National Geological and Geophysical Data Preservation Program
Fiscal Year 2008

Final Technical Report
for
U.S. Department of the Interior
U.S. Geological Survey Grant 08HQGR0106-2008-0007:
Budget period: 08/15/2008 through 07/31/2009

Gregory A. Schumacher-Principal investigator
Ohio Department of Natural Resources-Division of Geological Survey
Horace R. Collins Laboratory
3307 South Old State Rd.
Delaware, OH 43015
740-548-7348 ext. 25
740-657-1979 (FAX)
greg.schumacher@dnr.state.oh.us

Submitted
October 30, 2009

Abstract

The Energy Policy Act of 2005 mandates the U.S. Geological Survey to implement a National Geologic and Geophysical Data Preservation Program to inventory, archive, and preserve geologic and geophysical data collected over the past 150 years. With financial assistance from U.S. Geological Survey (USGS) Grant 08HQGR0106 proposal 0007, Ohio Department of Natural Resources, Division of Geological Survey recently completed comprehensive inventories for eight major collections currently housed at the H. R. Collins Laboratory (HRCL). These collections include: 1) USGS and U.S. Department of Agriculture aerial photographs flown from 1949 to 1974, 2) Cenozoic-age sediment samples, 3) seismogram tracings recording earthquake events, 4) lithology strip logs, 5) geochemical analysis records for economic carbonate deposits and coal beds, 6) thin sections, 7) side wall core and core plugs, and 8) oil samples from Ohio's producing horizons. Extensive inventories were completed for each collection and entered into ACCESS databases. Collection Metadata and ACCESS databases will be forwarded to the U.S. Geological Survey for inclusion into the National Catalog.

Also in 2008 and 2009, the Ohio Division of Geological Survey (ODGS) extensively revised the web page for the HRCL to better serve the public, developed a preservation plan for the collections housed at the HRCL, and formed an advisory committee to assist with future planning and development of grant proposals. Two ODGS staff members attended the Geoscience Data Preservation Techniques Workshop held July 14 and 15, 2009 in Bloomington, Indiana.

Introduction

In the mid 1980's, the ODNR, Division of Geological Survey began work to integrate all paper inventories and records from physical sample, derived geoscience collections, and indirect geoscience collections into a digital catalog of databases and user friendly web-based maps. From June of 2005, a major effort has been underway to inventory and develop ACCESS databases for the 15 major geoscience collections housed at the HRCL. Cooperative efforts with the U.S. Geological Survey and funding provided by U.S. Geological Survey Grant 07HQGR0145, proposal 0024 (2007) and Grant 08HQGR0106-0007 (2008) have assisted the ODGS in completing inventories and ACCESS databases for 11 of the 15 collections. The U.S. Geological Survey Grant G09AP00094-0006 (2009) provides funds to assist the ODGS in completing inventories for the four, yet to be, inventoried collections (Table 1).

This report will focus on the inventories, ACCESS databases, and Metadata completed from August 15, 2008 through July 31, 2009 as part of U.S. Geological Survey Grant 08HQGR0106-0007. In addition, we will provide updates concerning: 1) revision of the HRCL webpage, 2) development of a preservation plan to maintain and preserve the HRCL geoscience collections, 3) formation of an HRCL advisory committee, and 4) ODGS staff attend Geoscience Data Preservation Techniques Workshop.

Goals Accomplished

Introduction

The Ohio Division of Geological Survey completed comprehensive inventories, ACCESS databases, and Metadata for the eight collections outlined in Table one. A total of 75,712 records were entered into eight ACCESS databases. The ACCESS databases have been reviewed and edited to ensure that reliable information was entered. Copies of the databases and Metadata are provided to the U. S. Geological Survey to be incorporated into the National Catalog.

Collection overview

The USGS and U.S. Department of Agriculture (USDA) aerial photographs flown from 1949 to 1974 are the largest collection inventoried as part of the work for Grant 08HQGR0106-0007 (Table 1). The collection consists of two sets of air photos that have statewide coverage. The USGS air photo set, flown from 1954 to 1963, is organized by 15-minute topographic quadrangle. The USDA air photo set, flown from 1949 to 1974, is organized on a county by county basis.

Samples of unconsolidated Cenozoic-age sediments were collected from 22 of Ohio's 88 counties. The bulk of the collection is till samples collected for texture analysis. The remainder of the collection consists of sand and gravel, Pleistocene wood, and lake clay samples.

Paper seismic tracings of worldwide earthquakes were recorded by the John Carroll University Seismic Observatory, Cleveland Ohio from 1909 to 1992. Each daily drum-recorder record measures 30 cm by 102 cm. A total of 6,205 tracings of the estimated 40,000 seismic tracings record earthquake events.

