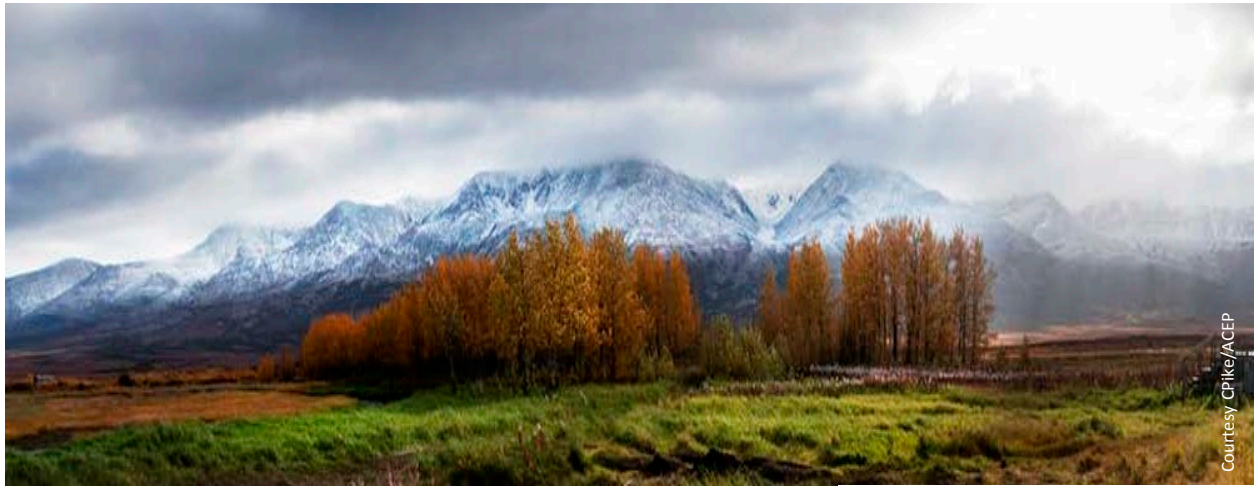
Overview of the National Geothermal Data System (NGDS) & Department of Energy's Geothermal Data Repository (GDR) node on the NGDS



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Arlene F. Anderson
Technology Manager
Geothermal Technologies Office

National Geothermal Data System (NGDS) User Interface

NGDS is a catalog of documents and datasets that provide information about geothermal resources within the United States, including information from other parts of the world, used to:

- Determine geothermal potential;
- Guide exploration and development;
- Make data-driven policy decisions;
- Minimize development risks;
- Understand how geothermal activities affect your community and the environment;
- Guide investments.

http://geothermaldata.org/

National Geothermal Data System FREE Software

http://geothermaldata.org/ngds/publish_data

How is Data Discovered?

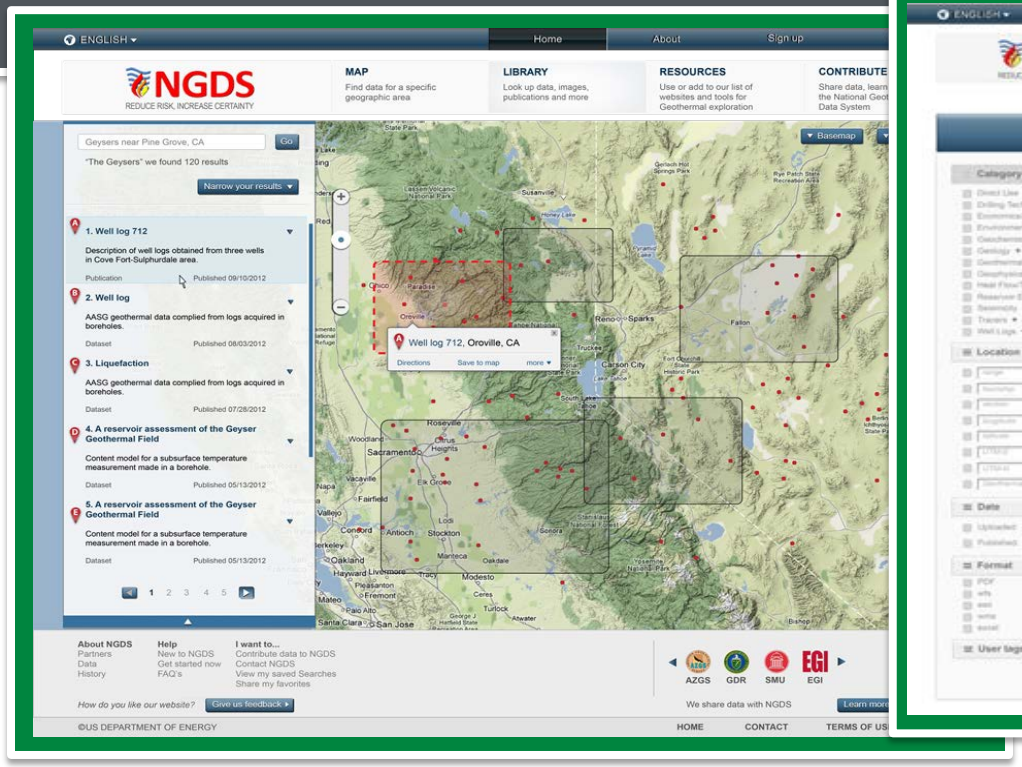
- Map data records
- Use Library to filter by keywords
- Explore Resources Tab for more free/open-source applications to use with NGDS data

