



Geologists in the Public Eye

The spring has been a busy time for many of the geologists here at the Survey. Fred J. Anderson gave a series of talks to undergraduate Geoscience students at Minot State University in Minot, North Dakota on the many different regulatory and investigative programs ongoing at the NDGS as well as an update of current geologic mapping investigations and highlights of ongoing landslide mapping work in the Valley City area. Fred also gave this year's presentation on the *Coal Geology of the Northern Great Plains* at the 2005 Lignite Energy Council's Annual Teacher Education Seminar, held on the campus of Bismarck State College this June.

About 200 sixth graders, in attendance at the 2005 Career Days held at Bismarck and Century High Schools on March 22 and April 21 respectively, received exciting presentations on the many different careers in the geosciences by Survey geologists Lorraine Manz and Fred J. Anderson. Lorraine and Fred provided numerous small group presentations throughout each day to captive audiences of students and teachers.

At Bismarck State College on March 16, in what appears to be turning into a regular venue for Lorraine Manz, 6th grade students at the Gateway to Science Annual Environmental Festival learned about "*Living on the Edge.*" While not exactly high adventure, with the aid of a stream table, which was immensely popular, Lorraine showed the students how streams work, what riparian areas are, and why they are so important. A shortened version of this presentation was given to students on May 5 and 6 at the Annual 3rd Grade Water Festival at the Hughes Education Center in Bismarck – another educational event at which Lorraine looks set to make a regular appearance. On February 15 Lorraine presented the results of a recent study on the use of cosmogenic ³⁶Cl to date glacial deposits in southwestern North Dakota to the North Dakota Geological Society. The talk, entitled "*Cosmogenic ³⁶Cl Dating of Late Pleistocene Glacial Deposits in Southwestern North Dakota*" was also given to a small group of faculty and students at the Department of Geosciences at North Dakota State University on March 28, and is reproduced in a slightly altered form on pages 13 to 16 of this Newsletter.

John Hoganson and Ed Murphy continue to enlighten the state's citizenry on the Corps of Discovery's exploration of the Louisiana Purchase and the American northwest. During April they spoke to audiences in Hazen, Watford City, and Williston at the U.S. Park Service's "Corps of Discovery II" traveling exhibition on the "*Scientific Observations of the Lewis and Clark Expedition in North Dakota.*" On June 4, Ed and John gave their talk at the North Dakota Star Party at Cross Ranch near Washburn and again on June 28 at the ND Heritage Center in Bismarck to a Dickinson State University Lewis and Clark class.

On June 8, Ed spoke on the "*Status of the NDGS Digital Map Program*" at a Soil Survey Geographic Data (SSURGO) luncheon held in recognition of the completion of the of the digital soils program in North Dakota. (See Ed's article on next page).

The educational tours of the Johnsrud Paleontology Laboratory at the ND Heritage Center in Bismarck continue to attract the attention of local schools and other interested parties. Tours were given by John Hoganson and Brett Woodward on March 18 (Minot State group), April 21 and 22 (state legislators), April 27 (ND Historical Society Board), and to school groups on May 3 and 17.

North Dakota Geological Survey Finishes Soils Digitization Program Ahead of Schedule

By Ed Murphy

In November, 2004, the North Dakota Geological Survey completed work on the soils digitization project, 2.5 years ahead of schedule. The soils digitization project was transferred to the Geological Survey from the North Dakota Soil Conservation Committee on July 1, 1997. Two employees (Steve Kranich and Don Thom) transferred over from the Soil Conservation Committee and three others (Elroy Kadrmas, Sheila Glaser, and Bob Shjeflo) were new hires into the program. When the Geological Survey took over, about one-third of the state had been completed and 32 million acres remained. For the first four years, Don, Steve, Sheila, and Bob manually transferred the soil lines from old coverages onto recently flown orthophoto bases. The line work was then scanned and placed into final form by Elroy using ArcInfo software. In 2001, the North Dakota Department of Agriculture obtained a 319 (nonpoint source) grant from the U.S. Environmental Protection Agency to assist with this program. At that point, we switched from manual compilation to computers and all of our compilers learned to use ArcInfo. Agri ImaGIS (out of Maddock and Fargo) took over the digital compilation.

On June 8, the U.S. Natural Resources Conservation Service, ND Department of Agriculture, and the ND Geological Survey hosted a luncheon commemorating the end of the digital soils program in North Dakota. At that luncheon, Agriculture Commissioner Roger Johnson presented the Geological Survey employees who worked on the soils program a copy of a resolution from the North Dakota Industrial Commission that read in part, *"...Due to the dedication and diligence of Geological Survey employees Steve Kranich, Don Thom, Bob Shjeflo, Sheila Glaser, and Elroy Kadrmas, the State of North Dakota finished the project in November, 2004 ... Now, therefore, the North Dakota Industrial Commission commends these Geological Survey employees for the important contributions they made towards completion of the soils digitization project and the Commission members extend their thanks for a job well done."*



North Dakota Agriculture Commissioner Roger Johnson (left) presented framed resolutions of appreciation from the North Dakota Industrial Commission at the recent SSURGO (Soil Survey Geographic Data) recognition and outreach luncheon on June 8. From left to right: Commissioner Johnson, Elroy Kadrmas, Bob Shjeflo, Steve Kranich, and Ed Murphy. Not pictured: Don Thom and Sheila Glaser.

