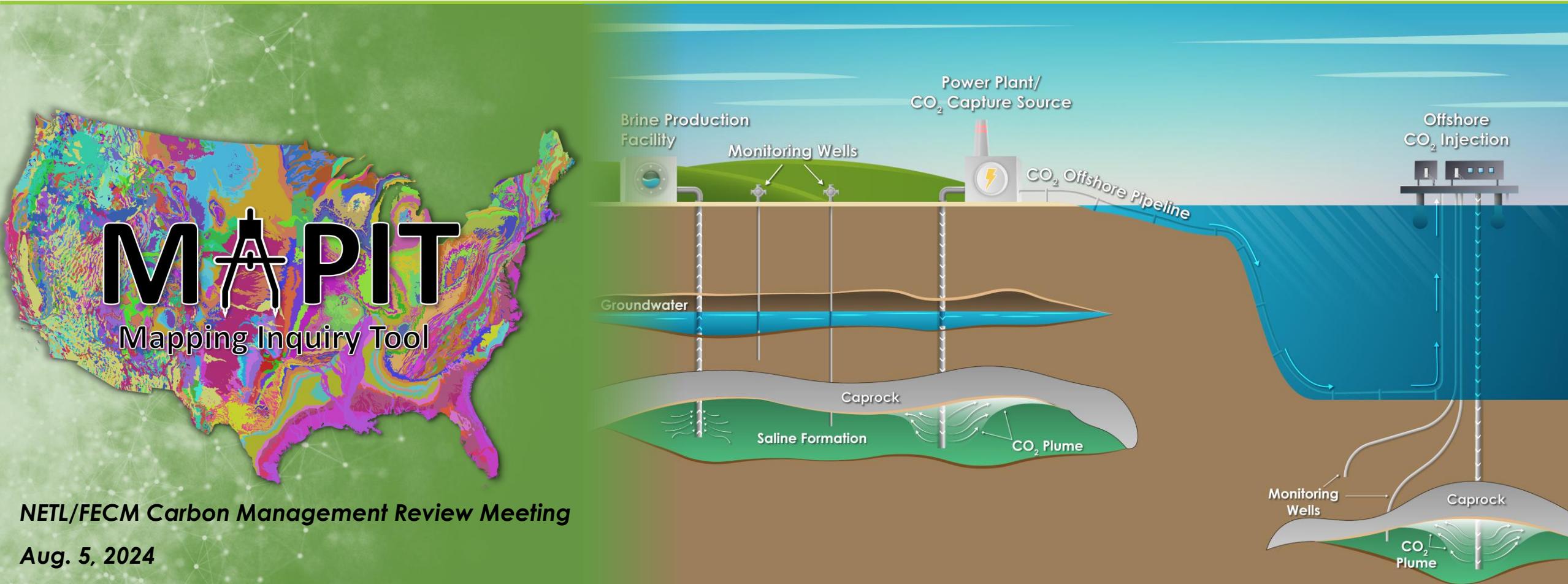


Carbon Storage Site Mapping Inquiry Tool (MapIT)



