

U.S. Geological Survey Activities Related to American Indians and Alaska Natives

Fiscal Year 1999



Front cover. Yupik mask, whale. Published courtesy of the Alaska State Museum; catalog number II-A-5413. Photograph by Barry McWayne.

Back cover. *Top*, Yupik mask, paddle-shaped. *Lower right*, Yupik mask, walrus-humanoid. *Lower left*, Yupik mask, beaver. Published courtesy of the Alaska State Museum; catalog numbers II-A-1454, II-A-5399, and II-A-5393, respectively. Photographs by Barry McWayne.

Yupiks from southwestern Alaska use masks representing animal and other spirits in religious ceremonies and dances. To ensure success in hunting, a tenet of the Yupik religion requires maintaining a positive relationship between people and the spirits of the animals that they hunt. The Yupik masks demonstrate respect for the animal spirits to ensure a bountiful harvest.



U.S. Department of the Interior
U.S. Geological Survey

U.S. Geological Survey Activities Related to American Indians and Alaska Natives

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U.S. DEPARTMENT OF THE INTERIOR
BRUCE BABBITT, Secretary

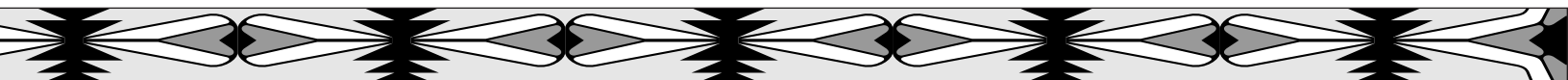
U.S. GEOLOGICAL SURVEY
CHARLES G. GROAT, Director

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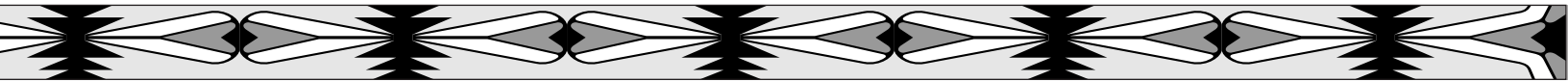
| Multiply | By | To obtain |
|-------------------------------------|--------|-------------------|
| <i>Length</i> | | |
| yard | 0.9144 | meter |
| mile | 1.609 | kilometer |
| kilometer (km) | 0.6214 | mile |
| <i>Area</i> | | |
| acre | 0.4047 | hectare |
| square mile | 2.590 | square kilometer |
| square kilometer (km ²) | 0.3861 | square mile |
| <i>Volume</i> | | |
| gallon | 3.785 | liter |
| liter (L) | 1.057 | quart |
| <i>Mass</i> | | |
| milligram (mg) | 35.27 | ounce avoirdupois |



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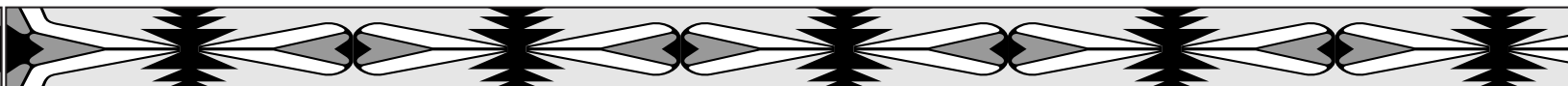
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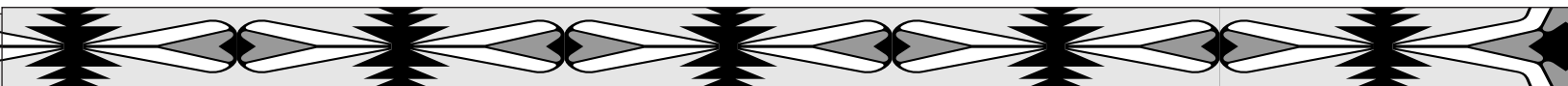
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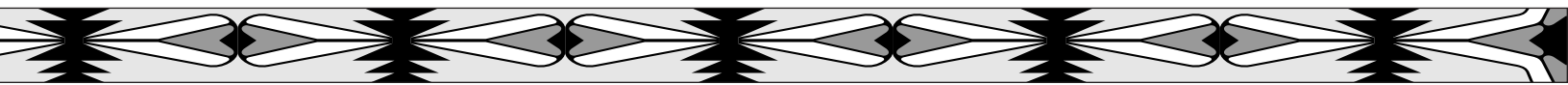
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Introduction





U.S. Geological Survey Activities Related to American Indians and Alaska Natives Fiscal Year 1999

Introduction

The U.S. Geological Survey (USGS) is a scientific bureau within the Department of the Interior; the bureau strives to produce impartial 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, streamflows, biota, and other data sets are available to American Indian and Alaska Native institutions.

The USGS recognizes the need to 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 (FY) 1999. Some of the USGS activities are conducted in concert with the Bureau of Indian Affairs (BIA). Others are conducted by Tribes and the USGS.

The USGS is encouraging American Indians and Alaska Natives to pursue careers in science. USGS offices are working with their local Native schools and colleges to help achieve this goal. Although plans for formal school partnerships did not come to fruition in FY 1999, the USGS did increase the hiring of Indian and Native student interns. These students gained insights and experience in potential careers, and the USGS gained a new perspective on scientific research and a capable, energetic field staff. 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 providing technical and scientific support to improve the self-sufficiency of Indian and Native Governments in managing their lands. USGS support includes increasing the transfer of scientific information to American Indian and Alaska Native Governments and training employees of these governments to conduct and improve the quality of scientific studies.

The USGS is nonregulatory 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 formal studies conducted through existing USGS programs. Formal programs consist of specific data collection, investigative, monitoring, and research projects. These projects frequently continue for 2 or more years, although a few are parts of longer term activities. Formal projects are frequently funded through cooperative agreements or reimbursable accounts, from monies provided to the USGS by individual Tribal Governments or by the BIA. The USGS provides matching funds for cooperative projects. These formal projects may also receive funding from the U.S. Environmental Protection Agency (EPA), the Indian Health Service (part of the Department of Health and Human Services), or other Federal agencies. Also, the USGS is working with other 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 BIA are cooperating to use USGS knowledge to the benefit of Indian and Native 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 response to an observed need. In these activities, USGS employees are fulfilling the mission of the USGS—to make science relevant—while helping 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 & Engineering Society. 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.

This report will help in developing outreach, educational, and program documents for use in future years. It is hoped that USGS employees, American Indians, and Alaska Natives will adapt the reported activities to new areas and use USGS contacts to expand the relevance of the USGS to more Americans.

This document was cooperatively prepared by the USGS American Indian/Alaska Native Liaisons—

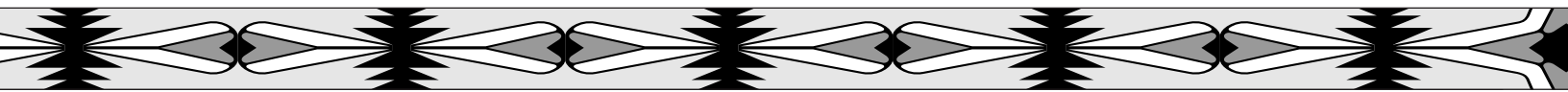
- Sharon Crowley, Geologic Division American Indian/Alaska Native Liaison
- Bonnie Gallahan, National Mapping Division American Indian/Alaska Native Liaison
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- Steve Hammond, Water Resources Division American Indian/Alaska Native Liaison
- Hardy Pearce, Biological Resources Division American Indian/Alaska Native Liaison
- Susan Marcus, USGS American Indian/Alaska Native Liaison

Readers are welcome to contact the USGS with any questions that they may have. Information on how to contact the USGS American Indian/Alaska Native Liaisons is provided at the end of this report inside the back cover.

In memoriam. This report presents the work of the U.S. Geological Survey. The work is conducted by individual, dedicated employees. We take this opportunity to acknowledge the work of Dallas Childers, who died while assisting with a Water Technician Training course, sponsored by the Bureau of Indian Affairs. Mr. Childers, a hydrologist with the USGS in Oregon, retired from the USGS but retained his commitment to sharing his knowledge of hydrologic techniques with American Indian students. As a colleague wrote, “He sought to empower Native Americans with more control over their destiny and the environment around them. Several Native Americans worked side-by-side with us in the field. They were receiving on-the-job training that would allow the Tribes to take over the data collection aspects of the project. During this work I can honestly say that I learned as much from the tribal members as they did from us. At the same time Dallas enhanced the work environment with an appreciation and respect for their culture to a degree that I had never before experienced in any of my project work with local Native Americans in Idaho, Nevada, Oregon, or Washington. He made the difference.”

Educational Activities





Educational Activities

USGS Recruitment Team. Representatives of the USGS visited Haskell Indian Nations University (HINU) as part of a broad effort to encourage natural science education and increase personnel diversity within the USGS. The USGS team learned about HINU's academic programs and provided HINU officials with information about USGS career series; for example, hydrologists, cartographers, geologists, and other scientific and technical specialties. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

American Indian Program Council. The USGS assisted the American Indian Program Council (AIPC) in implementing two recent executive orders (EO 13021, "Tribal Colleges and Universities" and EO 13096, "American Indian and Alaska Native Education"). The AIPC held a training session in September 1999 to inform Federal employees about the executive orders and how to put them into practice in "win-win" situations to benefit Native students and Federal agencies. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

Continuing Progress with EdNet. The BIA Office of Indian Education is conducting an exciting project called "Access Native America." The project has three parts: (1) school connectivity to the World Wide Web, (2) education management, and, most importantly, (3) school classroom applications. The USGS continues to work with the BIA to link BIA-supported Indian schools through the EdNet program. There are 215 sites involved, including 185 schools from kindergarten to 12th grade, with the remainder consisting of colleges and dormitories. By March 2000, more than 120 elementary and secondary schools as well as Tribal colleges will have been connected to the World Wide Web. The USGS is providing the technical wide-area network expertise to connect each of these schools to the Department of the Interior's integrated communications network (DOINET) and the World Wide Web. The USGS is also assisting the BIA to train 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, expand the information available, and reduce isolation, particularly in remote locations. For many Indian schools, World Wide Web access permits "virtual trips" to libraries and museums. Several schools have created their own web pages. Indian students have improved communications with other American Indians. Contact: Tim Lee, 303-236-4955, tlee@usgs.gov

Tribal College Summits. The Department of the Interior sponsored the first Tribal College Summit at Cankdeska Cikana Community College in North Dakota in November 1998. The USGS presented educational, outreach, and special opportunities available through the USGS to American Indians and

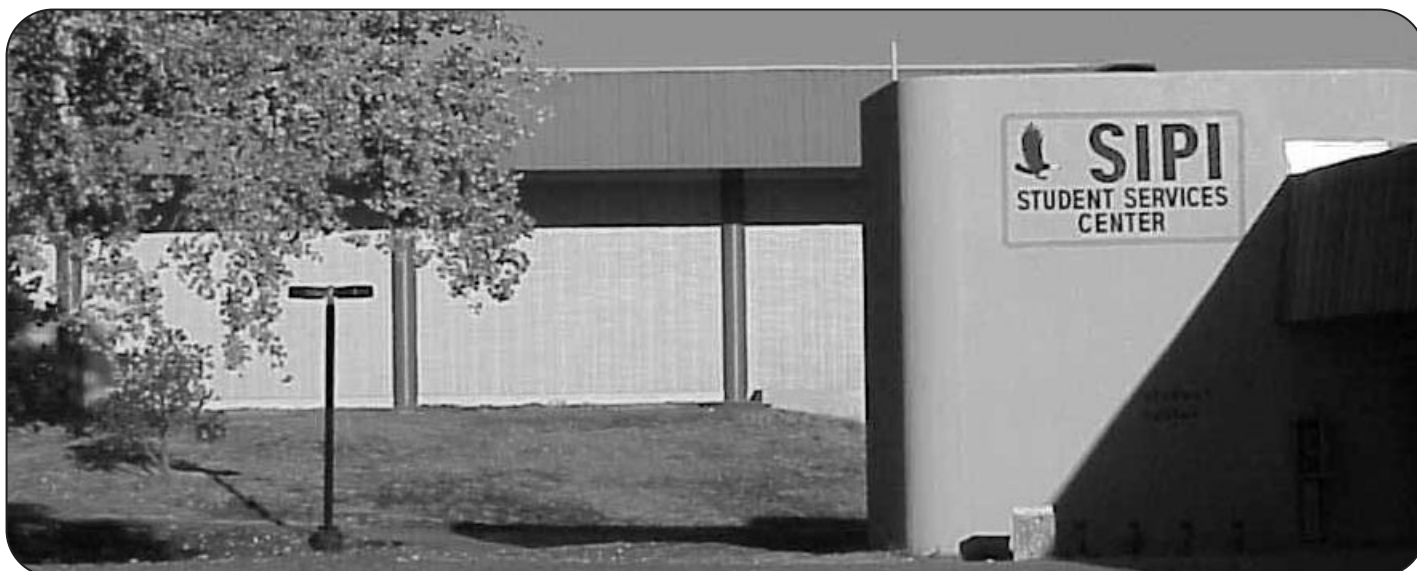
Alaska Natives, as well as information about the bureau's scientific mission. A series of lectures, open discussions, and panel presentations culminated in deliberations by smaller working groups. The USGS developed a cooperative education project between the USGS Northern Prairie Wildlife Research Center and Cankdeska Cikana Community College to provide immediate education assistance, long-term employment opportunities, and integration of traditional values in the Federal workplace.

In June 1999, the USGS supported and participated in the 1999 Tribal College Conference "Building the Land-Grant Community with Tribal Colleges and Universities," held at Iowa State University. Fourteen of the 17 tribal colleges in the north-central region attended the meeting. The primary objectives of the summit were to establish relationships with faculty of Tribal colleges and to encourage future collaborations among tribal colleges, other land-grant universities, and Federal agencies. Contact: Northern Prairie Wildlife Research Center, 701-253-5515, ronald_kirby@usgs.gov, or David Trauger, 703-648-4065, david_trauger@usgs.gov

National Indian Education Association. The National Indian Education Association's 30th Annual Convention was held at the Myriad Center in Oklahoma City, Oklahoma, October 1999. The theme of the USGS exhibit was "Exploring a Changing Planet." This conference offered an opportunity to introduce USGS educational resources and learn more about issues facing Native American educators and students nationwide. Attendees were pleased to learn about the USGS and to have the opportunity to obtain free science education materials. Contact: Mark Barber, 605-594-6176, barber@usgs.gov, or Carrie Jucht, 605-594-6083, cjucht@usgs.gov

Southwestern Indian Polytechnic Institute. Southwestern Indian Polytechnic Institute (SIPI) and the USGS, through its support of the Federal Geographic Data Committee, are conducting quarterly satellite broadcasts for all participating tribal colleges and universities from SIPI. The broadcasts, titled "GIS in Indian Country," have been successful, providing good connections to the community, a means of including fieldwork in the curriculum, and an excellent model for school-to-career opportunities. These broadcasts are dedicated to promoting tribal self-sufficiency by improving management of geographic information and building intertribal communication networks.

