

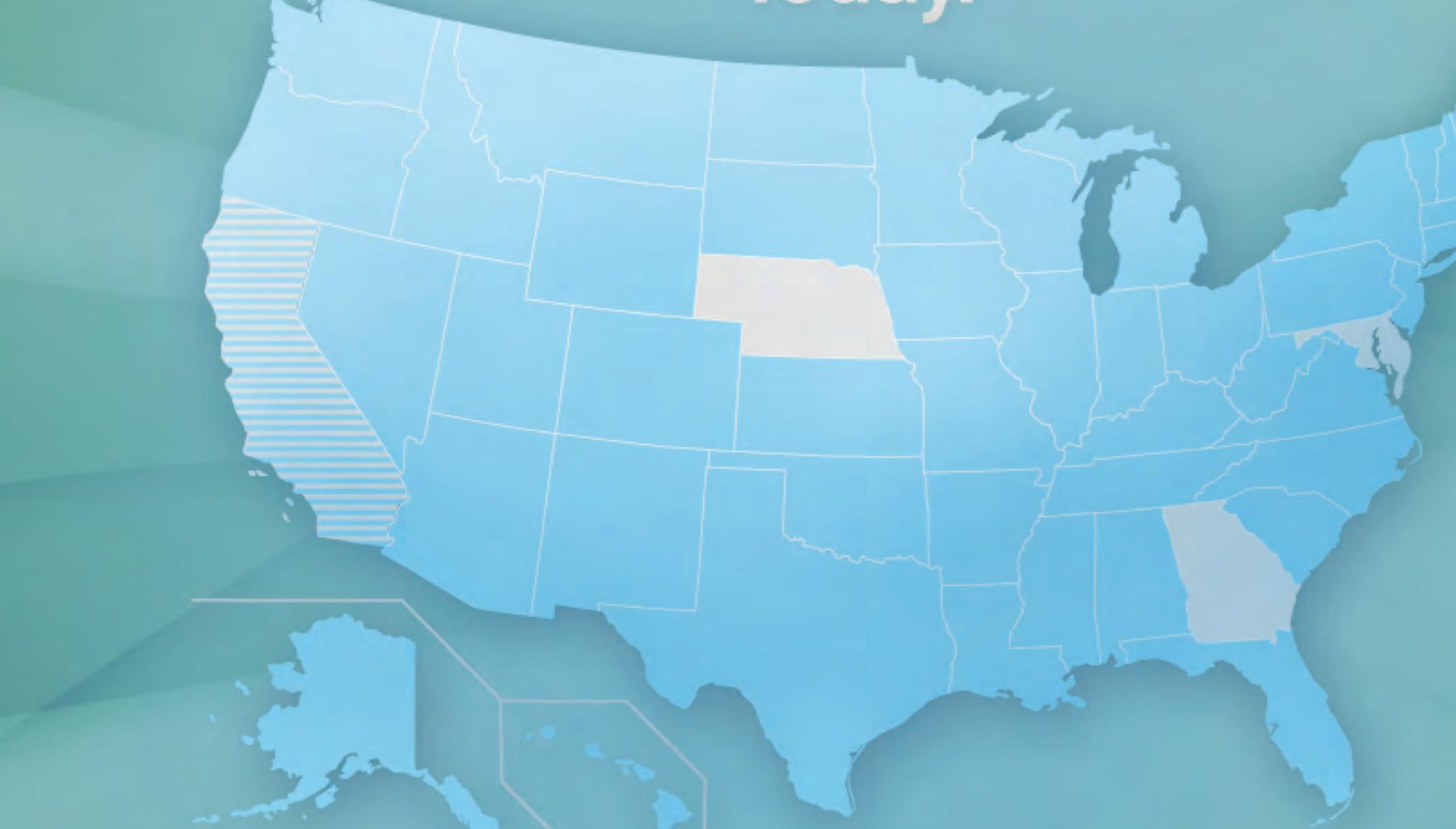
## What is the National Geothermal Data System?

The NGDS is a distributed network of databases that are collectively building a system for acquisition, management and maintenance of geothermal and related data.

