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

NGDS
National Geothermal Data System

www.GeothermalData.org

National Geothermal Data Systems Data Acquisition and Access

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National Geothermal Data System

This presentation does not contain any proprietary confidential, or otherwise restricted information.

Overview

- **Timeline**
  - January 29, 2010 – February 28, 2014
  - Completion to date: 5%
- **Budget**
  - DOE: $1,550,000; Awardee: $0
  - Funding received FY09: $0
  - Funding received FY10: $1,550,000
- **Barriers**
  - Resource assessment and data needs, including lack of available and reliable resource and related information.
- **Partners**
  - U.S. Geological Survey

Relevance/Impact of Research

Purpose:

To **increase the capacity** of the National Geothermal Data System (NGDS) to accommodate **new and legacy data**. This includes the acquisition of key data from DOE-funded geothermal **demonstration projects** and working with the **US Geological Survey** to acquire and provide access to legacy data and data associated with the DOE funded **Geothermal Resource Assessment and Classification**.

Relevance/Impact of Research

Impact – Data re the basis of knowledge and fundamental for education and decision-making; the impacts of access to reliable data (new and legacy) include:

- **Reduces the upfront risk** for industry and investors associated with exploration and development of a targeted project
  - Reduces the time, costs, and risk for making a business decision to invest in the project.
  - Helps to bring more geothermal energy online
  - Facilitates use of US Geological Survey's Resource Classification System to evaluate geothermal site potential.
  - Stimulates industry growth
- Basis to educate new **workforce**
- Provides a platform to support **research and development**
- Supports more rapid approval of leases and licenses by providing **land and resource management agencies** with access to reliable information
- Supports **decision-making processes** at both state and federal level

Scientific/Technical Approach

To support the acquisition of new and legacy data from DOE-funded demonstration projects, the US Geological Survey, and other sources, the NGDS will:

- Develop mechanisms for **web-based submission, registration and attribution** of digital documents and datasets.
- Develop and deploy the **NGDS Digital Library and Catalog** for these documents and datasets.
- Provide mechanisms for **open access via the web to the NGDS Digital Library** by both NGDS and other external sites to promote the wide distribution of the archived documents and datasets.

Scientific/Technical Approach

To support the acquisition of new and legacy data from DOE-funded demonstration projects, the US Geological Survey, and other sources, the NGDS will:

- Develop **web-based mechanisms** for **submission of bulk data** that will be parsed into the NGDS-core database.
- Develop as well as utilize externally developed **web services to facilitate the access** to defined suites of data, documents and datasets through the NGDS Geothermal Desktop and other external web sites and online tools.

Scientific/Technical Approach

PROPRIETARY AND MORATORIUM DATA

1) The NGDS is being designed to fully respect and **protect intellectual property rights and proprietary data** while still allowing these data to be part of the NGDS. Thus, the NGDS will provide mechanisms to:
   - **handle private data securely and keep these data private** in perpetuity as necessary or desired.

2) For data that are generated via DOE or other federal funds that must eventually become public:
   - these data can be held **private** for whatever **moratorium period** is appropriate and the user controls when/if and which data go public.

