

FINAL TECHNICAL REPORT

Lake Superior Legacy Collection – FY2014

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Abstract:

Roland D. Irving, Wisconsin's first true geologist, established the Lake Superior Division of the USGS in 1882. As head of the division, Irving began a detailed survey of the Upper Midwest during which he and his protégé, Charles Van Hise, pioneered the application of microscopic petrography. The Division's fieldwork continued long after Irving's untimely death in 1888, and in the course of 40 years of investigation and research the Survey geologists published nine monographs, three bulletins, and a professional paper. The raw data used to produce these influential works makes up the Lake Superior Legacy Collection and currently consist of approximately 450 field notebooks, 62 maps, 9,800 hand samples, 15,500 thin sections, six books of microscopic and macroscopic lithological descriptions, a 24 volume specimen catalog, and a book of chemical analyses. For the third year of this project, staff and students at the Wisconsin Geological and Natural History Survey have built upon the work completed during the first two years. We have, in partnership with the UW Digital Collections, scanned an additional 39 field notebooks and have created metadata for all the remaining field notebooks in our possession, including an additional 52 received from USGS in Oct 2014. We have photographed our entire collection of thin sections in plain and cross polarized light. We now have a catalog of 30,100 high resolution images (2 for each of our 15,500 thin sections) and a database that links together the physical samples, photographs, and field notebooks.

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Introduction

Charles Van Hise, the second director of the United States Geological Survey's Lake Superior Division (USGS, LSD), went on to become the president of the University of Wisconsin (UW). Because of his importance to local history the UW Digital Collections (UWDC) scanned and placed online the 65 field notebooks Van Hise authored while director of the Division. This work was done in 2011 and was the impetus that led the Wisconsin Geological and Natural History Survey (WGNHS) to examine the entire collection and to look for ways to preserve it while increasing access to its contents.

The following year (FY 2012), WGNHS applied for and received a grant from the USGS National Geological and Geophysical Data Preservation Program (NGGDPP) to inventory and index the Lake Superior Legacy Collection. During that year, we completed a comprehensive inventory of the collection, created a database to index its various parts, and scanned and placed online 45 more field notebooks. We uploaded to the National Data Catalog (NDC) 6,058 metadata records for hand samples and 8,056 metadata records for thin sections.

In FY 2013, we received a grant to continue this work. During this year, we completely restructured our database, corrected the metadata records in it, and created new metadata for samples in our possession. We uploaded to the NDC an additional 2040 records for hand samples and 2603 records for thin sections. Working in partnership with the UWDC, we scanned the complete contents of an additional 36 field notebooks and four books of lithological descriptions. We also captured metadata from another 177 field notebooks.

For FY 2014, we were awarded a similar grant to continue this work. A proposal for a work plan and budget was submitted in March 25, 2014, and revised July 1, 2014, for the 12-month period beginning August 1, 2014, and ending July 31, 2015. Work completed in FY2014 is described below.

Comparison of Workplan Goals and Project Accomplishments for FY2014

The principal goal of this project is to provide access to the information in the Lake Superior Legacy Collection to researchers and historians while continuing to protect its deteriorating physical samples and original documents for the future. In our proposal, we outlined two goals. The first was to update our digital infrastructure by scanning a third set of field notebooks and populating our database with metadata from the notebooks. The second was to rescue data by scanning half of our thin sections in plain and cross polar light. The end product and result towards which all of our data preservation efforts are aimed (as was described in the proposal) is a three-part digital resource giving comprehensive access to the entire collection:

1. An online library displaying scanned images of field notebooks, maps and books of lithological descriptions maintained by UWDC, our digital partner, at: <http://uwdc.library.wisc.edu/collections/EcoNatRes/WGNHS>

The specific objective related to this goal – an additional 3000 pages scanned and placed on line in FY2014 – has been met. Our partner in this project, the UW Digital Collection, digitized these pages at their expense. The goal remains to get all of the relevant paper materials in this collection on line. At the rate we are working, we expect it to take approximately three more years to complete this goal. The UW Digital Collection has undertaken the scanning of an additional 3000 pages, at their expense, in FY 2015. We are currently looking for funding to complete the rest of the scanning.

2. An online catalog showing digital photographs of approximately 15,500 thin sections in polarized and cross-polarized light hosted on WGNHS's website. We proposed to photograph half of the thin sections in FY 2014.

We have made extraordinary progress toward meeting the goal of creating an online catalog of the thin sections in our possession. We exceeded our original goal of photographing half of the collection and, in fact, have washed and photographed nearly all of the 15,500 thin sections in plain and cross polar light (rather than the half we had proposed). The images were checked for quality assurance and 540 photographs were retaken. About 140 thin section slides were too damaged to wash or photograph and we discovered 60 slides were missing. But we also discovered another 200 thin sections we thought were lost, stored separately from the main collection. We now have a catalog of approximately 31,000 images (two photographs per thin section) on our network file servers. We plan to provide online access in the future, using an image viewer that will allow users to pan and zoom to view details, as well as to phase the image from plain- to cross-polarized light. We are currently looking for funding to build that application.