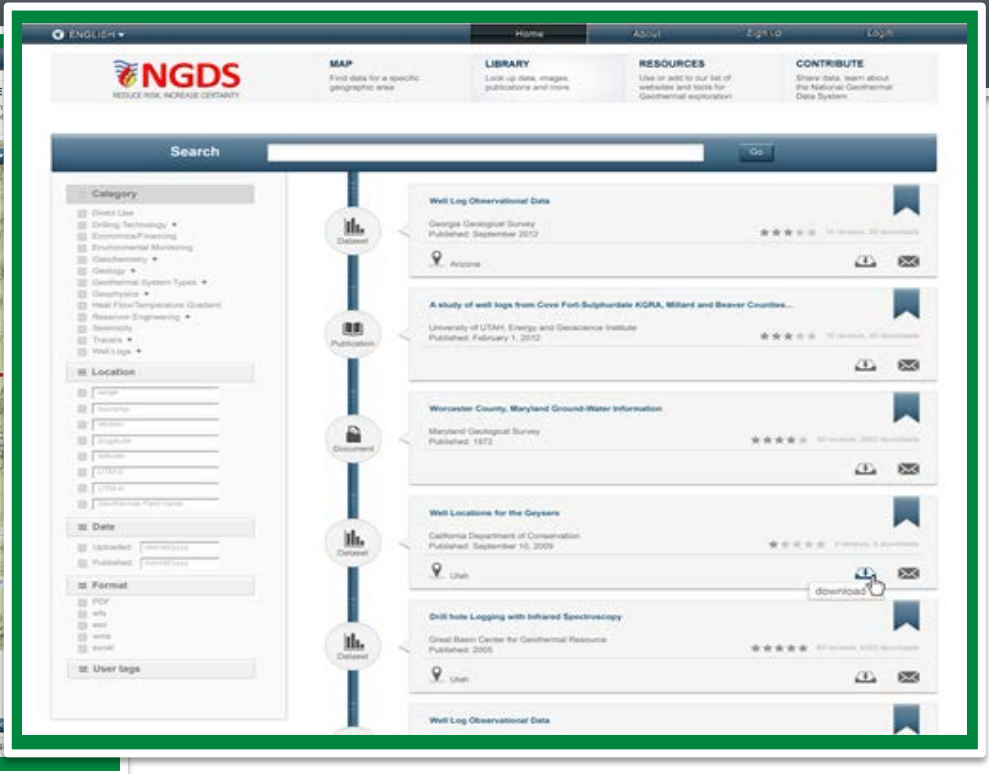
Contributing your data

Your geothermal resource information can:

- Remain privately accessible;
- Be openly accessible to the public;
- Be only visible to others within the contributing agency

How is NGDS typically used? Researchers; Data contributors; Web developers.





Open Data Policy Requirements	NGDS Capabilities
Domain: all federal agency data; all research data funded by federal agencies	Works for all digital data
Legal Status: Executive Order	DOE-GTO funded
Public access at no cost	☒
Searchable/ discoverable	☒
Interoperability	☒
Scalability	☒
Metadata core requirements	☒
Open Source	☒
Assistance/Education for data creators and end users	☒
Community building efforts	☒
Description Requirements (What info, access requirements)	☒

State Geological Survey Data Providers

Ongoing project, #'s as of 07-02-2014

Data Provider	Data Item
Participating State Geological Surveys, and Universities (50 State Representation)	• Borehole Temperature total collected data points are 532,574
	• Thermal Conductivity total collected data points are 36,029
	• Well Header total collected data points are 1,738,184
	• Well Log total collected data points are 658,228
	• Well Test total collected data points are 72,682
	• Borehole Lithology Intervals total collected data points 1,843,140
	• Active Fault total collected data points 45,083
	• Drill Stem Test total collected data points 13,952

State Geological Survey Data Providers

Ongoing project, #'s as of 07-02-2014

Data Provider	Summary of Data Provided
Participating State Geological Surveys, and Universities (50 State Representation)	• Total Expected Deliverables: 1,083
	• Total Online Deliverables to Date: 1,037
	• Percent Complete: 96%
	• Total Data Points: 7,055,076
	• Total Data Services (interoperable WMS and WFS): - 370* in 616 layers
	• 10 Gravity/Aeromag maps
	• 35 OneGeology Maps
	• 125 additional WMS-only Maps

***Services may include 2-3 deliverables based on the state's annual Scope of Work (SOW)**

Southern Methodist University: Data Providers

Project Ended FY13, #'s approx. as of June 24, 2014 Final Technical Report

Data Provider	Data Item
Southern Methodist University	• Nationwide heat flow data on >44,000 wells • >6,000 related resources tied to wells • ~900 publication PDFs and related links
Bureau of Economic Geology (BEG) at University of Texas at Austin	• Texas reservoir analysis (55 different reservoirs; 138 depth slices) • Well data on ~42,000 wells • ~400 publication PDF's
Cornell Energy Institute	• ~9,000 wells in NY & PA with heat flow calculations • Estimated temperatures at depth to 10 km • ~600 publication PDF's • Economic analysis report & maps
Geothermal Resources Council (GRC)	• Bibliographic information for 33,000 publications • >13,000 PDF's uploaded - 15,000 indexed by subject and geographic location • New online library website containing concise abstracts

Southern Methodist University: Data Providers

Project Ended FY13, #'s approx. as of June 24, 2014 Final Technical Report

Data Provider	Data Item
MLKay Technologies	• >1 million Texas oil and gas well site data - Including location, flow, test, depth, age, wellbore, etc.

