



## **Annual Report May 2004**

**NSF Undergraduate Minorities in Environmental Biology Program  
Recruiting Native Americans into the Environmental Sciences  
NSF Proposal Number 0203404**

Principal Investigator: Ray Pierotti, Center for Indigenous Nations Studies  
and Department of Ecology and Evolutionary Biology, University of Kansas

Co-Principal Investigator: Larry Erickson, Center for Hazardous Substance  
Research, Kansas State University

## **Project Summary**

Despite a long tradition of knowledge about ecological and environmental phenomena, Native Americans are one of the most under-represented groups among undergraduate science majors, graduate students, and science faculty. In 1993 the PI and the University of Kansas (KU) initiated a collaborative program with Haskell Indian Nations University (HINU) to create opportunities for Native American students interested in environmental science careers to develop research skills at HINU while completing their Associates degree, then transfer to KU in order to complete their Bachelor's degree in science. This program, funded by the NSF Division of Environmental Biology (DEB93-17582) through its original UMEB program, lasted for a four-year period until 1998, during which time 11 of 22 student participants graduated. Additional support was obtained from the All Nations Alliance for Minority Participation (ANAMP), which allowed us to continue to support the other eleven and add four additional students to this program. In all, 23 or 26 participants graduated by Spring 2001. All 23 graduates are currently either employed in science oriented careers or enrolled in graduate school. The PI on the grant (Pierotti) was named Tribal College/ University Mentor of the year in 1998 by the Society for the Advancement of Chicanos and Native Americans in Science for accomplishments resulting from this initial program.

In 1999, HINU initiated a four-year Baccalaureate granting degree program in Environmental Science. Around the same time, KU opened a Masters program in Indigenous Nations Studies (INSP), increasing opportunities for advanced students to specialize in work on environmental issues of importance in Indian Country. The relationship between the Hazardous Substance Research Center (HSRC) at Kansas State University (KSU), which helped to create the Haskell Environmental Research Studies Center (HERS), and degree granting programs at both KU and HINU has also expanded to include opportunities for students to move between institutions to obtain specialized training in chemical engineering and environmental remediation.

Over the same time period, faculty from the collaborating programs at KU, KSU, and HINU, formed a consortium to create the first international program for Native American students at HINU. This program involves exchanges between HINU and Gorno Altaisk State University (GASU), a university serving indigenous peoples in Siberia. Emphasis in this program is on providing opportunities for students to conduct studies on water quality and environmentally related health issues that reflect shared concerns between indigenous peoples in North America and Siberia.

With our current funding obtained from NSF-UMEB, which began in fall 2002, we are creating additional opportunities for students to take advantage of these programs to enrich their undergraduate environmental science curricula and to gain experience with international exchanges.

## ACCOMPLISHMENTS DURING THE 2003-2004 REPORTING PERIOD

A delegation from GASU visited Kansas in May/June 2003 to complete work on the USDA-SCRP project. This group was partly funded by our NSF-UMEB program.

During this trip, the partners worked with a local NGO, The Friends of the Kaw. This organization sponsored a canoe trip to share information with the GASU delegation on the status of the Kansas River, one of the most polluted rivers in the U.S., and their grassroots efforts to preserve it. Local journalists reported on the trip, which allowed a local community organization to draw attention to an important local environmental issue. The newspaper reporter who wrote the story, Abby Mills, has subsequently received an NSEP fellowship to work with the KSU faculty when they travel to the Altai in Summer 2004 and to attend courses at GASU during the fall semester.



Dave Murphy, the Kansas River Keeper, speaks to the GASU and KSU faculty and students participating in the exchange, in addition to members of The Friends of the Kaw and community members about conserving the Kansas River during a canoe trip.

Dr. Aleinikova and her student, Victor Mamreshev, traveled with funds from our NSF-UMEB grant. Drs. Larry Erickson, Larry Davis and Mikhail Korenman worked with them to create a database for the water quality data. They also made plans for a visit by Drs. Jim Steichen and Larry Davis (KSU) and Heidi Mehl (KU), a Cherokee undergraduate student, during summer 2004 to continue the USDA-SCRP project using



NSF-UMEB funding. The 2004 exchange will focus on stream and lake shore remediation and will create a demonstration project at the GASU field station on Lake Teletskoye..

During her trip, Dr. Aleinikova presented the scientific results of the water quality-monitoring program at the International Forum of Analytics and Analysts in Voronezh, Russia, (June 2-6, 2003: <http://www.vgta.vrn.ru/forum/inf-engl.htm>).

