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National Geological and Geophysical Data Preservation Program

**Preservation of Geologic Data and Collections in Illinois:
Compilation, Documentation and Planning**

Final Technical Report

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Ronald Klass
Information Management Coordinator
Tel. 217-244-5585
Fax 217-333-2830
rklass@illinois.edu

Zakaria Lasemi
Geologist and Head, Bedrock Geology and Industrial Minerals
Tel. 217-244-6944
Fax 217-333-2830
zlasemi@illinois.edu

**Illinois State Geological Survey
Institute of Natural Resource Sustainability
University of Illinois
615 East Peabody Drive
Champaign, IL 61820**

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Abstract

This report summarizes the work performed for the Illinois State Geological Survey FY10 NGGDPP project:

- Metadata records were created for 3 additional collections: Geophysical Logs, Clay Mineralogy, and Microfossils. Paper records were also scanned for the Geophysical Logs and Clay Mineralogy collections.
- Additional metadata records and scans were created for the Electrical Earth Resistivity collection.
- Existing metadata records for other non-static collections were updated.
- All new or modified metadata records were uploaded to the National Catalog.

We believe the collection metadata generated and uploaded for this project represents an appropriate and successful use of the resources provided under the project contract.

Collection Metadata and Digital Conversion

Geophysical Logs Collection

This collection consists of a filing cabinet containing approximately 800 paper downhole Geophysical Logs generated by survey staff in the 1970s and 1980s, and digital logs starting in the 1990s. The paper logs were never cataloged so for all practical purposes did not exist as a resource.

Using student help, all paper logs were scanned and corresponding metadata entered. This included some logs that originated from digital files as they were created long ago and it is unclear whether the original digital files exist. A custom database interface was developed to facilitate data entry and to link scanned files, and to cross-check that all scans existed and were properly named and located. A total of 1220 metadata records were uploaded.

Some preliminary organizational and planning work was done for digital logs, but time and resources did not allow further work in the contract period. Work is continuing using Geophysics staff resources as available.

Historic Clay Mineralogy Reports Collection

This collection consists of two filing cabinets of X-Ray Diffraction Clay Mineralogy reports made over the entire 50-year career of internationally-recognized clay mineralogist, Herb Glass. The data are particularly valuable because they were created at the ISGS by the same person using the same equipment and standard procedures. Mr. Glass also had a strong interest in the interpretation of the data and worked closely with geologists requesting sample analyses.

To prioritize data for preservation, we used analyses from locations determined as key by Mr. Glass with respect to interpreting the stratigraphic units of Illinois. We decided to preserve the original handwritten analysis data sheets by scanning, leaving a future option to enter the actual lab data if and when deemed prudent.

Myrna Killey, a retired staff Geologist who worked extensively with Mr. Glass and is quite familiar with his work assisted with the project. Ms. Killey was particularly helpful in locating analysis data sheets as she was familiar with many of Mr. Glass's projects and naming conventions. A student scanned data sheets, entered data, and assisted locating analyses.

This was a difficult collection to work with, with a number of unforeseen issues. For example, until very late in Mr. Glass's career, apparently no formal method of tracking analysis data was in place; only a very few of his samples reference a sample number in the modern Clay Mineralogy XRD database. Mr. Glass generally used only a shorthand name to identify a sample, and used a filing system where a specific analysis might be filed under any one of several different categories. Due to these and other factors, substantial effort was expended by Mr. Glass and Ms. Killey locating data sheets for some of the analyses.

In addition, Mr. Klass spent a significant amount of time tracking down and verifying accurate locations for many of the samples. This included cross-checking locations on Mr. Glass's lists with the actual analysis data sheets, reviewing Mr. Glass's hand-drawn points on topo maps, reviewing publications that referenced samples and locations, and searching our core samples database. Finally, due to the exacting detailed work of the process the student required considerable training and assistance.

A custom data interface was designed to enter the metadata, including an efficient interface to cross-check (or copy with the press of a button) information from our core samples database. This was quite useful in the approximately one-third of cases where a core sample was referenced with the analysis data. The interface also included efficient methods to locate, name, move, and link scanned files to the database. A number of reports facilitated cross-checking for data entry errors.

A total of 657 metadata records, each corresponding to an analysis of a set of samples from a specific location were uploaded. Scans of the original data sheets for 494 analyses were completed.

We plan to continue some work on this project in FY11, including some scanning that we were not able to complete in FY10. Ms. Killey is writing documentation that will be very helpful (and perhaps in some cases necessary) to future researchers wishing to use Mr. Glass's work. In addition, Ms. Killey plans to identify for scanning and preservation important hand-drawn maps by Mr. Glass which summarize his interpretations.