Texas Tech University	• >40,000 wireline logs
	  - Associated with 8,100 wells
	• Largest off-shore temperature data collection from BHT in the United States
	  - Includes location, corrected BHT, logs, etc.

University of North Dakota	• 217 thermal conductivity measurements • 350 radiogenic heat production measurements • 245 Temperature at depth data for 6 states • Significant contributions to SMU's nationwide heat flow dataset • >125 publication PDFs
Siemens Corporate Technology	• Provided complete systems integration

State Geological Survey Contributions: University Data Providers *#'s as of 07-02-2014*

Data Provider	Data Item
Stanford Reservoir Engineering Department	• Bibliographic Database for Proceedings from the annual Stanford Geothermal Workshop and PANGEA publications count: - 13023 metadata records with location keywords
	• Metadata Records for 3 Adsorption Data publications (data spreadsheet, publication, and final report)
GeoHeat Center, Oregon Institute of Technology (OIT)	• Geothermal publications metadata: - 1532 technical papers submitted
	• Co-located well sites: - 1462 records OIT Geothermal Areas, Wells, Thermal Springs tier 2 web service
	• Klamath Falls #57310 document: - 19 page complete report with well tests, chemical analysis, and project assessment
	• Documentation and registration of data set describing 404 Co-located sites
	• Documents and data related to the Klamath Falls #57310 project scanned and publicly accessible online with metadata

State Geological Survey Contributions: University Data Providers *#'s as of 07-02-2014*

Data Provider	Data Item
University of Utah, Energy & Geoscience Institute (EGI)	• 2350 well log records indexed in NGDS Well Log Observation Content Model with links to scanned logs
	• 7430 metadata records created for scanned documents (publications, maps, reports)
University of Nevada, Nevada Bureau of Mines and Geology (NBMG)	• 440 online geologic maps with metadata: - 27 layers in tier 3 OneGeology service
	• 526 geothermal publications with links
	• 832 scanned notices, permits, and literature online with associated metadata
	• Geothermal exploration activity map web applications - 14 web map applications with 205 web services
	• Nevada Direct Use and Power Plant tier 3 Content Model services with links

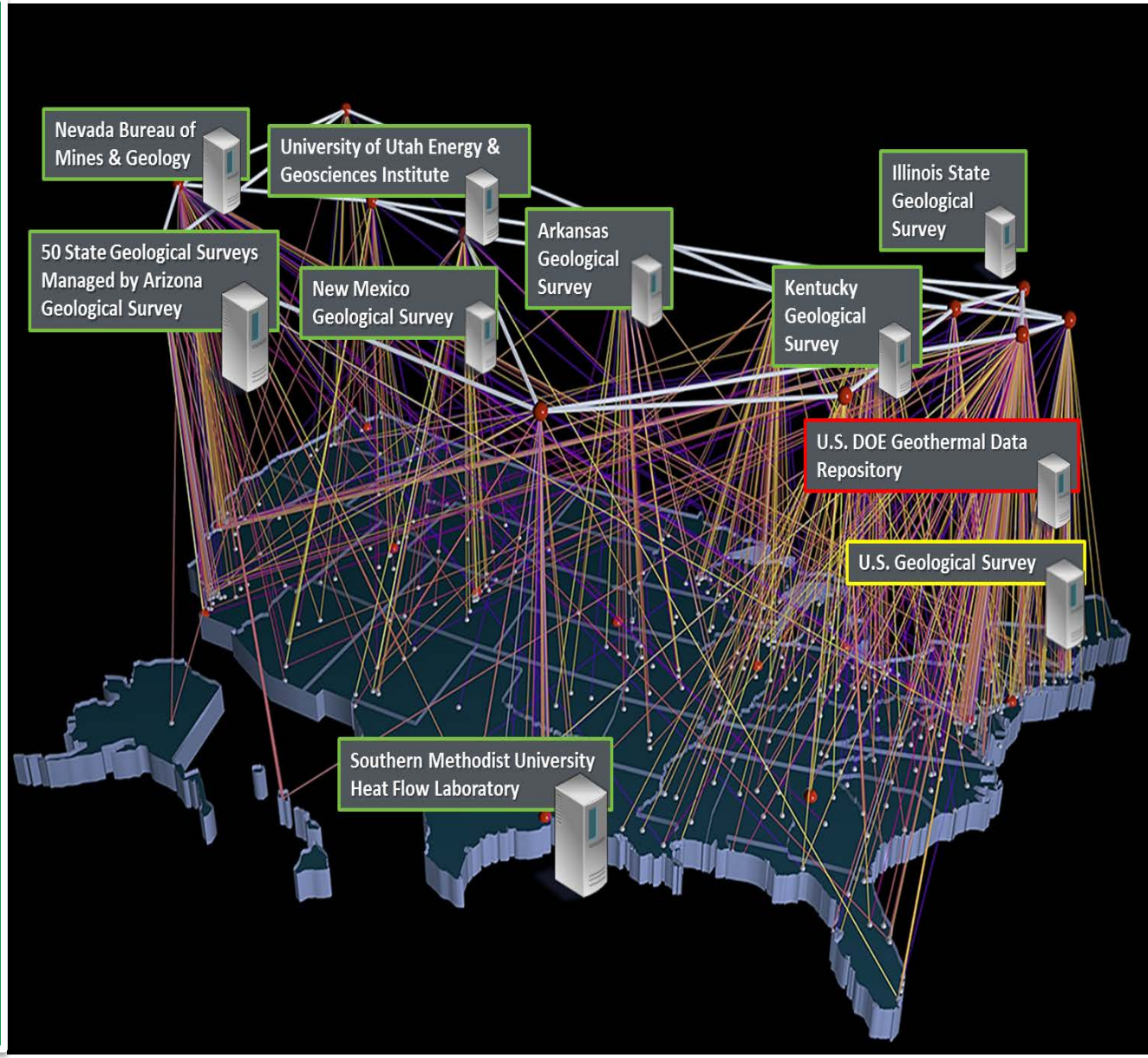
The Geothermal Data Repository (GDR) is DOE's Node on the National Geothermal Data System (NGDS)

