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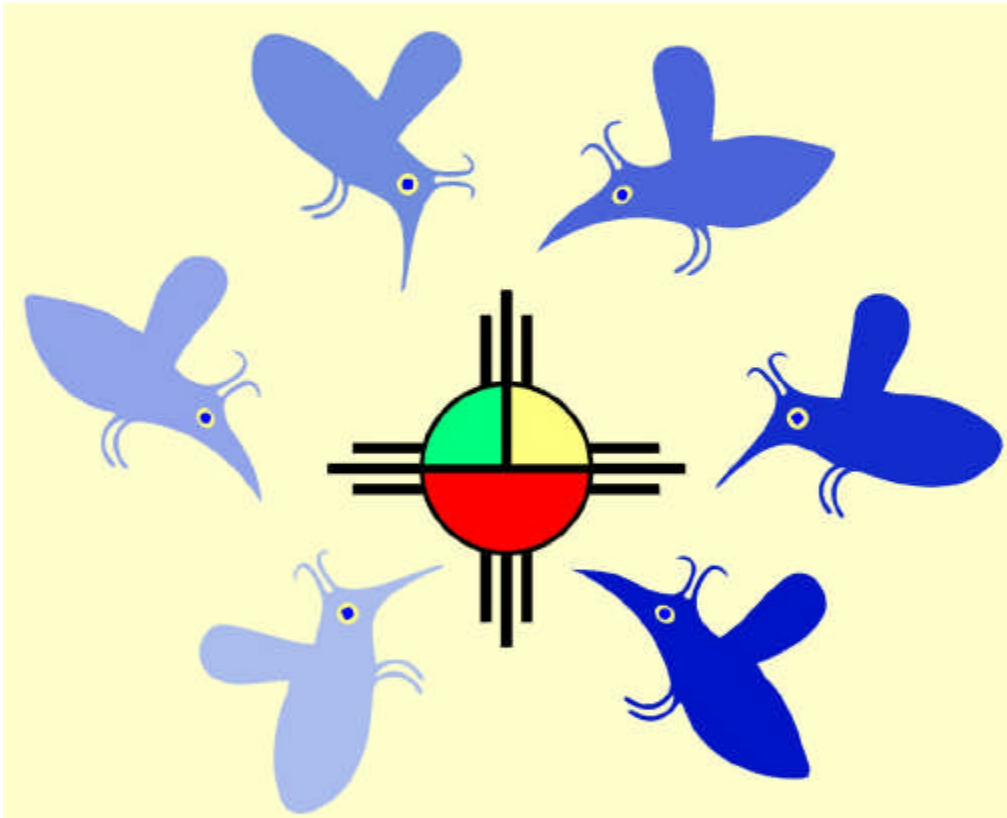
# Activities Related to American Indians and Alaska Natives



## Fiscal Year 1998

U.S. Department of the Interior
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# Activities Related to American Indians and Alaska Natives

## Fiscal Year 1998

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# U.S. Geological Survey
# Activities Related to
# American Indians and Alaska Natives
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* Names in this report are the most accurate that could be readily determined from several sources. Any inaccuracies are unintentional. Corrections are welcome.

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# Introduction

# U.S. Geological Survey
# Programs and Activities Related to
# American Indians and Alaska Natives
# Fiscal Year 1998

The U.S. Geological Survey (USGS) is an impartial scientific organization that strives to produce scientific results that are relevant to the people of the United States and their land and resource managers. In cooperation with American Indian and Alaska Native governments, the USGS conducts 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 flows, biota, and other data sets are available to American Indian and Alaska Native institutions. The USGS recognizes the need learn from and to share knowledge with Native peoples. This report describes most of the activities that the USGS conducted with American Indian and Alaska Native governments, educational institutions, and individuals during Federal fiscal year 1998. Some of the USGS activities are conducted in concert with the Bureau of Indian Affairs. Others are conducted by Tribes and the USGS. In 1999, we are increasing the depth and breadth of USGS contacts with Indian educators. We are encouraging USGS offices to work with their local Native schools and colleges with the intention of completing at least two new formal partnership agreements during fiscal year 1999. On technical and scientific matters, the USGS is collaborating with Indian and Native governments in support of the independence and capabilities of those governments to manage their lands. The USGS is doing this by increasing the transfer of scientific information to American Indian and Alaska Native governments and by training employees of these governments to conduct and improve the conduct of scientific studies. The USGS is encouraging American Indians and Alaska Natives to pursue careers in science. The USGS is seeking ways to hire Indian and Native students. By identifying, improving, and disseminating information about hiring mechanisms available, the USGS intends 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). USGS is non-regulatory and is not a significant manager of Federal or Trust lands or assets. There are two types of USGS activities involving American Indians, Alaska Natives, and their lands. The first type is the course of formal studies, conducted through existing USGS programs. Our formal programs consist of specific data collection, investigative, and research projects. These projects frequently continue for two or more years, although a few are parts of longer-term activities. These are frequently funded through cooperative agreements or reimbursable accounts, from monies provided to the USGS by individual tribal governments or by the Bureau of Indian Affairs (BIA). The USGS provides matching funds for cooperative projects. These formal projects may also receive funding from the U.S. Environmental Protection Agency, the Indian Health Service (part of the Department of Health and Human Services), or other Federal agencies. The USGS working with its sister bureaus in the Department of the Interior to provide the scientific information and expertise needed to meet the Department's science priorities. Within this context, the USGS and the Bureau of Indian Affairs are cooperating to use USGS knowledge to the benefit of Indian and Natives peoples and their lands.

The second type of activity is less formal, based on initiatives designed and conducted by USGS employees. Frequently involving educational activities, these endeavors are prompted by employee interests, often as collateral issues, resulting from an individual or group of USGS employees identifying and responding to an observed need. In these activities, our employees help us fulfill a mission of the USGS, to make science relevant, while helping our fellow citizens. USGS employees have also taken the initiative to assist American Indians and Alaska Natives through participation in several organizations. These organizations were created to foster the knowledge of science among Native peoples and to help build support and communication networks. One such group is the American Indian Science and Engineering Society (AISES). This group sponsors an annual national meeting in which USGS employees participate. USGS employees join this organization on a voluntary basis, paying the costs themselves, yet bringing the benefits of this expanded network to the USGS, as many employees do with other professional organizations.

Each part of the USGS has identified an American Indian/Alaska Native liaison. Within the USGS, we will use this report to help in developing outreach, educational, and program documents for use in future years. We hope that USGS employees, American Indians, and Alaska Natives will adapt these activities within new areas and will use the USGS contacts to expand the relevance of the USGS to more Americans.

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This document was cooperatively prepared by:
Susan Marcus, USGS American Indian/Alaska Native Liaison
Lou Ducret, Water Resources Division American Indian/Alaska Native Liaison
Sharon Crowley, Geologic Division American Indian/Alaska Native Liaison
Cynthia Cluck, National Mapping Division American Indian/Alaska Native Liaison
Alexandra Hadley, Office of Program Support American Indian/Alaska Native Liaison
Hardy Pearce, Biological Resources Division American Indian/Alaska Native Liaison

You are welcome to contact us with any questions that you may have. Information on how to contact us is provided at the end of this report.

# Educational Activities

# Educational Activities

The U.S. Geological Survey has worked independently and in support of the Bureau of Indian Affairs to improve natural science education for American Indian and Alaska Native students. Implementing the Memorandum of Agreement, signed by the Assistant Secretary, Water and Science, and the Assistant Secretary, Indian Affairs in October 1996, has encompassed many diverse activities. Notable educational achievements are described below.

**Tribal Colleges and Universities Executive Order.** Implementation of Executive Order 13021, Tribal Colleges and Universities will be lead by the U.S. Department of Education. This Executive Order focuses attention on the responsibilities of Federal agencies to work with Tribal colleges and universities and makes these educational institutions comparable with Historically Black Colleges and Universities and Hispanic-Serving Institutions. The USGS is participating in the Department of the Interior's implementation of the Order. The USGS works closely with Haskell Indian Nations University while the Bureau of Reclamation is doing the same with the Southwestern Indian Polytechnic Institute (SIPI). The USGS and the Bureau of Reclamation staffs met to discuss ways to support these two institutions without duplicating efforts or overextending available resources. USGS staff visited SIPI, in Albuquerque, NM. In meeting with the Assistant to the SIPI President and the Science Program Coordinator, the USGS sought to understand the needs of SIPI and the mutually beneficial opportunities that can provide be developed. As a result of the meeting, the USGS provided excess furniture and scientific equipment to SIPI. Additionally, the USGS has begun a project to collect information on facilities at Tribal colleges that could be rented for Departmental or bureau conferences. USGS offices will work with Tribal colleges to identify specific, technical areas for cooperation. Contact: Sue Marcus, 703-648-4437, smarcus@usgs.gov

**Technology Literacy Challenge Grant Review.** The Bureau of Indian Affairs distributed $1 million in Technology Challenge Grants to Indian schools in 1998. The schools submitted competitive proposals to the BIA. The proposals detailed how the Indian school or consortium of schools would use a share of the funds to acquire technology and training to enhance the learning environment. The National Science Foundation and the USGS provided people to review proposals and make recommendations to the BIA on which proposals ranked the highest. The top proposals were then funded by the BIA. See the additional item, below, on further USGS assistance that has come from this program.

| Year | 1997 | 1998 | |
|---|---|---|---|
| Proposals submitted | 44 | 15 | |
| Proposals recommended | 5 (14) | 3 | In 1997,a consortium of 9 schools submitted 1 proposal, so a total of 14 schools benefitted from the funds. |

USGS Contact: Sue Marcus, 703-648-4437, smarcus@usgs.gov

**Minority Scholarships.** The American Chemical Society and the American Geological Institute separately award scholarships to minority students to encourage these students to pursue university degrees in science. An American Indian employee of the USGS is a member of the American Chemical Society's Minority Scholarship Selection Committee and the American Geological Institute's Minority Scholarship Committee. Her work on these committees included evaluating scholarship applications and selecting the best qualified applicants. Two USGS employees are permanent members of the American Geological Institute's Minority Participation Advisory Council. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

**Continuing Progress with EdNet.** The Bureau of Indian Affairs' Office of Indian Education (OIEP) is conducting an exciting project called "Access Native America". The project has three parts: (1) school connectivity to the Internet; (2) education management; and most importantly, (3) school classroom applications. The U.S. Geological Survey continues to work with the BIA to link BIA-supported Indian schools through the EdNet program. There are approximately 185 primary and secondary schools funded by the OIEP for American Indian children. By August 1998, more that 40 elementary and secondary schools and 6 Tribal colleges had been connected to the Internet and the World Wide Web. The USGS is providing the technical wide-area network (WAN) expertise to connect each of these schools to the DOINET/Internet. The USGS is also assisting the BIA train help teachers and other educators to use this vast system, which also includes e-mail communications. The schools use these digital resources to assist Indian students, reduce the isolation, and expand the information available, particularly in remote locations. Many Indian schools are in remote locations where Net access permits "virtual trips" to libraries and museums. Several schools have created their own Web pages. Indian students are also have improved communications with other American Indians. Contact: Tim Lee, 303-236-4955, tlee@usgs.gov

**Providing Role Models.** An American Indian employee of the USGS was an invited speaker at Mount Holyoke College in March 1998 entitled "Minority Women in Science - a Native Perspective". This talk focused on common workplace issues that pertain to minorities and women in general, as well as workplace issues that are specific to American Indian female scientists. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

**Native American Science Fair.** Each year, the USGS provides scientific experts as judges for the Annual Native American Science and Engineering Fair held in Albuquerque, and sponsored by the American Indian Science and Engineering Society. Contact: Florian Maldonado, 303-236-1281, fmaldona@usgs.gov

**National Indian Education Association.** The USGS participated in the National Indian Education Association annual conference in Tacoma, Washington. Sharing an exhibit booth with the Bureau of Indian Affairs, the USGS distributed water posters and other educational information to teachers and students. This was the second year of USGS participation in this event, which is the largest convention of Indian elementary and secondary educators. In 1996, the Department of the Interior's Assistant Secretaries of Water and Science and of Indian Affairs announced an agreement to improve science education for American Indian students at the National Indian Education Association meeting in Sioux Falls, South Dakota. Contact: Sue Marcus, 703-648-4437, smarcus@usgs.gov

**High School Biologists.** Cooperating with the Inter-Tribal Council of Louisiana, the USGS' National Wetlands Research Center in Lafayette, Louisiana, hired two high school students as biological science aids. The students, members of the Chitimacha Tribe of Louisiana, assisted USGS biologists and learned field procedures for routine biological data gathering. Contact: National Wetlands Research Center, 318-266-8501, robert_stewart@usgs.gov

**Water Resources Technician Training.** A dozen Native Americans completed a 1-week training session, "Introduction to Hydrologic Data Collection and Computation Techniques" in Las Cruces, New Mexico, June 8-12,1998. Another 12 completed a similar offering in Fairbanks, Alaska, July 13-17,1998, and 13 from 11 Tribes received training under this annual program on August 24-28, 1998 in Ellensburg, Washington.

