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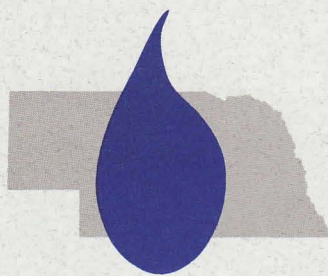
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# Water Current

University of Nebraska Water Center/Environmental Programs

Vol. 26 No. 5  
October 1994

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## Festival of Color draws crowd

An interest in gardening, landscaping and water issues drew more than 3,000 people to the second annual Festival of Color Open House of the Department of Horticulture, University of Nebraska-Lincoln.

The event took place Sept. 10 at the John Seaton Anderson Turfgrass and Ornamental Research Facility at the Agricultural Research and Development Center at Mead.

This year's theme was water quality, and a number of presentations and demonstrations addressed water conservation and pollution prevention.

coordinator for the Nonpoint Source Pollution Program of the Nebraska Department of Environmental Quality (NDEQ).

The NDEQ and the U.S. Environmental Protection Agency Region VII provide major funding to the festival because of its importance in preventing nonpoint source contamination.

The festival provides the department with a unique opportunity to reach an urban audience with information about nonpoint source pollution, Traylor said.

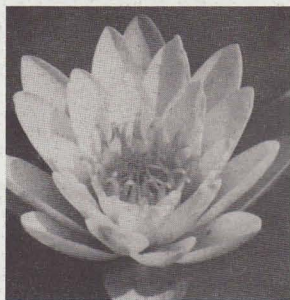
The Water Center/Environmental Programs unit, UNL, also co-sponsored the interdisciplinary event.

Urban audiences are interested in learning ways to maintain water quality in the landscape, said Bob Volk, director of the Water Center/Environmental Programs unit.

Don Steinegger, UNL horticulturist, said he was very satisfied with the event. Attendance was more than triple that of the



UNL horticulturist Roch Gaussoin points to the colorful petals of adapted flowers in a trial plot at the Festival of Color.



*"Everything went well. Throughout the event, people were interactive; they were asking questions. It was very educational."*

— Don Steinegger,  
UNL horticulturist

"What I really liked is that the festival had demonstrations of very practical, simple things individuals can do that help protect water quality," said Elbert Traylor, information education

previous year, and there was much interaction, he said.

"Everything went well. Throughout the event, people were interactive; they were asking questions. It was very educational," Steinegger said.

To obtain "Prairie-Scapes," a brochure on water-efficient landscaping designed for the Festival of Color, contact the Water Center/Environmental Programs unit.



# From the Director



**Bob G. Volk**

We received great news in that the National Science Foundation wants to fund a proposal we submitted for science teacher education.

The proposal asked for approximately \$250,000 per year to fund a program that will:

1) produce a four-year television series on water to be broadcast statewide to science teachers over Neb\*Sat,

2) support a statewide research project on water involving 10,000 secondary students and 100 Nebraska teachers, and

3) generate a permanent base of information on water for Nebraska teachers, students, citizens and public agencies.

However, the challenge before us is that in order to receive the grant we must raise approximately \$150,000 per year in matching funds. This opportunity for science education and research is too good to miss. If you know of funding sources, please contact us.

The Festival of Color Sept. 10 at the John Seaton Anderson Turfgrass and Ornamental Research Facility at the Agricultural

Research and Development Center, Mead, was outstanding. I congratulate Amy Greving and Don Steinegger of the Department of Horticulture and the many extension educators and assistants as well as volunteers for making that a successful day. I urge everyone to make this annual event a priority.

In preparation for the festival, a brochure called "PrairieScapes" was developed that focuses on water quality and water efficiency in home landscaping. Seven leaflets give recommendations for water-conserving and pollution-preventing landscape methods. A list of desirable plant varieties for the prairie region is included. To obtain copies, contact the Water Center/Environmental Programs unit. (Address below)

The annual Water Resources Seminar Series, which takes place every spring semester, will have a different look this year. The Department of Biological Systems Engineering is taking the lead and is putting together a series of seminars on "Waste and

Water." Seminars will include subjects such as composting, recycling, remediation, livestock waste and municipal waste. The seminar, which is offered both as a credit course for students and as a series of public lectures, will take place Wednesdays from 3 to 4 p.m. in L.W. Chase Hall, Room 116. We are making arrangements for satellite hookup enabling downlink locations across the state to have access.

