

Energy Data eXchange: NETL's Digital Library and Virtual Laboratory Supporting the Fossil Energy and Carbon Management Research Community

Catalyzing Collaboration & Accelerating Innovation



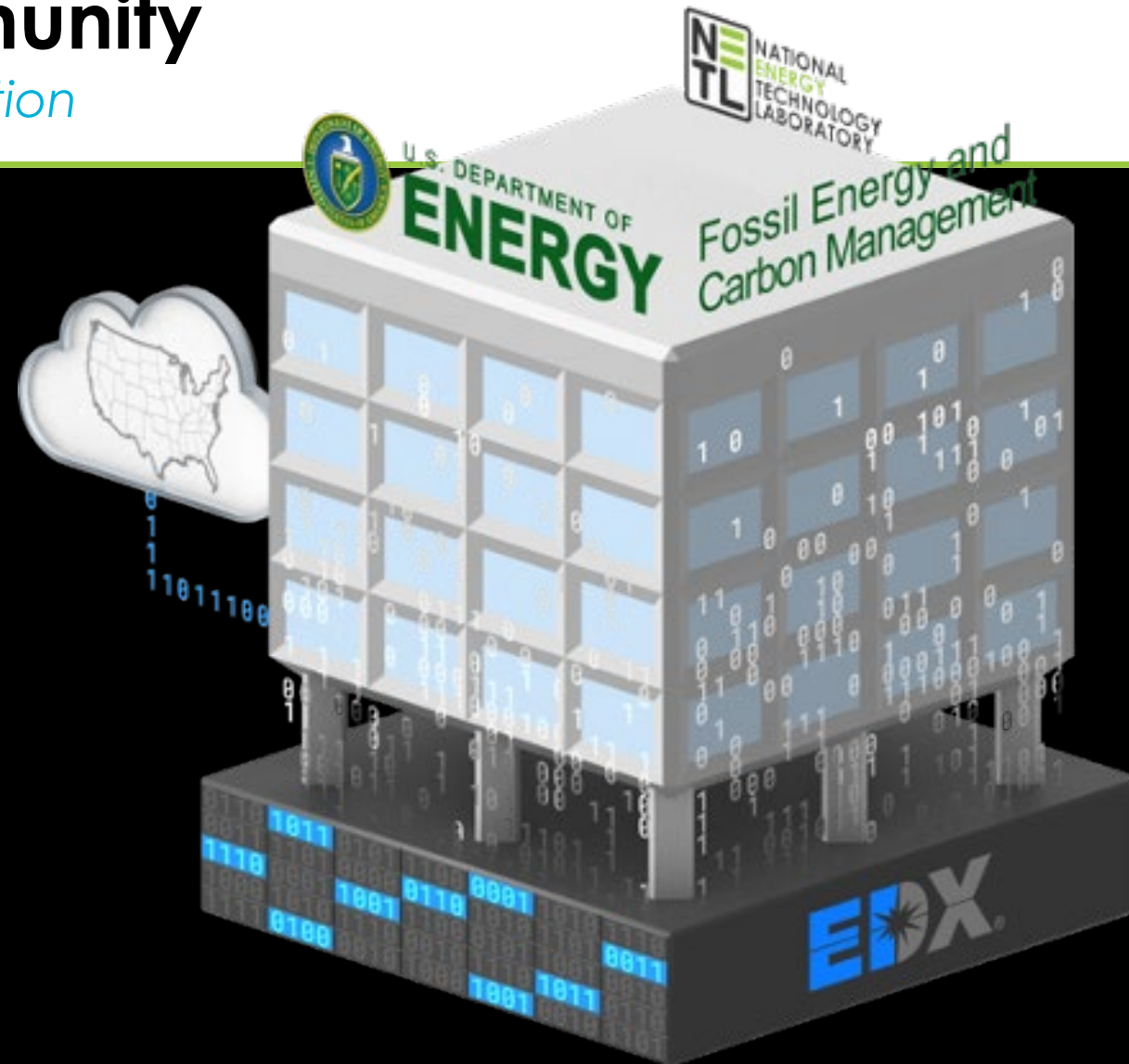
Energy Data eXchange

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National Energy Technology Laboratory (NETL)

Research Innovation Center

Maximus Federal Support Contractor



Disclaimer

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FECM R&D is Impeded by Common Challenges

- Finding and accessing relevant datasets
- Publishing & preserving R&D data products
- Accessing previously developed R&D data
- Sharing secure R&D scale data resources among team
- Collaborating across multi-organizational teams
- Need to access prior R&D data products to accelerate next-generation innovations

