# News In Brief

**Compiled by Mark A. Gonzalez, Editor**

## Hoganson Chosen as the 2001 Master Alumnus for Contributions to the State's Paleontological Program

**Article courtesy of Steve Bergeson, University Relations, North Dakota State University**

Fossils and prehistoric animals are the rage. Recent blockbuster movies have brought dinosaurs to the big screen. The public's interest has created hot-selling toys and novelties like dinosaur-shaped vitamins or candy. That popularity is proving to be a double-edged sword for alumnus John Hoganson, a paleontologist with the North Dakota Geological Survey and curator of the State Fossil Collection located at the North Dakota Heritage Center in Bismarck.

Dr. Allan Ashworth (left), Chair of the Department of Geosciences at NDSU, presented John Hoganson with the 2001 Master Alumnus Award from the College of Science and Mathematics during Master Alumnus week activities in March.

"Some people call it 'dinosaur hype.' Others say it is the 'dinosaur rip-off,'" said Hoganson, the first student to graduate from NDSU's earth science program in 1970 and the 2001 Master Alumnus of the College of Science and Mathematics (Fig. 1). "People are fascinated with prehistoric life. That's good, but it has also created a problem for us. We're losing a lot of important fossil resources to out-of-state and generally unqualified collectors."

Since the 1880s, North Dakota and other western states have drawn scientists with the lure of fossils of ancient plant and animal life. "A lot of North Dakota fossils are sitting in several eastern museums and universities. We've found the remains of 12 different species of dinosaurs, all from about 65 million years ago," Hoganson said. "The most famous of them would be Triceratops and Tyrannosaurus rex."

But the most spectacular North Dakota fossil was found by two local people, Mike Hanson and Dennis Halvorson, near Cooperstown. "It is a marine reptile, called a mosasaur, that lived at the same time as the dinosaurs. It's 23 feet long—the skull alone is three feet long. They had flippers and huge teeth," said Hoganson, noting the animal's restored skeleton is now on display at the Heritage Center. It was donated to the state by the land owners, the Tranby family.

The finds have attracted the interest of commercial collectors. Two years ago, seven private firms came to the state looking for fossils and bones. "The commercial fossil collectors are making contracts with private land owners and ranchers. We never know what is being found," Hoganson said. "I'd like to see a law passed to require that reporting."

During his March visit to campus, Hoganson said high public interest means a bright future for the field of paleontology. He expects many opportunities for students who can persevere, enjoy the outdoors, and are not driven by financial reward. "Very few paleontologists get into positions where they are going to make big bucks," he said. But Hoganson said the job's rewards are the quest for knowledge and the intrigue of adventure. "Every time I go out into the field, it's a thrill. There's always something new," he said. "We've been finding wonderful things that have never been found before in North Dakota. So, it's always exciting."

He also emphasizes that the study of fossils teaches valuable lessons for all of us. "The only way we know what kinds of animals and plants lived in the past is through finding their fossilized remains," Hoganson said. "How else would we know that 58 million years ago, North Dakota was a sub-tropical rain forest, or that 75 million years ago, Fargo was covered by an ocean? Fossils are very important scientific and educational resources. We need to preserve them for future generations."

And, according to Hoganson, the fossils may give us significant insights into what may lie ahead. "The more we understand the past and the changes in climate and environment, the more we may understand what could happen in the future. That's why fossils and the people studying them are so important," he said.

Prior to his present position, Hoganson received a Ph.D. from the University of North Dakota, was employed as a paleontologist with a major oil company, and taught graduate-level courses at the University of North Dakota. He has numerous publications to his credit, including book chapters, journal articles, and abstracts. In 1996, he received an award from the U.S. Forest Service, Custer National Forest for his fossil resource management efforts and was honored with the 1993 Governor's Award for Excellence in Public Service.

## Geological Survey and United States Forest Service–Dakota Prairie Grasslands sign cooperatively Memorandum of Understanding to manage paleontological resources

**by John W. Hoganson**

In 1986, the North Dakota Geological Survey signed an agreement with the United States Forest Service–Custer National Forest to manage cooperatively paleontological resources found on USFS administered lands in North Dakota. This was the first agreement of its kind between the USFS and a state agency. In January 2001, that commitment was reaffirmed when the Geological Survey and newly established USFS-Dakota Prairie Grasslands endorsed a new Memorandum of Understanding regarding cooperative management of fossil resources.

