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Nebraska Earth Systems Education Network – Fall 2001

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Fall 2001 Newsletter

Issue Number 28

"Everything is Connected to Everything Else." - Dave Gosselin, NESEN Director

The events of September 11 have, without a doubt, had a significant impact on each of us as individuals and as a country. The aftermath of this tragic event has clearly demonstrated how "everything is connected to everything else." At all levels, there have been an uncountable number of examples of the importance of collaboration and cooperation in achieving a variety of objectives. One of the important aspects of collaboration and cooperation is that mutual respect and understanding for what each group brings to the relationship is developed. Throughout this academic year, let's do what each of us can to improve collaboration and cooperation with our teaching colleagues and, more importantly, with our students. Taking this approach will not only improve what we do, but it will also make our working environment more pleasant. Have a great year.

Right Before Your Eyes -- Introducing Universal Data Visualize by Mark Mesarch

In the past, when you found a database on the World Wide Web that had some interesting data you wanted your students to investigate, they had to download the data and import it into a spreadsheet or graphing software of some kind. WELL, NOT ANYMORE! Your students can graph the data right on the web with a new tool called the Universal Data Visualizer or the UDV. Nebraska Educational Television, in coordination with NESEN, the Center for Advanced Land Management Information Technologies, and the Konza Environmental Education Program, are developing this program. The first two databases, solar energy interacting with different kinds of plant canopies and groundwater levels in the Sandhills, are available for "test-drives" right now. You can access the site and test these by going to <http://www.americasfarm.org/>. Click on the MENU button at the top of the screen, then click on the Data Visualizer button. Some explanation and examples of the UDV are presented. To actually use the UDV with one of the data sets described above, click on USE UDV, followed by the NESEN logo. After you've finished, look for a survey to tell us how we can make this tool better and how you used the UDV in your classroom.

"Awesome Aquifer Adventure" Videos by Lori Davison

The Awesome Aquifer Club (AAC), sponsored by the Groundwater Foundation, is a classroom-based program that promotes groundwater education during the school year through classroom and community activities. The club is available to any interested educator.

This year the AAC is announcing the availability of a new video, "The Awesome Aquifer Adventure." This lively and exciting seven-minute video features "G.W." Gecko, the official AAC mascot, teaching and learning about groundwater with students at the annual Children's Groundwater Festival in Grand Island, Nebraska. The video contains groundwater information and can also serve as a promotional and recruitment tool for the Awesome Aquifer Club. The video will be sent at no charge to the first 250 people requesting it in writing. To receive your free video, write The Groundwater Foundation at P.O. Box 22558, Lincoln, NE 68542. Please include your name,

full mailing address, phone number, fax, e-mail and briefly describe your interest in water education. To receive more information concerning the Awesome Aquifer Club or the "Awesome Aquifer Adventure," contact Chad Foust, Youth Programs Director at 1-800-858-4844 or info@groundwater.org.

Pioneers Park Geology by Roger K. Pabian, CSD Research Geologist

The landscape, streams, rocks and soils at Pioneers Park southwest of Lincoln will show the visitor some geological processes in action, as well as the results of some from the past that have left their mark on one of Lincoln's premier attractions. There aren't many areas where one can see such a variety of geology in only about 1 ½ square miles.

Haines Branch, the small stream that flows through the park, demonstrates the depositing, transporting and reworking of sediments on their way to becoming incorporated in beds of sandstone, shale, and limestone of marine origin. The park visitor can also see outstanding examples of wind-blown deposits and of glacial deposits of Pleistocene age that have been laid down in the park in the geologic past. If one is interested in older rocks, one can observe sandstone and shale of late Cretaceous age. You can also compare the Cretaceous sandstone that make up the columns at the park and learn why one can be used for building and the other cannot.

Because there are many different kinds of rocks in the park and the topography there is somewhat rugged, there are many different soils to be seen there. The complex soil distributions are shown in a colored version of the 1980 soil survey of Lancaster County. These soils also help to explain the vegetation you will see in various locations throughout the park.

All of these features are correlated with a topographic map that shows the position of the hiker-biker trail and points out where to see many of the geologic features of Pioneers Park. A trip route listing stops and featuring commentary on the stops is also included. Pioneers Park is a small geological treasure that makes it one of Lincoln's finer attractions.