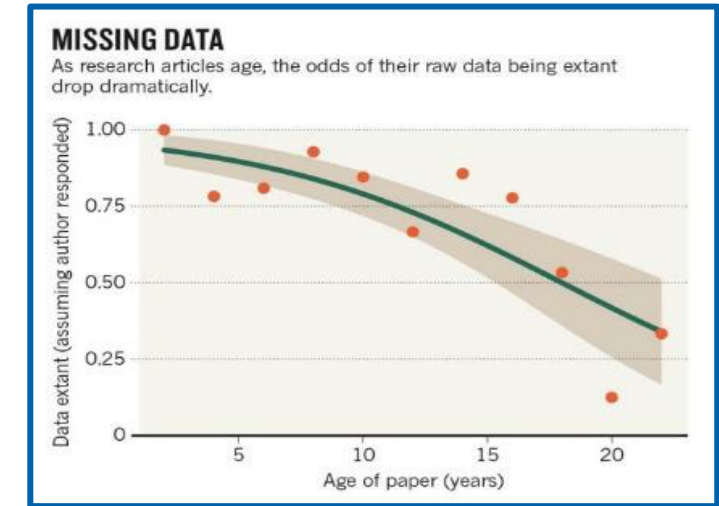


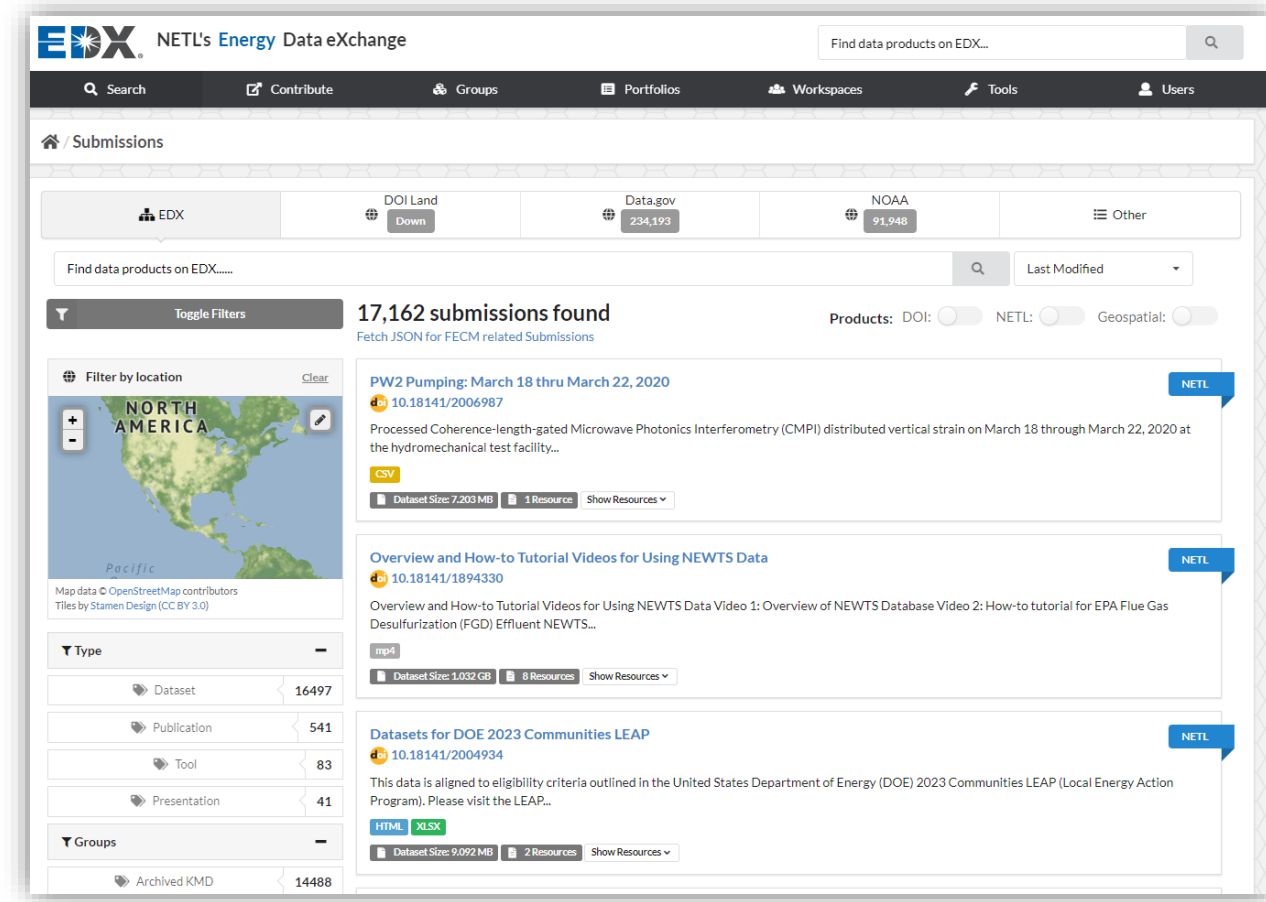
Image from : <http://www.nature.com/news/scientists-losing-data-at-a-rapid-rate-1.14416>



How has FECM addressed these issues?



