

The Wilson M. Laird Core and Sample Library: A Building Full of Rock Core Continues to Shape the Destiny of North Dakota

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Introduction

The Wilson M. Laird Core and Sample Library in Grand Forks was established in 1980 (fig 1a), and was renovated in 2016 (fig. 1b). The core library is the brainchild of the building's namesake, Wilson M. Laird, North Dakota State Geologist from 1941-1969 (Murphy, 2015; fig. 2). The library houses one of the finest collections of rock core and drill cuttings in the country and perhaps the world, all due to Laird's foresight. It is truly a library, but the rocks tell the story, a story as glorious as any, the history of planet Earth.



Figure 1a. Original Wilson M. Laird Core Library constructed in 1980. Steam plant and parking lot on the right may be compared to Photo 1b for reference.



Figure 1b. Recently renovated core library in 2016. Steam plant and parking lot on the right may be compared to Photo 1a for reference.

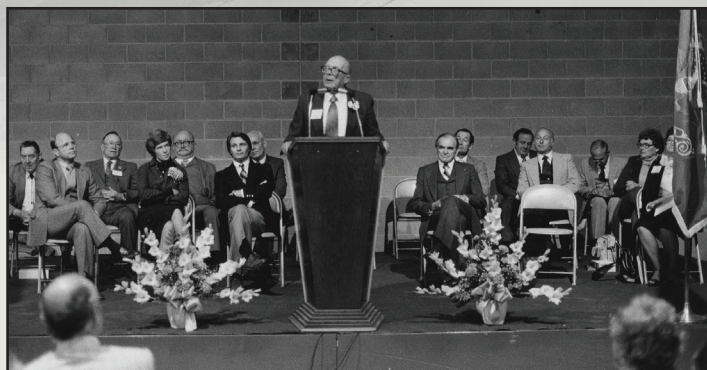


Figure 2. Former NDGS State Geologist Wilson M Laird speaking at Commemoration of the Wilson M. Laird Core Library, 1980.



Figure 3. Former NDGS State Geologist Lee C. Gerhard giving a tour of the old core warehouse.

The core library has a long and storied past dating back to the early 1900s, well before oil was discovered in North Dakota (Murphy, 2009; fig. 3). Laird understood the value that the rock core had not only economically, but also academically. In 1941, he instigated the provision in the state legislature that any core collected, as well as selected cuttings, must be submitted to the

state within a designated time, usually 180 days. However, storing of such core was a more complex matter, as significant space was necessary to house the material. At that time, the North Dakota Geological Survey (NDGS) was located on the campus of the University of North Dakota (UND) in Grand Forks, where Laird was also the Chair of the Geology Department. This practice took place until 1989, when the NDGS/UND geology department affiliation was severed and the NDGS moved to Bismarck. However, for logistical reasons, the cores remained in Grand Forks under the jurisdiction of the NDGS. Since the first core facility was established in 1918, material has been stored in numerous buildings on the UND campus, as each facility eventually became full (fig. 4). The Wilson M. Laird Core and Sample Library was constructed in 1980 (fig. 1a) and expanded in 2016 (fig 1b).



Figure 4. Main and only laboratory in the original Wilson M. Laird Core Library.



Figure 5. Geologists from Whiting Oil and Gas utilizing the large conference room in the core library.

The Facility

The new facility consists of 28,000 square feet of additional warehouse space, 12,000 square feet of laboratory space, and 14,000 square feet of office space including a large conference room (fig. 5). Three core laboratories are on the first floor including a blacklight lab (fig. 6), and four smaller labs are on



Figure 6. Blacklight lab on first floor of renovated building. Blacklights may be positioned using black control hanging from each panel of lights. Room painted green for ideal fluorescence when black lights are on.

the second floor. A microscopy room is also on the second floor. The warehouse contains approximately 91 miles of rock core and 50,000 boxes of drill cuttings representing 80% of cores cut in North Dakota's portion of the Williston Basin, and about 95% of the samples collected. Jeff Bader (Director) and Tim Nesheim are both on-site subsurface geologists and are supported by Kent Hollands, Jonathan LaBonte, and Francis Nwachukwu in daily library activities (fig. 7).

Benefits to North Dakota

So why in the world would anyone want to keep a bunch of rocks around for decades? The rocks in the core library represent billions of dollars' worth of oil company investment in North Dakota's natural resources and is mostly irreplaceable. Oil wells are expensive to drill, and it is from oil companies' drilled wells that the submitted core comes. These cores and cuttings are an invaluable resource for geologists looking to develop mineral and energy resources in North Dakota and will continue to be so in the future as oil and gas activity rebounds from the recent recession and pandemic crises. Industry professionals often visit to examine and describe core. Over the last 37 years, 1.1 million feet of core has been viewed and described in the Wilson M. Laird Core and Sample Library and tens of thousands of samples have been collected for analytical testing. These examinations help them better understand the geology of their lease area, thus potentially reducing exploration costs and increasing development. Our website also allows premium access to well information including core photographs (292,000), photographs of thin sections of rock called photomicrographs (143,000), and analytical results. The collection is also used by academia, dominantly the UND geology, petroleum engineering, and EERC groups, but also by institutions from around the world. These investigators come to North Dakota to examine the core and cuttings for various research projects; results of which are often published, leading to increased interest, and understanding of North Dakota geology and mineral resource exploration. Recently we hosted the 2019 and 2021 Williston Basin Core Workshops that were attended by 140 geologists and engineers (fig. 8). Finally, a significant number of oil and gas insights, innovations, and discoveries have been made because of information garnered through core examination



Figure 7. Core library staff from left to right, Kent Hollands (Engineering Technician), Jonathan LaBonte (Laboratory Technician), Jeff Bader (Director), and Tim Nesheim (Geologist).



Figure 8. Dr. Sven Egenhoff of Colorado State University presenting at the 2019 Williston Basin Core Workshop.

and analyses (Murphy, 2015). One of the more significant of these was Whiting Oil and Gas' Pronghorn play that resulted from detailed core investigations by Whiting in our core facility. Oil extraction taxes generated from this discovery paid for the cost of library construction in less than one year (Murphy, 2015).

Future Plans

Because of the 2016 expansion, the core library has enough space for several decades of core collection. Presently some of that space is being utilized by UND to store materials including building materials and records. During recent renovation of the Chester Fritz Library on the UND campus, items such as map cabinets and metal filing cabinets were temporarily stored at the core library while construction was completed at Fritz.

As we recover from the typical downturns in the industry and rebound from the pandemic, we continue to photograph our backlog of core for the website. In 2020, we set a record for photographs, with nearly 30,000 feet photographed. To date, we have 187,000 feet of standard 6-8-inch photos, which is approximately 39% of the core inventory. Thus, we will continue to push photography and uploaded images to the website. As we move forward additional thin sections and photomicrographs will be added. We also are making a concerted effort to recover any outstanding core that has not been submitted to the library.

Academically, we will continue to hold workshops for industry on an annual or bi-annual basis. Again, as drilling activity comes back in the Williston Basin, we anticipate a strong interest from industry in these workshops. Our subsurface geologists continue to investigate the core in anticipation of industry, as well as academic needs. Our core will also continue to be highlighted at the annual Williston Basin Petroleum Conferences.

References

Murphy, E.C., 2009, Wilson. M. Laird core and sample library: North Dakota Department of Mineral Resources Newsletter, v. 36, no. 1, p. 7-9.
 Murphy, E.C., 2015, The Wilson. M. Laird core and sample library: North Dakota Department of Mineral Resources Geo News, v. 42, no. 2, p. 1-3.