The Nebraska Research Initiative has vastly increased our research efforts in the water sciences. Many grants have been received as a result of the Initiative.

As a result, Nebraska has one of the leading programs in water sciences in the nation. I strongly feel that the continuation of funds for water-related efforts is in the best interest of Nebraskans. Your support would be helpful.

*Bob Volk*

## Water Current

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# Glossary



## of water-related terms

*Editor's Note: This is the third excerpt of the "Glossary of Water-Related Terms," published as NebGuide G93-1191-A by Cooperative Extension, UNL.*

*The guide was co-authored by William Kranz, David Gosselin, DeLynn Hay and James Goeke.*

**Health advisory level (HAL)** is a non-regulatory health-based chemical concentration in drinking water that results in no adverse health risks when a given amount of water is ingested over exposure periods ranging from one day to a lifetime.

**Hydrologic cycle** describes the constant movement of water above, on and below the earth's surface. Processes such as precipitation, evaporation, condensation, infiltration and runoff comprise the cycle.

**Infiltration** is the downward entry of water into the soil. The infiltration rate is a function of surface wetness soil texture, surface residue cover, irrigation application or precipitation rate and other factors.

**Leaching** is the removal of dissolved chemicals from soil by the movement of a liquid (like water).

**Maximum contaminant levels (MCLs)** are legally enforceable drinking water standards required by the Safe Drinking Water Act. Standards set by the Environmental Protection Agency

establish the maximum permissible concentration of selected contaminants in public water supplies. Contaminants are included on the list if they pose a public health risk.

**Maximum contaminant level goals (MCLGs)** are public drinking water standards that serve as nonenforceable goals for selected contaminants contained in drinking water that pose no health risk to people over a lifetime of exposure. A MCLG is a suggested level set by EPA as a guideline for water utilities.

**Methemoglobinemia** or blue baby syndrome is the condition that limits the oxygen-carrying capacity of red blood cells. The condition occurs when bacteria in the digestive tract convert nitrate to nitrite. Nitrite reacts with hemoglobin in the blood, producing methemoglobin which cannot carry oxygen. The resulting oxygen starvation causes a bluish discoloration of the body. The condition is largely confined to infants less than 9 months old.

**Non-point source (NPS) pollution** is the source of surface or groundwater pollution originating from diffuse areas without well-defined sources. Common examples of NPS are chemicals that enter surface water during runoff events from cropland and turfgrass, and soil erosion from cultivated cropland and construction sites.



## Fact sheets describe MSEA research

Research at the Nebraska Management Systems Evaluation Area (MSEA) near Shelton continues. The site is one of five in the Midwest established to evaluate the impact of agricultural management systems on groundwater quality.

At the Nebraska site, researchers with the U.S. Department of Agriculture-Agricultural Research Service and the University of Nebraska Institute of Agriculture and Natural Resources are studying four different nitrogen/irrigation management systems on a field scale to evaluate the impact of different water and nitrogen management practices on contamination of groundwater by agrichemicals. In addition, more than 25 research projects are being conducted on small plots to develop improved practices for water and nitrogen management.

Fact sheets summarizing research in progress are now available at no cost.

- Fact Sheet #1: Introduction to the Nebraska MSEA Water Quality Project
- Fact Sheet #2: Summary of 1992-1993 Results From the MSEA Management Block Study
- Fact Sheet #3: Factors Affecting the Adoption of Nitrogen and Water Management Practices for Improving Water Quality
- Fact Sheet #6: Impacts of MSEA Management Systems on Ground Water Nitrate-N Concentrations
- Fact Sheet #7: Impacts of MSEA Management on Ground Water Atrazine Concentrations
- Fact Sheet #9: Quantifying Nitrate Leaching Under Continuous Corn and a Corn/Soybean Rotation
- Fact Sheet #10: Managing Blocked End Furrow Irrigation Systems
- Fact Sheet #11: Comparing Corn/Soybean Rotation to Continuous Corn

To obtain fact sheets, contact Water Center/Environmental Programs, University of Nebraska, 103 Natural Resources Hall, Lincoln, NE 68583-0844, (402) 472-3305.