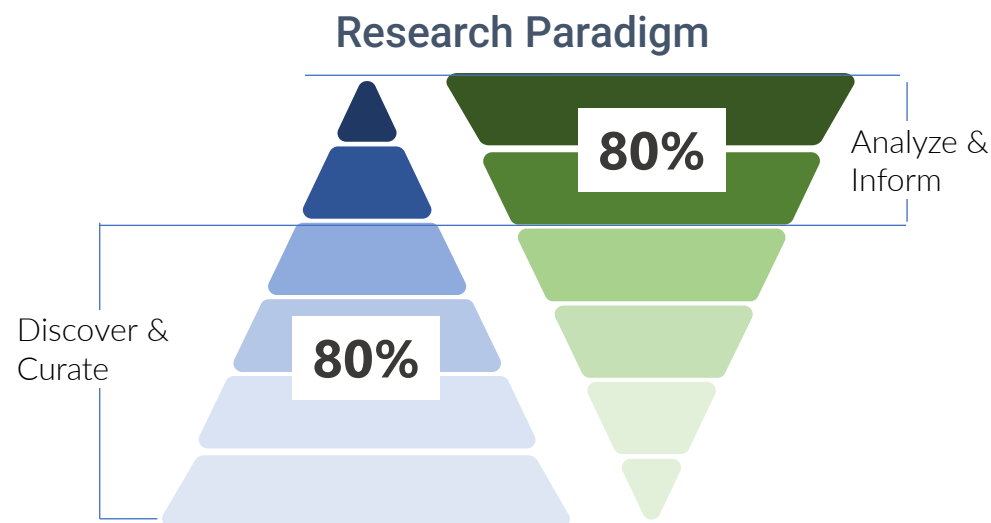
a web-hosted, virtual
library and laboratory
that supports the
NETL/FECM
community



EDX is addressing these data curation problems?

Inverting the Data Pyramid

Studies have shown that researchers spend **80% of their time** getting data to a point where they can do something with it



EDX helps teams with compliancy, often without them even knowing it



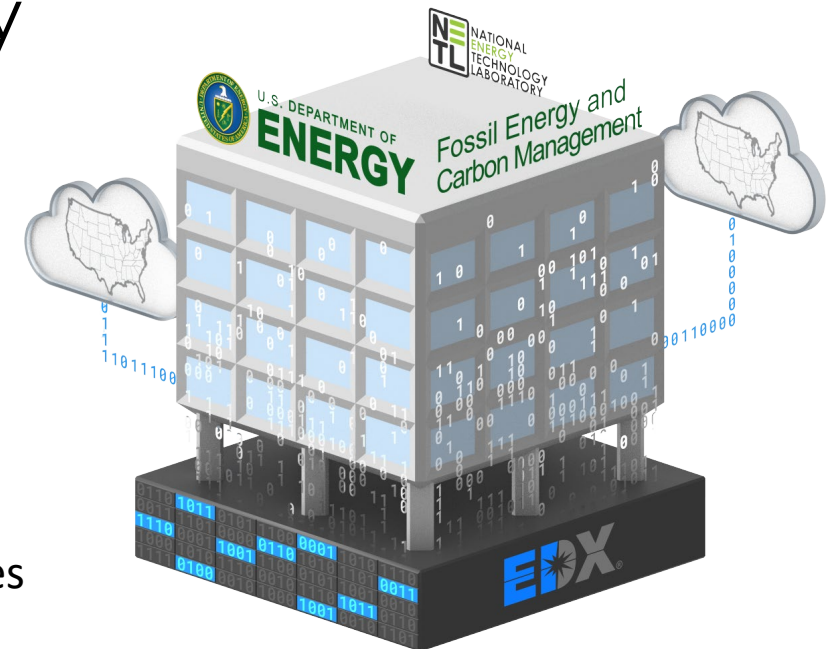
- Serves as a **data warehouse** for **published data submissions**, allowing users to upload/download data
- Provides a **private sharing environment** facilitates **collaboration** and **curation**
- Provides automated data **searching at scale using AI** via **SmartSearch**
- Offers a **built-in publishing workflow** to allow public access to appropriate data
- Empowers researchers with a **Cyber/IA and cloud-compliant data and analytics platform**
- *In Development*—Enable **access to data, analytics tools, and on-prem/cloud-based computing resources** in a single location

Did you know?

