from USGS
Grays Bend
Sacramento

USGSPubConnect [Filter](#)

Please click on the map to load new data from USGS:

A new window will open showing any USGS data near your chosen location. The latitude and longitude for that point will display below:

Latitude:  Longitude:

[Geology of US states](#) [+/-](#)

[Airborne geophysical surveys](#) [+/-](#)

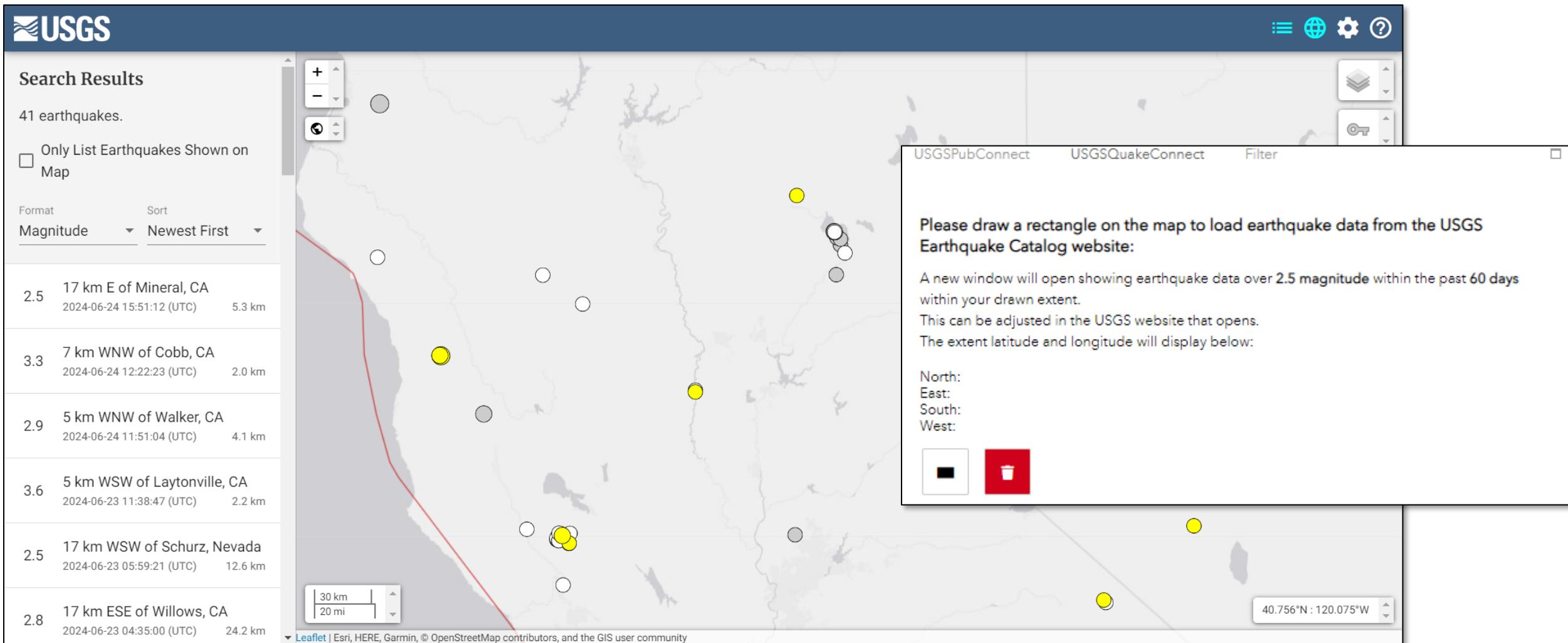
[Estimates of undiscovered mineral resources](#) [+/-](#)

[The continental crust](#) [+/-](#)

[National geochemical survey database](#) [+/-](#)

[Geochemistry of stream sediments in the US from the NURE-HSSR database](#) [+/-](#)