The training opportunities, each part of separate 6-week "Water Resources Technician Training Program" sponsored by the Bureau of Indian Affairs, were organized and led by USGS hydrologists and USGS Volunteers for Science. The USGS classroom and field sessions focused on fundamental concepts in collecting and analyzing surface-water, ground-water, water-quality, and sediment data. Students were exposed to hydrologic theory. Hands-on activities included practical concepts such as streamflow measurements, ground-water level measurements, and sample collection of sediment and water-quality constituents for subsequent analyses. The teacher/student ratio of approximately 1:4. This is conducive to providing each student with the basic skills to apply to water-resources investigations to assist Indian governments manage their resources and it helps participants develop marketable skills. Contact: John Gray, 703-648-5318, jrgray@usgs.gov or, for the New Mexico session, Linda Weiss, 505-262-5300, lsweiss@usgs.gov or, for the Washington session, Tom Zembrzuski, 253-428-3600 x2608, tjzembrz@usgs.gov

**Water Resources Outreach Program, Turtle Mountain Indian Reservation.** The purpose of this project is to develop a water-resource program that will be presented to the students on the Turtle Mountain Indian Reservation. The USGS and the Turtle Mountain Band of Chippewa's Department of Natural Resources are developing this program for the Band's fifth grade students. By stimulating interest and encouraging students to actively participate in the water-resources program, USGS and Tribal employees hope to create a solid foundation for a lifetime of awareness and knowledge of their water resources that will benefit them and their community in the future.

A water festival-type program was presented to 12 classes of fifth graders. Hands-on activities helped the students learn about ground water, water quality, the water cycle, surface water, and point and non-point source pollution. The USGS also prepared a school calendar that included all the known school activities, and featuring kids enjoying the water resources of Belcourt Lake. Months are named in English and Chippewa. Each month challenges students with a water resource question. Answers are provided on the following month's page. Contact: Kathleen M. Rowland, 701-250-7418, krowland@usgs.gov

**Promoting American Indian Science Education through South Dakota State University.** The USGS' South Dakota Cooperative Fish and Wildlife Research Unit continued to participate in a South Dakota State University program titled "2+2+2" to help more American Indian students prepare for careers in the agricultural and biological sciences. The "2+2+2" is a team effort between high schools, Tribal colleges, and South Dakota State University. Options for study range from environmental management to food science to wildlife and fisheries. Each "two" of the "2+2+2" represents two years in high school, Tribal college, and the State University. The program's goal is to have all these "2s" add up to a brighter future for American Indians. Contact: South Dakota Cooperative Fish and Wildlife Unit, 605-688-6121, berryc@mg.sdstate.edu

**Partnership with Indian School.** Partnerships between USGS offices and individual schools is an approach that is being implemented in South Dakota, between the Flandreau Indian School and the USGS' EROS Data Center. The Flandreau Indian School (located on the Flandreau Santee Sioux Reservation) and the USGS' EROS Data Center signed a memorandum of understanding to codify their joint goals. The Data Center has conducted a hands-on workshop for Flandreau teachers using remotely sensed data and Data Center computers. Teachers were also introduced to the GLOBE program that can get teachers involved in United States space missions. A mentoring/shadowing program has begun to bring students to the Center, giving them positive role models. One student has now become

interested in a career in science. More than $140,000 in excess USGS equipment and furniture has been donated to the school. The Data Center is also exploring the possibility of expanding its partnerships to include other Indian schools.

The Flandreau Indian School (FIS) received a $40,000 grant from the National Aeronautics and Space Administration (NASA). This was a direct response to an article about the USGS partnership in the Department of the Interior's "People, Land, and Water" publication. This money will allow a satellite dish to be put up on the grounds of the FIS and will enable them to have free Internet access. The new technology will improve USGS' communications with them as well. Contact: Mark Barber, 605-594-6176, barber@usgs.gov or Carrie Jucht, 605-594-6083, cjucht@usgs.gov

**Anniversary Celebration.** The EROS Data Center had its 25th anniversary celebration on September 19, 1998. The Flandreau Indian School "Indian Club" danced and sang as one of the featured performers during the festivities. This beautiful activity was a result of the USGS partnership with the Flandreau Indian School and helped portray the partnership to those in the USGS who may not have been aware of it. Contact: Carrie Jucht, 605-594-6083, cjucht@usgs.gov

**Training in Fisheries Management.** In Fiscal Year 1998, the USGS' South Dakota Cooperative Research Unit coordinated research of a graduate student who was hired as a full-time fishery biologist by the Cheyenne River Sioux Tribe. The Tribe had expressed interest in such an arrangement during previous work with USGS while fish and aquatic habitat information was being collected on the Reservation. USGS Cooperative Fish and Wildlife Research Units often sponsor the graduate education of students in natural resource management. As a result of contacts made in providing services to Tribes, these students often find positions with Tribal governments. Contact: South Dakota Cooperative Fish and Wildlife Unit, 605-688-6121, berryc@mg.sdstate.edu

**Hydrology and GIS Training Program at Haskell Indian Nations University.** The USGS provides part-time salary support for a Natural Resources Instructor for the Haskell Indian Nations University. A USGS hydrologist also assisted in teaching GIS and water-quality concepts in ecology and other science laboratory classes at the University. The USGS provides advice on natural resources curriculum issues as a member of the Haskell Environmental Research Studies Center Advisory Board. Additionally, the USGS participated in the annual career fair at Haskell. The USGS personnel in Kansas are currently seeking to place several Haskell students in part time and summer positions throughout the USGS. Contact: Thomas Trombley, 913-832-3551, trombley@usgs.gov

**USGS in Montana Employs Indian College Students.** The USGS, in concert with the Bureau of Indian Affairs, hired two students from the Salish Kootenai College to conduct hydrologic studies with USGS scientists on Indian lands. The students gained practical field experience that will be pertinent to their potential careers in hydrology, while USGS had capable field assistance to conduct its mandated activities.

The students spent approximately 80 per cent of their time in the field, primarily on surface-water activities where they learned to make discharge measurements and entered data into a computer data base. Additionally, one student assisted in collecting ground-water samples, while the other assisted in drilling and logging test wells. Contact: Mark S. Gerl, 406-441-1319, mgerl@usgs.gov

**Mentoring Isleta student.** The scientific research of a graduate student from the Pueblo of Isleta was supported by the USGS New Mexico Cooperative Fish and Wildlife Research Unit and the New Mexico Department of Game and Fish. She studied exotic ungulates (non-native hoofed animals) in southern New Mexico, using telemetry. The student completed the requirements for an Master of Science degree at New Mexico State University. Contact: New Mexico Cooperative Fish and Wildlife Research Unit, 505-646-6053, bthompson@nmsu.edu

**Graduate Student Sponsorship.** The New Mexico Department of Game and Fish (NMDGF) and the USGS' Cooperative Fish and Wildlife Research Unit work together to provide opportunities for graduate students. In FY 1998, the NMDGF supported a Native American graduate student's research on bighorn sheep, culminating in a graduate thesis under the sponsorship of the Cooperative Research Unit. Contact: New Mexico Cooperative Fish and Wildlife Research Unit, 505-646-6053, bthompson@nmsu.edu

**Duckwater School.** The Duckwater-Shoshone Elementary Indian School, in Duckwater, Nevada, is a small, relatively remote school serving the Duckwater Shoshone Tribe. This school was considered very worthy of additional computer technology by the USGS and National Academy of Science reviewers who evaluated proposals for BIA technology grants. Although the Duckwater School was not awarded a grant, the USGS contacted the school staff to determine what technology would be welcomed. The USGS transferred excess computer equipment to the school. This will help the students and school staff while effectively recycling excess USGS equipment. The USGS conducted a similar excess property transfer to White Mountain Apache schools on the Fort Apache Reservation. Contact: Sue Marcus, 703-648-4437, smarcus@usgs.gov

**Cooperation with the University of Arizona to Train American Indian Students for Careers in Fishery and Wildlife Biology.** The USGS Arizona Cooperative Fish and Wildlife Research Unit continues to support a natural resource training program for American Indians who are recommended by Tribal Councils or individual Tribal members. The most important criteria for enrolling in the program is a desire to complete an undergraduate or graduate degree in wildlife or fisheries management at the University of Arizona. Three students from the Navajo Nation and five from the White Mountain Apache Tribe are currently participating in the program. Nineteen American Indians have completed the program: twelve received Bachelor of Science degrees, six have completed or are working in Masters's programs, and one has completed a Doctorate. Highlights of the program in 1998 include:

Two members of the White Mountain Apache Tribe graduated with Bachelor degrees. One began a career with the Tribe's Game and Fish Department and the second entered the University's Master's degree program in Natural Resources Policy.

Two additional White Mountain Apache students are participating in the program under Cooperative Education Agreements with the U. S. Fish and Wildlife Service. One is enrolled in a Masters program in wildlife biology and the other will complete a Bachelor degree in fisheries.

A student from the Nanticoke Lenni-Lenape Indian of New Jersey and the Delaware Tribe of Western Oklahoma completed a Master's degree and was placed with the U. S. Fish and Wildlife Service on the San Bernardino National Wildlife Refuge in Douglas, Arizona.

One of the three Navajo Nation students is graduating from the program. This person will be receive a Bachelor's degree and will return to work with the Tribe as a wildlife biologist. Contact: Arizona Cooperative Fish and Wildlife Research Unit, 520-621-1959**,** gmaughan@ag.arizona.edu

**Graduate Studies in Fisheries.** The USGS' Cooperative Fish and Wildlife Research Unit at Oregon State University sponsored the graduate work of a Tribal member of the Confederated Tribes of the Umatilla Indian Reservation. The student will receive a Master of Science degree in fisheries biology. Contact: Oregon Cooperative Fish and Wildlife Research Unit, 541-737-1938, lih@ccmail.orst.edu

**Expertise at Environmental Field Camp.** In May 1998, a USGS researcher was an instructor at the USFWS Challenge Cost Share-Funded Becharof Ecosystem Environmental Science Field Camp. Students from very isolated, and predominantly Alaska Native, communities gathered to learn about the various components comprising the Becharof National Wildlife Refuge. This public outreach is intended to give high school seniors, primarily Native Alaskans, exposure to ecosystem science while providing an exciting field practicum experience. The USGS scientist taught ethnobotanical uses of plants, as well as brown bear and caribou ecology, plant community mapping, animal tracking, and nature observation skills. This is the second time this field camp has been sponsored. This outreach program has been well received by the Native community and has stimulated much interest in the natural sciences. Contact: Tom Smith, 907-786-3456, tom_smith@usgs.gov

**Environmental Education Programs for Native Americans.** In cooperation with the U.S. Fish and Wildlife Service (USFWS), the Alaska Department of Fish and Game (ADFG) and the Tanana Chiefs Conference, Inc., the USGS is conducting research on the freshwater ecology of Yukon River chum salmon stocks. The accessibility of the Chena River study site makes it ideal for educational programs for students wishing to learn about field science in Alaska.

In July 1998, 12 students with the BIA-sponsored Water Resources Technician Training Program visited the site and were given training in the operation of salmon-counting weirs, tagging and measuring fish, mapping spawning habitat, and collection of environmental data (e.g., water velocity, temperature, and substrate types). Participants receive college credit and Water Resource Technician certification.

In August 1998, students from the Earth Quest Wildlife and Wildlands Camp visited the site. The Earth Quest Camp is also operated under a Challenge Cost Share Agreement among the USFWS, the Tanana Chiefs Conference, Inc., Alaska Bird Observatory, Alaska Biological Research, Inc., Alaska Boreal Forest Council, ADFG, Alaska State Parks, Alaska Public Lands Information Center-Fairbanks, Northwest Arctic Borough School District, and the University of Alaska Fairbanks. The students, age 14 to 17, came from rural areas throughout Alaska. During their visit to the USGS study site, they were given an overview of the research project and hands-on experience with fisheries sampling techniques. They also had an opportunity to meet USGS staff and find out how and why people become biologists. Contact: Jim Finn, 907-786-3450, jim_finn@usgs.gov

**Geographic Information Systems Training in Alaska.** Preliminary talks have begun in an attempt to coordinate efforts in training Native Alaskans and Indians on Geographic Information Systems (GIS). The USGS Alaska Biological Science Center is hosting workshops as part of its National Spatial Data Initiative benefits grant, and the Native American Fish and Wildlife Society has begun to schedule similar GIS sessions. Contact: Director, Alaska Biological Science Center, 907-786-3512, or Joy Geiselman, 907-786-3668, joy_geiselman@usgs.gov or Karen Oakley, 907-786-3579, karen_oakley@usgs.gov

**Hydrologic Training for Alaska Natives.** The USGS sponsored a 1-week hydrologic technician training session for approximately 20 Alaska Natives from rural communities throughout Alaska. The session, which trained the Alaska Natives in hydrologic procedures was well received. Improving the understanding of their water resources will assist Alaska Natives and their governments to better manage these resources. Contact: Gordon Nelson, 907-786-7111, glnelson@usgs.gov

# Environmental Activities

# Environmental Activities

**Everglades Ecosystem Program.** The concerns of the Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida are integral parts of the concerns about the health and management of the Everglades. Scientists from the USGS participate with representatives of these Tribes on the South Florida Ecosystem Restoration Working Group. In consultation with the Working Group and Tribal representatives, USGS scientists focus on water management issues, landscape ecology, wetland ecology, fire ecology, ornithology and icthyology, coral reef ecology, and long-term monitoring.