- **EDX** is an accredited and internationally recognized data curation platform
- **EDX** enables private collaboration across multiple institutions
- **EDX** makes it easy to publish data
- **EDX** has served the NETL/FECM community for over 12 years as:

- A data curation library
- A virtual laboratory for data compute
- A multi-organizational coordination and collaboration platform

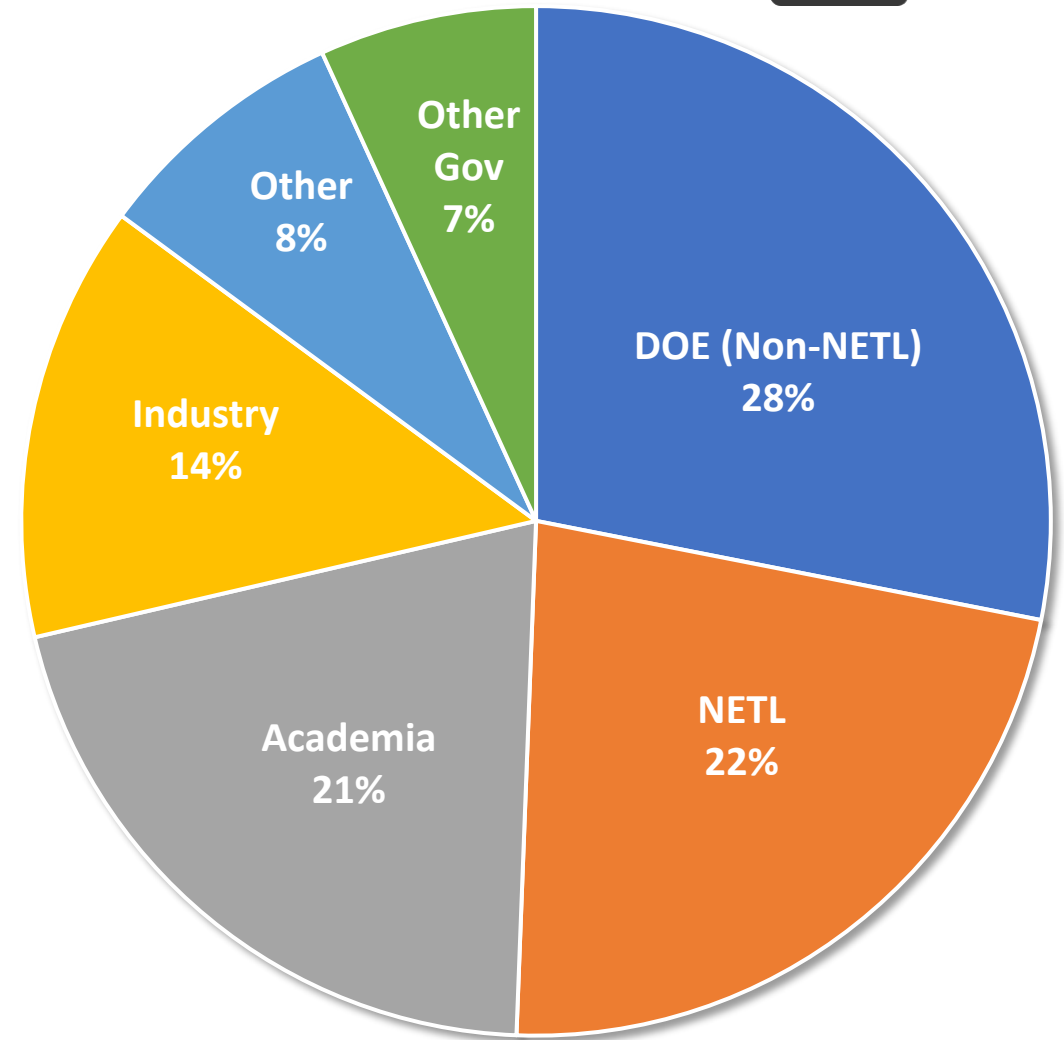
> 3,500 registered users > 1200 research driven workspaces > 34 Million resources



Who is part of the EDX community?