The USGS presented sessions on how and why Native American educators are using geographic information systems (GIS) in the curriculum to teach math, science, history, and geography. Many educators on tribal lands are finding that the use of GIS is a natural one, given the high level of connectedness to the Earth that is a part of the culture and education in



Campus of the Southwestern Indian Polytechnic Institute, Albuquerque, New Mexico. Photograph by Joseph Kerski.

most Tribal schools. Through GIS technology, students can work on projects using real-world data in an exciting new way and solve real-world problems in a team environment, simulating what occurs in the workplace. The USGS presented major types of USGS geospatial data and described several projects using GIS in education, including a neighborhood analysis project, a natural hazards earthquake project, a regional geography project, a chemical spill analysis project, and a pollution land-use project. Sponsors of these broadcasts include SIPI, the National Consortium for Rural Geospatial Innovations in America, the Federal Geographic Data Committee, and the Intertribal GIS Council, Inc. Participating institutions access the broadcast via satellite from a signal broadcast from the Distance Learning Center of SIPI. Contact: Bonnie Gallahan (program issues), 703-648-6084, bgallahan@usgs.gov, or Joseph Kerski (GIS/education issues), 303-202-4315, jjkerski@usgs.gov

Wildlife Studies. The USGS supported research on survey techniques for the northern goshawk by a Choctaw graduate student. The U.S. Fish and Wildlife Service and the University of Minnesota's Conservation Biology Graduate Program cosponsored the advanced education. Contact: Minnesota Cooperative Fish and Wildlife Research Unit, 612-624-3421, dea@usgs.gov

Biological Science Aids. In cooperation with the Inter-Tribal Council of Louisiana, the USGS National Wetlands Research Center in Lafayette, Louisiana, sponsored two biological science aides. The high school students were members of the Chitimacha Tribe of Louisiana and assisted USGS biologists in field-data gathering. Contact: National Wetlands Research Center, 318-266-8501, bob_stewart@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 entitled "2+2+2" to help more American Indian students prepare for careers in the agricultural and biological sciences. The "2+2+2" program is a team effort among high schools, tribal colleges, and South Dakota State University. Options for study range from environmental management to food science to wildlife and fisheries. Each "2" of the "2+2+2" represents 2 years in high school, Tribal college, and (or) the State University. The program's goal is to have all these "2s" add up to a brighter future with increased opportunities for American Indians. Contact: South Dakota Cooperative Fish and Wildlife Unit, 605-688-6121, berryc@usgs.gov

Geographic Information System Support and Training Program at Haskell Indian Nations University. This project developed and supports a GIS training program at Haskell Indian Nations University as part of HINU's new baccalaureate program in environmental science. The USGS Kansas District Office provides equipment and maintenance support for a GIS lab on the HINU campus. As part of this support, the USGS teaches an introductory class in GIS, gives demonstrations and presentations to natural-resources classes, and assists with field trips. Students are provided with opportunities to work on BIA, Tribal, USGS, and other Federal agency GIS projects. Contact: Tom Trombley, 785-832-3551, trombley@usgs.gov

Earth Sciences for Indigenous Peoples. The USGS worked cooperatively with the Haskell Environmental Research Studies Center of the Haskell Indian Nations University to develop an introductory, college-level course in the earth sciences. The

primary goal of the project was to integrate traditional Native American teachings with conventional Western scientific concepts of the Earth. Accomplishments in FY 1999 included development of place-based teaching modules for tribal homelands in the Great Plains and Northern Rocky Mountains and coastal regions. Internship positions for Native American students on USGS research projects were established. The USGS cooperated with HINU to select students and arrange for student activities on USGS research projects. A video highlighting Native American perspectives in the earth sciences also was being produced. Contacts: Sharon Crowley, 703-648-6453, scrowley@usgs.gov; Maria Montour, 303-236-2787, mmontour@usgs.gov, or Charles Barker, 303-236-5797, barker@usgs.gov

Inter-Tribal Bison Cooperative Conference. The USGS supported the Inter-Tribal Bison Cooperative's second annual conference. The Confederated Salish and Kootenai Tribes hosted this meeting in Polson, Montana, in September 1999. The USGS provided scholarships to encourage participation by students from 10 tribal colleges. The conference program was designed to be both a learning experience and a spiritual/cultural connection for students involved with the restoration of bison on Tribal lands. Workshops were conducted on bison biology and ecology, as well as animal science and economic opportunities. Contact: David Trauger, 703-648-4065, david_trauger@usgs.gov

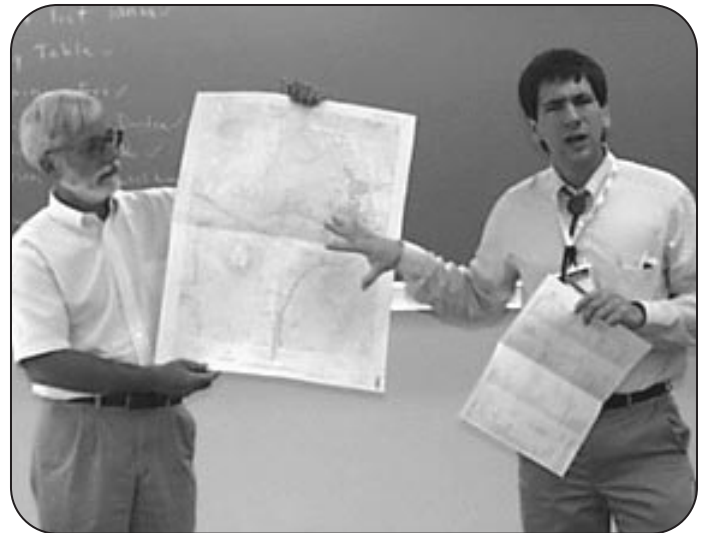


Four bison bulls. Photograph by Bert Gildart.

Graduate Student Sponsorship. The New Mexico Department of Game and Fish cooperates with the USGS Fish and Wildlife cooperative unit in providing opportunities for graduate education. The department supported a Native American graduate student in conducting research on bighorn sheep; the cooperative unit sponsored the student's graduate course work and thesis. Contact: New Mexico Cooperative Fish and Wildlife Research Unit, 505-646-6053, ccaldwell@nmsu.edu

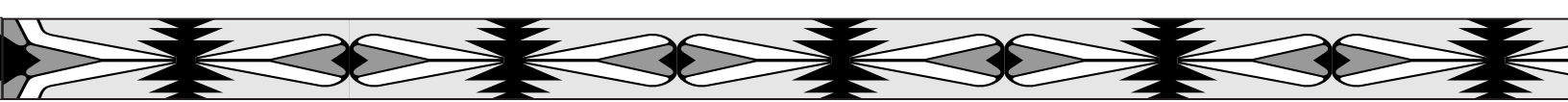
Water Camp for Teachers. The USGS, through its Idaho District Office, provided funding for scholarships for two Native American teachers from tribal schools at Duck Valley (Shoshone-Paiute Tribes) and Fort Hall (Shoshone-Bannock Tribes) to attend the Idaho Water Education Foundation "Water Camp for Teachers." The workshop was held at the College of Southern Idaho in Twin Falls, Idaho, in June 1999. The Nez Perce and Coeur d'Alene Tribes were also contacted and indicated an interest in participating in 2000. Contact: Derrill J. Cowing, 208-387-1316, dcowing@usgs.gov

Institute for Tribal Environmental Professionals Workshop. The Institute for Tribal Environmental Professionals (ITEP), located at Northern Arizona University in Flagstaff, Arizona, is engaged in a variety of activities that support Native-student environmental research projects, nationwide training for tribal environmental staffs, and communication and outreach with Tribes on resource-protection issues. The USGS was invited to participate in an ITEP workshop in August 1999. The workshop was designed to assist tribal personnel in learning some applications of geographic information systems and the World Wide Web. The USGS presented sessions involving digital geospatial data that tribal members could use in environmental management and Native language programs. Contact: Joseph Kerski, 303-202-4315, jkerski@usgs.gov



Joseph Kerski of the USGS (right) and high school teacher Steve Wannan conduct the geographic information system/global positioning system segment of an August 1999 workshop presented by the Institute for Tribal Environmental Professionals.

Training in Fisheries and Wildlife Biology. The USGS Cooperative Fish and Wildlife Research Unit at the University of Arizona continues to support a natural-resource training program for American Indians who are recommended by Tribal Councils, individual Tribal members, or partner agencies.



Three students from the White Mountain Apache Tribe, two from the Navajo Nation, and one from the San Carlos Apache Tribe are currently enrolled in the program. Fourteen students have received bachelor of science degrees through the program, six have completed or are enrolled in masters programs, and one has completed a doctorate.

Two students from the White Mountain Apache Tribe graduated with bachelor degrees in wildlife and fisheries resources. Both returned to the Fort Apache Reservation and began careers with the White Mountain Apache Tribe's Game and Fish Department. The third student from White Mountain completed requirements for a masters degree in fisheries biology and began work with a regional fisheries resources office of the U.S. Fish and Wildlife Service. Contact: Arizona Cooperative Fish and Wildlife Research Unit, 520-621-1959, gmaughan@usgs.gov

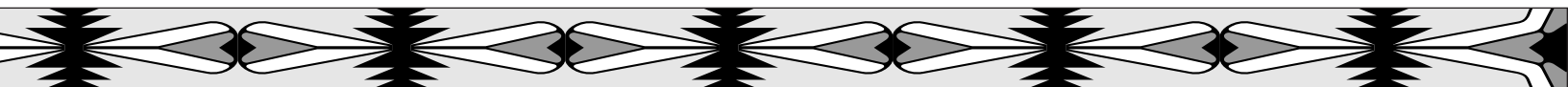
Graduate Studies in Fisheries. The USGS Cooperative Fish and Wildlife Research Unit at Oregon State University sponsored the graduate work of a tribal member of the Confederated Tribes of the Umatilla Indian Reservation. The student will receive a master of science degree in fisheries biology. Contact: Oregon Cooperative Fish and Wildlife Research Unit, 541-737-1938, melani.bonnichsen@usgs.gov

Alaska Natives Learn the Science of Ecosystems. In September 1999, students from isolated Native Alaskan villages attended a field camp at Becharof National Wildlife Refuge to learn the principles of ecosystem science and participate in an exciting field experience. USGS scientists taught bear and caribou ecology and plant community mapping and worked with the students on the traditional use of plants by Alaska Natives, animal tracking, and nature observation skills. The Native community has supported this outreach effort, which has stimulated considerable interest in the natural sciences among Alaska Native students. Contact: Alaska

Biological Science Center, 907-786-3512,
tom_smith@usgs.gov

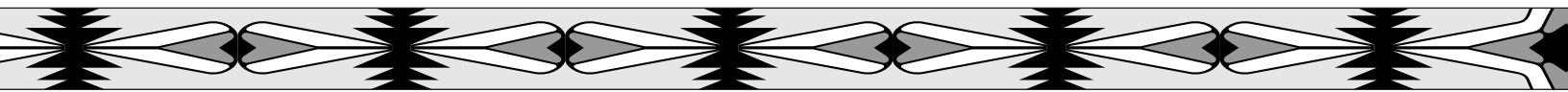
Marine Science Opportunities. The USGS Glacier Bay Field Station hired a member of the Sitka Tribe of Alaska as an intern in marine research. Biologists and geologists provided training in a mapping study of the ocean floor, general oceanography, and inventory and monitoring of Dungeness crab populations. The USGS plans to continue to sponsor this intern throughout her studies in biology at the University of Alaska-Southeast during semester breaks and summer recess. Contact: Alaska Biological Science Center, 907-786-3512, jim_taggart@usgs.gov

Native Students Assist in Biological Research. USGS scientists in Alaska have increased the level of communication between U.S. Government researchers and Alaska Natives. To demonstrate the kind of research being conducted, the USGS recruited 42 Yupik students to assist in a waterfowl study on the Yukon-Kuskokwim Delta in Alaska. The students captured geese and swans and fitted them with satellite transmitters attached to neck collars; movements of the waterfowl were then monitored as part of the large study. Although students from the Chevak Native Village and neighboring communities have assisted biologists since 1986, 1999 saw the greatest number of participants. The program has been very successful in providing hands-on biological training for Alaska Natives, while also providing essential assistance in conducting scientific research. Contact: Alaska Biological Science Center, 907-786-3512, craig_ely@usgs.gov



Environmental Activities





Environmental Activities

Contamination of the Penobscot River. A study is being conducted by USGS biologists to determine the occurrence and distribution of dioxins that are adversely affecting the resources of the Penobscot River in Maine. The Penobscot Nation requested the assistance of the USGS in determining the impact on tribal biological interests. Contact: Columbia Environmental Research Center, 573-875-5399, bill_mauck@usgs.gov

South Florida Ecosystem Program. The concerns of the Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida are integral to the health and management of the Everglades. The Miccosukee and Seminole Tribes, with the USGS and other agencies, participate cooperatively on the South Florida Ecosystem Restoration Working Group. The working group identifies research needed for wise management of the area. The USGS conducts research to help other entities with their water-management decisions. Current USGS research in support of the working group focuses on water flow and management issues, landscape ecology, wetland ecology, fire ecology, ornithology and ichthyology, coral reef ecology, and long-term monitoring.

As part of the Everglades Restoration Program, the U.S. Army Corps of Engineers and the South Florida Water Management District (SFWMD) propose modifying water deliveries to tribal lands, Big Cypress National Preserve (National Park Service), and other areas located in the interior of the Everglades. 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 ecological conditions within both Seminole and Miccosukee tribal lands. The effects that these proposed water delivery changes will have on tribal lands can be determined only if interior flows are accurately known.

The Everglades Construction Project, developed as a result of the Everglades Restoration Program, required diversion of the surface water from a specific basin into a storm treatment area. This diversion will cause changes in the portion of the water subject to tribal entitlement. The project utilizes the individual strengths of the three entities (the Seminole Tribe, the SFWMD, and the USGS) that coordinate its operation. The USGS collects and analyzes data on surface water flows. Implementation and development of strategically located streamflow gaging sites will help define future surface-water flow requirements. Subsequent studies, based on accurate flow calibrations generated by these sites, may then be used by other agencies for computing nutrient and other contaminant loadings in the canal system. Providing continuous flow data at selected impact points for interior basins will also complement the existing eastern flow canal discharge network and allow more accurately timed surface-water releases.

The USGS operates two gages in cooperation with the Seminole Tribe and the SFWMD. The USGS maintains, operates, calibrates, and computes discharge by using acoustic velocity meters systems (AVM) at the two sites. The Seminoles are responsible for servicing, operating, and maintaining flow-weighted nutrient autosamplers at the same sites, activated by these AVM's. The samples are sent to the USGS for analysis. The SFWMD provides real-time data transmission support by servicing the radio frequency/cell phone telemetry infrastructure located at each of the two gaging sites. Furthermore, the SFWMD is responsible for combining the flow data with nutrient sample data to determine total nutrient loads. These combined data are disseminated in several annual "load" reports. The final discharge data are also published in the annual USGS Water Resources Data Report, v. 2a.

One gage was operated in cooperation with the Miccosukee Tribe. At the end of FY 1999, that part of the project was modified so that the Miccosukee Tribe currently operates equipment within the structures built by the USGS. Contact: Mitch Murray, 305-717-5827, mmurray@usgs.gov (water issues), or Florida Caribbean Science Center, 352-378-8181, russell_hall@usgs.gov (ecology issues)

Study of Environmental Contaminants. A proposed copper-zinc-sulfide mine may pollute the waters of the Sokaogon Chippewa Community near Crandon, Wisconsin. The proposed Crandon Mine would be located upstream from the Mole Lake Band lands, which includes Rice Lake. The Tribe sought assistance from the USGS in determining baseline conditions in waterways and in identifying adverse impacts of toxic metals on aquatic resources such as wild rice beds or reproduction of walleye pike. Walleye and wild rice are the principal cultural and economic natural resources of the Tribe. USGS biologists exposed walleye fry and wild rice seedlings to various concentrations of heavy metals to establish baseline toxicity thresholds for metals likely to be associated with the proposed mine (copper and zinc). They also conducted bioassays using native zooplankton from the Swamp Creek Drainage. All tests were conducted by using water and organisms collected and shipped from Mole Lake or organisms cultured in Mole Lake water. The study also evaluated the effects of varying concentrations of organic carbon on toxicity thresholds. The USGS created a data base for the Tribe that will be the foundation of a risk assessment and environmental impact analysis of the environmental effects of the proposed mine. The toxicity threshold values will be used by the Tribe to establish water-quality standards for the Swamp Creek and Rice Lake watershed. Contact: Mid-Continent Ecological Science Center, 970-226-9100, lee_ischinger@usgs.gov

Water-Quality Monitoring on Menominee Lands. The Menominee Indian Tribe of Wisconsin is seeking information on the current status of water quality and biotic conditions of the Wolf River within the Menominee Reservation, including the presence or absence of contaminants in water, sediments, and biota. The USGS is providing the information as part of a project that is developing a set of baseline data for the Menominees. Data from the baseline monitoring are being used to establish a tribal data base describing water quality of the Wolf River near the upstream and downstream boundaries of the Menominee lands. This data base was designed to determine the concentrations of specific trace elements in water-column samples and in samples of fish livers, caddisfly larvae, and fine streambed sediments at the sampled sites. The USGS will also determine particle-size fractions of the fine streambed sediments at the sampled sites. Contact: Kevin Richards, 608-821-3861, krichard@usgs.gov

