May 2004

Nebraska Earth Systems Education Network – Spring/Summer 2004

Nebraska Earth Systems Education Network
9 Nebraska Hall, University of Nebraska-Lincoln, Nebraska 68588-0517
Phone: 402-472-0773
Fax: 402-472-4608
Web site: http://nesen.unl.edu
Email: nesen 2@unl.edu

Spring/Summer 2004 Newsletter

Issue Number 36

NATS Annual Fall Conference

The Nebraska Association of Teachers of Science (NATS) annual fall conference will be held Oct. 28-30 at Camp Calvin Crest in Fremont, Neb. This year the conference theme is "Leave No Teacher Behind." Presenting at NATS is a great opportunity to share your successful educational strategies with colleagues. The conference is attended by educators at various levels of career development who could benefit from your expertise. NATS is still accepting new presenters for this fall's conference. If you are interested in presenting, please fill out the proposal form included in this newsletter and return it to John Niemoth at Waterloo Public Schools, 800 N. Front, P.O. Box 328, Waterloo, NE 68069. Also, an electronic copy of the proposal for is available on the NATS website at http://www.nebraskaacademy.org/nats/Confrences/index.htm. The deadline for submitting proposals is June 1.

Geographic Educators of Nebraska Summer Workshops

The Geographic Educators of Nebraska (GEON) are offering three workshops this summer for all teachers, K-12. The "Wetland Education Workshop" is June 10-12 at Chadron State College. This free workshop will focus on Chimney Rock and water resources around Scottsbluff, Neb. Its purpose is to introduce educators to the value of wetlands in Nebraska. For more information, contact Catherine Lockwood at 308-432-6275 or e-mail: clockwood@CSC1.edu. The deadline for registration is May 20, 2004.

"Geography of the City" will be held June 14-18 and July 23 at the University of Nebraska at Omaha (UNO). Graduate credit is offered and housing is available at the UNO residence halls. Upon completing a lesson plan, GEON will pay a stipend of $250. For more information contact Chuck Gildersleeve at UNO, 402-554-4803, or e-mail: Charles_Gildersleeve@mail.unomaha.edu or call Steve Callaghan at 402-426-9457.

"Geography of the Frontier III: Lewis and Clark in Nebraska" will be June 27-July 1 and July 23 at Dana College in Blair, Neb. Graduate credit is offered. Room and board, plus a $200 stipend, is paid by GEON for your completed lesson plan. For more information about this workshop, please contact Lonnie Moore at 402-443-5904 or by mail at 1412 Sycamore, Wahoo, NE 68066.

Groundwater Workshop for Secondary Earth and Environmental Science Teachers

The Kansas Geological Survey and the University of Kansas will convene a free, four-day summer course for in-service, secondary Earth and environmental science teachers in Lawrence, Kan., July 25-29, 2004. The workshop will cover the principles of groundwater flow and water quality assessment, groundwater contamination and remediation technologies, Plume Busters computer software that uses role-play and mathematical simulation to reinforce the teaching of groundwater principles, and environmental policy issues and laws as they relate to groundwater.

The workshop is grant supported and directed by Dr. P. Allen Macfarlane of the Kansas Geological Survey. Teachers participating in will be eligible for one graduate credit hour in geology for attending the course or two graduate credit hours in geology upon completion of an approved project in the following fall semester. Tuition, lodging, meals, and curricular materials, including software, will be provided free to all participants. Participants will be given copies of the Plume Busters software at the end of the course for use in their Earth and environmental science classes. Accommodations will be in a dormitory of the University of Kansas near the Kansas Geological Survey. Meals will be provided by the university.

For an application or more information, visit http://www.kgs.ku.edu/Hydro/GWtutor/register.html or contact Dr. P. Allen Macfarlane, Geohydrology Section, Kansas Geological Survey, 1930 Constant Ave., Lawrence, KS 66047; (785) 864-2068; dowser@kgs.ku.edu. The application deadline is May 21, 2004. Participants will be notified of acceptance into the workshop by June 2, 2004.

Fatal Pine Disease Continues to Raze Trees in Nebraska

By Christine Meyer, information and education specialist, SNR

With all its splendor and dignity, the Scotch pine (*Pinus sylvestris)* has acquired an adversary, a disease as ruinous in Nebraska as Dutch elm disease. The pinewood nematode (*Bursaphelenchus xylophilus)*, a microscopic worm-like organism that feeds in the wood of pines and other conifers causes the disease, called "pine wilt." The pinewood nematode is transmitted from diseased trees to healthy trees by an insect called the "pine sawyer beetle" (*Monchamus spp.*). The immature, or larva, stage of the beetle is an insect that bores into the wood of failing and deceased trees. Once the larva becomes an adult beetle, nematodes in the wood of the tree move onto the body of the beetle to make their escape. The beetle chews out of the ailing tree in search of a healthy tree to feed on, carrying the nematodes with it. A single beetle may carry thousands of nematodes per flight.