A small private vessel and a tugboat wait in a lock chamber of the new Melvin Price Lock and Dam No. 26 on the Mississippi River near Alton, Ill.

# Tour participants **flooded** with impressions

by Bettina Heinz Hurst

The 40 participants of the annual Nebraska Water Resources Tour watched in apparent disbelief as a crew plowed up agricultural land topped by several feet of sand along the Missouri River Basin.

The tour, which traveled through Iowa, Illinois and Missouri July 25-28, emphasized agricultural damage and recovery from the Great Flood of 1993.

The most devastating flood in modern U.S. history, it inundated more than 20 million acres of land in nine states and caused between \$15-20 billion in damage.

**Missouri Flood Busters**  
Driving through St.

Charles County, Mo., tour participants were challenged to imagine the road and its surrounding environment submerged in water. About 40 percent of the county flooded in 1993, according to Petra Haws, public information specialist for the St. Charles County Emergency Management Agency.

"You will see an attempt at rebirth," Haws said as the bus drove through small communities in which boarded-up, deserted houses alternate with renovated and reconstructed ones.

"Many fields have been replanted and are doing very well," Haws said. "It'll take some time, but we'll get there."



Tour participants David Barry and Bob Volk look at an old tractor engine in the Deere & Co. Administrative Center in Moline, Ill.



In one small town, a banner announced the local "Flood Buster Party" celebrating the return of its residents. About 10,000 county residents had to be relocated, and about 40 percent of them have returned. Buyout programs are in progress, and many are still debating whether to take advantage of them, Haws said.

Affected by the Illinois, Missouri and Mississippi river floods, water in this area did not recede until mid-September after cresting Aug. 1, 1993.

The Emergency Management Agency began putting out evacuation notices in April 1993, and most residents stayed with relatives in the region.

"Our difficulty was keeping track of where 10,000 people went," Haws said.

Some residents anticipated lower flood levels

because they were not flooded during the 1973 flood, Haws said. However, during the 1993 flood, 95 forecast points in the upper Midwest exceeded the previous floods of record, many by 6 feet or more.

Danny Kluesner, St. Charles County farmer, recalled riding in a motor boat with his wife and children above the power lines lining the streets. Few farmers in the area had flood insurance, and those who did mostly carried it because it was a loan requirement, he said.

Near Hartsburg on the Missouri River, participants watched bulldozers pull a plow through several feet of sand deposits. In the Missouri River Basin, sand deposits ranged from 6 inches to 10 feet. Cost of plowing is about \$400-600 per acre.

University of Missouri



Cooperative Extension staff said the situation brought unique questions, such as how deep one needs to plow, how to incorporate sand to restore the bottomlands to crops, and what crops do best under these conditions. Traditionally, corn and soybeans are grown there, but the sandy soil does not have enough water holding capacity for corn. Average land values, about \$1,000 per acre prior to the flood, have decreased by about \$200 to \$300.

#### Agricultural Research

During the tour, experts from universities and

**"You will see an attempt at rebirth."**

— Petra Haws,  
St. Charles County  
Emergency Management  
Agency

agencies gave presentations on agricultural research. Al Austin, civil engineer at Iowa State University, gave an overview of ISU research and background information on the 1987 Iowa Groundwater Protection Act. The act was funded through a pesticide and fertilizer tax.

One of the act's benefits has been an actual change in farming practices, Austin said. In the last three years there has been a decrease in the amount of fertilizer applied in Iowa.

Austin, a former director of the Iowa Water Resources Research Center, said ISU activities include research on atrazine, a commonly used herbicide, which has been detected in shallow wells and streams and rivers in Iowa.