GDR Geothermal Data Repository

http://gdr.openei.org

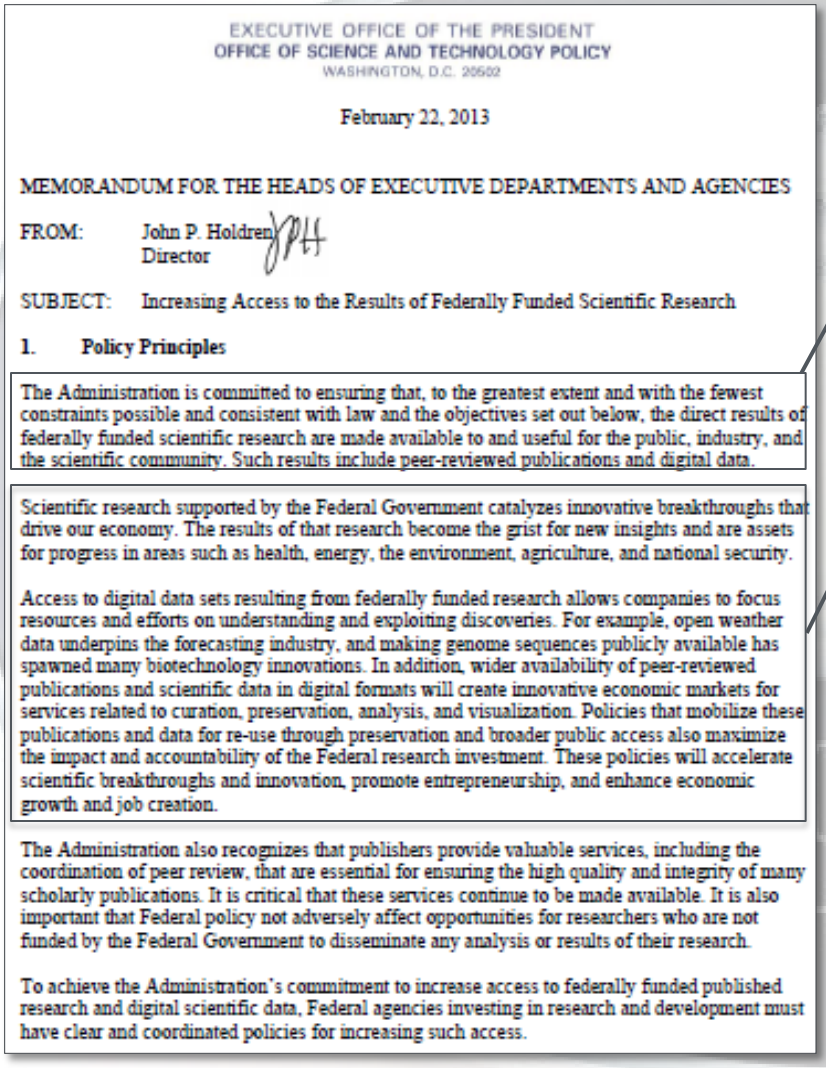
NGDS

http://geothermaldata.org



Federally Funded Scientific Research

Increasing Access to Results



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20502

February 22, 2013

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: John P. Holdren
Director

SUBJECT: Increasing Access to the Results of Federally Funded Scientific Research

1. Policy Principles

The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.

Access to digital data sets resulting from federally funded research allows companies to focus resources and efforts on understanding and exploiting discoveries. For example, open weather data underpins the forecasting industry, and making genome sequences publicly available has spawned many biotechnology innovations. In addition, wider availability of peer-reviewed publications and scientific data in digital formats will create innovative economic markets for services related to curation, preservation, analysis, and visualization. Policies that mobilize these publications and data for re-use through preservation and broader public access also maximize the impact and accountability of the Federal research investment. These policies will accelerate scientific breakthroughs and innovation, promote entrepreneurship, and enhance economic growth and job creation.

