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Technical Report

Heinrichs Geoexploration Co. Digitization and Catalog

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Introduction

As part of the Energy Policy Act of 2005, the U.S. Geological Survey (USGS) was tasked with creating a National Geological and Geophysical Data Preservation Program (NGGDPP).

This Program is intended to work principally with the nation's geological surveys to: (1) archive geologic, geophysical, and engineering data, maps, well logs, and samples; (2) provide a national catalog of such archival material; and (3) provide technical and financial assistance related to the archival material.

The Program is envisioned as a national network of cooperating geoscience materials and data repositories that are operated independently yet guided by common standards, procedures, and protocols for metadata. The holdings of all collections will be widely accessible through a single, common, and mirrored Internet-based catalog, the National Digital Catalog (NDC), thus maximizing the availability of and interconnectedness of all the collections.

Scope and Implementation

In 2011 The Arizona Department of Mines and Mineral Resources (ADMMR) was merged with the AZGS in FY12. The Arizona Geological Survey (AZGS) rescued and stored the records when ADMMR was shut down. Since that time, the AZGS has inventoried the many collections of mining materials, typically mineral exploration reports, maps, and supporting documents. These collections contain mineral exploration information all over the world, but are largely focused on Arizona and the Southwest.

This year, AZGS digitized and cataloged 1,841 maps from Walter Heinrichs, Jr. and Grover Heinrichs, co-founders of Heinrichs Geoexploration Co. Metadata records are stored as ISO 19139 records, XML encoding of ISO 19115, and published through the USGIN catalog at search.usgin.org. Maps were previously stored in map tubes with brief descriptive labels. They required flattening in order to scan on a HP DJ4500 Scanner. Master images were captured as uncompressed TIFF files at 400dpi, using either 8-bit grayscale or 24-bit color. Access files were created using jpg compression and converted to PDF files.

Metadata & Digital Infrastructure (Results)

Summary

The AZGS cataloged maps from a large batch of previously inventoried map tubes, mostly from Walter Heinrichs, Jr. and his brother Grover Heinrichs. A small fraction of maps belong to the A.F. Budge collection. As such, the project documents are referred to as the Heinrichs Geoexploration Maps, the company operated jointly by Walter and Grover. It appears the prior inventory that indicated slightly more than 2,000 records appears to be a low. Processing this year has proven it to be about half of the total number, even accounting for duplicates.

As with previous records, the AZGS used the USGIN metadata schema, related to the geographic metadata standard, ISO 19115, and finally encoded as ISO 19139 XML for metadata exchange. Required metadata includes a title, description, creator, publication date, distributor contact, metadata contact, metadata date, and a link to the item. Recommended metadata includes thematic keywords, spatial keywords, resource identifier, bibliographic citation, geographic coordinates, and starting and ending dates (USGIN, 2011). As map sizes vary widely, the dimensions are included in the description. Thematic keywords were used for maps to capture types: a claim map, geologic map, subsurface map and whether it included sample data or geophysical surveys. Spatial keywords are assigned by joining the map's mine ID to location information stored in the mines table, taken from the Arizona Mineral Industry Location System.

Casey Brown and Becky Eden cataloged 1,841 maps with USGIN metadata using the Microsoft Access database developed previously for inventorying the collections. This data was then used to create an XML record and uploaded to USGIN. From there the records are harvested to the Sciencebase.gov catalog.

The preferred presentation portal at AZGS is still the Mine Data website built in Drupal, <http://minedata.azgs.az.gov>. It too is populated from the data exported from MS Access. It allows users to filter for items based on keywords, perform a text search for documents by title or retrieve all results based on a map location.

Metadata Created

Table 1. Number of maps by county.

County	Maps
Pima	316
Pinal	251
Yavapai	230
Graham	194
Mohave	153
Maricopa	149
Cochise	146
Gila	128
Santa Cruz	120
La Paz	51
Greenlee	42
Yuma	33
Coconino	12
Undefined	11
Navajo	2

Availability

Records are available from USGIN,

<http://repository.stategeothermaldata.org/resources/metadata/1800GEOXmapsV2/> , AZGS,

<http://minedata.azgs.az.gov>, and the NDC,

<https://www.sciencebase.gov/catalog/item/511ab167e4b084e2824d6a18>.

USGIN aggregates multiple datasets from various sources. To search for this dataset, use the collection description in the search box: Heinrichs Geoexploration Co. Maps. Results can be narrowed geographically by drawing a bounding box on the interactive map.

<http://minedata.azgs.az.gov> only contains records from ADMMR. To find the Heinrichs Geoexploration Co. maps, use the filters from the Search Page to narrow results to Document: Image: Map and Walter Heinrichs, Jr. or Grover Heinrichs.

Figure 1. A sample of search results from ScienceBase

<https://www.sciencebase.gov/catalog/items?parentId=511ab167e4b084e2824d6a18>



Vulture Mine, Drill Hole Map, Sheet 3-N

A.F. Budge Mining Ltd. Maps: Vulture Mine, Drill Hole Map, Sheet 3-N; 1 in. to 20 feet; 37 x 24 in.

Categories: Data; Tags: Gold, Lode, natural resource exploration, Sherman, Sheridan, Zinc, Sulfide, *All tags...*



Sierrita Project, McGee Anglin, Geologic Map

Heinrichs Geoexploration Co. Maps: Sierrita Project, McGee Anglin, Geologic Map; 1 in. to 500 feet; 26 x 18 in.

Categories: Data; Tags: claim maps, Gold, Lode, Copper, Oxide, geology, plans, *All tags...*



Wooley, I.P. Traverse Line No. 2 Sheet 1

Heinrichs Geoexploration Co. Maps: Wooley, I.P. Traverse Line No. 2 Sheet 1; 1 in. to 1000 feet; 25 x 21 in.

Categories: Data; Tags: Copper, Oxide, Pinal337, Dataset, maps and atlases, T4S R13E Sec 33 N2, *All tags...*



Mayer Vicinity Land and Mineral Status

Heinrichs Geoexploration Co. Maps: Mayer Vicinity Land and Mineral Status; 1 in. to 2000 feet; 31 x 37 in.

Categories: Data; Tags: claim maps, Yavapai1026, Mayer - 7.5 Min, Dataset, Agua Fria metallic mineral dist., *All tags...*

Bibliography and Links

US Geoscience Information Network, (2011), "Metadata Recommendations for Geoscience Resources," (accessed 2015-11-23, http://repository.usgin.org/uri_gin/usgin/dlio/335)