Oneida National Hydrologic Investigations. The USGS is assisting the Oneida Tribe of Wisconsin by compiling and presenting information on water quality on Oneida lands. In FY 1999, the USGS completed studies that computed sediment loads by using either daily discharges from streamgages at water-quality monitoring sites or regression analysis to compute daily discharges from existing data at the Duck Creek gaging station. The data were compiled and used to perform trend analyses. The USGS project included sampling streambed sediments upstream and downstream of a site where dredging spoils from the Fox River were applied on lands adjacent to Duck Creek. The sediments near the spoils site were analyzed for specific and notably toxic polychlorinated biphenyls (PCB's). Data on streambed sediments were collected at three sites on the main stem of Duck Creek. Additionally, the study provided retrospective and baseline hydrologic information for the Oneida Tribe's watershed. This information was obtained from retrospective analysis of existing literature, data bases, and other information; existing geographic information system coverages; and collection of water-quality samples that filled gaps in the retrospective data base. Contact: Kevin Richards, 608-821-3861, krichard@usgs.gov

Mississippi River Ecological History. USGS scientists cooperated with the State of Minnesota in sponsoring a conference with workshops on the Prairie Island Dakota Community. The conference produced an ecological history of the Upper Mississippi River. Contact: Upper Midwest Environmental Science Center, 608-781-6221, barry_johnson@usgs.gov

Identifying the Occurrence, Distribution, and Concentration of Hydrocarbons in the Shell Valley Aquifer. This study, done in cooperation with the Turtle Mountain Band of Chippewa Indians, evaluated hydrocarbons in the Shell Valley aquifer, in creeks, and in wetlands. The objectives were to determine the spatial distribution of hydrocarbons in ground

water, creeks, and wetlands and to determine the concentrations and types of hydrocarbons present. The Turtle Mountain Band uses the aquifer as a water supply. The study has been completed, and a final report is being prepared for publication. Contact: Wayne R. Berkas, 701-250-7429, wrberkas@usgs.gov

Long-Term Monitoring on the Fort Totten Indian Reservation. This study established a monitoring program to provide the Spirit Lake Tribe with data that could be used to determine changes in the hydrologic and water-quality conditions on their lands. The objective was to develop a long-term program to monitor the water levels and water quality in selected lakes and wetlands on the tribal lands. The project will also create a long-term 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

Quantity and Quality of Water Resources of the Cheyenne River Sioux Reservation. The Environmental Protection Department of the Cheyenne River Sioux Tribe (CRST) is developing water-quality standards for the Cheyenne River Sioux Tribe. To help complete this task, the CRST asked the USGS to summarize existing water-quality data for one site on each of the two major rivers traversing tribal lands. Data collected as part of the National Stream Quality Accounting Network, from a station on the Cheyenne River and from a station on the Moreau River, were summarized, compared to various existing State and EPA standards, and analyzed for trends. The results of the study have been published in a USGS Water-Resources Investigations Report.

In 1998, several Federal and State agencies and the CRST, designated as trustees of various natural resources, initiated a natural-resource damage assessment. The purpose of the assessment was to determine if various natural resources have been negatively affected by mine tailings discharged to Whitewood Creek. Elevated concentrations of arsenic and mercury were the primary causes for listing portions of Whitewood Creek and the Belle Fourche River, which are tributaries to the Cheyenne River, as CERCLA (Comprehensive Environmental Response, Compensation and Liability Act of 1980) sites by the EPA in 1981. In 1998, the Tribe asked the USGS to work with the Tribe in collecting information that could help identify potential sources of mercury or methylmercury in the Cheyenne River basin. In 1999, primarily driven by the results from the assessment sampling completed by the USGS, the Tribe asked the USGS for assistance in collecting information that could identify any potential sources of mercury or methylmercury in the Moreau River basin. Samples were collected along the Moreau River late in FY 1999. Additional sampling in both the Cheyenne and Moreau River basins has been proposed for FY 2000. The Tribe also has requested that the USGS expand the scope of the mercury sampling to include

selected stock ponds throughout the Cheyenne River Tribal lands during FY 2000. A proposal has been submitted to the BIA for funding consideration. Contact: Allen Heakin, 605-355-4560, x216, ajheakin@usgs.gov

Contamination of Food Source. Tribal members of the Crow Creek Sioux Tribe and the Lower Brule Sioux Tribe have traditionally depended on clams and fish in Lake Sharpe, South Dakota, as a source of food. Because of concerns about contamination of food sources, USGS scientists studied invertebrates living in the lake bottom for evidence of arsenic, selenium, or mercury. These elements are potentially dangerous to human health. Of the three elements, there was evidence of bioaccumulation of selenium in the fishery at specific locations in Lake Sharpe. Contact: Columbia Environmental Research Center, 573-875-5399, bill_mauck@usgs.gov

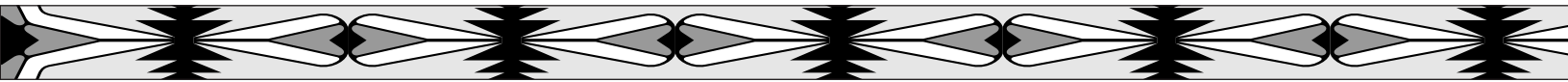
Surface-Water Quality and the Effects of Oil Production, Osage Nation. The USGS is cooperating with the Osage Nation to sample water quality and measure stream discharge at 140 surface-water sites on the Osage Reservation. Surface-drainage basins above each water-quality site will be delineated by using a digital elevation model; these delineations will be used to define the associated oil wells. The study is also identifying the oil wells upgradient from the sampling sites by using a digital elevation model. The BIA has compiled historical data on more than a century of local drilling for oil and gas. Water-quality data will be compared with oil-well information for upgradient wells. Results of the study will be compared with land-use practices associated with the production of oil and gas. Contact: Marvin M. Abbott, 405-810-4411, mmabbott@usgs.gov

Soil and Water Contamination of Lands of the Ponca Tribe of Oklahoma. USGS officials, with representatives of the BIA and the Bureau of Reclamation, briefed members of the Ponca Tribe of Oklahoma on the results of USGS studies of water and soil contamination on Ponca lands. Ponca and USGS officials discussed the findings of two separate, though related, studies of contamination. In one study, the USGS identified contamination by polycyclic aromatic hydrocarbons (PAH's), PCB's, and pesticides in soils, bed sediment, and water in a small creek that is a tributary of the Salt Fork of the Arkansas River in Kay County, approximately 3 miles south of Ponca City in northern Oklahoma. The headwaters of the creek are within 50 yards of the northern border of Ponca tribal lands. In another study, the USGS examined possible contamination of drinking-water supply wells between a refinery and the Salt Fork of the Arkansas River. The USGS also examined potential hydrologic links between surface- and ground-water sources to determine likelihood of contamination migration. Contact: William Andrews, 405-810-4416, wandrews@usgs.gov

Contamination of Soil and Water on Trust Lands of the Pawnee Nation of Oklahoma. The Bureau of Land Management (BLM), BIA, and EPA share responsibility for oversight of petroleum production by private companies on Indian trust lands. The BLM found evidence of contamination of both soils and water by brines in Payne County on land held in trust for the Pawnee Nation of Oklahoma. The USGS identified the current extent and nature of surface and water contamination. The USGS also investigated the possible contamination of the shallowest freshwater aquifer, the Ada aquifer. The results are being reviewed by the BLM. The data and interpretations provided by the USGS will be used by resource managers to stem further contamination and to determine mitigation strategies. Contact: William J. Andrews, 405-810-4416, wandrews@usgs.gov

Caddo Aquifer Vulnerability. The Caddo Tribe of Oklahoma is interested in the vulnerability of ground water in northern Caddo County, Oklahoma, to pesticide contamination. The USGS is compiling and summarizing existing information for the Tribe's use in water-resource management. The USGS will also advise Caddo officials on the preferred methods that the Caddo Tribal Government can use to evaluate the vulnerability of their ground-water resources. Contact: Carol Becker, 405-810-4436, cjbecker@usgs.gov

Ground-Water Contamination on and near the Fort Peck Indian Reservation. Currently, the USGS is monitoring two instances of ground-water contamination on the Fort Peck Indian Reservation, on behalf of the Fort Peck Assiniboine and Sioux Tribes. The USGS investigated the extent, magnitude, and movement of two contamination plumes and reported the results, to date, in USGS Water-Resources Investigations Reports. In one case, saline water is contaminating nonsaline ground water in Quaternary deposits in the East Poplar oil field. Saline-water contamination in the East Poplar oil field may extend as much as 12.4 square miles and affect 9 billion to 60 billion gallons of ground water, which discharges to the Poplar River. The probable source of saline-water contamination is brine that is a byproduct of the production of crude oil in the East Poplar oil field. In another case, nitrate is contaminating the Flaxville and underlying aquifers. Concentrations of nitrate equaled or exceeded 10 milligrams per liter of nitrate as nitrogen in 84 percent of the wells completed in the Flaxville aquifer; dryland farming and livestock are the predominant sources of nitrate. The USGS is continuing to collect additional data in these two study areas to investigate saline-water plume migration and seasonal nitrate trends. Contact: Joanna Thamke, 406-457-5923, jothamke@usgs.gov



Geohydrologic and Water-Quality Assessment of the Pueblo of San Ildefonso. The Pueblo of San Ildefonso and the USGS are cooperating to evaluate the extent of environmental impacts on the geohydrologic system of the Pueblo of San Ildefonso and adjacent Federal lands managed by the Department of Energy (DOE), by using existing information derived from internal and external sources. The project is identifying the water-quality characteristics of water resources within Pueblo and adjacent DOE lands. It will also identify potential sources of pollution within the study area. The water-quality data from this study can be used by the Pueblo of San Ildefonso in developing its water-quality standards.

A critical component of this project is training provided by USGS staff to Pueblo staff. The training will assist the Pueblo staff in developing their technical ability to collect water data. At the conclusion of the study, the Pueblo will have increased independence in conducting the activities. Contact: Cynthia Abeyta, 505-830-7958, cgabeyta@usgs.gov

Geohydrologic and Water-Quality Assessment of Pueblo of Jemez Ancestral Lands. This study is evaluating the extent of environmental impacts on the geohydrologic system of the Upper Jemez River watershed from internal and external sources. The project is identifying the water-quality characteristics of water resources within the Jemez River watershed and point and nonpoint sources of pollution within the study area. The water-quality data can be used by the Pueblo in deciding among appropriate economic development alternatives. As part of this project, USGS staff will work with Pueblo staff to enhance the Jemez employees' technical ability to collect water data, thereby increasing the Pueblo's self-sufficiency so that Jemez employees can conduct assessment activities independently. Contact: Cynthia Abeyta, 505-830-7958, cgabeyta@usgs.gov

Assessment of Aquifer Sensitivity on Navajo Nation Lands and Ground-Water Vulnerability to Pesticide Contamination on the Navajo Indian Irrigation Project. The primary objective of this study is to determine the sensitivity of aquifers to agricultural activities and attendant pesticide application occurring on the overlying land surface. The assessment of aquifer sensitivity on Navajo Nation lands will be based on an evaluation of the physical setting of the aquifers, including the overlying topography and geology, depth to water from the land surface, precipitation, and characteristics of the overlying soils. Digital data sets and GIS coverages describing these conditions will be some of the products of this study. Additionally, the project will assess ground-water vulnerability on the Navajo Indian Irrigation Project, including an evaluation of agricultural practices. These practices include how much and when irrigation water is applied. The use of pesticide products, as well as the amount, timing, and method of application of

these products, will also be considered. Potential sources of data for this study include the Navajo Nation and its contractors, the USGS and other Federal natural-resource agencies, and State natural-resource agencies in Arizona, New Mexico, and Utah. Contact: Paul Blanchard, 505-830-7947, pblanch@usgs.gov

Sedimentation and Erosion on Navajo Lands. The USGS is identifying the sources and mechanism of sediment production on lands of the Navajo Nation. Parts of the investigation will estimate rates of hillslope, valley, and channel erosion in tributary drainage basins and sediment yields from drainage basins within the Navajo Partitioned Lands. Results of the study will help the Navajo Nation's land-use managers and residents assess the stability of channels and the relative erodibility of valleys and hillslopes. Contact: John Parker, 520-670-6671, x271, jtparker@usgs.gov

Invasive Species. Exotic plant species are invading tribal lands in the Southwest. USGS scientists have provided a standardized methodology for the collection of field data on invasive plants. The Southwest Exotic Plant Mapping Program provides Tribes with a data base and associated maps for inventorying, monitoring, and sharing data on exotic plant species. The Navajo Nation participates in this cooperative effort. Several sites on the Navajo Reservation have been used to implement the program. Data collected at these sites will be added to the program's data base. The effectiveness of methods to control the spread of exotic species on Navajo lands can then be monitored by the Tribe by using data and maps that are available on the program's web site. Contact: Colorado Plateau Field Station, 520-556-7466, kat@usgs.nau.edu

Water-Quality Inventory Assessments for the Nez Perce National Historical Park, Idaho and Montana. In FY 1999, the USGS measured streamflow discharge and collected water samples for suspended sediments and selected water-quality constituents from four key water bodies in Nez Perce National Historical Park sites in Idaho and two key water bodies in Montana. Key water body choices for assessment were based on significance and importance to the historic heritage of the Nez Perce Tribe and the National Park Service's (NPS) need to establish a preliminary set of water-quality data for streams in areas potentially affected by land- and water-use activities. Data collection and analysis were completed and then transferred to the NPS. The Nez Perce Tribal Water Resources Division has been consulted during the study process.

A Nez Perce Tribal Water Resources Division proposal for supplemental surface-water monitoring at three of the four USGS study sites in Idaho was accepted by the NPS. Supplemental work included onsite habitat assessment, discharge measurement, and chemical and biological parameters. Contact: Deb Parlman, 208-387-1326, parlman@usgs.gov

Mining Contamination. Wastes from mines owned by several major mining companies have contaminated the Coeur d'Alene Basin in Idaho. Scientists are studying the release and distribution of metals into the Coeur d'Alene Basin and the contamination of water, sediments, invertebrates, plants, and fish by metals and other mining wastes released from the mines. The USGS is participating in the Coeur d'Alene natural-resource damage assessment to ascertain the extent of this contamination and damage to natural resources. Natural resources under trusteeship of both the Federal Government and the Coeur d'Alene Tribe have been affected by the mining-related contamination. Historically, Lake Coeur d'Alene has been an extremely important fishing site for the Coeur d'Alene Tribe. Fishing yielded catches of native fishes such as westslope cutthroat trout, bull trout, and mountain whitefish. Cutthroat trout, once the most abundant trout species in the Coeur d'Alene River system, declined to 4 percent of the catch in 1967, and the population has remained low to the present day. The significant decline of the cutthroat trout population is due to heavy-metal contamination originating from mining and processing of silver ore. Results of the research are being compiled, with selected results published in professional journals. Contact: Columbia Environmental Research Center, 573-875-5399, bill_mauck@usgs.gov

White Sturgeon Studies. The Nez Perce Tribe [Nee-me-poo] was interested in determining whether white sturgeon were spawning in the Salmon and Snake Rivers that originate on tribal lands. USGS scientists prepared artificial models of the physical characteristics of the stream bottoms for tribal use in conducting research. Federal biologists instructed the Tribe in the use of the models, particularly in free-flowing rivers. Contact: Western Fisheries Research Center, Columbia River Research Laboratory, 509-538-2299, jim_seelye@usgs.gov

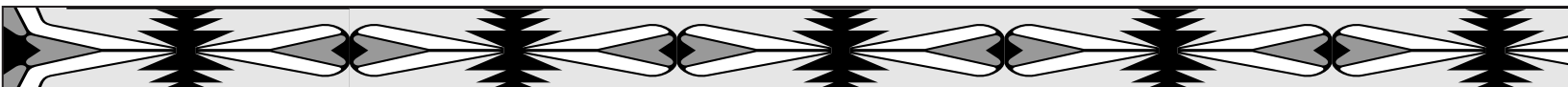
Monitoring Movement of Pesticides on Shoshone-Bannock Tribal Lands. The USGS, in cooperation with the Idaho Soil Conservation Commission (representing the Shoshone-Bannock Tribes), began a project in FY 1999 to examine the migration and persistence of two pesticides and their degradation products through soil at selected field locations on the Fort Hall Indian Reservation. The study will use or adapt existing procedures to collect soil samples from multiple depths in selected fields to assess pesticide uses in the area. Soil samples representing four periods before and after pesticide application will be collected and analyzed for pesticides and their degradation products. A report of findings will be prepared at the conclusion of the work. Personnel from the Shoshone-Bannock Tribes, Natural Resources Conservation Service (U.S. Department of Agriculture), Idaho State Department of Agriculture, and the USGS are cooperating to complete the project. Contact: Deb Parlman, 208-387-1326, parlman@usgs.gov

