
1998 NORTH DAKOTA EARTH SCIENCE FAIR

by Ann M.K. Fritz

If success can be measured in numbers, then the NDGS's first Earth Science Fair was a definite hit. Over 200 kids were at the North Dakota Heritage Center in Bismarck on Friday, October 23 for the first day of the Earth Science Fair. Events continued through Sunday, October 25 and featured a wide range of activities and demonstrations for students, teachers, and the general public.

Sponsored by the North Dakota Geological Survey (NDGS) and the State Historical Society of North Dakota, the event was held in conjunction with Earth Science Week. "Our goal was to get people to recognize how Earth science affects their daily life, whether it be the petroleum that goes into their car or the soil beneath their feet - and I think we succeeded," said Ann Fritz, geologist with the NDGS and coordinator of the event. Fritz noted that almost the entire NDGS staff was actively involved in planning the event. The event was publicized in newspapers statewide, and a local television crew was on hand both Friday and Saturday.

The Earth Science Fair began on Friday, October 23 with a day designed for students and their teachers only. Pre-registration was required for the Friday sessions and spaces were filled on a first come - first served basis. The initial response for the Friday activities was overwhelming: 65 registrations were received for a total of 1,258 students. However, due to space and time constraints, only 23 groups could be accommodated. Two hundred and fifteen students from 17 different schools and 5 home schools from across the state attended the Fair (*Figure 1*).

Students and their teachers participated in hands-on experiments about oil, sedimentary basins, soil, glaciers, rocks, geologic maps, and fossils. One student from St. Leo's School in Minot commented, "I loved it! I thought it would be like a big auditorium where one after another grown-up talked, but it was not like that." Sessions were approximately 45 minutes long and were presented by an NDGS geologist or Natural Resource Conservation Service (NRCS) soil scientist. Session activities included, for example, "layer cake geology" - in which students cored a "sedimentary basin" (a layer cake), measured the core, constructed a stratigraphic column and cross section of the "basin." At the conclusion of the demonstration, the students could eat the "basin"! Other demonstrations topics included glacial deposition and erosion, porosity and permeability, soil texturing, constructing a geologic map, and searching for fossils.

Teachers attending the Fair received a packet that included information from both the NDGS and the American Geological Institute (AGI), which was the national sponsor of Earth Science Week (see inset p. 18). The packets contained a soil poster, a geoscience careers poster, a geologic time bookmark, and an Earth Science Week Activity Book all provided by AGI. Also included in the packets was a copy of the Summer/Fall 1998 issue of the *NDGS Newsletter*, a list of selected Earth science internet sites, and a "Welcome Page" describing the goals of Earth Science Week, educational publications of the NDGS, and other sources of free or nominally priced Earth science information and Earth science curricula.

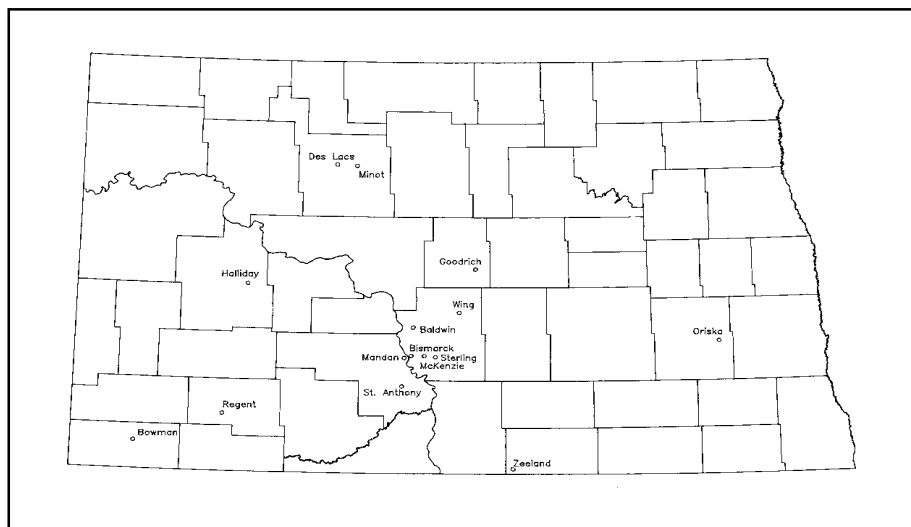


Figure 1. Hometowns of the participants of the 1998 North Dakota Earth Science Fair. Distance was not an obstacle for most teachers and students.

The Earth Science Fair continued on Saturday, October 24 with an open house for the general public, featuring family-oriented events and activities. The day began at 1 p.m. with a walking tour of the State Capitol grounds, followed by a lecture on prehistoric life in North Dakota, an Earth Science Film Festival, and ongoing demonstrations by NDGS geologists. These geologists were available to answer questions about North Dakota's rocks, minerals, fossils and other natural resources.

The Earth Science Fair concluded on Sunday, October 25 with a slide lecture entitled "The Rise and Fall of the Dinosaurs," presented by Dr. John Hoganson, paleontologist with the NDGS.

All events on Saturday and Sunday were free and open to the public.

Teachers were asked to evaluate the Friday activities. Comments from one teacher sum up the general attitude about the Earth Science Fair:

"All of the sessions that we attended were excellent. My students were very impressed. They even talked about the sessions on the way home! The Earth Science Fair is a HIT!.... I know that I would put my preregistration in right now for next year if that were possible."

Based on such positive comments, keen interest from both students and teachers, and good media coverage, the NDGS will continue sponsoring Earth Science Week events. In fact, AGI has already designated October 10 - 16, 1999 as Earth Science Week. Look for details regarding next years Earth Science Week activities in the next issue of the NDGS Newsletter.