Water rights of the Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida have been a sources of considerable concern within the broad framework of ecosystem restoration. The Water Rights Compact, between the South Florida Water Management District (SFWMD) and the Seminole Tribe of Florida, is one example of "creating a comprehensive and effective system of regulation applicable to Seminole lands that is in harmony with the State's system." In addition, a recent agreement mandates that no diminution or alteration of Tribal rights, particularly water rights defined in the Compact, may occur as a result of implementing the Act. The accurate determination of flow through the interior canal networks is necessary for water budgets and regional model calibrations by the U.S. Army Corps of Engineers, Miccosukee and Seminole Tribes, South Florida Water Management District, National Park Service, and the U.S. Environmental Protection Agency.

The USGS is providing water quality and quantity measurements and cross-agency training to the Seminole Tribe. The activity makes use of a tri-agency agreement (Seminole Tribe, USGS, SFWMD) and a separate funding agreement between the USGS and Seminole Tribe. The Miccosukee Tribe may participate in future training programs.

As part of the Everglades Restoration program, the Corps of Engineers and the SFWMD propose modified water deliveries to Indian lands, Big Cypress National Preserve (National Park Service), and other areas located in interior Florida. The proposed modified water deliveries are designed to provide net flood protection and water delivery benefits to agricultural lands as well as partial restoration of historic ecosystem conditions within both Seminole and Miccosukee Tribal lands. The effects that these proposed modifications in water deliveries will have on Indian Tribal lands can only be determined if interior flows are accurately known. The Everglades Construction Project, developed as a result of the Everglades Restoration Program, required diversion of surface water to a storm-water treatment area and will cause a significant portion of the water subject to the Seminole Tribe's entitlement to be unavailable for direct Tribal use. Best management practices in the area and other aspects of the Everglades Restoration Program may also impact water available for Tribal use. The SFWMD has agreed to conduct several studies concerning the quality of water entering the Seminole's Big Cypress Reservation. USGS is contributing information on nutrient and other contaminants in the canal system. These studies will be used to identify sources of water-quality degradation and may trigger enforcement action or creation of a new regulatory program to address water-quality problems. Contact: Contact: Aaron Higer, 561-687-6560, ahiger@usgs.gov (water issues) or Florida Caribbean Science Center, 352-378-8181, russell_hall@usgs.gov (ecology issues)

**Chippewa Ottawa Treaty Fishery Management Authority.** A team of USGS scientists worked with the Chippewa Ottawa Treaty Fishery Management Authority to implant temperature recording devices in 92 lake trout. The fish were released into Lake Huron where internal and external temperatures will be logged hourly for a year. Data will be recovered from the tags when the fish are recaptured in sport or tribal commercial fisheries, and should yield unprecedented insights into the environment occupied by trout. Contact: Roger A. Bergstedt, 517-734-4768, roger_bergtedt@usgs.gov

**Effects of Lampricides on Native Mussels.** The USGS Biological Resources Division and the Bad River Band of Lake Superior Chippewa Indians are cooperating in a study to evaluate the effects of lampricide treatments on mussels native to waterways on the Bad River Reservation. Lampricides are chemical treatments, developed by Federal and other scientists, to reduce the population of lampreys in the Great Lakes. Lampreys are an introduced species that harm Great Lakes fisheries. USGS scientists are seeking a method of reducing the lamprey population without harming native mussels. Contact: Upper Midwest Environmental Sciences Center, 608-783-6451, leslie_holland-bartels@usgs.gov

**Contamination on the Lands of the Bad River Band of Lake Superior Chippewa Indians.** The objective of this work with the Bad River Band of Lake Superior Chippewa Indians and the U.S. Environmental Protection Agency (EPA) is to define the local ground water flow system around the County Road A Contamination Site. The Contamination Site is a paper mill sludge disposal locality with two open ponds. The EPA hopes to confirm whether contaminants associated with the sludge are moving off-site in the ground water. It is critical to the investigation to identify the proper locations down-gradient of the contaminated sites for placement of monitoring wells. These monitoring wells will be used for water-quality sampling and as additional water level information. Water level recorders, pond stage recorders, and meteorological instruments will be employed to estimate a water budget for the ponds in order to define the connection between the pond and the ground water system. Contact: Jim Krohelski, 608-821-3850, jtkrohel@usgs.gov

**Oneida Indian Nation Hydrologic Investigations.** Provide retrospective and baseline hydrologic information for the Oneida Indian Nation's watershed. This information will be obtained from a retrospective analyses of existing literature, databases, and other information including existing geographic information system (GIS) coverages. The project will also collect water-quality samples to fill gaps in the retrospective database. A Water Resources Investigation Report will be prepared that correlates environmental and anthopogenic factors with water quality. The report results will be used to identify the best sites for long-term water quality sampling for the Oneida Nation. Contact: Jim Krohelski, 608-821-3850, jtkrohel@usgs.gov

**Menominee Reservation Water Quality Monitoring.** Information is needed to describe the current status of water quality and biotic conditions of the Wolf River within the Reservation of the Menominee Indian Tribe of Wisconsin, and to determine the presence or absence of contaminants in water, sediment, and biota. The primary objective of the baseline monitoring is to establish data at index stations near the upstream and downstream boundaries of the Reservation that will help to conserve and protect ambient conditions and ecosystems and be used to determine future changes in environmental conditions of the Reservation. Project

activities include determining the concentrations of specific trace elements in water column samples and in composite samples of fish livers, caddisfly larvae, and fine streambed sediments. The project will also determine particle size fractions of the fine streambed sediments. Contact: Jim Krohelski, 608-821-3850, jtkrohel@usgs.gov

**Identifying the Occurrence, Distribution, and Concentration of Hydrocarbons in the Shell Valley Aquifer.** The purpose of this study, done in cooperation with the Turtle Mountain Band of Chippewa Indians, is to evaluate hydrocarbons in the Shell Valley aquifer, in creeks, and in wetlands. The objectives are to determine the spatial distribution of hydrocarbons in ground water, creeks and wetlands, and determine the concentrations and types of hydrocarbons. The aquifer is used by the Turtle Mountain Band as a water supply. Contact: Wayne R. Berkas, 701-250-7429, wrberkas@usgs.gov

**Hydraulic Properties of Surficial Sediments in the Shell Valley Aquifer.** The purpose of this study is to systematically examine the hydraulic characteristics of the Shell Valley aquifer, which is used by the Turtle Mountain Band of Chippewa Indians. The study will investigate the vertical distribution of sediment texture and determine an accurate potentiometric surface. The spatial distribution of the sediment textures, and calculate the hydraulic conductivity of the aquifer at two locations in the aquifer. Contact: Douglas G. Emerson, 701-250-7402, demerson@usgs.gov

**Fish Habitat Research.** The USGS' South Dakota Cooperative Fish and Wildlife Research Unit continued to assist the Oglala Sioux Tribe in preparing a report on the status of the environmental health of the White River watershed in South Dakota. The U. S. Fish and Wildlife Service cooperated in this effort. Contact: South Dakota Cooperative Fish and Wildlife Research Unit, 605-688-6121, berryc@sdstate.edu

**Soil and Water Contamination of Lands of the Ponca Tribe of Oklahoma.** There is visible and geochemical evidence of contamination by organic substances of a small creek that is a tributary of the Salt Fork of the Arkansas River in Kay County approximately three miles south of Ponca City in northern Oklahoma. The creek is fed by springs located on and within 50 yards of the northern border of Ponca Tribal lands (Area 31). Water in the creek has an oily film and the sediment in the creek bottom and banks is coated with black sludge. In places, the sludge is thick and voluminous. The creek visibly gains in flow as it crosses Area 31. At some undetermined date, the creek channel was excavated to cut off a meander on Area 31. There has been vegetative die-off on the southwest side of Area 31 and trees along the northern border of Area 31 are stressed and dying.

The USGS study is identifying the chemical composition of the visible contamination as well as possible visible and chemical evidence of the contamination movement down the creek to other trust lands. USGS will examine the soil and ground water in the alluvium in Area 31 along the creek and determine whether it is also contaminated with the same substance. Most importantly to human health, the USGS will investigate the health risks associated with exposure to the contamination. This project is funded by the Bureau of Indian Affairs. Contact: Donna L. Runkle, 405-810-4403, dlrunkle@usgs.gov

**Water Contamination of Supply Wells of the Ponca Tribe of Oklahoma.** Recent sampling by the Inter-tribal Environmental Council of Oklahoma found contaminants in water in two wells belonging to the Ponca Tribe of Oklahoma, though the Oklahoma Department of Environmental Quality has stated that the compounds do not pose a health risk. Because of evidence

of historic contamination of a creek and potential sources of present contamination in the area, evaluation of the ground-water quality between the creek and the well will help determine the risk of drinking ground water from this area. The project is designed to conduct sampling and analysis to determine whether the creek is contaminated in the vicinity of the wells, the extent of the contamination, and whether the ground water in the aquifer is contaminated between the creek and the wells. The study will also identify the chemical composition of the contamination. This project is funded by the Bureau of Reclamation. Contact: Donna L. Runkle, 405-810-4403, dlrunkle@usgs.gov

**Contamination of Soil and Water on Trust Land of the Pawnee Nation of Oklahoma.** The Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), and U.S. Environmental Protection Agency (EPA) share responsibility for oversight of petroleum production by private companies on Indian trust land. The Bureau of Land Management has found evidence of contamination of both soils and water by brines in Payne County on land held in trust for the Pawnee Indians. Grasses, small shrubs, and large trees are dead. On the gentle upper slopes near an incised creek, the grass is living but the larger trees are dead, which may indicate that the contaminated ground water is moving deeper towards its discharge points in the creek. The BIA and EPA sampled water seeping out of a stream bank about 30 to 40 feet below the site and found that it contained abnormally high quantities of dissolved solids.

The extent, nature, and sources of contamination on the Pawnee lands have not been determined. The USGS project is attempting to determine the source or sources of the surface and water contamination and the extent of surficial contamination. It is also investigating whether the shallowest freshwater aquifer, the Ada aquifer, is contaminated. Oil production activities in the vicinity of the site include four production wells drilled in the 1950's, one salt-water disposal wells, and three wells of unknown status. There are also newer wells in the general vicinity. Contact: Donna L. Runkle, 405-810-4403, dlrunkle@usgs.gov

**Contamination Affects on the Fort Peck Reservation.** Brine from oil-production activities in the East Poplar Oil Field has been disposed of in evaporation pits or injected into subsurface geologic units. Disposal of the brine apparently has resulted in contamination of aquifers used by the Assiniboine and Sioux Tribes of the Fort Peck Reservation. The objectives of the project are to determine the areas of contamination and the chemical characteristics of the brine and the contamination. Work includes investigating possible geochemical reactions, the direction and rate of movement of certain constituents. The source areas of the contaminants and the effect of the contamination on other water resources, such as the Poplar River, are also being studied. Contact: Joanna Thamke, 406-441-1319, jothamke@usgs.gov

**Extent and Origin of Nitrates in the Flaxville Aquifer, Fort Peck Reservation.** A source of ground water for the Assiniboine and Sioux Tribes of the Fort Peck Reservation is contaminated with nitrate compounds. Water samples collected from the Flaxville aquifer during reconnaissance studies indicated that nitrate concentrations in ground water in the Flaxville aquifer commonly exceeded drinking water standards. Currently, the source of the nitrates is unknown. The objectives of the USGS project are to determine where and why nitrates are concentrating in the Flaxville aquifer and to identify where the nitrates are coming from. The study will also determine the hydraulic characteristics of the Flaxville aquifer, and will describe conditions in the unsaturated zone that may influence nitrate concentrations. Contact: Joanna Thamke, 406-441-1319, jothamke@usgs.gov

**Investigating Flood Hazards Along Streams on the Northern Cheyenne Reservation.** USGS hydrologists are delineating the 100-year flood plain along streams in the Northern Cheyenne Indian Reservation . The areas that would be inundated by a 100-year flood along these streams are important to planning safe uses of the Northern Cheyenne Tribal lands. Information on flood-prone areas, provided by the USGS, will help the Tribe make decisions concerning the location of buildings, structures, roads, and other facilities. By using the flood plain information, the Tribe can make more effective use of their land and avoid uneconomical, hazardous, or unnecessary uses of parts of the flood plain in connection with these facilities,. The objective of the project is to determine the extent of flooding that would occur as the result of a 100-year recurrence-interval flood along Lame Deer Creek, Muddy Creek, Rosebud Creek, and the Tongue River. Contact: Charles Parrett, 406-441-1319, cparrett@usgs.gov

**Paleoflood Hydrology of Dry Creek and St. Mary's Lake, Flathead Reservation.** Dry Creek is a small stream that drains about 11 square miles upstream from St. Mary's Lake in the Mission Range on the lands of the Confederated Salish and Kootenai Tribes. Tabor Dam was constructed in 1930 to increase the size of the natural lake. A recent evaluation indicated that the dam, although generally considered stable, requires modification to safely handle a probable maximum flood (PMF). However, the use of the PMF as the criteria is controversial because the probability of exceeding the PMF is unknown. Paleoflood hydrology, which is the study of the geologic record of past floods, offers a way of using preserved flood data from the past several thousand years to assess the reasonableness of PMF estimates. The purpose of this study is to obtain paleoflood evidence for Dry Creek and to estimate flood magnitude and frequency based on the paleoflood evidence. Contact: Charles Parrett, 406-441-1319, cparrett@usgs.gov

**Middle Rio Grande Basin.** The Middle Rio Grande Basin project completed year three of a five-year investigation of ground water resources in the area between Espanola and San Acacia, New Mexico. This region encompasses part or all of 14 Pueblo Nations surrounding the metropolitan areas of Santa Fe, Bernalillo, Albuquerque, and Belen, New Mexico. Geologists and hydrologists from this USGS project have been working to provide scientific information about factors that control the location, quality, and availability of ground water in this ecologically sensitive and fast-growing area of the State. USGS contacts with Tribal representatives have served to explain the scope of these scientific studies, the methods of investigation and the potential uses of the geologic and hydrologic information for Tribal management of water resources.