Cui-ui in Pyramid Lake, Nevada. The cui-ui is an endangered fish of the sucker family that is found only in Pyramid Lake, Nevada. The Pyramid Lake Paiute Tribe has historically relied upon annual spawning runs of cui-ui for food. Because the Tribe controls the use of Pyramid Lake and fully supports efforts to restore the cui-ui population, the Tribal Council has passed resolutions prohibiting harvest of cui-ui by non-Indians and Tribal members. The USGS is studying the population dynamics and reporting the results to the Tribal Chairman. Adult cui-ui are netted at the south end of Pyramid Lake in the spring and are marked to determine the mortality rate. Fish are recaptured in the fall at selected stations around the lake to determine juvenile population size and estimate mortality over the summer. Contact: Western Fisheries Research Center, Reno Field Station, 702-784-5451, gary_scoppettone@usgs.gov

Carson Valley Ground-Water Flow Paths. The Washoe Tribe of Nevada and California has tribal lands that lie within the Carson River drainage in Carson Valley. The shallow alluvial aquifer is known to be contaminated by industrial spills in the vicinity of Gardnerville, east of and upgradient from the Carson River. The Washoe Tribe requested a reconnaissance evaluation of the potential for contaminants to affect tribal water-supply wells west of the river. This evaluation included assessment of the need for a more detailed quantitative ground-water model of the local ground-water flow paths. The informal evaluation was completed in FY 1999, and the results reported to the Tribe. Contact: Terry Rees, 775-887-7635, trees@usgs.gov

Water Quality on Lands of the Washoe Tribe of Nevada and California. In FY 1998 and 1999, the USGS cooperated with the Washoe Tribe of Nevada and California in a natural-resources damage assessment associated with acid mine drainage. The drainage comes from the Leviathan Sulfur Mine in the upper reaches of Bryant Creek, which crosses tribal lands. The USGS sampled water and bed sediments and measured streamflow in a reconnaissance-level study to evaluate distribution of heavy metals within the drainage basin. The very detailed low-level analyses for metals in water and stream sediment were published in the water year 1998 Nevada annual data report, stored in the USGS National Water Information System. A summary was also provided to the interagency natural-resource damage assessment team as part of an evaluation of potential damage to environmental and cultural resources on tribal lands. Contact: Terry Rees, 775-887-7635, trees@usgs.gov

Potential Mercury Contamination and the Washoe Tribe of Nevada and California and the Fallon Paiute Shoshone Tribes. Within the framework of the Department of the Interior's National Irrigation Drainage 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 Shoshone Tribe lie within this drainage. Traditional 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 being released into the middle and lower Carson River drainage. Contact: Ray Hoffman, 775-887-7614, hoffman@usgs.gov

Organochlorine Compounds and Mercury in Fish Tissue from Lake Roosevelt and the Upper Columbia River, Confederated Tribes of the Colville Reservation. The presence of organochlorine compounds (such as PCB's, dioxins, furans) and mercury in fish of Lake Roosevelt has been well documented. This information has resulted in concerns about the effects of local fish consumption on human health; indeed, health advisories regarding the consumption of Lake Roosevelt fish have been issued by the Washington State Department of Health. However, changes in industrial practices have been made in recent years, and one report has described decreases in concentrations of dioxins and furans in fish tissue. In this study, the USGS is collecting and analyzing selected fish tissues for concentrations of PCB's, dioxins, furans, and mercury. The results will be statistically compared to results from previous studies, and any trends will be described. Contact: Mark Munn, 253-428-3600, x2686, mdmunn@usgs.gov

Contaminated Chinook Salmon. The Department of Energy's Hanford Laboratory in Washington State has been used for nuclear waste disposal. Tribes in the region, including the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Reservation, and the Nez Perce Tribe [Nee-me-poo], are concerned that chromium leaking from the site might adversely affect chinook salmon. USGS biologists have simulated conditions of the Hanford Reach of the Columbia River in Washington in the laboratory to study impacts under various exposures. Research is underway and expected to be completed about 3 years. Contact: Columbia Environmental Research Center, 573-875-5399, bill_mauck@usgs.gov

Hydrogeologic Reconnaissance of the Artesian Aquifer Under the Shoalwater Bay Indian Reservation and Tokeland Peninsula. The Shoalwater Bay Indian Tribe obtains water from an artesian aquifer (an aquifer that comes to the surface) lying under its lands and the Tokeland Peninsula, which extends into Willapa Bay off Washington State. The aquifer consists of alluvial-terrace deposits underlying beach sand and overlying basalt bedrock. The Tribe is concerned about the effects of increasing population and commercial development on the quantity and quality of water in the aquifer. Specific water-quality concerns include seawater intrusion, nitrate and bacterial contamination from septic tanks, and

pesticides applied in nearby forests. The USGS is conducting a study that will describe the general hydrologic framework and ground-water flow within the aquifer and the water chemistry of the aquifer, including concentrations of nitrate and selected pesticides. Contact: Ron Lane, 253-428-3600, x2604, rclane@usgs.gov

Restoring Salmon in the Trinity River Basin. USGS staff are involved in efforts to restore salmonid fisheries in the Trinity River basin, California. This project, involving tribal interests of the Hoopa Valley and the Yurok Tribes, and the Karuk Tribe of California, is a major interagency, interjurisdictional effort to restore a fishery decimated by water exportation and other land-use practices. USGS hydrologists are leading the effort to complete the Trinity River flow evaluation, produce the summary report, and make recommendations to the Department of the Interior on actions needed to restore the fishery. Contact: Jon Nowlin, 775-887-7600, jonowlin@usgs.gov

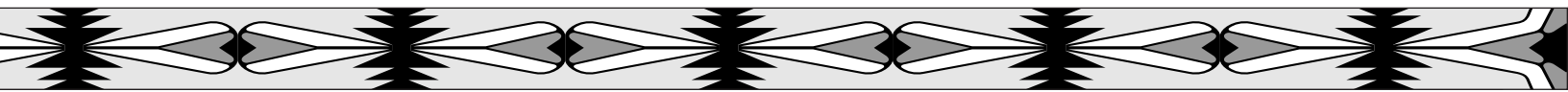
Social Science Research for Alaska Natives. At its field station at the University of Washington, the USGS conducts social science research relating to subsistence issues that affect Alaska Natives. In 1999, studies were conducted in the Denali National Park and Preserve on the traditional use of cabins and other shelters that had been associated with trapping and other subsistence uses. The historic use of the structures was of particular interest to residents of the Athabaskan villages of Nikolai and Telida.

The use of plant materials by contemporary Alaska Natives was the subject of a study in Lake Clark National Park and Preserve. Residents of the villages of Nondalton, Newhalen, Iliamna, Pedro Bay, and Lime participated in the research.

Research was also conducted on the management of the Northwest Arctic caribou herd through a cooperative effort by the Iñupiat communities of Ambler, Kiana, Noatak, and Kotzebue. Separately, the cultural significance and historic patterns of the use of bird eggs by the Hoonah Indian Association were studied because use patterns may conflict with natural-resource management in the Glacier Bay National Park and Preserve. Contact: Forest and Rangeland Ecosystem Science Center, 541-750-7307, darryll_johnson@usgs.gov

Resource Activities





Resource Activities

Determining the Effect of Water Temperature on Lake Trout Predation by Sea Lampreys. Although significant progress has been made in restoring lake trout in Lake Huron, further study is needed to determine how water temperature influences sea lamprey predation on trout populations. The USGS and the Chippewa/Ottawa Fishery Management Authority have undertaken cooperative research to investigate the effects of water temperature on lamprey predation on lake trout.

Bioenergetics, the study of energy exchanges within and between living things and their environment, will be used to calculate the mortality of lake trout by lamprey attacks in relation to water temperature. A byproduct of this research will be a measurement of the effectiveness of international efforts to control sea lampreys in Lake Huron.

Lake trout have been tagged in an effort to determine daily and seasonal water temperature preferences. In cooperation with the tribal Fishery Management Authority, the first tagging phase began in 1998, and the first annual data on water temperature preferences by lake trout were available in the fall of 1999. The results of the study will benefit lake trout management and restoration programs by Federal, Tribal, State, and Canadian Provincial agencies throughout the Great Lakes Basin. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Substrate Mapping of Lake Whitefish Spawning Areas in Whitefish Bay, Lake Superior. The Sault Ste. Marie Tribe of Chippewa Indians is committed to long-term inventorying and quantifying all nearshore fish habitat in the treaty-ceded waters of Lakes Superior, Huron, and Michigan. Collecting this information will be essential to managing the development of shorelines within the ceded territory and to protect biologically significant areas. The USGS is providing technical assistance to the Tribe by mapping spawning and nursery habitat for lake whitefish within Whitefish Bay of Lake Superior.

The Tribe has received funds from the EPA for habitat inventory and has asked the USGS Great Lakes Science Center to initiate the effort because of USGS experience with survey design and ownership of required equipment. The project relates to the mission of the center to inventory and quantify critical biological habitats and, at the same time, identifies those areas that provide economic and cultural benefits to Native peoples. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Water Supply for the Keweenaw Bay Indian Community. The Keweenaw Bay Indian Community (KBIC) uses two public water-supply wells completed in the Jacobsville Sandstone to supply a housing community east of Marquette,

Michigan. The KBIC and EPA Region 5 personnel determined that completing a wellhead protection plan (WHPP) for the wells would be in the best interest of the Tribe. As part of the WHPP, the USGS study delineates the area contributing to the recharge for the public water-supply wells and describes the hydrogeology of the study area, emphasizing the relation between surface water and ground water in shallow wells completed in glacial and lacustrine deposits and deeper wells completed in the Jacobsville Sandstone. The KBIC will be completing additional components of the WHPP. Contact: Jim Nicholas, 517-887-8903, jrnichol@usgs.gov

Water Resources of the Bad River Band of Lake Superior Chippewa Indians. In a cooperative study, the Bad River Band of Lake Superior Chippewa Indians and the USGS are characterizing the local and regional ground-water flow systems in the northern part of the Bad River Indian Reservation. Information gathered to characterize the hydrogeologic framework will provide the basis for site-specific investigations of long-term water-resource and water-quality trends. The hydrogeologic framework consists of the geologic setting (rock types and their physical and chemical properties) and the hydrologic setting (for example, porosity, permeability, and hydrologic flow). As part of this investigation, three boreholes have been drilled into the bedrock aquifer in the northern part of the reservation. The hydrogeologic characteristics of selected intervals of rock and aquifer are being evaluated by using geophysical logs, rock core analysis, and aquifer pumping tests. Characterizing the hydrogeologic framework will lay the foundation for future numerical modeling. Water quality will be evaluated at selected sites and depths. Contact: Charles Dunning, 608-821-3827, cdunning@usgs.gov

Investigation of Ground-Water Contamination at Road Site on the Lands of the Bad River Band of Lake Superior Chippewa Indians. The USGS is working with the Tribe and the EPA to define the local ground-water flow system around a site on County Road A. The site, which was used for disposing paper mill sludge, has been under investigation by Region 5 of the EPA for several years; it includes two open ponds. The EPA plans to use the information being provided by the USGS to determine whether contaminants associated with the sludge are moving off the site and into the ground water. It is critical to the investigation to identify the proper locations downgradient of the contaminated sites for placement of monitoring wells. These monitoring wells will be used for water-quality sampling and for additional water-level information. Water-level recorders, pond-stage recorders, and meteorological instruments will be employed to estimate a water budget for the ponds to define the connection between the pond and the

ground-water system. Contact: Charles Dunning, 608-821-3827, cdunning@usgs.gov

Fish Passage Project. The Menominee Indian Tribe of Wisconsin and the USGS cooperated to enhance fish passage in the Wolf River. USGS fishery biologists determined movement of lake sturgeon through analysis of radio telemetry tracking data. The Tribe collected data by using USGS equipment with technical assistance provided by USGS scientists. Results from the study will determine the best location for a fish passage structure at Shawano Dam on the Wolf River. Contact: Leetown Science Center, Conte Anadromous Fish Laboratory, 413-863-9475, x42, boyd_kynard@usgs.gov

Reintroduction of Lake Sturgeon. Two dams block the natural migration of lake sturgeon in the Wolf River, Wisconsin, onto the Menominee Indian Reservation. In an effort to establish a lake sturgeon population on Menominee lands, USGS fishery biologists implanted radio transmitters in 24 sturgeon and released them above the dams. Movements of the reintroduced lake sturgeon will be studied to determine if the species will prosper. The project is a cooperative effort among the USGS, the Menominee Indian Tribe of Wisconsin, the U.S. Fish and Wildlife Service, and the State of Wisconsin. Contact: Upper Midwest Environmental Sciences Center, 608-781-6221, brent_knights@usgs.gov

Zoar Community Water System, Menominee Reservation. The USGS is delineating the area of ground-water contribution and the length of time it takes ground water to travel to two wells that are parts of the Zoar Community Water System on the Menominee Reservation. This information will be used by the Menominee Indian Tribe of Wisconsin for water-resource and wellhead protection planning in the Zoar Community area. Contact: Charles Dunning, 608-821-3827, cdunning@usgs.gov

Historical Trends in Streamflow, Sedimentation Rates, and Sediment Trace-Element Concentrations Associated with the Wolf River, Keshena Falls to Balsam Row Dam. The objectives of this project are to identify natural and historical concentrations of trace elements in streambed, flood-plain, and backwater sediments of the Wolf River from Keshena Falls to Balsam Row Dam, mostly within the lands of the Menominee Indian Tribe of Wisconsin. This cooperative study between the Menominee Tribe and the USGS will also determine the range of historical (150+ years) variability of flooding and the sedimentation characteristics along the same reach of the Wolf River. Major factors affecting stream sedimentation and flooding characteristics—geologic and natural versus land-use effects—will be identified. The study may be expanded to the Wolf River upstream of Keshena Falls or to selected tributaries to the Wolf River. Contact: Faith Fitzpatrick, 608-821-3818, fafitzpa@usgs.gov

Water-Resource Assessments of the Lands of Six Minnesota Indian Communities. The availability, quantity, and quality of both ground and surface waters of the lands of the Grand Portage Band of Lake Superior Chippewa, the Bois Forte Band of Chippewa, the Prairie Island Dakota Community, the Upper Sioux Community, the Lower Sioux Mdewakanton Tribe, and the Shakopee Mdewakaton Sioux Community are being assessed by the USGS. The assessments will provide information useful for sound management decisions regarding use and protection of water resources. All the reservations and communities are concerned about protecting water sources. Studies are underway to determine the zone of contribution and the well-head protection area for community and municipal wells. Contact: Don Hansen, 612-783-3250, dshansen@usgs.gov

Compilation and Analysis of Water-Resources Data for the St. Croix Reservation and Vicinity. The St. Croix Chippewa Tribe is concerned about the future health of several lake and stream watersheds adjacent to their lands. The USGS is providing the St. Croix Tribe with a summary and analysis of available water resources near their lands. This information will be used by the Tribe in developing their management plans for specific lake and stream watersheds of interest. Contact: David A. Saad, 608-821-3865, dasaad@usgs.gov

Hydraulic Properties of Surficial Sediments in the Shell Valley Aquifer. The USGS is in the second year of this study to systematically examine the hydraulic characteristics of the Shell Valley aquifer, North Dakota, 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 USGS is determining the spatial distribution of sediment textures and calculating the hydraulic conductivity of the aquifer at two locations in the aquifer. Contact: Douglas G. Emerson, 701-250-7402, demerson@usgs.gov

Surface- and Ground-Water Resources of the Sisseton-Wahpeton Sioux Tribe. The general objective of this study is to collect hydrologic data to evaluate the surface- and ground-water resources of the Lake Traverse Reservation. More specifically, the USGS will work with the Sisseton-Wahpeton Sioux Tribe of the Lake Traverse Reservation to determine the location, depth, quality, and quantity of water on their lands. Determining the effects of surface- and ground-water interactions, recharge, and discharge on the hydrologic system will also be part of the study. Contact: Ryan Thompson, 605-353-7171, x225, rcthomps@usgs.gov