Scientific/Technical Approach

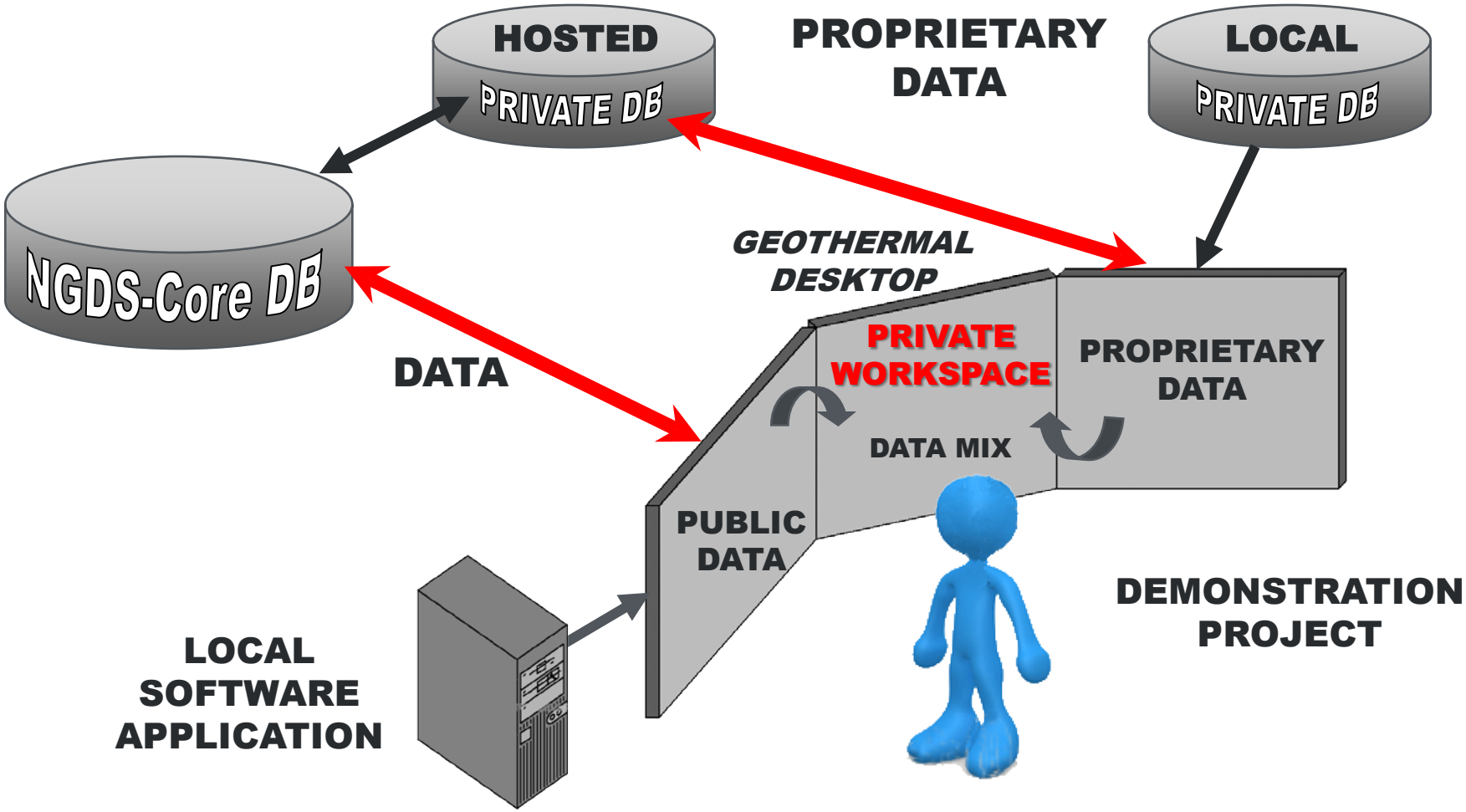
PROPRIETARY AND MORATORIUM DATA

3) To both facilitate the capture of data generated by DOE-funded projects and to allow users to mix private with public data, through the Geothermal Desktop the NGDS will provide:
   - a **private working space** where the user can **input and work with moratorium and/or proprietary data**, intermixing them with public data during their analysis, all **in a secure and private environment**.

