

# U.S. Geological Survey Activities Related to American Indians Central Region

Fiscal Year 2002



**Front Cover:**

**The cover photograph is from the Archive Collection at Blue Cloud Abbey. The photograph was taken in the 1890's in the Dakota Territory of South Dakota. The original is off an 8-inch glass plate.**

**A special thank you goes to the Blue Cloud Abbey for use of the image.**

## Introduction

Information is a resource that can help Native American governments and their people. The U.S. Geological Survey (USGS) makes available technical expertise, reports, and other impartial information sources that can benefit Native Americans interested in subsistence issues, water, land use, and the health of many parts of the environment.

The USGS works in cooperation with Native American governments, conducting research on water and mineral resources, animals and plants of environmental, economic, or subsistence importance, natural hazards, and geologic resources. Digital data on cartography, mineral resources, stream flow, biota, and other topics are available to American Indian individuals and institutions. The USGS recognizes the need to learn from and share knowledge with Native peoples.

This report describes most of the activities that the USGS Central Region conducted with Native American governments, educational institutions, and individuals during Federal fiscal year 2002. Some of these USGS activities were carried out in concert with the Bureau of Indian Affairs (BIA), Tribes, and the USGS also conducted other activities.

In 2001, the USGS began examining its activities related to Native American and Alaska Natives to determine how it can better serve these customers within its mandates. A growing number of Tribal governments, educational institutions, and other Tribal organizations have begun using geographic information systems and other digital technologies in recent years. As Tribes become more interested in and more adept at managing digital information, they are seeking relevant data from the USGS more frequently. Using digital technologies provides Tribal governments with additional means of managing lands and resources for the benefit of current and future generations. The USGS recognizes the need to make its information available to Tribal governments, and to work with those governments and other institutions to advance data management capabilities.

The USGS is responding to this need by increasing the transfer of scientific information to Native American governments and by training employees of those governments to conduct and improve scientific studies. The USGS is also encouraging Native Americans to pursue careers in science and seeking ways to hire Indian and Native students. By identifying, improving, and disseminating information about available hiring mechanisms, the USGS is working to make hiring such students easier, and therefore more likely for USGS managers.

The USGS is the Federal science bureau within the Department of the Interior (DOI). The USGS is non-regulatory and is not a significant manager of Federal or Trust lands or assets. The regional structure is intended to bring us closer to our customers; we hope that Native Americans and Alaska Natives will use this report.

How to use this report: In the following pages, diverse USGS Central Region activities related to Native Americans are grouped into several categories. If you find an interesting activity that you think might be appropriate to undertake in your area, contact the person(s) listed to learn how the activity was carried out. Ask for suggestions as to whom in the USGS could assist you in setting up a similar activity in your area. If in doubt as to how to proceed, contact ♦ Gene Napier, Central Region and Geography Discipline Native American Native Liaison 605-594-6088 or email at [enapier@usgs.gov](mailto:enapier@usgs.gov).

## Highlights of Fiscal Year 2002

### South Dakota

**Tribal Colleges Convene in Sioux Falls** On October 15 and 16, 2002, 25 of the 33 Tribal Colleges in the United States met at the U.S. Geological Survey's (USGS) EROS Data Center (EROS) near Sioux Falls, South Dakota. The Tribal College Forum was co-hosted by the USGS and Sinte Gleska University (SGU) of the Rosebud Sioux Reservation. The Forum addressed how information and technologies from USGS can assist Tribal College Universities (TCU) in providing economic opportunities to their students and communities. An outcome of the Forum was the creation of a consortium of TCUs that seek to share technologies and capabilities to improve career prospects for their students and service to their Tribes. The 57 participants included several tribal college presidents, their technical specialists, Federal and State agency representatives, non-profit and private groups. USGS Director Charles "Chip" Groat gave the keynote address. Vice Presidents of SGU, Albert White Hat, Leland Bordeaux, and Steve Emery provided presentations while James Rattling Leaf and Jhon Goes In Center facilitated the Forum. Senator Johnson and Congressman Thune, both of South Dakota, also sent representatives. Contact Person: Gene Napier, 605-594-6088, [enapier@usgs.gov](mailto:enapier@usgs.gov)



James Rattling Leaf, Rosebud Sioux Reservation, Mission, South Dakota.



(Left) Albert White Hat, Sr., Rosebud Sioux Reservation, Mission, South Dakota.

(Center) Jhon Goes In Center, Rosebud Sioux Reservation, Mission, South Dakota.

(Right) Director USGS (Chip) Groat, Speaking at the NativeView Forum, South Dakota EROS Data Center.

## **South Dakota**

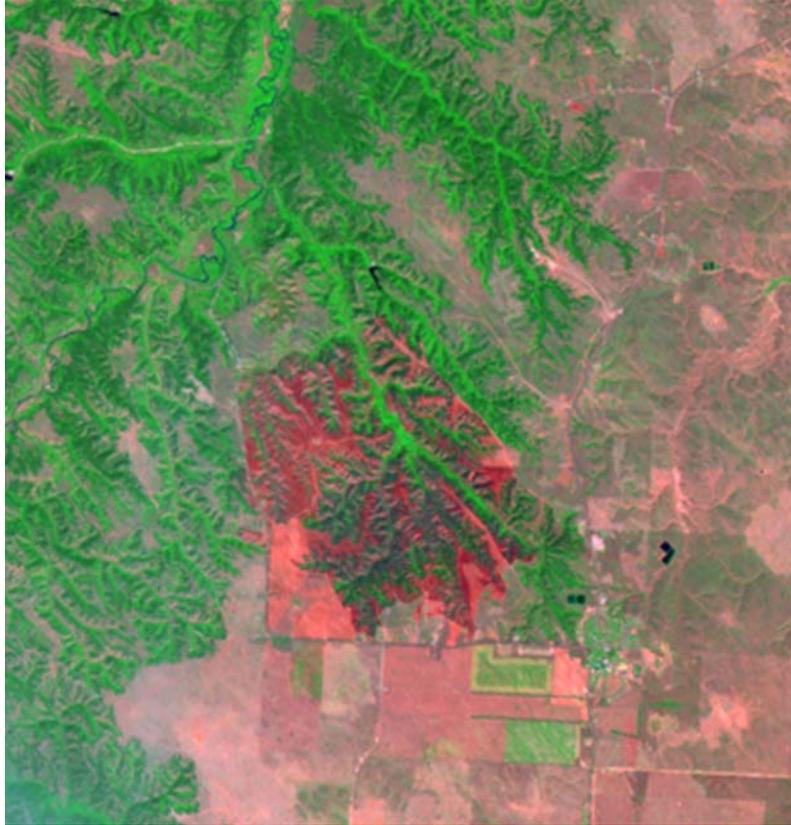
**Oglala Lakota College Advisory Board** Oglala Lakota College (OLC) is an accredited institution offering baccalaureate and master's degrees on the Pine Ridge Reservation of the Oglala Sioux Tribe. It is a member of the Oyate Consortium, a group of five colleges and universities in the Dakotas, which share educational goals, some faculty and staff, and technologies. OLC has about 1,400 students enrolled in courses at nine locations on the Pine Ridge Reservation. Oglala Lakota College is participating in the National Science Foundation's Model Institutions of Excellence (MIE) program to build curricula to train an increasing number of students in mathematics, science, engineering, and technology (MSET). The USGS has been invited as a member of the OLC-MIE advisory board to help identify courses and faculty for the curricula, and then internship and job possibilities for the students. OLC has special interest in analytical chemistry of water samples because they are planning a new facility at Pine Ridge to process several thousand water samples collected on reservations each year. Offering students the option of staying on the Reservation while continuing their formal education makes it likely that more students will choose to stay in college. Once they complete their formal education, they may apply the skills learned on the Reservation to enhance Native American economic development, health, and culture. Contacts: Stacy Phelps [sphelps@olc.edu](mailto:sphelps@olc.edu) Douglas Posson [dposson@usgs.gov](mailto:dposson@usgs.gov) Greg Mohrman [gmohrman@usgs.gov](mailto:gmohrman@usgs.gov) Dan Fitzpatrick [djfitzpa@usgs.gov](mailto:djfitzpa@usgs.gov)

## **South Dakota**

**National States GIS Council (NSGIC)** In cooperation with the Federal Geographic Data Committee, the National States GIS Council plans and develops regional Tribal-State workshops with National Aeronautics and Space Administration (NASA), the Intertribal GIS Council (IGC), and other Tribal entities. The workshops teach GIS and metadata usage for the governing bodies to use in their planning processes. In August 2002, the Bureau of Land Management hosted a NSGIC Tribal-State Federal meeting in Billings, Montana. The meeting had workshops and discussions on the availability of metadata, who is using what data and methods, how to partner to share data and GIS expertise, solutions to developing effective partnerships to better communicate data requirements, opportunities for more cost sharing, and building stable, effective GIS programs. Eleven American Indian Tribal governments and the States of Montana and Washington participated along with the Federal representatives. Contact: Bonnie Gallahan, 703-648-6084, [bgallahan@usgs.gov](mailto:bgallahan@usgs.gov) or Gene Napier, 605-594-6088, [enapier@usgs.gov](mailto:enapier@usgs.gov)

## **South Dakota**

**Horse Looking Fire** (Saint Francis Fire), The USGS EROS Data Center, working with Sinte Gleska University, provided a Landsat 7 image to the Rosebud Tribe to support a fire damage assessment of the Horse Looking Fire on lands of the Rosebud Sioux Tribe. This Landsat 7 image of the fire damage helped the Tribe get a grant from the Wildland Urban Fire Interface, (WUFI). The grant will provide employment for 80 Rosebud tribal members. Lightening started the fire, originally called the St. Francis Fire, on July 29. The fire spread quickly due to drought conditions, destroying valuable timber resources of the Rosebud Tribe and causing the evacuation of 500 people. Tribal, BIA, State, and the US Forest Service sources deployed an estimated five hundred firefighters. The fire was contained on August 3, 2002 after scorching roughly 3,032 acres. This image was also used at the Indian Economic Summit in Phoenix, Arizona in September 2002, to demonstrate how USGS information can benefit Tribal communities. Contact: Gene Napier, 605-594-6088 [enapier@usgs.gov](mailto:enapier@usgs.gov)



This image was also used at the Economic Summit at Phoenix AZ with the following caption (Saint Francis fire was contained on Saturday, August 3, 2002, scorching roughly 3,032 acres in South-central South Dakota. Lightning started the fire July 29 and it spread quickly due to drought conditions. The wildfire greatly impacted the Rosebud Sioux Tribe destroying valuable timber resources and causing the evacuation of 500 people. The cost of fighting the fire has yet to be determined. An estimated five hundred firefighters were deployed from Tribal, BIA, State and the US Forest Service.)