Geographic Information Assistance. The USGS South Dakota Cooperative Fish and Wildlife Research Unit is assisting Tribes in mapping biological features on lands of the Standing Rock Sioux Tribe, the Cheyenne River Sioux Tribe,

and the Lower Brule Sioux Tribe. As part of the South Dakota Gap Analysis Program, biologists used data gathered by the Lower Brule Tribe to develop ownership boundaries that were depicted on a stewardship GIS layer. Wildlife biologists surveyed small mammals on the Standing Rock and Cheyenne River Reservations to record population distributions. Contact: South Dakota Cooperative Fish and Wildlife Research Unit, 605-688-6121, berryc@usgs.gov

Environmental Health of Part of the White River

Watershed. The USGS South Dakota Cooperative Fish and Wildlife Research Unit continued to assist the Oglala Sioux Tribe of the Pine Ridge Reservation 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. In addition, the Tribe's data on land ownership boundaries were incorporated and depicted digitally in the South Dakota Gap Analysis Program (GAP). The GAP identifies inadequate representation of a species in areas managed for long-term survival of that species. Contact: South Dakota Cooperative Fish and Wildlife Research Unit, 605-688-6121, berryc@usgs.gov

Water Quality of South Dakota Reservoirs. USGS biologists are assisting in a study of the physical, chemical, and biological characteristics of Federal reservoirs in southwest South Dakota. The Oglala Sioux Tribe and the Cheyenne River Sioux Tribe are interested in results of these investigations as the results may influence management needs for the Bureau of Reclamation. The USGS is preparing a summary report on water quality in the reservoirs that analyzes all available data. Contact: Columbia Environmental Research Center, 573-875-5399, bill_mauck@usgs.gov

Water-Supply and Water-Quality Assessment for the Oglala Sioux. Drinking water for the 13,200 residents of the Oglala Sioux Tribe's Pine Ridge Reservation (PRR) is obtained primarily from shallow wells completed in the upper unconfined portion of the Arikaree aquifer. Northwestern parts of the PRR lack a reliable drinking water supply, and water-quality problems exist at scattered locations throughout the Oglala Tribal lands. There is concern among the leaders of the Tribe that some of the drinking water on the PRR could be adversely affecting human health. A comprehensive assessment of water quality from public water-supply wells was recently completed by the USGS. The results of the assessment have been summarized in a USGS Water-Resources Investigation Report. A cooperative funding agreement to provide technical assistance for a source-water assessment of public water-supply wells was signed in FY 1999 between the Tribe's Water Resources Department and the USGS. A proposal to complete a well inventory for the PRR and to construct a potentiometric map of the unconfined portion of the Arikaree aquifer was submitted to the Tribe and subsequently forwarded to the BIA for funding

consideration in FY 2000. The potentiometric map will show the expected level of standing water if a well were to be drilled. The proposal is a multiyear effort, ending with the production of the potentiometric map in FY 2002. This proposal also specifies that tribal representatives will receive training on USGS well-inventory methods and accompany USGS employees during field visits. Training would also be provided to the Tribe on data-base management and construction of GIS coverages. Contact: Allen Heakin, 605-355-4560, x216, ajheakin@usgs.gov

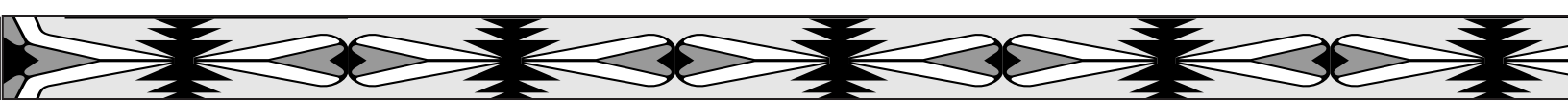
Water Resources of Sac and Fox Nation. In FY 1999, the USGS published USGS Water-Resources Investigations Report 96-4173, "Freshwater Resources and Saline Water near the Sac and Fox Nation's Lands, Eastern Lincoln County, Oklahoma." Contact: Marvin M. Abbott, 405-810-4411, mmabbott@usgs.gov

Ground-Water Resources Reconnaissance of Osage

Reservation. As part of a cooperative program with the Osage Nation, the USGS completed a report of the results of an areal survey of the quality and availability of ground water in the reservation (USGS Water-Resources Investigations Report 99-4231, "Water Quality of the Quaternary and Ada-Vamosa Aquifers on the Osage Reservation, Osage County, Oklahoma, 1997"). The program included a comparison of data on ground-water quality versus land use. Contact: Marvin M. Abbott, 405-810-4411, mmabbott@usgs.gov

Water Use of the Blackfeet Nation and Crow Tribal Nation Reservations. Water-use information was determined for parts of the Blackfeet and Crow Reservations. The Tribal Governments will use this information to administer laws governing water use, appropriation, and allocation. Water-development planning requires current water-use data to evaluate the full range of alternatives for expanded or revised use patterns. Contact: Charles Parrett, 406-457-5928, cparrett@usgs.gov

Availability of Ground Water Along the Little Bighorn River, Crow Tribal Nation. Recent concerns about water availability for the Crow Tribal Nation have necessitated a detailed description of the water resources of the Crow tribal lands. Ground water in the alluvial and terrace deposits in the Little Bighorn River basin is an important resource of the Crow Tribe. The USGS project, which was funded by the BIA, will provide information to the tribal government to help manage their water resources. The USGS study will describe the geometry and hydraulic characteristics of the alluvial and terrace deposits. It will also determine the potential well water levels and general directions of ground-water flow. The study will identify sources of recharge and discharge and hydraulic interactions with other hydrogeologic units, irrigation canals, and the Little Bighorn River. A general description of ground-water quality in the alluvial and terrace deposits will be completed.



The USGS will also investigate the potential availability of ground water from bedrock aquifers. Contact: Lori Tuck, 406-457-5900, ltuck@usgs.gov

Analysis of Surface-Water Resources of the Blackfoot Nation. The surface-water resources of the Blackfoot Indian Reservation include pristine mountain streams, glacial lakes, and prairie wetlands. These resources are of considerable cultural and economic importance to the Blackfoot Nation. The high-quality surface waters support diverse populations of fish and wildlife, are widely used for stock watering and irrigation, and supply drinking water for many residents. This study analyzes and describes the surface-water resources of the major river basins of the Blackfoot Indian Reservation. Contact: Mike Cannon, 406-457-5900, mcannon@usgs.gov

Paleoflood Hydrology of Dry Creek and St. Mary's Lake. Dry Creek is a small stream that drains about 11 square miles upstream from St. Mary's Lake, Montana, in the Mission Range on Confederated Salish and Kootenai tribal land. 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 convey a probable maximum flood (PMF). However, using a PMF estimate 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 on the basis of the paleoflood evidence. Contact: Charles Parrett, 406-457-5928, cparrett@usgs.gov

Regional Geohydrology of the Middle Rio Grande. The USGS, with cooperators from Pueblos and State and local agencies, is investigating the critical aquifers of the Middle Rio Grande region of New Mexico. Project results will describe current subsurface hydrologic characteristics and will provide predictive hydrologic forecasts for the region. Mapping and geologic framework data will be used in urban growth modeling, ground-water protection, and water-quality assessment for Pueblos; resource evaluations by the New Mexico Bureau of Mines and Mineral Resources; and geologic map products for the National Park Service. USGS activities include detailed bedrock and surficial geologic mapping in the Albuquerque and Santa Fe basins. Hydrologic and geologic data on the Santa Fe Group aquifer system is gathered and integrated with investigations of major basin faults and the effects of faulting on ground water. Contact: Jim Cole, 303-236-1417, jimcole@usgs.gov

Cooperative Studies with the Navajo Nation. In cooperation with the Navajo Nation, the USGS conducted studies of the Oljato aquifer between FY 1996 and FY 1998. The project met its goals to define the lateral and vertical extents of the alluvial

Oljato aquifer in Monument Valley. The hydraulic characteristics of the sand, gravel, and clay that make up the aquifer were also determined. The study evaluated the quality of water and identified the direction of water movement in the aquifer. The results of the studies were published with USGS and Navajo coauthors in FY 1999 as USGS Water-Resources Investigations Report 99-4074. Contact: Lawrence Spangler, 801-908-5056, spangler@usgs.gov

Geochemical Analysis of Ground-Water Ages, Recharge Rates, and Hydraulic Conductivity of the D Aquifer, Black Mesa. The D aquifer overlies the N aquifer in the Black Mesa area. The USGS is characterizing the water quality of the N aquifer and determining whether leakage is occurring from the D aquifer, possibly due to pumping of the N aquifer. The investigation is using geochemistry to identify a geochemical signature, if any, of the D aquifer and to date the age of the water in the D aquifer. A conceptual ground-water flow model of the area is also being developed. Both the Hopi Tribe and the Navajo Nation will apply these findings to their separate uses of the N aquifer. Contact: Margot Truini, 520-556-7352, mtruini@usgs.gov

Black Mesa Monitoring Program. The Black Mesa monitoring program 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. Contact: Bob Hart, 520-556-7137, bhart@usgs.gov

Navajo Surface-Water Project. The Navajo surface-water project is designed to help the Navajo Nation's Water Resources Department compute streamflow records from their streamflow gaging stations by creating a data base to compute and store streamflow data. The USGS is also providing training in record computation, assisting with rating curve development, and providing quality assurance. Contact: Gregory G. Fisk, 520-556-7225, ggfisk@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 quality. There are four primary objectives of this study. The first objective is to determine surface-water inflows and outflows in Granite Creek within the boundary of the Yavapai-Prescott Indian Reservation, as well as peak flows of four tributaries to Granite Creek. The second objective is to define the potential occurrence and concentration of suspect contaminants in water, sediment, and the alluvial aquifer of Granite Creek that are associated with past and current industrial activities within and near the Tribal lands. A third objective is to identify the rate and direction of movement of potential contaminants entering or existing in the alluvial aquifer of Granite Creek.

The final objective is to determine the potential for development of ground-water supplies on the Tribal lands. Contact: Bob Hart, 520-556-7137, bhart@usgs.gov

Hydrologic Investigation of Grande Wash, Fort McDowell Yavapai Nation. The objectives of this investigation are to furnish hydrologic data that will contribute to the protection of life and property. Specifically, the investigation will determine if ground water near the landfills is contaminated and if the landfills are sources of that contamination. It will also delineate a 100-year flood-plain elevation within Grande Wash, Arizona. The study will evaluate the effects of existing and planned land use on peak surface-water flows within the Grande Wash drainage upstream from the Fort McDowell Yavapai Nation. The source, quantity, and quality of streamflow in Grande Wash at the west boundary of the Fort McDowell Reservation will also be determined. Contact: John P. Hoffman, 520-670-6671 x265, jphoffma@usgs.gov

Hydrologic Studies to Support Nez Perce Water Rights Adjudication. Hydrologic data for streams and associated subbasins within the Salmon and Clearwater River basins were analyzed to support instream flow claims made by the BIA on behalf of the Nez Perce Tribe. These claims are part of the adjudication of the Snake River basin concerning 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 to develop a methodology for estimating flow duration values for subbasins within the study area. Reports for both these studies have been approved by the BIA and the USGS and have been published by the USGS. Contact: Steve Lipscomb, 208-387-1321, lipscomb@usgs.gov

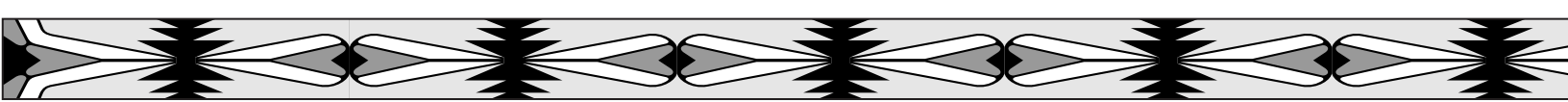
National Water Quality Assessment Benefits Nevada Tribes. The National Water-Quality Assessment Nevada Basin and Range Study Unit covers the Carson and Truckee River basins in northwestern Nevada and Las Vegas Valley in southern Nevada. Information on ground-water quality in Las Vegas Valley is important 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. Water-quality data from the study unit in the upper Carson River basin have provided the Washoe Tribe of Nevada and California with information about stream quality and biological conditions on their lands downstream from the Leviathan Mine. These data were used, in part, as a basis for a natural-resource damage assessment action on behalf of the Tribe. Other water-quality data for streams and aquifers in the Truckee and Carson basins are of importance to the Washoe Tribe (Carson River and Lake Tahoe basins) and the Pyramid Lake Paiute Tribe (lower Truckee River). Contact: Mike Lico, 775-887-7626, mlico@usgs.gov

Ground-Water Study with the Washoe Tribe of Nevada and California. This study is reevaluating the source and magnitude of ground-water recharge to Eagle Valley, Nevada, in which lies Carson City, the Washoe Tribe's Carson Community, and other lands of the Washoe Tribe of Nevada and California. The project is a cooperative effort among the USGS, Carson City, and the Washoe Tribe. To date, project results include defining the relation 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. FY 1999 activities focused on finalizing data interpretation and report writing. Contact: Terry Rees, 775-887-7635, trees@usgs.gov

Truckee-Carson Program. This project supports Department of the Interior bureaus in execution of various provisions of Public Law 101-618, the Truckee-Carson-Pyramid Lake Settlement Act. The project has developed a complex river operations model for the Truckee and Carson Rivers and the Truckee Canal. The results of this work are used as a scientific basis for the department'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 department and the BIA in water-settlement negotiations and related litigation and water-rights transfers. Project activities in FY 1999 concentrated on model testing, documentation, and report writing. Contact: Jon Nowlin, 775-887-7604, jonowlin@usgs.gov

Water Quality for the Fallon Paiute Shoshone Tribe and Others. The Fallon Paiute Shoshone Tribe, the Nevada Division of Water Resources, the U.S. Navy, and the Bureau of Reclamation are cooperating with the USGS to better define sources of water to, controls on, and the quality of water in the Fallon Basalt aquifer. This aquifer is a sole-source drinking-water supply for the city of Fallon, the Fallon Naval Air Station, and the Tribe. The Fallon Tribe is also contributing data to the project and is providing access to tribal lands for this study. Phase II of the project involves developing a digital model of the aquifer and assessing the potential for onsite treatment of arsenic concentrations (which exceed current drinking-water standards) in the basalt. Contact: Terry Rees, 775-887-7635, trees@usgs.gov

Fallon Paiute Shoshone Tribes and the Newlands Irrigation Project. The Fallon Indian Reservation lies within the Newlands Irrigation Project area, and the Fallon Paiute Shoshone Tribes have significant land and agricultural interests on and near the reservation. Thus the Tribes may be affected as land and water uses change on the Newlands project. The USGS developed a conceptual ground-water model of shallow



aquifers in the Newlands Irrigation Project near Fallon in cooperation with the Bureau of Reclamation. The model was designed to assess the potential effects of proposed Federal buyouts of irrigated lands and water rights in the Newlands project on ground-water levels and quality. Contact: Terry Rees, 775-887-7635, trees@usgs.gov

The Walker River Paiute Tribe and the Walker River. The Walker River Paiute Tribe has supported several streamgages on the Walker River. These gages provide information on the surface-water supplies on tribal lands. The gages are also useful in determining the effects of water use on flows of the Walker River into Walker Lake, below the Walker River Reservation. In the last 2 years, both State and Federal agencies have focused increased attention on causes of long-term declines in the levels of Walker Lake and concomitant increases in lake salinity. Separate State and Federal teams were formed in FY 1999 to address the affects of upstream agricultural withdrawals, including those of the Tribe, on streamflow to the lake. A Federal team has also been formed to assess settlement of long-standing Tribal claims for unfulfilled water rights. In addition to the cooperative hydrology program with the Tribe, the USGS is supplying hydrologic information to State and Federal agencies in support of the various studies of the basin hydrology. Contact: Jon Nowlin, 775-887-7600, jonowlin@usgs.gov

Northwest Forest Plan. President Clinton's Pacific Northwest Forest Plan calls for major changes in the management of forests on Federal lands in the Pacific Northwest. The purpose of this plan is to ensure that species associated with old-growth and riparian areas have suitable habitat throughout their ranges. Tribal and Federal resources and management of those resources have reciprocal effects. Pacific Northwest Tribal Governments are significant stakeholders in the development and implementation of the Federal plan. Tribal Governments have identified resources of tribal interest, notably aquatic species, although some nonaquatic species are involved in the plan. USGS biologists are cooperating with the U.S. Fish and Wildlife Service to create a monitoring program that will determine the effects of the forest plan on these important resources. Contact: Forest and Rangeland Ecosystem Science Center, 541-750-7307, michael_w_collopy@usgs.gov

Studies to Support Watershed Assessments with Initiating Governments. Washington State recently enacted legislation for assessing and managing the water resources in several watersheds throughout the State. The legislation places the authority for the assessments and the management of water resources with a collection of local Governments, which include Native American Governments. The principle goal of the assessments is to determine the quantity of water present and available for use within a watershed. Making these determinations is complex, and several Governments, including

those of the Lummi Indian Nation, Nooksack Indian Tribe, Jamestown S'Klallam Tribe, and the Elwha Klallam Tribe, have requested USGS assistance in providing information for use in these determinations. The USGS is conducting three studies in support of watershed assessments in the Elwha, Dungeness, and Nooksack basins. The scope of the studies varies but generally focuses on assembling existing water-quantity data, collecting various types of streamflow and meteorologic data, and analyzing the data to determine hydrologic conditions in the watersheds. Contact: Gary Turney, 253-428-3600, x2626, gturney@usgs.gov

Sea Otters and Sea Urchins. USGS scientists conduct surveys of sea otter populations off the coast of Washington. Results of annual otter counts are provided to the Makah Nation. Tribal members value sea urchins that are native to waters adjacent to the Makah lands; the sea urchins are also a delicacy relished by sea otters. The Makah Nation monitors sea otter population numbers to ascertain potential conflicts with a possible commercial tribal fishery for sea urchins. Contact: Western Environmental Research Center, 541-754-4388, ron_jameson@usgs.gov

Salmon River Watershed Analysis, including Channel and Flood-Plain Processes, Quinault Indian Nation. The Quinault Indian Nation is collaborating with the USGS and several other agencies to conduct an analysis of the Salmon River watershed. The watershed covers 3 square miles of forested land, much of which has been affected by timber harvesting. The river has native runs of Chinook and Coho salmon, as well as steelhead trout. The Quinault Nation also operates a salmon hatchery on the river. The watershed analysis will serve as a tool to support decisionmaking processes in managing the river system and restoring salmon runs. Under two separate projects, the USGS is leading the efforts for two modules of the watershed analysis—the hydrology and geomorphology modules.