Cat Schooley

Geospatial Research Scientist



Disclaimer



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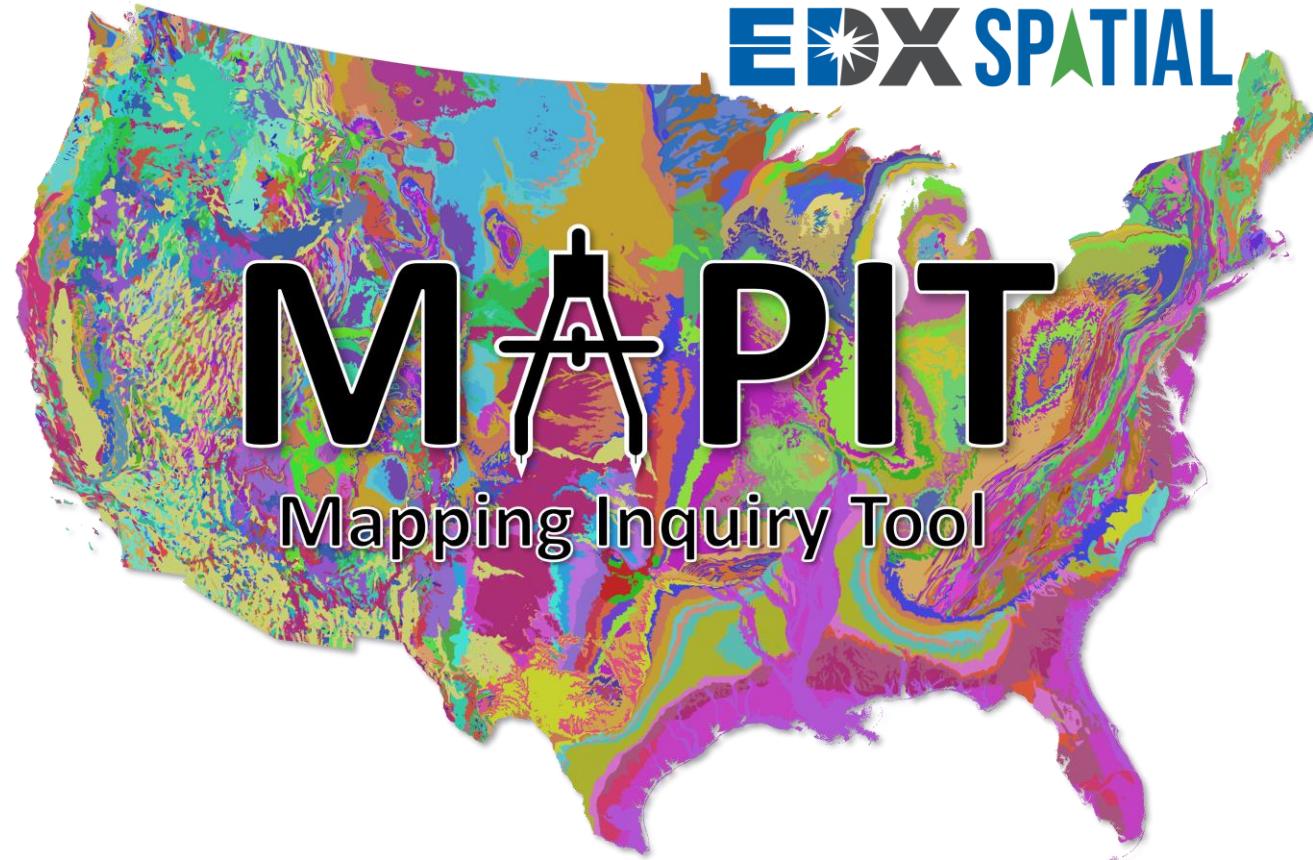
³National Energy Technology Laboratory, 626 Cochran Mill Road, Pittsburgh, PA 15236, USA

MapIT Serves as a Powerful, Comprehensive Data Exploration Tool for Diverse Stakeholders