With funding from USDA-SCRIP and NSF-UMEB, a team from GASU joined Dr. Raymond Pierotti, a Comanche Ecologist at KU (CINS and Department of Ecology and Evolutionary Biology), on a trip to the Navajo and Hopi Reservations in New Mexico and Arizona so they could learn about environmental issues facing the Navajo people. Issues of common concern were addressed, including problems with overgrazing by traditional herders that reduce water quality in streams and springs. The Siberian scholars were introduced not only to cultural traditions and the Traditional Ecological Knowledge of Native Americans, but also to practices put into place by the Navajo Environmental Protection Agency and other tribal entities that were established to set environmental and cultural standards on reservation land. They also participated in traditional Navajo and Hopi ceremonies, including sweat lodge, and the butchering of a sheep for a group feast, an activity with great resonance for both Southwestern tribes and Altaian herding peoples.

The GASU group traveling with Dr. Pierotti and his students included Yuri Tabakaev, rector; Victor Lukyanenko, dean of foreign languages and director of international programs; Nikolai Malkov, biology professor; Julia Mekechinova, student in the languages program; and David Khydarov, biology student.

Native American students participating in the program included Myron Dewey of the Agui Diccutta Band of the Walker River Paiute and Dustina Edmo (Shoshone-Bannock), both of whom recently graduated from HINU. Dustina is a champion women's traditional dancer who traveled to the Altai with the HINU exchange in 2001 and participated in the 2002 exchange as part of this program. A primary organizer of this exchange was Allen Long (Navajo), a senior majoring in Applied Indigenous Studies at Northern Arizona University (NAU). The expert on traditional knowledge, particularly of sacred sites including springs and petroglyphs was Benny Lebeau (Wind River Shoshone), a senior at NAU majoring in Applied Indigenous Studies. Benny also works to preserve sacred springs of tribes in the American West, and taught our Altaian visitors about the significance of springs to Native Americans.

The group departed Lawrence and traveled through central and western Kansas. In western Kansas they were able to see feedlots around Dodge City and discussed the social and environmental consequences of feedlots. They also discussed the concept of the Buffalo Commons and its implications for development in Siberia.

The U.S. and Russian partners then drove through the Oklahoma Panhandle and across New Mexico to Window Rock. Along the way they were shown Tribal Casinos and discussed the role of Casinos and ecotourism in economic development. In Window Rock they had a full day meeting and workshop at the Navajo EPA. During these meetings they discussed how indigenous peoples can control their own water and air quality. The GASU faculty and students introduced themselves and spoke on the environmental issues they are facing in the Altai. Issues of shared concern included

grazing and water quality. There were also presentations on the use of GIS techniques in assessing concerns.

The partners also attended a presentation on historical preservation and wildlife management on reservation land. They then traveled to Wheatfield Lake where they camped. The GASU faculty and students fished in the lake and were shown the environmental aspects and issues linked to sheepherding. That evening around the fire the partners exchanged traditional stories and music. The Siberians received instruction in traditional cedar flute playing and the importance of music and song in traditional knowledge and ceremonies was discussed.



U.S. and Russian partners meet with faculty at DCC.

The group then traveled to Dine Community College (DCC) where they met with faculty and administrators who told them of the Navajo creation story and its relevance to environmental concerns. There was extensive discussion and exchange of ideas about effective means of educating students who are strongly linked to indigenous cultures and allowing them to develop intellectual traditions within an indigenous context.



Faculty and students from NAU, HINU, and GASU at Canyon de Chelly.

The US and Russian partners were then taken to Canyon de Chelly by DCC faculty through the back routes to the head of the canyon and were there shown traditional agricultural practices and were able to observe indigenous conservation practices.

After leaving the Navajo Reservation they traveled to Moenave and the Hopi Village of Moenkopi. In Moenkopi the Siberians were able to observe traditional Hopi ceremonies and dances and were provided a feast as guests of honor by one the Hopi families. In the evening the partners visited the petroglyphs at Newspaper Rock, an area where many petroglyphs are well preserved. There was a presentation on petroglyphs by Benny Lebeau, a Shoshone elder who is an expert on petroglyphs and is active in the preservation of petroglyph sites throughout the western U.S. Nikolai Malkov compared many of the petroglyphs with similar sorts of carvings found in the Altai and extensive discussion ensued.

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

HINU and GASU partners at petroglyph site in the Altai Republic during the 2001 exchange.

The group camped on the Navajo family rancheria controlled by Allen Long's family in Moenave. During this period they were able to participate in a traditional sweatlodge ceremony run by the head of the family at the rancheria where they were camped. This visit also allowed observation of traditional methods of irrigation and crop management and how indigenous wildlife was incorporated into management practices. During the men's sweat the female members of the group traveled to Second Mesa to visit Hopi families (males sweat separately from females in traditional Dine practice). The following day there was a sweat for female members of the family and the group.