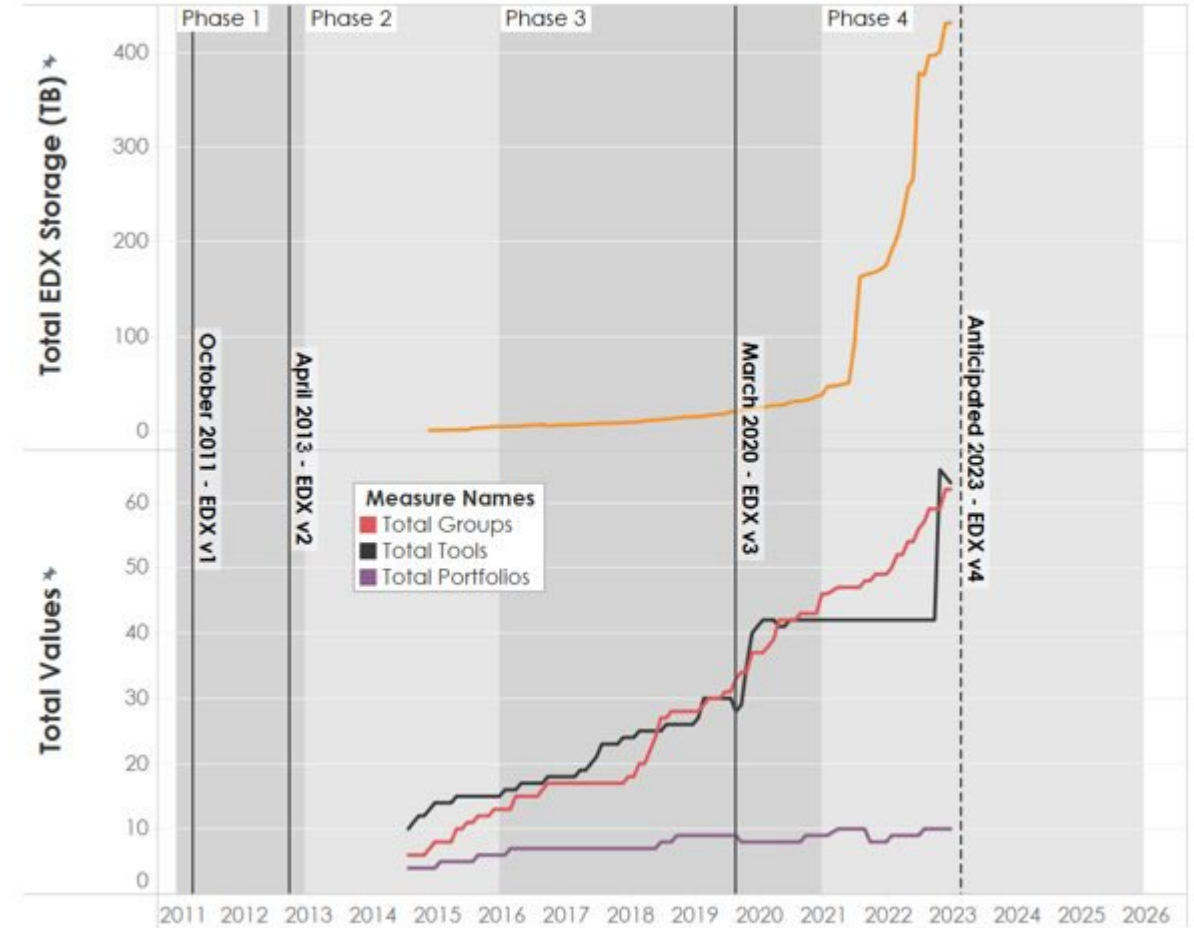
- ✓ NETL/FECM employees
- ✓ External collaborators
- ✓ General public

2600+ Active Registrants



What is curated on EDX?

- **430+** TBs of data
- **60+** published groups
- **60+** published tools
- **10+** research portfolio websites



OVER 34 MILLION DATA RESOURCES!!!

EDX provides a platform to meet compliance



Ensuring Free, Immediate, and Equitable Access to Federally Funded Research

- **DOE/NETL Data Policy and Guidelines**
 - [Memorandum From ASFECM Brad Crabtree \(Aug 2022\)](#)
 - Public Access Plan 2023
- **Federal Data Policy and Guidelines**
 - [Digital Accountability and Transparency Act \(DATA\) of 2014](#)
 - [Geospatial Data Act of 2018](#)
 - [Foundations for Evidence-Based Policymaking Act of 2018](#)
 - [Maintaining American Leadership in Artificial Intelligence \(EO 13859\)](#) (February 2019)
- **FAIR Guiding Principals**
 - Findable, Accessible, Interoperable, Reusable



