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## Resource News-May/June 1992

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## Cedar Valley study: Reclamation district should lead regional planning effort

The Cedar Valley Reclamation District should take the lead in the complex planning process for water management and rural economic development in the Cedar River Basin, according to a recent University of Nebraska-Lincoln report. Such a broad planning effort would be unique among reclamation districts in the state.

The report, "Socio-Economic Assessment Study of the Cedar River Basin, Nebraska," prepared by the UNL Conservation and Survey Division (CSD) and the UNL Department of Community and Regional Planning, suggests that the scope of the Cedar Valley Reclamation District be expanded to include all aspects of rural economic development in Wheeler, Boone, Nance and

Greeley counties. The district was chosen, the report said, for "its representation, historical significance and identity with the basin."

On April 1, Michael J. Shaughnessy, an attorney for the reclamation district, presented a statement supporting the socio-economic study to the U.S. House of Representatives Energy and Water Development Subcommittee on Appropriations. The statement was prepared by Cedar Valley Reclamation District President Lee Sonderup.

Established in 1965 to promote and facilitate proposed U.S. Bureau of Reclamation surface-water irrigation projects in the Cedar River Basin, the district now would develop plans to examine (See *Cedar Valley continued on page 2*)

## Expert says science of wetlands must precede politics

Wetlands must be defined biologically before policy makers can make decisions about what to protect, a wetlands expert said recently.

Delivering the keynote address before the 1992 Nebraska Water Conference, held March 15-16 in Lincoln, Charles L. Elliot, a regional wetlands coordinator with the U.S. Fish and Wildlife Service in Denver, said there are three criteria to consider when determining wetlands: vegetation type, soil type and hydrologic characteristics. The problem is that different agencies look at different plants, different soil characteris-

tics and different hydrologic conditions to make designations. A consistent system must be developed to eliminate confusion and confrontation, he said.

In 1989, four federal agencies jointly published the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands." These were the U.S. Army Corps of Engineers, the Environmental Protection Agency, the Department of Agriculture's Soil Conservation Service (SCS) and the Fish and Wildlife Service. Many landowners (See *Wetlands continued on page 3*)

## Nebraska mineral value drops \$25 million in 1991

Lower oil and gas prices and a slumping national economy contributed to a decrease of more than \$25 million in the value of Nebraska's mineral production in 1991, two University of Nebraska-Lincoln geologists said in an annual report.

Raymond R. Burchett and Duane A. Eversoll, UNL Conservation and Survey Division geologists and authors of "Nebraska Mineral Operations Review, 1991," said that total mineral-production value dropped 11 percent last year, to \$210.9 million. The decline is the first since 1989. Values peaked in 1981 at about \$316 million and declined from then until 1989, when they began to rise.

Itemizing the production value, the researchers said the value of oil and gas fell from \$129.8 million in 1990 to \$122.5 million in 1991--a 6 percent decrease.

They also reported a 20-percent decrease in the value of Nebraska's non-fuel mineral produc-

tion. The value was about \$85 million in 1991, down from \$106 million in 1990. They attributed the drop to a decrease in sales of cement, sand, gravel, crushed stone and lime last year. Most non-fuel minerals mined in Nebraska are used in construction.

The number of producing oil wells decreased from 1,742 to 1,716 in 1991 and production of 42-gallon barrels of oil dropped from 5,889,722 to 5,832,115. The number of natural-gas wells increased from 11 in 1990 to 12 in 1991, and gas production rose from 114 million cubic feet in 1990 to 126 million cubic feet in 1991.

Of the 128 oil or gas wells drilled last year, 49 were for exploration, 71 were for development and eight were classified as tests or miscellaneous service. Kimball County had the largest number of exploration and development wells, followed by (See *Mineral Production continued on page 3*)

## Division publishes expertise directories

Need information about a particular natural-resource issue but don't know who to ask? Pick up one of two expertise directories just published by the University of Nebraska-Lincoln Conservation and Survey Division (CSD).

Both directories contain an index of CSD faculty and selected staff by subject areas and an explanation of division programs and services. The first brochure--on gold paper--was produced for a general audience and lists areas of expertise and phone numbers. The second directory--printed

on blue paper--is arranged like the first but also contains information on advanced degrees, research interests and service, as well as terminology for a more technically oriented audience.

For a free expertise directory, write or call: Conservation and Survey Division; 113 Nebraska Hall; Lincoln, NE 68588-0517; (402) 472-3471. Please specify if you would like the general- or technical-audience version, or both.

## Cedar Valley *continued from page 1*

the economies, growth potentials and level of urbanization of area cities and towns, as well as serving to further develop public utilities and services in the region.

To develop such plans, the report stated, the district will have to negotiate with and seek compromise among competing interests by providing a forum to encourage public involvement and commitment.