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

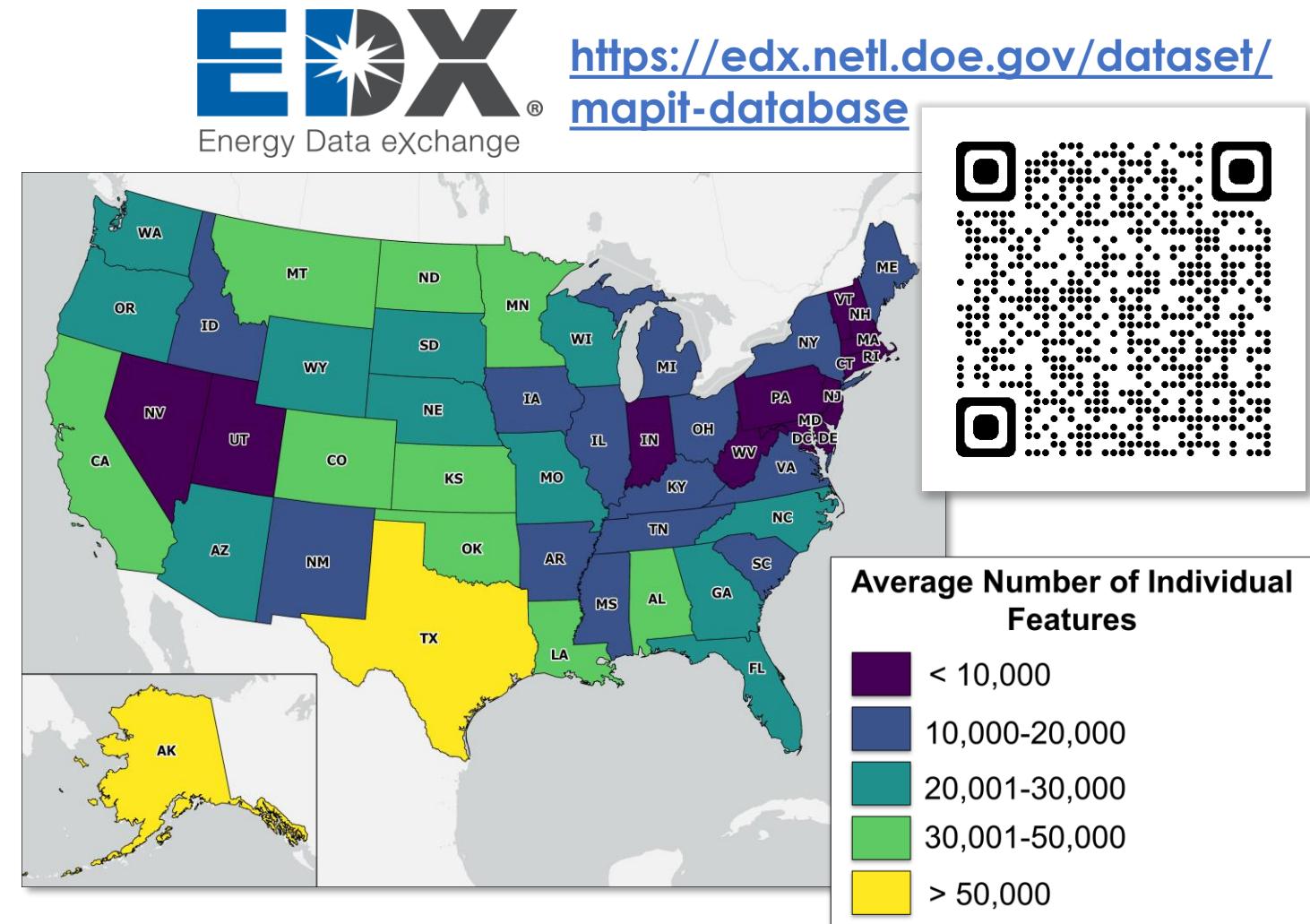
Objective: Develop **comprehensive, user-friendly tool** that provides a way for **regulators, industry, researchers, and other stakeholders** to **find, query, and download** relevant data related to carbon storage projects



CCS - Carbon capture and storage
EPA - U.S. Environmental Protection Agency

Building a Data Catalog and Database was the First Step in Creating this Powerful Data Exploration Tool

- Data needs were determined through a **review of the U.S. EPA Class VI Permit Guidance**
- Data sources were chosen based on **authority**, **completeness**, and **credibility**
- Data Catalog consists of over **600 data resources** with description and **links to original data sources**
 - **Database published on EDX**
 - **Data were integrated into MapIT**