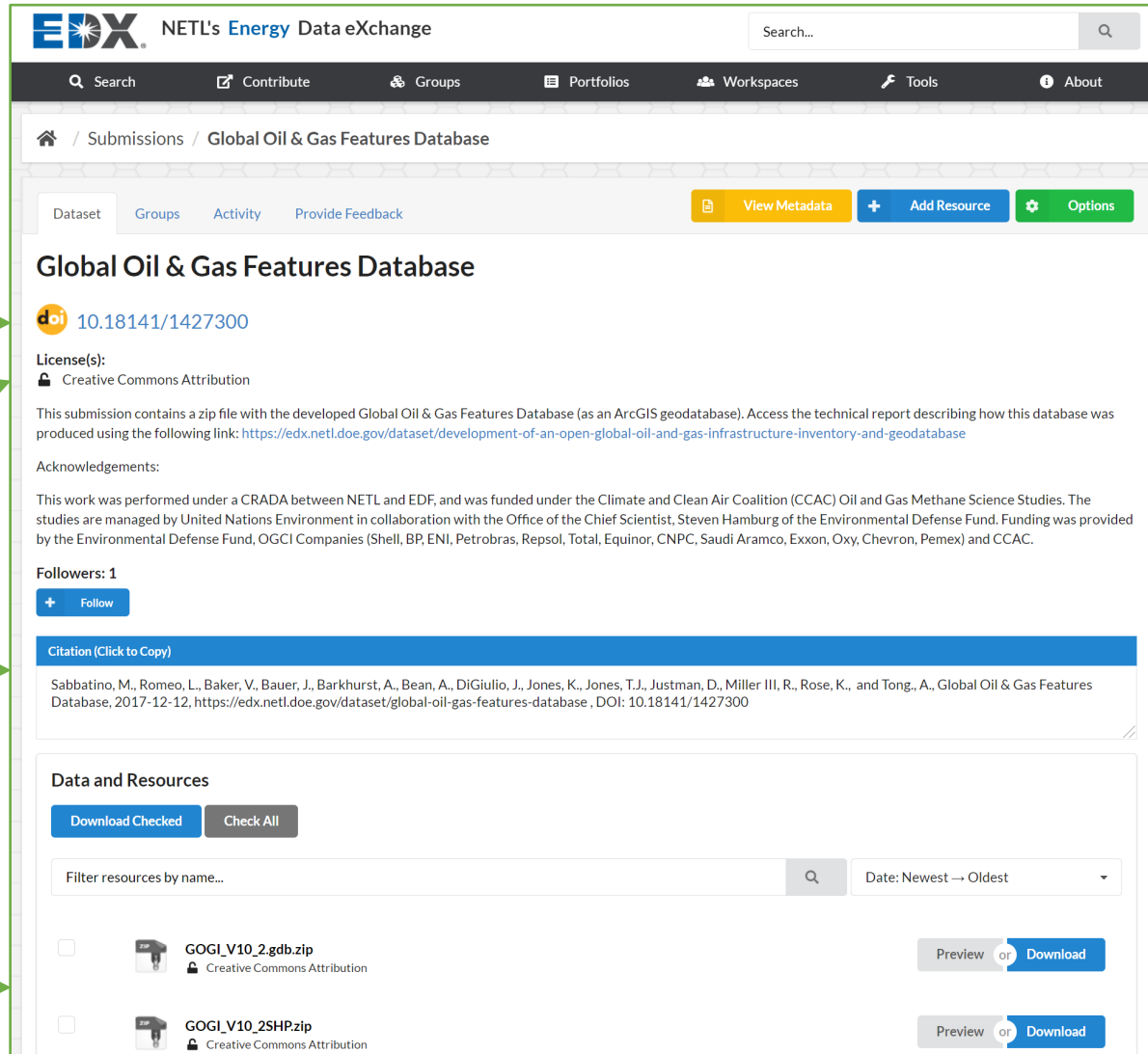
Advantages of publishing data products

OSTI DOI Number →

Data License →

Data Citation →

Data Access →



EDX[®] NETL's Energy Data eXchange

Search... [Search Icon]

Search Contribute Groups Portfolios Workspaces Tools About

Submissions / Global Oil & Gas Features Database

Dataset Groups Activity Provide Feedback View Metadata Add Resource Options

Global Oil & Gas Features Database

doi 10.18141/1427300

License(s):
Creative Commons Attribution

This submission contains a zip file with the developed Global Oil & Gas Features Database (as an ArcGIS geodatabase). Access the technical report describing how this database was produced using the following link: <https://edx.netl.doe.gov/dataset/development-of-an-open-global-oil-and-gas-infrastructure-inventory-and-geodatabase>

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Citation (Click to Copy)

