
INVENTORY OF GEOLOGICAL AND GEOPHYSICAL DATA COMPLETED AT THE NDGS

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Introduction

The NDGS has recently completed a comprehensive internal inventory of currently available geological information and data sources. This inventory was sponsored, in part, by the U.S. Geological Survey's National Geological and Geophysical Data Preservation Program (NNGDPP). The NNGDPP was created because much of the geoscience information (such as geologic cores, rocks, minerals, fossils, photographs, and field notes) collected during the life cycles of state geological surveys was, in many cases, in danger of being lost due to insufficient facilities and funding support for long-term preservation.

The NDGS has significant holdings of geological and geophysical information that has been collected since the Survey's inception in 1895. Over the past 113 years, the NDGS has collected and generated a variety of geoscience data in various formats, ranging from handwritten field notes, rock samples, and oil well cores to GIS files. Geoscience data currently housed at the NDGS fall into the following six general categories: 1) geologic cores and samples collected by the oil and gas and subsurface minerals exploration industries, 2) fossil specimens and data maintained in the ND State Fossil Collection, 3) photographic imagery (including both land-based and aerial imagery), 4) field and laboratory notes and reports, 5) miscellaneous publications and reports related to the geology of North Dakota, and 6) various geologic materials collected from throughout the state.

Oil and Gas Industry - Core and Sample Library

We currently maintain numerous one-of-a-kind types of geologic data (electric logs, cores, cuttings, and field notes). Our 20,000-square-foot core and sample library (named after former state geologist Wilson M. Laird) contains over 350,000 feet of core and samples from most of the 16,000 oil wells drilled in North Dakota. We also possess more than 15,000 thin sections generated by oil companies and graduate students studying these Williston Basin cores. The core library also houses cuttings from water wells, groundwater investigations, and a variety of test holes.

Subsurface Minerals Exploration

The North Dakota Geological Survey houses thousands of electric logs from coal exploration and subsurface mineral programs (including salt, uranium, and clay). Since 1968, companies obtaining subsurface mineral permits from the NDGS have had to submit copies of the basic data generated under that permit (electric and driller's logs, chemical analyses, etc.) to our agency. Beginning in 1975, companies obtaining coal exploration permits have been required to do the same. These open-hole suites include gamma, resistivity,

spontaneous potential, and density logs. A number of these companies or mineral divisions folded during the 1980s and 1990s and their inventories of geologic data were often discarded. As a result, in many cases the North Dakota Geological Survey maintains the only existing copies of this material. In all cases, the Survey maintains the only copies of this geologic data that is available in the public domain.



Aisle view of core storage configuration at the W.M.L. Core and Sample Library located on the campus of the University of North Dakota in Grand Forks. The core library is constructed with eight aisles (16 rows) like this one that are nearly filled to capacity. Core and sample retrieval is facilitated by a fork-lift and operator.

ND State Fossil Collection

The ND State Fossil Collection consists of vertebrate, invertebrate, plant, microfossil, and trace fossil specimens primarily from North Dakota. The collection contains several hundred thousand accessioned specimens from 2,270 localities. At this time, there are 5,485 cataloged specimens in the collection. There are estimated to be 500,000 individual specimens contained in this collection with specimens added on nearly a daily basis.



Fossils collected in North Dakota are preserved in the ND State Fossil Collection housed in the Johnsrud Paleontology Laboratory at the North Dakota Heritage Center in Bismarck.

Photographic Imagery

The NDGS has a nearly complete set of 1:20,000 scale paper-based aerial photographs for North Dakota. This stereo coverage was flown between 1957 and 1964. The public, including geotechnical firms, have access to these photographs. Historical photography taken by various Survey geologists over the years are also held in Survey files.

Field and Laboratory Notes and Reports

The North Dakota Geological Survey has in its possession many of the original field notes and photographs that various Survey geologists have generated throughout the years. Photos include glass negatives, black and white paper photos, and 35 mm slides. We also have a variety of geologic reports from industry that were gifted to our agency.

Summary of geoscience data holdings at the NDGS

From our recent inventory we have identified six major collections of geoscience data. These collections hold an estimated 695,000 individual geoscience data items that are planned for incorporation into a long-term NDGS data preservation program. In the future, virtually all of the paper holdings will be scanned into digital files both for archival purposes as well as for public access.

The field notebooks of NDGS geologists are an important source of geologic information. Two examples of field notes in Survey archives – top: pages from one of the field notebooks of former State Geologist A.G. Leonard. Leonard's notes were written on June 20, 1903 while he identified terraces in the Medora area. Leonard used an altimeter to determine the elevations of the terraces. Bottom: pages from one of the field notebooks of State Geologist Ed Murphy. Murphy's notes were written on June 25, 1991 while measuring a geologic section at Rattlesnake Butte in Grant County.



Collection of historic 10-inch paper aerial photographs housed in the offices of the NDGS in Bismarck. Individual photographs are stored in traditional aerial photography storage boxes. A county index of aerial photomosaics is stored in the vertical files with the collection.