Then the group participated in a traditional sheep butchering ceremony that was of great interest because sheep butchering is also an Altaian tradition. Dr. Malkov participated and exchanged ideas on the most efficient forms of butchering.





U.S. and Russian partners participate in a sheep butchering ceremony on the Navajo Reservation.

Both Dr. Malkov and the head of the family were each responsible for dealing with his own half of the sheep. They did the work practically simultaneously, losing no blood, because in both Altaian and Native American tradition nothing of the food should be wasted.

When the traditional dishes were cooked, Dr. Malkov was able to give Altaian names for each. Visitors from GASU also made bread in the traditional Navajo way and later all of the people shared the food cooked together.

The group then traveled to Monument Valley where they were shown how tribes manage historical and cultural sites. Several participants in the exchange were interviewed by Mike Cuenca (CSG) about the exchange program for a documentary film he is making. In the afternoon they moved on to Page Arizona, where they were shown Glen Canyon Dam. This was particularly pertinent because the Alataians are also faced with a major dam project on their sacred river and were able to observe firsthand the social and environmental consequences of a major dam project.





Rector Tabakaev at the Grand Canyon.

They then camped in Lee's Ferry on the Colorado River below the dam, where the Siberians were able to bathe and fish in the river. The next day they drove through Grand Canyon National Park from the east entrance.

After touring the park the partners went to Flagstaff, where they met with faculty of Applied Indigenous Studies Program at Northern Arizona University. At NAU they were shown a traditional hogan built for ceremonies, which the Altaians compared to one type of traditional hut used by some of the groups of Indigenous Siberians. Individuals from NAU included Aregai Tecele, professor of hydrology and decision Systems Analysis, School of Forestry; Octaviana Trujillo, professor and chair, college of ecosystem science and management, Applied Indigenous Studies Department; Ronald Trospen, Director, Native American Forestry Program, college of ecosystem science and management.

The GASU delegation also met with staff from the Institute for Tribal Environmental Professionals (ITEP), Todd Barnell, Research Specialist, Frederick Sherman, David Delmar, and Matt Andrews. Discussions focused on training programs for tribal professionals in wildlife and environment. Partners had discussions with students and faculty who work to improve environmental management (forestry and water resources) on tribal lands. Topics discussed included how the university uses the media to promote their work with the environment to local communities.

The partners next visited a sacred spring known only to local indigenous peoples located on the eastern slope of Dook'o'slid (San Francisco Peaks). There they participated in a water blessing ceremony and compared the ceremonial treatment of sacred springs in Altai with similar situations in the southwestern U.S. Afterwards the partners visited the Museum of Northern Arizona where the Siberians were able to observe both the natural and cultural history of the area.

The final stop was at the University of New Mexico, where partners met with Anne Calhoun from the College of Education. Dr. Calhoun teaches writing and literacy to indigenous communities and has participated in previous exchanges. The partners also met with Gregory Cajete, Director of Native American Studies and an Associate

Professor in the College of education. Information Drs. Calhoon and Cajete shared will benefit the project by providing GASU faculty and Republic journalists with techniques for educating and communicating about environmental issues with the indigenous population in the Altai Republic.

## **Publications**

Pierotti, R. and Annett, C. (In Press). The importance of indigenous perspectives: the experiences of indigenous students from the U.S. and Siberia during a scientific exchange program. *Indigenous Nations Studies Journal*.

Calhoon, J.A., and C.A. Annett. 2003. American Indian and Altaian literacies. Tenth International Literacy and Education research Network Conference on Learning, to be held at the Institute of Education, University of London 15-18 July 2003.

Calhoon, J. A., Wildcat, D. R., Annett, C., Pierotti, R., & Griswold, W. 2003. Creating Meaningful Study Abroad Programs for American Indian Post-Secondary Students. *Journal of American Indian Education* 42(1), 46-57.

<http://jaie.asu.edu/abstracts/abs2003.htm>

## **Presentations**

Dr. Aleinikova presented the scientific results of the water quality-monitoring program during the International Forum of Analytics and Analysts in Voronezh, Russia, June 2-6, 2003 (<http://www.vgta.vrn.ru/forum/inf-engl.htm>).

Dr Pierotti made the following presentations on topics related to this project:

- 1) November 2003. Spiritual and Biological Creation and the Concept of Relatedness. Native American Symposium: Identity and Difference. Se. Oklahoma State Univ.
- 2) November 2003 Insights from Indigenous Knowledge into Evolution and Population Biology Traditional Knowledge Symposium, Society for Ecological Restoration, Austin, TX.
- 3) March 2004. Keepers of the Game: Myth or Reality. Ethnobiology Society. Davis, CA.

