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Summer 2000 Newsletter

Issue Number 25

“Everything is Connected to Everything Else.”

Dave Gosselin, NESEN Director

Another academic year has started and I am sure that all of you are ready for another exciting time. One of NESEN's primary goals is to connect K-12 educators to resources at the University. We have made progress in this area, especially this past summer. We had nine teams consisting of a K-12 educator, pre-service student and a university scientist working together on an integrated research and educational project. As part of this project, we had three workshops that provided an opportunity for these three groups to talk about a variety of topics related to science education. These workshops were invaluable to me, because they demonstrated to me again how important communication is and how important it is that there be a chance to exchange ideas between educators and scientists. Not everyone agreed on the issues, but each respected the perspective of the other. Only through communication and the development of a mutual respect for each group's perspective can we cooperate and develop collaborative relationships. We need to improve cooperation and collaboration at all levels so that we, collectively, can be successful educating our youth. Over this next academic year, take advantage of your opportunities to improve communication with your fellow teachers. Not only will it help improve what we all do, it will also make our working environment more pleasant. Have a great academic year.

Central Plains Severe Weather Symposium 2000: Don't Miss the Opportunity; Students and Teachers Welcome! **by Ken Dewey**

On Saturday, October 7, 2000, the High Plains Regional Climate Center and the Department of Geosciences at the University of Nebraska-Lincoln will be hosting an all-day weather symposium entitled "The Four Seasons of Severe Weather." It will be held from 8 a.m. until 6 p.m. at the Nebraska Center for Continuing Education Conference Center, 33rd & Holdrege streets, in Lincoln, Nebraska. The symposium will have activities aimed at all age levels, so families are encouraged to attend.

The symposium will feature several nationally prominent weather and climate experts talking about lightning safety, tornado chasing myths and reality, storm damage to buildings, forecasting winter storms, getting weather warnings to the public, and weather spotters and public safety. Jeff Morrow of the Weather Channel will talk about how the Weather Channel covers severe weather in the Great Plains.

The National Weather Service will launch a special balloon to demonstrate how meteorologists gather upper air weather data.

There will be a variety of informational and educational displays. Organizations planning to be in attendance are: Weather Channel, UNL meteorology club, the National Severe Storms Laboratory, the National Drought

Mitigation Center, and state office staff of the U.S. Natural Resources Conservation Service (NRCS). The National Severe Storms Laboratory, the National Drought Mitigation Center, and NRCS staff will have displays and informational materials available for those attending the symposium. The National Weather Service will also have information on weather and weather safety. Several famous storm chasers will be in the exhibit area to meet the public and describe storm videos they have created. Local television meteorologists will also be present.

For more information, contact Dr. Ken Dewey, 214 Bessey Hall, the University of Nebraska, Lincoln, NE 68588 (Email: kdewey1@unl.edu or phone: 472-3597).

For more information about the event, check out the symposium website:
<http://hpccsun.unl.edu/nebraska/CPSWS.html>

Integrating Earth System Science Research and Education by Richard Levy

At the beginning of 2000, NESEN initiated a National Science Foundation-funded program to involve teachers in scientific research and scientists in inquiry-based learning. Two of our primary objectives were to: (1) develop a program that involves classroom teachers and undergraduate pre-service teachers in earth systems research aimed at improving their understanding of scientific principles and practices; and (2) improve scientists understanding of the culture of K-12 education, including relevant teaching and classroom practices.

Following several months of logistical organization by NESEN staff, teams consisting of a scientist, a classroom teacher and a pre-service teacher were established. Over the summer, these teams investigated a variety of topics ranging from remote sensing analysis of agriculture to the microfossil analysis of mummified remains. In concert with the research projects, several workshops were held to investigate the nature of science and current teaching practices and issues including standards and inquiry.

Participants are currently writing research reports and developing educational units based on their experience. Many program participants hope to present their project results at the Nebraska Academy of Science annual meeting in spring 2001. Furthermore, over the next few months we plan to publish research results and educational units on our website (http://nesen.unl.edu/teacher/Research_experience/resexp.htm), so visit our site for a taste of some real science for the K-12 classroom.

The following comments indicate that this experience was very positive:

"This research project has been very interesting ... and the experience has been very worthwhile. Thank you!"

"...the NESEN summer research workshop has been wonderful. It has been great to work with two highly motivated and inquisitive people. I am actually hoping to be back from Brazil next year in time to participate in a second NESEN program, if you are doing one."

"As to the NESEN project itself I am very happy that it has been made available and I hope that they continue to do this in following years, as it was a deeply rewarding and enriching experience."

If you are interested in participating in this type of activity, contact Dave Gosselin: dgosselin@unl.edu or phone 402-472-8919 for more information.

America's Farm Charles Flowerday

The UNL Center for Advanced Land Management Information Technologies (CALMIT) and UNO are using "America's Farm," as the cooperative effort is called, to highlight agricultural applications of remote sensing, which are methods of assessing earth conditions from a distance, and geographic information systems (GIS), computerized means of analyzing spatial data. These sophisticated technologies will be explored through the delivery of near-real-time data on farm operations to high school and college classrooms. It will also feature web-camera video and views of the farm from aircraft and satellites. America's Farm is located on the University of Nebraska 9,500-acre Agricultural Research and Development Center near Mead.

The final web product will include background information about farming, remote sensing, mapping, GIS and global positioning systems (GPS), which are satellite-based means of determining exact location. It will also feature views of rural life, including farms and their surroundings, from the ground level, the air and satellites; data collected and integrated from the field, the air or satellites; and tutorials on the application of the technologies.