The Administration also recognizes that publishers provide valuable services, including the coordination of peer review, that are essential for ensuring the high quality and integrity of many scholarly publications. It is critical that these services continue to be made available. It is also important that Federal policy not adversely affect opportunities for researchers who are not funded by the Federal Government to disseminate any analysis or results of their research.

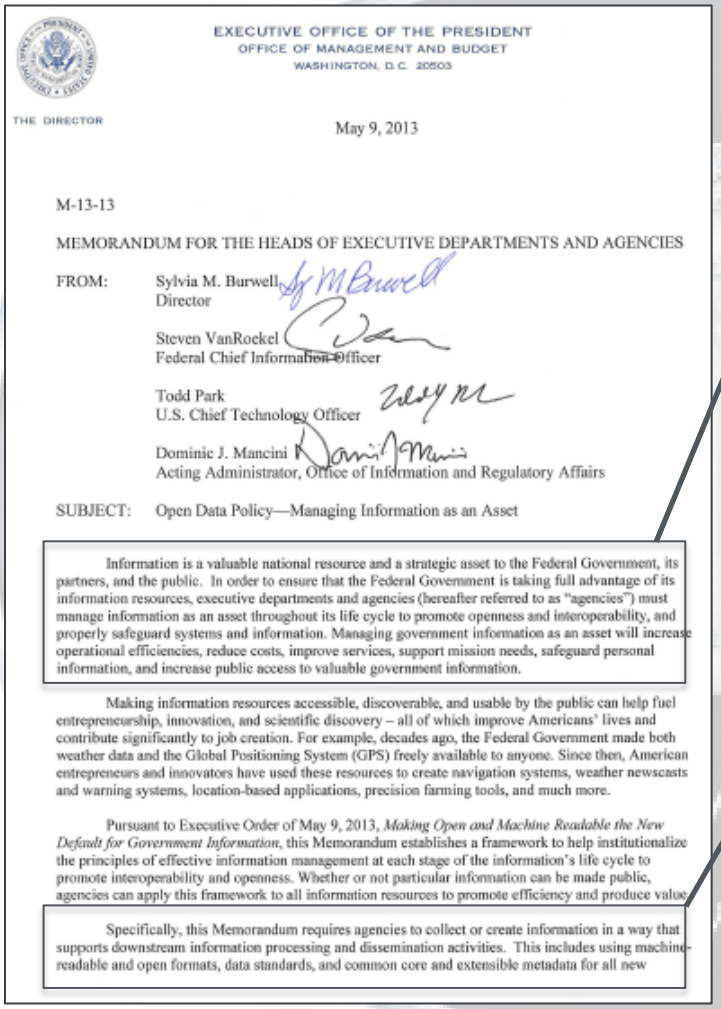
To achieve the Administration's commitment to increase access to federally funded published research and digital scientific data, Federal agencies investing in research and development must have clear and coordinated policies for increasing such access.

". . . the direct results of federally funded scientific research are made available to and useful to the public, industry, and the scientific community.

"Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. . . data in digital formats will create innovative economic markets for services related to curation, preservation, analysis, and visualization."

Federal Guidance – Open Data Policy

Managing Information as an Asset



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

May 9, 2013

M-13-13

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Sylvia M. Burwell
Director

Steven VanRoekel
Federal Chief Information Officer

Todd Park
U.S. Chief Technology Officer

Dominic J. Mancini
Acting Administrator, Office of Information and Regulatory Affairs

SUBJECT: Open Data Policy—Managing Information as an Asset

Information is a valuable national resource and a strategic asset to the Federal Government, its partners, and the public. In order to ensure that the Federal Government is taking full advantage of its information resources, executive departments and agencies (hereafter referred to as "agencies") must manage information as an asset throughout its life cycle to promote openness and interoperability, and properly safeguard systems and information. Managing government information as an asset will increase operational efficiencies, reduce costs, improve services, support mission needs, safeguard personal information, and increase public access to valuable government information.

Making information resources accessible, discoverable, and usable by the public can help fuel entrepreneurship, innovation, and scientific discovery – all of which improve Americans' lives and contribute significantly to job creation. For example, decades ago, the Federal Government made both weather data and the Global Positioning System (GPS) freely available to anyone. Since then, American entrepreneurs and innovators have used these resources to create navigation systems, weather newscasts and warning systems, location-based applications, precision farming tools, and much more.

Pursuant to Executive Order of May 9, 2013, *Making Open and Machine Readable the New Default for Government Information*, this Memorandum establishes a framework to help institutionalize the principles of effective information management at each stage of the information's life cycle to promote interoperability and openness. Whether or not particular information can be made public, agencies can apply this framework to all information resources to promote efficiency and produce value