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

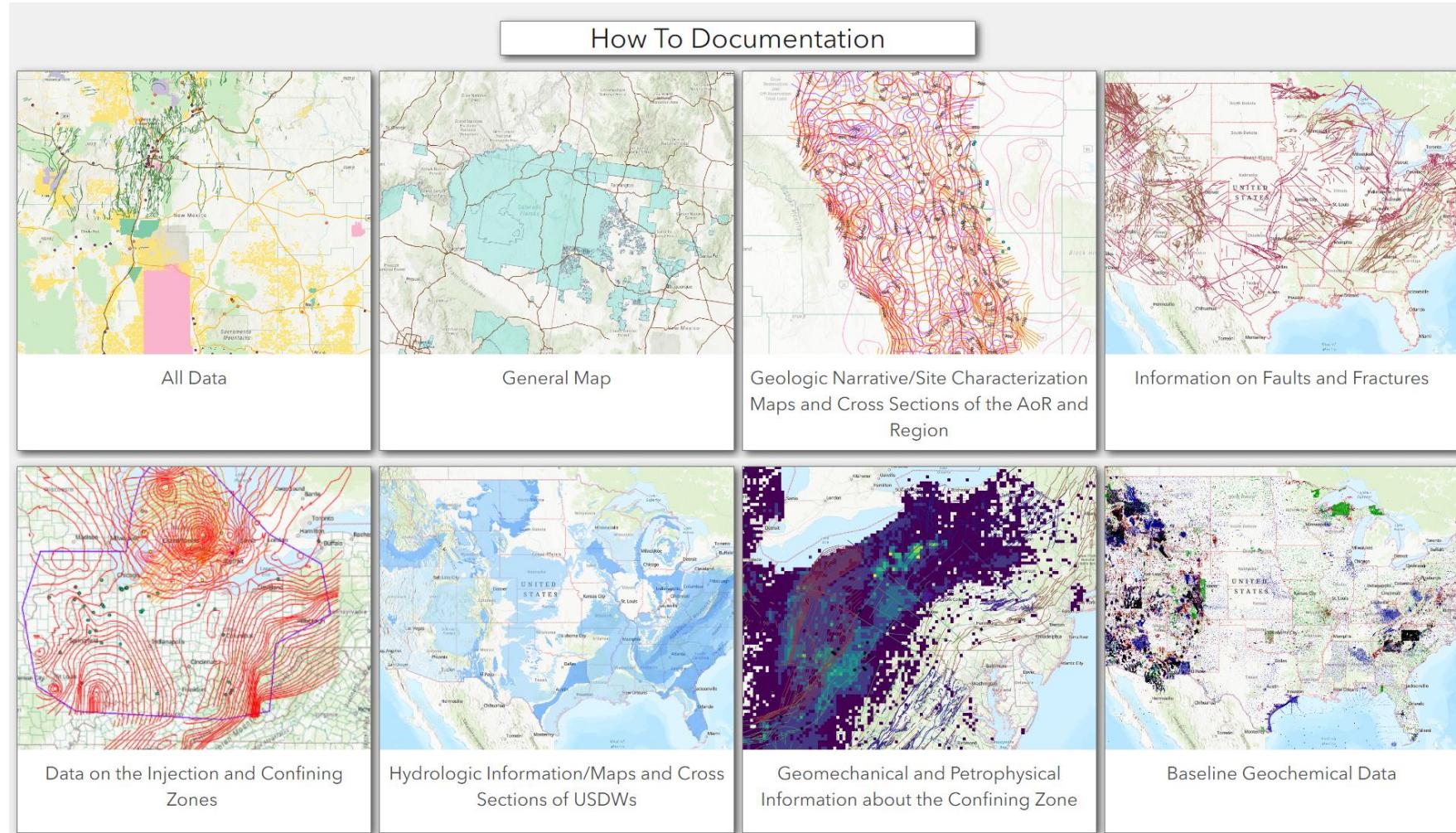


Categories	Data Examples	Authoritative Data Sources
General	Roads, Wells, Environmental and Social Justice, Boundaries	U.S. Department of Energy, U.S. Census Bureau
Geologic Narrative	Depth, Salinity, Pressure	National Energy Technology Lab (NETL)
Faults and Fractures	Faults, Fractures, Geologic Structure	U.S. Geologic Survey (USGS), States