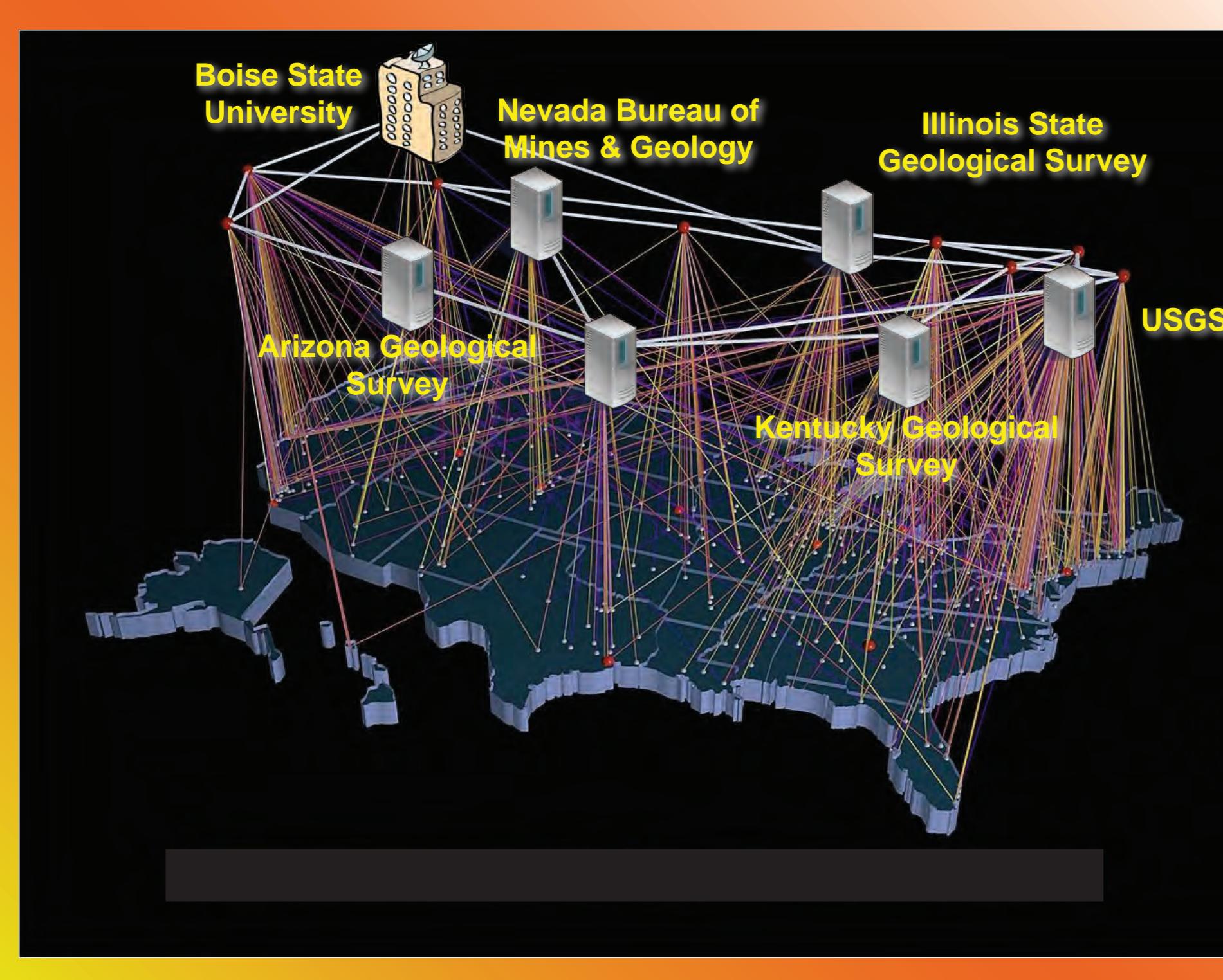
Users of the system will include federal and state agencies, researchers, decision makers, the general public, educational institutions, the geothermal industry, and financial institutions. The NGDS will be designed by using and adapting existing technology as well as emerging informatics standards and protocols.

Major participants in the NGDS to date are: GeoStrat Digital Information System, Energy & Geosciences Institute, Great Basin Center for Geothermal Energy, Geo-Heat Center, Stanford Geothermal Program, and U.S. Geoscience Information Network. The U.S. Geological Survey, Bureau of Land Management, and Geothermal Energy Association will contribute to building the system as will a number of community task forces that target specific issues.