3. An online database indexing the entire collection and aiding researchers to relate hand samples to their thin sections and to their descriptions in the online field notebooks and lithological descriptions. The database gives the user the hand sample number assigned by the Lake Superior Division then links that sample to its thin section, the notebook and page number in which the sample is described (as well as the book's author and year), as well as the location in the field from which the sample was taken. This database will be hosted by WGNHS's website.

In FY 2014, we completed metadata creation for all of the field notebooks in our possession, including a set of 52 notebooks that were sent to us from the USGS warehouse in Herndon, VA, in October of 2014. Each sample described in any notebook now has an entry in the database, or in a spreadsheet that will be loaded into the database. Major fields in the database include:

- Notebook number
- Author
- Year
- Hand sample number
- Thin section number
- Section, township, range, with quarter sections where available (each a separate field)
- Page number wherein the sample is described

- State and informal location (to help a researcher see the general area from which the sample was collected)
- Whether or not the hand sample or thin section is in our possession, and their locations in our research center

We plan to provide online access in the future, using a publicly accessible, map-based web application for searching and viewing records in the Lake Superior Legacy Collection. Users will be able to search for sample records on the interactive map. We are currently looking for funding to build that application and to connect it to the catalog of thin section photos.

In our proposal, we stated that we would not be uploading any records to the NDC this year. However, as stated above, we learned that we were missing some thin sections we originally believed we had in our possession, and we found several boxes containing about 200 thin sections we previously thought were lost. In addition, while importing metadata into the database and comparing it to existing metadata, we made a number of corrections, mainly to location data. A new set of records reflecting these corrections was uploaded to our collections P517-Hand Samples and P1590-Thin Sections in August of 2015.

Summary of Progress

We have, in partnership with the UW Digital Collections, scanned an additional 39 field notebooks and have created metadata for all of the rest of the field notebooks including an additional 52 received from USGS in Oct 2014. We have also photographed our entire collection of thin sections, producing high resolution images in plain and cross polarized light. We now have a catalog of 31,000 high resolution images (two for each of our 15,500 thin sections) and a database that links the disparate pieces of the collection (see table below). What remains is to continue to scan the rest of the field notebooks and to develop the applications needed to access the WGNHS databases and thin section catalog from the web.

Appendix I contains a summary of the inventory of the Lake Superior Legacy Collection.

Appendix I: Inventory of the Lake Superior Legacy Collection

Collection element	Original extent	Portion in our possession	Brief description	Possible reasons for gaps	Work performed / Percentage complete*
Hand samples	App. 80,600**	9,796	Rock samples taken from the field	Unused sample numbers, samples lost in field, in a fire, or in transportation, samples loaned to other institutions.	Metadata (location information): 83%
Thin sections	App. 18,000	15,500	Microscope slides made from hand samples	Same as above, also, slides are easily damaged. Some may have been discarded.	Metadata (location information): 81% Photography: 98%
Field notebooks***	486	461	Geologic and topographic notebooks, including drill hole logs	Unknown.	Metadata: 100% Scanning: 46%
Thin section catalog	3 ledger books	3 ledger books	Catalog correlating hand sample numbers with thin section numbers		Metadata: See below
Chemical analyses	Unknown	2 ledger books	Chemical analyses of samples—not all are Lake Superior Division samples		Metadata: See below
Photograph negative catalog	Unknown	1 ledger book	List of photograph negatives including location taken and corresponding notebook and	Unknown. The photographs have not been located.	N / A

			page number		
Specimen catalog	24 ledger books	24 ledger books	Listing of specimens from 1 to 80,816, some with location information, thin section number, notebook number and page		Metadata: See below
Lithological descriptions	9 ledger books	6 ledger books	Microscopic and macroscopic descriptions of samples written by Irving and Van Hise, organized by rock type	Unknown	Metadata: 100% Scanning: 100%
Maps	Unknown	62	Plat maps showing sample numbers and rock types, mostly of parts of Michigan's Upper Peninsula	Unknown	Metadata: 100% Scanning: 100%

*Note: For percentage of work completed, numbers were calculated using the complete number of items in our possession, so not all work will show a 100% completion. For example, though we have not completed metadata for 100% of the hand samples, we have likely exhausted the resources available to us, leaving a percentage of the work incomplete.

**As we got further into the project, we discovered that nearly half of the hand samples were from drill holes. Several of the notebooks are simply lists of sample numbers with the depth from which they were taken in the hole. We do not have any of these samples, and, in fact, don't know whether they were cuttings or core. At least some of these drillings were done by a private company, and there is so little metadata for them that we suspect the Lake Superior Division was not in possession of them at all.

***Metadata from the specimen and thin section catalogues has been created to supplement metadata from the notebooks and to create metadata for the hand samples and thin sections. As such, attaching a percentage complete is quite difficult. For the chemical analyses, we have noted only whether or not an analysis exists for each specimen.