

**Final Technical Report for FY2008
National Geological and Geophysical Data Preservation Program**

**Prepared for:
The US Geological Survey**

**Prepared by:
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Abstract

The New Hampshire Geological Survey (NHGS) completed the on-line state survey, entered four relevant collections into the USGS Inventory of Geologic and Geophysical Collections, and developed a long-range data preservation plan in compliance with requirements of the National Geological and Geophysical Data Preservation Program FY 2008. Submission of this final technical report fulfills the grant reporting requirements.

For NNGDPP FY 2008, NHGS was awarded \$6,347 from USGS for 1) conducting a collection level inventory, 2) creating a data-preservation long-range plan and 3) completing the on-line state survey. Priorities outlined in the 2008 National Geological and Geophysical Data Preservation Program Announcement No. 08HQPA0015 were adjusted by the NNGDPP Review Panel because NHGS did not receive FY 2007 funding. Therefore, the review panel advised that the NHGS focus on collection-level inventories, the on-line state survey and the long-range data-preservation plan. In addition, NHGS was not required to create metadata until FY 2009. Metadata goals and priorities are outlined in the NHGS Long-Range Data-Preservation Plan.

Four collections were entered into the on-line inventory in FY 2008, including the University of New Hampshire's (UNH) 63 highway maps (used in the creation of the 1997 Lyons' New Bedrock Geologic Map of New Hampshire) and 170 geologic bulletins and mineral resource surveys. Preservation of the highway map collection includes digital conversion and metadata creation in FY 2009. Another significant collection that NHGS inventoried is the approximately 115,000 well completion reports in the New Hampshire Water Well Inventory Database. This collection will be the focus of an individual-level inventory in FY 2009. Additionally, NHGS completed a collection-level inventory on one physical collection, 195 well cuttings and associated well logs and field notes, from recently drilled bedrock monitoring wells. NHGS assessed the condition of these collections and entered the data into the on-line survey.

During FY2008, NHGS focused heavily on making contacts for data acquisitions, as well as acquiring diverse, applicable collections from these sources. We are confident our collections will have numerous applications, and will be accessed and used by a wide variety of professionals in the scientific community, as well as by interested laypeople. In the coming years, our collection will be made fully accessible to the public through the NHGS website for digital materials.

NHGS developed a Long-Range Data-Preservation Plan during NNGDPP FY 2008 through consensus of key members of the NHGS Data Preservation Program. This plan includes goals for inventory and preservation of physical collections and ancillary geoscience data, and the creation of digital infrastructure. The plan includes the formation of a New Hampshire Data Preservation Advisory Committee (DPAC) to provide guidance and assistance with long term goals, program development, and collection acquisition. Goals which were set by NHGS for NNGDPP FY 2008 were met. However, the NHGS Long-Range Data-Preservation Plan includes future goals such as: (1) continuous entering of new collections into the USGS Inventory of Geologic and Geophysical Collections, (2) generating metadata for current collections for upload to the NDC, (3) converting paper records (such as well completion reports) to digital format beginning with the New Hampshire Seacoast Region (4) updating of the DES website to reflect items entered into the USGS NDC, (5) Securing safe, appropriate, accessible long-term storage for collections and (6) outreach for access to NHGS' physical, and derived and indirect geoscience data collections.

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1.0 Introduction

The New Hampshire Geological Survey (NHGS) has completed requirements set by the National Geological and Geophysical Data Preservation Program (NGGDPP) for FY2008. The primary priorities of this grant period were to perform collection-level inventories, complete the state online survey, and develop a long-range data preservation plan for future data preservation efforts. This Final Technical report describes FY 2008 project details and includes NHGS objectives for the FY 2009 grant period.

2.0 Project Summary

NHGS recently completed its inaugural NGGDPP FY 2008 grant year. Three tasks were proposed for the NGGDPP FY 2008 Grant. However, as suggested by the NGGDPP review panel, two general efforts were accomplished under that grant and funding for FY 2008 in the amount of \$6,347 was used for: (1) conducting a collection-level inventory for available geologic and geophysical data, and (2) preparation of a long-range data-preservation plan. In addition, NHGS completed the on-line state survey. In fulfillment of the grant requirements, this final technical report will be submitted to the USGS by November 30, 2009.

Four collections were inventoried in FY 2008 (1) University of New Hampshire's (UNH) 63 highway maps that were used in the creation of the Lyons' New Bedrock Geologic Map of New Hampshire (1997), (2) 170 paper reports, including geologic bulletins and mineral resource surveys, (3) well completion reports in the New Hampshire Water Well Inventory Database and (4) 195 well cuttings and associated well logs and field notes from recently drilled bedrock monitoring wells.