To order a copy, send a request to: Educational Circular 14; Conservation and Survey Division Room 113; University of Nebraska-Lincoln; Lincoln, NE 68588-0517; \$7 plus \$2 postage and handling.

New and Improved NESEN Website by Mark Mesarch

The retooling of the NESEN website (<http://nesen.unl.edu>) is almost complete. Look for improvements including a convenient indexed tab navigation system at the top of all the web pages and easier-to-use lessons that have been categorized and include short descriptions about them. Also, links have been reorganized and a user rating system will allow you to voice your opinion about the links to other users. New resources and projects will be added to the site over time. Please, tell us what you think by dropping us an email at nesen@unl.edu.

Science Day by Andy Knudsen

Science Day is an activity for high school students held at UNL the first week of April. Students will be able to participate in interactive sessions led by UNL faculty and to view exhibits produced by UNL Science Departments. In previous years, some session titles have been "The Wild World of Weather" and "Fossil Mammals: Current Research on Evolution and Extinction." Science Day presents an excellent opportunity for high school students to learn about science research and to ask questions about science careers. The day's activities are free and open to everyone. Science Day is held in conjunction with Science Olympiad. However, you do not need to participate in Science Olympiad to be involved with Science Day activities. Those wishing to participate should contact Cindy Larson-Miller at (402) 472-8965 or clarson@unlserve.unl.edu

Women in Science Conference by Andy Knudsen

At the Women in Science Conference, February 22-23, 2002, high school girls will explore interests in science, mathematics, engineering and technology. The conference will be held in Lincoln, Nebraska. Activities include tours of laboratories and speaker presentations. The girls will have an opportunity to meet women role models from business, industry, and academia. Students will also interact with graduate and undergraduate students to learn more about college life and how to succeed in majors related to mathematics and science. Nebraska Experimental Programs to Stimulate Competitive Research (EPSCoR) funds the conference. Those interested in attending Women in Science should contact Jane Kaufmann at (402) 472-8965 or register online at www.unl.edu/scimath. The registration deadline is January 31, 2002. Space is limited.

Maps and Publications

These are just two of the many maps available through the Conservation and Survey Division's maps and publications office at UNL located in room 104, Nebraska Hall.

GENERAL REFERENCE MAP OF THE UNITED STATES OF AMERICA (GIM-135).

This map was developed to replace the 1973 general reference sheet of the National Atlas; it is the latest product of the National Atlas of the US, printed by the US Geological Survey.

THE NATIONAL WILD & SCENIC RIVERS (GIM-134)

This map was produced by the US Geological Survey in cooperation with the USDA Forest Service, USDI Bureau of Land Management, US Fish and Wildlife Service, and National Park Service.

These two maps are \$7 each. Please continue to check the web page at <http://csd.unl.edu/csd/mappub.html> featuring Earth Science Materials for Teachers. New materials are added to the web page as they are received.

The New Learning Web - Explore the World of Natural Science at USGS by Carolyn Bell

Click on the new U.S. Geological Survey (USGS) Learning Web at www.usgs.gov/education to try your hand at exploring the world of natural science. At the site, students can easily use a variety of research tools such as glossaries covering volcanoes, mapping, biology, and water. They can also find help with their homework. Teachers and home-schoolers will find lesson plans with innovative activities regarding environmental concerns, fossils, caves, and much more. Visitors can also look into areas of special interest to them, such as understanding natural hazards, investigating careers in science, and tracing history through maps. All visitors can become map wizards by creating their own maps.

The USGS serves the nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life. For more information on USGS programs, visit their website at www.usgs.gov. If you would like to receive the latest USGS news automatically by e-mail, send a request to listproc@listserver.usgs.gov. You will need to specify a list server(s) that you are interested in, they are: water-pr, geologic-pr, geological-pr, biological-pr, products-pr, and lecture-pr. In the body of your message write: subscribe (name of list server) (your name). Example: subscribe water-pr Joe Smith.

