

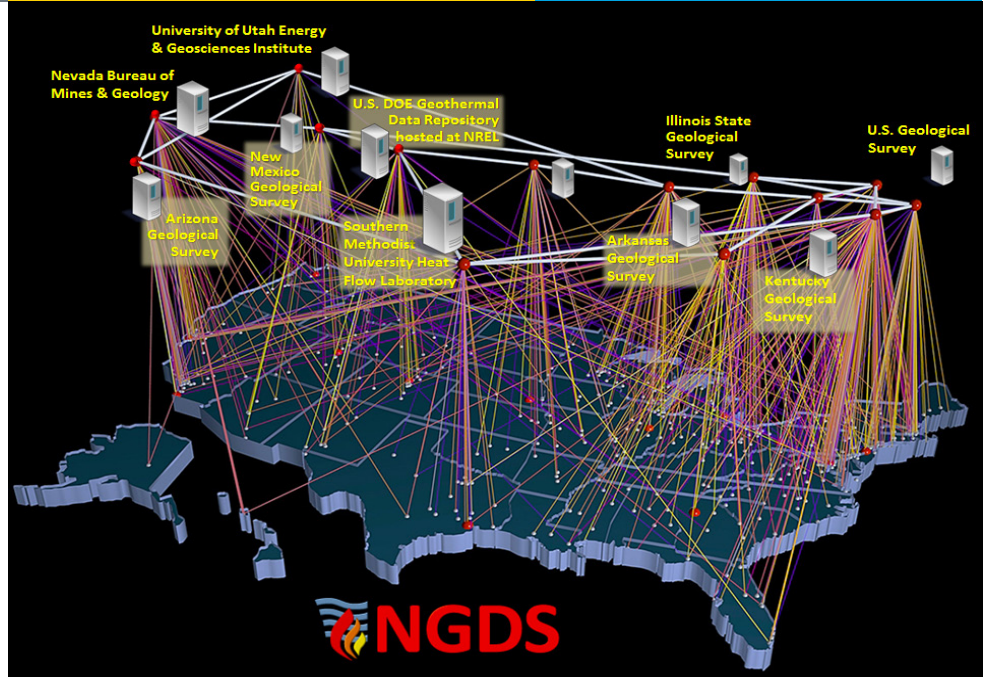
What is the National Geothermal Data System (NGDS)?

The Geothermal Technologies Office (GTO) funded and launched the NGDS and the DOE Geothermal Data Repository node to facilitate a seamless delivery of geothermal data for a variety of applications. NGDS is an interoperable networked system of distributed data repositories accessed through federated catalog nodes and is built upon an open architecture using open source software practices. The system provides access to geothermal data from providers across the U.S., including all 50 state geological surveys, the nation's leading academic geothermal centers, the geothermal industry, and a variety of federal agencies. In addition, the NGDS model can be accessed internationally.

The NGDS serves as a platform for sharing consistent, reliable geothermal-relevant data with users of all types. A "Resources" tab provides users access to discover tools and models for geothermal exploration and development. One such resource is Geothermal Prospector (http://maps.nrel.gov/gt_prospector), which provides data, visualization, querying, and analysis capabilities. Prospector allows users to explore many factors at a site that affects project development potential. As aggregated data supports new scientific findings, this content-rich linked data ultimately broadens the collective intelligence available to fuel discovery and development of commercial-scale geothermal energy production. This in turn will serve to drive down risks and costs that now tend to deter investment in geothermal projects.

The NGDS is providing critical geothermal attributes, such as temperatures at depth, flow rates, and resource characterization. All data are free and available, either for mapping using the NGDS user interface, or for downloading for use with other applications.

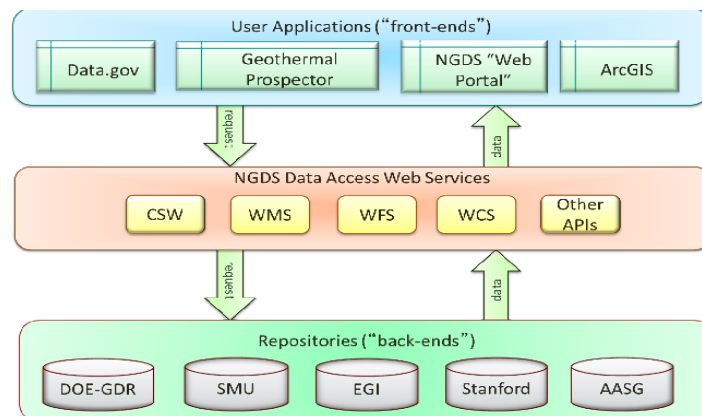
To learn more about the NGDS, log on at <http://geothermaldata.org>. Log onto geothermal.energy.gov for more information on the Energy Department's Geothermal Technologies Office, or contact geothermal@ee.doe.gov.



As new data come online across the nation, the United States Department of Energy advances industry access to vital resource characterization and new technologies that will ultimately enable new geothermal development.

From Open Data to Linked Open Data¹

The NGDS is built using the U.S. Geoscience Information Network (USGIN) data integration framework. This promotes interoperability across the Earth sciences community. The basic structure of the NGDS employs state-of-the-art informatics to advance geothermal knowledge, as depicted below. NGDS nodes host data in a variety of formats, from simple digitized documents and images to raw field data to highly structured and intricately linked data. New data providers who want to become a node on the NGDS are able to deploy the open source NGDS Node-In-A-Box software, based upon CKAN 2.0, and quickly get started. Alternatively, the NGDS project has published several standards for metadata and service endpoints, which can help a provider leverage their existing catalogs for interoperability with the NGDS. In addition, nodes such as the DOE Geothermal Data Repository (see reverse) are now online. A federal "Open Government Directive" mandates free access to information when use and re-use of data is critical.