**Geothermal energy. Making tomorrow's future possible. Today.**



## What are the Goals of the Data System?

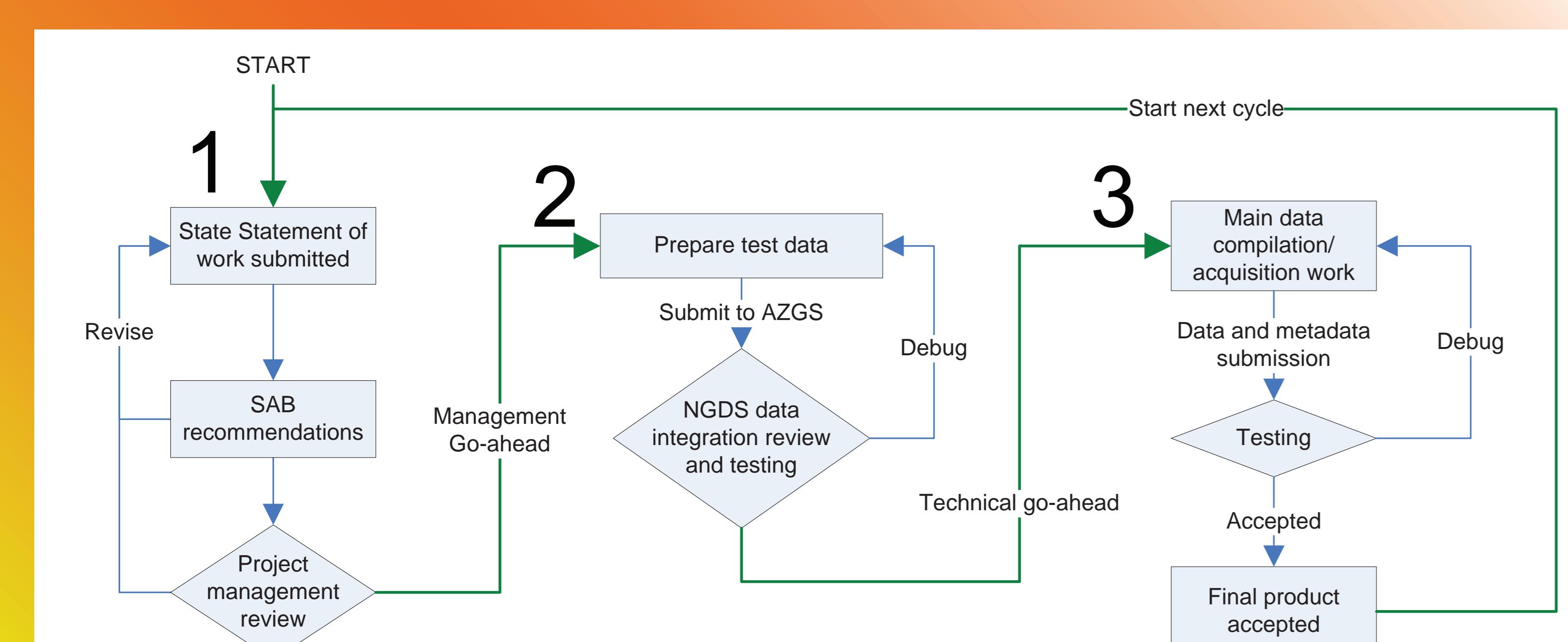


Access to these distributed data will be provided through a desktop application (Geothermal Desktop) as well as via the web sites of member databases. Online web-services can also be accessed through a variety of GIS Client applications, such as ArcMap and Google Earth.

A distributed system means all data does not come from one site. It is about data sharing and interoperability among the linked sites so data can be easily discovered and downloaded in compatible formats and easily aggregated by the user to meet their particular needs. The NGDS must make it as easy as possible for the users within the realistic framework in which we will be working.

The second phase of this project aims to expand and enhance the National Geothermal Data System (NGDS) by creating a national, sustainable, distributed, interoperable network of state geological survey-based data providers that will develop, collect, serve, and maintain geothermal-relevant data that operates as an integral compliant component of NGDS. We will bring data from the State Geological Surveys (via AASG) into the NGDS, by digitizing at-risk legacy, geothermal-relevant data (paper records, samples, etc), publishing existing digital data using standard NGDS data services, and through limited collection of new data in areas lacking critical information.

## The Process of Contributing Information to the Data System



Participants have two options on how to make their data available:

- Register files in an NGDS-compliant document repository.
- Implement a web service, either at your agency, a NGDS data center (Boise State, regional project hubs at state geological surveys--Kentucky, Illinois, or Nevada), or by arrangement with another agency.

Data will be considered part of the NGDS when it is locatable using the NGDS core catalog, and accessible via the web according to procedures described in the metadata record obtained from the NGDS core catalog.