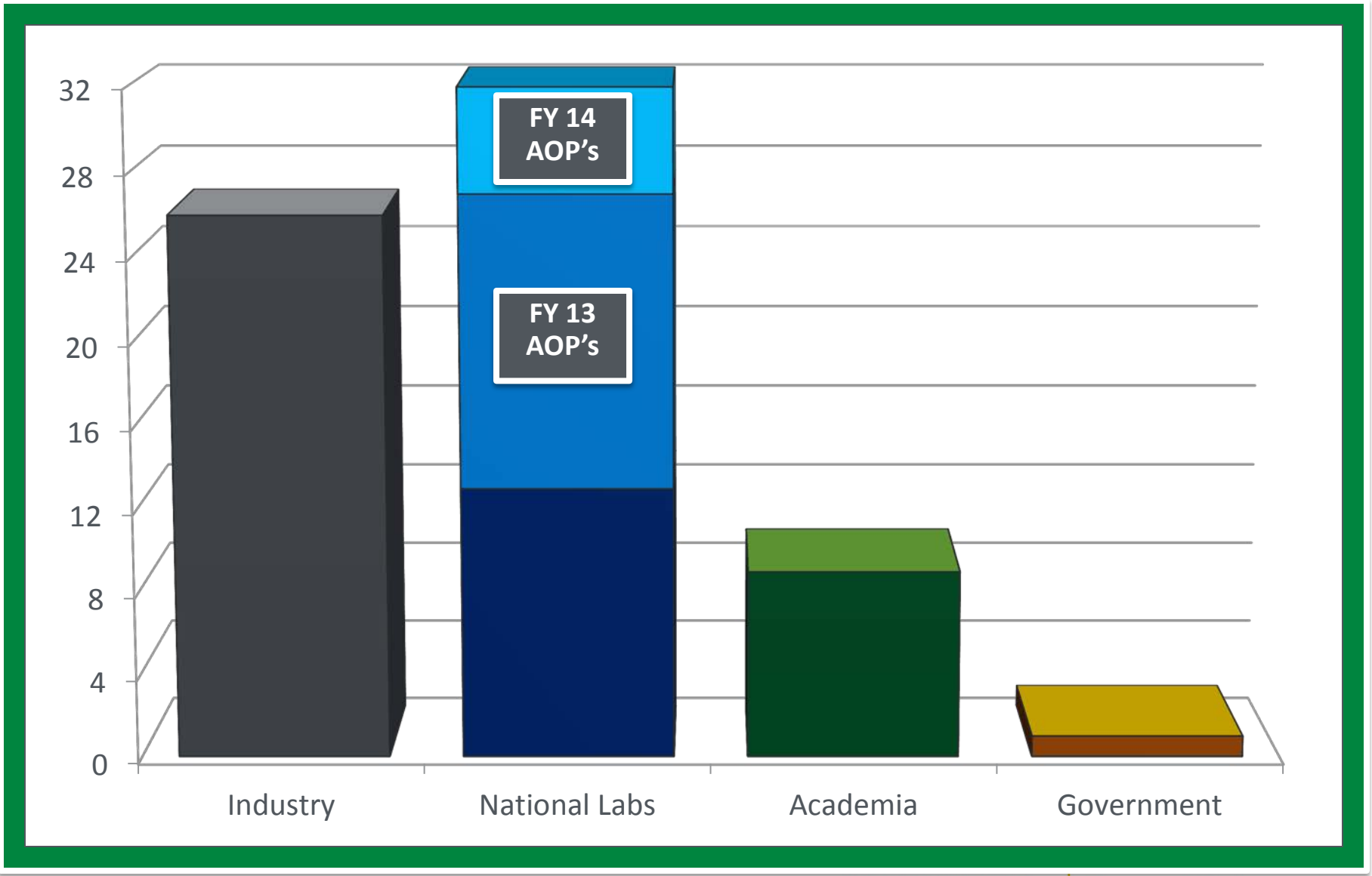
Specifically, this Memorandum requires agencies to collect or create information in a way that supports downstream information processing and dissemination activities. This includes using machine-readable and open formats, data standards, and common core and extensible metadata for all new

"Information is a valuable national resource and a strategic asset to the Federal Government, its partners, and the public. . . Departments must manage information as an asset throughout its life cycle to promote openness and interoperability…"

"Specifically, this memorandum requires agencies to collect or create information in a way that supports downstream information processing and dissemination activities. . . Using machine readable and open formats, data standards, and common core and extensible metadata for all new information creation and collection efforts…"

DOE Geothermal Data Repository (GDR)