Airborne magnetic surveys in parts of the basin during prior years demonstrated that mapping detailed fracture patterns can help identify geologic influences on ground-water flow. The USGS funded completion of these airborne surveys in Fiscal Year 1998 over parts of 11 Pueblos: San Juan, Santa Clara, San Ildefonso, Pojoaque, Nambe, Tesuque, Jemez, Zia, Santa Ana, San Felipe, and Santo Domingo. This work compliments previous work that covered part or all of the Cochiti, Sandia, and Isleta Pueblos. The results of these airborne surveys, along with concurrent geologic mapping on the Pueblos by USGS and the New Mexico Bureau of Mines and Mineral Resources, are discussed with Tribal officials prior to publication and public release.

Collaboration between USGS and the north-central New Mexico Tribes is exemplified by the work that has taken place on the Isleta Pueblo over the last several years. Geologists meet regularly with the Pueblo's environmental and resource officers to discuss progress of geological mapping and geophysical investigations USGS employees have also conducted

field excursions with Tribal officers. USGS information has been used by Isleta Pueblo to guide drilling activities aimed at evaluating ground- water resources on Isleta lands. Two geologic maps were released during 1998 for the Wind Mesa (Open-File Report 97-740) and the Dalies NW (Open-File Report 97-741) quadrangles. Airborne geophysical survey data were released as Open-File Report 98-341 for the entire Pueblo and surroundings.

USGS maintains an active cooperative program with the Pueblo Nations for hydrologic studies in the Middle Rio Grande Basin area. USGS obtains data from stream gaging stations and wells to document the quantity and quality of water resources on Tribal lands and nearby areas. Contact: (Geologic issues) Jim Cole, 303-236-1417, jimcole@usgs.gov or ; (Hydrologic issues) Jim Bartolino, 505-262-5336, jrbartol@usgs.gov

**Hydrologic Studies of Pueblo of San Ildefonso Lands.** This USGS study is evaluating the extent of environmental impacts on the geohydrologic system of the Pueblo of San Ildefonso and adjacent Department of Energy (DOE) lands. The study will identify the water-quality characteristics of water resources on the Pueblo and adjacent DOE lands. It will identify potential sources of pollution within the study area. Water-quality data are being provided for future use by the Pueblo of San Ildefonso in their development of water-quality standards. The USGS is also providing technical training to Pueblo employees (see Technical Assistance part of this report). Contact: Cynthia Abeyta, 505-262-5358, cgabeyta@usgs.gov

**Geohydrologic and Water-Quality Assessment of Pueblo of Jemez Ancestral Lands.** The primary objective of this study is to evaluate the extent of environmental impacts on the geohydrologic system of the Upper Jemez River Watershed. This is being accomplished by identifying the water-quality characteristics of water resources within the Jemez River watershed and identifying point and non-point sources of pollution within the study area. As part of this project, the USGS is providing water-quality data to the Pueblo of Jemez for thier future use in determining appropriate economic development alternatives. The USGS is also providing technical training to Pueblo employees (see Technical Assistance part of this report). Contact: Cynthia Abeyta, 505-262-5358, cgabeyta@usgs.gov

**Indian Participation in Climate Assessment**. A Zuni Pueblo member represents Indian stakeholders on a Southwest regional assessment team. The Southwest regional team, with a federal co-coordinator from the USGS and a non-federal co-coordinator from the University of New Mexico, is part of the National Assessment of Potential Consequences of Climate Variability and Climate Change. The team is expected to evaluate societal consequences of climate issues in the southwest. Team members were selected to represent a variety of stakeholders to provide the project with multiple perspectives. Together, the team will produce a written report on their findings. A video on the project features the Indian representative, along with other team members. Contact: Todd Hinkley, 303-236-5850, thinkley@usgs.gov

**Sedimentation and Erosion on Lands of the Navajo Nation.** Navajo land-use managers must contend with erosion and sedimentation in determining the best uses–or non-uses–of their lands. This study, by the USGS, is identifying sources and mechanisms of how sediment is produced. The study will estimate rates and volumes of hill-slope, valley, and channel erosion and sedimentation in tributary drainage basins within the Navajo lands. Results of the study will help land-use managers and residents assess the stability of channels, and the relative erodibility of valleys and hill-slopes. Contact: John Parker, 520-670-6671 x271, jtparker@usgs.gov

**Locating Exotic Plants.** The USGS' Forest and Rangeland Ecosystem Science Center has developed the Southwest Exotic Plant Mapping Program to provide Tribal, Federal, State and private land managers with data and maps for inventorying, monitoring, and sharing data on exotic plant species in the Southwest. The Navajo Nation participates in this project.

USGS scientists have provided a standardized methodology to the Navajos for the collection of field data and has assisted in implementing the effort at several sites on the Navajo Reservation in Arizona and New Mexico. Data collected will be added to the Program's database. The data and associated maps, available on the Program's web site, will help the Navajo Nation monitor and control the spread of exotic species on Navajo. Contact: Forest and Rangeland Ecosystem Science Center, 541-750-7307, michael_collopy@usgs.gov

**Availability and Quality of Surface-Water and Ground Water Resources of the Yavapai-Prescott Indian Reservation.** The Yavapai-Prescott Indian Tribe's primary water-resource needs are related to water rights, availability, and water quality. The USGS study is assisting the Tribe by determining surface water inflows and outflows in Granite Creek within the Reservation boundary as well as peak flows in four tributaries to Granite Creek. The project is also defining the potential occurrence and concentration of suspected contaminants, associated with past and current industrial activities within and near the Reservation, in water, sediments, and the alluvial aquifer of Granite Creek. The study will identify the rate and direction of movement of potential contaminants entering or existing in the alluvial aquifer of Granite Creek. This work will assist the Tribe in determining the potential for developing ground-water supplies on the Reservation. Contact: Greg Littin, 520-556-7255, grlittin@usgs.gov

**Hydrologic Investigation of Grande Wash, Fort McDowell Mohave-Apache Indian Community.** The USGS investigation is helping the Fort McDowell Mohave-Apache Indian Community protect life and property by furnishing hydrologic data to the Community. The investigation is determining whether ground water near landfills is contaminated and whether the landfills are sources of that contamination. The source, quantity, and quality of streamflow in Grande Wash at the western boundary of the Fort McDowell Reservation will be evaluated, and the 100-year flood-plain will be delineated within Grande Wash. The effects of land use on peak surface-water flows within the Grande Wash drainage upstream from the Reservation are also being examined. Contact: John P. Hoffman, 520-670-6671 x 265, jphoffma@usgs.gov

**Apache Trout.** Scientists from the USGS' Arizona Cooperative Fish and Wildlife Research Unit, in cooperation with the White Mountain Apache Tribe's Fish and Game Department and the U. S. Fish and Wildlife Service, are continuing studies to assess the survival of Apache trout. These native species have been reintroduced into streams on the Fort Apache Indian Reservation. The Cooperative Research Unit sponsors a graduate student, who is a Tribal member, to conduct the research. Contact: Arizona Cooperative Fish and Wildlife Research Unit, 520-621-1959, gmaughan@ag.arizona.edu

**Fallon Basalt Aquifers - Phase I, Data Synthesis and Analysis**. The Nevada Division of Water Resources, the Navy, and the Bureau of Reclamation are cooperating with USGS on this study to better define sources of water and controls on the quality of water in the Fallon Basalt Aquifer. This Aquifer is the sole source of drinking water for the City of Fallon, the Fallon Naval Air Station, and the Fallon Paiute and Shoshone Tribe (Fallon Colony). The Fallon Colony is contributing data to the project, providing access to Tribal lands for drilling, and is a potential

cooperator for Phase II of this study. Phase ll involves developing a digital model of the aquifer and an assessment of the potential for in situ treatment of arsenic concentrations, which exceed current the U.S. Environmental Protection Agency's maximum concentration levels for drinking water. Contact: Terry Rees,775-887-7635, tfrees@usgs.gov

**Monitoring Water Quality from Leviathan Mine.** USGS is cooperating with the Washoe Tribe of Nevada and California in a Natural Resources Damage Assessment associated with acid mine drainage from a sulfur mine in the upper reaches of the Bryant Creek drainage which crosses Tribal Lands. USGS scientists sampled water and bed-sediments and measured streamflow discharge in a reconnaissance study to evaluate distribution of heavy metals within the drainage basin. The data will be used as a basis for determining the potential damage to environmental and cultural resources on Tribal lands. The Washoe Tribe, and others, have requested ongoing technical concerning drainage from the Leviathan Mine. It is likely that the USGS will be asked to be involved in additional studies in the drainage when results from the initial sampling round are received and additional needs can be defined. Contact: Jon Nowlin, 775-887-7600, jlnowlin@usgs.gov

**National Irrigation Drainage Program– Carson River.** Within the framework of this Department of the Interior Program, a study was done in the Carson River drainage to determine the occurrence and concentration of methylmercury. Tribal lands of the Washoe Tribe of Nevada and California and of the Fallon Paiute and Shoshone Tribe lie within this drainage. Traditional subsistence resources such as fish have been known to be contaminated with mercury, a legacy of the Comstock mining era in which milling processes resulted in thousands of tons of mercury to be released into the middle and lower Carson River drainage. Contact: Ray Hoffman, 775-887-7614, hoffman@usgs.gov

**Ecological Conditions along the Elwha River.** The formerly free-flowing Elwha River was famous for the diversity and size of its salmon runs; it produced an estimated 380,000 migrating salmon and trout and support 10 runs of anadromous salmonids, including runs of chinook that exceeded 100 hours. After construction of the Elwha Dam (1912) and the Glines Canyon Dam (1927), more than 70 miles of the river and its tributary habitats were lost to anadromous fish production. In response to the loss of salmon in the Elwha River basin, the Elwha River Restoration Act of 1992 was passed. The law began the process of assessing the feasibility of restoring the Elwha River ecosystem. The USGS, in cooperation with the Lower Elwha Klallam Tribe, is evaluating the current ecological status and nutrient dynamics of the Elwha River to assist in developing salmon restoration management plans and develop an ecological framework for describing current and future ecological conditions in the Elwha River Basin. Contact: Mark Munn, 253-428-3600 x 2686, mdmumm@usgs.gov

**Fault-Hazards and the Quinalt Indian Nation.** As part of an ongoing effort to characterize earthquake hazards in the Pacific Northwest, the USGS has mapped Quaternary-age faults and folds on the Quinault Indian Reservation since 1992, with assistance from the Quinault Department of Natural Resources. In 1997 and 1998, the USGS collected marine geophysical data directly off the shores the Quinault lands. The purpose of the mapping is to identify the near-shore counterparts to onshore geologic structures and to determine their rates of movement. This investigation addresses the question of whether crustal faults, independently of large subduction earthquakes, pose a significant seismic hazard to local communities.