The proposed planning system represents a shift from traditionally fragmented planning methods whereby counties and municipalities work separately, said Robert Kuzelka, CSD natural resources planner and co-principal investigator on the study. The proposed four-county planning region should be able to better foster development in regional municipalities by more effectively meeting competition from larger surrounding communities, the report said. The other principal investigator was N. Brito Mutunayagam of the UNL Community and Regional Planning department. Project research assistants were Leonard Boryca, Bruce Hammond and Kevin Jameson.

The report said the planning process should address the following:

- The improvement and enhancement of agriculture and agricultural productivity;
- The quality of potable water for residents of urban and farm communities;
- The improvement of recreational opportunities;
- The development of tourism and allied activities and infrastructure;
- The protection of wetlands and natural habitats of fish and wildlife, particularly those of endangered species.

The Bureau of Reclamation, part of the U.S. Department of the Interior, first began its investigation into possible reservoir sites on the Cedar River in 1944. Detailed site-specific studies were issued in six reports between 1960 and 1982. But as the relationship between surface water and groundwater became more understood and non-irrigation water demands more common, planning a reservoir became more difficult.

In September 1991, the bureau issued a report concluding that a reservoir would not supply enough irrigation water to make the project economically feasible. Other economic values beyond those available to agriculture, it stated, had to be shown before the reservoir would be economically feasible. Bureau officials also said they were shifting away from water development, as they felt that original charge had largely been met, and were starting to focus on total resource management.

Cedar Valley Reclamation District officials realized that further district irrigation activities could not be justified solely by the development of natural resources in the basin and that any more projects must also improve local economies and improve the quality of life in and around area settlements, the report said.

District officials then began two studies, the recently completed socio-economic assessment and a forthcoming natural-resources assessment, being conducted by CSD hydrologist Anne Matherne. Together the studies will provide information on the physical, social, economic and decision-making conditions of the region and may lead to the creation of a rural-development planning strategy.

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**Resource News is a bimonthly publication of the Conservation and Survey Division, 113 Nebraska Hall. Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, 68588-0517. It is distributed free to all interested in earth science in the state. To receive it, write to the address above. In addition, the Resource News audience will receive Resource Notes, the annual report of the division. The Conservation and Survey Division is the agency designated by statute to investigate and interpret the geologically related natural resources of the state, to make available to the public results of these investigations and assist in the development and conservation of these resources. The Conservation and Survey Division provides information and educational programs to all people without regard to race, color, national origin, sex or handicap. Background of nameplate on page one depicts the layered rock column from the Geologic Bedrock Map of Nebraska. Layers shown are (from the bottom) Precambrian, Cambrian, Ordovician, Silurian and Devonian rocks.**

## ***CALMIT completes Nebraska wetlands database***

Using a geographic information system, scientists at the Center for Advanced Land Management Information Technologies (CALMIT) have completed a wetlands database for Nebraska as part of an effort by the U.S. Environmental Protection Agency (EPA) to develop a procedure for assessing landscape sensitivity to cumulative wetland loss.

The idea for the project came out of a May 1991 meeting in Kansas City, Mo., called by EPA to develop plans for a comprehensive inventory of wetlands and to identify existing databases for EPA region VII--Nebraska, Kansas, Iowa and Missouri. Donald C. Rundquist, director of the Conservation and Survey Division's CALMIT, and James W. Merchant, CALMIT associate director, attended that meeting.

In conjunction with the Nebraska Department of Environmental Control and EPA, CALMIT brought together existing datasets from a variety of sources to assemble the database for Nebraska, which contains information on wetland location and area, as well as on surface runoff, stream length and slope, population growth, agricultural growth, land use, ecological regions, climate and soils. If continued funding and sufficient data are available, CALMIT will soon begin to assemble similar databases for other states in the region, Rundquist said.

He said the regional database could be used for assessing wetlands and identifying areas at risk, which should help with policy decisions.

## **Mineral Production *continued from page 1***

Hitchcock, Cheyenne, Hayes, Dundy and Banner counties.

The authors also reported:

--The state's one active uranium mine, located near Crawford in Dawes County, produced about 334,000 pounds of yellowcake uranium in 1991. Its value was about \$2.9 million.

--Twenty-six limestone quarries produced 4.3 million tons in 1991, 300,000 more than was produced last year. Limestone production value increased from \$21.2 million to \$22.8 million.

--Sand, gravel and silt or siltstone pits increased by

nine. The 676 pits produced 10.7 million tons in 1991, falling from 15.8 million tons produced in 1990. Value decreased from \$45.7 million to \$28.4 million.

--The state's eight clay or shale pits produced 217,000 short tons last year, compared to 219,000 short tons in 1990. The product value was \$990,000 last year, compared to \$901,000 in 1990.

The report is available from CSD, 113 Nebraska Hall, University of Nebraska-Lincoln, 901 North 17th St., Lincoln, Neb., 68588-0517 for \$2.50 plus appropriate city and state sales tax.