Project Performer Type – 69 Submitters as of June 30, 2014



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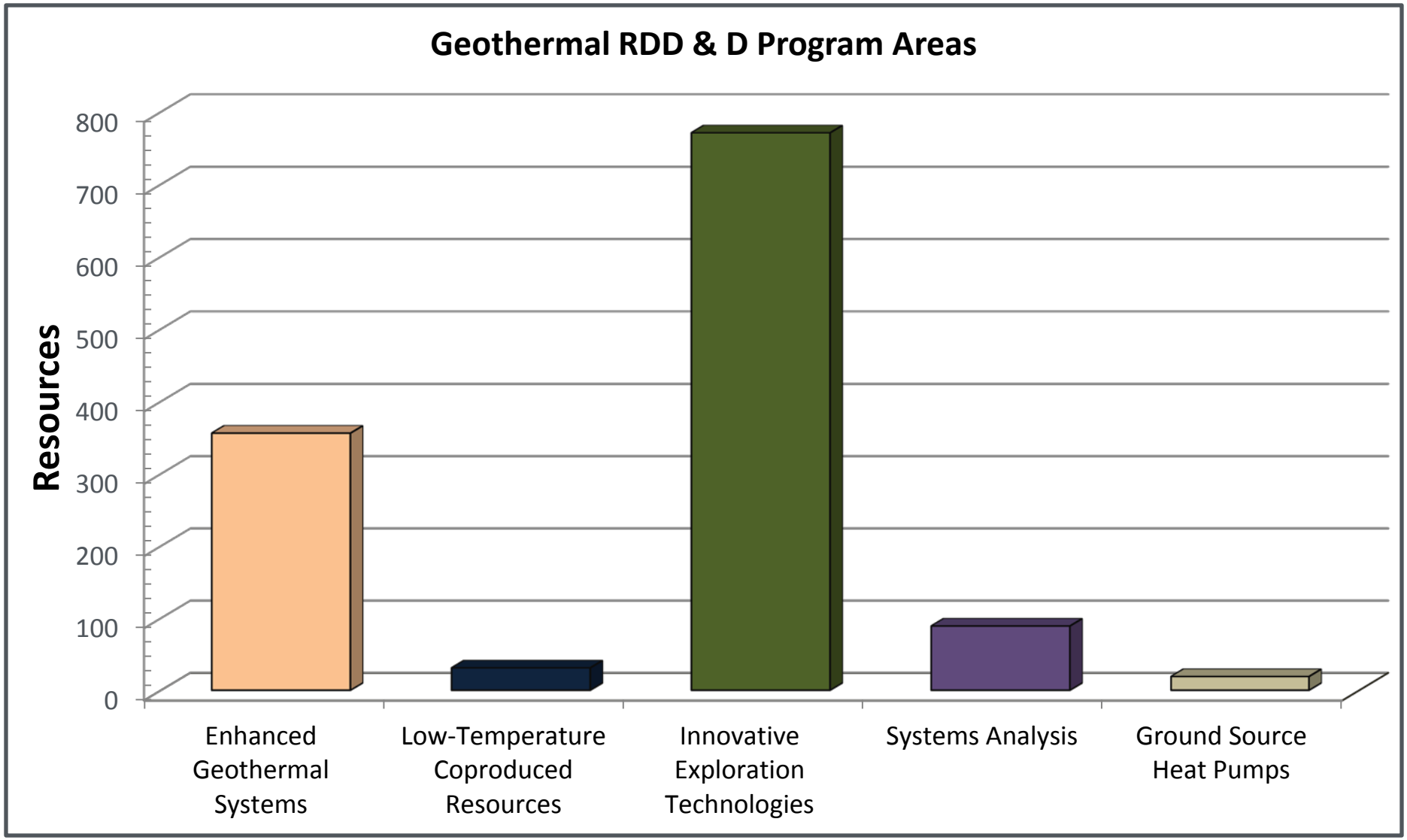
DOE Geothermal Data Repository (GDR)

Program Area - 1266 Data Resources Submitted as of June 30, 2014



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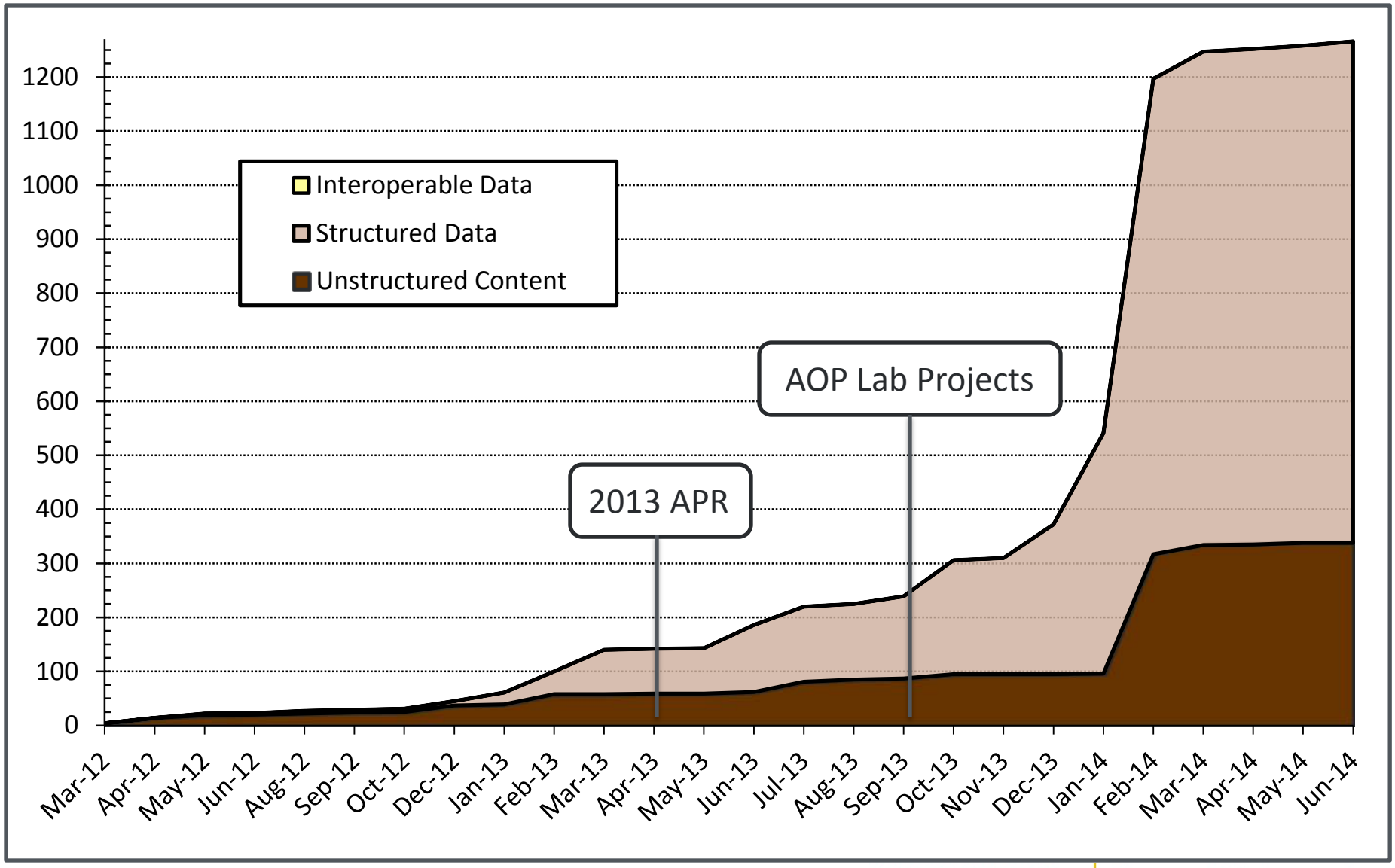
DOE Geothermal Data Repository (GDR)