## **Educational Activities**

### **Montana**

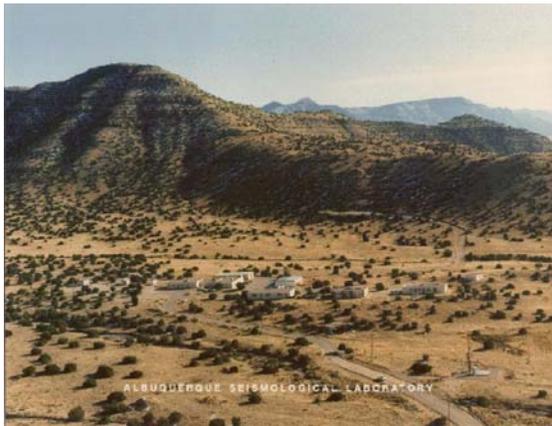
**Water-Resources Training for Chippewa Cree** The USGS conducted a three-day workshop for water-resources technicians of the Chippewa Cree Tribe of the Rocky Boy's Indian Reservation. The seven technicians who attended were introduced to the principles of hydrologic data collection and computation techniques. Contact: Norman Midtlyng (406) 457-5900, [nmidtlyn@usgs.gov](mailto:nmidtlyn@usgs.gov)

### **New Mexico**

**Southwestern Indian Polytechnic Institute (SIPI)** Southwestern Indian Polytechnic Institute (SIPI) and the USGS, through its support of the Federal Geographic Data Committee (FGDC) are conducting quarterly satellite broadcasts from SIPI for participating Tribal colleges and universities. The broadcasts entitled "GIS in Indian Country," have been popular with students and faculty. They provide a good connection to the Indian community, a means of including field work in the curriculum, and an excellent school-to-career opportunity. These broadcasts are dedicated to promoting Tribal self-sufficiency by improving management of geographic information and building intertribal communication networks while maintaining a national standards of data quality through the National Spatial Data Infrastructure. Contact: Bonnie Gallahan, 703-648-6084, [bgallahan@usgs.gov](mailto:bgallahan@usgs.gov)

## **New Mexico**

**USGS/Albuquerque Seismological Laboratory Seismic Test Facility Lease with the Pueblo of Isleta** The USGS recently signed a 10-year lease with the Pueblo of Isleta for use of seismometer test tunnels and boreholes on Isleta lands, south of Albuquerque, New Mexico. The USGS' Albuquerque Seismological Laboratory (ASL) has used these facilities since 1961 for low-noise testing of modern seismic instruments in support of global seismograph networks used for monitoring seismic activity worldwide. This site is notable for its low-noise characteristics. Seismic equipment manufacturers want their instruments to be tested here as a key step in qualifying the instruments for use in seismic networks. The USGS/ASL also operates a standard Global Seismograph Network (GSN) station at this location, one of 120 such stations operating worldwide in more than 80 countries and islands. GSN stations support earthquake monitoring and research at the USGS National Earthquake Information Center, tsunami warning efforts by the National Oceanic and Atmospheric Administration, and monitoring efforts for the Comprehensive Test Ban Treaty. The Pueblo of Isleta and the general public receive occasional educational talks and presentations on how the seismic equipment functions for monitoring earthquakes. Contact Person: Charles R. (Bob) Hutt, 505-462-3201 [bhutt@usgs.gov](mailto:bhutt@usgs.gov)  
Web: <http://aslwww.cr.usgs.gov> Live Seismograms: <http://www.liss.org/>



**(Left)** Albuquerque Seismological Laboratory Test Facility, located on the Isleta Reservation just south of Albuquerque (Photo Credit Eagle's Eye Photo of Albuquerque).

**(Right)** The tunnel entrance goes back into the rock about 50 feet or so to two 20'x 20' rooms where we place the seismometers on the floor for testing. The concrete floor is attached directly to the rock. The rock is Pre-Cambrian granite, one of the best kinds of rock on which to put a seismometer for detecting earthquakes at great distances. This is because this granite came up from a great depth more than 600 million years ago, so it is like a big nail driven deep into the earth's crust where it's easy to pick up seismic waves coming from distant earthquakes. (Photo Credit: Dr. Charles R. (Bob) Hutt).



**(Left)** The drum recorder being loaded into the truck by John (our warehouse packing and crating guy) and Steve (one of our contract field engineers) is used for recording a magnified version of ground motion detected and amplified by a seismometer and amplifier system. It uses heat sensitive paper and a heated stylus (pen) for writing the lines on the paper. Note that this drum recorder is old technology. Nowadays, we use high-tech digital data acquisition systems for recording the seismic data. However, these old drum recorders are very useful for museum displays and tour groups. We connect a seismometer to it and set the seismometer on the floor close by. This means you can jump on the floor close to the seismometer and make the pen move. Quite exciting for kids (and everybody) to see that they can actually make a concrete floor move! (We tell them they are "making their own earthquake.") (Photo Credit: Dr. Charles R. (Bob) Hutt).

**(Right)** Steve Roberts, a Honeywell field engineer at the USGS Albuquerque Seismological Lab, is testing a seismometer in the ASL Seismic Test Facility tunnel. This seismometer detects the tiny ground vibrations (seismic waves) caused by distant earthquakes. (Photo Credit: Dr. Charles R. (Bob) Hutt).

### **North Dakota**

**Spirit Lake Nation Wetlands Ecology** The Spirit Lake Nation will initiate a wetland-monitoring program on its lands in 2003. In preparing for that program, USGS personnel trained members of the Spirit Lake Nation in wildlife and plant inventory techniques. The training also included assistance in the development of quality assurance project plans (QAPP) to ensure that data quality is consistent with objectives of the wetland-monitoring plan. Early in 2003, USGS staff will assist Spirit Lake personnel in selecting candidate wetland sites and establishing photographic stations for monitoring general temporal changes in candidate wetlands. Contact: Ned H. Euliss, Jr., 701-253-5564, [ned\\_euliss@usgs.gov](mailto:ned_euliss@usgs.gov)

### **South Dakota**

**Sinte Gleska GIS Lab** USGS personnel are working with Sinte Gleska University (SGU) to develop a sustained SGU laboratory for geographic information systems research and applications. The effort has two primary components: programmatic development and infrastructure development. Programmatic development involves identifying spatial analysis needs within the Rosebud Sioux community and defining pilot projects with groups such as the Rosebud Sioux Tribal housing authority, the Tribal Land Enterprise, and University constituents. The second component, infrastructure development, addresses the physical infrastructure such as computers and networking, data needs, and human resource development (training, internships, staff exchanges, workshops). Significant accomplishments in FY2002 include: developing a work-plan; conducting training sessions in the use of global positioning systems (GPS) methods for field data collection and organization; and conducting ESRI-certified ArcView training. Contact Person: Gene Napier, 605-594-6088, [enapier@usgs.gov](mailto:enapier@usgs.gov)



Mike Coan (on the right), an SAIC scientist at the EROS Data Center, demonstrates the use of a consumer grade global positioning system receiver to collect geolocated field data on the Rosebud Reservation. Observing from left to right are Kenny Haukus from the Rosebud Sioux tribal housing authority, and Steve Sweigert and James Rattling Leaf of Sinte Gleska University. (Photo Credit: David Meyer PhD).

## **South Dakota**

**Workshop in Geographic Information Systems for Professionals from the Rosebud Sioux Tribe and Sinte Gleska University** The Rosebud Sioux Tribe, Sinte Gleska University in South Dakota, and the USGS signed a Memorandum of Understanding in Fall 2000 to work together to improve science education for Native American students. During 2002, the partnership fostered successful workshops and an online course. In June 2002, James Rattling Leaf, Sinte Gleska University, and Joseph Kerski, USGS Geographer, conducted a three-day hands-on geographic information systems workshop for tribal and university professionals from water resources, the tribal land office, cultural resource management, biology, and other fields.



James Rattling Leaf, and Joseph Kerski, teamed up to conduct the workshop at Sinte Gleska University at Mission, South Dakota. The workshop emphasized the use of digital spatial data, such as computer maps, satellite imagery, and aerial photographs, to help make wise decisions about the Earth and its people. This workshop was a hands-on experience using geographic information systems (GIS).

## **South Dakota**

**Workshop in Geographic Information Systems for SGU Students Training to Become Full-Time Geography Teachers** In August 2002, Joseph Kerski, USGS geographer, conducted a two-day GIS workshop for educators in a geography-teaching course. Through the workshop, future and current teachers became familiar with the power of GIS technology and methods, and learned about ways to implement GIS in their own classrooms.



The workshop included a segment on collecting field data and coordinates with Global Positioning Systems (GPS).