Student Presentations sponsored by this Project:

- 1) Erica Noguerra. March 2004 Use of the poisonous Silverleaf Nightshade berries in indigenous manufacture of Asadero Cheese. Ethnobiology Society. Davis, CA.
- 2) Bhani Singh and Lynnette Dornak. June 2004. The role of male parental care in hybridization in the Northern Flicker. Society for the Study of Evolution Meeting. Ft Collins, CO.

## **Media Coverage**

Lawrence Journal World. June 2, 2003. "Russian visitors study Kaw for answers to take home." By Abby Mills.

<http://www.ljworld.com/section/citynews/story/133947>

Lawrence Journal World June 1, 2003. "State: Siberian visitors to join float trip on Kansas River".

<http://www.ljworld.com/section/archive/story/133815>

Lawrence Journal World November 28, 2003. Friends and neighbors.

[http://www.ljworld.com/section/bigger\\_photo/96230](http://www.ljworld.com/section/bigger_photo/96230)

The Manhattan Mercury June 3, 2003. "Russians study Kansas River during visit".

By Associated Press

<http://www.themercury.com/stories/article.12424.aspx>

Biohawk, the University of Kansas Biology Division newsletter. Fall 2003. Connections between indigenous peoples in Siberia and America.

## **Online Resources**

Streaming Video: Community-Based Drinking Water Quality Analysis: A partnership between Gorno-Altai State University and Haskell Indian Nations University

<http://www.seekpeace.com/civil/hinugasu.mov>

<http://www.engg.ksu.edu/HSRC/international/altai.html>

<http://www.engg.ksu.edu/HSRC/UMEB/>

## **Additional Grant Support**

**U.S. Agency for International Development/ALO** "Media relations for science reporting and environmental advocacy: facilitating higher education leadership and administration at Gorno-Altai State University." Larry Erickson and Jackie Spears (KSU), Mike Cuenca (CSG) and Victor Lukyanenko (GASU). \$ 125,000

**U.S. Department of Agriculture Scientific Cooperative Exchange Program.** "Assessing the impact of traditional grazing techniques on drinking water quality: A cooperative program between Haskell Indian Nations University and Gorno-Altai State University, Russia." 2000-2003. Dan Wildcat (HINU) and Nikolai Malkov (GASU). \$44,987.

## **Student Projects**

**Verna Potts** (Potawatomi) Graduate from Kansas State University in December 2003. She conducted research in tribal health issues and environmental problems that contributed to health problems. Verna worked with Kimberly Shafer, MS, RD, Doctoral

Candidate, Kansas State University and Barbara Lohse, PhD, RD, The Pennsylvania State University, State College, PA (see project description below).

**Miriam Litfin-Salt** (Navajo) Graduated from Kansas State University in May 2004. She was involved in research into how traditional diets of indigenous peoples compared in quality to diets that tribal peoples have today. Miriam worked with worked with Kimberly Shafer, MS, RD, Doctoral Candidate, Kansas State University and Barbara Lohse, PhD, RD, The Pennsylvania State University, State College, PA (see project description below).

QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.

Miriam Liftin-Salt and Kimberly Shafer organizing materials for interviews at Haskell Indian Nations University.

### **Project Description**

“A Descriptive Study of Native American Young Adults’ Cognitive and Affective Reactions to a Stage-Based Nutrition Education Intervention about Fruits and Vegetables”.

A minimum of 25 Native American young adults aged 18-24 years were recruited to participate in a cross-sectional descriptive study to provide feedback on components of a stage-based nutrition education intervention on fruits and vegetables. Young adults were required to participate in two phases of the study: 1) telephone assessment call and 2) cognitive interview. At recruitment, young adults received a fruit and vegetable magazine. Following recruitment, young adults participated in a 15 minute assessment call over the phone. The purpose of this call was to collect information on current fruit and vegetable intake and consumption behaviors. One week after completing the



assessment call, young adults participated in a face-to-face cognitive interview. During the interviews, young adults were asked for their reactions to two newsletters on fruits and vegetables, the magazine administered at recruitment, the assessment phone call, and the recruitment process. An incentive pay of \$20 was provided after the completed interview.

Role of Native American undergraduate research assistants: Two Native American undergraduate students have been assisting with recruitment by putting up fliers, attending Pow Wows, and through personal contact with potential subjects. The Native American students have provided input on development of the interview guide and participated in training sessions to become familiar with the interview process. They were also instrumental in piloting the cognitive interview guide with Native Americans. The primary role of the students was to conduct individual interviews with Native American young adults.