Research results will be incorporated into a synthesis of crustal earthquake faults in the Pacific Northwest and used to update the next edition of the USGS-National Seismic Hazards Maps due to be published in 2000. The National Oceanic and Atmospheric Administration donated the use of a research vessel. Contact: Pat McCrory, 650-329-5677, pmccrory@usgs.gov

**Trinity River Basin.** The USGS is assisting with restoration of the salmonid fisheries in the Trinity River Basin, California. This project, involving Tribal interests of the Hoopa Valley, Yurok, and Karuk Indians of northern California, is a major inter-agency, inter-jurisdictional effort to restore a fishery decimated by water exportation and other land-use practices. USGS District staff are leading the effort to complete the Trinity River Flow Evaluation, produce the summary report, and make recommendations to the Secretary of the Interior on actions needed to restore the fishery. Contact: Jon Nowlin 775-887-7600, jlnowlin@usgs.gov

**Studies of Radionuclides Near Amchitka Island.** USGS scientists currently serve on the Sea Otter Pilot Study Advisory Committee sponsored by the Aleutian/Pribilof Islands Association, Inc., and the Alaska Sea Otter Commission. The committee is developing a project to examine levels of radionuclides in sea otter skulls collected before, during, and after the time of the underground nuclear detonations on Amchitka Island (1965, 1969, 1971) to determine if radionuclides are escaping from the island into the marine environment, and effects, if any, on the natural resources of the region. Contact: Jim Bodkin, 907-786-3550, james_bodkin@usgs.gov

**Alaska Native Subsistence Issues.** The USGS Forest and Rangeland Science Center maintains a Social Science Program at the University of Washington that studies issues relevant to Alaska Natives. In 1998:

USGS scientists and collaborators completed a study of the traditional, Alaska Native use of cabins and other shelters associated with trapping and other subsistence uses of land in Denali National Park. Two of the communities studied, Nikolai and Telida, are Athabaskan villages.

In the resident zone villages of Nondalton, Newhalen, Illiamna, Pedro Bay, and Lime Village in the Lake Clark National Park and Preserve, USGS researchers are finishing a study of contemporary plant uses by Native communities.

Eagle Village and Circle have significant contemporary and historical subsistence use of lands within the Yukon-Charley Rivers National Preserve. USGS biologists continued a project involving collecting and analyzing data on wildlife harvesting and use by these Athabaskan villages.

USGS staff and others are working together to identify possible cooperative management strategies for the complex of National Park Service units in northwest Alaska. The primary issue involves subsistence use of the Northwest Arctic caribou herd by the Iñupiat communities of Ambler, Kiana, Noatak, and Kotzebue, and coordinating these uses with natural resource management goals of the National Park Service.

USGS scientists are studying the cultural significance and patterns of historic use of bird eggs by the Hoonah Tlingit community in order to prepare a Tlingit ethno-ornithology use plan for the Natives in Glacier Bay National Park and environs. Data were collected to complete a qualitative study of traditional subsistence use on preserved Federal lands.

Contact: Director, Forest and Rangeland Ecosystem Science Center, 541-750-7307, collopym@fsl.orst.edu

# Resource Activities

# Resource Activities

Resolving Conflicts Concerning Mining Activities. Visiting officials from the Government of Suriname met with USGS scientists to discuss mining operations in the U.S. that could serve as models for development in Suriname. The Government of Suriname was also interested in resolving conflicts between large mining companies and Indigenous peoples regarding development of gold deposits. A USGS scientist put the Surinamese officials in contact with resource specialists in the Bureau of Indian Affairs help the Surinamese learn about issues concerning indigenous peoples and resource extraction on Indian lands in the U.S. Through discussions with the BIA the officials were given examples of problem resolution, contract development for resource extraction on Indian lands, and public relations. A continuing relationship among USGS and BIA minerals staffs developed from this meeting. Contact: Don Bleiwas, 303-236-8747, bleiwas@usgs.gov

**Characterization of Water Resources at Keweenaw Bay Indian Community.** The objective of the study is to conduct a water-resources appraisal of Keweenaw Bay Indian Community Tribal lands. The study includes information on surface and ground-water quality, and water levels in wells, lakes, ponds, and wetlands, and from other data-collection sites. Contact: Jim Nicholas, 517- 887-8903, jrnichol@usgs.gov

**Water Resources of Bonifas Creek and Adjacent Wetlands.** The Lac Vieux Desert Band of Lake Superior Chippewa Indians needs water resources information for Bonifas Creek and its adjacent wetlands near their lands in Watersmeet, Michigan. Of particular interest are the background water quality of Bonifas Creek and the travel time for water through about 160 acres of wetlands between the Tribal land and the creek. The objective of this study is to evaluate the water quality of Bonifas Creek and the hydrology of adjacent wetlands. Contact: Jim Nicholas, 517-887-8903, jrnichol@usgs.gov

**Water Resources on the Reservation of the Bad River Band of Lake Superior Chippewa Indians.** The objective of this cooperative study is to further define the local and regional ground-water flow system in the northern part of the Bad River Indian Reservation. Information gathered to characterize the hydrogeologic framework will provide the basis for current and future site-specific investigations concerned with long-term water-resource and water-quality trends. The hydrogeologic framework will be characterized by drilling boreholes at three sites, conducting geophysical surveys, rock core analysis and packer testing of the aquifer at selected sites and depths. The characterization of the hydrogeologic framework also lays the foundation for numerical modeling in the future. Water quality will be evaluated at selected sites and depths. Contact: Jim Krohelski, 608-821-3850, jtkrohel@usgs.gov

**Study of Environmental Contaminants.** A copper-zinc sulfide mine is being developed upstream of Sokaogon Chippewa Community's lands near Crandon, Wisconsin. Fishery biologists from the USGS' Mid-Continent Ecological Science Center were asked to assist the Tribe in determining the aquatic baseline conditions. The USGS scientists created a data base for the Tribe that will be the foundation of a risk assessment and Environmental Impact Analysis of the environmental impacts of the mine. Assistance to the Tribe will be provided through September 1999. Contact: Director, Mid-Continent Ecological Science Center, 970-226-9100, rey_stendell@usgs.gov

**Migratory Needs of Sturgeon.** USGS scientists continued research for the Menominee Indian Tribe of Wisconsin on fish passage needs of two migratory species of sturgeon. Assistance was provided by the USGS' S. O. Conte Anadromous Fish Laboratory, partially funded by the Great Lakes Foundation, and supported by the States of Wisconsin and Michigan. Contact: Steve McCormick, 413-863-9475, ext. 31, steve_mccormick@usgs.gov

**Water Resources of Specific Indian Communities.** Detailed information of the water resources of four Indian communities is necessary for the efficient use, management, and protection of these resources. These studies will evaluate the availability and quality of surface and ground water for domestic and municipal use. The American Indian communities are Nett Lake (Bois Forte Band of the Minnesota Chippewa Tribe), Prairie Island Dakota Community, Lower Sioux Mdewakanton, and Upper Sioux Community. Contact: James Ruhl, 612-783-3252, ruhl@usgs.gov

**Hydrogeology of the Grand Portage Indian Reservation.** The Grand Portage Band of Lake Superior Chippewa has identified two critical issues regarding the management, use, and protection of ground water on their Reservation. Information about the hydrogeology and water quality of the aquifers on the Reservation currently is limited to a regional-scale description determined from a reconnaissance-level investigation. Tribal officials need more specific information about local ground-water conditions in order to better deal with these issues. The objectives of the project are to determine the general availability and quality of ground water with special emphasis on designated development areas and to evaluate the potential for aquifer contamination from on-land waste disposal sites. Contact: Tom Winterstein, 612-783-3150, twinters@usgs.gov

**Long-Term Monitoring on the Spirit Lake Sioux.** Rising surface waters have caused significant disruption to living conditions on the lands of the Spirit Lake Tribe. The purpose of this study is to establish a monitoring program that would provide the Spirit Lake Tribe with data that could be used to determine changes in the hydrologic and water-quality conditions on the Reservation. The objectives are to: (1) Develop a long- term program to monitor the water levels and water quality in selected lakes and wetlands on the Reservation, and (2) Develop a long tem program to monitor ground-water levels and water quality in the Spiritwood, Tokio, and Warwick aquifers. Contact: Douglas G. Emerson, 701-250-7402, demerson@usgs.gov

**Surface and Ground Water Resources of Lake Traverse Reservation.** The objective of the study is to collect the necessary hydrologic data to evaluate the surface-and ground-water resources of the Sisseton Wahpeton Sioux Tribe's Lake Traverse Reservation in South Dakota and North Dakota and of Roberts County in South Dakota. More specifically, the assessment will determine the location, depth, and quality, and quantity of water in the study area and the effects of surface-and ground-water interactions, recharge and, discharge on the hydrologic system. Additional efforts have recently been initiated to assess water and bed-sediment chemistry in the Cheyenne and Moreau Rivers. Contact: Ryan Thompson,605-353-7176 x225, rcthomps@usgs.gov

**Quantity and Quality of Water Resources of the lands of the Cheyenne River Sioux Tribe.** Water quality is poor in some areas of the Cheyenne River Reservation. Many residents obtain drinking water from sources that are not of adequate quality. This study intends to give water managers better information to improve the quality of drinking water to Cheyenne River Reservation residents. The project will describe the variability of streamflow within and adjacent to the Reservation and determine selected aquifer properties. Surface and ground water

qualities will be described and characterized, including their suitability as drinking-water sources, livestock watering, and irrigation. Project personnel will inventory water use for selected areas within the Reservation. The study will describe temporal trends in water quality for the Cheyenne and Moreau Rivers and will develop a generalized hydrologic budget for the Reservation. Contact: Allen Heakin, 605-355-4560 x216, ajheakin@usgs.gov

**Water Supply and Water-Quality Assessment of the Pine Ridge Indian Reservation.** Drinking water for the 13,200 residents of the Pine Ridge Indian Reservation is obtained primarily from shallow wells. Northwestern parts of the Reservation lack a reliable drinking-water supply, and water-quality problems exist at scattered locations across the Oglala Sioux Tribal lands. There is great concern among the leaders of the Oglala Sioux Tribe that some of the drinking water consumed on the Reservation is adversely affecting human health. A comprehensive assessment of the supply and quality of Reservation water has been initiated. Preliminary results of water-quality sampling indicate drinking water does not meet standards in some public supply wells. Contact: Allen Heakin, 605-355-4560 x216, ajheakin@usgs.gov

**Water Resources of Mellette and Todd Counties, South Dakota.** A water-resources investigation of Mellette and Todd Counties recently was completed. An investigation of elevated arsenic concentrations in ground water in the Grass Mountain area of the Rosebud Indian Reservation also was completed. Several proposals have been submitted to the Rosebud Sioux Tribe for additional studies of their lands. The proposals include additional arsenic studies in other areas of the Reservation, a ground-water flow model, and a well inventory of abandoned wells in Todd County Contact: Janet Carter, 605-355-4560 x215, jmcarter@usgs.gov

**Ground-Water Resources Reconnaissance of the Osage Reservation.** A cooperative program with the Osage Nation is providing data and information to the Osage from an areal survey of the quality and availability of ground water in the Reservation. The program is also comparing data describing ground-water quality to land use. Contact: Marvin M. Abbott, 405-810-4411, mmabbott@usgs.gov

**Mineral Exploration in Montana.** A USGS geologist is developing a database of exploration activities in Montana. Data on non-fuel activities on Indian lands was provided by BIA minerals specialists. Contact: Don Bleiwas, 303-236-8747, bleiwas@usgs.gov

**Surface-Water Resources of the Blackfeet Reservation.** The surface-water resources of the Blackfeet Reservation include pristine mountain streams, glacial lakes, and prairie wetlands. These resources are of considerable cultural and economic importance to the Blackfeet Tribe. The high quality surface waters of the Blackfeet lands support diverse populations of fish and wildlife, are widely used for stock watering and irrigation, and supply drinking water for many residents. The purpose of this study is to analyze and describe the surface-water resources of the major river basins of the Blackfeet Reservation. Contact: Mike Cannon, 406-441-1319, mcannon@usgs.gov

**Availability of Ground Water for the Crow Tribe.** Recent concerns about water availability for the Crow Tribe have necessitated a detailed description of the water resources of the Crow Indian Reservation. Ground water in the alluvial and terrace deposits in the Little Bighorn River Basin is an important resource of the Crow Reservation. The study, funded by the BIA, and

conducted by the USGS, will describe the general quality of the ground water in the alluvial and terrace deposits, and the potential availability of ground water from bedrock aquifers. More specifically, objectives of the project include describing the geometry and hydraulic characteristics of the alluvial and terrace deposits and the potentiometric surface and general directions of ground-water flow. The sources of recharge and discharge of the Little Bighorn River and its hydraulic interactions with other hydrogeologic units, irrigation canals, etc. will also be parts of the investigation. Contact: Lori Tuck, 406-441-1319, ltuck@usgs.gov

**Water-use on the Blackfeet and Crow Lands.** Water-use data are needed to administer various laws governing water use, appropriation, and allocation. Water-development planning requires current water use data to evaluate various alternatives for expanded or revised use patterns. Water-use information was determined for portions of the of the Blackfeet and Crow Reservations. Contact: Charles Parrett, 406-441-1319, cparrett@usgs.gov

**Research on Zuni Pueblo.** In past years, the Zuni Pueblo has participated in the Biological Resource Division's Gap Analysis Project in New Mexico. In Fiscal Year 1998, scientists from the USGS' New Mexico Cooperative Fish and Wildlife Research Unit met with Zuni representatives to identify areas of potential joint research in issues related to this continuing endeavor. Contact: New Mexico Cooperative Fish and Wildlife Research Unit, 505-646-6053, gmaughan@ag.arizona.edu