## **South Dakota**

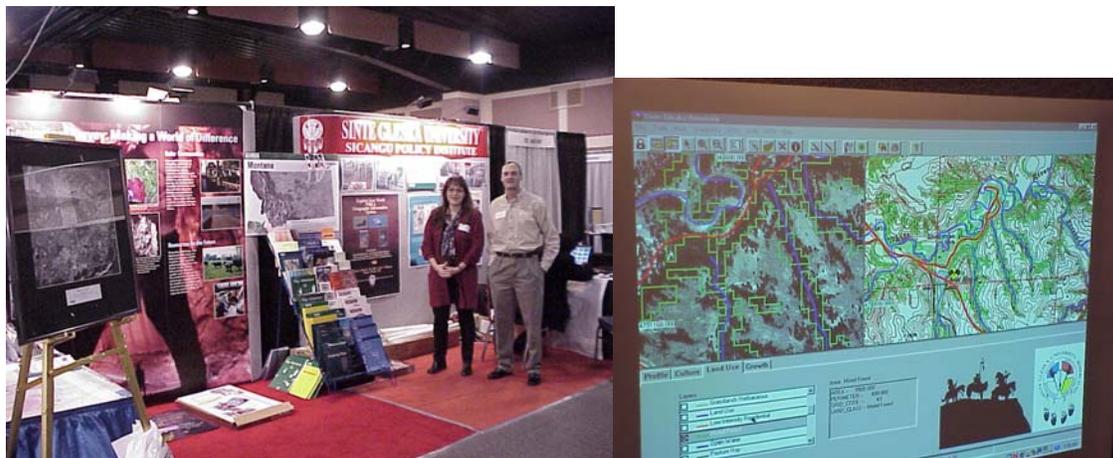
**Introduction to Geographic Information Systems and Science, Sinte Gleska University, Fall 2002 Semester** Sinte Gleska University endorsed its first-ever online course in geographic information systems as a part of its long-term goal making the University a focal point in spatial analysis. Joseph Kerski, USGS geographer, served as instructor for the course. Location of the online course is: <http://rockyweb.cr.usgs.gov/public/outreach/sgu/sgugis.html>



The course objectives are to understand the principles, applications, trends, and pertinent issues of GIS, to become competent in solving problems with spatial analysis by using GIS software (ArcView). Increasing proficiency in communicating objectives and results of research and production conducted with GIS, and understanding how to obtain and analyze data such as that focused on watersheds, population, cultural resources, terrain, natural hazards, land cover, and land ownership is also stressed in the course. Finally, we want the students to gain an understanding of how to manipulate and apply vector and raster spatial data, particularly with regard to Native American issues, emphasizing lands in and near the Rosebud Sioux region of South Dakota.

## **South Dakota**

**USGS and Sinte Gleska University Host Exhibit and Conduct GIS Workshop at the annual conference of the National Indian Education Association – October 2001** The USGS and Sinte Gleska University hosted a joint exhibit booth at the National Indian Education Association's annual conference during October 2001 in Billings, Montana. Over 3,000 Native American educators gathered for the conference.



**(Left)** USGS information and education specialist Carrie Jucht, left, and USGS Geographer Lance Clampitt stand near the materials and demonstrations that were shown to the conference attendees.

**(Right)** James Rattling Leaf, Joseph Kerski, and Jhon Goes In Center conducted a workshop in how Geographic Information Systems can be applied effectively teach geography, history, science, environmental studies, and mathematics. They demonstrated an application, above, that integrates satellite images, aerial photographs, sound, ground photographs, movies, and topographic maps from the past and present for the Rosebud Sioux lands.

## **South Dakota**

**USGS and Sinte Gleska University Host Exhibit and Conduct GIS Workshop at the annual conference of the National Indian Education Association – November 2002** The USGS and Sinte Gleska University hosted a joint exhibit booth at the National Indian Education Association's annual conference during November 2002 in Albuquerque, New Mexico. Over 3,000 Native American educators gathered for the conference.



**(Left)** At the exhibit, USGS information and education specialist Carrie Jucht, right, explains the use of USGS resources to a conference attendee.

**(Center)** Jhon Goes in Center, left, Sinte Gleska University, Esther Worker, ESRI Inc., Joseph Kerski, USGS, and James Rattling Leaf, Sinte Gleska University, conducted a hands-on workshop in GIS for attendees at the conference.

**(Right)** Conference attendees examined Native American population by county, tornadoes, watersheds, and earthquakes using ArcGIS software.

## **Resource /Environmental Activities with Technical Assistance**

### **Colorado**

**Water-quality for the Southern Ute Indian Tribe** The Southern Ute Indian Tribe has rights to 1/6 of the storage capacity of the Vallecito Reservoir and has supported USGS water quality work there. The Vallecito Dam and Reservoir were constructed to furnish supplemental water to about 54,000 acres. The Vallecito Dam prevents the flooding of crops, farmland, and structures along the Vallecito River during spring runoff by storing the floodwater for controlled releases to benefit irrigation. The Southern Ute Tribe is supporting a USGS study that is characterizing current water-quality conditions in the Vallecito Reservoir watershed over five years beginning in 2000. These data will be used to establish a baseline of major ions, metals, nutrients, and dissolved oxygen concentrations in reservoir inflows, in the reservoir itself, and in the reservoir outflow. Current conditions will form the baseline for comparisons with later years, to assess the affects of future population growth and land-use changes on reservoir water quality. Monitoring is planned to continue for 10 to 20 years after the initial 5-year characterization of existing water-quality conditions to determine water-quality trends. The Missionary Ridge wildfire of June 2002 severely burned the watershed adjacent to Vallecito Reservoir. The Southern Ute Tribe, the U.S. Bureau of Reclamation, and the Pine River Watershed Stakeholders Group have asked the USGS to prepare a proposal to evaluate the affects of the Missionary Ridge wildfire on the water quality of Vallecito Reservoir in 2003. Therefore, in 2003 more intensive sampling will be conducted for a broader set of parameters. Contact: Tony Ranalli, 303-236-4882 ext.313, [tranalli@usgs.gov](mailto:tranalli@usgs.gov)

### **Kansas**

**Historical channel change along Soldier Creek, northeast Kansas** USGS scientists analyzed information from eight USGS streamflow-gaging stations to assess historical channel change along Soldier Creek, northeast Kansas. At each gaging station, channel change was assessed

using channel-bed elevation as the primary indicator. Changes in channel-bed elevation were inferred from changes in the stage associated with the mean annual discharge at each station. Other variables (channel width, channel area, and streamflow velocity) were used as additional indicators of change. Results indicated that the most substantial channel changes occurred downstream from Rocky Ford at the Soldier Creek streamflow-gaging stations located near Topeka and Delia. The available evidence indicated that the channelization of Soldier Creek, completed in 1961, was likely to be the primary cause of the channel changes at these locations. The decreasing base level provided by the Kansas River also may have contributed to the channel changes at these locations. At the Soldier Creek gaging station near Topeka, immediate effects of the channelization included a decrease in channel-bed elevation of about 5 feet and an increase in channel width of about 35 feet. The instability introduced by the channelization caused channel-bed degradation that moved upstream at the rate of about 0.7 to 1.2 miles per year. At the Soldier Creek gaging station near Delia, located about 12 miles upstream from the upstream end of the channelized section, channel-bed degradation began during the 1970s and resulted in a net decrease in channel-bed elevation of about 5 feet by 1999. The available evidence indicated that Soldier Creek at and upstream from Rocky Ford has not been substantially affected by the upstream-progressing channel-bed degradation as of 2001. In this part of the basin other causes of channel change, such as land use and floods, may be relatively more important. Contact: Kyle Juracek, 785-832-3527, [kjuracek@usgs.gov](mailto:kjuracek@usgs.gov)

## **Kansas**

**Water Quality on the Lands of the Prairie Band Potawatomi Nation** Water quality is a major concern for the Prairie Band of Potawatomi Nation because creeks on their lands provide sources of subsistence hunting and fishing for Tribal members. Ground water is used in domestic wells on the reservation and is being considered as a source for water supply as the Tribe develops its economic base. Surface water on Tribal lands has been sampled on a quarterly basis since June 1996 and two reports have been published as a result of the surface water monitoring. In 2002, a ground water component was added to the study and eleven wells completed on the reservation will be sampled on a yearly basis to assess ground water quality. Tribal personnel assist USGS scientists in collecting and preparing samples for analysis in conjunction with the water quality aspects of this study. As part of the capacity building, Tribal personnel have also attended training courses at the USGS National Training Center in Denver as well as training with USGS personnel on other water quality studies in the Kansas District. The study is scheduled to continue through 2004 with a cumulative interpretative report on the water quality of the Potawatomi lands to be released at the conclusion of the study. Contact: Heather Ross, (785) 832-3575, [hross@usgs.gov](mailto:hross@usgs.gov)

## **Minnesota**

**Hydrologic and Lake Level Changes, Long Lost Lake, White Earth Band of the Minnesota Chippewa Tribe** Long Lost Lake is a 480-acre land-locked lake, within the boundaries of the White Earth Indian Reservation. The lake is approximately 6 miles west of Lake Itasca, the source of the Mississippi River, in northwestern Minnesota. The water level (stage) of Long Lost Lake has risen approximately 20 feet since about 1990. Twelve Tribal residences, several roads, and 50 acres of Tribal lands are submerged. Thirty Tribal members have been displaced from their homes due to stage increases in the lake. This study will document historical changes in the stage of Long Lost Lake, to determine the cause and effect relations that have resulted in increased lake stage, and to develop a general understanding of the hydrology of lakes that experience rapid and dramatic changes in lake stage. Climatological changes and human modifications within the watershed will be considered as potential factors related to increased lake stage. This study also will develop the monitoring network needed to understand the hydrologic setting and hydrologic budget of the Long Lost and information about the setting of the lake relative to other lakes in the area. The study began in FY02 and is expected to conclude in FY05. Contact: Don Hansen, 763-783-3250, [dshansen@usgs.gov](mailto:dshansen@usgs.gov)

## **Minnesota**

**Moose Population Dynamics In Northeastern Minnesota** The USGS Minnesota Field Station of the Northern Prairie Wildlife Research Center is conducting moose research with the Minnesota Department of Natural Resources, Fond du Lac Band of Lake Superior Chippewa, and the 1854 Authority. The objectives of the study are to determine survival rates of adult moose, causes of mortality, and to improve aerial surveying of the moose population. Twenty-four moose have been captured, fitted with radio-collars, and aerially radio-tracked once per week. From January 2002 to January 2003, four moose have died of malnutrition, wolves killed one, and one was shot during the hunting season. The five non-hunting mortalities were all females. This information will help the Tribes and the State improve moose management and make sound decisions by providing information critical to the long-term welfare of moose in Minnesota. Forty additional moose will be captured in FY 2003 to add to and replace the study animals that have died. Contact: Michael Nelson, 218-365-4505, [michael\\_nelson@usgs.gov](mailto:michael_nelson@usgs.gov)



Moose after being fitted with radio-collar photo was taken by Brian Borkholder, Fond du Lac Resource Management Division.