Injection and Confining Zones	Depth to Top, Geologic Contours	USGS, States
Hydrology	Aquifers, Surface Hydrology, Water Wells	USGS, States
Geomechanical and Petrophysical	Well Locations, Well Logs, Well Density	NETL, States
Baseline Geochemical	Sample Locations	USGS

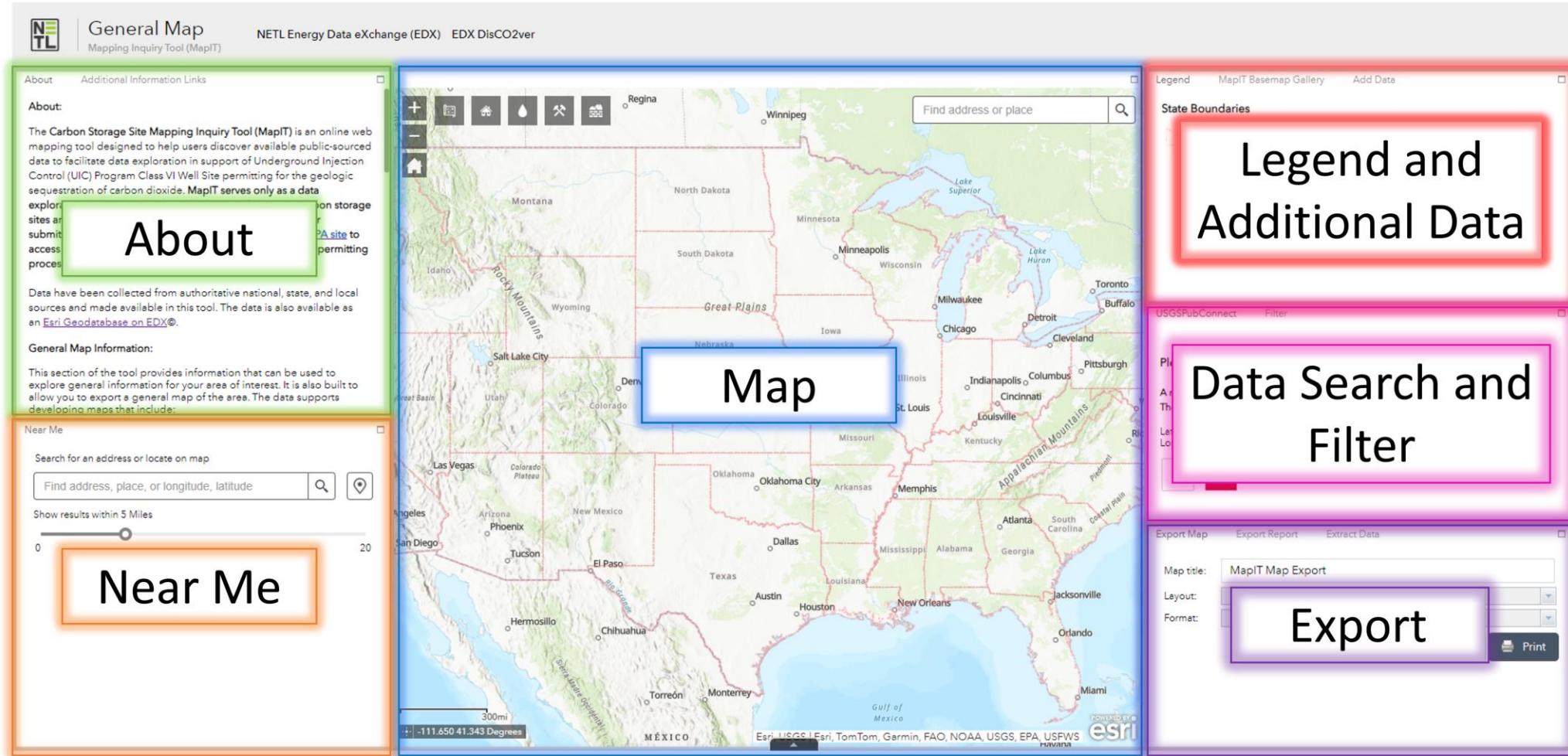
Each Module within MapIT has its own Page to Improve Utility and Increase Accessibility



