

Award Number  
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**WYOMING STATE GEOLOGICAL SURVEY'S  
GEOLOGICAL and GEOPHYSICAL  
DATA INVENTORY PROJECT**

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## **Abstract**

The Wyoming State Geological Survey (WSGS) cooperated with the USGS to meet goals described by the National Geological and Geophysical Data Preservation Program (NGGDPP) by preserving and documenting the WSGS's collection of geological and geophysical data and samples. The majority of the funding from award number 08HQGR0110 was used to hire a graduate student familiar with archiving tasks. This student aided WSGS staff in the geological and geophysical data inventory project. Long range data preservation planning for the WSGS was established. A total of six collections varying in size, format, and condition were identified and inventoried. The WSGS has a wide range of geologic data and a diverse material collection that benefits geologists, industry, residents, academics, and students interested in the geology and geologic resources of Wyoming.

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## **Background**

The Wyoming State Geological Survey (WSGS) is continuing to accelerate its transition from a traditional, reactive state agency to a modern, dynamic, and applied organization. The WSGS provides the best science possible to ensure the responsible development of mineral and energy resources, promote economic prosperity, and to protect state resources. While working to increase public awareness of its contributions, the WSGS endeavors to provide the most accurate, up-to-date information on geologic hazards, natural resource, energy issues, water issues, and other geology-related topics so that interested parties can make informed decisions about issues that affect them. The WSGS also supplies the geologic knowledge necessary for the beneficial and responsible development of Wyoming's unconventional energy resources, including shale gas, bypassed underpressured natural gas, deep gas (more than 15,000 feet below ground), in-situ coal gasification, uranium, and liquid syngas from oil shale and coal.

## **Project Introduction**

Organizing, preserving, and documenting the Wyoming State Geological Survey's geologic material collections will provide efficient accessibility to over 75 years of the WSGS's geologic research. The WSGS's most accessed data is any and all material relevant to energy exploration and development. The Wyoming natural resource portfolio includes coal, oil and gas, uranium, and unconventional energy sources such as oil shale. The WSGS has geologic materials pertaining to all of the state's energy resources, and it is constantly accessed by geologists, consultants, exploration geologists, petroleum geologists, engineers, planners, educators, various local, state, and federal entities, universities. WSGS material collections are accessed by local individuals interested in the resources of their own backyards, and by individuals throughout this Nation and world. Wyoming has a diverse geologic profile that extends beyond energy resources. The WSGS data collections are also used by paleontologists, mineralogists, prospectors, hydrologists, civil engineers, vulcanologists, and surficial processes specialists. The WSGS geologic materials collection is accessed by parties of multiple interests on a regular, if not daily basis.

## **Project Overview**

This project focused on developing a long range data preservation plan for preserving, documenting, acquiring, and accessing all of the WSGS collections and for achieving the goals of the National Geological and

Geophysical Data Preservation Program (NGGDPP). The WSGS has a wide range of geologic data and diverse material collections that have gradually accumulated since the Wyoming State Geological Survey's inception in 1933. The following six collections were inventoried; (1) maps, (2) hand samples, (3) thin sections and polished sections, (4) aerial photography, (5) paleontological samples, and (6) fluid samples. The majority of WSGS collection materials and data have yet to be inventoried. All of the collections are randomly organized and are only easily accessible by those geologists that are familiar with their contents and whereabouts. The WSGS is improving the organization and accessibility of the collections in cooperation with the NGGDPP.

The first types of materials targeted for inventory included samples from prospects, maps, fossils, mineral samples, coal samples, petroleum samples, reports of investigations, and aerial photographs. It was decided to inventory the reports of investigations when the paper reports and unpublished materials are inventoried, preserved, organized, and documented

### **Project Staff**

Four full time employees with over 30 years of combined service at the WSGS participated in this project. David Lucke is the principal investigator. As a full time employee at the WSGS, David is the GIS and IT Manager. His knowledge of database management and metadata served as a guide. Fred McLaughlin is an investigator. He is a full time employee at the WSGS and is the Manager of Regional Geology, Mineral, and Water Resources. Fred is familiar with the majority of collections and how to access them for customers. His knowledge of geology was relied on when determining what materials have the most urgent need for archiving and improved access. Phyllis Ranz is an investigator. As a full time employee at the WSGS, Phyllis is a GIS specialist. Her knowledge of GIS and data formats provided assistance in the electronic file aspects of the project.