The United States Forest Service, as a federal land-management agency, has statutory responsibility under the Antiquities Act of 1906 and the Federal Land Policy Management Act of 1976 (FLPMA) to manage and protect significant paleontological resources. The North Dakota Geological Survey has statutory responsibility to conduct investigations designed to promote public understanding of North Dakota's paleontological and other natural resources and to operate and maintain a public repository for North Dakota's fossils (Section 54-17.4, N.D.C.C.). Also, the North Dakota Industrial Commission, acting through the Office of the State Geologist, has statutory responsibility to protect paleontological resources located on land owned by the State or its political subdivisions (Section 54-17.3, N.D.C.C.).

Both the USFS and NDGS have statutory responsibilities and a mutual professional interest in the management of paleontological resources. So it is advantageous to both agencies to work cooperatively in matters relating to the recognition, management, and protection of fossil resources and their scientific values. This agreement establishes a cooperative effort with respect to management and protection of significant paleontological resources on Forest Service lands of the Dakota Prairie Grasslands, specifically the Little Missouri National Grassland, Grand River National Grassland, Cedar River National Grassland, and the Sheyenne National Grassland.

The following are some of the management procedures agreed to.

1) The USFS will forward to the NDGS applications that they receive to conduct paleontological activities on Forest Service lands in North Dakota. The NDGS will review the professional qualifications of the applicant and the proposed activity and will provide recommendations to the USFS whether a permit should be issued.

If the NDGS receives a request to collect paleontological resources on Forest Service lands, the NDGS will inform the applicant that a permit is required from the Dakota Prairie Grasslands office in Bismarck.

2) The NDGS and USFS agree to provide each other with information about previously and newly discovered paleontological sites on Forest Service lands in North Dakota.

3) When a potentially significant paleontological site on Forest Service lands in North Dakota is discovered and/or threatened by human activities or natural events that could impact or destroy the site, a site-significance determination willbe made by the NDGS, and if appropriate, mitigation measures will be recommended.

4) Through this agreement, qualified professional paleontologists with the NDGS may collect paleontological specimens on Forest Service lands in North Dakota.

5) As a result of this agreement, the USFS has designated the NDGS State Fossil Collection at the North Dakota Heritage

Center in Bismarck as a repository for paleontological specimens collected from Forest Service lands in North Dakota. The NDGS agrees to curate the fossil specimens and maintain records regarding the specimens.

The NDGS has established similar agreements, to manage cooperatively paleontological resources on other federally administered lands in North Dakota, with the Federal Bureau of Land Management, Army Corps of Engineers, and Bureau of Reclamation.

## NDGS to study the effects of stock ponds on sedimentation processes in the Little Missouri National Grassland

The Little Missouri Badlands experience some of the highest rates of erosion and sediment movement in the world. These high rates result from a combination of sparse vegetation, steep topography, weakly lithified bedrock geology, and a semiarid climate, which is punctuated by intense summer thunderstorms that produce brief but powerful runoff events. The production and transport of sediment through the river system has affected the wildlife that has evolved in the Little Missouri River and nearby, similar rivers, such as the Yellowstone and Missouri Rivers. Endangered and threatened species, such as the pallid sturgeon, least tern, and squaw fish, are some of the life forms that have evolved and prospered in muddy, sediment-rich waters.

In the past 60 years, more than 3000 dams or stock ponds have been built in the Little Missouri National Grassland. The stock ponds trap sediment and typically release water that contains less sediment. The U.S. Forest Service wants to know if the overall effect of these dams is to reduce the sediment supply of the Little Missouri River, thereby altering the environment of some threatened and endangered species.

Mark Gonzalez has signed a Memorandum of Understanding with the U.S. Forest Service—Dakota Prairie Grasslands to conduct a study of sedimentation processes along small streams in the Little Missouri National Grassland. Although it is widely known that dams trap sediment, it is also possible that the cleaner (i.e., less sediment filled) waters released from dams have greater capacity to erode sediment from channel reaches below dams. Gonzalez will compare streams with and without stock ponds and will quantify the volume of sediment that typically moves through undammed streams and the volume of sediment that is trapped in reservoirs. Finally, he will examine if sediment is mined from channels in reaches beneath dams and if this mining compensates for sediment trapped in reservoirs.