The disease, first spotted in Nebraska in 1980, mostly kills Scotch pines, but Austrian pines (*Pinus nigra*) and other species are also susceptible. The first noticeable symptoms of pine wilt are the change in needle color from green to grayish green, then to straw-brown. In Nebraska, hundreds of pines die annually from pine wilt. The nematode has been found in 40 U.S. states, 9 Canadian provinces, and northern Mexico. Its extensive distribution indicates that the nematode is an indigenous pest in North America.

To impede the deadly pine disease, plant specialists are working with industry professionals to research and treat infected trees, educate about proper disposal of infected trees and find alternative species for landscape, windbreak and Christmas tree use, said Mark Harrell, forest health specialist with the University's Nebraska Forest Service

"Control of pine wilt is difficult, and current strategies involve only trying to slow its rate of spread," he said. "The recommendation is to destroy trees being killed by the disease as soon as possible to prevent the beetles from emerging and carrying nematodes to healthy trees. Burning, burying, or chipping the dead or dying trees can do this. Wood from dead trees should not be stored or transported to other areas, because beetles can continue to develop and emerge from the cut logs."

Meanwhile, trees that have noteworthy historical or landscape value, such as some over 100 years old at Arbor Lodge in Nebraska City, continue to die. An 88-foot tall Scotch pine in the Tecumseh cemetery recently fell to pine wilt. The eradication of diseased trees and the introduction of alternative species will be key in overcoming pine wilt, as no chemical treatments are currently effective. Insecticide and nematicide sprays have not been successful in preventing trees from being killed by the disease, Harrell said.

For more information about pine wilt, consult NU Cooperative Extension Circular EC00-1878, "Pine Wilt – A Fatal Disease of Exotic Pines in the Midwest," available at local Cooperative Extension offices or on the Web at: http://www.extension.iastate.edu/Publications/SUL9.pdf.

Survey Publishes Fact Sheet on Arsenic in Nebraska's Drinking Water

By Steve Ress, communications coordinator, Water Center/SNR, and Charles A. Flowerday, editor, SNR

Complying with impending federal limits for arsenic in drinking water could put significant stress on the budgets of some small Nebraska towns. In view of this change and research designed to help with this problem, the Conservation and Survey Division of the School of Natural Resources has published an eight-page fact sheet on the extent of the arsenic threat in Nebraska and the implications of these new regulations.

Arsenic occurs naturally in groundwater and is linked to certain types of cancer and other health concerns, including cardiovascular, hormonal and neurological problems. But the exact quantity of arsenic in drinking water that may cause problems remains elusive and subject to debate. The dimensions of these discussions are also covered in the fact sheet.

David Gosselin, groundwater geologist with the School of Natural Resources, leads a team working with 10 small Nebraska towns on these studies. More than 75 small public water systems statewide have arsenic concentrations in drinking water that could exceed the U.S. Environmental Protection Agency's (EPA) new standard of 10 parts per billion (ppb). This new limit, lowered from 50 ppb, goes into effect January 2006. Most of these systems serve fewer than 3,300 people, and compliance costs may exceed $120 million statewide, Gosselin said.

The fact sheet provides background about the current understanding of the distribution of arsenic in Nebraska's groundwater. A better understanding of arsenic in the state's groundwater can help water resource managers minimize public health risks by avoiding water with high arsenic concentrations and help reduce the cost of new regulations related to arsenic.

Key questions addressed in the publication include: Where and how much arsenic is in the groundwater? Why does arsenic occur where it does? and, How may arsenic vary in public water supplies? The team has sampled wells in Benkelmen, Cambridge, McCook, Stromsburg, Shelton, Elwood, Lodgepole, Broadwater, Oshkosh and Anselmo. The fact sheet also contains maps showing arsenic distribution in the United States and Nebraska.

"There are a variety of strategies that can be applied to remove arsenic from water, but most of them are expensive, which is tough on small communities," he said.

These approaches include finding a new groundwater supply, a trial-and-error process because of arsenic's great variability in the environment, or treating the contaminant. Communities need to consider potential variations in arsenic concentrations when developing well sampling plans to meet the new EPA standards and protect human health, he said.

Another possible method for removing arsenic from groundwater within the aquifer would be to create a reactive barrier around the well's intake pipe. This would involve treating the normal gravel packing that surrounds the well's intake pipe with iron hydroxide. The compound chemically bonds with arsenic. As the water passes through this treated barrier, arsenic and other metals such as uranium will bond to the treated gravel and remain there.

Research continues, and Gosselin said he hopes to develop some recommendations within the next year. While not detailed extensively in the fact sheet, more information about treatment methods is available from David Gosselin, 113 Nebraska Hall, University of Nebraska-Lincoln, Lincoln, NE 68588-0517; or by calling (402) 472-8919, or by emailing dgosselin2@unl.edu.