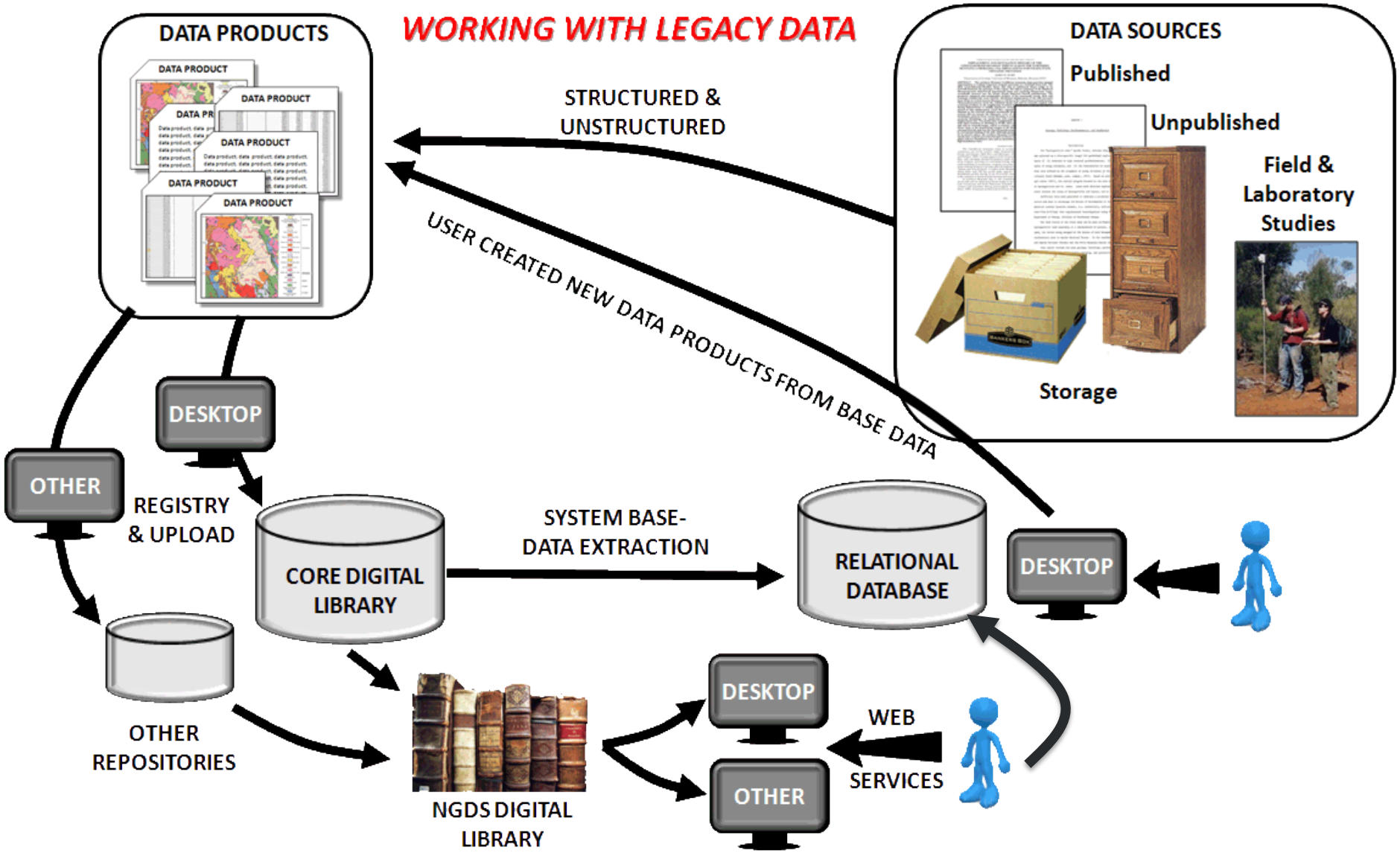
4) In addition, data sets will be able to be **published that are stripped of proprietary information**. In this way we hope to encourage the user of the system as an operational database for industry.

Scientific/Technical Approach

GEOTHERMAL DESKTOP – CUSTOM WORKING ENVIORNMENT



Scientific/Technical Approach



Accomplishments, Expected Outcomes and Progress

Data Model

- Polled NGDS partners re data types
- Examined other sources for data model (e.g., Energistics, Public Petroleum Data Management (PPDM), GeoSciML, GeoStrat, EarthChem, IRIS)
- Contacting Demonstration Project PI's to determine their needs
- Compiling and comparing approaches, data types, standards and protocols used

Data Catalog & Registry

- Prototype of a data registry and metadata catalog (GIN)
- Investigation of additional approaches (e.g., Mercury)
- Initial design for Digital Library sketched out

Geothermal Desktop

- Focus on development of the data entry and management modules
- Developed initial approach to map (GIS) views of data

Project Management/Coordination

Team Management

- Weekly team meetings
- Teams: Design, Development, Tools, Web Services

Technical

- Aglie approach to project management (OnTime software)

Leveraging NSF-funded projects

- **GeoStrat** funded by the Earth Science Division/Geoscience Directorate

Project Management/Coordination

Working closely with two other NGDS data acquisition projects:

- "Heat Flow Database Expansion for NGDS Data Development, Collection and Maintenance" (D. Blackwell, PI, Southern Methodist University),
- "State Geological Survey Contributions to NGDS Data Development, Collection and Maintenance" (M.L. Allison, PI, Arizona Geological Survey)