Metadata should be created and submitted for any resource that is meant to be accessible individually via the web. If metadata already exists, it will need to be checked to ensure that it meets the minimum requirements defined for the system. Tools are being developed by the AZGS to generate acceptable metadata records quickly and easily.

For new and existing digital documents that are not online and do not already have metadata written, we're developing an online document repository. This open-source, Drupal-based web application allows the documents to be made available online, while providing a simple form for metadata creation. This metadata can be harvested into the NGDS Catalog.

These document repositories will be run by regional hubs, although any interested group may also decide to run their own.

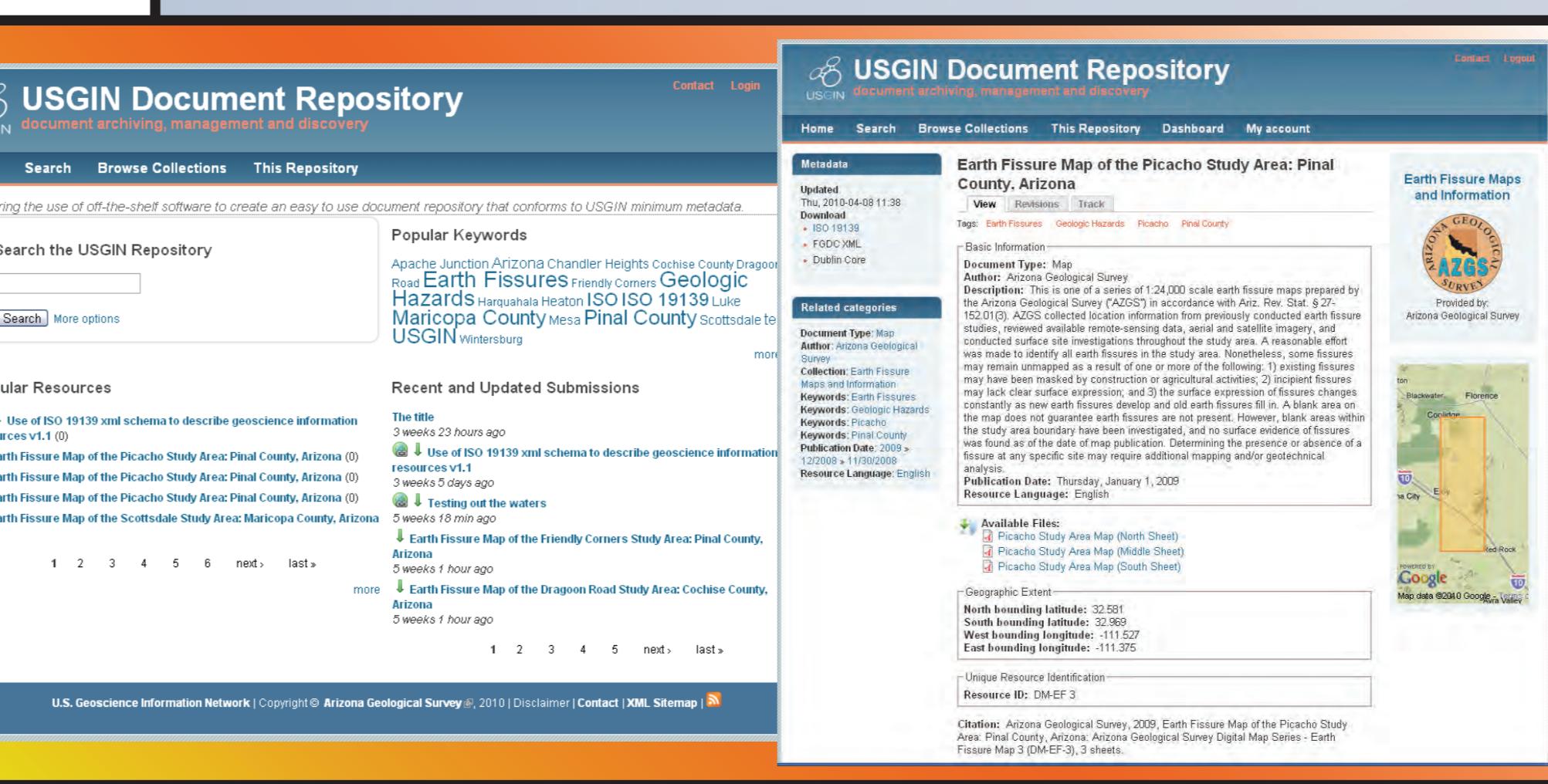
(beta version) [repository.usgin.org](http://repository.usgin.org)

For existing online datasets and services without useful metadata, an online metadata assistant is being developed.