The Great Flood also

shaped the research agenda. Austin is currently involved in a flood warning project, and some ISU projects study the performance of tillage systems under flood conditions.

Peter Weyer, project coordinator for the Center for Health Effects of Environmental Contamination, University of Iowa, said the CHEEC Data Management Center was established in response to water quality research needs outlined in the Iowa Groundwater Protection Act.

CHEEC's environmental databases, such as the one on the sources and treatments of Iowa's municipal water dating back to the 1900s, are important, he said.

"It has been a really valuable tool in our epidemiologic studies," Weyer said.

The center also maintains a statewide cancer and birth defect registry, through which scientists can correlate occurrence of cancer and birth defects to exposure to environmental contaminants, often

including contaminants in water. A pilot survey of private rural Iowa wells in 1987-88 showed widespread contamination of wells through bacteria, nitrate and pesticides, Weyer said.

#### Education

Ed Ediger, member of the Upper Big Blue Natural Resources District Board of Directors and commissioner on the Nebraska Natural Resources Commission, has taken part in the tour several times.

"It's educational," Ediger said. "It takes me to scenarios I've never been."

Retired farming couple Marcy and Vernon Krueger of Red Cloud joined the tour for a second time because it offers a rare chance to travel and learn about a resource, Marcy said.

"While we were farming, we became more aware of how valuable water is, even more valuable than oil," she said. "There's only so much of it, and we need to conserve it."

David Barry, Lower

Platte South NRD board member, said he was most interested in seeing the flood damage and the recovery efforts.

"I guess I thought the flood damage would be worse and the recovery slower," he said. "It was an interesting tour."

The Water Center/Environmental Programs unit, the Nebraska Water Conference Council, the Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln; and the Nebraska Natural Resources Commission co-sponsored the tour.

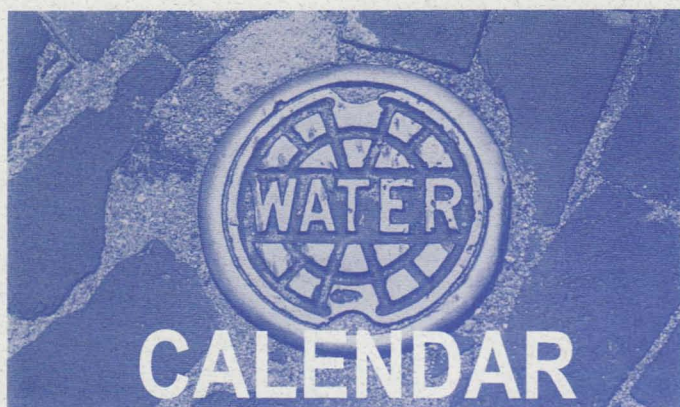


(ABOVE) Plowing of a field covered by sand deposits leaves trenches deep enough to stand in.



(LEFT) Three bulldozers pull a special plow capable of plowing 4 feet deep. The plow is used to mix soil with the several feet of sand deposited on this field near Hartsburg on the Missouri River.





## October

**Oct. 16:** 14th annual observance of World Food Day.

**Oct. 16-18:** 39th Annual Midwest Ground-Water Conference, Bismarck, N.D. Sponsored by North Dakota State Water Commission, North Dakota State Geological Survey, University of North Dakota-Energy and Environmental Research Center, U.S. Geological Survey, Water Resources Division and North Dakota Water Resources Research Institute. Contact Robert B. Shaver, 900 East Boulevard, Bismarck, N.D. 58505-0850, (701) 224-2754.

**Oct. 18:** The Groundwater Foundation's Annual Symposium. "The Drinking Water Challenge: Groundwater and Public Health." Ramada Hotel and Conference Center, Lincoln. For more information, contact The Groundwater Foundation at (402) 434-2740 or 1-800-858-4844.

**Oct. 19-21:** Great Plains Animal Waste Conference: Confined Animal Production and Water Quality. Denver. Contact GPAC Confined Animal Production and Water Quality, Attn. Reagan Wascom,

Department of Agronomy, Colorado State University, Fort Collins, CO 80523, (303) 491-6103.