UNH relinquished many geoscience data collections (including the Highway Map Collection) to the NHGS because university renovations required the items be moved. NHGS has started assessing the condition and performing a collection-level inventory on the geologic records and samples that UNH. The Highway Map Collection was assessed and inventoried at the collection

level for FY 2008. The UNH Highway Maps Preservation of this collection including digital conversion and metadata creation is currently underway and will conclude by the end of FY 2009. Accompanying the Highway Map Collection were numerous linen-backed quadrangle maps, original 1909 New Hampshire soils maps, pegmatite maps showing mica and feldspar deposits, mining plans, and field notes. The latter collections will be reviewed to ensure that they contain comprehensive data and are applicable to our program; if usable, they will be entered into the on-line survey in future grant years. Inventory and metadata creation of individual items will occur as part of the NHGS long-term preservation efforts. When possible, original paper materials will be scanned and archived in a digital database, which will eventually be web accessible.

Another significant collection that NHGS inventoried includes above mentioned well completion reports. NHGS is the data steward for well completion reports (which are submitted by drillers) and the associated New Hampshire Water Well Inventory Database. When reports are received, NHGS enters the data into the database. The paper reports are then given a unique reference number based on the town, and then stored in filing cabinets (Photo 1). The well reports provide critical information, such as depth to bedrock, static water level, and type and thickness of overburden, which support a wide variety of uses. This data provides direct benefits to homeowners, real estate agents, drillers, consultants, and state and federal agencies. Ultimately, the data support a range of water resources and infrastructure planning activities and the development of public policy. NHGS anticipates receiving additional requests for the geologic data listed above if the data were more readily available. Work for future grant years involves creating a web accessible database that links a well location on an orthophotograph with the well data and a digital scan of the well completion report.

NHGS also inventoried 170 historic geologic reports stored at NHGS, many of which are out of print and do not exist in any other form. These documents are often requested by students and researchers because of the exceptional nature of the data they contain (e.g. geochemical analysis of rocks).

Additionally, NHGS completed a collection-level inventory on one physical collection, 195 well cuttings from a bedrock well drilling project. These well cuttings are accompanied by detailed well logs and field notes. The well cuttings are currently stored in sealed plastic bags (Photo 2). NHGS assessed this condition of this collection and entered the collection-level metadata into the on-line survey. Metadata will be created at the individual-level for FY 2009. NHGS will conduct a collection-level inventory on the NHGS core collection for FY 2009. The NHGS core collection as stored at an off-site storage location on private property (Photo 3) in core boxes (Photo 4). The core will be preserved and inventoried at an individual level in future grant years.

During FY 2008, NHGS also focused heavily on establishing contacts for data acquisitions, as well as acquiring diverse, relevant collections from these sources for future collection inventories. A few examples of collections acquired during this grant year include data compiled by the first State Geologist of New Hampshire (Charles T. Jackson), approximately 100 maps relating to strategic mineral data in New Hampshire, 60 Sand and Gravel Maps of New Hampshire from the 1960's and dozens of reports and associated maps pertaining to mines and mineralogy in New Hampshire.



Photo 1. Well Completion Reports.



Photo 2. Representative Well Cuttings.

Our physical collection inventory includes 195 well cuttings from 9 recently drilled bedrock monitoring wells, accompanied by detailed field notes (See photo 2), and a 4,700-foot core collection located in a barn located in Weare, New Hampshire (Photos 3 and 4).



Photo 3. Off-site Core Storage Location



Photo 4. Over 4,700 feet of samples (95% labeled)

3.0 Background and Purpose

The New Hampshire Geological Survey (NHGS) was statutorily established in 2001 as a bureau of the New Hampshire Department of Environmental Services (NHDES). Prior to the inception of the Survey, the State's need for geological information was served by the Office of the State Geologist and intermittent support staff. During this time, the State Geologist was stationed at various locations and institutions, including universities and other state agencies. As a result, geologic data, reports, and physical samples and cores are scattered among these institutions. NHGS has been working towards becoming the central repository for geological and geophysical data in New Hampshire by participating in the National Geological and Geophysical Data Preservation Program (NGGDPP) for the past two years.

Accomplishing this objective is justified for many reasons. The scientific information NHGS' provides is recognized as critically important for technical assistance to other state and federal agencies, and for the private sector and the general public. With renewed interest in mineral

resources and alternative energy sources (such as geothermal energy), as well as continued pressure on water resources from population growth, NHGS has emerged as an important source of scientific information and data. Archived data is crucial in current projects of the survey, including STATEMAP bedrock and surficial geologic mapping and funded geomorphic and hydrologic studies. NHGS often provides information to state and federal agencies and local municipalities. In addition, the NHGS frequently receives geoscience data requests from private individuals, corporations and industry, students, and educators.