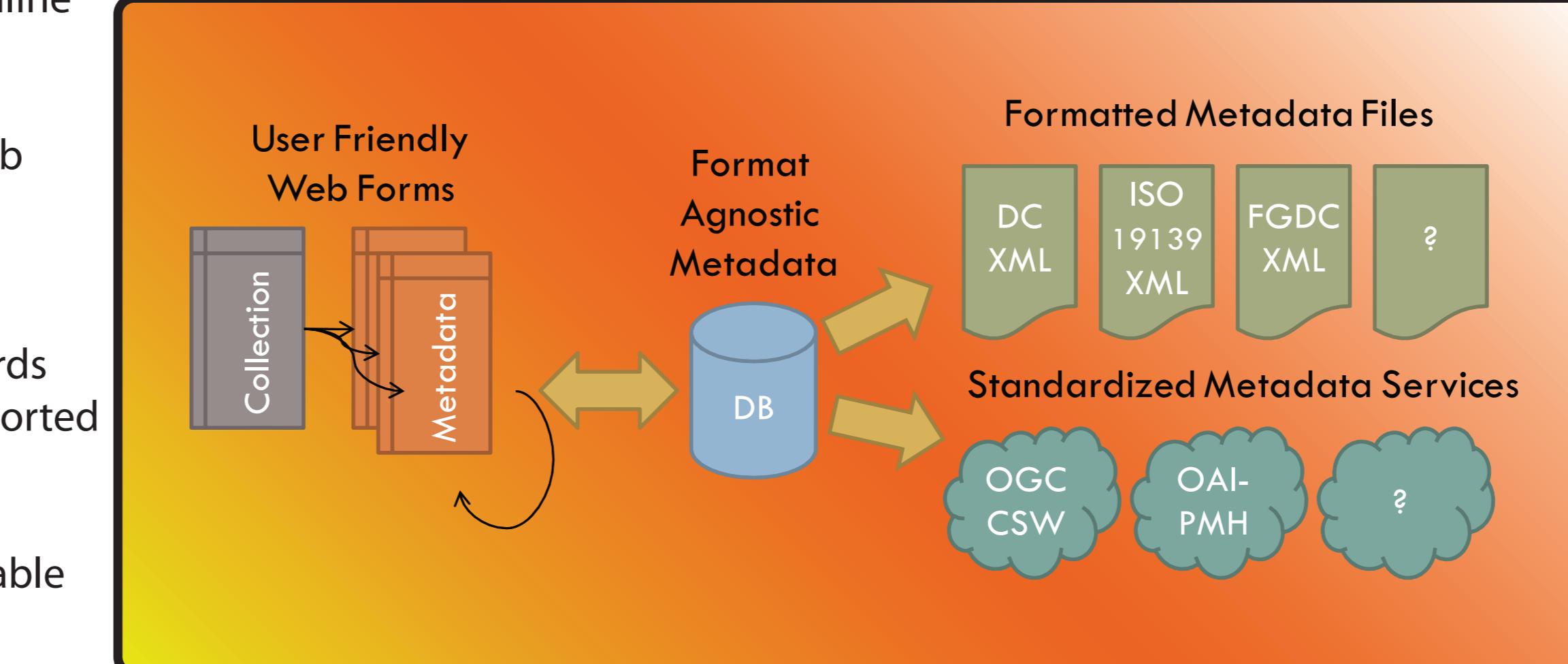
Another open-source, Drupal-based web application, this system will speed up manual metadata creation through user-friendly web forms. Interoperable, expandable, conceptual metadata records are stored in a database and can be exported in a number of standard formats.

Again, these records can be made available to the NGDS catalog, making your data available to a wide audience.