**(Left)** Brian Borkholder, Fond du Lac Resource Management Division, took close-up of moose after being fitted with radio-collar photo



**(Center)** Filming Moose after fitting moose with radio-collar, photo was taken by Sonny Meyers the Executive Director for the 1854 Authority based in Duluth. The 1854 Authority represents the Grand Portage and Bois Forte bands of Lake Superior Chippewa.



**(Right)** Fitting moose with radio-collar, photo was taken by Sonny Meyers the Executive Director for the 1854 Authority based in Duluth.

## **Missouri**

**Effects of Past Mining on Aquatic Resources Important to Native Americans of Northeast Oklahoma** The Tri-States Mining District, which comprises parts of Jasper and Newton Counties, Missouri, Cherokee County, Kansas, and Ottawa County, Oklahoma, was mined for lead and zinc for more than a century. Although mining has ceased, mine wastes remain distributed throughout the District and there is evidence of surface water and groundwater contamination throughout the region. The Quapaw Tribe of Oklahoma and other Native American groups have expressed concern about health risks associated with the consumption of fish and other aquatic organisms from waters in the Tri-States District. Late in 2001, a study was initiated to determine the extent of metal contamination from historical mining on fishes and other aquatic organisms. USGS scientists collected fish and crayfish from selected locations in the Spring and Neosho River systems of northeast Oklahoma. Samples of crayfish are being analyzed for concentrations of lead, cadmium, zinc, and iron to identify important pathways of metal exposure in stream food webs and potential risks to Native American consumers of aquatic organisms. Fish and invertebrates were prepared for human consumption, as they would have been by Native Americans. Blood was obtained from each fish and analyzed for metals and for biochemical responses (biomarkers) indicative of exposure to and effects of lead and other toxic metals. Contact: Michael J. Mac, 573-876-1900, [michael\\_mac@usgs.gov](mailto:michael_mac@usgs.gov)

## **Montana**

**Northern Divide Grizzly Bear Project** The USGS Northern Rocky Mountain Science Center in Montana, in cooperation with the Confederated Salish and Kootenai Tribes, the Blackfeet Nation, and other Federal and State agencies, is leading a multi-year research project to determine the number of grizzly bears in the Northern Continental Divide Ecosystem of the United States. This project, requested by the Governor of Montana and supported by Senator Burns (MT), is expected to produce a scientifically valid estimate of the size of the grizzly bear population for the entire ecosystem. The study area is immense, encompassing 7.9 million acres from the Salish-Kootenai lands in west to the Blackfeet Reservation lands in the east and from the Canadian border in the north to Montana Highway 200 in the south. Much of the project is on Tribal lands. Representatives from both Tribal governments have been actively involved in all stages of the planning process and will serve as project sub-area leaders. Contact: Kate Kendall, 406-888-7994, [kkendall@usgs.gov](mailto:kkendall@usgs.gov) Representatives from the Tribal governments are: Salish-Kootenai: Dale Becker, phone: (406) 675-2700 ext 1278 [daleb@cstk.org](mailto:daleb@cstk.org) Blackfeet: Dan Carney, phone: (406) 338-2430 [dcarney@3riv](mailto:dcarney@3riv)



The grizzly in the picture actually was in the Yellowstone Ecosystem. "The grizzly bear is a subject of study in the Northern Continental Divide Ecosystem" (Photo Credit Chad Dickinson).

## **Montana**

**Northern Cheyenne Nation and Coalbed Methane.** In FY02, the Northern Cheyenne Nation began a partnership with the USGS to core drill several Fort Union coal beds and to evaluate the potential of coalbed methane resources on the Northern Cheyenne Reservation (NCIR). Coring was performed in conjunction with drilling seven wells to monitor water in the southern part of the Reservation. The Bureau of Indian Affairs Regional Office in Billings, Montana and the USGS Montana Water Resources District cooperatively supported the drilling project. Personnel from USGS Central Region Geology Team and the Northern Cheyenne Natural Resource Department collected coal cores from three wells and desorbed and measured gas on the drill site. Additional desorption was performed in USGS laboratories in Denver, Colorado. Retrieval of continuous cores of the coal beds, which include the Knobloch, Wall, Pawnee, and Flowers-Goodale coals, permitted gas desorption, adsorption (isotherm), gas composition (chemistry and isotopic), coal quality, and coal petrology analyses. The data will be used to estimate the gas-in-place resources on the Northern Cheyenne lands. This information is critical for the Northern Cheyenne Tribal Council to use in making policy decisions on the possible development of coalbed methane, especially with the onset of development off the Reservation. The information will also provide baseline data for determining the effects of gas drainage from future coalbed methane development off the Reservation. Contact: (geology) Romeo M. Flores, 303 236-7774, [rflores@usgs.gov](mailto:rflores@usgs.gov) (water) Mike Cannon, 406 457-5900, [mcannon@usgs.gov](mailto:mcannon@usgs.gov) Tribal contact: Jason Whiteman, 406 477-6503



**(Left)** Two NCIR student trainees from the Northern Cheyenne Tribe who assisted us to desorb gas in our mobile lab (Photo Credit Margaret Ellis).  
**(Center)** NCIR drillrig- a truck-mounted drill rig, which was used for our coring of the coal beds in the Tribal lands (Photo Credit Gary Stricker).  
**(Right)** Photo Caption – Art Clark (USGS) explains the coring process to Patricia Morrison, Deputy Assistant Secretary for Land and Minerals Management. Also pictured are staff of the Northern Cheyenne Natural Resources Department working on the project including: (from left to right) Floyd Fisher, Stephanie Whitegrass, Jason Whiteman (Director) and Leland Pine.

**Montana**

**Surface-Water Monitoring Stations**

The USGS operated the following surface-water monitoring stations:

<u>Number of Stations</u>	<u>Cooperator</u>
2	Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
9	Confederated Salish and Kootenai Tribes of the Flathead Indian Reservation
7	<u>Blackfeet Tribe</u>
4	Northern Cheyenne Tribe
3	Chippewa Cree Tribe of the Rocky Boy's Indian Reservation
11	Bureau of Indian Affairs

Funding: Cooperating Agencies \$124,350, Other Federal Agencies \$97,200, USGS \$124,350  
 Contact: Wayne R. Berkas (406) 457-5900, [wrberkas@usgs.gov](mailto:wrberkas@usgs.gov)

**Montana**

**Lower Missouri River Surface-Water-Quality Monitoring, Fort Peck Indian Reservation**

The USGS conducted surface-water-quality monitoring at three sites on the lower Missouri River along the southern boundary of the Fort Peck Indian Reservation.

<u>Number of Stations</u>	<u>Cooperator</u>
3	Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation

Funding: Cooperating Agencies \$31,300, USGS \$15,000  
 Contact: John Lambing (406) 457-5900, [jlambing@usgs.gov](mailto:jlambing@usgs.gov)

**Montana**

**Technical Assistance to the Blackfeet Nation on Water-Resources Issues** In FY2002, the USGS continued to provide technical assistance to the Blackfeet Nation on water-resources issues. The USGS provided the Tribal government with information and guidance regarding ground-water-flow directions and water levels in the vicinity of a wetland area near the town of Browning. The USGS also provided streamflow data and technical assistance to Tribal authorities during flooding in June 2002 related to a major snowstorm. Contact: Mike Cannon, 406 457-5900, [mcannon@usgs.gov](mailto:mcannon@usgs.gov)

## **Montana**

**Flood-Frequency At Gaged and Ungaged Sites in Montana** Reliable flood-frequency information for streams is essential for design and operation of various water-control structures such as dams, levees, and water-supply systems. In addition, reliable flood-frequency data are required for proper design of stream-crossing transportation structures, such as bridges and culverts, and for identification of flood-prone areas for land-use management and flood-insurance purposes. This study is a cooperative activity with the Confederated Salish and Kootenai Tribes. It is intended to update flood-frequency information for all gaged sites in Montana that have at least 10 years of unregulated-flow record; to use the updated flood-frequency information, together with geomorphic and climatic data compiled at each gaged site, to develop regional regression equations and a region-of-influence computer model for the estimation of flood-frequency at ungaged sites; and to develop a Web-based program to help a user apply the estimation methods at ungaged sites. Contact: Charles Parrett, 406 457-5900, [cparrett@usgs.gov](mailto:cparrett@usgs.gov)

## **Montana**

**Hydraulic Characteristics and Flood-Limit Delineation of the Jocko River on Part of the Flathead Reservation** The objective of this cooperative project is to delineate the flood limits and hydraulic floodway for 100- and 500-year events for a 20-mile reach of the Jocko River from near Arlee, Montana, to the river's mouth near Dixon on the Flathead Reservation of the Confederated Salish and Kootenai Tribes. USGS hydrologists surveyed channel-geometry (cross-section) data for the Jocko River and are using the data in a hydraulic model to calculate water-surface profiles and other hydraulic parameters such as flow area, conveyance, flow widths, mean flow depths, and velocities. The hydraulic data will be used to delineate the flood plain and floodway. Determination of hydraulic characteristics is a prerequisite to the delineation of flood limits and a hydraulic floodway for the 100-year flood. The 100-year flood is commonly used as a regulatory flood for flood-plain management and flood insurance purposes. Adoption of flood-plain management regulations for the Jocko River would enable land-use and fishery managers for the Salish and Kootenai Tribes to better plan and guide future development to minimize riverine impacts and would also enable citizens to purchase subsidized flood insurance. Contact: Charles Parrett, 406-457-5928, [cparrett@usgs.gov](mailto:cparrett@usgs.gov)