User applications ("front ends") are loosely-coupled to data sources via Web Services. Any number of user applications and data repositories are permissible, as long as they access data via Web Services. Repositories contain raw data, model results, information,

¹For more information on the White House's Open Data Policy, visit: <http://www.whitehouse.gov/administration/eop/ostp/library/docsreports>.

How to Submit Data via the DOE Geothermal Data Repository (DOE-GDR)

Below are instructions for all DOE Geothermal Technologies Office funds recipients.

Step 1. Register

Funds recipients register for an account before submitting data by visiting the DOE-GDR at <https://gdr.openei.org>. For technical assistance with registration or help accessing the data submission interface, contact GDRHelp@ee.doe.gov.

Step 2. Submit

Once registered, users log into the data submission site to submit data. For each data resource (Excel, Word, PDF, or data containment software), funds recipients will:

- Provide appropriate metadata and contact information
- Agree to the data handling terms of the DOE-GDR
- Specify the release date for any protected data consistent with the Intellectual Property Provisions
- Attach the data

Once data has been submitted, recipients will not be able to edit the data for the duration of the review and curation process. It is recommended that recipients retain a copy of the submitted data. For information and assistance concerning the preparation of data files, metadata, unique data requirements, or the data curation process, email GDRHelp@ee.doe.gov.

Data submitted to the DOE-GDR and identified as "Protected Data" are subject to the terms and conditions set forth in the Intellectual Property Provision incorporated into the award. Prior to the public release date, Protected Data are held in a secure data store with restricted access. All other submitted data will be made publicly available.

Step 3. Cancel or Resubmit

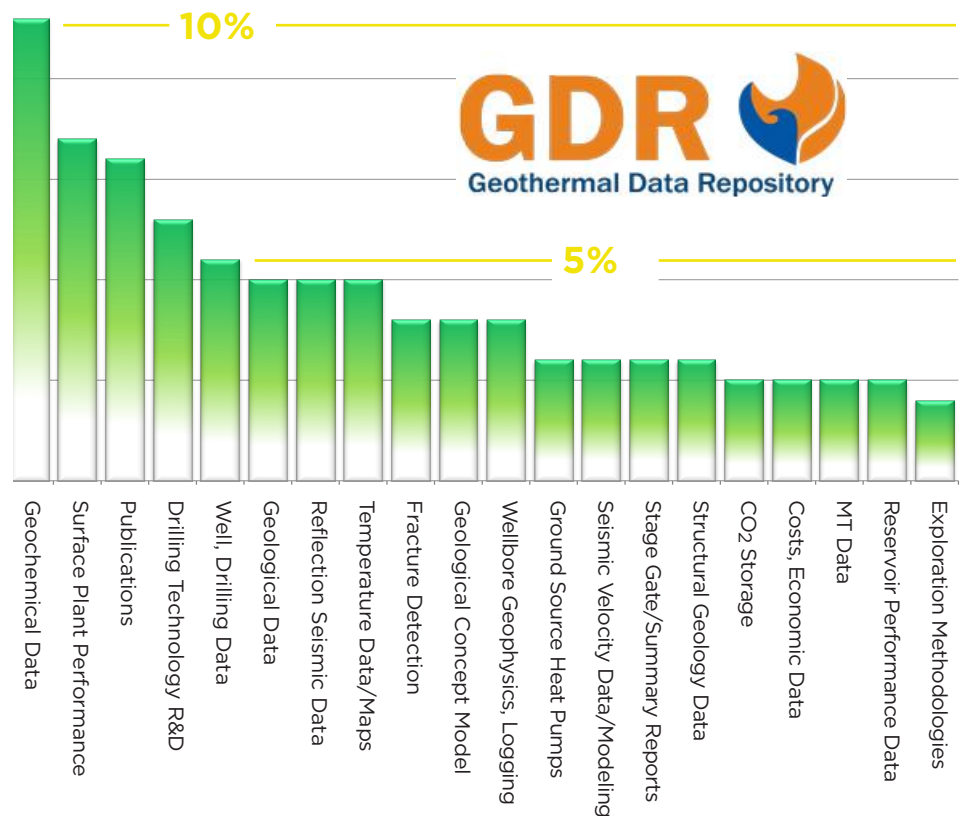
You may cancel a submission at any time prior to public release. Cancellation will terminate the curation process and remove any copies of the originally submitted data from the system. If you wish to edit data or metadata after submission, you will need to cancel and resubmit.

DOE Geothermal Technologies NGDS Node

As the repository for all data collected from DOE funds recipients of the Geothermal Technologies Office, The DOE Geothermal Data Repository (DOE-GDR) represents a vital node on the NGDS. The DOE-GDR is hosted on the Open Energy Information (Open EI) platform. Applicants detail the kind of data they will generate and must budget for formatting and uploading their data to the GDR as part of their proposal for DOE geothermal funds. In addition, a Data Management Plan must be submitted.

The graph below shows the top 20 most common types of data submitted to the GDR to date.

Most Common Submissions by Resource Category



Structured data are intended to be interactive and useful to subscribers. While Tier 1 data (scanned reports and documents) are static, Tier 2 data are structured in spreadsheets and databases and hence more easily re-used. Tier 3 data are designed for interoperability. Preferred formats are those that support the best reusability. The GDR accepts a variety of file formats; however, the use of proscribed data interchange models will maximize data mapping and exposure. More information can be located in the Frequently Asked Questions section at gdr.openei.org.