**Oct. 26-27:** Integrated Watershed Management in the South Platte Basin: Status and Practical Implementation. Greeley, Colo. Contact Colorado Water Resources Research Institute, 410 University Services Building, Colorado State University, Fort Collins, CO 80523. Attn. Kathleen C. Klein, coordinator, (303) 491-6308 (phone), (303) 491-2293 (fax).

## November

**Nov. 6-10:** American Water Resources Association 30th Annual Conference, Chicago. "National Water Quality Assessment." Contact General Chairman, Phillip E. Greeson, U.S. Geological Survey, Norcross, GA, (404) 409-7700.

**Nov. 17-18:** 1994 Groundwater Guardian Conference of The Groundwater Foundation. "Communities Leading Groundwater Protection." Doubletree Hotel - National Airport, Washington, D.C. Contact The Groundwater Foundation at (402) 434-2740 or 1-800-858-4844.

**Nov. 21:** Nebraska Fertilizer and Ag Chemical Institute Research Symposium, Lincoln.

**Nov. 30-Dec. 2:** Nebraska Nonpoint Source Pollution Management Workshop, Ramada Inn, Kearney. Contact Elbert Traylor, Nebraska Department of Environmental Quality, (402) 471-4700.

## December

**Dec. 5-6:** "Reslicing the Water Pie." Nebraska Water Resources Association and Nebraska State Irrigation Association Joint Annual Conference, Ramada Inn, Kearney. Contact Sara Kay at (402) 474-3242.

**Dec. 7-8:** Northwest Regional Riparian Symposium: "Diverse Values — Seeking Common Ground." Boise, Idaho. Contact Idaho Water Resources Research Institute, 106 Morrill Hall, University of Idaho, Moscow, ID 83844-3011, (208) 885-6429 (phone), (208) 885-6431 (fax).

**Dec. 12-13:** "Protecting Ground Water: Promoting Understanding, Accepting Responsibility, and Taking Action." Washington, D.C., Renaissance Hotel. Sponsored by Terrene Institute in partnership with U.S. EPA. Contact Terrene Institute, Washington, D.C., (202) 833-8317 (phone).

**Dec. 23-Jan. 3, 1995:** UNL Closedown.

## March

**March 7, 1995:** Nebraska Children's Groundwater

Festival, Grand Island. Contact The Groundwater Foundation at (402) 434-2740 or 1-800-858-4844.

**March 13-15, 1995:** Annual Nebraska Water Conference, "Water: Understanding the Resource," Burnham Yates Conference Center and Cornhusker Hotel, Lincoln.

**March 24, 1995:** Earth Wellness Festival. A County-Wide Event for Fifth-Graders. 9 a.m. to 4 p.m., Southeast Community College, Lincoln. Contact Arlene Hanna or Soni Ericksen, 444 Cherrycreek Road, Lincoln, NE 68528-1507, (402) 441-7180 (phone).

## April

**April 23-26:** "Water Conservation in the 21st Century: Conservation, Demand, and Supply." Salt Lake City, UT. Contact J. Paul Riley, Utah State University, Logan, UT 84322-4110, (801) 750-2783 (phone).

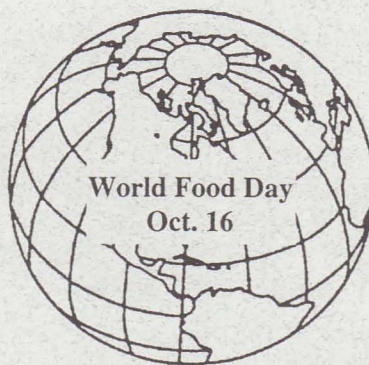
## May

**May 8-10:** "Planning for a Sustainable Future: The Case of the North American Great Plains," Lincoln. Contact Donald Wilhite, International Drought Information Center, P.O. Box 830728, University of Nebraska, Lincoln, NE 68583-0728. (402) 472-6707 (phone), agme002@unlvm.unl.edu (e-mail).