## **Nebraska**

### **Surface Water Monitoring Stations FY 02**

2 -- Installation of streamflow data collection stations, Santee Sioux Tribe  
Funding: Santee Sioux Tribe \$24,000, USGS \$24,000

Contact: Phil Soenksen (402) 437-5156, [pjsoenks@usgs.gov](mailto:pjsoenks@usgs.gov)

2 -- Installation of streamflow data collection stations, Omaha Tribe  
Funding: Omaha Tribe \$24,000, USGS \$24,000

Contact: Phil Soenksen (402) 437-5156, [pjsoenks@usgs.gov](mailto:pjsoenks@usgs.gov)

1 -- Installation of streamflow data collection station, Winnebago Tribe  
Funding: Winnebago Tribe \$12,000, USGS \$12,000

Contact: Phil Soenksen (402) 437-5156, [pjsoenks@usgs.gov](mailto:pjsoenks@usgs.gov)

## **Nebraska**

### **Surface Water Monitoring Stations FY 03**

2 -- streamflow data collection, review and publication of data, Santee Sioux Tribe  
Data collection began in October 2002

Funding: Santee Sioux Tribe \$12,000, USGS \$12,000

Contact: Phil Soenksen (402) 437-5156, [pjsoenks@usgs.gov](mailto:pjsoenks@usgs.gov)

2 -- streamflow data collection, review and publication of data, Omaha Tribe  
Data collection began in October 2002

Funding: Omaha Tribe \$12,000, USGS \$12,000

Contact: Phil Soenksen (402) 437-5156, [pjsoenks@usgs.gov](mailto:pjsoenks@usgs.gov)

1 -- streamflow data collection, review and publication of data, Winnebago Tribe

Data collection began in October 2002

Funding: Winnebago Tribe \$6,000, USGS \$6,000

Contact: Phil Soenksen (402) 437-5156, [pjsoenks@usgs.gov](mailto:pjsoenks@usgs.gov)

## **New Mexico**

**Geologic Framework of Rio Grande Basins, New Mexico** The USGS is conducting geologic and geophysical studies to provide a framework for understanding aquifers in several critical ground-water basins along the Rio Grande, which extends from Colorado to Mexico. The current focus of this project is the Española ground-water basin in the greater Santa Fe, New Mexico, region, which includes lands belonging to the Pueblos of Cochiti, Nambe, Pojoaque, Tesuque, San Ildefonso, San Juan, and Santa Clara. A major project goal is to develop a three-dimensional geologic model of the ground-water basin that will eventually improve the understanding of ground-water flow and resources. The project includes: geologic mapping in cooperation with the New Mexico Bureau of Geology and Mineral Resources and the University of New Mexico; geophysical mapping of the subsurface in cooperation with Los Alamos National Laboratory and the Summer of Applied Geophysics Experience educational program; investigations into how faults affect the aquifer system; and studies of geologic history to predict the distribution of underground aquifers. Geologic and geophysical maps of Pueblo areas provide information that aids in ground-water protection, and assessment of water and other natural resources. In April 2002, the Rio Grande basins project hosted a workshop in Santa Fe to foster communication among scientists working in the Española basin and communicate the results of the studies to the 85 workshop attendees, several of whom were members of Pueblo nations. Contact: Mark Hudson, 303-236-7446, [mhudson@usgs.gov](mailto:mhudson@usgs.gov) Tien Grauch, 303-236-1393, [tien@usgs.gov](mailto:tien@usgs.gov)

## **New Mexico**

**Geohydrologic and Water-Quality Assessment of Pueblo of San Ildefonso Lands** The Pueblo of San Ildefonso need geohydrologic and water-quality information to help care for the people of the Pueblo. To provide that information, USGS, in cooperation with the Pueblo's Department of Environmental and Cultural Preservation, is conducting a multi-year study to determine the surface- and ground-water quality, and characteristics of the Pueblos water resources. The work is identifying environmental impacts to the geohydrologic system from internal and external sources. The information will be used by the DCEP as the basis for health risk assessments and potentially for establishing water-quality standards for the Pueblo. The cooperative project is also providing training for Pueblo of San Ildefonso staff in the collection of surface-water, ground-water, and water-quality data, and in basic interpretation of water-quality data. Funding FY02: Pueblo of San Ildefonso \$30,000; U.S. Geological Survey \$30,000  
Contact: Dale Rankin (505) 830-7965, [drrankin@usgs.gov](mailto:drrankin@usgs.gov)

## **New Mexico**

**Water Resources Technician Training Program, Introduction to Hydrologic Data-Collection Techniques** In April 2002, USGS New Mexico District personnel provided a 4-day training class for Tribal representatives throughout the U. S. The training, held in Las Cruces, New Mexico, included classroom and field instruction in ground-water concepts and data collection, surface-water data collection and water-quality data collection. The training was part of a 5-week earth-sciences course sponsored by the Bureau of Indian Affairs that utilized instructors from several Federal agencies and New Mexico State University. About 30 students attended this year's training. Contact: Edward (Nick) Nickerson (New Mexico), 505-646-7618, [nickerso@usgs.gov](mailto:nickerso@usgs.gov)

## **New Mexico**

### **Surface Water Monitoring Stations**

1 -- stage only, Isleta Pueblo

2 -- streamflow, Zuni Pueblo

6 -- streamflow, BIA

Funding: Cooperating Agencies \$70,976, USGS \$10,214

Contact: Mike Roark, (505) 830-7903, [mroark@usgs.gov](mailto:mroark@usgs.gov)

Expected levels of funding for FY 2003 are as follows:

Cost center: New Mexico District

### **New Mexico**

**Consultation with Santa Clara Pueblo** USGS scientists are working with the Forestry Department at the Santa Clara Pueblo in the Pueblo's development of an Integrated Resource Management Plan. The USGS scientists are participating in discussions of possible study designs for field data collection, as well as sharing protocols used by USGS social scientists to improve understanding the relationships between people and the landscape. USGS research at the Cerro Grande burn, which occurred partly on Pueblo land, has led to acquisition of satellite images and development of data in a geographic information system (GIS); all data and products are being provided to the Tribe. In addition, USGS scientists support the Pueblo's efforts to increase expertise in GIS, using global positioning systems (GPS), and remotely sensed data by providing technical advice and assistance on request. Contacts: Sandra Haire [sandy\\_haire@usgs.gov](mailto:sandy_haire@usgs.gov); Dave Lambert [dlambert@santaclarapueblo.org](mailto:dlambert@santaclarapueblo.org)

### **New Mexico**

**Understanding Fire in Southwestern Forests: Western Science and Native Views** A discussion group was held at the Western Social Science Association (WSSA) meeting in Albuquerque last April to discuss the importance of traditional knowledge in understanding and managing fire-adapted systems. A major focus of the discussion involved the ramifications of sharing knowledge, including the proprietary nature of traditional knowledge and the differences in perspective on this issue among the different tribes. Invited participants included members of the Santa Clara Pueblo, Isleta Pueblo, and Rosebud Sioux. Contact: Sandra Haire ([sandy\\_haire@usgs.gov](mailto:sandy_haire@usgs.gov))

### **North Dakota**

**Spirit Lake Tribe Capacity Building** USGS personnel accompanied Spirit Lake Tribal staff in the field and provide quality-assurance regarding the collection, processing, and shipping of water quality samples. USGS personnel have helped the Tribal staff assemble and install wetland-monitoring packages, and provided training on how to read and record water-level information, how to calibrate the equipment, and how to transfer data from the field to the office. USGS personnel also provided training on how to select the location, make, and compile a discharge measurement. The USGS National Water Quality Laboratory processed the water quality samples. Contact: Douglas G. Emerson, 701-250-7402, [demerson@usgs.gov](mailto:demerson@usgs.gov)

### **North Dakota**

#### **Surface Water Monitoring Stations**

2 -- streamflow, Three Affiliated Tribes

Funding: Three Affiliated Tribes \$11,340, USGS \$11,340

Contact: Douglas G. Emerson, 701-250-7402, [demerson@usgs.gov](mailto:demerson@usgs.gov)

### **North Dakota**

#### **Water-Quality Monitoring Stations**

4 - lake water-quality sampling sites, Turtle Mountain Band of Chippewa Indians

Funding: \$14,450, USGS \$14,450

Contact: Douglas G. Emerson, 701-250-7402, [demerson@usgs.gov](mailto:demerson@usgs.gov)