Nearly 3,500 paper strip logs produced by many geologists record their interpretations of the lithology, fossils, and other geologic information from many cores, oil and gas samples, and measured sections. A single strip log measures 9 cm by 35 cm that are often joined together to form long strip logs.

Records of the geochemical analyses on file at the HRCL provide users with the chemical analysis file number, location information, rock type or coal seam, stratigraphic information, thickness data, property owner, and general information. Chemical composition and engineering property data is available for carbonate samples.

The records for the thin section, side wall, and core plug collections provide users with American Petroleum Institute Number, ODGS core or sample number, location data, lease and well number, stratigraphic information, and core interval of the thin section, side wall, or core plug.

The majority of the oil sample collection was collected from selected Ohio oil and gas producing horizons by students of the Ohio State University from August 1981 to March 1982. A small number of samples have been donated by other companies and individuals. The samples were exposed to open air and subjected to temperature changes during collection, but now the samples are sealed in test tubes or glass jars and refrigerated. The following producing horizons were sampled: Trempeleau, Rose Run, Trenton, Clinton/Newburg, Oriskany, Gordon/Ohio, Berea, and Injun.

Web page update

In September 2009, the ODGS completed a major revision of the Horace R. Collins Laboratory web page (see http://www.ohiodnr.com/OhioGeologicalSurvey/HoraceRCollinsLaboratory/tabid/7943/Default.aspx). The updated web page provides guests with a wealth of new information concerning using the laboratory, scheduling a visit, and reserving the conference room and learning center. Also, links to the Ohio Seismic Network, the Lake Erie Data Center, and the Ohio Department of Natural Resources, Divisions of Watercraft and Parks allow guests to explore these sites. The web page contains a section highlighting the Ohio Geological Sample Repository and the collections housed at the HRCL. In the near future, the ODGS plans to activate links to the eleven collections inventoried as part of USGS Grant 07HQGR0145-0024 and Grant 08HQGR0106-0007.

Preservation plan update

The long-range data-preservation plan of the ODGS is subdivided into six major goals to be accomplished in three major phases (Table 2). The collection inventory and core box preservation phase consists of the completion of comprehensive collection inventories, data base development compatible for the National Catalog of Archived Materials, site-specific metadata, and the replacement of deteriorating and rotting core cardboard boxes.

The collection inventory and core box preservation phase began in July of 2005 and is scheduled for completion by May of 2010. Continued funding provided by U.S. Geological Survey Grant G09AP00094-0006 will allow the ODGS to complete collection inventory phase of the long-term data-preservation plan.

The digitizing phase will utilize the collection inventories to determine which paper records should be scanned and preserved in a digital format. Future grant requests will address the need for continued funding from the USGS to complete this task.

The repository expansion phase consists of conversion of existing ODGS drilling support warehouse into additional collection storage with the addition of new shelving, and purchase of climate control systems to enhance collection preservation through moisture control. The ODGS estimates that the new shelving will provide additional storage space for approximately 25,000 meters of core. Also, the ODGS plans to expand current staffing levels of the HRCL with the addition of one full time geologist to assist with repository operations, geologic research, and public outreach.

Advisory committee

In March 2009, the ODNR hosted the first meeting of the HRCL advisory committee. The committee is comprised of four members representing Ohio's citizens and the public-at-large, the academic community, the geotechnical and engineering geology sectors, and industry (see Table 3). The committee reviewed and provided insight to improve our 2009 Grant proposal: U.S. Geological Survey Grant G09AP00094-0006 and provided guidance for future grant proposals. Other topics

discussed included: HRCL classroom renovation project currently delayed because of severe budget reductions, possible 2009 Federal Stimulus Facility Expansion Plans, and the HRCL Public Awareness Campaign. The committee agreed to reconvene in August 2009.

At the August meeting, the committee was updated on the accomplishments and progress of grants, projects, and activities currently underway at the HRCL, continued work on a planned core workshop for early 2010, and discussed additional sources of funding to help offset reduced funding because of ongoing budget reductions.

Data Preservation Workshop

Joseph Wells, ODGS Geographic Information Systems Database Administrator and Gregory Schumacher, principal investigator attended the Geoscience Data Preservation Techniques Workshop hosted by the Indiana Geological Survey on July 14 and 15, 2009. Mr. Schumacher presented a paper highlighting a core preservation and consolidation project that not only increased available shelf space for core storage, but produced a net saving of nearly $35,000 (Schumacher, 2009). The information learned from workshop participant presentations, field trips, hands-on activities, group discussions, and informal conversations with individual workshop participants answered many questions concerning the National Geological and Geophysical Data Preservation Program and provided valuable ideas and resources to improve future grant proposals and the daily operations of the HRCL. Mr. Wells found the discussion on database and metadata formats very useful and encourages more discussion on these topics in the future.