As part of the hydrology module, the USGS is also measuring low-flow discharge at selected sites on the Salmon River and correlating them with nearby continuous-discharge records. These data will be used in base-flow predictive models to estimate low-flow recurrence intervals for ungaged streams in the basin.

As part of the geomorphology module, the USGS is investigating channel-migration processes. The USGS will analyze the interactions between channel migration, large woody debris, flood plains, and the surrounding forest. Historic maps, photographs, and documents will be compiled. Field activities will include mapping historic channels and logjams. Radiometric dating will be used in the analysis phase of the study. Contacts: Bill Bidlake, 253-428-3600, x2641, wbidlake@usgs.gov or Jim O'Connor, 503-251-3222, oconnor@usgs.gov

Salmon Life History. USGS fishery biologists are assisting the Skagit System Tribal Cooperative in preparing a life history of Chinook salmon in the Skagit River, Washington. The study is funded by Seattle City Light and investigates the importance of intertidal estuarine habitats in the life cycle of Chinook salmon. First, the length of time spent in this ecosystem is determined. Changes in ear-bone microstructure are then measured to evaluate the daily growth of juvenile Chinook salmon. The USGS provides the Cooperative with laboratory space, use of specialized equipment, supervision, and technical assistance in conducting the study. Contact: Western Fisheries Research Center, 206-526-6282, frank_shipley@usgs.gov

Sea Birds Feed on Endangered Salmon. The USGS cooperated with the Columbia River Inter-Tribal Fish Commission to determine the impact that predation by colonial water birds has on young salmonids in the lower Columbia River. Salmon and steelhead stocks in the Columbia Basin, the majority of which are listed or proposed for listing under the Endangered Species Act, are eaten in great quantities by Caspian terns, double-crested cormorants, and various gull species. The predominant area for this predation is the Columbia River estuary, home of the world's largest Caspian tern colony and the largest double-crested comorant colony on the Pacific coast of North America. A team of USGS, Inter-Tribal Fish Commission, and Oregon State University fishery biologists measured the extent of loss to bird predation and determined that restoring former bird nesting colonies outside the Columbia River estuary, thus attracting sea birds away from the estuary, would significantly reduce predation and enhance the survival of young salmonids. The USGS funded two Inter-Tribal Fish Commission biologists to help with the project and a member of the Confederated Tribes and Bands of the Yakama Nation as a seasonal technician. Contact: Dan Roby, 541-737-1955, robyd@ucs.orst.edu

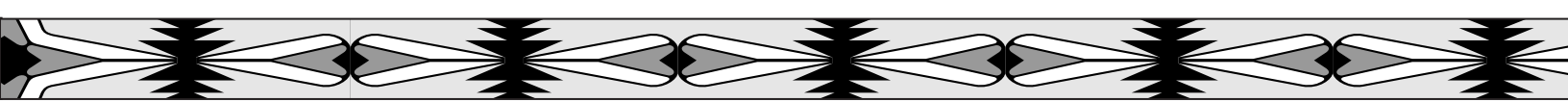
Steelhead Restoration. USGS fishery biologists cooperated with the Confederated Tribes and Bands of the Yakama Indian Nation in an effort to restore steelhead trout to streams in the Wind River basin. Federal scientists and Tribal representatives worked on a technical advisory committee to the Wind River Watershed Council, the study coordinating entity. Contact: Western Fisheries Research Center, Columbia River Research Laboratory, 509-538-2299, jim_seelye@usgs.gov

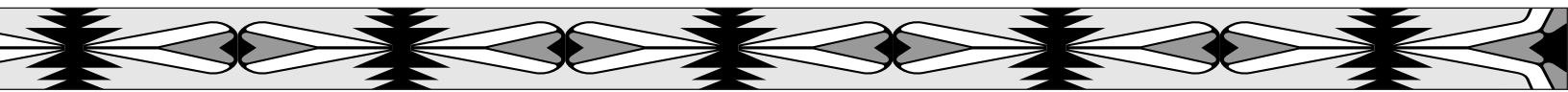
Pacific Lamprey. The Confederated Tribes of the Umatilla Indian Reservation contracted with the USGS to assist in reestablishing Pacific lampreys in the Umatilla River. Fishery biologists prepared a research plan for the Tribes and began the

study by capturing lampreys migrating upstream and holding them in USGS facilities until they matured. Then procedures were developed for fertilizing eggs of adult lampreys, hatching the eggs in the laboratory, and growing larval Pacific lampreys. The young fish will be released in the Umatilla River in Oregon. The USGS is also establishing a method for determining the age of Pacific lampreys. The process involves injecting a chemical dye into larval lampreys and then measuring the fish as they mature. USGS biologists worked with the Columbia River Inter-Tribal Fish Commission by providing tissue samples to be used in the genetic characterization of Pacific lampreys in the Columbia River basin. Contact: Western Fisheries Research Center, Columbia River Research Laboratory, 509-538-2299, jim_seelye@usgs.gov

Anadromous Fishery Restoration. USGS fishery biologists participated in the Klamath River Fishery Restoration Program, a cooperative effort among the Yurok, Karuk, Klamath, and Hoopa Valley Tribes; the U.S. Fish and Wildlife Service; and the Bureau of Reclamation. The USGS developed a River System Impact Assessment Model for the Klamath River that will provide a better understanding of water-quality and water-quantity management problems that limit anadromous fish restoration in the Klamath Basin. Scientists will also collect data to fit the model and perform the required analyses. Contact: Mid-Continent Ecological Science Center, 970-226-9100, lee_ishinger@usgs.gov

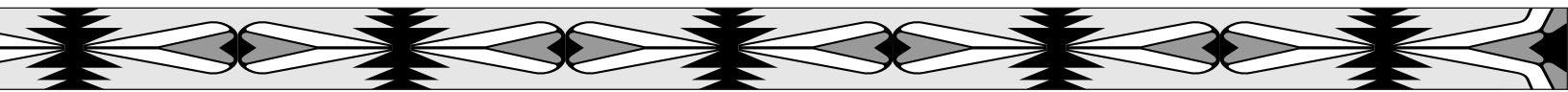
Kuskokwim Mineral Belt Project. The USGS Kuskokwim Mineral Belt (KMB) project is investigating the regional geology and assessing the undiscovered deposit potential of the central Kuskokwim region, one of Alaska's most promising mineral frontiers. Nearly 25 percent of the 15,000-square-kilometer (3.7-million-acre) study area is Native-patented or interim-conveyed land. Calista Corporation, an Alaska Native Corporation, will use the results of the USGS work to help them evaluate and manage the mineral resources of their lands. USGS and Calista geologists are cooperatively studying the Calista lands by performing joint field investigations and sharing geologic, geochemical, and mineral deposit information. The KMB project began in 1997 and has completed three helicopter-supported field seasons to perform geologic mapping, stream-sediment sampling, and mineral deposit studies, all aimed at evaluating the undiscovered mineral resource potential of the central part of the KMB (mostly in Sleetmute quadrangle). Contact: Marti Miller, 907-786-7437, mlmiller@usgs.gov





Technical Assistance





Technical Assistance

Technical Training in Water Monitoring. During FY 1999, four employees of the Hopi Tribe, two from the Hoopa Valley Tribe, and one each from the Gila River Indian Community and the Yavapai-Prescott Indian Tribe took the USGS Field Water-Quality Methods course at the USGS National Training Center in Denver, Colorado. Additionally, two Hoopa Valley employees took the Sediment Data Collection course, and one Alaska Native took the Modeling Ground-Water Flow course. Contact: Russ Smith, 303-236, 4932, rsmith@usgs.gov

Atlantic Salmon and Rainbow Trout Fisheries

Enhancement. The USGS assisted Tribal Governments near the USGS Tunison Laboratory of Aquatic Science in Cortland, New York, in restoring and enhancing tribal fisheries. In November 1998, 50 tagged, 3-year-old Atlantic salmon were released in Hemlock Creek on lands of the Onondaga Nation to assist the Onondaga in reestablishing a depleted fishery. USGS scientists assisted the St. Regis Band of Mohawk Indians in enhancing its salmon fishery. Ten thousand Atlantic salmon fry were released in two tributaries of the St. Regis River in July 1999; survival rate studies were conducted in October 1999. Two hundred rainbow trout were released in Williams Creek on the Onondaga lands in May 1999 and were immediately available for recreational fishing. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Nutrient Analyses for the Seminole Tribe of Florida. The Seminole Tribe of Florida collects water samples to help the Tribe monitor water quality in a canal that passes through their lands in southern Florida. The USGS supports this project by providing nutrient analyses of the samples. Contact: Constance Geller, 352-237-5514 x210, cngeller@usgs.gov

Juvenile Lake Trout Assessment in Keweenaw Bay, Michigan. The USGS is cooperating with the Keweenaw Bay Indian Community (L'Anse Reservation) and Ontonagon Bands of Ojibwa Indians of the L'Anse Reservation in rehabilitating the lake trout population in lower Keweenaw Bay of Lake Superior. There is concern about dwindling numbers of juvenile lake trout in these treaty-ceded waters, and so the Tribes developed a lake trout management plan to restore the lake trout population. One key question is whether the low abundance of juvenile fish is the result of poor survival of hatchery-reared lake trout or of naturally produced lake trout. Consequently, the USGS Great Lakes Science Center was requested to assist the Tribes in collecting data on the contribution of hatchery-reared fish to the lake trout population in lower Keweenaw Bay and other related information. The USGS is also documenting the abundance of forage fish by using a bottom trawl in the bay. The technical assistance provided by USGS scientists will help the Tribes in evaluating the

effectiveness of the management strategies that they are implementing in accordance with their lake trout management plan. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Endangered Species and the Santee Sioux. The Topeka shiner, a small silvery fish of the carp family, has been identified as threatened and endangered. The Santee Sioux Tribe of Nebraska requested assistance from USGS fishery biologists in identifying the species on tribal lands. The scientists demonstrated techniques for fish sampling and measuring physical habitat to Tribal biologists to search for Topeka shiners on the Santee lands. Results of the Tribe's efforts will be incorporated into larger studies on the species in eastern South Dakota. Contact: South Dakota Cooperative Fish and Wildlife Unit, 605-688-6121, berryc@usgs.gov

Surface-Water Quality on the Prairie Band of Potawatomi Reservation. Tribal personnel are being trained in water-quality sampling and quality assurance/quality control procedures by USGS scientists. The USGS also provides periodic water-quality assessments at selected sites on the lands of the Prairie Band to identify and monitor potential sources of contamination that could cause human-health concerns. As part of the training program, several Tribal staff members attended the water-quality sampling course at the USGS National Training Center in Denver, Colorado. 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

Geographic Information Systems Support for the Prairie Band of Potawatomi Reservation. This project provides GIS support to the Prairie Band of Potawatomi. Students at Haskell Indian Nations University, using the facilities of the HINU GIS lab, create and document geographic data layers for the Tribe under the supervision of a USGS hydrologist. Data are provided to the Tribe on compact disc or other medium. Training in GIS concepts and the use of GIS software is provided to the Tribe, thus enabling them to analyze data provided to them. Contact: Tom Trombley, 785-832-3551, trombley@usgs.gov

Geographic Information Systems Training for Missouri River Basin Tribes. This cooperative project with the Mni Sose Intertribal Water Rights Coalition provides several 1-week introductory GIS classes to Missouri River Basin Tribes using the Haskell Indian Nations University's GIS lab. The first half of the class is a 2-day introduction to ArcView. The

remainder of the class consists of tribal examples with students downloading data over the World Wide Web and creating a geographic data base for their lands. Three separate 1-week classes were conducted for about 20 Tribes during FY 1999. Followup support is also provided. Contact: Tom Trombley, 785-8323551, trombley@usgs.gov

Cooperation with the Confederated Salish and Kootenai Tribes. 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. This activity assists the Tribes in obtaining the best available data for use in water-resource management. It also helps improve Tribal self-sufficiency by increasing the capabilities of tribal employees. Contact: Bob Davis, 406-457-5901, rdavis@usgs.gov

GIS Assistance for Tribes. USGS scientists are assisting Tribes on the southern Colorado Plateau in GIS mapping efforts. The USGS Colorado Plateau Field Station maintains a permanent Trimble global position base station that enables easy downloading of differential correction files used in GIS processes. Contact: Forest and Rangeland Ecosystem Science Center, Colorado Plateau Field Station, 520-556-7466, charles_van_riper@usgs.gov

Cooperation with Jicarilla Apache Tribe. Extensive research is underway on a large, interstate migratory herd of elk in northern New Mexico. USGS scientists are working with resource management staff from the Jicarilla Apache Tribe in conducting the study; the Tribe is sharing its equipment with Federal scientists. Jicarilla tribal lands are adjacent to the study area. Contact: New Mexico Cooperative Fish and Wildlife Research unit, 505-646-6053, ccaldwell@nmsu.edu

Coordination with Santa Clara Pueblo. Representatives of the Santa Clara Pueblo, led by the Governor, met with USGS New Mexico District Office representatives to negotiate ways to meet the needs of both parties. Data access and availability are concerns of both parties, although perspectives and needs are very different. The USGS respects the Pueblo's need to increase self-sufficiency, while the Pueblo developed a better understanding of the USGS perspective on data availability. Based on the understandings of each other's needs, as expressed in the meeting and in continuing discussions, cooperative functions are changing to meet the Pueblo's needs, while the sense of open dialogue remains. Contact: Linda Weiss, 505-830-7901, lsweiss@usgs.gov

Reservoir Characterization. A representative of the Santa Ana Pueblo contacted the USGS to discuss the possibility of characterizing a reservoir by using methodologies developed by the USGS. The USGS techniques of reconstructing water-quality trends for core data may be applicable in this situation. Contact: Peter Van Metre, 512-927-3506, pcvanmet@usgs.gov

Wetland Construction. USGS wetland scientists are assisting the Navajo Nation with the creation of a new multipurpose wetland near Pinon, Arizona. The new wetland will provide scarce marsh habitat for wildlife, as well as treat municipal wastewater from Pinon. The USGS is assisting with the design, construction, and monitoring of treatment efficiency in cooperation with the Indian Health Service and Bureau of Reclamation. Contact: Mid-Continent Ecological Science Center, 970-226-9100, lee_ishinger@usgs.gov