Sabbatino, M., Romeo, L., Baker, V., Bauer, J., Barkhurst, A., Bean, A., DiGiulio, J., Jones, K., Jones, T.J., Justman, D., Miller III, R., Rose, K., and Tong, A., Global Oil & Gas Features Database, 2017-12-12, <https://edx.netl.doe.gov/dataset/global-oil-gas-features-database>, DOI: 10.18141/1427300

Data and Resources

Download Checked Check All

Filter resources by name... [Search Icon] Date: Newest → Oldest

<input type="checkbox"/>	 GOGI_V10_2.gdb.zip Creative Commons Attribution	Preview or Download
<input type="checkbox"/>	 GOGI_V10_2SHP.zip Creative Commons Attribution	Preview or Download

Many journals require models, tools and data be publicly available prior to journal publication.

Managers



Federal Project Managers
Federal Team Supervisors

- ✓ Private collaboration & public curation support for researcher teams/groups
- ✓ Embedded capabilities that enable compliance with federal/DOE orders
- ✓ Preview data products prior to public release

Researchers



NETL/FECM Researchers
External Collaborators

- ✓ Compliant citations and host for data products
- ✓ Management approval & awareness of R&D data products
- ✓ Raises visibility for collections of data products
 - (e.g., EDX Groups; hosting of Git repos)

EDX++ (EDX as a hybrid, multi-cloud solution)

Freedom for users to use any cloud service providers

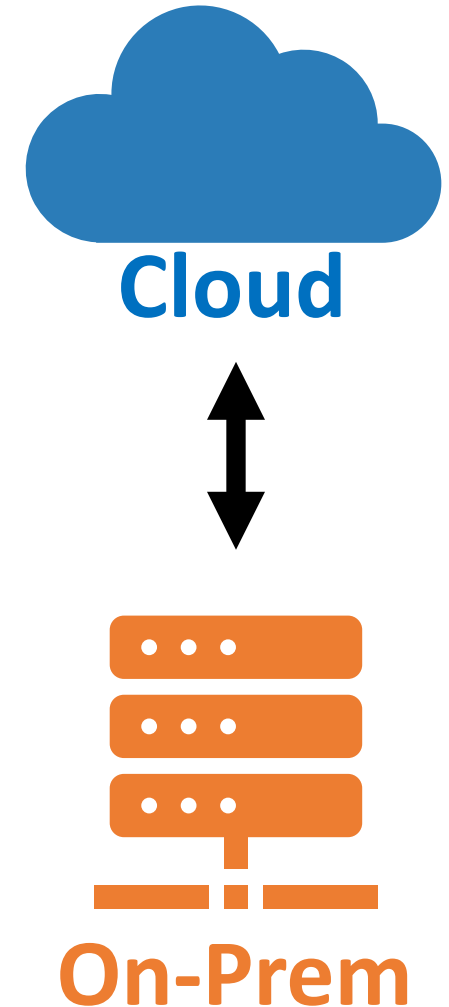
- Compute at the source of the data
- Utilize APIs to move data
- Web hosted applications

Improves flexibility and performance

- Does not limit users to one storage & compute platform
- Compute occurs at the data source