### **Oklahoma**

**Monitoring of Nitrate and Pesticides for the Chickasaw Nation** The Chickasaw Nation is

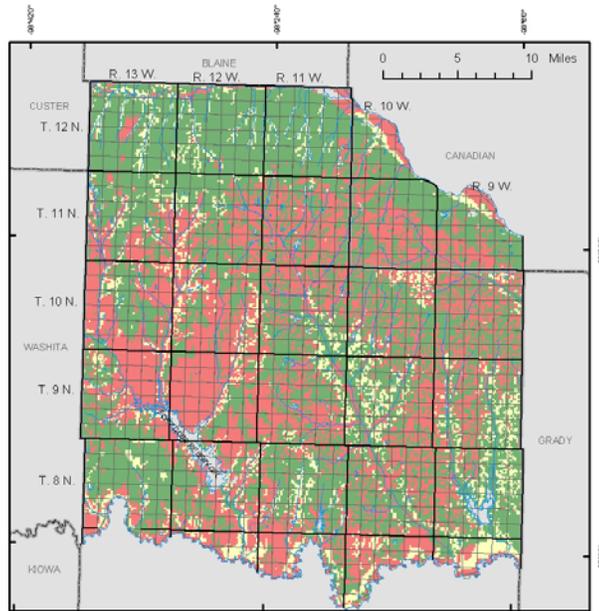
concerned about potential contamination of groundwater by nitrate and pesticides leaching from cropland and pastures in their Tribal Jurisdictional Area. As part of a water-resource assessment, USGS staff, assisted by Chickasaw Nation Environmental staff, sampled 17 wells in south-central Oklahoma in August 2002 for water properties, nitrate concentration and 86 commonly-used pesticides, at parts per trillion reporting limits. Only one well had a nitrate concentration exceeding the drinking water standard and 4 wells had detectable concentrations of organophosphate or triazine pesticides. A summary of the study is posted at <http://ok.water.usgs.gov/chickasaw/> Contact: Jason Masoner, 405-810-4407, [masoner@usgs.gov](mailto:masoner@usgs.gov)

## **Oklahoma**

**Trace Metals in Grand Lake, Northeastern Oklahoma for the Seneca-Cayuga Tribe** The Seneca-Cayuga Tribe is concerned that trace metals from the Tri-State Lead/Zinc mining district may contaminate sediments in the bed of the northern part of Grand Lake of the Cherokees. The Tri-State District is the largest superfund site in the U.S. and is upstream from the Lake. In April 2002, USGS staff, assisted by Seneca-Cayuga Environmental Staff, conducted a reconnaissance investigation of the transport of metals from that mining district. The team collected bed sediment and water-column samples for analyses of total concentrations of cadmium, lead, and zinc. All three metals were detected in the water column at concentrations ranging from 0.15 to 35 ug/L (exceeding the drinking-water standard for lead), and were detected in sediments in concentrations ranging from 3 to 540 mg/Kg. Summaries of the data were prepared for the Tribe. Contact: Kyle Davis, 918-254-6651, [kcdavis@usgs.gov](mailto:kcdavis@usgs.gov)

## **Oklahoma**

**Hydrologic Information and GIS Capacity Building for the Caddo Tribe** The Caddo Tribe of Oklahoma is concerned about the vulnerability of ground water to pesticide contamination in northern Caddo County and parts of Canadian County, Oklahoma. On behalf of the Tribe, the USGS constructed pesticide-soil-leaching –potential maps, for the pesticides alachlor, atrazine, cyanazine, and metolachlor. The maps show the potential for pesticides to leach below the root zone when applied to the land surface using common application methods. The Tribe, with USGS assistance, is developing a geographic information system (GIS) that includes soils information, land use, pesticide use, existing water-quality data, and other data for parcels of land. USGS scientists worked with Tribal employees on ways to use GIS and available information for pesticide management planning. At the Caddo Tribal headquarters in October 2002, several Tribal members were trained in the use of spatial data and basic GIS software applications by USGS staff. Contact: Carol J. Becker, 405-810-4436, [cjbecker@usgs.gov](mailto:cjbecker@usgs.gov)



**EXPLANATION**

- Low potential for alachlor to leach below root zone
- Intermediate potential for alachlor to leach below root zone
- High potential for alachlor to leach below root zone

Leaching potentials were developed using WIN-PST assuming that alachlor is broadcast on soil at a standard rate with a high probability of rainfall and high efficiency irrigation.

**MAP A. POTENTIAL FOR ALACHLOR TO LEACH BELOW ROOT ZONE, CADDO INDIAN TRIBAL LAND, SOUTHWEST CENTRAL, OKLAHOMA**

USGS Carol Becker, U.S. Geological Survey, Oklahoma City, OK, November 2001

**Map showing risk of alachlor leaching to ground water in the Caddo Tribal Jurisdictional Area**

**Oklahoma**

**Overview of Water Resources for the Wichita and Affiliated Tribes** The USGS provided the Wichita and Affiliated Tribes with a draft report that describes surface and ground water, water use, availability, and water quality in northern Caddo County and northwestern Grady County, Oklahoma. The study area is about 900 square miles and extends from the Canadian River on the north to the Washita River on the south. Contact: Marvin M. Abbott, 405-810-4411, [mmabbott@usgs.gov](mailto:mmabbott@usgs.gov)

**Oklahoma**

**Availability of Water in Arkansas River Alluvial Aquifer, Osage Nation** A cooperative project with the Osage Nation included using direct-push drilling, lithostratigraphic and hydrologic analysis, and water-quality sampling to evaluate the quantity and quality of water in alluvial and terrace aquifers along the Arkansas River in Osage County. Two Native American student hydrologists are conducting the project under USGS supervision as part of their Masters of Science program requirements for Oklahoma State University. Contact: Marvin M. Abbott, 405-810-4411, [mmabbott@usgs.gov](mailto:mmabbott@usgs.gov)



Native American Graduate Students Shana Mashburn and Caleb Cope conducting drilling and sampling of the Arkansas River Alluvium, in cooperation with the Osage Nation, April, 2002 (Photo Credit Marvin Abbott).

## **Oklahoma**

**Osage-Skiatook Petroleum Environmental Research Project** USGS scientists are leading the Osage-Skiatook Petroleum Environmental Research Project in which research is being conducted to investigate the transport, fate, and biologic effects of produced water and hydrocarbon releases from oil production at two sites on Skiatook Lake, northwest of Tulsa. Collaborating partners include: the Osage Nation, U.S. Department of Energy, U.S. Environmental Protection Agency, Bureau of Indian Affairs, U.S. Army Corps of Engineers, University of Tulsa, Oklahoma State University, University of Oklahoma, and USGS research scientists from Oklahoma, Virginia, Colorado, and California. Funding: USGS \$110,000 Contact: Jim Otton, 303-236-8020, [jkotton@usgs.gov](mailto:jkotton@usgs.gov)



Salt "scar" caused by produced water brines leaking from pit (foreground) at oil production tank battery on the shore of Lake Skiatook (Photo Credit Jim Otton).

## Oklahoma

### North Canadian River Near Shawnee Gage

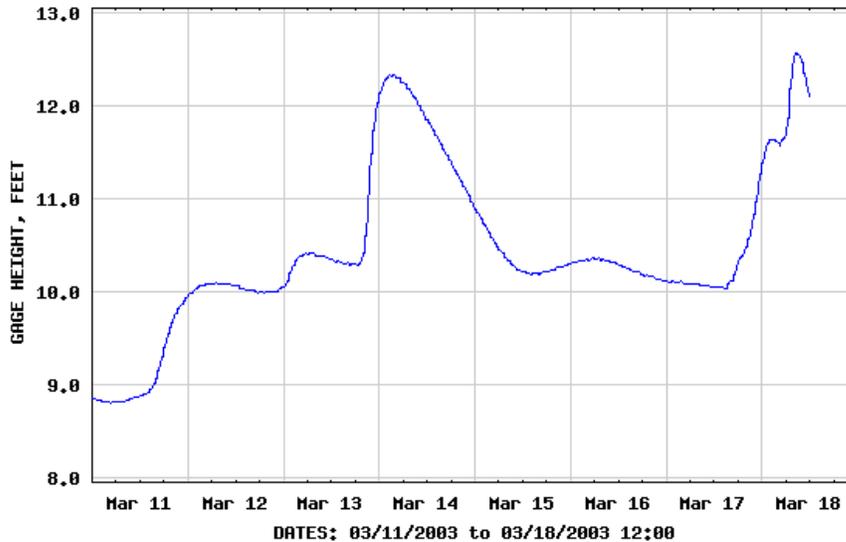
The Citizen Potawatomi Nation is funding the stream gage "North Canadian River near Shawnee Oklahoma".

Funding: Citizen Potawatomi Nation \$12,000, USGS \$12,000

Contact: Bob Blazs, 405-810-4419, [rblazs@usgs.gov](mailto:rblazs@usgs.gov)



USGS 07241800 North Canadian River at Shawnee, OK

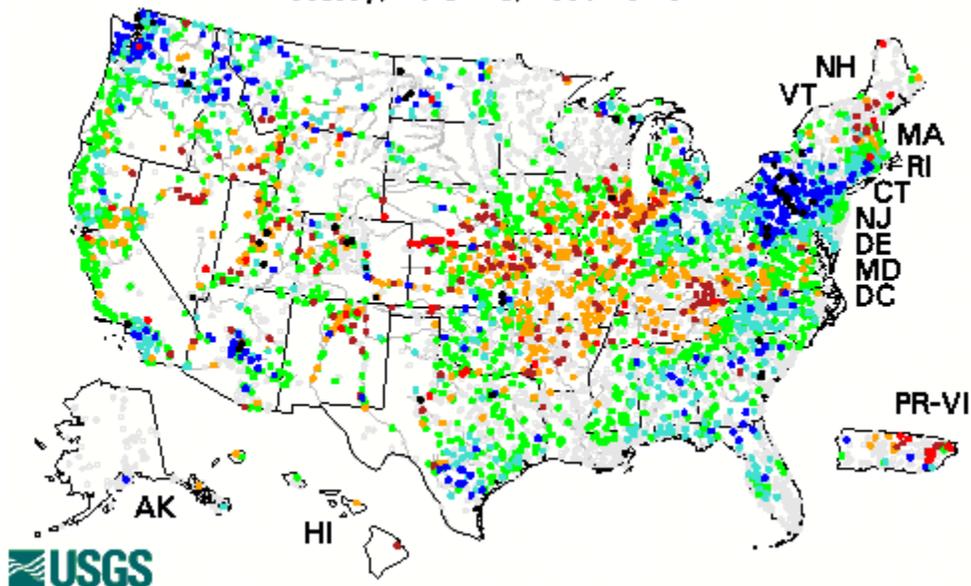


**Provisional Data Subject to Revision**

Real-Time Hydrograph from North Canadian River near Shawnee, OK gage

<http://waterdata.usgs.gov/ok/nwis/rt>

Tuesday, March 18, 2003 15:20ET



<http://waterdata.usgs.gov/nwis/rt>

## Explanation

- New record high for day
- $\geq$  90th percentile
- 75th - 89th percentile
- 25th - 74th percentile
- 10th - 24th percentile
- < 10th percentile
- New record low for day
- Not ranked

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Real-time data typically are recorded at 15-60 minute intervals, stored onsite, and then transmitted to USGS offices every 4 hours. Recording and transmission times may be more frequent during critical events. Data from real-time sites are relayed to USGS offices via satellite, telephone, and/or radio and are available for viewing within 3 minutes of arrival.