## **Wetlands *continued from page 1***

criticized the manual for being overly inclusive, and in 1991 the Bush administration suspended the SCS National Wetlands Inventory until the manual is revised.

Elliot, who supervises the National Wetlands Inventory for an eight-state area in the Midwest, said wetland plants differ from upland plants in that they contain special tissue that allows the plant to take oxygen from the atmosphere and transfer it down through the submerged stem. Leaf structure above the water differs from that below, he said; many wetland plants also have floating leaves, which provides ample surface area above the water for respiration. A wetland determination can be made just by examining the plants growing in a basin, he said. Wetlands plants only grow where there is, or recently was, standing water.

The presence of hydric soils, which have a gray appearance, is another good indicator that the basin is, or once was, a wetland, he said. Soils underwater for even a few days undergo major changes. Compounds in the soil are forced to give up oxygen, which causes the gray coloring. Hydric soils can be still be identified in basins that have stood dry for several years.

Elliot said the most controlling factor in wetland designation is hydrology, although it is the most difficult to

identify. Water levels and groundwater flow characteristics change throughout the growing season and vary with precipitation from year to year, he said.

At the end of his talk, Elliot showed slides demonstrating just how extreme wetland change can be from year to year. His slides depicted change in a North Dakota wetland from 1970-1991.

In that time, the physical, vegetative and hydrologic characteristics of the wetland shifted. Some years, the wetland basin held open water and in others the basin was dry. Varying water levels caused changes in vegetation type and controlled the extent of vegetative encroachment, Elliot said. During several years of extreme drought, the groundwater table dropped, causing the wetland to become a recharging unit (one which transfers water back into the groundwater). Before and after the drought, the wetland drew water from the ground.

The annual Nebraska Water Conference is sponsored by the University of Nebraska-Lincoln Institute of Agriculture and Natural Resources and the UNL Water Center, with special contributions from the UNL Conservation and Survey Division.

# New publications on Nebraska geology, geography and water

Available from the Conservation and Survey Division

- Nebraska Mineral Operations Review, 1991: R.R. Burchett and D.A. Eversoll, CSD; 15 p.; \$1
- Directory of Natural Resources Expertise and Services (for general audience): CSD; 5-panel brochure; Free
- Directory of Natural Resources Expertise and Services (for technical audience): CSD; 7-panel brochure; Free
- Mineral Facts for Nebraska, Nebraska Geonotes, with 1991 data: R.R. Burchett, CSD; 15 p.; (GIM-38) 50 cents
- Mineral Resources Map of Nebraska, Nebraska Geonotes, with 1991 data: R.R. Burchett, CSD; 1 p.; (GIM-30) 50 cents
- Oil and Gas Facts for Nebraska, Nebraska Geonotes, with 1991 data: R.R. Burchett, CSD; 8 p.; (GIM-47) 50 cents
- Oil and Gas Fields in Nebraska, Nebraska Geonotes, with 1991 data: R.R. Burchett, CSD; 1 p.; (GIM-33) 50 cents
- Dixon County Test-Hole Log Book: R.R. Burchett and F.A. Smith, CSD; 45 p.; (THR-26) \$4.50
- Greeley County Test-Hole Log Book: R.R. Burchett and

- F.A. Smith, CSD; 74 p.; (THR-39) \$5.25
- Wheeler County Test-Hole Log Book: R.R. Burchett and F.A. Smith, CSD, (adapted from D.R. Lawton and R.A. Hiergesell); 52 p.; (THR-92) \$4.50

Add a \$1.50 mailing fee; \$2 for an unfolded map in a mailing tube; rates are double for first class. Please use order numbers (in parentheses). Nebraska residents should add state and city sales tax.

Available from U.S. Geological Survey

- National Water Summary 1988-1989, hydrologic events, floods and droughts; contains the article "Nebraska: floods and droughts" by G.B. Engel and E.E. Fisher, USGS: book compiled by R.W. Paulson, E.B. Chase, R.S. Roberts and D.W. Moody, USGS; 591 p. (Nebraska article p. 377-384); (W-2375) \$39

Contact the Nebraska district office of the USGS to order at 100 Centennial Mall, Lincoln, Neb. 68508 (402) 437-5082

## Coming up: National, state and regional meetings and workshops

- Mid-America GIS Symposium, May 5-7, Overland Park, Kan.
- American Geophysical Union, 1992 Spring Meeting, held in conjunction with meetings of the Canadian Geophysical Union and the Mineralogical Society of America, May 12-16, Montreal, Quebec, Canada.
- 1992 International Geoscience and Remote Sensing Symposium, May 26-29, Houston.

- American Association of State Geologists, June 13-19, Tuscaloosa, Ala.
- North-Central Region Soil Survey, Work Planning Conference, June 15-18, Minneapolis.
- CALMIT Workshops: GIS and Remote Sensing for Water Resources, September 14-18; Advanced Techniques in GIS, September 21-25, Lincoln; contact Chris Keithley for more information (402) 472-2565.

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