Comings and Goings

Bob Shjeflo

In mid-January of this year, Bob Shjeflo left the NDGS to take up a position with the North Dakota Department of Transportation. Since his hiring in June 1998, Bob worked for the Survey as a geologic mapping technician on the soils digitization project and also on a number of projects under the STATEMAP program. Bob's expertise in the use of GIS software means that he maintains close contact with some of the Survey staff, both as an advisor and friend. We wish him well.

Don Thom

Geologic mapping technician Don Thom left the Survey on June 30. One of the original staff hired in 1997 to work on the compilation and digitization of the state soil surveys, Don was one of the few individuals who saw the project through from beginning to end, having been involved in its start-up in 1991 under the auspices of the North Dakota Soil Conservation Committee. Don's technical and mapping skills were undoubtedly instrumental in the early completion of the soils digitization project (see Ed's article on previous page). He will be sorely missed around here.

Beverly Zwing

A few days earlier, on June 28 we said goodbye to Beverly Zwing. Bev joined the Survey and Oil & Gas Division in July 2001, as an administrative officer, and for nearly four years has carried out her duties with great efficiency and a sense of humor that I, for one, will sadly miss. Bev has accepted a position with the U.S. Army Corps of Engineers.

We wish all of our former colleagues every success in their new ventures.



Dinosaurs and Dragons Summer Reading Program Kickoff an Overwhelming Success

By John W. Hoganson

Thank You North Dakota Geological Survey



On June 1, 2005, the *Discover Dinosaurs and Dragons* summer reading program was launched at the North Dakota Heritage Center in Bismarck. Over 2,300 children and their parents spent the day at the Heritage Center exploring the world of dinosaurs and the imaginary world of dragons, the theme of this year's Bismarck and Mandan Public Libraries and North Dakota State Library summer reading program. Events included displays and activities by the Society of Creative Anachronism, programs and "tattooing" by the North Dakota State Library, North Dakota Forest Service tours of the

plants and petrified tree along the capitol grounds Arboretum Trail, children's book readings by local celebrities, face painting by Mandan Girl Scouts, crafts making by the Bismarck Parks and Recreation Department, a live snake exhibit by Dakota Zoo, and dinosaur presentations and fossil identifications by the NDGS. Stay tuned, because we anticipate that next year's summer reading program kickoff will be larger than this one and will also have, at least in part, a dinosaur theme.

Sponsors for the day included the State Historical Society of North Dakota, the Bismarck Public Library, the Mandan Public Library, the North Dakota State Library, the Bismarck Parks and Recreation Department, the Dakota Zoo, the Society for Creative Anachronism, the Kiwanis club of Mandan, the North Dakota Forest Service, the North Dakota Geological Survey, Cass-Clay, Inc., McDonald's, the Mandan Girl Scouts, and the North Dakota Council of the Arts.

Geological Survey publishes *Prehistoric Life of North Dakota* poster

By John W. Hoganson and Brett Woodward

Educators frequently bring their classes to the North Dakota Heritage Center to visit the NDGS Johnsrud Paleontology Laboratory and fossil exhibits. This has been a popular and important activity of the Survey's outreach program. The teachers have often asked if there is a source of general information about North Dakota prehistoric animals that they could use in their classrooms. In response, we recently published a poster titled "*Prehistoric Life of North Dakota*," Educational Series 30. The full-color poster is 2 feet by 3 feet in size. One side contains images of 47 prehistoric animals superimposed on a geologic map of North Dakota. Included in the prehistoric menagerie are artists' renditions of *Tyrannosaurus rex*, large marine lizards called mosasaurs, a 30-million-year-old saber tooth cat, sharks, crocodiles, Ice Age woolly mammoths and many more. The images are paintings by many of the most well-known prehistoric animal artists. The animals are positioned on the map approximately where fossils of the animals have been discovered.

Photographs and descriptions of about 80 spectacular fossils from North Dakota are shown on the reverse side of the poster. Fossils from the NDGS State Fossil Collection at the Heritage Center and paleontology collections in the Department of Geology and Geological Engineering at the University of North Dakota, the Geology Department at North Dakota State University, and the Geology Department at St. Lawrence University, Canton, New York are included. The fossils are arranged by geologic time period and the formations in which they are found. They range in age from the Cretaceous, about 80 million years ago, through the last Ice Age, just a few thousand years ago. There are outcrop photographs of typical rock exposures for each of the geologic periods. Descriptions of North Dakota's climate and environment for the different geologic periods, with habitat reconstruction paintings done by several artists, are also included.