## Amazon Virtual Machine Images



## Online Metadata Editor

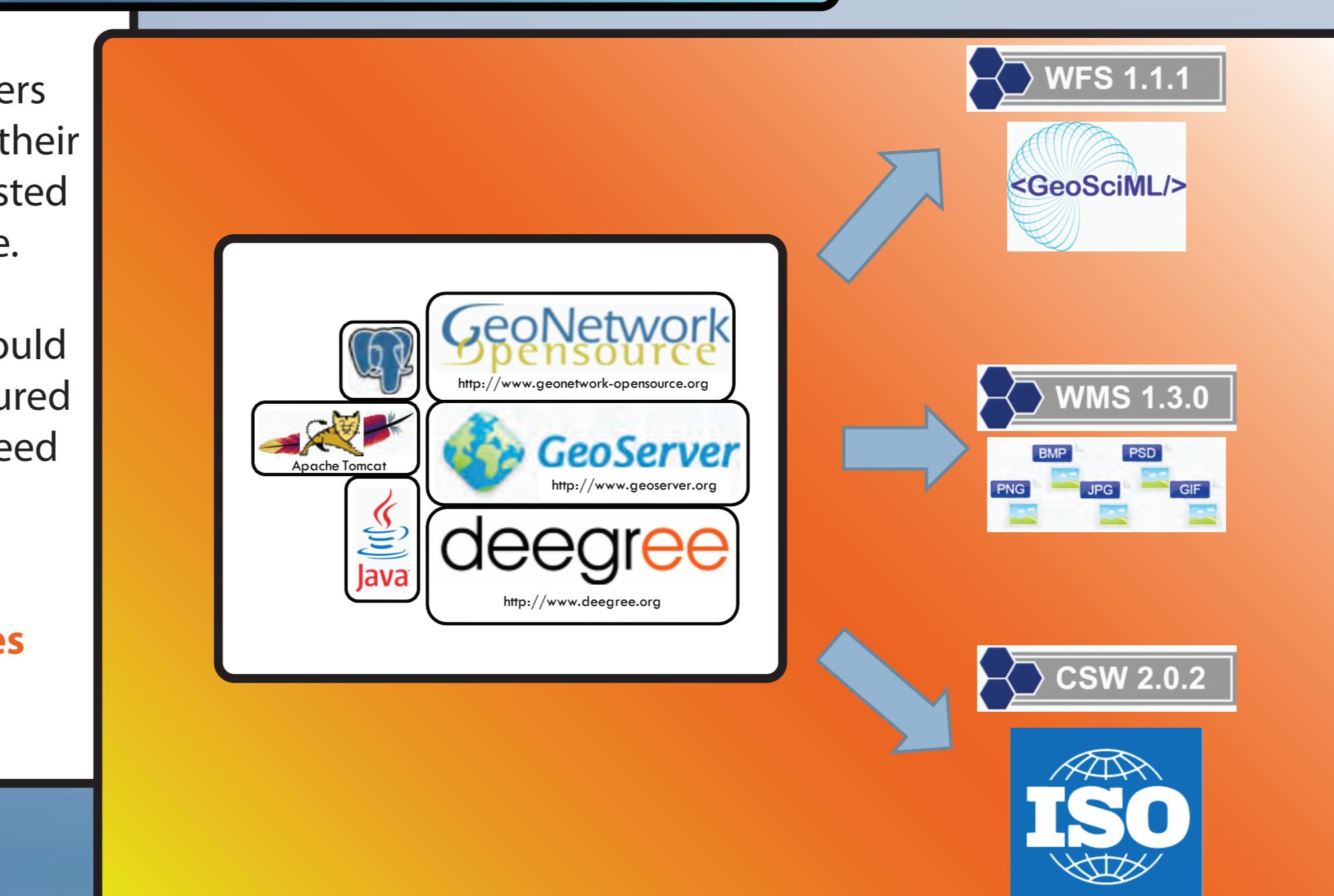


Some data providers may not have the hardware that would be required to put their own web-services online. These providers can either work through a regional hub to provide their data to through the hub's servers, or may be interested in hosting their data on an Amazon Virtual Machine.

We're developing Amazon Machine Images that would allow anyone to spin up a virtual server pre-configured with the software and documentation that you'll need to provide online OGC Services at a much lower cost-of-entry than buying a physical server.

[lab.usgin.org/applications/amazon-web-services](http://lab.usgin.org/applications/amazon-web-services)  
[aws.amazon.com/ec2](http://aws.amazon.com/ec2)

## Online Document Repository



## What Are We Doing to Make This Easier? The AZGS At Your Service...

We've been working with our partners at the Great Basin Center for Geothermal Energy, the Geo-Heat Center and Southern Methodist University to spin up some sample services, such as the nationwide heatflow dataset shown here.

These sample services help users to understand the benefits of providing data through web-services, and also gives developers something to work with while creating applications to consume these services.