Current Status: Twenty-three Native American young adults have completed interviews. Recruitment has ended and the remaining young adults are participating in their assessment calls and interviews. One Native American student is working on the project and is currently interviewing young adults

**Sean Praeter** (Cherokee) Graduated with honors from the University of Kansas in the Spring of 2003. Sean conducted research into Environmental Justice issues on Tribal lands under the supervision of Dr. Pierotti. Sean will be attending Cambridge University.

**Jana Reid** (Lakota) Graduated from Haskell Indian Nations University in December 2003 and is currently a graduate student in Biology at Emporia State University. She has been involved in research in ichthyology and aquatic ecology, working in the University of Kansas Museum of Natural History for the last two years. She also attended OTS courses and conducted research in Costa Rica.

**Stan Holder** (Winnebago) is a junior at the University of Kansas, where he is majoring in Ecology and Evolutionary Biology. Stan has worked for the US Forest Service during the summer for the last three years, and on endangered Spotted Owls as his research for the last two years. He plans to go to graduate school after finishing his Bachelor's Degree. Stan is being mentored by Ray Pierotti.



Heidi Mehl collecting small mammal live traps at Kansas field site.

**Heidi Mehl** (Cherokee) is a senior in Ecology and Evolutionary Biology at the university of Kansas. Heidi is involved in research into the population dynamics of small mammals under the supervision of Dr. Pierotti. She is also studying issues involved in the evolution of aquatic organisms. Heidi will be participating in the Summer 2004 trip to Gorno-Altai State University in Russia where she will work with Drs. Jim Steichen and Larry Davis on a bioremediation demonstration project run by Dr. Aleinikova.

**Students participating in Siberia exchange program:**

**Myron Dewey** (Agui Diccutta band of Walker River Paiute) Graduated from Haskell Indian Nations University in Spring 2003. He was in the Information Systems program at Haskell and an intern in the HERS Center. He conducted research and gained experience in Wildland Firefighting Burn operations, line construction, briefing techniques and on-line survival techniques. Myron is interested in developing field-based approaches to firefighting and appropriate responses to threats from wildfires. Myron is working with Mike Cuenca and Bill Curtis to produce video documentaries of environmental research and create online materials for the UMEB program. Myron accompanied Siberian students and faculty to the Southwest in June 2003, documenting environmental issues on tribal lands and solutions employed to deal with these problems.



Myron Dewey (HINU student) at Monument Valley.

**Dustina Edmo** (Shoshone) Graduated from Haskell Indian Nations University in Spring 2003. She traveled to Siberia in 2001 with the Haskell students and faculty participating in the USAID/ALO and EPA sponsored water-quality monitoring program and worked with the Siberian delegation from Gorno-Altai State University during their visit to Kansas in 2002. Dustina traveled with Siberian students and faculty to the Southwest in June 2003, exploring environmental issues on tribal lands and the solutions that tribal environmental professionals are employing to deal with these problems.





Dan Wildcat (HINU faculty), Victor Lukyanenko (GASU faculty), Dustina Edmo (HINU student), and George Godfrey (HINU faculty) doing a presentation on Traditional Ecological Knowledge at the Altaian Lyceum in Gorno-Altai, Russia during the 2001 exchange.

**Allen Long** (Navajo) is a senior at Northern Arizona University majoring in Applied Indigenous Studies. His area of expertise is environmental problems on tribal lands and reservations and how these can be solved by employing a mix of traditional tribal ways with technological solutions derived from the dominant culture. He was a principal organizer of the exchange program trip to the Navajo and Hopi reservations in spring 2003. Allen is mentored by Ray Pierotti.





Allen Long (NAU student), Benny LeBeau (NAU student), Dan Wildcat (HINU faculty), David Khaydarov (GASU student), Julia Mekechinova (GASU student), Victor Lukyanenko (GASU faculty), Austin Cuenca (Junior High School participant), Rector Yuri Tabakaev (GASU faculty), and Nikolai Malkov (GASU faculty) at Canyon de Chelly.

### **Siberian Students Participating in Exchange Program**

**David Khaydarov** is a junior at Gorno-Altai State University in biology. David worked with Dr. Ray Pierotti to compare the impacts of traditional herding practices on water quality on the Navajo Reservation in Arizona and the Altai Republic in Siberia. He will be one of the participants in the 2004 trip by KSU and KU faculty and students to GASU to develop bioremediation demonstration projects in Siberia. David is mentored by Drs. Ray Pierotti (KU) and Nikolai Malkov (GASU).

**Victor Mamrashev** Graduate from Gorno-Altai State University in 2003 and is now on the faculty of the Department of Biology and Chemistry at GASU. Victor worked with two UMEB students at K-State to analyze the data collected from the USAID/ALO funded water-quality monitoring program during their visit to Kansas. Drs. Larry Davis (KSU) and Vera Aleinikova (GASU) mentored Victor.