**May 14-18, 1995:** American Institute of Hydrology Annual Meeting, Denver, CO. Contact AIH, (612) 379-1030 (phone).



# Sharing Water: Farms, Cities and Ecosystems



## Toward a water ethic

This theme for the 1994 World Food Day teleconference develops the links between this unique resource and the uses put to it by humans in their struggle for food, material progress, health and environmental protection.

All over the world, fears of water scarcity and/or water pollution are mounting, and some experts are saying a global crisis is near.

- In 1992, 320 million people lived in countries with either water stress or extreme scarcity, but that number could grow above 3 billion by 2025.

- At the end of the United Nations Water Decade in 1990, half the people in developing countries still had no sanitation facilities, and a third lacked safe drinking water.

- Irrigated agriculture accounts for two-thirds of all water taken from nature

for human use, yet two-thirds of the water used in irrigation is wasted.

People everywhere are starting to argue over fair sharing of water resources, the importance of conservation and the need to charge water users and fine polluters.

Most people in industrialized countries hardly ever think about freshwater unless there is a drought or contamination scare. In dozens of countries, however, lack of a steady and sufficient water supply is a major cause of poverty, disease and underdevelopment, a critical constraint on agriculture, industry and personal quality of life.

Water problems start, in any society, when demand begins to bump up against available supply. Other characteristics of the water crisis include the following:

- Though renewed each year, the total water supply falling out of the sky as rain or snow is finite, but the number of water users is rising steadily through population growth.

- While the number of users is rising, the per capita demand for the resource is climbing even faster.

- The quality of water is deteriorating in most parts of the world, actually reducing supply.

- The moment that a resource becomes scarce, competition begins for its shares.

These are the basic factors in the growing worldwide debate over water use, conservation, sharing and environmental responsibility.

*Source: U.S. National Committee for World Food Day*

For individuals, a water ethic calls for an examination of lifestyles and consumption patterns with an eye toward reducing personal claims on the earth's finite water supply.

As an essential ingredient in most manufacturing operations and the receptacle for much of our waste, water has a role in virtually every product we buy and is polluted by much that we throw away.

We rarely think about water when we see an automobile, for example, but producing a typical U.S. car requires more than 50 times its weight in water.

Especially for those 1 billion of us in the high-consumption class, cutting down on our purchases of material things, from clothes and shoes to paper and appliances, conserves and protects water supplies as effectively as installing a low-flush toilet does.

*Source: U.S. National Committee for World Food Day*

### Mailing List Update

We are updating our mailing list. If you have a change of title, name, and/or address, or would like to have your name added or removed from the Water Current mailing list, please complete this form. If you know of individuals who might be interested in receiving our publications, please submit their names.

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# Flood stress lingers



Flood damage to residences, outbuildings and grain bins is a common sight in the Missouri River Basin area.

Participants in the Annual Water Resources Tour (See Page 4) learned that the Great Flood of 1993 is still taking its toll.

Julie Sessions, project assistant, Institute of Agricultural Medicine, University of Iowa, told participants that efforts initiated during the flood are still continuing. The institute co-sponsored the Farm Flood Response Workshop in Iowa City, Iowa, in November 1993.

Those involved in agricultural health and safety became acutely

aware of the need to coordinate information, Sessions said. In the aftermath of the flood, federal, state and other agencies often issued information that did not match.

"There was a great need to coordinate communication," she said.

Although recovery is well under way, the effect of the flood on the lives of the flood plain residents should not be underestimated, she said. Residents

still suffer from physical problems, such as respiratory illness stemming from mildew and biotoxins. Calls to a hotline set up during the farm crisis in the early 1980s reached a new high in spring of this year due to flood-related financial crises, she said.

"The mental stress and anguish related to the flood is still very real," Sessions said.

In the aftermath of the flood, a number of educational exchanges have

begun. An electronic roundtable among flood recovery workers is offered on the Internet. FLOOD-L is operated by a moderated LISTSERV distribution system, which allows many subscribers to share information and ideas through their e-mail systems by sending messages to and receiving messages from a central electronic address.

FLOOD-L is hosted by the University of Missouri-Columbia.

## WATER CENTER/ENVIRONMENTAL PROGRAMS

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