Layer Cake Geology: A teacher helps her student take a core sample from a layer cake. The different layers of the cake represent layers of sedimentary rock deposited in a sedimentary basin, like the Williston Basin.



Layer Cake Geology: Measuring and describing the "core." NDGS geologist Randy Burke helps a student measure and describe his cake core sample.



Layer Cake Geology: Creating the cross-section. Once the cores have been measured and described, students create a cross section of the cake.



Students create a "glacial lake" in a presentation on glaciers in North Dakota. In this demonstration, students take a teaspoon of sand and deposit it in a glacial "lake," the lake is actually a 2-liter soda bottle with the top cut off. Earlier, students had mixed sediment with shaved ice to represent sediment deposited directly by a glacier. Students then compared the sediment deposited in a glacial lake to the sediment deposited by glacial ice.

Earth Science Week is a National Event

Earth Science Week was celebrated not only in North Dakota, but also in 39 other states. Activities ranged from public lectures in South Dakota, to guided tours and hikes in Arizona, to observing the drilling and installation of a monitor well in Texas. Oregon Senator Ron Wyden spoke eloquently about the importance of Earth Science, and the celebration of Earth Science Week. The following statement by Senator Wyden was entered into the Congressional Record in July:

Mr. President, in the nineteenth century, Merriwether Lewis and William Clark explored the western reaches of our expanding country. As they explored my home region of the Pacific Northwest, Lewis and Clark catalogued the mineral and natural resources of the land. In particular, they spoke of a mighty river known to the local inhabitants as Nch'i Wana, the Great River. We know it today as the Columbia River and its importance as a reliable source of water and power to the people of the Pacific Northwest is undeniable.

When twentieth century American explorers embarked on a similar journey to explore the Moon, one of the earliest actions was to bend down to the surface and pick up a rock. That simple movement framed an ancient reflex that underscores the basic imperative to explore our surroundings. Today, I want to recognize the important role played by the earth sciences in expanding our economy, supporting our national goals, and increasing our knowledge of the larger world.

Modern geophysical research reveals that ours is a dynamic planet. On the Earth's surface, great tectonic plates shift continental positions with terrific force. On the oceans' surface, microscopic plants and animals help regulate global atmospheric gases and serve as the foundation of our planet's food web. In the deep ocean abyss, mysterious and wondrous animal communities thrive in endless darkness by deriving life-sustaining nutrients from active volcanic vents.

Earth science is a global science that speaks a global language and unites people by promoting sustainable development. The study of earth science provides the skills necessary for locating and utilizing natural resources, understanding natural processes that often conflict with human designs, and comprehending our natural heritage through the unusual perspective of geologic time. The unique panorama of geologic time allows us to observe the full range of natural processes on Earth and aids in developing a comprehensive view of the natural world beyond a perspective limited only to that of human influence. In my home state of Oregon, we celebrate the land and respect the power of nature. We have learned to protect our citizens and expand our economy by working with nature and prudently mitigating natural hazards. In consideration of the importance of the earth sciences in the daily lives of all Americans, I submit, for the Record, the resolution issued by the Association of American State Geologists.

The resolution follows:

Whereas the earth sciences are fundamental to society; and

Whereas the earth sciences are integral to finding, developing, and conserving mineral, energy, and water resources needed for society; and

Whereas the earth sciences promote public safety by preparing for and mitigating natural hazards such as floods, landslides, earthquakes, volcanic eruptions, sinkholes, and coastal erosion; and

Whereas the earth sciences are crucial to environmental and ecological issues ranging from climate change and water and air quality to waste disposal; and

Whereas geological factors of resources, hazards, and environment are vital to land management and land use decisions at local, state, regional, national, and international levels; and

Whereas the earth sciences contribute critical information that enhances our understanding of Nature,

Therefore, be it resolved that the second full week of October henceforth be designated as Earth Science Week.



Students examine microscopic fossils using a binocular microscope in the session on prehistoric life in North Dakota. One of the goals of the Earth Science Fair was to not only introduce students to what geologists do, but also to the tools that geologists use.



Students use tweezers and a magnifying glass to pick out 60 million-year-old shark teeth and fish vertebrae from the tray of sediment.



NDGS staff member Johnathan Campbell helps students clean dinosaur bones.



A student examines a rock in "Geoslueth," a geologic mapping exercise designed by NDGS geologist Karen Mitchell.



NDGS staff member Steve Kranich helps students use a stereoscope to see a 3-D image of the eruption of Mount St. Helens.



NRCS soil scientist Jackie Henderson demonstrates how to properly describe soil, with a little water and a Munsell soil-color chart.

President Clinton's Earth Science Week Message

The White House, Washington, D.C. - October 9, 1998

Warm greetings to all those observing Earth Science Week, sponsored by the American Geological Institute.

From meteorology to geology to oceanography, the earth sciences unlock the mysteries of our planet. Earth science research has given us the knowledge to find, develop, and conserve the Earth's precious natural resources while safeguarding our environment. It has also provided us with a fuller understanding of global climate patterns and helped communities better prepare for and mitigate the devastating impact of such natural hazards as hurricanes, tornadoes, floods, and earthquakes.

Earth Scientists are the stewards and caretakers of our environment, and this week offers a special chance to learn about the miracles of mysteries they study each day. All of us are indebted to these dedicated men and women whose contributions to research, innovative technologies, and new knowledge have improved the quality of our lives and the well-being of our nation.

I encourage all Americans, especially our young people, to participate in the different Earth Science Week activities occurring in schools and communities across the country. By understanding more about our planetary system and the natural processes that shape our world, we preserve the Earth's splendor for generations to come.

Best wishes for a successful observance.

Bill Clinton