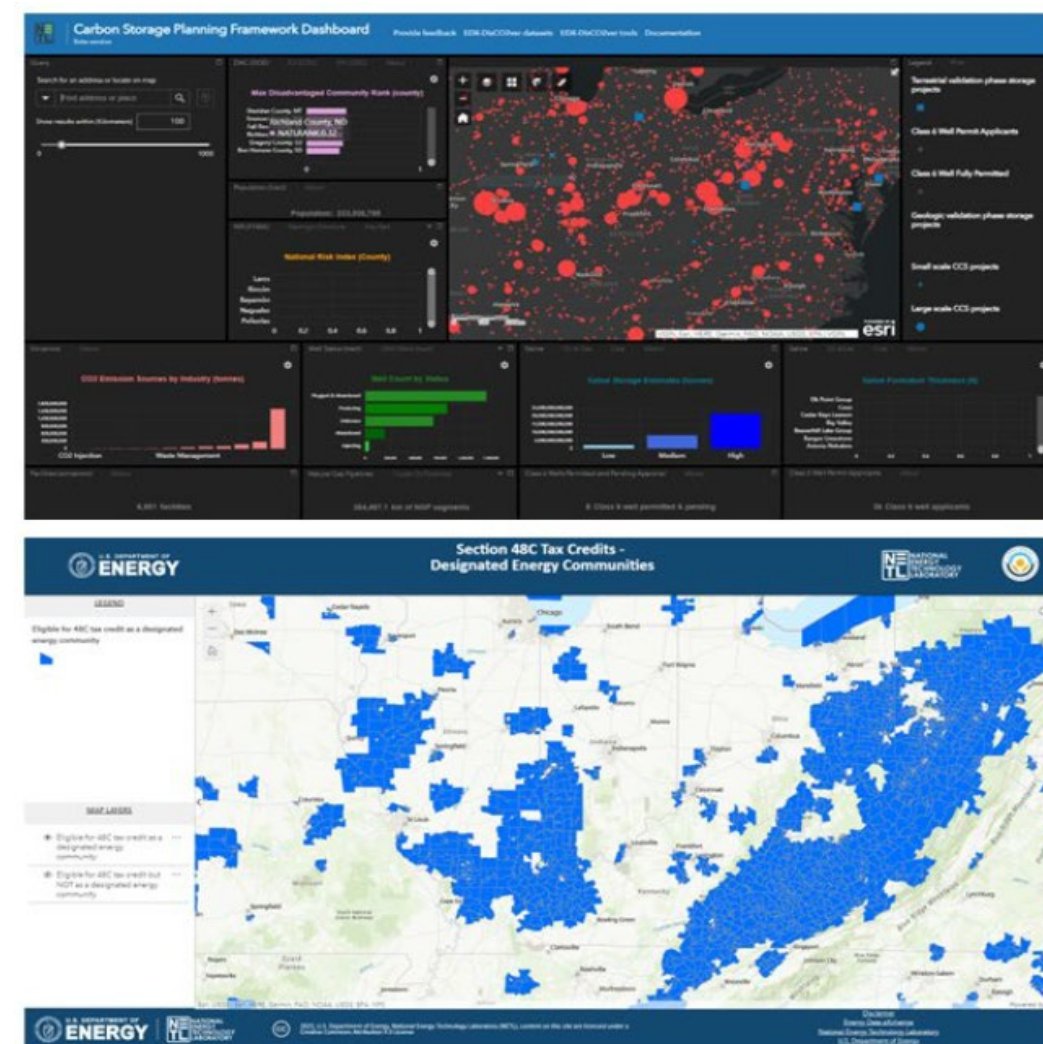
Resilience

- Redundancy across multiple geographic regions
- Strategic alignment for data transfer and compute across multiple cloud service providers



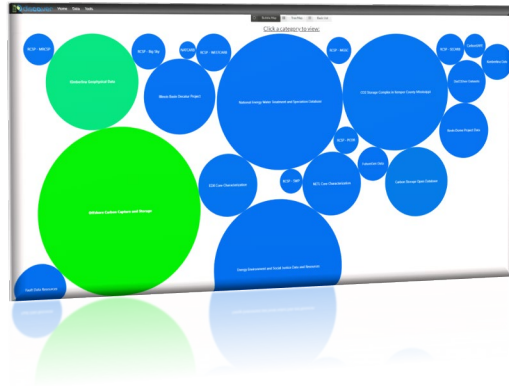
EDX++ example of early success; EDX Spatial

- The official geospatial visualization, exploration, and discovery tool of the Energy Data Exchange (EDX)
- Hosts thousands of earth-energy data files from public and Department of Energy (DOE) Fossil Energy Carbon Management (FECM) related sources
- Geospatial data on EDX Spatial is interactive and can be downloaded within the application or as standalone files through EDX's published data search repository



EDX Supports Researchers

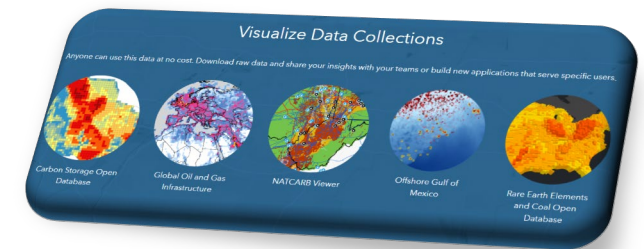
Developing Tools used for Data Discovery and Visualization



NETL
SmartSearch

A screenshot of the NETL SmartSearch login interface. It features the NETL SmartSearch logo at the top, followed by the text "Welcome to SmartSearch". Below this are input fields for "Username" and "Password", and a blue "Sign In" button with a right-pointing arrow.

EDX
SPATIAL



How to find more information?

- Visit <https://edx.netl.doe.gov/>
 - EDX [Reference Shelf](#)
 - EDX [Training Videos](#) (pre-recorded)
 - Robust [API Documentation](#)
- Contact EDXSupport@netl.doe.gov or SAMI@netl.doe.gov
 - Focused training for research teams ([Request Training](#))
 - Outreach for EDX orientation
- Attend Thursdays Keynote!

Using Cloud to Host Large Open-Source Datasets

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