Working with

- Aglie approach to project management (OnTime software)

Leveraging NSF-funded projects

- **GeoStrat** funded by the Earth Science Division/Geoscience Directorate

Project Management/Coordination

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Budget & Spending Plan
Quarterly & Monthly Reports

Contact Information	Name	Phone	Email	Program Element/Area	5-NGDS
HQ Technology Manager	Arlene Anderson	AA 202-586-3818	arlene.anderson@ee.doe.gov	Project Initiated (dd/mm/yy)	9/1/2009
GO Project Officer	Ava Norman	AN 303-275-4852	ava.norman@go.doe.gov	Planned Project Completion Date	5/31/2014
GO Project Monitor	Grant Logsdon	GL 720-356-1284	grant.logsdon@go.doe.gov		
National Laboratory Contact, if applicable					
Principal Investigator	Walt Snyder	208-426-5905	wsnyder@boisestate.edu		
Co-Principal Investigator (if applicable)				Performing Organization (Prime only)	Boise State University

CID or Laboratory Designation	DE-EE0001120		
CPS Agreement #			
Program Value (B&R) Code			
Status	Active		
Overall Stage of Development	3-Education and Outreach		
Funding Partner(s) [Any partner or subcontractor who provides cost share]			

Project Description (non-proprietary): The objective of this project is to design, implement and test the "National Geothermal Data System" (NGDS) and thus contribute to the U.S. Department of Energy's (DOE) Geothermal Technologies Program's (GTP) mission to conduct research, development and demonstration to establish Enhanced Geothermal Systems as a major contributor for electricity generation. The NGDS will be an internet-based, online system with open access to the public and all interested parties.

Project Goal: Develop a data system that will facilitate the development of Geothermal Energy

The NGDS team has m data system has moved focus is on the content follow shortly. In addi and the Public Petroleu data exchange standard development continues was developed to prov of delivery which is be sure it is compatible w building online tools to the Geothermal Dedic the approach to a "Fir developed an initial sp An on-site visit to US Classification and ass background for the UD

For GO Use Only: DOE Project Officer Quarterly Report Summary Analysis

National Laboratory Progress Summary (to be provided by PI):

C. Progress within tasks and milestones for reporting quarter

Number of Task, Subtask, Milestone, Deliverable per project SOPO	Title - Tasks, Subtasks, Milestones, Deliverables including Go No/Go Decision Pts	For milestones provide type	Status of Progress in Task or Milestone (G,Y,R)*	Start Date (Tasks, Subtasks Only)	Original Planned Completion Date (*task and milestones*)	Approved Updated Completion Date	% Completion Planned	% Actual Completion	Milestone / Decision Point Deliverable	Budget by Task (report for task level only, subtasks are n: Original (baseline)	Approved Updated Budget	Actual (Amount spent to date per task)	Com
PHASE I													
Task 1.0	**Data System**		G	9/10/2009			27%	35%		$154,757		$65,500	
Subtask 1.1	System Conceptual Design		G	9/10/2009			27%	35%					
Task 2.0	**Data Sharing and Web Services**		G	9/10/2009			27%	26%		$127,463		$15,000	
Subtask 2.1	Data Catalog and Procedures for Data		G	9/10/2009			27%	2%					
Task 3.0	**Geothermal Desktop**		G	9/10/2009			27%	27%		$119,962		$45,000	
Subtask 3.1	Data	A - ARRA Milestone	G	9/10/2009	9/30/2009		27%	27%	Begin interacting desktop software to access NGDS				
Task 4.0	**Standards, Protocols and**		G	9/10/2009			27%	27%		$26,721		$12,052	
Subtask 4.1	Plan of Design		G	9/10/2009			27%	27%					
Task 5.0	**Clarification Systems**		G	9/10/2009			26%	16%		$59,327		$12,947	
Subtask 5.1	Geothermal Resource Clarification		G	9/10/2009			10%	16%					
Subtask 5.2	Financial Risk Clarification System		G	9/10/2009			10%	6%					
Task 6.0	**Management Plan**		G	9/10/2009			27%	45%		$17,516		$7,415	
Subtask 6.1	Development and Tracking of a Project		G	9/10/2009			27%	45%					
Task 7.0	**Sustainability Plan**		G	9/10/2009			27%	46%		$17,529		$7,035	
Subtask 7.1	Design of a Sustainability Plan		G	9/10/2009			27%	46%					
Task 8.0	**Data Acquisition Plan.** ARRA Milestone: Complete draft acquisition plan	A - ARRA Milestone	G	9/10/2009	12/31/2009		27%	35%	Complete draft acquisition plan	$166,577		$45,715	
Task 10.0	**Data Acquisition by Source or**		G	9/10/2009			27%	27%		$458,162		$101,000	
Subtasks 10.1 to 10.3	Data Acquisition by Source or Type of Data		G	9/10/2009			27%	27%					
Task 11.0	**Community Interaction and**		G	9/10/2009			50%	58%		$26,846		$15,423	
Subtask 11.1	Industry Workshops		G	9/10/2009			50%	58%					
Subtask 11.2	Booths and Workshops At Professional		G	9/10/2009			50%	58%					

