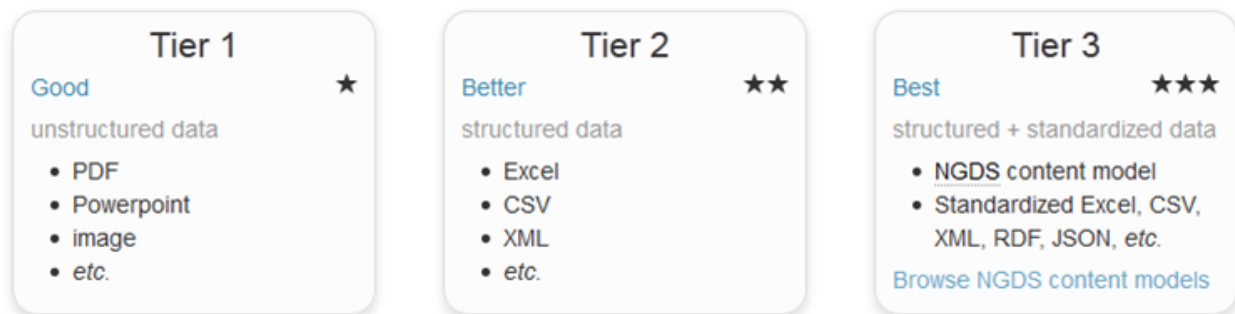


Become a part of the National Geothermal Data System

Expose your data, maps, web map applications, and web services to the users of NGDS to create shared benefit for scientists, researchers, and geothermal resource developers. Data sharing, data management, and innovation in data access are at your fingertips with NGDS.

Tiers of Data

Contributed data is categorized into 3 tiers based on structure and standardization, with Tier 3 being the most desired data. Understanding how your data fits into this scheme allows you to enhance your data for user availability and to manage it properly in the system.



**Join us Wednesday, October 2nd from 2pm - 5pm for the
NGDS Workshop to learn more about contributing data to NGDS.**

Registering Resources with NGDS

There are a few ways users may contribute data to the system, outlined in the scenarios below. Delving deeper into interoperable data formats and services, guides are provided for further discussion on web services and data management.

Scenarios

NGDS Node In A Box <http://node.usgin.org/ngds/contribute>

Explore the future of contributing to the National Geothermal Data System with the newest user interface, still in development, and provide input on its usability.

NGDS Repository <http://repository.stategeothermaldata.org/repository/>

Discover how to upload resources to the current user interface for NGDS data repository.

Guides

Web Services

Examine why data available in web service formats is arguably the most readily available and accessible data form. Web service creation will be discussed with slide shows and short documentation.

Data Services Management

Manage the entirety of your institutions subsurface (as well as gravity, aeromagnetic, and other) data using NGDS.

Walk through these tutorials & guides during the NGDS Workshop Wednesday, October 2nd from 2pm - 5pm and become a part of the community.

These scenarios & guides are also available in the **DataIn** folder within the **GeothermalResourcesCouncil** folder at <https://github.com/usgin/Workshops/>.

NGDS Node In A Box (NIAB)

<http://node.usgin.org/ngds/contribute>

Welcome to the future of contributing to the National Geothermal Data System with the newest user interface, still in development. Whether it's publications, digital maps, exposed databases or Tier 3 standardized web services, the NIAB is the future access point for getting your data into NGDS. Please see Sam Zheng at the UI Testing Station for more information and to provide your input on this exciting new project. (Alternatively, feedback may be submitted at <http://geothermaldata.org/contact>.) The following scenario will add a Tier 3 web service to the NGDS node by simply uploading a CSV text file and entering metadata.

1. From the site above, Click **Log In** from the upper right corner
 - a. username: test_user
 - b. password: password
2. From the site above, click **CONTRIBUTE**
3. Choose **Individual Upload**
4. In the Create dataset form:
 - a. Enter Title as **Illinois Well Logs** (or some permutation not yet in use)
5. Click **Next: Add Resources**
 - a. Choose **Structured Resource**
 - b. Click **Upload a file**, then navigate to Desktop/ILWellLogs.csv
 - c. Choose the **Well Log Observation** content model from the Content Model drop-down list.
6. Click **Next: Additional Metadata** (if prompted, choose "Leave Page")
 - a. Use the Dataset Extent graphic to draw a bounding box around the state of Illinois
 - b. Enter Author as **AZGS - metadata@usgin.org**
 - c. Enter Data Maintainer as **AZGS - metadata@usgin.org**
 - d. Enter URI (identifier) as **test_ILWellLogs**
 - e. Click **Finish**. The metadata for the resource is now entered into the system.
7. To publish this resource as a Tier 3 standardized web service, click **Publish as OGC**
 - a. Indicate the Geoserver Layer Name as **WellLog**
 - b. Choose the Latitude Field as **LatDegree** from the drop-down
 - c. Choose the Longitude Field as **LongDegree** from the drop-down
 - d. Click **Publish** below. This should give a pop-up box indicating that the resource has now been published as an OGC service.
 - e. To view the Web Map service, choose **Explore** across from the *WMS* or *WFS* resource

If you've completed this scenario, please visit <http://NGDS1.geothermaldata.org> to take a short survey that will help us to enhance the user experience.

NGDS Repository

<http://repository.stategeothermaldata.org/repository/>

This is the current user interface for NGDS data repository. Here, you can input data of all tiers, whether it's publications, digital maps, exposed databases or Tier 3 standardized web services. The following scenario will add a Tier 3 web service to NGDS through the NGDS Repository.