All real-time data are [provisional and subject to revision](#).

The **colored dots** on this map depict streamflow conditions as a [percentile](#), which is computed from the period of record for the current day of the year. Only stations with at least 30 years of record are used. The **gray circles** indicate other stations that were not ranked in percentiles either because they have fewer than 30 years of record or because they report parameters other than streamflow. Some stations, for example, measure stage only.

## Oklahoma

### Surface Water Monitoring Stations

1-- streamflow gaging station: operation, maintenance, data review, and publish data,

Funding: USGS, \$6,000, Citizen Potawatomi Nation, \$6,000

**Contact: Bob Blazs, 405-810-4419, [rblazs@usgs.gov](mailto:rblazs@usgs.gov)**

## South Dakota

### Surface Water Monitoring Stations

1 -- streamflow, Bureau of Indian Affairs, Yankton Sioux Tribe

1 – streamflow, Bureau of Indian Affairs, Crow Creek Sioux Tribe

1 – streamflow, Bureau of Indian Affairs, Oglala Sioux Tribe

1 – streamflow, Bureau of Indian Affairs, Rosebud Sioux Tribe

1 – crest-stage gage, Bureau of Indian Affairs, Oglala Sioux Tribe

1 – streamflow, Sisseton/Wahpeton Sioux Tribe

1 – streamflow, Standing Rock Sioux Tribe

1 – streamflow, Rosebud Sioux Tribe

3 – streamflow, Oglala Sioux Tribe

3 – crest-stage gage, Lower Brule Sioux Tribe

Funding Sources:

Cooperating Agencies \$30,100, Other Federal Agencies \$48,850, USGS \$30,100

Point of Contact: Ralph Teller, (605) 355-4560, ext. 222, [rtteller@usgs.gov](mailto:rtteller@usgs.gov)

## South Dakota

### Potentiometric Map for the Arikaree Aquifer Pine Ridge Reservation

The U.S. Geological Survey, in cooperation with the Oglala Sioux Tribe, is conducting a study to map the potentiometric surface of the Arikaree aquifer. The aquifer is present near the surface in approximately 80 percent of the Reservation and is the single largest source of ground water for the Tribe. The objective of this study is to provide the Oglala Sioux Tribe with a map depicting the potentiometric surface of the Arikaree aquifer and a compilation of well location and construction information. The map would be useful to several Tribal departments and could serve as a tool for helping to locate new wells, predict ground-water movement, and assess aquifer vulnerability to contamination. Funding Sources: Cooperating Agency \$40,000, USGS \$40,000 Point of Contact: Allen Heakin, (605) 355-4560, ext. 216, [ajheakin@usgs.gov](mailto:ajheakin@usgs.gov)

## **South Dakota**

**Flandreau Water Supply Assessment** The objectives of the study are: (1) compile and summarize existing water-quality data to describe water supplies of the Flandreau Santee Sioux Tribe and the BIA Boarding School at Flandreau; (2) collect water samples from selected ground- and surface-water sites relevant to the Tribal water supplies and to analyze the samples for many compounds including emerging contaminants; and (3) prepare a report that describes the findings of objectives 1 and 2. Funding Sources: Cooperating Agency \$11,250, USGS \$11,250 Point of Contact: Bryan Schaap, (605) 352-4241, ext. 226, [bdschaap@usgs.gov](mailto:bdschaap@usgs.gov)

## **South Dakota**

**Lake Traverse Reservation Pesticide Management Plan Support** The U.S. Geological Survey, in cooperation with the Environmental Protection Agency, completed a compilation and analysis of data to provide background material for a Pesticide Management Plan for the Sisseton-Wahpeton Sioux Tribe. Numeric and geospatial datasets included: Pesticide concentrations in ground- and surface-water, precipitation, soil information, topographic data, geohydrologic features, land cover and use, and pesticide use in the area. The Sisseton-Wahpeton Sioux Tribe will use the assembled information to develop a Pesticide Management Plan for their lands. Funding Sources: Other Federal Agency \$20,000  
Point of Contact: Ryan Thompson, (605) 352-4241, ext. 225, [rcthomps@usgs.gov](mailto:rcthomps@usgs.gov)

## **South Dakota**

**Water-Quality Monitoring of the Missouri River within the Yankton Sioux Reservation** The Missouri River constitutes the southern boundary of the Yankton Sioux Reservation (YSR) in southeastern South Dakota, and is an invaluable resource to the Yankton Sioux Tribe (YST) as well as to the States of South Dakota and Nebraska. Several miles downstream from the western boundary of the YSR, the flow of the Missouri River is impounded by Fort Randall Dam to form Lake Francis Case. Downstream from Fort Randall Dam, the river is free-flowing for several miles until it contacts backwater from Lewis and Clark Lake. Thus, within the YSR boundaries, the Missouri River is both impounded as well as free flowing, which results in a diversity of habitat critical to numerous fish and wildlife species. Beginning in 2002, a water-quality monitoring program for the Missouri River within the YSR was initiated. The program consists of a cooperative effort between YST and the U.S. Geological Survey (USGS). Water-quality samples for analysis of field-measured properties, major ions, nutrients, selected trace elements, and suspended sediment are collected six times per year at three different stations. The monitoring program will be operated as a long-term effort.  
Funding Sources: Cooperating Agency \$27,000, USGS \$27,000  
Point of Contact: Steven Sando, (605) 352-4241, ext. 230, [sksando@usgs.gov](mailto:sksando@usgs.gov)

## **South Dakota**

**Hydrogeology of the Ogallala and Arikaree Aquifers with Emphasis on Calibration of a Numerical Flow Model, Rosebud Indian Reservation** The Ogallala and Arikaree aquifers are important water resources for the Rosebud Sioux Tribe and are used extensively for agricultural, municipal, and domestic water supplies. A need was identified for a water-resources tool to evaluate management and environmental issues such as planning for source-water protection, describing potential impacts of contamination, and estimating sustainable aquifer withdrawals. The objective of the study is to develop, calibrate, and document a numerical ground-water flow model of the Ogallala and Arikaree aquifers underlying the Rosebud Indian Reservation. The model is to be used by the tribe to test various hydrologic conditions.  
Funding Sources: Cooperating Agency \$25,000, USGS \$25,000  
Point of Contact: Andy Long, (605) 355-4560, ext. 237, [ajlong@usgs.gov](mailto:ajlong@usgs.gov)

## **South Dakota**

**Rosebud TMDL** Water-quality assessment in support of total maximum daily load (TMDL) development for the Little White River in Todd County, SD

The objectives of this study are: (1) compile and review of historical data; (2) water-quality sampling to further define conditions of the Little White River and its tributaries; and (3) modeling/analysis of selected data. The Rosebud Sioux Tribe will use the data and analysis to write a TMDL for the Little White River. Technology transfer, a major part of this project, will aid the tribe with TMDL development for other streams within Todd County.

Funding Sources: Cooperating Agency \$26,700, USGS \$26,700

Point of Contact: Joyce Williamson, (605) 355-4560, ext. 219, [jewillia@usgs.gov](mailto:jewillia@usgs.gov)

## **Wyoming**

### **Surface Water Monitoring Stations**

13 -- streamflow, Shoshone and Northern Arapaho Tribes

4 -- rating maintenance, Shoshone and Northern Arapaho Tribes

**Funding:** Joint Business Council of the Shoshone and Northern Arapaho Tribes \$78,798 and USGS \$64,472

**Contact:** Robert Swanson, (307) 778-2931, [rswanon@usgs.gov](mailto:rswanon@usgs.gov)

Cost center: 8664 Wyoming District

## **Central Region**

### **Collection of Basic Records**

In cooperation with a number of Tribes and Pueblos, the USGS, Central Region, operates and maintains over 50 streamflow monitoring stations and over 6 reservoir stations, and collects water-quality data at over 20 ground- and surface-water sites.

## **Central Region**

**General National Mapping Program Activities** The U.S. Geological Survey (USGS) conducts the National Mapping Program of the United States. Cartographic, geographic, and remotely-sensed information in digital, graphic, and image form are collected and distributed in support of Federal, State, Tribal, and local governments, private sector organizations and the general public.

Since 1994, the USGS has worked through the Interior Geographic Data Committee (IGDC) to identify topographic map revision and geospatial data requirements in support of high-priority Department of the Interior (DOI) programs and applications. This is accomplished through the DOI High-Priority Base Data Program, which is funded and administratively managed by the USGS's National Mapping Discipline (NMD). Key program objectives include minimizing redundancy in the production of digital data and maximizing the number of customer requirements satisfied for each product generated.

Under the DOI Program, the NMD annually solicits the DOI bureaus for their graphic revision and geospatial data requirements, and a working group of the IGDC selects the project areas where these base data are needed to support priority natural resource and land management issues in the upcoming fiscal year. Tribal requirements for USGS base data are typically gathered through the Bureau of Indian Affairs (BIA) area offices and submitted by the BIA as part of this process. In FY 2002, \$480K of NMD funds were used to produce digital base data and revised topographic maps to support the projects identified specifically by the BIA in the following Central Region States:

**Montana** – interferometric synthetic aperture radar (IFSAR) elevation data for the Crow Indian Reservation.

**New Mexico** – high-resolution National Hydrography Dataset (NHD) for portions of the Navajo and Zuni Indian Reservations.