Principal Investigator, David Lucke, and, Fred McLaughlin, Staff Geologist and Investigator, called upon a fourth full time employee, Joan Binder, Executive Assistant, to assist them in creating a long range preservation plan. Joan has a Masters of Library Science and over 25 years of library and archival experience. In addition to her main responsibilities as the Assistant to the Director/State Geologist, Joan has been working with the Wyoming State Archives in relationship to the retention and preserving of the indirect and derived geoscience data types within the Wyoming State Geological Survey. Joan is familiar with the State Survey's legal framework

for the acquisition, documentation, preservation, and access to its geological and geophysical collections (i.e., Wyoming Statute 9-2-804 Geological Survey duties; disposition of materials and specimens collected; Wyoming Statute 36-6-102 Submission, custody, & confidentiality of coal, uranium or other mineral exploration subsurface log reports; and, Wyoming State Archives retention schedules, records management manual, and preservation guidelines).

The funds from the USGS Assistance Award (number 08HGR0110) allowed the WSGS to hire a graduate student who has a background and experience in archives. Her time was spent on organizing and assessing the derived and indirect geoscience data types.

Additional staff members that contributed to the project are identified as follows. The WSGS employs one part time student that dedicates his entire time to the preservation, access, and documentation of fossils. A second WSGS contract employee dedicates her entire time to the electronic aspect of all of the collections, working closely with a full time employee Phyllis Ranz. However, the acquisition, preservation, documentation, and access are mainly the responsibilities of the WSGS geologists and scientists in addition to their main duties.

### **Accomplished Project Goals**

The Wyoming State Geological Survey has completed the following goals during the 2008-2009 Geological and Geophysical Data Inventory project:

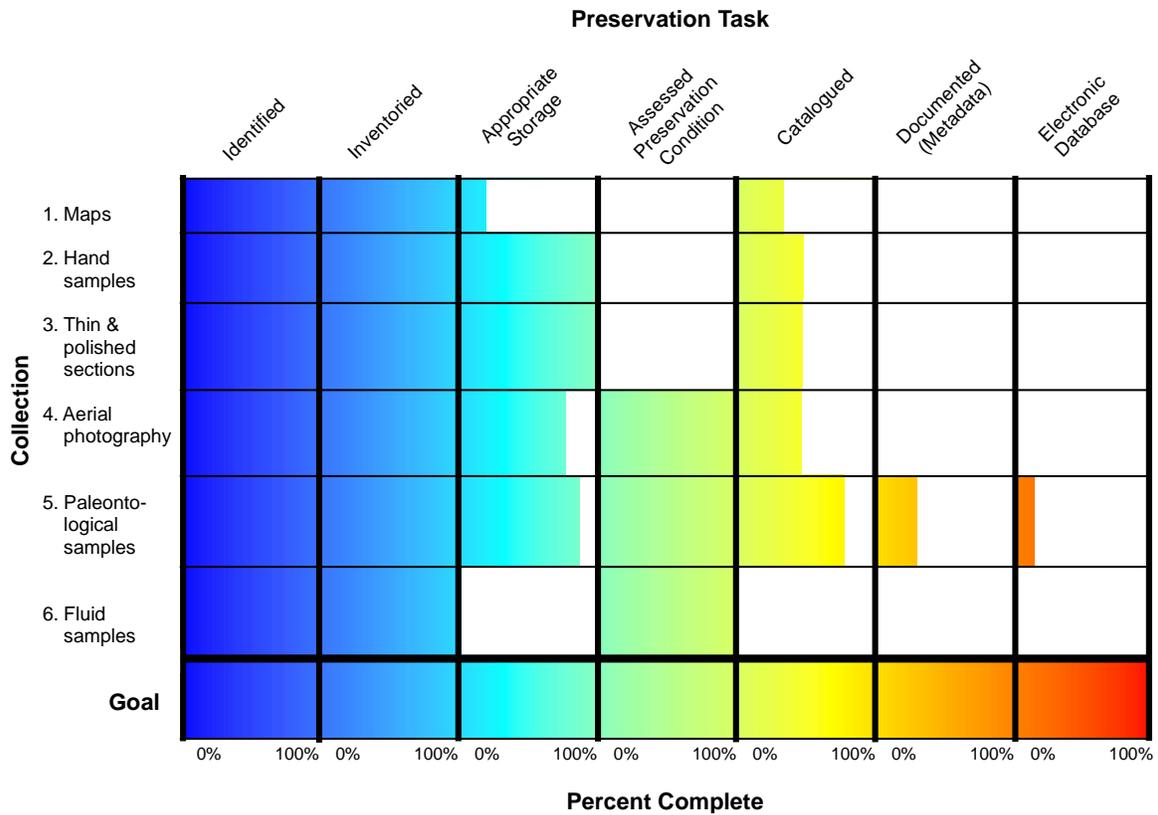
- Established a committee to oversee the procedures and protocols for the Wyoming State Geological Survey that are consistent with the national standards and allow users to quickly determine what is accessible and where it is located
- Established protocols to evaluate what geological materials are kept, assimilated, or discarded and ensuring samples and data continue to be useful and reliable
- Established which paper records and data to convert to digital formats for preservation and access
- Established maintenance of digital data in contemporary formats and on permanent media
- Established how to update digital data to new formats to maintain accessibility as older digital storage technology becomes obsolete and newer technology becomes available