Goals yet be to Accomplished

Although the ODGS completed the goal of inventorying all eight collections summarized in Table 1, additional work remains to capture the site-specific data for many records in the eight databases. For example, site-specific data for 1,525 of 1,787 (85%) core and oil and gas well strip logs is available in the Ohio Geological Survey Oil and Gas Interactive Web Map and Database. On the other hand, the inventory of the measured section strip logs revealed that only 425 of 1,641 (26%) have site-specific data written on each log. The capture of this missing data is complicated by the fact that the paper ODGS Open-file measured sections were difficult to access because they were being scanned. The scanning was not completed until early June 2009. Also, site-specific data is not available on some Open-file reports, but the location of the measured section has been plotted on 15-minute or 7.5 minute topographic maps on file. During the measured section inventory, we decided to postpone the time consuming process of searching through the paper files for those sections lacking site-specific data and then locating those sections of the appropriate topographic quadrangle. It was decided to postpone this work in order to complete the other seven collection inventories. Unfortunately, we ran out of time before we could complete this important work. However, the ODGS plans to complete the capture of site-specific data for those records lacking this information and then update the collection databases in the future.

Bibliography

Schumacher, G. A., 2009, Core preservation and consolidation project reclaims wasted shelf space, *In* Steinmetz, J. C., Pierce, F. W., Hill, R. T., eds., Proceedings of the 2009 AASG/US Geological Survey Data Preservation Techniques Workshop (July 14-15, Bloomington, Indiana): Indiana Geological Survey Open-file Study 09-13, CD-ROM.

Table 1. Summary of the physical samples or paper records inventoried as part of U.S. Geological Survey Grants 07HQGR0145-0024 and Grant 08HQGR0106-0007. U.S Geological Survey Grant 09HQPA0009-0006, currently underway, will inventory the remaining major collections not inventoried at the H. R. Collins Laboratory

FY 2007 Grant 07HQGR0145-0024

845 rock cores totaling over 300,000 feet
5,000 wells with sample suites and 1,175 wells with duplicate sample suites
600 wells with sample strip logs

FY2008 Grant 08HQGR0106-0007

54,009 USGS and USDA aerial photographs flown from 1950 to 1979
8,650 samples of unconsolidated Cenozoic-age sediment
6,205 seismogram tracings recording earthquake events
3,428 lithology strip logs of cores, oil and gas wells, and measured sections
2,627 geochemical analysis records for economic carbonate deposits and coal beds
353 Thin sections
241 Side wall core or core plugs
199 Oil samples from Ohio's producing horizons

FY2009 Grant 09HQPA0009-0006 (in progress)

250 Lake Erie soft-sediment core and grab samples
80 sand and gravel resource investigations
20 file drawers Lake Erie Data Center of paper records and maps
30 environmental impact statements with point data for boring logs

Table 2. The Ohio Division of Geological Survey Long-Range Data-Preservation Plan

Phase 1: Collection Inventory and core box preservation

Goal 1- Complete digital inventories, databases compatible to the National Catalog of Archived Materials, and site specific metadata for the 15 collections housed at the Horace R. Collins Laboratory.

Goal 2- **Completed July 2008**. Replacement of oversized and/or deteriorating core boxes with 2,966 new cardboard core boxes. The reboxing project resulted in the long term preservation of 7,395 m (24,265 feet) of core. Also, this effort opened additional shelf space for the storage of 1,158 m (3,800 feet) of core in space that was previously being wasted by storing small diameter core in oversized core boxes.

Phase 2: Digital conversion of paper collections to digital formats

Goal 3- Scan paper documents in digital format and make available to public utilizing ODGS website.

Collections to be scanned:

- Lithology strip logs
- Geochemical analysis records
- Seismogram tracings
- Aerial photographs
- Selected paper records of the Lake Erie Data Center

Phase 3: Repository and staff expansion

Goal 4- Convert existing ODGS drilling support warehouse into additional core and sample collection storage space with the purchase of new shelving.

Goal 5- Purchase a climate control system for moisture control in collection storage areas.

Goal 6- Hire one full time geologist to assist repository coordinator with repository operations and maintenance, geologic research, and public outreach.

Table 3. Members of the Horace R. Collins Advisory Committee

Tina Niven-consulting geologist representing Ohio's citizens and the public-at-large

Dr. Scott Bair-The Ohio State University representing Ohio's universities and colleges

Brian Mott-certified professional geologist with DLZ Ohio representing Ohio's geotechnical and engineering firms

Mort Schmidt- certified professional geologist with Cox-Colvin and Associates representing Ohio's industrial mineral businesses