The Industrial Commission provided a copy of the poster to each school (about 600) in North Dakota. Governor John Hoeven, commission chairman, commented that, "The Industrial Commission is happy to be able to provide a complimentary copy of this poster to each school in our state, so that our children can experience in a very vivid way the incredibly diverse natural history of North Dakota." He went on to say that, "The Geological Survey has done an excellent job of telling the fascinating story of the animals that have roamed our state for the last 80 million years." Commissioner and Attorney General Wayne Stenehjem stated that, "Fossils serve as a key to our State's rich history" and that the poster is "an excellent tool to be used by our educators in telling the story of the various animals that inhabited our State through geologic time, from dinosaurs to woolly mammoths and saber tooth cats." Agriculture Commissioner Roger Johnson reflected that, "Everyone, not just young people, can learn something from this poster. It is a colorful and fun way to learn about our State's ancient past and the unusual animals that once lived here."

We have already received positive comments about the poster from the education community. Gilbert Black, principal at Midkota High School, wrote that the poster is "an excellent representation of North Dakota prehistoric life" and stated that he put the poster "to immediate use today (in his biology class) as we are discussing reptiles and their historic and current place in North Dakota." In a note to the NDGS, Dr. Andrew Hennessey, Kulm High School stated that the poster was "excellent" and will help him in covering fossils in his classes.

The full-color poster (Educational Series 30) retails for \$3, plus an additional \$2 for shipping and handling. A page-sized version of the poster (Miscellaneous Map 37) costs \$0.25. Both are available from the North Dakota Geological Survey at (701) 328-8000.



Figure 1. Front side of the poster.

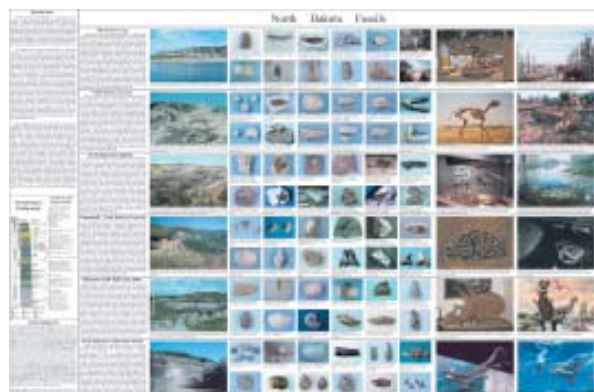


Figure 2. Back side of the poster.

North Dakota Petroleum Council Fieldtrip

By Ed Murphy

Once again, the North Dakota Geological Survey assisted the North Dakota Petroleum Council with the fieldtrip portion of their annual teacher education seminar. This is the thirteenth year the Petroleum Council has sponsored the teacher seminar. Participants received one and one half days of class room instruction, a two hour fieldtrip to the Tesoro Refinery in Mandan, and an all day fieldtrip to an oil well and a gas production facility at Tioga. There is no fee for the teachers and upon successful fulfillment of course requirements they receive one hour of continuing education credit from the University of North Dakota. Ron Ness (President of the ND Petroleum Council), Lynn Helms (Director of the ND Oil and Gas Division), Kent Ellis (Special Projects Coordinator for the Bismarck Public Schools), and myself co-led the fieldtrip to Tioga. Amerada Hess provided a tour of their gas facility and provided access to an oil well they were drilling south of Tioga. Fieldtrip participants included K-12 teachers as well as industry and government representatives.



Lynn Helms (third from the right) guided small groups around the drilling rig, pointing out the mud system and safety features. The teachers had the opportunity to stand in the dog house of the rig and observe roughnecks pull drill pipe out of the hole as they prepared to set the surface casing.



Roughnecks "break pipe" (unscrew the drill collars) by holding tongs while the driller (left edge of photograph) rotates the pipe counterclockwise. The crew was pulling the drill pipe out of the hole in preparation for setting the surface casing. The driller operates the motors on the rig, i.e., the rotation and the lifting mechanism for the pipe.



A group photo of fieldtrip participants at a granite monument marking the spot of the Clarence Iverson No. 1, the first producing oil well in North Dakota. The well was drilled in 1951 and produced oil until 1977. To the right of the monument, in the front row, is Tude Gordon (white baseball cap), believed to be the only living person that worked on the Clarence Iverson. Tude reminisced with the group about his oilfield experiences.



Kathy Neset (Neset Consulting) used oil well cores, well samples, and lithologic logs to explain well site geology and the important functions that mud logging companies and consulting geologists perform during the drilling of an oil well. On the left side of the table is a viewer with a black light used by geologists to look for the presence of hydrocarbons on drill cuttings. Hydrocarbons fluoresce under black light.