- Module themes were adapted from the **Class VI Underground Injection Control (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



About

Near Me

Map

Legend and Additional Data

Data Search and Filter

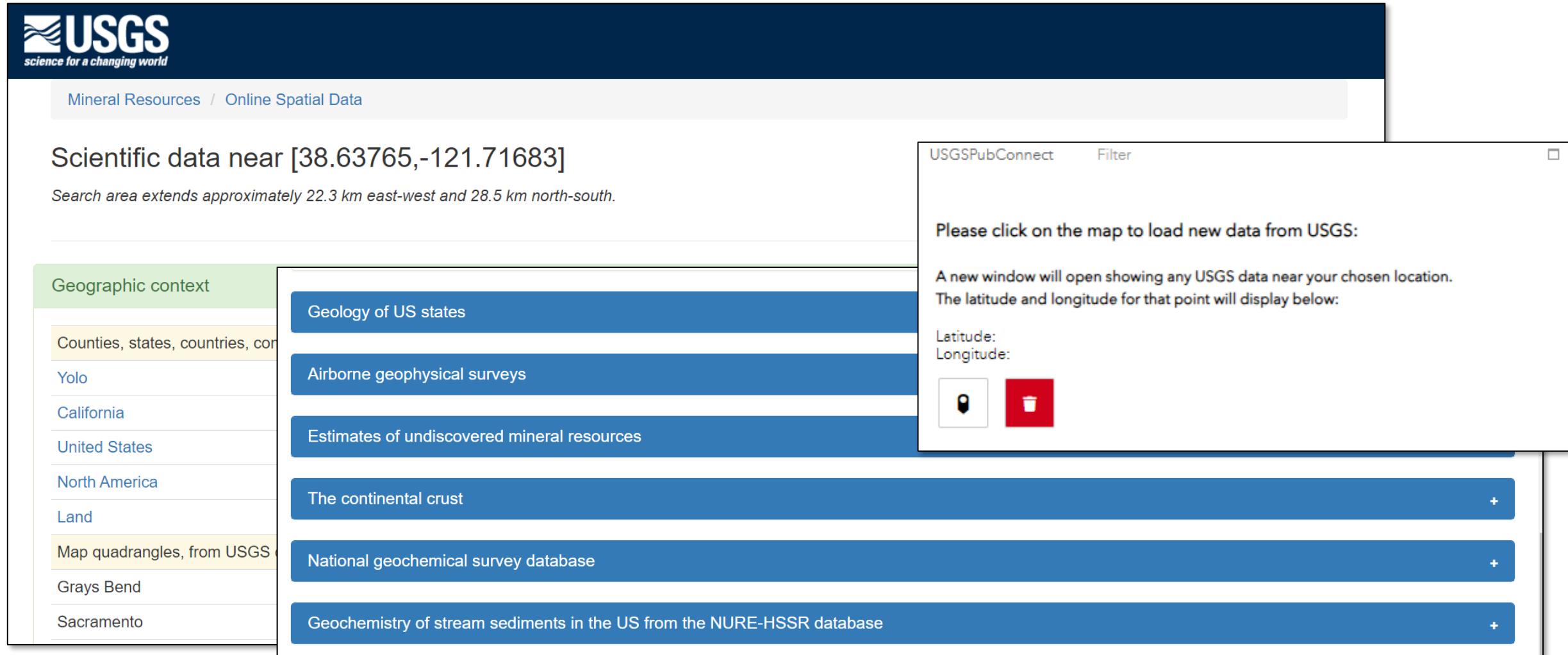
Export



The Near Me Widget is a Powerful Tool that Allows you to Explore Data within your Area of Interest



Custom Widgets Connect Users with Additional USGS Resources – PDFs, Seismic Data, etc.