Inquiry-based scenarios, developed around the resources, will require that students research a problem, develop questioning skills, acquire and analyze data and generate a set of conclusions.

All of the individual pieces will be put into a web-delivered, graduate course. A pilot course for educators was taught during the spring semester through UNO. Course revisions are being made based on feedback from participants, and it should be offered nationwide next fall.

America's Farm also has resulted in a plan to incorporate the nation's first "technology track" into the curriculum at Mead High School, one of six magnet schools for agriculture in the country. The track will allow students to specialize in high technology such as remote sensing and GIS.

Lessons From Environmental Change Workshop On-line by Mark Mesarch

Nine pairs of teachers from Nebraska, Iowa and Wyoming attended the National Institute For Global Environmental Change (NIGEC) summer workshop on environmental variability. During the workshop, teachers designed lesson plans and activities for at least a week-long unit that would fit into their current curriculum plans. Curriculum units were developed for elementary, intermediate and high school age students. Topics included deforestation of the rainforest; terraforming Mars with knowledge of climate change on Earth; the validity of global warming; and the history of global warming and its theory. Most projects explore the interconnectivity of the environment. These projects will be made available on-line at http://nesen.unl.edu/nigec/teacher_resources.htm.

New Publications and Teacher Resources Available by Judy Otteman

The Conservation and Survey Division map and publication office has several new resources. A new booklet, Eruptions of Mount St. Helens: Past, Present, and Future, highlights the eruptive history of this composite volcano. This booklet reviews the volcano's activity since its reawakening in 1980, and speculates about its activity in the future. The booklet is free.

There is a new circular from the U.S. Department of the Interior titled Dams and Rivers - A Primer on the Downstream Effects of Dams. This circular explores the emerging scientific arena of change in rivers below dams. The Platte River is featured. It is Circular 1126 and is free.

The popular USGS teacher packets are now available on the web. Materials within the packets have been designed to be reproducible. The lesson plans and teaching guides for all of the teaching packets are available on-line. Check out www.usgs.gov/education/learnweb to learn more about the packets. Hard copies are still available in the office.

A new map called A Tapestry of Time and Terrain is now available. This USGS thematic map combines the topography and geology of the United States. This map is accompanied by a pamphlet, which explains how the map was made and describes 48 physiographic features shown on the map. This map sells for \$7 plus \$4 for handling.

To order these resources call 402-472-7523. Check out other materials on the Conservation and Survey Division web site: <http://csd.unl.edu/csd.html>

Conservation and Survey publications suited to K-12 education

- **SM-4 General Soil Map of Nebraska: (1:1,000,000; 1990)** \$7.50. The general soil map of Nebraska offers an intermediate scale for general use, a good reference for teachers and students.
- **LUM-31 Groundwater Vulnerability to Contamination in Nebraska Using the DRASTIC Method: color (1:1,000,000; 1991)** \$7. This computer-generated map displays areas prone to contamination in an easy-to-understand format that integrates many earth science factors.
- **LUM-34 Satellite View of Nebraska: (1:1,000,000; 1997)** - \$10 Healthy plant cover is red; sparse is gray.
- **LUM-35 Satellite View of Nebraska: (1:500,00; 1997)** - \$15 (Same as above in larger format.)
- **RR-12 Flat Water: A History of Nebraska and Its Water (1993)** \$27.50. This book deals extensively with irrigation but also includes as many aspects of Nebraska's water history as possible.
- **RA-4a The Groundwater Atlas of Nebraska: (revised 1998)** \$8. This atlas depicts many aspects of the state's groundwater, geology and landforms. A glossary is included.
- **RA-5b An Atlas of the Sand Hills: (revised 1998); paper bound** \$25. This area is an ecological meeting ground, where species from different regions coexist, creating distinctive biological communities. Subjects include virtually all aspects of the region's natural history and much of its human history.
- **EC-1 Record in Rock--A Handbook of the Invertebrate Fossils of Nebraska: (1970) ?** \$9
- **EC-10 Geology, Geologic Time and Nebraska: (1993)** - \$9. Primer is intended for secondary students.
- **EC-11 Fundamentals of Groundwater Contamination: (1994)** - \$8. Groundwater contamination discussed is industrial site spillage, underground storage tank failure, landfill leaching, nitrates, primarily in irrigation, municipal or domestic wells, and flooding. It is well illustrated.
- **EC-13 Geology of Niobrara State Park, Knox County, Nebraska, and Adjacent Areas - with a Brief History of the Park, Gavins Point Dam, and Lewis and Clark Lake: (1997)** - \$8 (Use order number. Add sales tax and \$4 for first class postage for a map in a tube; \$3 for other.)

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Unless indicated, our newsletter was written by Joy Hurst and edited by Charles Flowerday, Conservation and Survey Division, University of Nebraska-Lincoln. Information for the NESEN Newsletter can be sent to Joy Hurst, 9 NE Hall, Lincoln, NE 68588-0517, email nesen2@unl.edu. NESEN's lead organizations are the 1) Conservation and Survey Division, 113 Nebraska Hall, University of Nebraska-Lincoln, Nebraska 68588-0517: Phone 402.472.0773; FAX 402.472.4608; Web Site <http://csd.unl.edu/csd.html> and the 2) School of Natural Resource Sciences, 303 Biochemistry Hall, University of Nebraska-Lincoln, Lincoln, NE 68583-0758; Phone 402.472.6873.