Fish Genetics. USGS fishery biologists offer assistance to Tribes in protecting their aquatic resources. The Nez Perce Tribe needed information on the migration pattern of juvenile Chinook salmon in the Snake and Columbia Rivers. USGS scientists conducted experiments that would genetically identify spring and fall migrating fish and thereby describe migration patterns in the Columbia Basin. Separately, the USGS assisted the Confederated Tribes of the Warm Springs Reservation in comparing the genetic diversity of hatchery fish versus wild fish in an attempt to ensure that restored stock are the most genetically viable. Contact: Western Fisheries Research Center, 206-526-6282, frank_shipley@usgs.gov

Chinook Salmon Disease. The Northwest Indian Fisheries Commission, representing more than 20 Tribes in Washington State, requested assistance in responding to an unknown disease in its hatcheries. USGS fishery biologists determined how the disease spread in a population of Chinook salmon and described the infecting agent that caused anemia and enlarged spleens; the infecting virus was identified. The commission and the State of Washington modified the management of hatchery stock to avoid the virus and expressed their appreciation for help in an emergency. Contact: Western Fisheries Research Center, 206-526-6282, frank_shipley@usgs.gov

Training in Collecting Water Data. The USGS conducted a 3-day training class in August in Bellingham, Washington, for 30 students, including members of the Lummi Indian Nation and Nooksack Indian Tribe. The training provided class and field instruction on how to make discharge measurements and collect surface-water data. Contact: Cynthia Barton, 253-428-3600, cbarton@usgs.gov

Quinault Indian Nation. Responding to a request from the Quinault Indian Nation for 1:100,000-scale Landsat Thematic Mapper Land Cover Characterization data for area coverage of the Quinault Nation in Washington State, the USGS has provided a copy of the Washington statewide data. As part of the USGS EDC's (Earth Resources Observation Systems Data Center) preliminary assessment of the data, the Quinault Nation will provide feedback to the EDC about the data set that will be used in the processing and packaging of the final data set. Contact Nancy Tubbs, 503-251-3210, ntubbs@usgs.gov



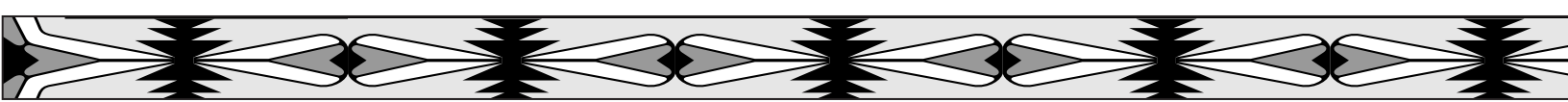
A class in the BIA Water Resources Technician Training Program for Native Americans visits a study site on the Chena River to learn how to operate a weir. Photograph from the Alaska Biological Science Center.

Landslide Prediction. Scientists with the USGS helped the Hoopa Valley Tribe develop a slope stability model for their lands. The model will guide development by identifying areas where landslides might occur. Contact: Western Ecological Research Center, Redwood Field Station, 707-464-6101, x5490, mary_ann_madej@usgs.gov

Education in Salmon Science. One topic in the BIA Water Resources Technician Training Program for Native Americans explores fisheries biology. Native Alaskan students visited a

study site on the Chena River where USGS scientists are conducting research on Yukon chum salmon. The students learned how to operate weirs on the river that count salmon, how to tag and measure fish, how to map spawning habitat, and how to collect environmental data. Alaska Natives from villages in western Alaska and the Yukon River drainage participated in the field work, which was also sponsored by the BIA, the Tanana Chiefs Conference, Inc., the EPA, the U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers. Students represented the Hughes Village, Douglas Indian Association, Ugashik Traditional Village, Native Village of Qwinhagak, Native Village of Kwigillingok, Qawalangin Tribe of Unalaska, Native Village of Hooper Bay, and Newtok Village. Contact: Alaska Biological Science Center, 907-786-3512, raymond_hander@usgs.gov

Water-Quality Sampling of the Taku River. The Douglas Indian Association has hired an intern who works with the USGS to help collect and process water samples each month on the Taku River. The Association also often provides a volunteer to help with water-quality sampling on Gold Creek in Juneau. The intern learns about water-resources principles and USGS operations while providing a valuable service to both the USGS and the Association. Contact: Bruce Bigelow, 907-586-7287, bbigelow@usgs.gov



Surface-water monitoring stations.

[The USGS operates the following surface-water monitoring stations, usually with cooperative funding from the Tribe, the BIA, or a third party]

| Number of stations | Cooperator | Contact |
|--------------------|---|--|
| 1 | Miccosukee Tribe of Indians of Florida and South Florida Water Management District | Mitch Murray (Florida) 305-717-5827 mmurray@usgs.gov |
| 2 | Seminole Tribe of Florida and South Florida Water Management District | |
| 1 | Bureau of Indian Affairs | Douglas G. Emerson |
| 2 | Three Affiliated Tribes of the Fort Berthold Reservation | (North Dakota) 701-250-7402 demerson@usgs.gov |
| 11 | Bureau of Indian Affairs | Ralph Teller (South Dakota) |
| 1 | Oglala Sioux Tribe | 605-355-4560, x222 rwteller@usgs.gov |
| 2 | Southern Ute Indian Tribe | Bob Boulger (Colorado) 970-245-5257, x3021 rboulger@usgs.gov |
| 6 | Blackfeet Nation | Ronald R. Shields (Montana) |
| 11 | Bureau of Indian Affairs | 406-457-5900 |
| 9 | Confederated Salish and Kootenai Tribes | rshields@usgs.gov |
| 2 | Fort Peck Assiniboine and Sioux Tribes | |
| 4 | Northern Cheyenne Tribe | |
| 19 | Bureau of Indian Affairs with the Joint Business Council of the Northern Arapaho and Eastern Shoshone Tribes (Wind River Reservation) | Bob Swanson (Wyoming) 307-778-2931 rswanson@usgs.gov |
| 5 | Bureau of Indian Affairs | Thomas S. Brennan (Idaho) |
| 1 | Nez Perce Tribe | 208-387-1366 tbrennan@usgs.gov |
| 5 | Bureau of Indian Affairs | Michael Roark |
| 2 | Pueblo of Zuni | (New Mexico) |
| 2 | Santa Clara Pueblo | 505-830-7954 mroark@usgs.gov |
| 1 | Fallon Paiute Shoshone Tribe | Kerry Garcia (Nevada) |
| 4 | Pyramid Lake Paiute Tribe | 775-887-7659 |
| 1 | Summit Lake Paiute Tribe | ktgarcia@usgs.gov |
| 12 | Walker River Paiute Tribe | |
| 2 | Washoe Tribe of Nevada and California | |

Surface-water monitoring stations--Continued

| Number of stations | Cooperator | Contact |
|--------------------|---|---|
| 1 | Arizona Department of Water Resources (Navajo Nation) | Christopher Smith (Arizona) 520-670-6671, x251 |
| 1 | Bureau of Indian Affairs & Peabody Coal Co. (Navajo Nation) | cfsmith@usgs.gov |
| 3 | Bureau of Indian Affairs & Peabody Coal Co. (Hopi Tribe) | |
| 2 | Havasupai Tribe | |
| 2 | Hopi Tribe | |
| 3 | Hualapai Tribe | |
| 1 | Tohono O'odham Nation | |
| 6 | Yavapai Prescott Indian Tribe | |
| 2 | Pueblo of Zuni | |
| 1 | Bureau of Indian Affairs (Chamokane Creek) | William Wiggins |
| 3 | Bureau of Indian Affairs (Nooksack River basin) | (Washington) 253-428-3600, x2664 |
| 7 | Confederated Tribes of the Umatilla Indian Reservation | wwiggins@usgs.gov |
| 4 | Confederated Tribes and Bands of the Yakama Indian Nation | |
| 1 | Hoh Tribe | |
| 1 | Makah Nation | |
| 2 | Nisqually Indian Tribe | |
| 1 | Quinault Indian Nation | |
| 1 | Quileute Tribe | |
| 11 | Confederated Tribes of the Warm Springs Reservation | Ed Hubbard (Oregon) 503-251-3239 leh@usgs.gov |
| 4 | Hoopa Valley Tribe | Robert Mason (California) |
| 3 | Karuk Tribe of California | 916-278-3178 |
| 1 | Tule River Tribe | rrmason@usgs.gov |
| 1 | Haida Corporation | Bruce Bigelow (Alaska) |
| 1 | Kawerak Inc. | 907-586-7287 |
| 1 | City of Klawock | bbigelow@usgs.gov |



Sediment-monitoring stations.

[The USGS operates the following sediment-monitoring stations]

| Number of stations | Cooperator | Contact |
|--------------------|---------------------------|---|
| 3 | Hopi Tribe | Gregory G. Fisk (Arizona) |
| 1 | Pueblo of Zuni | 520-556-7225 ggfisk@usgs.gov |
| 1 | Jamestown S'Klallam Tribe | William Wiggins (Washington) 253-428-3600, x2664 wwiggins@usgs.gov |

Ground-water monitoring stations.

(The USGS operates the following ground-water monitoring stations]

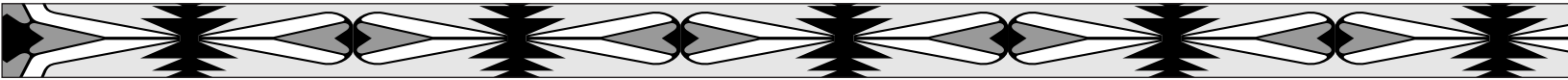
| Number/type of stations | Cooperator | Contact |
|--|--|--|
| 1 | Fort Belknap Community | Clarence L. Chambers (Montana) 406-457-5900 chambers@usgs.gov |
| 1 | Kaibab Band of Paiute Indians (USGS Collection of Basic Records program) | Christopher Smith (Arizona) 520-670-6671, x251 cfsmith@usgs.gov |
| 15 wells for monthly depth to water; 3 continuous record wells; 6 wells for annual water quality | Pechanga Band of Luiseño Mission Indians and Morongo Band of Mission Indians | Robert Mason (California) 916-278-3178 rrmason@usgs.gov |

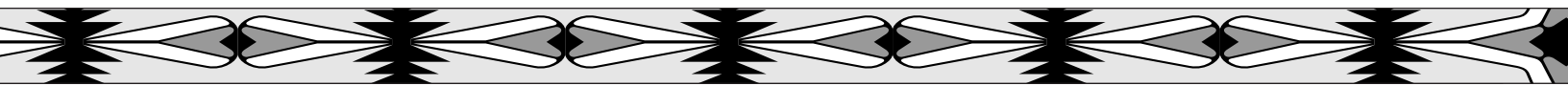
Water-quality monitoring sites.

[The USGS operates water-quality-monitoring equipment at the following sites]

| Number/type of sites | Cooperator | Contact |
|---|--|--|
| 1 gaging station 2 gaging stations 4 lake sites | Bureau of Indian Affairs Three Affiliated Tribes Three Affiliated Tribes | Wayne R. Berkas (North Dakota) 701-250-7429 wrberkas@usgs.gov |
| 1 2 | Pyramid Lake Paiute Tribe Walker River Paiute Tribe | Kerry Garcia (Nevada) 775-887-7659 ktgarcia@usgs.gov |

General Coordination and Policy Activities





General Coordination and Policy Activities

Self-Governance Negotiated Rulemaking. Tribal and Federal representatives have been conducting negotiated rulemaking for several years to create Federal regulations to implement the Self-Governance Act of 1994. The USGS has participated as part of the Federal negotiating team and as the editor of the documents that are published in the Federal Register. Contact: Susan Marcus, 703-648-4437, smarcus@usgs.gov

Federal and Indian Lands. A new map entitled "Federal and Indian Lands" was published by the USGS as part of the National Atlas of the United States of America. This new map shows Federal administration and trusteeship of principal land units by agency. Published at a scale of 1:7,500,000, it includes only those units larger than a township (36 square miles or about 23,000 acres) and represents a new design for future maps in the National Atlas program. This map is available from USGS Information Services, Box 25286, Denver, CO 80225. This new product replaces a previous edition produced in 1968. Contact: Earth Science Information Center, 1-888-ASK-USGS (1-888-275-8747), fax 303-202-4693

American Indian Science & Engineering Society. The American Indian Science & Engineering Society (AISES) celebrated its 20th Anniversary National Conference in Denver, Colorado, in December 1999. The USGS participated in coordinating the year-long conference planning. A workshop featuring a USGS presenter focused on the duality that Native professionals can experience between the Western and traditional Native worlds. The USGS also staffed a booth at the AISES career fair. In conjunction with the AISES conference, the USGS participated in the organization's Government Relations Board to share knowledge of and seek new opportunities for Federal interactions with AISES. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov, or Ray Kokaly, 203-236-1359, rkokaly@usgs.gov

Cultural Awareness Training Sessions. The USGS sponsored cultural awareness sessions in several locations to improve employees' understanding of Native American cultural sensitivities. The sessions were held in both field and headquarters offices with a full range of managers and scientists participating in the course. These sessions exposed USGS employees to perceptions and experiences that are different than the usual scientific perceptions and experiences found within the organizational culture of the USGS. Contact: Alexandra Hadley, 703-648-7770, ahadley@usgs.gov

Technology Innovation Challenge Grant. The USGS participated in a meeting, called by the BIA's Office of Indian Education, to create an outline for a grant proposal for funds to assist schools with primarily Indian students acquire and use technology more effectively. The meeting was held at Haskell

Indian Nations University. Representatives from Tribal colleges, other Department of the Interior agencies, National Aeronautics and Space Administration, and people involved with Indian education shared in the discussions. Contact: Maria Montour, 303-236-2787, mmontour@usgs.gov

American Indian Heritage Month. American Indian Heritage Month was celebrated at the USGS National Center in Reston, Virginia, with an art exhibit by contemporary Native artists. Contact: Alexandra Hadley, 703-648-7770, ahadley@usgs.gov

River Impoundments and Fish Passage. Dams and other barriers on tribal lands in the Northeast United States have disrupted fish migration for many years. The USGS has offered to assist American Indians in addressing problems associated with these structures. At the request of the BIA, USGS scientists talked with members of the Onondaga Nation about barriers to fish migration in rivers on Onondaga lands. In addition, USGS scientists provided advice to Federal Indian lawyers working on Federal Energy Regulatory Commission (FERC) relicensing of power projects on the St. Lawrence River. Throughout FY 1999, USGS biologists provided guidance to the St. Regis Mohawk Tribe on responding to the FERC relicensing process for hydroprojects on the Raquette River. The St. Regis Mohawk Tribe prepared a draft plan for restoring Kentsia'ko:wa (Atlantic salmon) in the St. Lawrence River. At the request of the St. Regis Tribe, USGS fishery biologists provided advice on technical aspects of the plan. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Biological Information for Committees of the Great Lakes Fishery Commission. The Great Lakes Fishery Commission has established committees to coordinate fishery and aquatic resource management in individual lakes. The USGS and American Indian groups such as the Chippewa/Ottawa Fishery Management Authority and the Great Lakes Indian Fish & Wildlife Commission are represented on several of these committees.

A USGS report describes progress toward meeting objectives for fish communities and for restoring native species in Lake Superior. A plan to restore walleye in that lake described strategies and goals for managing populations and habitat suitable for walleye. Much of the identified habitat is managed cooperatively by the Red Cliff Tribe, the Bad River Band of the Lake Superior Tribe of Chippewa Indians, the Keweenaw Bay Indian Community, the Bay Mills Indian Community, the Chippewa/Ottawa Fishery Management Authority, and the Great Lakes Indian Fish & Wildlife Commission.



To assist fishery management agencies in assessing the success of restoration efforts, USGS and Tribal scientists reported on the status of lake trout rehabilitation and important Lake Michigan prey fishes. Tribes of the 1836 Treaty of Lake Michigan participated with representatives from the Sault Ste. Marie Tribe of Chippewa Indians, Grand Traverse Band of Ottawa & Chippewa Indians, and the Little River Band of Ottawa Indians.