QuarterlySumRpt | B - Financial Data | B1 - Financial Data - Lab | Financial Instruct. & Defs

FY10-14 Monthly Spend Plan

Project Title:	National Geothermal Data System
Awardee:	Boise State University
Award #:	09EE0001120
Total DOE Obligation:	$4,992,089
Recipient Cost Share:	
Total Project Cost:	$4,992,089

Plan numbers should not be updated retroactively.
Plan numbers for future months may be updated.

	DOE			COST SHARE		VARIANCE	
	Phase	Plan	Actual	Plan	Actual	DOE	Cost Share
Sep-10	1	$0	$2,420				
Oct-09	1	$100,362	$18,031			$82,332	$0
Nov-09	1	$100,362	$30,925			$69,438	$0
Dec-09	1	$100,362	$34,866			$65,495	$0
Jan-10	1	$100,362	$14,201			$86,161	$0
Feb-10	1	$100,362	$36,056			$64,306	$0
Mar-10	1	$100,362	$214,428			-$114,066	$0
Apr-10	1	$100,362				$100,362	$0
May-10	1	$100,362				$100,362	$0
Jun-10	1	$100,362				$100,362	$0
Jul-10	1	$93,696				$93,696	$0
Aug-10	1	$93,696				$93,696	$0
Sep-10	1	$93,696				$93,696	$0
Oct-10	2	$85,795				$85,795	$0
Nov-10	2	$85,795				$85,795	$0
Dec-10	2	$85,795				$85,795	$0
Jan-11	2	$85,795				$85,795	$0
Feb-11	2	$85,795				$85,795	$0
Mar-11	2	$85,795				$85,795	$0
Apr-11	2	$85,795				$85,795	$0
May-11	2	$85,795				$85,795	$0
Jun-11	2	$85,795				$85,795	$0
Jul-11	2	$85,795				$85,795	$0
Aug-11	2	$85,795				$85,795	$0

To Date (cell K31) and Estimated Future Spending (N31) must equal the total for the Current Approve

(excludes National Laboratory Spending)

	Funds Expended to Date			Estimated Future Spend Plan			DOE EFSP
	DOE Amount	Cost Share	Total	DOE Amount	Cost Share	Total	By Fiscal Year
	2,420		2,420	2,420		2,420	
	141,299		141,299	141,299		141,299	
	212,814		212,814	212,814		212,814	
			0	423,907		423,907	
			0	423,907		423,907	$ 1,201,926
			0	257,384		257,384	
			0	257,384		257,384	
			0	257,384		257,384	
			0	257,384		257,384	$ 1,029,534
			0	260,569		260,569	
			0	260,569		260,569	
			0	260,569		260,569	
			0	260,569		260,569	$ 1,042,276
			0	243,662		243,662	
			0	243,662		243,662	
			0	243,662		243,662	
			0	243,662		243,662	$ 974,649
			0	243,662		243,662	
			0	243,662		243,662	
			0	253,958		253,958	
			0	0		0	$ 741,283
Totals	$ 2,569,253	$ 356,533	$ -	$ 356,533	$ 4,992,088	$ -	$ 4,992,088	$ 4,248,385