**North Dakota** – high-resolution NHD data for a portion of the Fort Berthold Indian Reservation.

**Wyoming** – IFSAR elevation data for the Wind River Indian Reservation.

In addition to the above projects, an additional \$1.0 million were used to produce high-resolution NHD data and to acquire color infrared imagery for the Texas portion of the U.S./Mexico Border project to meet the high-priority requirements of multiple DOI bureaus, including those of BIA. This imagery will be used to produce digital orthophotoquads in FY 2003.

### **Central Region**

***Southwest Strategy*** The USGS is an active partner in the Southwest Strategy, (SWS). SWS is an intergovernmental process that provides a forum for diverse entities to collaborate and resolve natural resource conservation, management and community development issues affecting Arizona and New Mexico. Through cooperative planning and improved decision-making, SWS strives to maintain, restore, and enhance the cultural, economic, and environmental quality of life for the people of Arizona and New Mexico. SWS brings together Federal, Tribal, State, and local governments, as well as private landowners and other stakeholders, in a problem-solving process. A key accomplishment in FY2001 was the coordination and implementation of National Fire Plan activities. Other ongoing collaborative activities include noxious weed management, rangeland monitoring, scientific information exchange, sustainable land use, threatened and endangered species management, Tribal-Federal Government-to-Government Relations, U.S./Mexico relations, and water issues. The USGS sponsors and chairs the Southwest Strategy's Scientific Information Work Group. The work group has developed a database containing information acquired from research and natural resource, social, and economic data that is critical to natural resource management in Arizona and New Mexico. The database will be available over the Internet in April 2003. The SWS sponsored a Tribal Gathering in April 2002 focusing on cultural resources, economic development, and natural resources. The Gathering provided an opportunity for new collaborations to develop meaningful products. Recommendations from the Gathering will be addressed through FY 2003 Tribal Relations Work Group Projects (see [www.swstrategy.org/tribefed.html](http://www.swstrategy.org/tribefed.html)). In July, USGS Scientists briefed Work Group members in collaborative projects on Indian Lands in Arizona. Future projects include joint sponsorship of the Annual Tribal Soil and Water Conservation District Conference in Laughlin, NV in November 2002 and for a Tribal Relations Training workshop for mid-level managers in May 2003. Contact Elaine Padovani, 520-670-5506, [epadovan@usgs.gov](mailto:epadovan@usgs.gov)

### **Central Region General Coordination** **"USGS Highlights Native American Employee"**



**Michelle L. Knuppe**

- JOB TITLE: Scientist
- Work on LANDFIRE Project, which is designed to provide the spatial data, and predictive models required for characterizing fuel conditions and fire regimes and for helping evaluate fire hazard status. Project is still in testing stage. Working with data and information from Zone 16 in Utah. Obtain field data and field surveys in the summer months.
- ADVANCED TRAINING: Attended South Dakota School of Mines for three semesters, then transferred to South Dakota State University where I graduated with a BS in Engineering Physics

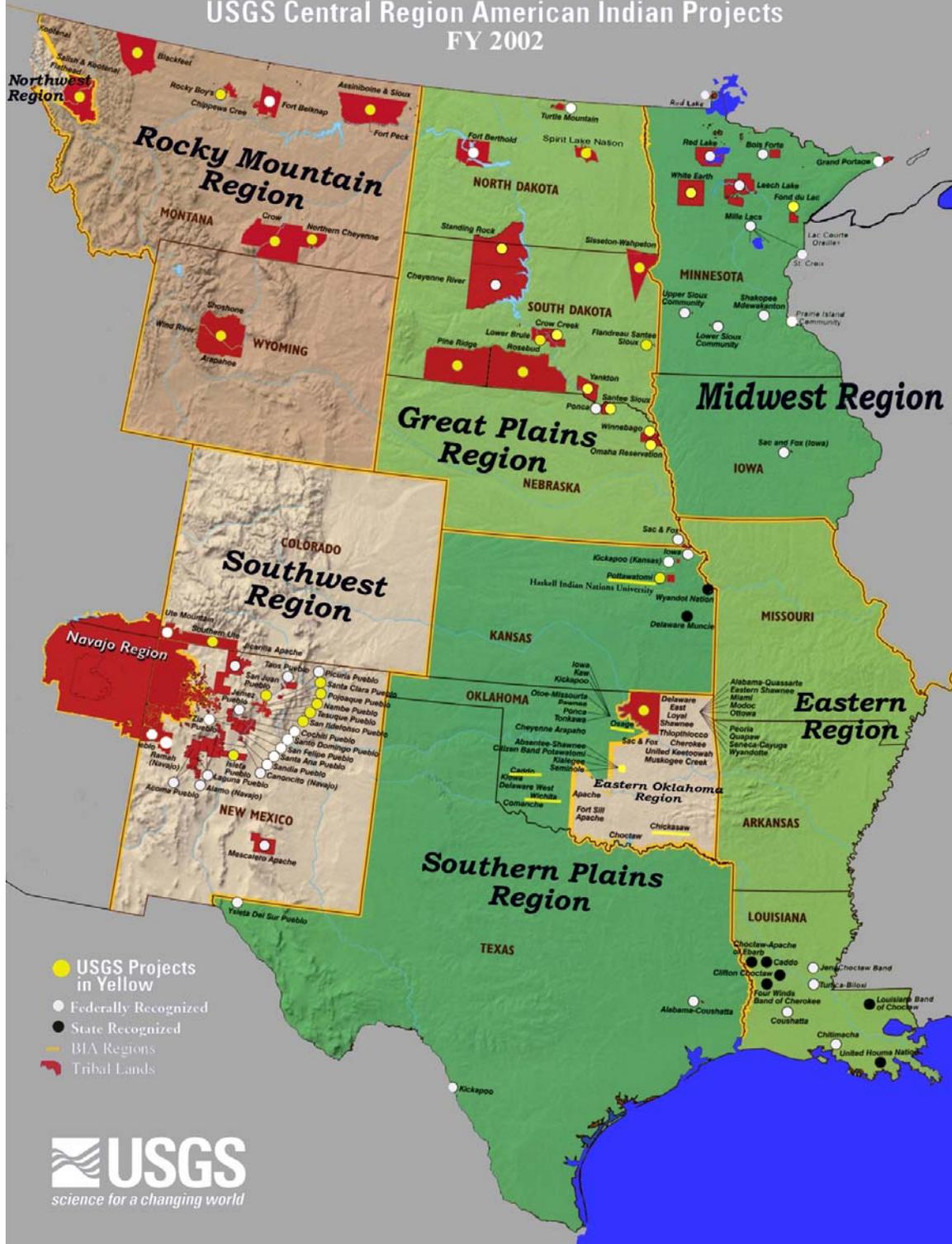
### **Central Region General Coordination**

**Intertribal GIS Council (IGC)** The Intertribal GIS Council and the USGS, through its support of the Federal Geographic Data Committee (FGDC), continues assisting the IGC in training and workshops on metadata and the National Spatial Data Infrastructure (NSDI). The USGS, FGDC, IGC, and U.S. Environmental Protection Agency are exploring opportunities to update Tribal boundary maps. Contact: Bonnie Gallahan, 703-648-6084, [bgallahan@usgs.gov](mailto:bgallahan@usgs.gov)

### **Central Region General Coordination**

**Rural Geospatial Innovations in America (RGIS)** The Federal Geographic Data Committee (FGDC) through its Memorandum of Understanding (MOU) with RGIS, will assist Federal, State, Tribal and local entities in implementing advanced geospatial information technologies to improve the quality of life, environmental health, and economics of rural communities. Implementing the MOU will include providing technical assistance in system development and management to Tribal Colleges and Universities, training programs, including K-12 education, short courses and university curricula, and advanced spatial analysis for decision-making processes. Contact: Bonnie Gallahan, 703-648-6084, [bgallahan@usgs.gov](mailto:bgallahan@usgs.gov)

# USGS Central Region American Indian Projects FY 2002



# Department of Interior

## USGS Contacts

The U.S. Geological Survey has an American Indian/Alaska Native Coordinating Team to establish policy and to coordinate USGS activities. Please contact any of the individuals listed below for more information or to discuss questions or concerns.

Director's Office: Susan Marcus  
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Central Region: Gene Napier  
EROS Data Center, Mundt Federal Center, Sioux Falls, South Dakota 57198  
605-594-6088; fax 605-594-6154; [enapier@usgs.gov](mailto:enapier@usgs.gov)

Western Region: Elaine Padovani  
ENR Building, 520 N. Park Street, Tuscon, Arizona 85719-5035  
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Office of Equal Opportunity: Lynne Sendejo  
MS 602, 12201 Sunrise Valley Dr., Reston, Virginia 20192  
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Water Resources: Tom Zembrzuski  
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703-648-5364; fax 703-648-5295; [tjzembrz@usgs.gov](mailto:tjzembrz@usgs.gov)

# Central Region USGS

The map divides the USGS Central Region into 8 BIA Regions with HQ in DC. The Federally Recognized Reservations are numbered with White Circles, and the State Recognized Reservations are numbered with Black Circles.

Bureau of Indian Affairs  
Washington, DC  
Ph# 202-208-3711

Mid-West Region  
Minneapolis, MN  
Ph# 612-713-4401

Rocky Mountain Region  
Billings, MT  
Ph# 406-247-7943

South West Region  
Albuquerque, NM  
Ph# 505-346-7590

Eastern Region  
Arlington, VA  
Ph# 703-235-2571

Great Plains Region  
Aberdeen, SD  
Ph# 605-226-7446

Southern Plains Region  
Anadarko, OK  
Ph# 405-274-6673

Eastern Oklahoma Region  
Muskogee, OK  
Ph# 918-687-2296

Northwest Region  
Portland, OR  
Ph# 503-231-6702