**Yulia Mekechinova** Graduate from Gorno-Altai State University in 2003 and serves as an Altaian and English Language Instructor. Yulia has expertise in Indigenous Altaian traditional knowledge and worked with Dr. Ray Pierotti to compare the impacts of traditional herding practices on water quality on the Navajo Reservation in Arizona and the Altai Republic in Siberia.

### **Student Participants: The New Generation**

**Dawn Morningstar** (Choctaw) is a junior at SE Oklahoma State University who is majoring in Botany with an emphasis on ethnobotany. She is working this summer on ethnobotany and plant ecology with Ray Pierotti and Kelly Kindscher. She plans to transfer to KU and Haskell to complete her degree program.

**Arlene Marks** (Tlingit) is a sophomore at Haskell who is working on environmental aspects of health with her tribe in Alaska. She is conducting surveys of traditional ways of coping with health and dietary problems with Ray Pierotti.

**Erica Noguerra** (Guatemalan Mayan) graduated from KU in May 2004 with a degree in Anthropology. She studies the ethnobotanical aspects of traditional food preparation by indigenous peoples in Mexico and central America under the supervision of Kelly Kindscher.

**Bhani Singh** (Sikh) is a sophomore at University of Missouri Kansas City and KU working on evolutionary ecology in birds under the supervision of Dr. Pierotti and his Cherokee PhD graduate student, Lynnette Dornak. She is a National Merit Scholar.

### **Faculty Participants**

**Cynthia Annett** is a Research Associate Professor with the Hazardous Substance Research Center at KSU and a principal partner in The Civil Society Group, LLP. Annett holds a Ph.D. in aquatic ecology from UC Berkeley. She has worked with the Russian Academy of Sciences on scientific exchanges since 1991, and has made nineteen trips to Russia, including five extended field expeditions to the Altai Republic. Annett worked closely with GASU faculty members and UMEB participants Nikolai Malkov and Victor Lukyanenko in 1996 on a USAID sponsored project to develop an economic development plan for the Altai Republic. She returned to the Altai in 1997 with funding from the National Science Foundation to lead an expedition to survey fishes and assess water quality. She is responsible for coordinating a program sponsored by USAID, the US-Russia Bilateral Committee, USDA, NSF, and the EPA to increase the participation of Tribal College faculty and students in international research and education in environmental and health sciences. Dr. Annett coordinates the exchange program for mentors and students in the UMEB program traveling to Siberia.

**Mike Cuenca** is a Research Associate at the HERS Center at Haskell and a principal partner in The Civil Society Group, LLP. Cuenca holds an M.A. in interdisciplinary special studies (awarded jointly by departments of Radio/TV/Film, English, and Film Studies) and has more than 25 years of professional experience in mass communications and higher education. Cuenca was principal investigator on an NEH grant awarded to HERS to develop web-based support materials for a World Geography course for the North American Tribal Colleges (<http://www.seekpeace.com/hinu/Global.html>). He produced the documentary video report for the Haskell/Gorno-Altai exchange program (<http://www.seekpeace.com/KUSRVC/hinugasu.html>) and has filmed the 2003 exchange trip to Arizona with student participant Myron Dewey. Cuenca is a co-Principal Investigator on the USAID/ALO grant “Media relations for science reporting and environmental advocacy: facilitating higher education leadership and administration at Gorno-Altai State University” which is providing partial funding for the exchange program with GASU.

**Larry Davis** is a plant chemical ecologist with K-State’s HSRC, and is a leader of the experimental research that is being conducted on the fate and transport of methyl tert-butyl ether (MTBE), benzotriazole, and several other compounds. The objectives of the research are to; 1) exploit a well tested experimental system with subsurface aeration and plants to enhance contaminant transport through, and sorption to, plants; 2) further develop a comprehensive mathematical model to describe the fate of water, contaminant, root exudates, plants, microbes, and oxygen in laboratory and field settings; and 3) apply plant assisted bioremediation technology at field sites. He will supervise research relevant to environmental problems concerning toxic compounds on Indian reservations. This topic is of considerable interest to Environmental Science majors at HINU.

**Larry Erickson** is a chemical engineer who works on environmental issues and serves as Director of the Great Plains/Rocky Mountain Hazardous Substance Research Center, which has supported research into integrated pest management, bioremediation, and phytoremediation for more than 10 years. Dr. Erickson has been working on the beneficial effects of vegetation in contaminated soil through his program. Dr. Erickson also serves as the KSU PI on a grant from EPA that supports the HINU Siberia exchange program on water quality, and is a co-PI on the USAID/ALO Siberia grant. With Dr. Lawrence Davis, Dr. Erickson will supervise students who are interested in applied and agricultural aspects of environmental problems.