A screenshot of a USGS web page. The top navigation bar includes the USGS logo and the text 'Mineral Resources / Online Spatial Data'. The main content area displays 'Scientific data near [38.63765, -121.71683]'. Below this, a message states: 'Search area extends approximately 22.3 km east-west and 28.5 km north-south.' To the right, a modal window titled 'USGSPubConnect' contains the text: '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:'. It includes input fields for 'Latitude:' and 'Longitude:' with a small location pin icon and a red trash can icon. Below the modal is a list of blue buttons with white text: 'Geology of US states', 'Airborne geophysical surveys', 'Estimates of undiscovered mineral resources', 'The continental crust', 'National geochemical survey database', and 'Geochemistry of stream sediments in the US from the NURE-HSSR database'. Each button has a small '+' icon on its right side. On the left, a sidebar titled 'Geographic context' lists 'Counties, states, countries, continents' (highlighted in yellow), 'Yolo', 'California', 'United States', 'North America', 'Land', 'Map quadrangles, from USGS' (highlighted in yellow), 'Grays Bend', and 'Sacramento'.

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, continents

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

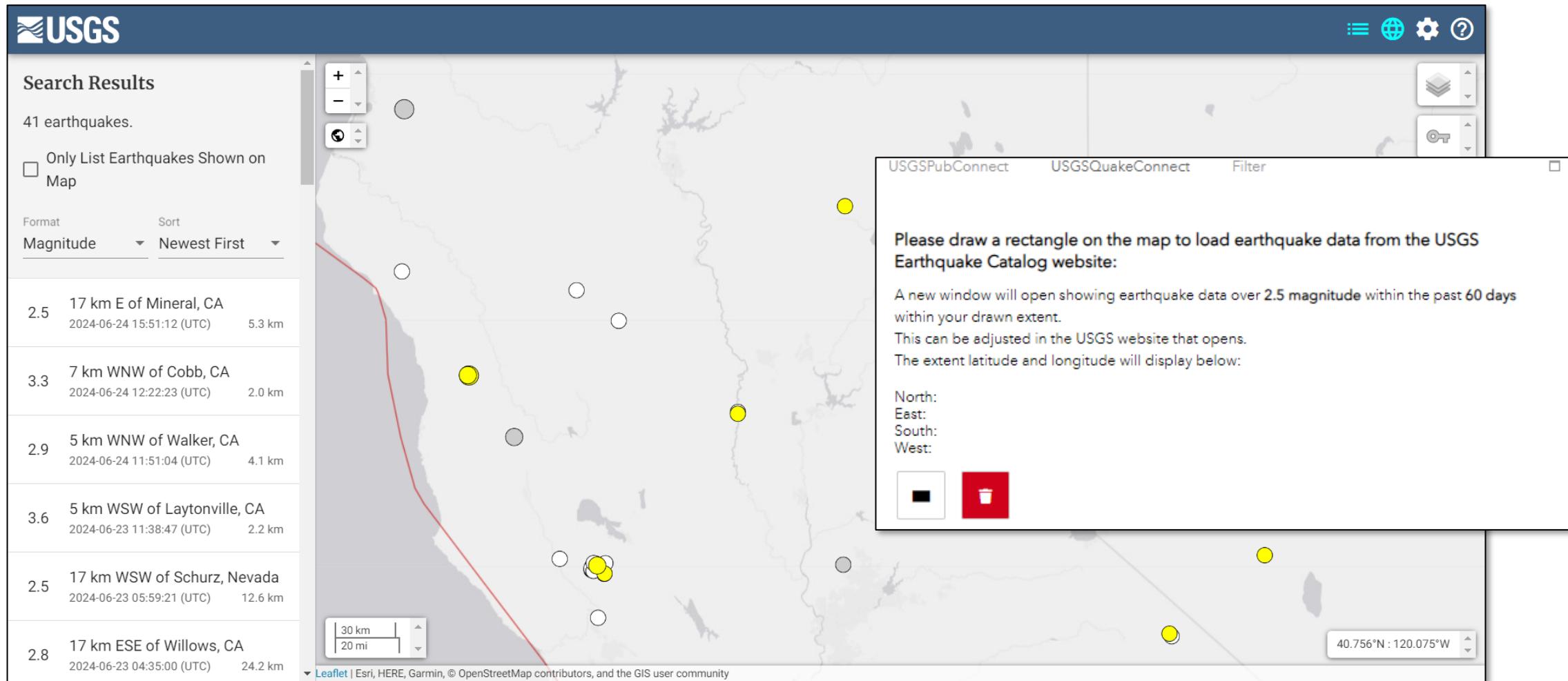
Estimates of undiscovered mineral resources