## NDGS Receives STATEMAP Award from the USGS

The NDGS received a $52,500 grant for the National Cooperative Geologic Mapping Program, STATEMAP. STATEMAP is a cooperative program between the U.S. Geological Survey and participating state geological surveys to produce digital geological maps of the United States. This is the sixth STATEMAP award that the NDGS has received since 1993.

In the most recent STATEMAP award, Ed Murphy and Mark Gonzalez will map the surface geology in parts of nine, 7.5-minute quadrangles (scale 1:24,000), which surround the North and South Units of Theodore Roosevelt National Park. Parts of these quads within the Theodore Roosevelt National Park were mapped by Bob Biek and Mark Gonzalez in a previous STATEMAP project. The grant also covers the expense to digitize the Killdeer 1:100,000-scale map, which Ed Murphy recently completed as part of the Dunn County mapping project (see **New Publications**).

Detailed geologic maps contain the principal geologic data used in the determination of geologic hazards, such as landslides and floods , the identification of avoidance features, such as abandoned dumps and mine-collapse structures, and the location of economic resources, such as coal, clay, sand, and gravel deposits. In urban areas and transportation corridors, geologic maps contain vital information used by developers, geotechnical consultants, and city engineers.

## New Faces: Vandel Interns with NDGS

In December 2000, Quentin Vandel began an internship on the Coal-bed Methane study under the direction of Ed Murphy. Quentin hails from Sabin, Minnesota, and attended school at nearby Moorhead. He recently completed his B.S. degree in Geology at NDSU. His favorite courses there included Prof. Schwert's Geomorphology and Prof. Eidukat's Mineralogy.

Quentin has been examining well logs and calculating reserves of strippable lignite deposits in western North Dakota. When Ed gives him some spare time, he heads outdoors to enjoy cross-country skiing in the winter and running and hiking in the summer. One of his favorite places to hike is the North Unit of Theodore Roosevelt National Park—great choice!

Quentin's internship ends in August when he will begin graduate studies with Nicholas Pinter at Southern Illinois University in Carbondale. His thesis study will involve tectonic geomorphology, specifically the development of mountain fronts along the Owens Valley/White Inyo Mountains in California.

# X Marks the Spot: #1

**By Mark A. Gonzalez**

This is the debut of a new column in the *NDGS Newsletter*. As a small gesture of thanks to our loyal readers, I am initiating a contest to enable readers to test their knowledge of North Dakota geography and geology. In this and subsequent issues, I will include a topographic map, ground photo, or air photo of some unidentified place in North Dakota. Readers will have an opportunity to examine the maps or photos and then to submit answers to questions regarding the locale. Answers may be submitted by mail, e-mail, or via our web site, which will contain the contest as it appears in the *NDGS Newsletter*.

Those individuals who submit correct responses will qualify for a random drawing to win a prize. The staff at the NDGS will conduct the drawing. Prizes for the first contest will include a copy of John Bluemle's *Face of North Dakota* (third edition) for one respondent and a Geologic Map of North Dakota for another. In future contests, NDGS will award these and other items, including casts of fossils found in North Dakota, posters, geologic fieldtrip guidebooks, and other items distributed by the NDGS.

For the debut contest, I have selected an easily recognized landform of North Dakota. Of course easy is relative. If you have ever been to this site, you will immediately recognize the spot on the topographic map. Even if you haven't been there, you might deduce the answer by studying some of the information provided on this topographic map and perhaps by consulting other maps of North Dakota. When you have identified the location marked by the X, submit your responses to these questions:

1) What is the place name of the location marked by the X (required for entry into drawing)?
2) For extra credit: What is the geologic formation (formal stratigraphic name) that crops out at this locality? (Note: this is not required for entry drawing, but is sure to win you the adulation of our readers.)

Responses submitted by July 15, 2001, will be eligible for the prize drawings. Be sure to include your name, mailing address, phone number, and e-mail address (optional). The names of everyone submitting a correct response will appear on our web site. (Inform us if you wish to remain anonymous.) Good luck.

Answers submitted by mail should be sent to:
Editor, NDGS Newsletter
Attn: Spot Contest
600 E. Boulevard Avenue
Bismarck, ND 58505-0840

Answers submitted by e-mail should be sent to:
ndgspubs@state.nd.us

To submit answers via the web, visit our web site at http://www.state.nd.us/ndgs and select the button "X Marks the Spot." Only one answer permitted per person. The contest is not open to employees of the Industrial Commission or members of their families.