**Selected oil-producing formations on the Jicarilla Apache Reservation.** This DOE-funded study is focusing on evaluating the nature, spatial distribution, structural development, and oil hydrocarbon production potential of sandstone reservoirs The study is focusing on the Mesaverde Formation and the El Vado Sandstone Member of the Mancos Shale on Jicarilla Tribal Lands. The work involves synthesizing existing data and adding new interpretations based on descriptions and measurements of outcrops and evaluation of a large array of seismic data. Identification and mapping of these reservoir changes from surface and subsurface data will give the Tribal Energy Department the tools to assess and properly exploit the reservoirs within the context of both exploration and secondary or tertiary recovery programs. Understanding the nature of the heterogeneous geometry of these units will also enable us to further evaluate the potential for low-contrast, low-resistivity units that could contain by-passed hydrocarbons and to develop working models that would assist the Tribe to recognize and evaluate them in future exploration programs. Transfer of digital data and base maps in digital form to the Tribe are an ongoing component of the study. Contact: Jennie Ridgley, 303-236-9048, ridgley@usgs.gov

**Navajo Surface Water Project.** The Navajo Nation and the USGS are collaborating to help the Navajo Nation's Water Resources Department (NNWRD) improve their water management practices. The USGS is assisting the NNWRD compute streamflow records from Navajo streamflow gaging stations by jointly creating a database to compute and store streamflow data. The USGS is providing training in record computation and is assisting with rating curve development. The NNWRD and the USGS are working together to provide quality assurance. Contact: Gregory G. Fisk, 520-556-7225, ggfisk@usgs.gov

**Black Mesa Monitoring Program.** Two programs are underway near Black Mesa. The first, the Black Mesa monitoring program, on the lands of the Navajo Nation, is designed to document long-term effects of ground-water pumping from the N aquifer by industrial and municipal users. The N aquifer is the major source of water for the 5,400 square mile Black Mesa area. The other program is a geochemical analysis of groundwater ages, recharge rates,

and hydrologic conductivity of the N aquifer. The objectives of this interpretive study are to characterize the water quality of the N aquifer and use geochemistry to develop a conceptual ground-water flow model. The interpretive study will also determine if leakage is occurring from the D aquifer. Both the Hopi Tribe and the Navajo Nation will apply these findings to their individual plans for use of N Aquifer. A long-term hydrological monitoring plan has been proposed for the N and D aquifers. Contact: (Monitoring study) Greg Littin, 520-556-7255, grlittin@usgs.gov ; (Interpretive study): Bill Steinkampf, 520-670-6671 x 269, bs@usgs.gov

**Preliminary Assessment of Hydrologic Conditions in Part of the Tohono O'odham Indian Reservation.** The USGS is conducting a preliminary assessment to estimate the quantity of surface-water flowing in Vamori and San Simon Washes. The assessment includes construction, testing, and calibration of load-cell scour sensors. The USGS and the Tohono O'odham Nation are working together to develop a plan for a more intensive study along the southern border of the Reservation. This study will evaluate the effects of future ground-water withdrawals and agricultural development on hydrologic conditions within the Reservation. Contact: Michael C. Carpenter, 520-760-6671x275, mccarp@usgs.gov

**Hydrologic Studies in Snake River Basin.** Hydrologic data for streams and associated subbasins within the Salmon and Clearwater River Basins were analyzed to support instream flow claims made by the Bureau of Indian Affairs on behalf of the Nez Perce Tribe. These claims are part of the adjudication of the Snake River Basin by the State of Idaho. The purpose of the study was to classify subbasins and make estimates of mean annual and mean monthly discharges for subbasins within the study area. A related study was done concurrently, with the objective of developing a methodology for estimating flow duration values for subbasins within the study area. Reports for both these studies have been approved for publication. Contact: Steve Lipscomb, 208-387-1321, lipscomb@usgs.gov

**Fallon Shallow Aquifer Model.** Changes in the quantity and location of surface water deliveries and application are being proposed as part of the Newlands Project near Fallon, Nevada. A ground-water model, assessing the potential effects of these proposed changes on ground-water levels and quality, is being completed in cooperation with the Bureau of Reclamation. Fallon Paiute Shoshone Tribe has land and agricultural interests in this location and are subject to potential impacts as land-use changes take place in the vicinity. Contact: Terry Rees, 775-887-7635, tfrees@usgs.gov

**Subsurface Flow in Clear Creek Watershed**. The Washoe Tribe of Nevada and California has tribal lands that lie within the Clear Creek Watershed. Understanding the recharge mechanisms and ground-water flow path in this watershed is important for the Tribe's quantification of their water resources. The objective of this project was to drill a monitoring well at a critical area in the watershed to determine the water level. This information is to be incorporated into the interpretation of the basin-wide flow system. Contact: Terry Rees, 775-887-7635, tfrees@usgs.gov

**Intermittent Recharge.** This study is re-evaluating the source and magnitude of ground-water recharge to Eagle Valley, Nevada, in which lies the State capital (Carson City), the Carson Community of the Washoe Tribe of Nevada and Cailfornia, and other lands of the Washoe Tribe. The project is a cooperative effort between the USGS, Carson City, and the Washoe Tribe. To date, project results have included defining the relationships between stream temperature and water infiltration rates, and revising (increasing) estimates of natural recharge

to the alluvial aquifers. These results have enabled Carson City to better manage infiltration facilities for ground-water allocation from the State Engineer. Fiscal Year 1998 activities included data acquisition and interpretation, and the initial draft of a Water Resources Investigations Report. Contact: Terry Rees, 775-887-7635, tfrees@usgs.gov

**Nevada Basin and Range National Water Quality Assessment.** This National Water Quality Assessment project includes the Carson and Truckee River basins in northwestern Nevada and Las Vegas Valley in southern Nevada. Information on ground-water quality in Las Vegas Valley is important to the Las Vegas Paiute Tribe, which is developing tourism as an economic base and depends upon the Las Vegas Valley alluvial aquifers for its water supply. Other water-quality data for streams and aquifers in the Truckee and Carson basins are of importance to the Washoe Tribe of Nevada and California (Carson River and Lake Tahoe Basins, described elsewhere in this report) and the Pyramid Lake Paiute Tribe (lower Truckee River). Contact: Hugh Bevans, 702-887-7688, hbevans@usgs.gov

**Assistance on Salmon Research.** The USGS' Oregon Cooperative Research Unit worked with the Columbia River Inter-Tribal Fish Commission on a research, monitoring, and evaluation project titled "Avian Predation on Juvenile Salmonids in the Lower Columbia River." The project examined the extent of predation on endangered salmon smolts by water birds as well as efforts to mitigate the predation. Two Inter-Tribal biologists were employed full-time on the study, and Tribal members were also hired as seasonal technicians. Contact: Director, Oregon Cooperative Fishery Research Unit, 541-737-1938**,** lih@ccmail.orst.edu

**Habitat Evaluation.** Construction of dams by the Bonneville Power Administration on the Columbia River will affect the habitat of Indian fisheries. At the request of the Pacific Northwest Power Planning Council, USGS biologists prepared and conducted sessions for Tribes on the procedures for evaluating impacts of dam construction on fishery habitats. The methodology developed by the scientists will be used to measure adverse impacts and provide the means for estimating monetary compensation for affected Tribes. Representatives of the Spokane, Kalispel, Burns-Paiute, and Nez Perce Tribes, and the Yakama Nation attended as well as the Confederated Tribes of the Colville Reservation and the Confederated Tribes of the Umatilla Indian Reservation. Contact: Director, Mid-Continent Ecological Science Center, 970-226-9100, rey_stendell@usgs.gov

**Water Quality and Quantity for the Morongo Band of Mission Indians.** The Morongo Band of Mission Indians uses groundwater reservoirs for water storage. The dimensions of the storage facilities, along with water quality are being determined in a cooperative project between the Morongo Band and the USGS. The Morongo Band collected water-level data that are being evaluated by the USGS to determine the relationships between pumping and draw-down of water. The USGS is studying the geohydrology and geochemistry of these groundwater reservoirs, with work focusing on Potrero Canyon and the Cabazon Storage Unit. The physical dimensions of the Cabezon storage unit were studied by the USGS using geophysical techniques. A report on the results will be given to the Morongo Band by the end of 1998. Monitoring wells were drilled to gather data on the water quality and hydraulic characteristics of the Cabezon unit. These will be used to gather data over many years. Wells in Portero Canyon and springs in Hathaway and Millard Canyons have been sampled for water quality and other characteristics. This sampling, which will continue in the Cabazon unit in Fiscal Year 1999, will help the USGS determine the source and age of ground water in the area. Contact: Peter Martin, 619-637-6827, pmmartin@usgs.gov

# Technical Assistance

# Technical Assistance

**American Indian Aquaculture.** The U.S. Food and Drug Administration approves certain drugs that are used in Tribal aquaculture projects. The USGS' Upper Midwest Environmental Sciences Center (formerly the Upper Mississippi Science Center) conducts nationwide research on the registration of new drugs, chemicals, and therapeutics used in aquaculture production. The Science Center established a partnership to assist FDA by conducting research on the environmental effects of these drugs in cooperation with the U. S. Fish and Wildlife Service, the International Association of Fish and Wildlife Agencies, and 37 State fish and wildlife departments. Because Tribal aquaculture operations are a significant percentage of nationwide facilities, Tribes will benefit directly from this research at no expense. Contact: Director, Environmental Sciences Center, 608-783-6451, leslie_holland-bartles@usgs.gov

**Onondaga Nation Hydrogeologic Sessions.** In May 1998, a USGS hydrologist made a presentation to Tribal officials of the Onondaga Nation on the hydrogeology of Tully Valley. The presentation was followed by a field trip though the Tully Valley during the next day. The presentation and field trip were made at the request of the U.S. Environmental Protection Agency (EPA), and were attended by EPA and New York State Department of Environmental Conservation representatives, as well as tribal officials. Contact: Robert Rogers, 518-285-5661, rrogers@usgs.gov

**Coordinating Environmental Priorities.** USGS staff met with representatives of the Inter-Tribal Council of Michigan and the U.S. Environmental Protection Agency's Tribal liaison to discuss Tribal environmental priorities in Michigan. Contact: Tom Weaver, 517-887-8912, tlweaver@usgs.gov

**Techincal Demonstration for Inter-Tribal Council of Michigan.** USGS hydrologists ran borehole-geophysical logs at Bay Mill Indian Community as a demonstration for Inter-Tribal Council of Michigan (ITCM). Contact: Tom Weaver, 517-887-8912, tlweaver@usgs.gov

**Training for Keweenaw Bay Indian Community Personnel.** The USGS provided technical training in the use of ARC/INFO and ARCVIEW software to a tribal geographic information systems (GIS) specialist from the Keweenaw Bay Indian Community. These commercial software programs are the Contact: Tom Weaver, 517-887-8912, tlweaver@usgs.gov

**Technology Aids in Finding Sacred Sites.** Scientists from the USGS' Environmental Management Technical Center (now the Upper Midwest Environmental Sciences Center) in Onalaska, Wisconsin, provided assistance to the Ho-Chunk Nation of Wisconsin. The USGS GIS experts scanned base maps of tribal lands and identified sites of ancestral burial mounds. Contact: Contact: Director, Upper Midwest Environmental Sciences Center, 608-783-6451, leslie_holland-bartels@usgs.gov

**Geographic Information Systems Training for the Mni Sose Intertribal Water Rights Coalition.** The USGS is working with the Mni Sose Intertribal Water Rights Coalition, Inc. to provide GIS data and to teach several 1-week GIS seminars for Tribes within the Missouri River Basin. Contact: Tom Trombley, 785-832-3551, trombley@usgs.gov

**Geographic Information Systems Support for the Prairie Band of Potawatomi Nation.** The purpose for this project is to provide GIS support to the Prairie Band of Potawatomi Nation. Students at Haskell Indian Nations University will create and document geographic data layers for the Tribe under the supervision of a USGS hydrologist. Data will be provided to the Tribe on compact disk or other media. The Tribe also will be provided training in GIS concepts and in the use of GIS software, enabling them to analyze data provided to them. Contact: Tom Trombley, 785-832-3551, trombley@usgs.gov

**Surface-water Quality on Lands of the Prairie Band of Potawatomi Nation.** This project will assist Potawatomi personnel in learning water-quality sampling and quality assurance/quality control procedures. It will also provide a periodic water-quality assessment at selected sites on the Reservation to identify and monitor potential sources of contamination that could affect human-health. As part of the training program, several Tribal employees attended the water-quality sampling course at the USGS National Training Center in Denver. In addition, Tribal staff accompany USGS personnel during water-quality sampling on the Reservation. Tribal personnel help collect and process samples for analysis. As the Tribal staff become more experienced with sample collection and processing and as they procure more equipment, their role in sample collection and processing will increase. Contact: Tom Trombley, 785-832-3551, trombley@usgs.gov

