
MEETINGS, CONFERENCES & WORKSHOPS

Fire Workshops by Mark A. Gonzalez

Although not new, geologists' interests in the effects of fire on the landscape were rekindled following the Yellowstone fire of 1988. My former colleague, Grant Meyer, studied the sedimentary response of steep, burnt, mountain basins in Yellowstone National Park for his dissertation. His work led to a stampede of other studies to investigate this exciting new field of geomorphology and sedimentology. In 1999, Grant Meyer (University of New Mexico), John Moody (USGS, Denver), and I chaired a special session entitled, "Fire and Geology: Surface Processes and the Stratigraphic Record," at the Geological Society of America meeting in Denver. Over 30 scientists presented research papers at this session. Interest in fire and geology continues to grow after several recent years of especially numerous and spatially large fires in the western United States.

Recently, I was invited to attend two fire workshops. The first took place in Watford City, on October 12, 2000. This was a multi-agency meeting that included area ranchers and land managers and scientists from North Dakota Game and Fish, the U.S. Wildlife Service (Lostwood National Wildlife Refuge), the McKenzie Ranger District of the Little Missouri National Grasslands, the Dakota Prairie Grasslands office in Bismarck, and the North Dakota Geological Survey. Participants examined the effects of the Gap Fire, which burned nearly 60,000 acres on October 31, 1999, in McKenzie County and adjacent parts of Montana. Much of the discussion concentrated on the prehistoric role of fire in the badlands ecosystem and how to use prescribed fire in today's management of federal and state lands.

On November 8 and 9, 2000, the USGS and Association of American State Geologists teamed together to conduct another Fire Workshop in Denver. Participants visited two burnt areas near Denver, the Hi Meadows fire of 2000, which burned several homes in the foothills west of Denver, and the Buffalo Creek fire of 1996, which was best known not for the fire, but for the rainstorm with an estimated 100-year recurrence interval that occurred just weeks after the fire. The catastrophic rainfall on a fire-denuded landscape created a flood with an estimated recurrence interval of more than 500 years.

Although fire is a widely recognized part of the natural, pre-settlement landscape in the western United States, much remains to be learned about the recurrence interval, intensity, geologic effects, and ecological responses to fire. A

century or more of fire suppression has created unprecedented fuel loads in some places. A careful, interdisciplinary look at fire management is overdue. Many federal agencies, including the Dakota Prairie Grasslands, will be conducting prescribed burns in the near future to improve the health of ecosystems. Geologists can examine ancient and recent deposits to provide ecologists and fire managers with important proxy information on the recurrence interval, extent, and geological responses of landscapes to fire in pre- and post-settlement times.

North Dakota State Science Standards by Mark A. Gonzalez

A dedicated team of educators in the state has been meeting to revise the content standards for the North Dakota State Science Standards. I was invited to join this group in their most recent meeting on November 4, 2000, when they met in Bismarck. The state science standards will serve as a guiding, though not binding, document for local school districts. One of the most debated changes to the document was the re-inclusion of a specific benchmark for the teaching of biological evolution. The theory of biological evolution had been included in state science standards until 1998. Although I was not witness to earlier meetings, it appears the theory was eliminated as an explicit benchmark at a recent meeting, though evolution remained a part of the standards in a less prominent fashion. Perhaps in reaction to a recent study by the Lerner Foundation (which was highly critical of the Science Standards of North Dakota, because evolution was missing as a benchmark), and perhaps as a realization that the theory of biological evolution is central to the teaching of much of biology, the theory was re-instated as a specific benchmark in high school curricula.

The writing team will be meeting at least two more times in the first few weeks of 2001. I hope to persuade the team that the theory of plate tectonics is as central to the understanding of earth science as the theory of biological evolution is to biology. By making the theories of plate tectonics and biological evolution specific benchmarks, educators can use some of the most powerful unifying theories in modern science to explain innumerable ideas and concepts in geology and biology. The theory of plate tectonics is central to understanding not just the movement of lithospheric plates, but also to understanding the internal structure of earth, the types and global distribution of volcanoes, the types and location of fault zones and earthquakes, the distribution of different rock types, the forces that create mountain chains, some of the factors that lead to extinction and evolution of some forms of life, and the factors that explain some climate changes

that occur on geological time scales. A declaration that makes the theory of plate tectonics a benchmark in the state's science standards is not another perfunctory requirement, but a recognition that it is the unifying theory that makes much of geology easily comprehensible and explainable. Adoption of evolution and plate tectonics benchmarks both improves and modernizes the science curriculum in North Dakota.