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



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

Export Map Export Report Extract Data

Extract Data

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

2 Study area

Same as Display

Select features Clip features

3 Output data format

CSV

4 Output file name

Extract Data Sep 19, 2023, 3:25:53 PM

Export Map Export Report Extract Data

Map title: ArcGIS Web Map

Layout: Letter ANSI A Landscape

Format: PDF

Advanced Print

Area of Interest (AOI) Information
Area: 3,139,081.745 62 ft²
Sep 19 2023 15:25:37 Pacific Daylight Time

Summary

Name	Count	Area(ft ²)	Length(ft)
Tribally-Controlled Lands	1	631,823,248.95	N/A
County Boundaries	4	3,139,081,624.36	N/A
State Boundaries	3	3,139,081,785.10	N/A
Secondary Roads	7	N/A	74,903.41
Primary Roads	8	N/A	252,087.03

Tribally-Controlled Lands

#	NAME	Area(ft ²)
1	Quapaw OTSA	631,823,248.95

County Boundaries

#	Name	State	2020 Total Population Estimate	Area(ft ²)
1	Newton County	Missouri	58648	1,716,150,965.50
2	Cherokee County	Kansas	19362	692,905,768.17
3	Ottawa County	Oklahoma	30265	602,919,443.37
4	Jasper County	Missouri	122761	127,105,427.31

State Boundaries

#	State	2020 Population Estimate	Area(ft ²)
1	Missouri	6154913	1,807,537,793.99
2	Kansas	2937880	699,706,150.50
3	Oklahoma	3959353	631,837,840.61

Secondary Roads

#	Name	MAF/TIGER Feature Class Code	Length(ft)
1	US Hwy 400	S1200	37,597.94
2	US Hwy 166	S1200	32,415.34
3	I-44 Lp	S1200	4,890.12

Primary Roads

#	Name	MAF/TIGER Feature Class Code	Length(ft)
1	I-44	S1100	155,506.34
2	Will Rogers Tpke	S1100	68,910.58
3	State Hwy 43	S1100	27,670.12

The Cross VI Mapping Inquiry Tool (CMIT) was funded by the United States Department of Energy, National Energy Technology Laboratory, in part, through a site support contract. Neither the United States Government nor any agency thereof, nor any of their employees, nor any support contractor, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.



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**



DEMO & POSTER SESSION

TUESDAY, AUGUST 6, 2024
5:45 PM - 7:45PM
BALLROOM GALLERY

Carbon Storage Site
Mapping Inquiry Tool
(MapIT)



CARBON TRANSPORT & STORAGE DATA AND
INNOVATION TO BRIDGE THE DIGITAL DIVIDE



Acknowledgments



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