1. From the website above, click **Login** in the upper-right of the page
 - Username: test_user
 - Password: password
2. Click **Create a New Resource**. Filling out this form creates the mandatory minimum metadata required for any given resource.
 - **Title**: Enter a short and descriptive title
 - **Description**: Must be at least 50 characters; abstract for papers
 - **Publication Date**: Select a date using the year drop-down and calendar
 - **Keywords**: Click the green + to add keywords
 - **Geographical Extent**: Use the bounding box graphic on page left
 - **Authors**: Email, Street, City, State, and Zip are required
 - **Distributors**: Organization hosting the data. Email, Street, City, State, and Zip are required
 - **Links**: Enter web services by clicking the globe icon. Enter links to web map applications, databases, or other linked resources by clicking the page icon.
 - OGC:WMS - Choose this Service Type and enter the WMS GetCapabilities URL (For example <http://services.azgs.az.gov/ArcGIS/services/aasggeothermal/AZWellLogs/MapServer/WMSServer?request=GetCapabilities&service=WMS>)
 - OGC:WFS - Choose this Service Type and enter the WFS GetCapabilities URL (For example <http://services.azgs.az.gov/ArcGIS/services/aasggeothermal/AZWellLogs/MapServer/WFSServer?request=GetCapabilities&service=WFS>)
 - Under **Manage Collections** on the upper left of the page, click **Add to a new Collection**
 - Type GRC in the box and choose **GRC Demonstration Collection** when it pops up
 - Click **Add to selected collection**
 - Click **Published / Visible to the public** to exposed the resource
 - Click **Save**

For more information and graphics, visit the following tutorials:

http://usgin.org/sites/usgin.org/files/Data_Delivery_Cycle.pdf

http://usgin.org/sites/usgin.org/files/sgd-repository_tutorial.pdf

If you've completed this scenario, please visit <http://NGDS1.geothermaldata.org> to take a short survey that will help us to enhance the user experience.

Web Services

For a data consumer, using web services allows access to a distributed network of data from many sources having disparate data types, using a huge (and ever-growing) variety of applications. For the data service provider, web services encode an XML-formatted message used to transmit requested data back to the client computer that can be read by browsers and GIS applications. Therefore, data available in web service formats is arguably the most readily available and accessible data form. Web Feature Services (WFS) is the Open Geospatial Consortium (OGC)-compliant format used for Tier 3 NGDS data.

Follow a complete, step-by-step example workflow for transforming data into web services at the following GitHub repository: <https://github.com/usgin/Workshops/blob/master/GeothermalResourcesCouncil/DataIn/OtherMaterials/ExceltoNGDSServices.pptx>

Visit the **Data In** station at the NGDS Workshop Wednesday 2pm-5pm for a complete walk-through which will outline how to:

- **Download schemas** from <http://schemas.usgin.org/tools/>. (The Content Models and Domain Experts station with Steve Richard will discuss schemas in more detail.)
 - Extract data from your database
 - Begin transforming data by mapping into an Excel Content Model
- **Create URIs**
 - Each record in a dataset has a globally unique identifier; hence each record can be seen as a unique object
 - An extra layer is added onto this idea in NGDS, where the URIs actually redirect to a file or XML-representation in a browser
 - Example URI:
http://resources.usgin.org/uri-gin/isgs/wellog_tif/120010010800_ies/
 - For more information about URIs, see the URI tutorial at the following link location:
<http://usgin.org/content/usgin-uri-tutorial>
- Run the **Excel to NGDS Services Tool**, available at <http://schemas.usgin.org/tools/>
 - This ArcMap tool transforms data in an Excel Content Model to a schema-conformant Feature Class or data table, ready for web service deployment
- **Load data** table in a database - whatever works for your own data management
- **Deploy** web service using ArcMap Server or GeoServer (among many options)

Data Services Management

Your institution can manage the entirety of your subsurface (as well as gravity, aeromagnetic, and other) data using NGDS, engaging the system through use of either a NIAB (Node In A Box) interface or by entering resources (including web services) through the NGDS Repository.

NGDS Repository

In the NGDS Repository, each institution has a self-managed “collection.” Simply register at <http://repository.stategeothermaldata.org/accounts/register/> to be added to the collection assigned to your institution. Within this collection you can manage files, databases, scanned and digitized log files, scanned and digital maps, web map applications and web services. Harvest an entire database of remote data into a specified collection if the metadata is in an accepted format (CSV, FGDC, ISO19139). If Tier 3 interoperable web services are created and registered with NGDS using the NGDS Repository, additional data management considerations are recommended.

A PostGIS database management system can be used for ArcGIS and open-source web services. As it supports OGC-compliant data tables, PostGIS is used to fulfill GeoServer (open-source web server application) requirements and is the preference of open-source software developers. PostGIS is recommended as a “production” database, where the service data should remain relatively static and password protected. An additional Postgres “staging” database is therefore a good choice to make edits to data before loading them into a PostGIS database.

Postgres “staging” database

- object-relational database system

PostGIS “production” database

- open-source application that supports an OGC-compliant object-relational database management system

NGDS Node In A Box (NIAB): No Need to Manage Data Services

The NGDS NIAB is built with a PostGIS back-end, so a CSV file for Tier 3 web services is uploaded, a data table is created and it is stored in a PostGIS database. GeoServer (an open-source web server application) is also included in the NIAB package. GeoServer works in the background to create the web feature service (WFS) and web map service (WMS), pulling from the data in the PostGIS database. No services data management is required with the NGDS Node, as data tables and services become populated automatically. However, managing a live data server will require attention to monitor performance, address security issues, and debug failures. Node In A Box is still in development, but this is the future.