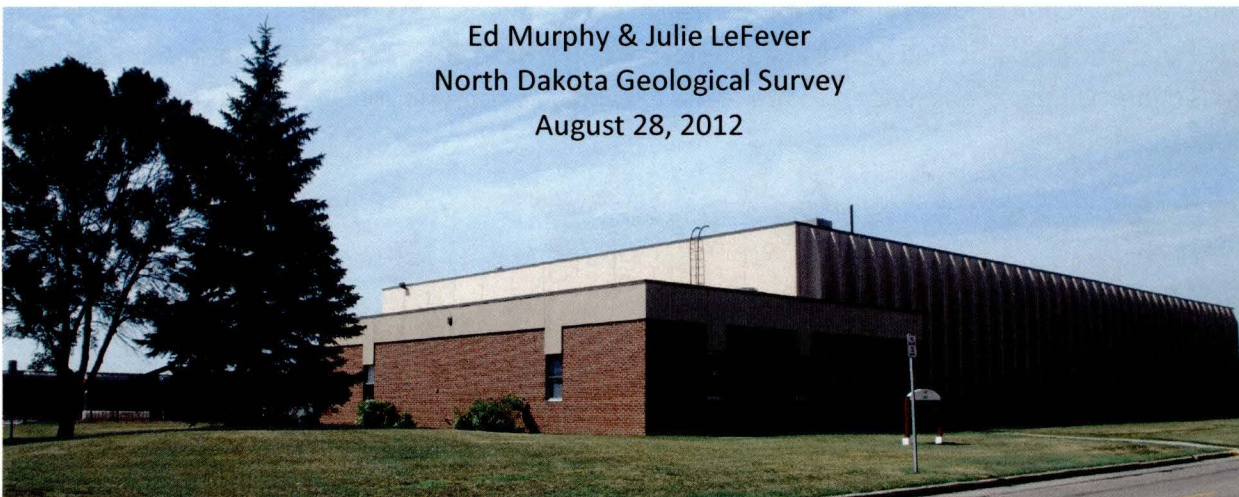


## ENERGY DEVELOPMENT AND TRANSMISSION COMMITTEE

### Tour of the Wilson M. Laird Core and Sample Library



Ed Murphy & Julie LeFever  
North Dakota Geological Survey  
August 28, 2012

Built in 1980, the core library consists of an 18,000 ft<sup>2</sup> warehouse and 2,000 ft<sup>2</sup> of office and laboratory space.

Comprehensive oil and gas legislation was passed by the 1941 state legislature requiring companies submit representative portions of the cores and samples to the Geological Survey. As a result of this legislation, the Wilson M. Laird Core and Sample Library is the most complete core facility in the country – it contains more than 80% of the core and 95% of the samples obtained in North Dakota.

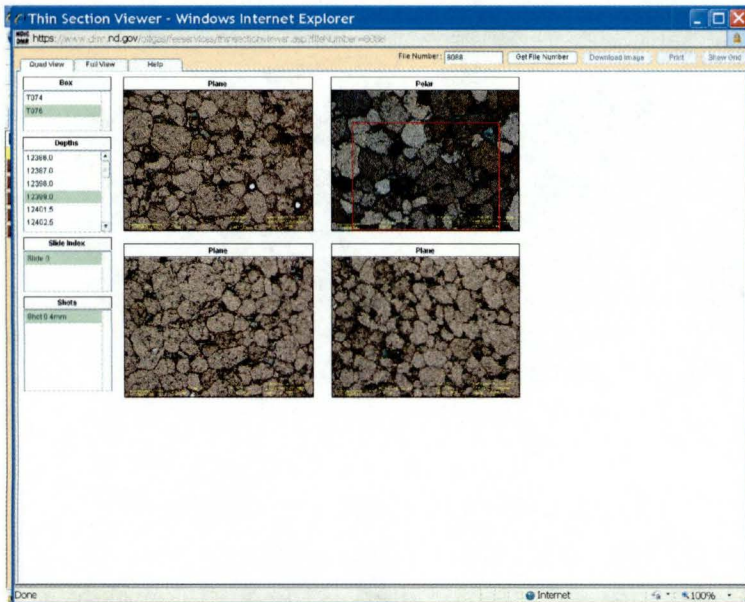
The facility houses roughly 80 miles of core (420,000 feet in 140,000 boxes) and 38,000 boxes of samples (also called drill cuttings or cuttings).

Most of the core that we receive has been longitudinally slabbed at the testing laboratory into a 1/3 piece (rocker) and a 2/3 piece (butt). We generally are sent the butt section. In recent years we have been requesting both sets from the companies so we can so we can establish the rocker as a curator set thus freeing up the butt pieces for more testing.