Similarly, the Great Lakes Science Center conducted an assessment of prey fish in Lake Huron. Such information helped in the management of lake fisheries and in the coordination of international aquatic resources. The State of Michigan, Province of Ontario, and the Chippewa/Ottawa Treaty Management Authority are represented on the Lake Huron Committee. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Midwestern Coordination. The USGS participates in quarterly meetings about memoranda of understanding (MOU's) among multiple Federal agencies; the meetings are sponsored by the Midwest Region Office of the BIA. Environmental staff from participating agencies, including the BIA, the USGS, the Indian Health Service, the U.S. Army Corps of Engineers, and the EPA, meet to cooperatively plan and coordinate Federal and Tribal activities in Michigan, Minnesota, and Wisconsin. The USGS also participates in quarterly meetings of the Michigan Tribal Environmental Group (MTEG). Representatives of Michigan Tribes, the Intertribal Council of Michigan, EPA Region 5, the USGS, the U.S. Department of Agriculture, the State of Michigan, and other groups constitute the MTEG. MTEG meetings serve as a forum for environmental issues pertinent to Michigan. Separately, the environmental staff of the Nottawaseppi Huron Band of Potawatomi met with EPA Region 5 and USGS representatives to discuss Tribal water-resources issues. A 4-year cooperative agreement will be implemented starting in FY 2000. Contact: Tom Weaver, 517-887-8912, tlweaver@usgs.gov

Native Americans and Wildfire. USGS scientists attended the Natural Areas Association and Traditional Pow Wow on Mackinac Island, Michigan, in October 1998. USGS representatives delivered a presentation entitled, "Fire Management in National Parks along the Upper Great Lakes: History, Philosophy, and Practicality." The presentation described the influence of American Indians on natural wildfires and their frequency. Contact: Great Lakes Science Center, 734-994-3331, nancy_m_milton@usgs.gov

Missouri River Land Transfer. With Congressional direction, the USGS conducted a 1-year study on the effects of a proposed transfer of lands along the Missouri River from the U.S. Army Corps of Engineers to the Lower Brule Sioux Tribe and the Cheyenne River Sioux Tribe. The USGS completed the study and reported the results to the Army. In the process of the

study, the USGS held discussions with interested parties, including the representatives of the BIA and the Oglala Sioux Tribe. Contact: Susan Marcus, 703-648-4437, smarcus@usgs.gov

General Coordination with Haskell Indian Nations University. The USGS maintains a field office on the Haskell Indian Nations University campus, which facilitated part-time employment of several Haskell students by the USGS. Along with projects involving HINU students in hands-on applied science activities, teaching and mentoring, the USGS staff at HINU provides advice to the university on natural-resources curriculum issues as members of the Natural Resources Advisory Board. The USGS also participated in a career fair at Haskell Indian Nations University in November 1998. Contact: Tom Trombley, 785-832-3551, trombley@usgs.gov

Oklahoma Surface-Water Workshop. The USGS Oklahoma District Office sponsored an Oklahoma surface-water workshop, attended by approximately 50 people representing cooperators, flood-plain managers, city engineers, conservation districts, Indian Nations, State, and Federal agencies. Eight speakers explained the many uses and benefits of current and historical information and data bases of streamflow information. The participants also discussed concerns about changes in funding by the U.S. Army Corps of Engineers (Tulsa District), resulting in the loss of 28 continuous streamflow discharge stations in Oklahoma. Contact: Kathy Peter, 405-810-4400, kdpeter@usgs.gov

Oil and Gas on Oklahoma Indian Lands. USGS officials participated in an interagency meeting concerning oil and gas issues on Indian land in Oklahoma. The meeting was sponsored by EPA Region 6 and included participation by the BIA, the BLM, the U.S. Fish and Wildlife Service, the Department of Energy, the Oklahoma Corporation Commission, and the Oklahoma Environmental Resources Board. Contact: Kathy Peter, 405-810-4400, kdpeter@usgs.gov

Indian Water Rights Conference. A USGS hydrologist presented information to a group of 44 environmental staff and leaders from about 23 Oklahoma Tribes at a water rights conference hosted in Tulsa, Oklahoma, by the Inter-tribal Environmental Council (ITEC). The meeting was organized by the staffs of the ITEC and the Cherokee Nation Environmental Office. The USGS official described sources of water information and the role of the USGS in support of tribal water-resources monitoring and investigations. A representative of the Oklahoma Water Resources Board explained that ceremonial criteria for culturally significant water can be included as a special use. Contact: Kathy Peter, 405-810-4400, kdpeter@usgs.gov

Federal Cooperation to Benefit Oklahoma Tribes. The staffs of the USGS and EPA Region 6 met to discuss USGS activities with Oklahoma Tribes. In two separate meetings, USGS officials met with officials of the BIA's Anadarko and Muskogee offices to discuss the Department of the Interior science priorities, mapping of trust lands in Oklahoma, joint environmental training, Caddo aquifer vulnerability project, Unified Watershed Assessments, and Indian water rights activities. The BIA requested that the USGS prepare a proposal for studying the Indian trust lands affected by oil production activities. Contact: Kathy Peter, 405-810-4400, kdpete@usgs.gov

Environmental Assessments of Tribal Lands. Representatives of the Kickapoo Tribe of Oklahoma met with a USGS scientist to discuss potential environmental assessment of Kickapoo lands. The session also included an explanation of the variety and uses of USGS data that could be used in tribal governmental planning. Contact: Kathy Peter, 405-810-4400, kdpete@usgs.gov

Community Development on the Concho Reserve. The Cheyenne and Arapaho Tribes of Oklahoma sponsored a community development symposium at their headquarters in Concho, Oklahoma. The symposium focused on developing community support programs between the Tribes and Federal and State agencies. Other Federal and State agencies attending were the U.S. Department of Housing and Urban Development, the BIA, the Natural Resources Conservation Service (U.S. Department of Agriculture), the Oklahoma State Department of Agriculture, and the Oklahoma Department of Environmental Quality. Contact: Kathy Peter, 405-810-4400, kdpete@usgs.gov

Coordination with the Wichita and Affiliated Tribes. Representatives of the Wichita and Affiliated Tribes met with the USGS to discuss a proposal to have the USGS assess water availability and quality of tribal lands. The project that resulted from these discussions will begin in FY 2000. Contact: Kathy Peter, 405-810-4400, kdpete@usgs.gov

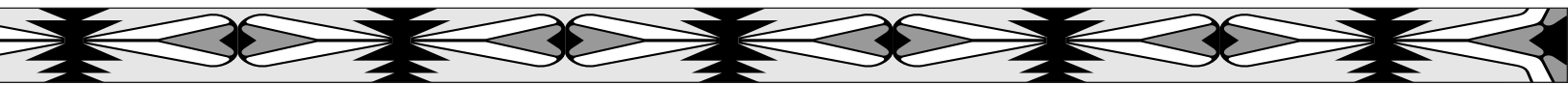
Environmental Coordination Meeting. USGS staff spoke about pesticides in water with the environmental staffs of Tribes from Oklahoma, Nebraska, Kansas, and Colorado. The USGS also identified sources of information and technical support at the meeting in Stillwater, Oklahoma. Contact: Kathy Peter, 405-810-4400, kdpete@usgs.gov

Open Communication with Montana Tribes. The USGS regularly communicates with representatives of the Confederated Salish and Kootenai Tribes, the Northern Cheyenne Tribe, the Blackfoot Nation, the Fort Peck Assiniboine and Sioux Tribes, and the Crow Tribal Nation on water-related issues. Contact: Bob Davis, 406-457-5901, rdavis@usgs.gov

Tribal Workshop Presentation. The Tribal Ground Water and Pesticide Management Plan Development Workshop, hosted by the Robinson Rancheria in Nice, California, featured a presentation by a USGS hydrologist. The workshop was sponsored by the EPA. Contact: Neil Dubrovsky, 916-278-3078, nmdubrov@usgs.gov

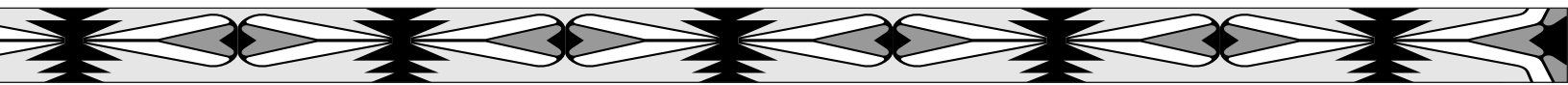
Cultural Awareness Training for Federal Employees in Alaska. The USGS is participating in the Federal Executive Association Training Subcommittee, which has set up a prototype 16-hour class entitled "Alaska Native Cultural Awareness." The class will cover history, laws, and heritage of Alaska Natives. Contact: Cora Bertrand, 907-786-7100, bertrand@usgs.gov





Opportunities





Opportunities

Intertribal GIS Council, Inc. The Intertribal GIS Council, Inc. (IGC), and the USGS, through its support of the Federal Geographic Data Committee (FGDC), will again cosponsor and develop the 2000 IGC annual conference. The FGDC has cosponsored this event for the last several years and plans to continue these efforts in the future. Upcoming activities with the IGC include revising the directory of GIS courses and programs offered at tribal colleges and universities, creating scholarship and student intern programs, and updating tribal boundaries in coordination with the EPA and the FGDC. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

American Indian Heritage Foundation. The American Indian Heritage Foundation, in cooperation with the National Indian Business Association (NIBA), the FGDC, and the Department of Energy will continue to meet regularly and explore opportunities for expanding the use of GIS on reservation lands. Upcoming meetings will include GIS presentations from the FGDC, the NIBA, and the U.S. Department of Energy. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

The Environmental Protection Agency. The EPA, the USGS, through its support of the Federal Geographic Data Committee, and the Intertribal GIS Council, Inc., will explore opportunities to update tribal boundary maps through an existing memorandum of understanding. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

The Bureau of Indian Affairs and the National Native American Law Enforcement Association. The BIA, the National Native American Law Enforcement Association (NNALEA), and the USGS, through its support of the Federal Geographic Data Committee, are coordinating the upcoming NNALEA 2000 annual conference. The conference will include presentations on FGDC, crime mapping, and the National Institute of Justice. Opportunities will be explored to incorporate GIS technology and crime mapping in the BIA's Police Academy. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

National Consortium for Geospatial Technology in Rural America (NCGTRA). NCGTRA and the Federal Geographic Data Committee recently approved a memorandum of understanding to assist Tribal, State, regional, and local governments in implementing advanced geospatial information technologies to improve the quality of life, environmental health, and economic competitiveness of rural communities. Cooperative implementation of the memorandum will include technical assistance in system development and management to tribal colleges and universities; training programs including K-12 education, short courses, and university curricula; and advanced spatial analysis for decisionmaking processes. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

Training Tribal GIS Professionals. The U.S. Fish and Wildlife Service's National Conservation Training Center, in cooperation with the Federal Geographic Data Committee and the Bureau of Land Management's National Training Center, will implement partnership concepts by developing workshops and professional training sessions to encourage tribal geographic data coordination. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@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, will be coordinating the availability of graduate fellowships. The fellowships will include assisting the USGS and the FGDC in developing cognitive models of geographic space, computational implementations of geographic concepts and geographic information and society, human capital research using GIS, environmental modeling, and regional modeling and optimization. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

Water Quality of Menominee Lands. Officials of the Menominee Indian Tribe of Wisconsin met with USGS hydrologists to discuss wellhead protection projects for several reservation community wells. The USGS has agreed to estimate the contributing areas for the Tribe's high-capacity wells. The USGS has proposed to develop an analytic element model to estimate the well contributing areas. In addition to the high-capacity wells, ground-water and surface-water interaction and simulation of sewage lagoons add to the complexity of the hydrologic system. Contact: Diane Maertz, 608-821-3801, demaertz@usgs.gov

Oneida Nation's Water Quality. The USGS will soon begin a long-term water monitoring project on the lands of the Oneida Tribe of Wisconsin. The studies will identify trends in nutrient and pesticide concentrations at two surface-water sites. Contact: Kevin Richards, 608-281-3861, krichard@usgs.gov

Water-Resources Study for the Wichita Tribe. The Wichita Tribe is interested in expanding their knowledge of the water resources in their area. The USGS will prepare a summary report of those resources in FY 2000. The report will identify, catalog, and evaluate existing information. Contact: William J. Andrews, 405-810-4416, wandrews@usgs.gov

Coordination with the Comanche and Kiowa Tribes. Representatives of the Kiowa Tribe of Oklahoma and the Comanche Nation met with USGS personnel several times during FY 1999. Originally, the group discussed the needs for information on water resources within the jurisdictional boundaries of the two Tribes. The Tribal officials requested a USGS proposal for a report summarizing existing data for water

resources within Tribal lands. Later in FY 1999, Comanche Tribal environmental staff met with USGS staff to discuss a project to map Tribal lands and trust lands of Tribal members in Oklahoma. The USGS and Comanche representatives also met with a BIA official at a streamgage on Comanche lands to discuss surface-water measurements and streamgage station operations. A separate meeting was held among representatives of the Comanche Tribal Environmental Program, the BIA, the USGS, and Topographic, Inc., to discuss mapping and hydrologic information needs of the Tribe and possible training and cooperative projects. The Tribe is building its environmental programs, specifically its geographic information system capabilities. Contact: Kathy Peter, 405-810-4400, kdpeter@usgs.gov

Salish Kootenai College. Salish Kootenai College, in cooperation with the Federal Geographic Data Committee and the Intermountain GIS Council, will be exploring opportunities for curricula development based on GIS. The FGDC will assist in the upcoming 2000 Intermountain GIS Users' Conference on Mapping Indian Country. Sessions have been developed to serve the interests and needs of the Native American community in the Upper Columbia and Upper Missouri River basins and to interest Native American students in GIS technology and educate them on future career opportunities in GIS. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

Arizona State University. The American Indian Studies Program and the Indian Justice Center at Arizona State University, in cooperation with the Federal Geographic Data Committee, are exploring opportunities to develop and implement university curricula, short courses, and training programs for using GIS technology and crime mapping on Indian lands. Contact: Bonnie Gallahan, 703-648-6084, bgallahan@usgs.gov

Bedrock Aquifers on Navajo Nation Lands. Work was begun in FY 1998 to collect information on the hydrology of the bedrock aquifers in the Monument Valley area of the Navajo Nation. The study is expected to be completed within a year of obtaining funding. Contact: Lawrence Spangler, 801-908-5056, spangler@usgs.gov

Idaho Water Awareness Week. In 2000, the USGS will participate in a Water Awareness Week in southern Idaho. Plans for the event include busing students from the Shoshone-Paiute

Tribes in Nevada to join in the activities. The USGS is helping to organize this event. Contact: Deb Parlman, 208-387-1326, parlman@usgs.gov

The Walker River Paiute and Walker River. In FY 2000, the USGS will study effects of water-rights transfers above the lands of the Walker River Paiute Tribe on river flows and Walker Lake levels. This USGS work is being done to provide technical support to BLM's environmental impact statement on Walker River water rights. Contact: Jon Nowlin, 775-887-7600, jonowlin@usgs.gov

Alaska Native Internship Program. The USGS has been working with other Department of the Interior bureaus in Alaska and the University of Alaska Anchorage to establish an internship program for Alaska Natives. Agreement has been reached, in principle, for a program that will give interns six college credits and 10 weeks of work experience in department bureaus. Contractual arrangements, however, have not yet been made. A startup program of about seven students is planned for FY 2000. Contact: Gordon Nelson, 907-786-7100, glnelson@usgs.gov

Geochemical Landscape of Alaskan Native Corporation Lands. Geologists from the USGS are developing collaborative plans with Alaska Native corporations to conduct projects to understand the geochemical landscape (the spatial variations in the distribution of chemical elements within media such as stream sediment and soil) of Native lands. The study areas constitute the southwestern quadrant of Alaska, including the Aleutian Islands. Part of the project includes collecting one sample every 400 square kilometers (in cells measuring 20 by 20 kilometers) and analyzing each sample for 43 chemical elements of both geological and environmental significance (for example, mercury, arsenic, and selenium). Geologists from the Calista Corporation and the Bristol Bay Native Corporation are participating in planning sample acquisition programs. The geochemical data will be used to create interpretive derivative maps involving watersheds, lithologies, geology, mineral deposits, and political boundaries. The products of the project are designed to assist the Native corporations in managing their lands. Contact: Andrew E. Grosz, 703-648-6314, agrosz@usgs.gov

USGS Contacts

The U.S. Geological Survey has an American Indian/Alaska Native Coordinating Team to establish policy and to coordinate USGS activities related to American Indians and Alaska Natives. The team consists of an American Indian/Alaska Native Liaison from each of the major organizational parts of the USGS. Readers are welcome to contact the liaisons (listed below) for further information.

Director's Office: Susan Marcus, Mail Stop (MS) 107
703-648-4437; fax 703-648-5470; 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 703-648-5755; 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

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