FY11 - Qtr 4	7/1/2011	9/30/2011			0	
FY12 - Qtr 1	10/1/2011	12/31/2011			0	
FY12 - Qtr 2	1/1/2012	3/31/2012			0	
FY12 - Qtr 3	4/1/2012	6/30/2012			0	
FY12 - Qtr 4	7/1/2012	9/30/2012			0	
FY13 - Qtr 1	10/1/2012	12/31/2012			0	
FY13 - Qtr 2	1/1/2013	3/31/2013			0	
FY13 - Qtr 3	4/1/2013	6/30/2013			0	
FY13 - Qtr 4	7/1/2013	9/30/2013			0	
FY14 - Qtr 1	10/1/2013	12/31/2013			0	
FY14 - Qtr 2	1/1/2014	3/31/2014			0	
FY14 - Qtr 3	4/1/2014	6/30/2014			0	
FY14 - Qtr 4	7/1/2014	9/30/2014			0	

Project Management/Coordination

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Schedule

	Project Management by Task *NGDS Data Acquisition and Access*	Phase 1				Phase 2				Phase 3			
		1	2	3	4	1	2	3	4	1	2	3	4
P = Phase; Q=Quarter	Calendar Year	2010				2011				2012			
November 19, 2009	Federal Fiscal Year	FY10				FY11				FY12			
Data Acquisition													
1.0	**Data model extension and development**												
	Conceptual Design & Data Model (P1); Prototype, Testing & Modification (P2-P3)	X	X	X	X	X	X	X	X	X	X	X	X
2.0	**Data acquisition plan, policies and procedures**												
	Development & testing (P1) and modification (P2, 3)	X	X	X	X	X	X	X	X	X	X	X	X
3.0	**Data Acquistion Prioritzation, Acquistion & Review**					X	X	X	X	X	X	X	X
4.0	**Legacy data acquisition**												
	4.1 Acquisition and short-term storage	X	X	X	X	X	X	X	X	X	X	X	X
	4.2 Digitization of nondigital data & input to database					X	X	X	X	X	X	X	X
Data Maintenance, Upgrades, and System Sustainability													
5.0	**Maintenance, Upgrade & Sustainability of the Data System**												
	Design (P I, 2) and Implementation of Procedures (P3)	X	X	X	X	X	X	X	X	X	X	X	X
ORGANIZATIONAL / MANAGERIAL													
6.0	**NGDS Sustainability Plan**												
	Development (P I & 2), Implementation & Modification (P3Q3-Q4)	X	X	X	X	X	X	X	X	X	X	X	X
REPORTING													
7.0	**Project Management and Reporting**	X	X	X	X	X	X	X	X	X	X	X	X

Phases as defilned in the FOA:

Phase 1 - Data Retrieval, Collection, Development, and Quality Analysis

Phase 2 - Transfer and Validation of Information to Data System

Phase 3 - - Execution of Data Maintenance Sustainability Plan

Future Directions

What is being worked on now and for the rest of FY10

- Develop and deploy the **NGDS Digital Library and Catalog** for documents and datasets.
- Develop mechanisms for **web-based submission** and attribution of digital **documents** and **datasets** into the Digital Library and Data Catalog
- Develop a **plan for data acquisition and sharing**, including the approach to web services
- Deploy the **beta version of the NGDS Geothermal Desktop**
- Develop a plan for setting, adopting and adapting to various **standards and protocols** for web services, metadata, data sharing, data acquisition, etc.
- Work with the US Geological Survey and others to implement within the NGDS the **Geothermal Resource Classification System** and tools for **Financial Risk Analysis and Classification**

Summary

- ***Data Acquisition Projects*** **-** NGDS working with data sources currently involved in NGDS data acquisition projects:
  - State Geological Surveys (M. Lee Allison, Arizona Geological Survey)
  - Heat Flow Database Expansion for NGDS (SMU, Blackwell)
  - US Geological Survey (Colin Williams)
- ***DOE-funded demonstration projects*** **-** NGDS-core must work with each project, initially on a one-on-one basis to determine data types they will be producing and mechanisms to best acquire those data; process has started.
  - User-based data input essential to keep up with new data generated from DOE-funded projects - this is what the Geothermal Desktop
- ***Other legacy data*** – much legacy data still needs to be found and acquired; need to identify and determine how such data may be acquired

END