4.0 Long Range Plan

NHGS completed a Long-Range Data Preservation Plan in August 2009 as required by the USGS for NNGDPP FY 2008. The Long-Range Data-Preservation Plan focuses on three critical areas: physical collections, derived and indirect geoscience data, and digital infrastructure. Highlights of the Long-Range Data-Preservation Plan include:

- Continuous populating of the on-line inventory as collections are acquired and logged
- Preserving and inventorying physical collections (cores and well cuttings)
- Converting paper records to digital format
- Creating metadata for collections once they have been cataloged and preserved
- Submitting metadata to the National Digital Catalog (NDC)
- Contacting other agencies to locate geological and geophysical data for preservation
- Securing a permanent, suitable building for our ever-expanding paper collection
- Making digital collections available to the public through our website
- Creating a data preservation advisory committee

The plan includes the formation of a New Hampshire Data Preservation Advisory Committee (DPAC) to provide guidance and assistance with long term goals, program development, and collection acquisition. Formation of the DPAC was initiated at the September and October 2009 meetings of the New Hampshire Geologic Advisory Committee (GRAC) meeting. The GRAC serves as the advisory committee for the New Hampshire Geologic Mapping Program. Members of the GRAC include representatives from:

- Department of Transportation (DOT)
- Environmental Protection Agency (EPA)
- Lakes Region Planning Commission
- Department of Resources and Economic Development (DRED) – Division of Forests and Lands
- Society for the Protection of New Hampshire Forests
- New Hampshire Association of Conservation Commissions
- Center for Science Education
- Department of Environmental Services (DES) – Coastal Program
- Private consulting firms
- Professors from UNH and Dartmouth College.

NHGS proposed that the DPAC exist as a subcommittee of the GRAC. The subcommittee will consist of members who have experience and vested interest in geological and geophysical data preservation in New Hampshire. The GRAC approved this request and plans to discuss formation of DPAC at future GRAC meetings. Several GRAC members expressed keen interest in participating in the data preservation advisory committee. Once formed, DPAC will review the Long-Range Data-Preservation Plan and provide guidance on further plan development and implementation.

5.0 Progress

NHGS has been assessing and inventorying geological and geophysical geoscience data acquisitions according to relevance and importance to the NHGS Data Preservation Program. Due to the hundreds of items we have received thus far, staff is working diligently to log and research collections before entering them into the NDC. During the FY 2008 grant period, four collections were entered into the Inventory of Geologic and Geophysical Collections (Table1).

Table 1.

Collection ID#	Collection Name	Total Number in Collection
P1509	Paper Collection NHGS	170
P1517	Highway Maps	63
P1538	Rock Cuttings	195
P1611	Well Completion Reports	115,000

Best Management Practices (BMPs) for the Data Preservation Program have been implemented and are listed below. Each step in this process is clearly delineated in a manual available to staff members. NHGS staff has found this system to be the most efficient, consistent, systematic way to keep track of our acquisitions and to manage the steady influx of information.

Data Preservation Collection BMPs

- A) Acquisition – includes accurately filled out relinquishing of collection sheet
- B) Logging Collections
- C) Research
- D) USGS On-line Inventory
- E) Preservation
- F) Metadata
- G) DES website update
- H) Long-term storage
- I) Access to collection
- J) Public outreach

NHGS staff attended the Geoscience Data Preservation Techniques Workshop hosted by the Indiana Geological Survey at Indiana University, and co-sponsored by the American Association of State Geologists (AASG) and the USGS, in July 2009. Critical information and preservation techniques acquired at this workshop helped NHGS data preservation program development and improved current data preservation practices. Following the Data Preservation Techniques workshop, we have amended our previous method for cataloging collections, and are working toward somewhat more descriptive, less wide-ranging entries.

All NGGDPP FY2008 reporting requirements outlined by USGS were met. As required by the USGS, the individual State Survey was completed in a timely manner. The Long-Range Data Preservation Plan was completed on time, as well as this FY 2008 Final Technical Report.

6.0 Goals

Goals which were set by NHGS for FY 2008 were met. We are aware that goals accomplished during this fiscal year are ongoing, such as acquisition of new collections, therefore NHGS objectives for the future include: (1) continuous entering of new collections into the USGS

Inventory of Geologic and Geophysical Collections, (2) converting paper records (such as well completion reports) to digital formats (3) generating metadata for current collections for upload to the NDC (3) updating of the DES website to reflect items entered into the USGS NDC, (4) Securing safe, appropriate, accessible long-term storage for collections and (5) outreach for access to NHGS' physical, and direct and indirect data collections.

NHGS will the focus on preserving geoscience data in the Seacoast Region of New Hampshire This region is one of the most stressed areas of ground-water use in the state due to population growth and land development and its proximity to the ocean. In addition, some Seacoast Region ground water has naturally occurring arsenic contamination. In some areas, one-third of all private wells exceed the 10 microgram EPA MCL for arsenic. This focus on the Seacoast Region was supported by the NNGDPP review panel in FY 2009.

7.0 Conclusion

Requirements set by USGS for NHGS FY 2008 Data Preservation Grant were fulfilled. The NHGS currently has thousands of individual items entered as 4 separate collections in the USGS Inventory of Geologic and Geophysical Collections. As we move forward with our data preservation efforts, we will focus on creating metadata and digital infrastructure for these collections at an individual-level.

During FY 2009 and beyond, NHGS will continue to acquire new collections, add them to the USGS on-line inventory, and ultimately include them in the NDC. We will discern how many viable collections (i.e. applicable, not yet preserved collections, containing accurate metadata) we hold once they have been properly categorized and researched. NHGS staff will work with our GRAC partners to secure future collections for the state of New Hampshire and move forward with preserving these and other collections for New Hampshire's scientific community.

References

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