# Custom Widgets Connect Users with Additional USGS Resources – Earthquakes



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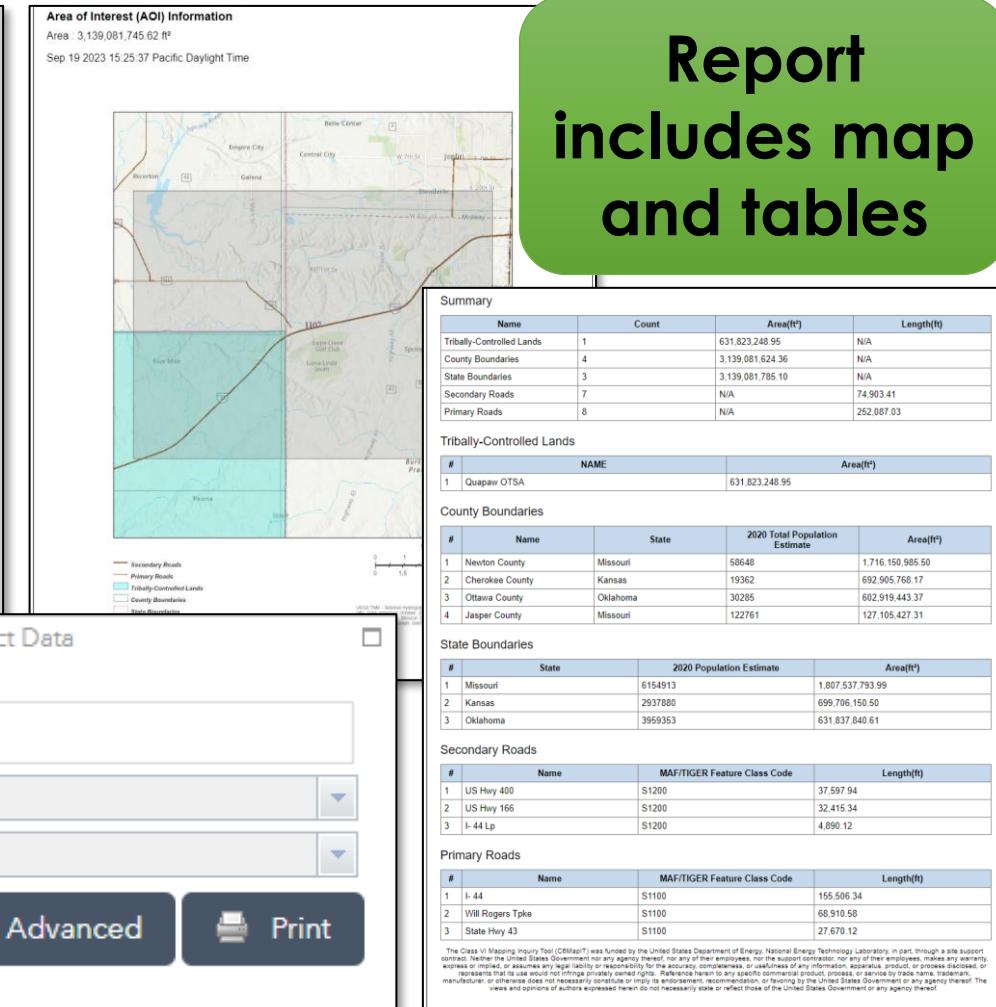
# Three Export Options allow Users to Create Maps, Reports, and Extract Data



- Data export** allows for users to perform further analysis in their own systems
- Maps and reports** can be used to showcase project plans and supports developing narratives for an area of interest

The screenshot shows the ArcGIS interface with two main windows. The top window is titled 'Extract Data' and lists '1 Layers to extract' (Public Oil and Gas Wells, Coal Mines, Sand and Gravel Operations, Crushed Stone Operations, Prospect and Mine-Related Points - 24k scale). It also shows '2 Study area' (Same as Display, Select features, Clip features) and '3 Output data format' (CSV). The bottom window is titled 'Export Map' and shows 'Map title: ArcGIS Web Map', 'Layout: Letter ANSI A Landscape', and 'Format: PDF'. It includes 'Advanced' and 'Print' buttons.

Report includes map and tables



# MapIT Helps Solve Data Accessibility, Availability, and Utility Challenges



## Value to Stakeholders:

- **Aggregates disparate data** into a single, intuitive location
- **Enhances data discovery and data sharing**
- Directly links users to original data sources
- **Dynamic datasets** ensure the most recent data is available
- Enables users to **find, query, and export data**



# Acknowledgments

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# NETL RESOURCES

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