The cores and samples housed in this facility are studied by the oil and gas industry, students, and faculty. So far this year we have had 56 scientists and students representing nineteen companies and five universities study rocks in the core library.

The average length of core cut in a well was 60 feet in 2008, but year to date in 2012 it has been 270 feet.

In 2004 the Geological Survey began photographing thin sections and core to post on the Oil and Gas Division subscription site. To date we have photographed all 15,800 thin sections in our collection and photographed 98,668 feet of core (roughly 25% of the core in the library). We have photographed all of the Lodgepole, Bakken, Three Forks, and Birdbear core in our collection. Doing so has helped to make the Oil and Gas subscription site the best one in the country.



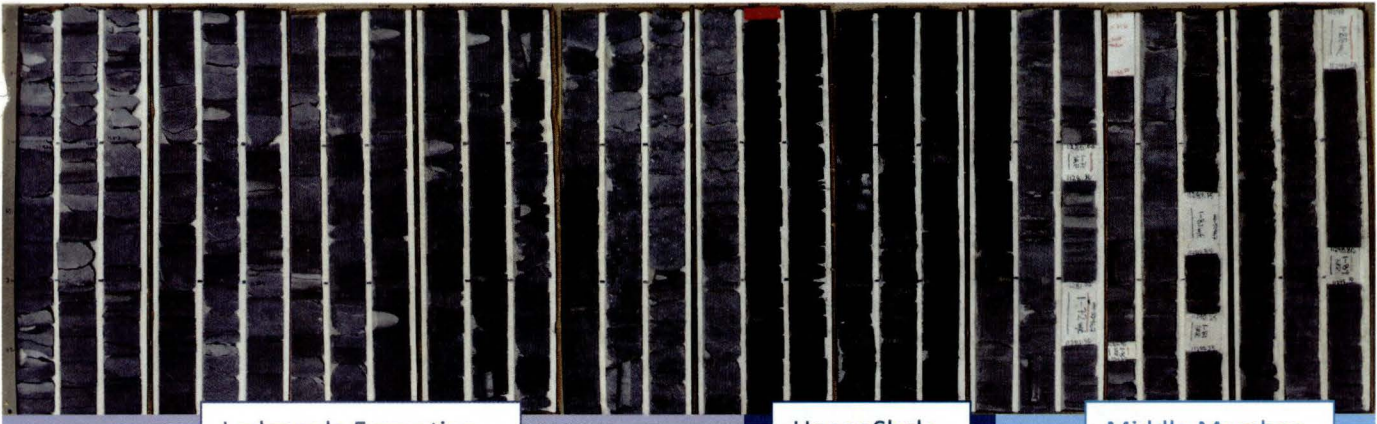
Four (quadrant) photomicrographs of a thin section of the Deadwood Formation at a depth of 12,399 feet in Mobil Oil's William Burnhardt #1 in Stark County.



Core viewer from the oil and gas subscription site showing core from the Three Forks Formation at a depth of 10,647 feet in Summit Resources Gap Federal 1-27H in McKenzie County.



CONTINENTAL RESOURCES CHARLOTTE 1-22H (core interval 11,210 – 11,571 feet)