**Mapping Biological Features.** The USGS' South Dakota Cooperative Fish and Wildlife Research Unit is assisting the Standing Rock Sioux and Flandreau Santee Sioux Tribes in mapping the biological features on both Tribes' Reservations. Contact: South Dakota Cooperative Fish and Wildlife Research Unit, 605-688-6121, berryc@sdstate.edu

**Confederated Salish and Kootenai Tribes Cooperative Project.** The USGS conducted a field exercise with the Confederated Salish and Kootenai Tribes to check the accuracy of field techniques and equipment for measuring streamflow. Contact: Charles Parrett, 406-441-1319, cparrett@usgs.gov

**Water-Quality Techniques for the Pueblos of San Ildefonso and Jemez.** An integral part of the separate hydrogeologic studies of the Pueblo of San Ildefonso and the Pueblo of Jemez is training provided by USGS staff to the staff of each Pueblo. The training will develop the Pueblos' employees' technical abilities to collect water data. At the conclusion of the study, the Pueblos will have increased independence in conducting the activities themselves on a regular basis. (See the Environmental Activities section of this report for additional information about the hydrologic issues addressed by these studies.) Contact: Cynthia Abeyta, 505-262-5358, cgabeyta@usgs.gov

**Getting Remotely Sensed Data to Indian Planners.** A USGS scientist has applied for funding, in conjunction with the Remote Sensing Institute at the University of New Mexico, for a project that would help local decision-makers use and integrate existing remotely sensed imagery into their land and resource planning processes. A goal of the proposal is to provide information to southwestern American Indian groups and the managers of Indian lands. Contact: Todd Hinkley, 303-236-5850, thinkley@usgs.gov

**Truckee-Carson Program.** This project is in support of Department of the Interior (DOI) bureaus in execution of various provisions of Public Law 101-618, the Truckee-Carson-Pyramid Lake Settlement Act. Funding is provided by USGS. The project has developed a complex river operations model for the Truckee and Carson Rivers and the Truckee Canal in support of the DOI's negotiations on reservoir and river operations to protect Indian trust resources for the Pyramid Lake Paiute and Fallon Paiute Shoshone Tribes. In addition to model development and support, the USGS acts as technical advisor on hydrologic issues to the DOI and the Bureau of Indian Affairs in the water-settlement negotiations and related litigation and water-rights transfers. Contact: Larry Bohman, 775-887-7679, lrbohman@usgs.gov

**Technical Training for Confederated Tribes and Bands of the Yakama Nation Employees.** In July 1998, the USGS conducted training for 10 members and employees of the Yakama Nation at the Tribal headquarters. The training included classes and field exercises on how to make discharge measurements and how to collect surface water data. Contact: Greg Ruppert, 509-547-2571, gruppert@usgs.gov

**Pacific Lamprey Study.** The Pacific lamprey is a prized cultural commodity to the Confederated Tribes of the Umatilla Indian Reservation and is a species at risk of extinction in the Columbia River. The USGS' Cooperative Fish and Wildlife Research Unit at Oregon State University advised the Confederated Tribes on their study of the Pacific lamprey. USGS scientists assisted in the defining the study's sampling design. Contact: Director, Oregon Cooperative Fish and Wildlife Research Unit, 541-737-1938, hiram.li@orst.edu

**Exotic Species in the Columbia River.** The Columbia River Inter-Tribal Fish Commission expressed concern over the potential adverse impacts of exotic marine species on the Columbia River fishery. USGS scientists assisted the Commission in the development of a computerized system that will gather and make publicly available pertinent information on exotic and alien species. Contact: Director, Oregon Cooperative Fish and Wildlife Research Unit, 541-737-1938, hiram.li@orst.edu

**Surface-Water Monitoring Stations.** The USGS operates the following surface-water monitoring stations, usually with cooperative funding from the Tribe, the Bureau of Indian Affairs (BIA), or a third party.

| Number of Stations | Cooperator |
|---|---|
| 2 | Seminole Tribe of Florida & South Florida Water Management District (includes 2 continuous recorders with Tribal nutrient autosamplers) |
| 1 | Miccosukee Tribe of Indians & South Florida Water Management District (includes 1 continuous recorder with Tribal nutrient autosampler) |

Contact: Mitch Murray-Florida, 305-717-5827, mmurray@usgs.gov

| | |
|---|---|
| 2 | Three Affiliated Tribes (Fort Berthold Reservation) |
| 1 | BIA |
| 1 | On Fort Bethhold Reservation; funded by other sources |
| 2 | On boundary waters of Standing Rock Sioux Reservation; funded by the Army Corps of Engineers (1 gage) & the North Dakota State Water Commission (1 gage) |
| 1 | On boundary of Fort Totten (Spirit Lake Sioux Tribe); funded by the Army Corps of Engineers |

Contact: Doug Emerson-North Dakota,701-250-7402, demerson@usgs.gov

| | |
|---|---|
| 2 | Sisseton-Wahpeton Sioux Tribe (Lake Traverse Reservation); funded by the BIA |
| 1 | Standing Rock Sioux Tribe; funded by the BIA |
| 1 | Cheyenne River Sioux Tribe; funded by the BIA |
| 1 | Crow Creek Sioux Tribe; funded by the BIA |
| 4 +1 | Oglala Sioux Tribe (Pine Ridge Reservation); 1 gage is a continuous recorder, funded by the Tribe; 4 gages funded by the BIA |
| 1 | Rosebud Sioux Tribe; funded by the BIA |
| 1 | Yankton Sioux Tribe; funded by the BIA |

Contact: Ralph Teller-South Dakota, 605-355-4560 x222, rwteller@usgs.gov

| | |
|---|---|
| 15 | Eastern Shoshone and Northern Arapaho Joint Business Council (Wind River Reservation) |

Contact: Theodore Bartke-Wyoming, 307-778-2931 x 2709, tcbartke@usgs.gov

| | |
|---|---|
| 1 | Nez Perce Tribe |
| 4 | BIA |

Contact: Thomas S. Brennan-Idaho, 208-387-1366, tbrennan@usgs.gov

| | |
|---|---|
| 5 | BIA |
| 2 | Pueblo of Zuni |
| 2 | Santa Clara Pueblo |

Contact: Michael Roark-New Mexico, 505-262-5354, mroark@usgs.gov

| Number of Stations | Cooperator |
|---|---|
| 1 | Fallon Paiute Shoshone Tribe |
| 4 | Pyramid Lake Paiute Tribe |
| 1 | Summit Lake Paiute Tribe |
| 12 | Walker River Paiute Tribe |
| 2 | Washoe Tribe of Nevada and California |

Contact: Kerry Garcia-Nevada,775-887-7659, ktgarcia@usgs.gov

| | |
|---|---|
| 2 | Havasupai Tribe |
| 3 | Hualapai Tribe |
| 2 | Hopi Tribe |
| 3 | Hopi Reservation; funded by BIA & Peabody Coal Co. |
| 1 | Navajo Reservation; funded by the Arizona Department of Water Resources |
| 1 | Navajo Reservation; funded by BIA & Peabody Coal Co. |
| 2(4) | Yavapai-Prescott Indian Tribe (2 continuous recorders and (4) crest-stage gages) |
| 1 | Tohono O'odham Nation |
| 2 | Pueblo of Zuni |

Contact: Christopher Smith-Arizona, 520-670-6671 x251, cfsmith@usgs.gov

| | |
|---|---|
| 8 | BIA |
| 7 | Blackfeet Tribe |
| 1 | Fort Peck Assiniboine and Sioux Tribes |
| 9 | Confederated Salish and Kootenai Tribes (Flathead Reservation) |
| 4 | Northern Cheyenne Tribe |

Contact: Ronald R. Shields-Montana, 406-441-1319, rshields@usgs.gov

| | |
|---|---|
| 4 | BIA (Chamokane Creek) |
| 4 | BIA (Nooksack River Basin) |
| 4 | Confederated Tribes and Bands of the Yakama Nation |
| 1 | Hoh Tribe |
| 1 | Makah Nation |
| 2 | Nisqually Indian Tribe |
| 1 | Quileute Tribe |
| 1 | Quinault Indian Nation |

Contact: Thomas Zembrzuski-Washington, 253-428-3600 x 2608, tjzembrz@usgs.gov

| | |
|---|---|
| 6 | Confederated Tribes of the Umatilla Indian Reservation |
| 11 | Confederated Tribes of the Warm Springs Reservation |
| 1 | Nez Perce Tribe |

Contact: Ed Hubbard-Oregon, 503-251-3239, leh@usgs.gov

| | |
|---|---|
| 1 | Hoopa Valley Tribe |
| 1 | Yurok Tribe |

Contact: Robert Mason-Cailfornia, 916-278-3000, rrmason@usgs.gov

**Water-Quality Monitoring Stations.** The USGS collects water quality at the following sites:

| Number of Stations | Cooperator |
|---|---|
| 1 gaging station | BIA |
| 10 wetlands sites | Spirit Lake Tribe |
| 2 gaging stations | Three Affiliated Tribes (Fort Berthold Reservation) |
| 4 lake sites | Three Affiliated Tribes (Fort Berthold Reservation) |

Contact: Doug Emerson-North Dakota, 701-250-7402, demerson@usgs.gov

| | |
|---|---|
| 1 | Pyramid Lake Paiute Tribe |
| 2 | Walker River Paiute Tribe |

Contact: Kerry Garcia-Nevada, 775-887-7659, ktgarcia@usgs.gov

**Ground-Water Monitoring Stations.** The USGS operates the following ground-water monitoring stations:

| Number of Stations | Cooperator |
|---|---|
| 1 | USGS (on Fort Belknap Reservation; Assiniboine and Gros Ventre Tribes) |

Contact: Clarence L. Chambers-Montana, 406-441-1319, chambers@usgs.gov

| | |
|---|---|
| 25 | Pechanga Band of Mission Indians |

Contact: James Bowers - 760-247-1401, jcbowers@usgs.gov

**Sediment Monitoring Stations**. The USGS operates the following sediment monitoring stations:

| Number of Stations | Cooperator |
|---|---|
| 3 | Hopi Tribe |
| 1 | Pueblo of Zuni |

Contact: Gregory G. Fisk-New Mexico, 520-556-7225, ggfisk@usgs.gov

| | |
|---|---|
| 1 | Lower Elwha Tribe (October - December 1997) |
| 1 | Jamestown S'Klallam Tribe |

Contact: Thomas Zembrzuski-Washington, 253-428-3600 x 2608, tjzembrz@usgs.gov

# General Coordination and Policy Activities

# General Coordination and Policy Activities

**American Indian Science & Engineering Society**. USGS American Indian employees are participating in the planning of the American Indian Science & Engineering Society's (AISES) 20th Annual National conference to be held in Denver on December 3-5, 1998. AISES is a non-profit organization that promotes the college education of young Native Americans in the sciences and engineering and aids in professional development of Native American scientists and engineers. The USGS employees are assisting in planning the conference and conference program, participating in the traditional foods and tours committees, and chairing of the equipment committee. One of the USGS employees is also a member of the AISES Government Relations Board, an board that provides personal and professional links with Federal agencies. USGS employees also regularly participate in the Native American Science and Engineering Fair in Albuquerque each year as judges and exhibitors. The Fair provides opportunities for mentorship and guidance about careers in the earth science and environmental fields. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

**American Indian Program Council (AIPC).** The USGS has participated in the American Indian Program Council through a member of its Central Region Mineral Resources Team. The AIPC is an interagency team of Federal representatives who meet quarterly to discuss and resolve issues involving recruitment and retention of Indian employees in Federal service. The USGS formed a Recruitment Team that is visiting Indian and other institutions to encourage students to pursue careers in science with the USGS. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

**Southwest Strategy.** The Southwest Strategy is a commitment by Federal agencies involved in natural resources management to collaborate with each other, the public, and Tribal, State, and local governments to maintain and restore the cultural, economic, and environmental quality of life in Arizona and New Mexico. Arizona and New Mexico have large expanses of public and Tribal lands intermingled with private lands, fast growing metropolitan centers, scarce water resources, unique cultural resources, diverse and fragile ecosystems with numerous endangered species, and many competing demands on public lands and water resources. The Strategy will address community development and natural resources conservation and management within the jurisdictions of the involved Federal agencies. It will be scientifically-based, legally defensible, and feasible.

The USGS is helping to guide the Southwest Strategy (SWS) by:

< Actively participating in the meetings of the National Staff Group, Regional Executive Committee, Regional Implementation Team, and selected Issue Work Groups, which, collectively, are the organizational elements of the SWS.

< Co-chairing the Research and Data Collection Work Group with the U.S. Forest Service. The USGS' Biological Resources Division hosted the first organizational meeting of Research and Data Collection Work Group, which was held April 16, 1998 in Denver and was attended by five USGS employees.

- As part of the bureau's support of the Research and Data Collection Issue Work Group, the USGS has taken the lead in preparing a compilation of all natural-resource research and data collection activities in Arizona and New Mexico. This compilation of information from all the participating Federal agencies will be crucial in identifying opportunities for collaboration and planning future efforts.