**Kelly Kindscher** is a biologist with the Kansas Biological Survey who studies plant community ecology, restoration ecology and ethnobotany. He works with students who are interested in plant research and traditional plant knowledge.

**Raymond Pierotti** is the Principal Investigator on this proposal. Being of Native American (Comanche) heritage and familiar with many of the problems faced by Native students planning careers in environmentally oriented research, Dr. Pierotti acts as a mentor and undergraduate academic advisor for all HINU students who transfer to KU to participate in the KU portion of the program. Dr. Pierotti served as co-PI on the KU LTREB project "Long-term studies of population and community ecology in an

experimentally fragmented landscape" (NSF DEB-9308065). Dr. Pierotti is trained in the population biology, ecology, and behavior of vertebrates and will supervise most research on animals by students opting for research in field ecology in Kansas.

**James Steichen** is a Professor of Biological and Agricultural Engineering at Kansas State University and the Associate Director of the National Institute for Land Management and Training.

**Dan Wildcat** (Yuchi) is a professor in American Indian Studies (HINU) and the Director of the Haskell Environmental Research Studies Center (HERS). He is one of the few Tribal College professors who regularly teaches World Geography, and has used his course to develop a successful international exchange program for Native students. As a faculty member in the department of Natural and Social Sciences he has extensive experience designing courses highlighting Indigenous perspectives. He is currently completing his PhD in Public Administration, integrating his Native American heritage into research on the administration of Tribal lands. Wildcat has published several papers and has co-authored a book on the importance of spatial worldviews to Traditional Knowledge of Indigenous peoples. Wildcat has pioneered methods for integrating Native American Traditional worldviews with modern science and technology.

#### **Siberian Faculty Participating in 2003 Exchange**

**Vera Aleinikova** is an environmental chemistry professor and head of the water quality-monitoring program at GASU. Dr. Vera Aleinikova has works closely with Larry Erickson and Larry Davis of KSU. During the 2003 exchange Dr. Aleinikova and her student Victor Mamrashev worked with two UMEB students at KSU to analyze the data collected from the USAID/ALO funded water-quality monitoring program. They are now making plans for a visit by Drs. Steichen and Davis with their UMEB students during summer 2004 to continue the project on water quality and stream remediation.

**Victor Lukyanenko** is Dean of Foreign Languages and head of International Programs at GASU. He has extensive experience in Russian-English translation, and serves in the role of chief interpreter for the government of the Altai Republic. Dr. Lukyanenko has worked extensively with the U.S. partners, including heading several exchange visits to the U.S. funded by USAID/ALO, USDA, and EPA. He is the Principal Investigator on the USAID/ALO environmental journalism project. His participation in the 2003 exchange was funded by the USDA-SCRIP program.

**Nikolai Malkov** holds a graduate degree in ornithology and teaches ecology and zoology. He has extensive experience coordinating international collaborative work, including a lead role on the Russian team that worked with the USAID planning team to develop a land-use and economic development plan for the Altai Republic. Dr. Malkov is of Altaian decent and is an expert on Traditional Ecological Knowledge. He was the principal investigator on the USAID/ALO water quality project and the USDA funded grazing land assessment projects and was co-author of the Red Book of the Altai



Republic. Dr. Malkov's participation in the 2003 exchange was funded by the USDA-SCRIP program.

**Yuri Tabakaev** is the Rector of GASU and holds a doctorate in philosophy. He traveled to the United States in 2002 on the USAID/ALO water-quality project. Dr. Tabakaev is of Altaian decent and an expert in Traditional Knowledge.

## **Reports by Gorno-Altai State University Student Participants**

### **David Khaydarov**

The problem of environmental protection and sustainable development attracts more and more attention nowadays. Industrial society has greatly influenced landscapes and climate, flora and fauna. The people whose life depended on nature now face the new problems and the new requirements of modern society. So indigenous people from different countries who used their lands in their own traditional way for a long time have got the same or very similar problems and now they are trying to preserve their traditions and cultural heritage.

And this summer we had an opportunity to compare the situation on the lands of Native Americans with the situation of native Siberian people—the Altaians. We took part in different meetings and presentations where we discussed the questions on the matter of grazing development, water quality monitoring and the problem of abandoned uranium mines with scientists and specialists from Northern Arizona University and the Navajo Nation EPA. The presentations with a lot of photo and video documents were really interesting and useful. I have found out many new facts about the meaning of Indian culture and traditions in solving the environmental problems.

To prevent the difficulties in sustainable land management our American colleagues successfully apply programs on ecological education, the aim of which is to explain the point of problems to the people. I am sure that we should use the same technologies working with indigenous people of the Altai. I was really impressed by the high level of techniques and equipment used in this field.