Look for services at these URLs:  
[services.usgin.org/gsvr](http://services.usgin.org/gsvr)  
[services.azgs.az.gov/arcgis/rest/services](http://services.azgs.az.gov/arcgis/rest/services)

## Demo Services



## Documentation / Help Desk



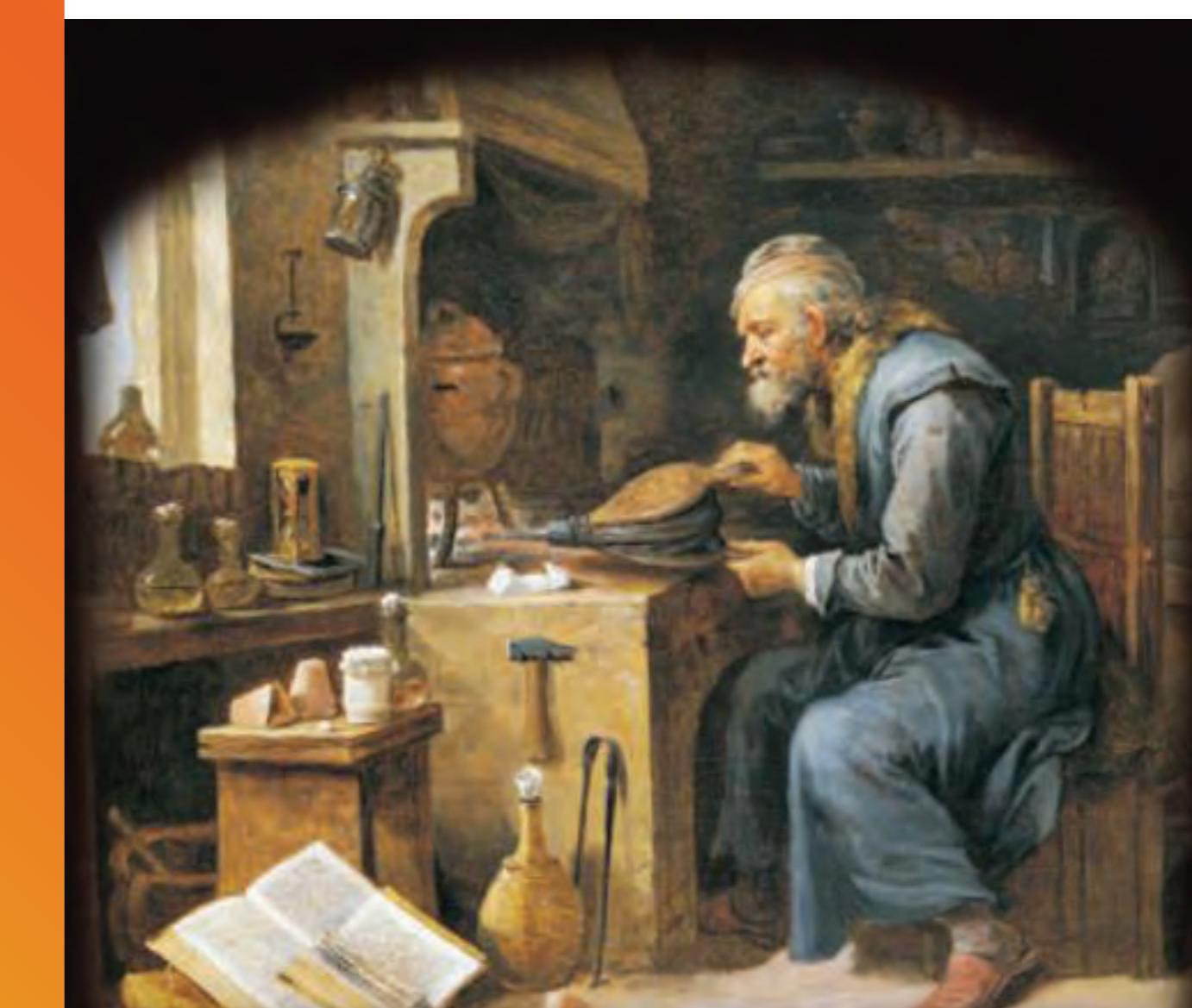
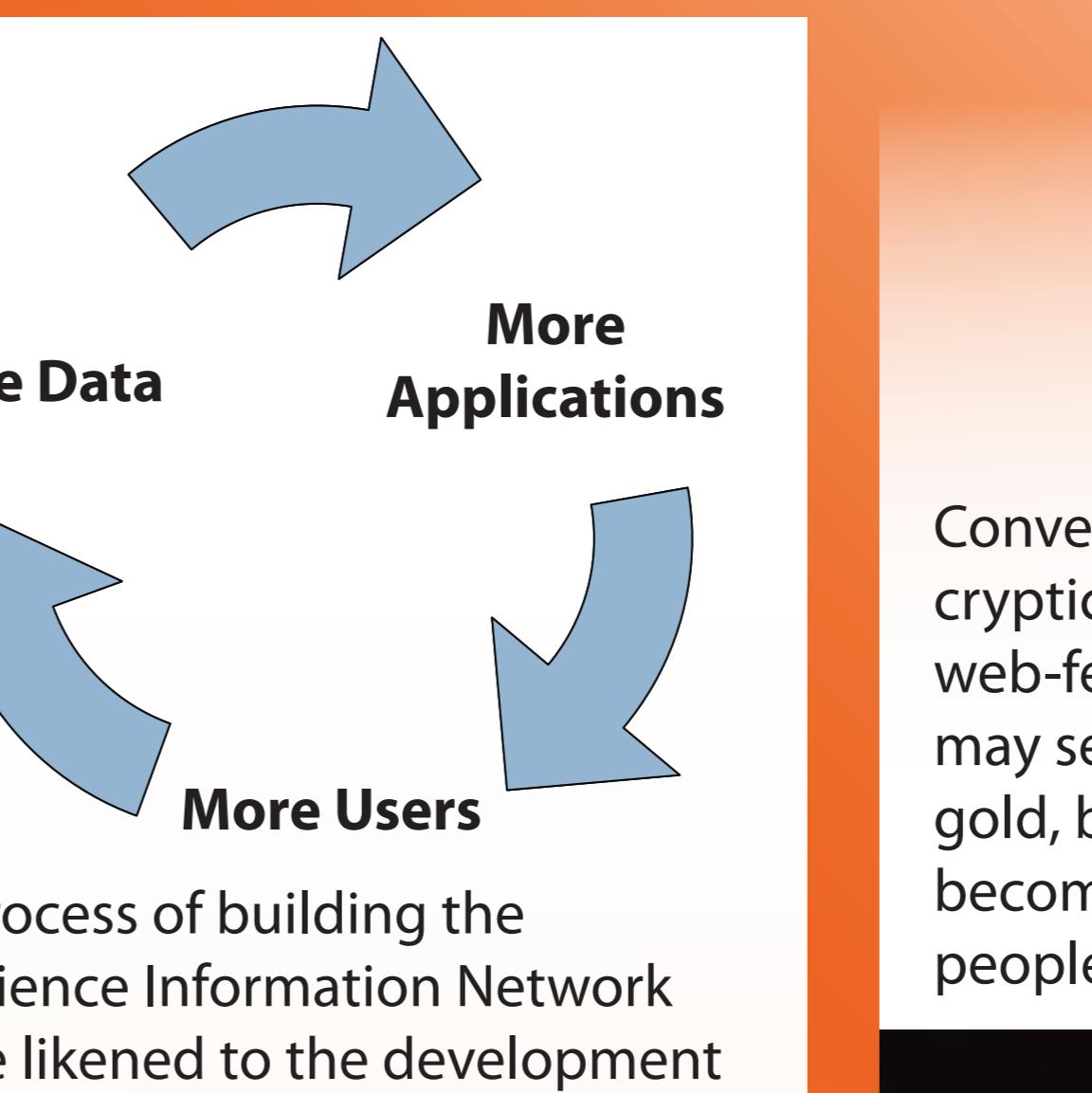
## What Are the Long Term Objectives of the Geoscience Information Network?

This effort hinges on development of a community of practice using a shared collection of protocols for publishing, finding, and delivering digital information online.

We want to convince you that:

1. Web-services are better ways to provide your data than shapefiles. They are literally the future of data sharing.
2. Web-services are becoming an increasingly important part of data generation, portrayal, distribution and acquisition.
3. It is **desperately** important to provide useful metadata for any data you ever want anyone else to be able to use.

After we've convinced you of that, we will see the expansion of this community of practice that will lead to the development of better tools for finding and viewing data, which convince more users to participate, leading to more data, and more tools, and more users, and more data...



**FOR MORE INFORMATION:**  
[www.geothermaldata.org](http://www.geothermaldata.org)  
[www.usgin.org](http://www.usgin.org)  
[lab.usgin.org](http://lab.usgin.org)  
[ryan.clark@azgs.az.gov](mailto:ryan.clark@azgs.az.gov)