- Participated in the second Federal/Tribal Roundtable held May 12, 1998 in Albuquerque, New Mexico. The USGS organized and hosted a regional briefing describing the Southwest Strategy which was held at Northern Arizona University on July 7, and to which Indian Tribes and BIA were invited.

- The U.S. Geological Survey has initiated a project focused on the Tularosa Basin of New Mexico that is designed to develop a model by which Federal, State, Tribal, and local agencies can contribute to and use a geographic information system (GIS) to support their natural-resource management decisions. The project will be conducted by the New Mexico Natural Heritage Program in cooperation with numerous agencies, the Earth Data Analysis Center and U.S. Geological Survey. The project is intended to reduce duplicative research and data-collection efforts, determine areas of future information needs, and provide an easily accessible data base for natural-resource decision making. The 2-year project is funded by the U.S. Geological Survey, the University of New Mexico, and The Nature Conservancy. Contact: Russ Livingston, 303-236-2730x221, russ_livingston@usgs.gov

**Continuing Cooperatiion With the Pueblo of Zuni.** In past years, the Pueblo of Zuni has participated in the USGS' Gap Analysis Project in New Mexico. In Fiscal Year 1998, USGS scientists from the New Mexico Cooperative Fish and Wildlife Research Unit met with Zuni representatives to identify areas of potential joint research. Contact: New Mexico Cooperative Fish and Wildlife Research Unit, 505-646-6053, bthompson@nmsu.edu

**Electronic Communication Improvement.** The USGS' Forest and Rangeland Ecosystem Science Center began a 3-year project to enhance communication between USGS scientists and Tribal natural resource managers. The project will eventually include five southwestern Tribes. Current efforts involve the Havasupai Tribe. The Science Center has assisted the Tribe in establishing e-mail capability. Work is continuing on the Tribal Information and Technology Enhancement Project begun in 1997; sources for funding and network hardware are being sought. Fifty personal computers, network hardware, and a technical team to install the hardware have been secured for the Tribe from Oracle's Promise, the philanthropic unit of the Oracle Corporation. Contact: Director, Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon, 541-750-7307, or, in Arizona, 520-556-7466, michael_rhodes@usgs.gov

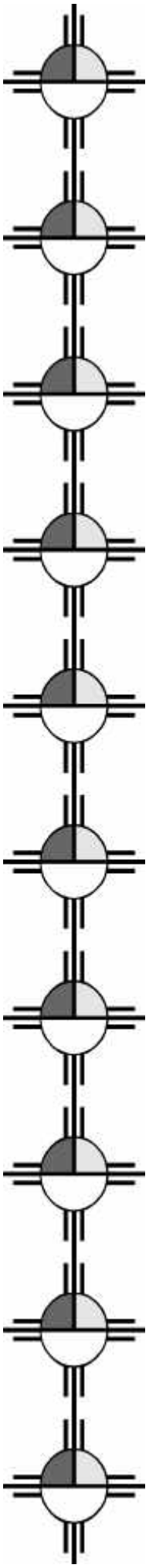
**Nevada Cultural Awareness Training.** District staff members involved in water-quality and sediment sampling in the Bryant Creek drainage received cultural resources training from the Washoe Tribe of Nevada and California. This training gave the staff a better understanding of the importance of plants, biota, and other resources for which there are continuing traditional uses. Contact: Jon Nowlin, 775-887-7600, jlnowlin@usgs.gov

**Cooperative Data Project in Alaska.** The USGS, along with other Department of the Interior (DOI) bureaus, signed a charter document for the Native Allotment Data Collection and Access Project (NADCAP). The charter provides a framework to ensure that, in Alaska, DOI bureaus and Native governments collaboratively share in the benefits and costs of acquiring geospatial and informational data specific to the State. Contact: Gordon Nelson, 907-786-7111, glnelson@usgs.gov

**Rural Partnerships.** USGS also gave a brief presentation to the Alaska Governor's Commission on Rural Governance and Empowerment. The USGS described our Alaska mission and how our operations impact Alaska tribal entities. The USGS also inquired about potential partnerships within Alaska Native communities. Contact: Gordon Nelson, 907-786-7111, glnelson@usgs.gov

**Employment Opportunities in Alaska.** The USGS is negotiating with the Douglas Indian Association Tribal Government to hire a student hydrology technician. Several meetings were also held with the Tlingit and Haida Indian Tribes of Alaska to discuss student employment. Contact: Gordon Nelson, 907-786-7111, glnelson@usgs.gov

# Future Opportunities



# Future Opportunities

**TECHWEB.** The USGS' EROS Data Center (EDC) has been asked to support TECHWEB, a U.S. Department of Education Technology Challenge Grant project involving six Native American elementary and secondary schools from North Dakota, South Dakota, and Nebraska. The EDC is applying for USGS Human Resources Initiative funds to enable it to help TECHWEB communities purchase new equipment, train teachers, receive computer technical support, and provide positive role models for at-risk Native American youth. Contact: Carrie Jucht, 605-594-6083, cjucht@usgs.gov

**Federal and Indian Lands Map.** A new map in The National Atlas of the United States of America™ series became available in December 1998. The map represents a new design for future maps produced by the USGS' National Atlas Program. The map will show the lands held in trust by the Bureau of Indian Affairs, and lands managed by the Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, National Park Service, Tennessee Valley Authority, Forest Service, Agricultural Research Service, Department of Defense, Department of Energy, and the Department of Transportation. The new sheet showing Federal and Indian lands, will be available for $4.00 from the USGS by calling 1-888-ASK-USGS. Contact: Harry Allan, 703-648-5530, hallan@usgs.gov

**Tribal Colleges Cooperation.** The USGS continues implementing the Executive Order 13021 on Tribal Colleges including discussing Tribal college and USGS research needs at the Tribal College Summit at Sprit Lake, North Dakota, November 13-14, 1998. The general theme of the summit was expanding assess to resources through collaboration and partnership with tribal colleges. This is being done by fostering relationships with tribal colleges, establishing a network of contacts, and matching available resources and opportunities with individual tribal college priorities. The USGS will also work with individual Tribal colleges to identify career and cooperative research opportunities. Contact: Susan Marcus; 703-648-4437; smarcus@usgs.gov

**Developing and Expanding College Curricula.** Dartmouth College's Native American Studies Program, Diné College, Turtle Mountain Community College, and the College of the Menominee Nation, are interested in cooperating with the USGS to expand their curricula to include more geographic information systems, metadata, framework, and standards courses. The curriculum improvement will benefit Indian students at these institutions. The students can then help their Tribal governments by sharing the expertise they have gained. Improving the technical capabilities of American Indian governments and individuals will assist tribal governments monitor and manage their resources, and will increase business and educational opportunities in their communities. The Federal Geographic Data Committee (FGDC) will be meeting with Dartmouth to explore these opportunities and the USGS will work through the FGDC. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

**National Indian Education Association.** The USGS distributed educational materials at a USGS booth at the National Indian Education Association conference, in Nashville, Tennessee in October 1998. Contact: Carrie Jucht, 605-594-6083, cjucht@usgs.gov or Mark Barber, 605-594-6176, barber@usgs.gov

**American Indian Heritage Foundation Coordination.** The American Indian Heritage Foundation, in conjunction with the National Native American Law Enforcement Association, the U.S. Secret Service Native American Liaison, and the USGS, through its support of the Federal Geographic Data Committee (FGDC), have met regarding Federal coordination and expansion of GIS opportunities on reservation lands. Upcoming meetings will include GIS presentations from the FGDC and other National Performance Review Community Demonstration Projects, particularly from law enforcement organizations. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

**Intertribal GIS Council.** The Intertribal GIS Council and the USGS, though its support of the Federal Geographic Data Committee (FGDC), have met and will cooperatively plan and develop the 1999 Intertribal GIS Council Conference. In 1998, the FGDC gave a presentation on the its programs at the annual conference. In 1999, the FGDC will play a more active role in the event. Upcoming activities with the Intertribal GIS Council include: a directory of GIS courses and programs offered at Tribal colleges, universities, and technical schools; creating scholarship and student intern programs, and; integrate GIS programs into tribal schools. Contact Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

**Native American Earth Science Course.** The USGS is working cooperatively with the Haskell Environmental Research Studies Center of the Haskell Indian Nations University to develop a college-level course in the earth sciences titled “Introduction to Earth Sciences: An Indigenous North American Perspective on Earth Knowledge”. The primary sources for the concepts and principles conveyed in the course will be a combination of existing earth sciences texts and traditional North American Indigenous sources: stories, symbols, ceremonies, and social institutions. Recent research with traditional Native peoples has revealed to non-Native scientists the tremendous amount of knowledge Indigenous peoples possess by virtue of longstanding experiences and histories understood and shaped by the places Indigenous people call home. Plans for the project in 1999 include developing place-based teaching modules for tribal homelands in the Great Plains and Northern Rocky Mountains regions of the United States. Teaching modules will also be developed for regions in Alaska. Internships for Native American students with on-going USGS projects will be offered in the summer of 1999, and a video introducing the concepts of this earth sciences course for tribal colleges will be produced by the end of Federal fiscal year 1999. Contact: Sharon Crowley, 703-648-6453, scrowley@usgs.gov

**University of Buffalo Native American GIS Program.** The University of Buffalo’s Doctoral Studies Program in Geographic Information Science, its Native American coordinator, and the USGS, through its support of the Federal Geographic Data Committee (FGDC), will be coordinating the availability of graduate fellowships. The fellowships will include assisting the USGS in developing cognitive models of geographic space, computational implementations of geographic concepts, geographic information and society, human capital research using GIS, environmental modeling, and regional modeling and optimization. Contact: Bonnie Gallahan at 703-648-6084, bgallahan@usgs.gov

**Michigan Tribal Environmental Group.** USGS staff attend quarterly Michigan Tribal Environmental Group (MTEG) meetings. Michigan Tribes, the Inter-Tribal Council of Michigan, the Environmental Protection Agency, USGS, and other groups are represented in the MTEG. These meetings serve as a forum for discussion of environmental issues pertinent to Michigan Tribes and USGS. Contact: Tom Weaver, 517-887-8912, tlweaver@usgs.gov

**Southwest Strategy.** The USGS helped to organize and participate in the Gathering of Indian Nations and Federal Agencies, held November 4-5 in Laughlin, Nevada. Representatives of 10 agencies met in Las Cruces, New Mexico in November 1998 to discuss how to share digital geographic and other data, what specific types of data are needed by the land managers, and how these data can best be assembled for use in decision making. Contact: Russ Livingston, 303-236-2730x221, russ_livingston@usgs.gov

**Southwestern Indian Polytechnic Institute (SIPI).** Southwestern Indian Polytechnic Institute (SIPI) and the USGS, through its support of the Federal Geographic Data Committee (FGDC), have been exploring cooperative opportunities for workshops, curriculum expansion, and satellite broadcasting. To facilitate these activities, the parties are investigating the possibility of expanding an existing Memorandum of Understanding between SIPI and the Bureau of Reclamation to include the FGDC. The needs of BIA educators and FGDC officials will be discussed in upcoming meetings between SIPI and FGDC. Executive Order 13021, on Tribal Colleges and Universities, provided some of the impetus for these contacts. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

**Continuing Cooperation with the Washoe Tribe of Nevada and California.** The Washoe Tribe of Nevada and California has indicated an ongoing interest in having the USGS conduct water resources investigations on their Tribal lands throughout Eagle Valley and Carson Valley, Nevada and into California. The USGS has significant knowledge of water resources in these areas and has collaborated successfully as a cooperator jointly with Tribal and local jurisdictions where the entities have lands within a common hydrographic area. Contact: Jon Nowlin, 775-887-7600, jlnowlin@usgs.gov

# Contacts

# USGS Contacts

The U.S. Geological Survey has an American Indian/Alaska Native Coordinating Team to establish policy and to coordinate USGS activities. You are welcome to contact us for information or for answers to your questions.

Director's Office: Susan Marcus, MS 105
703-648-4437; fax-703-648-5068; smarcus@usgs.gov

Biological Resources Division: Hardy Pearce, MS 300
703-648-4085; fax-703-648-4238; hardy_pearce@usgs.gov

Geologic Division: Sharon Crowley, MS 910
703-648-6453; fax-703-648-6683; scrowley@usgs.gov

National Mapping Division: Bonnie Gallahan, MS 590
703-648-6084; fax-703-648-; bgallahan@usgs.gov

Office of Program Support: Alexandra Hadley, MS 602
703-648-7764; fax 703-648-4445; ahadley@usgs.gov

Water Resources Division: Steve Hammond, MS 441
703-648-5033; fax-703-648-5295; sehammon@usgs.gov

Back-up for Sue
Director's Office: Sheri Harris, MS 105
703-648-4439; fax-703-648-5068; slharris@usgs.gov

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The U.S. Geological Survey is interested in hearing from its customers so that we can provide the best service possible. Please feel free to provide ideas, feedback, concerns, and compliments to:

Customer Service Team
U.S. Geological Survey
National Center, MS 105-CST
12201 Sunrise Valley Drive
Reston, VA 20192
Tel: 703-648-4439 E-mail: customer@usgs.gov