Lodgepole Formation

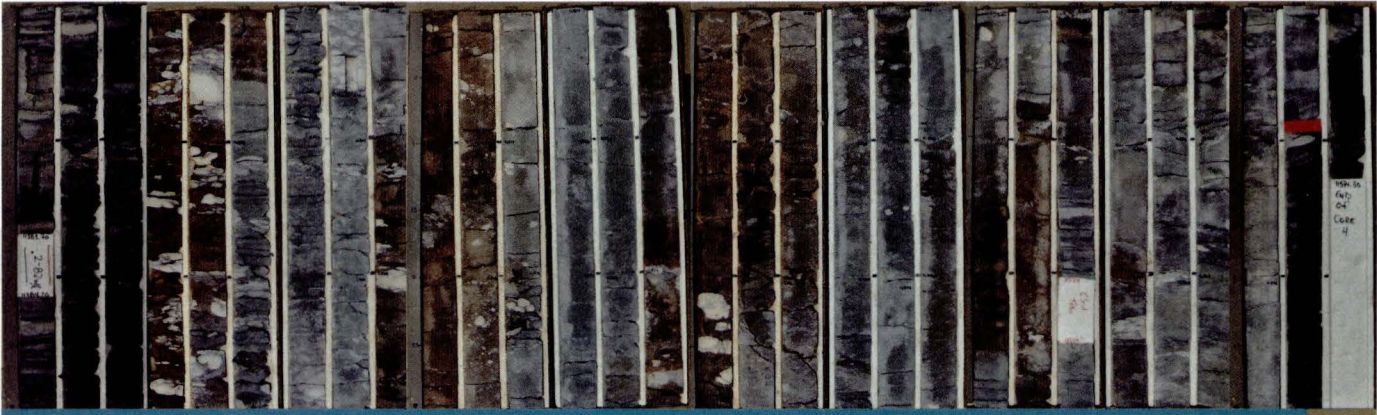
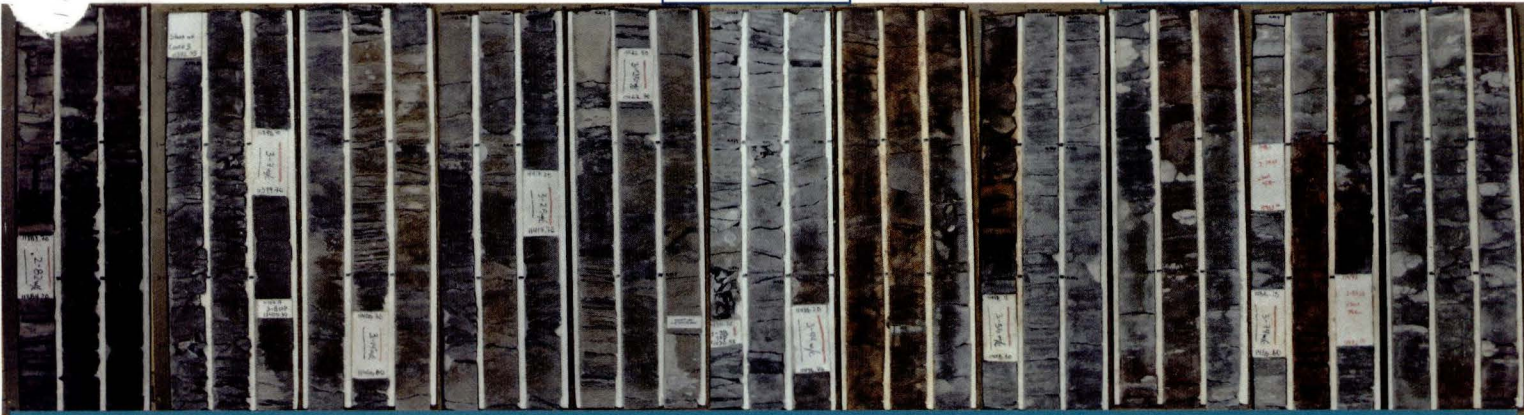
Upper Shale

Middle Member



Lower Shale

Three Forks Formation



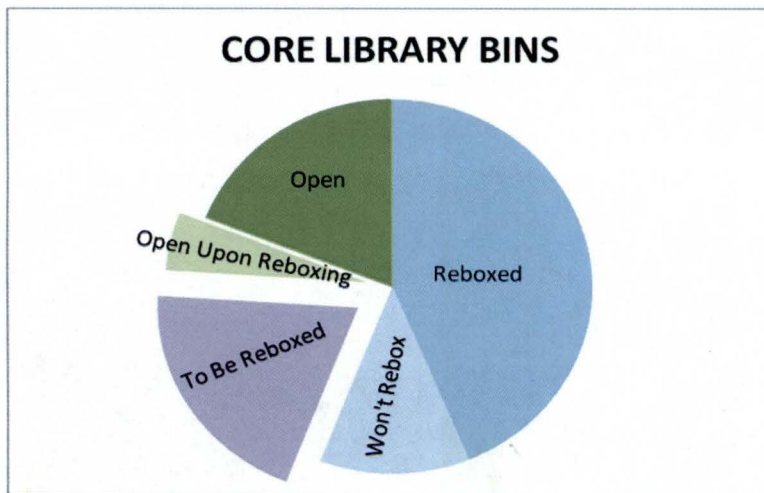
Birdbear Formation



The Wilson M. Laird Core and Sample Library is quickly filling up. Eight years ago we anticipated this happening and began an aggressive reboxing and discarding campaign to generate space. Had we not done so, the core library would have completely filled two years ago. So far, we have reboxed 197,000 feet of core using 62,300 boxes in the process.



Looking east along Aisle One in the core library. The reboxing of the south side of this aisle (shelving to the right) opened up 87 bins, a space savings of 44%.



Cores and samples from 64% (2,302) of the bins in the warehouse have been reboxed or discarded. At this time, we don't anticipate reboxing 12% (404) of the bins because doing so would not save space. That leaves us with 595 open bins and 674 bins left to rebox which will likely yield an additional 169 open bins.