Copies of the fact sheet are available from the Conservation and Survey Division; 104 Nebraska Hall; University of Nebraska-Lincoln, Lincoln, NE 68588-0517; or by calling (402) 472-7523, or by emailing csdsales@unl.edu. Individual copies are free; multiple copies are $2. Please add $2 shipping for multiple copies of 10 or less. Contact CSD for shipping cost on more than 10 copies. Nebraska residents should add city and state sales tax. Call CSD about sales tax questions.

Fair Brings Representatives from a Variety of Natural Resource Careers

By Charles A. Flowerday, editor, SNR

Steve Cinnamon of the National Park Service's Omaha office said the best thing about his job is that he gets paid to go to park service properties and be outdoors in the fresh air: to float down a river, to see bison, to kick the dirt, to see the sights along two rivers that are part of the National Wild and Scenic Rivers system.

He said the least favorite part of his job is personnel management, dealing with problem workers, which is why he advised recent graduates in natural resources and their professors to put personnel management skills in their curricula.

Jason Skold, the Missouri River program manager for the Nature Conservancy, said the thing he liked most about his job is the overall challenge of purchasing land for the conservancy, which often doesn't buy it outright but works through partners – finding willing sellers and needed financing and handing it over to managers. It involves finding the right piece of land, then the money, often state or federal, then long-term managers and sealing the deal, which in itself is difficult. The thing he likes least is that he's in an office too much, he added.

These and other observations, including interview tips and the economic conditions surrounding natural resource work, were part of the Natural Resources Career Fair March 11 at the University of Nebraska-Lincoln East Campus Union. Besides the good and bad in their work, 10 representatives from a variety of natural resource organizations, public, private and nonprofit, spoke to about 25 students on how to land a job, job prospects, kinds of positions available and what they entail. The fair was sponsored by the UNL Environmental Studies Program, a joint program of the School of Natural Resources and the College of Arts and Sciences.

Nick Simonson of the Natural Resources Conservation Service said his favorite aspect of the job is working with the high technology systems that support analysis of natural resources such as computerized geographic information systems (GIS) and global positioning systems (GPS). The least favorite part of his job is designing a sophisticated, Earth-friendly grazing plan, one that meets both

conservation and financial needs, and having Mother Nature refuse to cooperate by delivering three years of the worst drought in 70 years, he said.

Julie Powers of the Nebraska Department of Environmental Quality said the best thing about her job was mentoring new employees. Her least favorite was dealing with personnel problems and with people violating the law.

“Sometimes you have to take them to court. People can lose their jobs and businesses. You can agonize over it,” she explained.

Besides those mentioned, representatives were: Chad Ferris of Omaha’s Henry Doorly Zoo, caretaker of the zoo’s penguins; Howard Isaacs, who oversees regulation of drinking water systems for the Regulation and Licensure section of the Nebraska Health and Human Services System; Troy Thompson, public information specialist with the Lower Platte South Natural Resources District, a UNL alumnus and former editorial assistant with an SNR subunit, the Conservation and Survey Division; and Kent Zimmerman of the Nebraska Department of Natural Resources, another UNL alum who had studied under SNR fisheries professor Ed Peters.

Regarding current budgets and job prospects, Cinnamon noted that many retirements loom with the NPS, yielding openings, but that budgets are tight. The park service is looking for more partnerships as a result, much like the Niobrara Wild and Scenic River designation, which it manages without owning much of the land. Tight budgets come and go in cycles, he added, and the situation will improve.

Skold also noted that the Nature Conservancy is always looking for good partnerships, which are becoming increasingly important. This approach might yield more shared positions, which allow for jobs that might not exist otherwise but involve working for two bosses.

Responding to a question about the public’s need for education about conservation, Thompson said that, in general, the public understands this need but public leaders don’t always.

“The (public) surveys show good support for conservation of natural resources, but these concerns don’t always ‘trickle up’ to our leaders,” he said.

NESEN
113 Nebraska Hall
Lincoln, HE 68588-0517

The NESEN Newsletter is compiled by Kylee Anderson and edited by Charles Flowerday of the Conservation and Survey Division, University of Nebraska-Lincoln. Information for the NESEN Newsletter can be sent to Kylee Anderson at 9 NE Hall, Lincoln, NE 68588-0517 or *kander20@bigred.unl.edu*. NESEN’s lead organizations are the 1) Conservation and Survey Division, 113 Nebraska Hall, University of Nebraska-Lincoln, NE 68588-0517; phone 402-472-3471; fax 402-472-4608; website *http://csd.unl.edu/csd.html* and the 2) School of Natural Resource Sciences, 303 Biochemistry Hall, University of Nebraska-Lincoln, NE 68583-0758; phone 402-472-9873.