C2E2

by Mark A. Gonzalez

A diverse group of private foundations, environmental groups, industries, and state (including the NDGS) and federal agencies, joined together 5 years ago to form the Coalition for Conservation and Environmental Education (C2E2). This group met most recently on November 9, 2000. As a first time attendant to this group, I was impressed with their mission statement and vision. Although the goals are lofty, impressive, and generally beneficial to the interests of North Dakotans, the execution of plans is challenged by the shortage of available funds. Currently, members of C2E2 have been promoting several educational curricula, including the popular projects WILD, WET, and Food Land and People. C2E2 also is a catalyst for the annual Envirothon and an active supporter of local and state Science Fairs.

International Society of Vertebrate Paleontology

John Hoganson traveled to Mexico City for the annual meeting of the International Society of Vertebrate Paleontology in October. Hoganson presented a paper (see **New Publications**) describing evidence of the extinction of cartilaginous fish at the end of the Cretaceous Period. The Cretaceous/Tertiary boundary coincides with global mass extinctions. Study of the extinction of cartilaginous fish, found in the Breien Member of the Hell Creek Formation in North Dakota, provides evidence of changes in the environmental conditions in the shallow epicontinental sea that inundated much of North Dakota at the end of the Cretaceous Period.

AGI Curriculum Leadership Workshop

See the column **TEACHING TOOLS** for a detailed discussion of this workshop.

Geological Society of America, Annual Meeting

Ed Murphy and John Bluemle attended the annual meeting of the Geological Society of America, which was held in Reno, Nevada, during the third week in November. Ed presented one paper and was co-author on another (see **New Publications**). Ed's papers cover two fascinating topics in North Dakota geology. Ed's study of landslides provides detailed information on the most destructive geologic

process in western North Dakota. Ed has calculated that in some places along the Little Missouri River landslides have affected nearly 40% of the landscape. Landslides have caused several million dollars of damage to roadways in western North Dakota in recent years. Ed's other paper discusses the identification of another important Cretaceous/Tertiary boundary site in south-central North Dakota. As mentioned above within the piece about the International Society of Vertebrate Paleontology, study of so-called K/T (Cretaceous/Tertiary boundary) sites provides important information on the radical environmental changes that took place at the end of the Cretaceous Period, when there were global mass extinctions. The K/T boundary has been identified in several places throughout North Dakota, making the state an important locality in geological and paleontological studies.

John and Ed also used the meeting to begin their search for a Quaternary Geologist to participate in ongoing STATEMAP projects. In addition, they attended the interim meeting of the Association of American State Geologists, which is held in conjunction with the national meeting of the Geological Society of America.

Dean Pearson Receives National Award from Paleontological Society **by Ed Murphy**

Dean Pearson of Bowman, North Dakota, received the Paleontological Society's Harrell S. Strimple award, on November 15, at the Annual Meeting of the Geological Society of America in Reno, Nevada. The Strimple award is given in recognition of a lifetime of significant achievements in the field of paleontology by a non-professional (hobbyist). At 43, Dean is thought to be the youngest recipient of the award. Dean assisted in the creation of the Pioneer Trails Regional Museum and in the establishment of an impressive paleontology laboratory in a wing of the museum. Kirk Johnson of the Denver Museum of Natural History presented the award citation. He remarked on Dean's long and impressive list of accomplishments, noting, "Dean has undertaken and supervised research projects in Late Cretaceous, Paleocene, and Eocene invertebrates, plants, and vertebrates. He has been instrumental in organizing, staffing, and participating in surveys on state, federal, and county land. His significant discoveries include a new diverse Chadronian mammal site and the first *Tyrannosaurus rex* skeleton from North Dakota." In his acceptance remarks, Dean thanked his family for their understanding and patience in allowing him to spend so much time pursuing paleontological endeavors, acknowledged the assistance of his fellow Pioneer Trails Museum volunteers, and singled out local paleontologists John Hoganson (NDGS), Joseph Hartman (UND), Allen Kihm (Minot State), Marshall Lambert (Carter County Museum), Doug Nichols (USGS), and Kirk Johnson for influencing his passion.