NESEN 2001 Summer Workshops by Kylee Anderson

This past summer, from July 9th through the 18th, NESEN held three workshops at UNL: "The Dynamic Earth and Nebraska: Plate Tectonics, Earthquakes, and Volcanoes," "Hands-On With Nebraska Geology: 300 Million Years of Change," and "Soil Structure: The Building Within the Profile." Those who participated in one or more of the summer workshops were: Jerry Ott, Joan Lahm, Lynn Groff, Donna Hutchens, Richard Kendrick, Steve Ferris, Derek Geise, Berni Crow, Gerry Swingle, Ron Paulson, Julie Cook, Penni Cummings, and Judy Bogle. During each of the two-day sessions, participants took field trips, completed hands-on activities, and learned about new lessons and activities suitable for use in their science classrooms. Thanks to everyone for participating!

NIGEC 2001 Summer Workshop by Kylee Anderson

The "Global Environmental Change" workshop was held this past summer from June 18th through the 22nd at UNL. The participants of this workshop were Judy Ballantyne, Pam Galus, Becky Kadel, Susan Frack, Bridget Litrell, Ron Evens, Jeff Evens, Lisa Overkamp, Mary Lou Alfieri, Jodi Seeger, and Evelyn Whetzel. This workshop was a four-and-a-half-day study of the earth's atmosphere, biosphere, and hydrosphere. The objectives of the workshop were to introduce participants to concepts in global environmental change, make the participants more comfortable with environmental change concepts, increase the use of data in classrooms, model inquiry-based learning strategies, and to provide classroom activities for teachers. Thank you to everyone who participated. We hope you learned and enjoyed your experience.

Saltdogs... Where'd They Get That Name? By Edwin F. Harvey, Ph.D., P.G.

Why is [Lincoln's Baseball team] called the Lincoln Saltdogs you ask? Well, the Saltdogs take their name in part from the surface salt deposits found in the rare saline wetlands near Lincoln that occur along Salt Creek and some of its tributaries such as Little Salt Creek, Rock Creek and Olive Branch. These salt deposits result from the evaporation on or near the surface of saline groundwater that flows upward under artesian pressure from the underlying Dakota sandstone to discharge into the creeks and adjacent wetlands. The saltiness of the groundwater comes primarily from high concentrations of dissolved sodium (4,000 mg/L) and chloride (8,900 mg/L) ions—the same chemicals that make up common table salt (also the mineral halite). These waters also have elevated concentrations of sulfate, bicarbonate and potassium as well.

In the mid-to late 1800s these salt deposits were exploited for their commercial value, and the promise of a booming salt industry led to the city of Lancaster (later named Lincoln) being named the new territorial capital. Numerous attempts were made to drill into a deep salt source from which the saline waters were thought to originate, but these attempts found no such source. As a result, Lincoln would not become a major salt producer as the early settlers had envisioned, though in the late 1880s and 90s, the saline waters were used for treatment by a number of popular local bathhouses and sanitariums.

Until recently, scientists believed the ultimate source of the saline waters to be deeply buried Cretaceous shale deposited when much of central North America was covered by an inland sea some 70 to 160 million years ago. However, new research that Drs. Jerry Ayers and Dave Gosselin and I have completed using radiocarbon dating had determined that the saline groundwaters found in the Dakota aquifer near Lincoln are only 16,000 to 36,000 years old, and were likely recharged during the Pleistocene age when continental glaciers covered the northern portions of the Great Plains. This work is ongoing, and while we are not yet certain of the mechanism that carried the younger water into the deeper sediments where the salts likely originate, or how the salt is concentrated in the groundwaters over time, we are sure that the water itself is not ancient ocean water as previously surmised. The dissolved salts themselves may still be very old, and from the deeper shale sediments, but the groundwater that carries the salt through the Dakota sandstone and up to the surface is relatively young in comparison. Future research will attempt to further constrain the age of the water and will attempt to determine the ultimate origin of the dissolved salts. With perseverance, and maybe a little luck, I believe that this generation of scientists will find what those of the 1800s could not. In the meantime, I plan to relieve some of my frustration with regard to finding this unknown salt source by watching the Saltdogs, or the "Halite-Hounds" as I like to refer to them, tear up the bases and bring home a Northern League Championship.