

National Geological and Geophysical Data Preservation Program (NGGDPP) Final Technical Report; Minnesota; 2014/2015

Submitted to: US Geological Survey (USGS)

Award number: G14AP00127

Title: Location and descriptive metadata for Minnesota Geological Survey rocks and thin sections

Author: Tim Wahl, Minnesota Geological Survey, 2609 West Territorial Road, St Paul MN 55114-1009 USA; Fax 612-627-4778; tewahl@umn.edu

Start and end dates: 11 August 2014 – 10 August 2015

Submittal date of final technical report: 1 February 2016

Abstract: The 2014/2015 NGGDPP project at Minnesota Geological Survey (MGS) involved compilation of readily obtained location and descriptive metadata for the rock and thin section collections. This was successfully completed, as proposed, for the database that, as a result of this and previous NGGDPP support, includes entries for 43,545 hand samples, 15,251 thin sections, and 1,127 hand sample trays. Concurrently, hand samples were linked to thin sections to the extent readily achievable, so that one location record will apply to both.

Introduction: The Energy Policy Act of 2005 (Public Law 109-58, Sec. 351) established the NGGDPP in the USGS and outlined goals for the program to archive geological, geophysical, and engineering data, maps, well logs, and samples, to provide a national catalog of archived materials, and to provide technical and financial assistance to State geological surveys and relevant Department of the Interior (DOI) bureaus for archived materials (<http://datapreservation.usgs.gov/>).

Purpose and justification of work reported on here: MGS was established by the State as part of the University of Minnesota in 1872 to serve the needs of the people of Minnesota for systematic geoscience surveys required to ensure their prosperity, health, and security through stewardship of water, land, and mineral resources. The format of this mapping and research has evolved with the progress of science and technology, its use has been optimized through outreach, and MGS works closely with university, government, industry and community partners to ensure that these ongoing geological, geophysical, and geochemical surveys respond to the evolving needs of societal applications.

In 2007/2008, NGGDPP supported completion of a collection inventory and long-range plan, which identified key priorities in relation to applications such as groundwater management and mineral resource assessment, including 1) reprocessing of the aeromagnetic database, 2) enhancement of gravity station location precision, 3) vertical georeferencing of the rock property database, 4) cataloging and georeferencing of rocks and thin sections, 5) standardized formatting of existing metadata databases, 6) scan and web enable all MGS publications – 45,000 pages and 650 maps. Objective 1, 2, and 3 were completed with State of Minnesota support. Objective 4 was partially completed with NGGDPP support in 2009/2010. Objective 5 is ongoing. Objective 6 was completed with University of Minnesota Library support. Among the top priorities identified in the 2008 plan, aside from ongoing formatting of all databases and collection metadata, only Objective 4 - cataloging and georeferencing of rocks and thin sections - remained incomplete, allowing a focus on that topic, and identification of new priorities such as scanning and data entry for borehole geophysical records, as well as dealing with major collection donations and ongoing acquisition.

These rock hand samples, including prepared lithochemical samples and thin sections are essential for bedrock geology mapping and research by MGS and partners such as state and county agencies, consultants, researchers, and exploration managers, in relation to issues such as groundwater management and mineral resource assessment. Improved access to these materials through enhanced cataloging and metadata is already resulting in increased usage, resulting in improved geologic mapping, as well as increased efficiency and effectiveness in geological research, consulting, mineral resource assessment, and groundwater management.

Due to the previous 2009/2010 NGGDPP support, the individual item specimen ID catalog for thin sections was made 98% complete, although locations and other metadata remained lacking. Cataloging of the hand sample collection was completed at the tray level with 2009/2010 NGGDPP support. The 2013/2014 NGGDPP project enabled 9,703 thin sections and 36,999 rocks to be cataloged, while exploratory work clarified how best to approach the 2014/2015 project focused on location and descriptive metadata.

Accomplishments: Having completed as proposed, with NGGDPP support, the collection inventory and long-range plan (2007/2008 NGGDPP support), the first phase on metadata for rocks and thin sections subsequently was completed as proposed (2009/2010 NGGDPP support). Due to 2013/2014 NGGDPP support, the individual item catalog was completed, resulting in records for 42,228 hand samples, 15,251 thin sections, and 1,127 hand sample trays. In 2014/2015, compilation of readily obtained location and descriptive metadata for the rocks and thin section collections was completed, along with linking of hand samples to thin sections, so that one location record will apply to both. A total of 13,934 of the 15,251 thin sections were matched with hand samples, leaving 1,317 orphans, which will be addressed on an ongoing basis.

The goal of the work was to increase and ease usage of the MGS rock and thin section collections; to complete an individual item catalog of MGS rocks and thin sections; to link hand samples to thin sections in the metadata; to begin adding locations and associated metadata to this catalog of specimen IDs. These objectives thus were successfully completed.

Digital submission: It had been proposed that the metadata would be submitted to the catalog through the following steps: 1) further database design, 2) further investigative work on sources of locations and descriptive metadata, 3) entry of locations and descriptive metadata, 4) upload to NGGDPP National Digital Catalog (NDC). Plans now call for periodic catalog updates, as rocks are brought from the field, as sections are prepared, as analyses are carried out, and as the major current effort on incorporation of locations and other field data is completed – although a major donation of rocks, thin sections, and related materials that are highly relevant to our ongoing work is now a key priority.

Future plans: In addition to current effort on preservation and digital conversion of MGS geophysical logs, and ongoing work on locations and other field data for rocks and thin section, additional work is required on all collections databases, while reformatting is ongoing. An important current priority is dealing with the major donation of rocks, thin sections, and related materials. Discussions are underway with the MN Department of Natural Resources on optimized coordination with their role as proprietor of the drill core library and mineral exploration document archive, and with the Earth Sciences department on linkages to the fossil catalog.