- Established the priorities for preserving, providing accessibility, and documenting needs for the collections with measurable milestones and clear results
- Established a strategy to accomplish the proposed goals within the legal requirements
- Established a long-term commitment to achieve these goals (i.e., Digital Camera, Color copier/Scanner, 12 Fossil cabinets with trays)
- Established the user community
- Completed the online inventory form at [http://geology.usgs.gov/datapreservation/state\\_survey.htm](http://geology.usgs.gov/datapreservation/state_survey.htm)

### **Project Results**

The initial inventory indicated that there is no predictable way to know how the majority of collections will increase.

*Figure 1* displays the preservation task progress for the 6 inventoried collections. The inventory revealed that 4 out of the 6 collections need secure, safer, and appropriate storage. Three out of the 6 collections have been appropriately assessed for the general condition. The majority of the remaining collections that were not inventoried are of the derived and indirect geoscience data types which have not been preserved appropriately. The paleontological samples collection is the only collection with documentation (only 30 % documented using three identifiers). All other collections will still need to be documented. The Paleontological samples collection is the only collection accessible through an electronic database (only 10% accessible). The rest of the collections will need to be made accessible through an electronic database.



**Figure 1.** Progress of preservation tasks completed.

### **Future Needs and Challenges**

With all of the collections at the WSGS, the major challenge will be carrying out the long range preservation plan which entails not only the acquisition of new items and collections, but also the documentation, preservation, and access for all items and collections.

The most pressing collections need is to appropriately preserve and appropriately document the collections so that they can be made available in an electronic database via the Web.

### **Project Conclusions**

The WSGS has identified all of its collections and has outlined the process of inventorying, documenting, providing better access, and preserving the collections on a yearly basis. As the inventorying progresses, the WSGS will be better able to determine if the facilities housing the collections are appropriate and adequate; and, if the collections are appropriately stored. Staffing levels are not appropriate. Collections are not appropriately preserved or documented in an electronic database. The

collections are accessible to outside users only with the assistance of WSGS employees and inquiry remains the only the means of accessing them. Accessibility will increase once the collections are documented and made available in an electronic database via the Web. The long range preservation plan allows the WSGS to have appropriate control of the collections.

The entire process of inventorying, documenting, providing better access, and preserving the collections is estimated to take between 10 to 15 years to complete. This does not include future donations and new items for the identified collections. The data is irreplaceable and critical not only to Wyoming, but also the Nation. The collections represent a geologic treasure for future generations and will certainly provide future economic, social, environmental, and geologic benefits.