Microfossil Collection (Conodonts)

Conodonts evolved very rapidly, thus permitting paleontologists to recognize numerous conodont species that have geologically short time spans (a few hundred thousand years to a few million years), making them extremely useful for biostratigraphic studies and accurately dating stratigraphic units. Staff geologist Donald Mikulic and part-time (retired staff) paleontological curator Rod Norby assisted Mr. Klass in working with these collections. Investigation during the course of the project found that the size of the available microfossil data was significantly larger than estimated for the original proposal.

A set of historic microfossil collection logbooks, consisting of 52 separate sub-collections, was entered by a student into a database for creation of 8630 metadata records. An obsolete DOS-based conodont database was converted (after considerable research and effort) by Mr. Klass into a modern format for subsequent creation of 3361 additional metadata records. A total of 11991 metadata records for microfossils were uploaded.

In addition, a generalized paleontological database for all of our varied paleontological collections was designed and developed by Mr. Klass in consultation with Mr. Mikulic and Mr. Norby. Software to convert data from various differing styles of databases previously developed to hold specific collections (such as the stratigraphic microfossil database developed in FY08, as well as old historical databases such the DOS-based conodont database) was written to convert and import the data to the new generalized database.

Electrical Earth Resistivity Survey records

We have a collection of Electrical Earth Resistivity Survey data, reports and maps going back to the 1930's. In general these were used to determine sites with better potential for water wells in a survey area.

In FY08 we created metadata for sites that were cataloged in historical paper logbooks, and scanned data from 6 of 102 counties. The Geophysicist in charge of this collection found the FY08 NCGDPP work so valuable that for the last two years he has used his own resources to continue work on this collection with the assistance of Mr. Klass.

EER surveys from an additional 23 counties (making a total of 43) were scanned this fiscal year; also metadata for surveys in those counties that are not cataloged in the original historical logbooks used for FY08 was created. Metadata for 250 additional locations was created and included in an update to the National Catalog.

Updates to existing metadata

In addition to the collections previously described, the following collections were updated to include new data and data revisions (static collections were not updated). With these updates, all of our collections with metadata in the National Catalog are current as of August 2011.

- Rock Cores
- Rock Cuttings
- Paleontological Samples

Location Issues

Virtually all of our historical locations are in PLSS format. This format is prone to typos and transcription errors in many more ways than a simple x,y coordinate format, and each year a considerable number of metadata locations in PLSS do not convert to a coordinate because they do not reference a valid location. This can be used as a data entry integrity check, and in fact a few data entry typos are caught via this method. However the vast majority of the issues are with the original data.

Mr. Klass expended considerable time correcting invalid PLSS locations where feasible in order to have a good location for as many items as possible. In general most data without a location are essentially invisible to us (and cannot be uploaded to the National Catalog).

Comparison of Proposal Goals with Project Accomplishments

Geophysical Logs Collection

Goals: Scan and create metadata for an estimated 1500 Geophysical Logs produced by ISGS Geophysics staff. Continue with digital logs, time allowing.

Results: A total of 1220 metadata records with corresponding scans were created for the historic logs. Some organizational and planning work was done for digital logs but time and resources did not allow further work in the contract period.

Historic Clay Mineralogy Reports Collection

Goals: Create metadata for an estimated 500 “best” locations as determined by Mr. Glass with respect to interpreting the stratigraphic units of Illinois.

Results: A total of 657 metadata records, each corresponding to an analysis of a set of samples from a specific location were created. Scans of the original data sheets for 494 analyses were completed.

Microfossil Collection (Conodonts)

Goals: Create metadata for an estimated 5000 microfossils, primarily conodonts.

Results: A total of 11991 metadata records for microfossils were created. Approximately 8630 records were entered from old paper logbooks; the remainder were extracted and converted from an obsolete DOS-based database.

Summary of FY10 metadata record goals versus actual:

Metadata Records		
Collection Name	Estimated	Created and Uploaded
Geophysical Logs	Up to 1500	1220
Historic Clay Mineralogy reports	Up to 500	657
Microfossils (Conodonts)	Up to 5000	11991

Conclusion

We believe the collection metadata generated and uploaded for this project represents an appropriate and successful use of the resources provided under the project contract. We are continuing metadata creation for FY11.

Acknowledgements

Several staff members at the Illinois State Geological Survey participated in this project:

- **Mark Hart** entered and scanned additional Electrical Earth Resistivity collection reports.
- **Myrna Killey** (retired) assisted with the Historic Clay Mineralogy collection.
- **Don Mikulic** assisted with the Microfossils collection and with paleontological-related issues.
- **Rod Norby** (retired) assisted with the Microfossils collection and with paleontological-related issues.
- **Tim Young** assisted with the Geophysical Logs Collection.