Data Usability - 1266 Data Resources as of June 30, 2014



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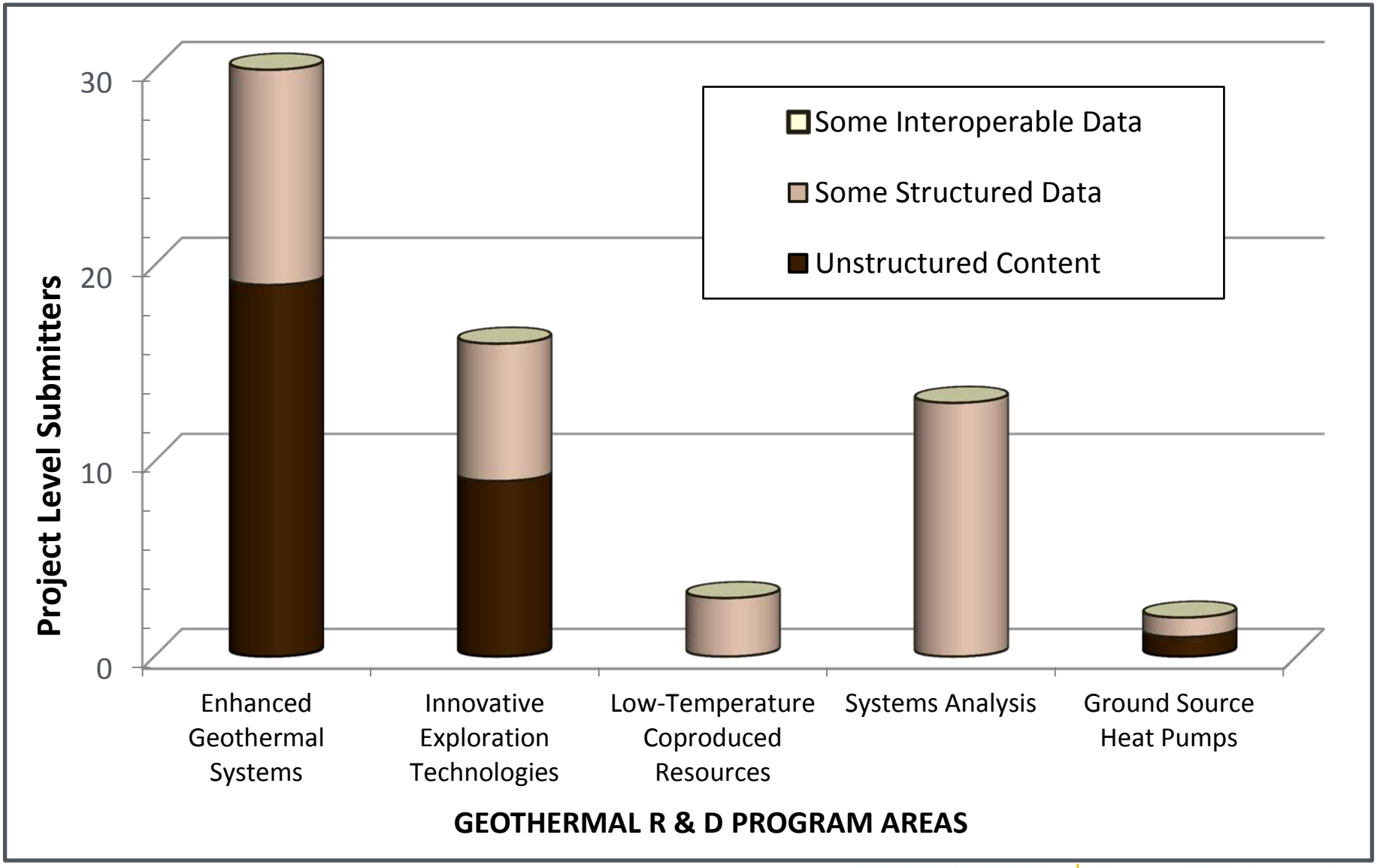
Geothermal Data Repository (GDR)

Data Usability – 69 Submitters as of June 30, 2014



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