Another thing that excited me too was the beauty of the American landscapes. Sandstone red cliffs, deep canyons, boundless deserts are more than impressive! And as a biologist I should especially mention the great biodiversity of that region, rich in interesting plants and fascinating animals. I had a great opportunity to enjoy watching them.

I know that all knowledge, experience and impressions we got from this journey was the result of hard work of the people who had organized this visit and who spent their time to make it more enjoyable for us. We appreciate them and I want to give special thanks to Ray Pierotti, Cynthia Annett, Wendy Griswold, Allen Long, Dustina Abrahamson, Myron Dewey, Daniel Wildcat, Mike Cuenca, and everybody who made it happen!

## **Julia Mekechinova**

Vast deserts of red sand, fancifully shaped rocks, canyons, rivers, howling wind, white-hot sky and the yellow disk of the sun—I see and feel all that even though months have already passed since I came back home from my second visit to the United States of America, particularly to Arizona. The places we visited this time seemed so wonderful to see. I have never seen anything like the landscapes of Arizona. The nature is so roughly-beautiful, wild and virginal, though it is surrounded by highly industrialized and cultivated lands of modern America.

I live on the other side of the Earth, in Russia, in Altai. The place I live in is also very beautiful, but it is very different from the places I saw in America. The mountains of Altai are very high with white caps of glaciers. The white-water rivers run down the mountains with a roar and find peace only in green valleys in which numerous villages are situated. I love my place and I think that our nature is unique. But the same idea occurred to me when I saw the nature of Arizona; these places are unique! They are so wonderful that one cannot find words to express one's feelings and emotions, one's delight. You just grab your camera and try to capture the beauty of those places on film. For instance I have heard about the Grand Canyon many times before and I saw pictures of it, but when I saw it in reality I understood that it was something absolutely different from which I expected it to be. I must say that it was greater and even more impressive than I thought.

And I understand now that different places are different indeed, but all of them are unique and they all have their own beauty, power and their own life, be it the red sands of Arizona, the green hills of Kansas, the mountains of Altai, or any other place on the Earth. But to feel that power and beauty one has to be there, may be even to live there.

That is why all people love their own places just like I do love the places I live in. And that is certain that our nature influences our lives and characters just like we influence our nature. That means that people from different parts of the Earth are not alike, but one thing unites them—they all depend on nature, on lands and water. And we should understand that bare love is not enough, we must respect and protect our lands. Tom my mind traditional knowledge of indigenous people can help here very much. The indigenous tribes pile up their knowledge about how to treat their lands for ages and ages. They know so much about it, they feel and understand their lands. They know what one can do with them and what one should never do. And that is where tradition and science come together and compliment each other. Scientific programmes the aim of which is to show common people how to treat nature are very useful and necessary. And they become even more useful when they contain some grains of traditional knowledge of indigenous people. It gives some sincerity to such programmes and helps to feel them better.

We spent one day on the river Kaw in Kansas; that was a lovely day. We floated down the river and our instructors told us a lot about the river; about its hawks and its history. They answered all our questions and told us about the ecological problems of that place and what's very important they explained and showed us how we can contribute to the improvement of the situation. All that was so interesting and instructive, but not at all boring. It was quite an experience for me. So-called ecological tourism is becoming more

and more popular in our Republic as well. The instructors of the natural park “Utch-Ermek” also instruct the people how not to do a great deal of harm to, but on the contrary, how to prevent doing harm to nature. And the main principle of them is to adhere to the traditions of the Altai people.

So I can say that not depending on where and how we live, we must not forget that we all depend on our land. Our duty is to preserve it. And in our country if industry and hi-tech traditions come to help science indigenous people help researchers to solve different problems. And it should be so because those who think about the future must not forget about the past.

QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.

Dan Wildcat (HINU faculty), Vera Aleinikova (GASU faculty), Nikolai Malkov (GASU faculty), Victor Mamrashev (GASU student), Dustina Edmo (HINU student), and Larry Davis (KSU faculty) on the bank of the Kansas River in Lawrence, Kansas.

### **Victor Mamrashev**

It was my second visit to the United States. This time it was more scientific and more independent. After a few days in Lawrence, my group departed to Arizona, while I went to Manhattan, Kansas, where I was supposed to take part in scientific work of professor Davis' team.

Perhaps my sojourn in Manhattan was not as exciting as the journey of the other members of the group to Arizona, but I had a good time, too. I spent most of my time in professor Davis' lab editing my Bachelor's thesis, because I had to defend it right after my return home. Instead of working with his team I just watched. Nevertheless, I've seen and done very many interesting things.

Lawrence Davis and his research group are working on problems of soil and ground water remediation. As a result of human activities various pollutants get into soils and other components of the environment. When grazing lands and fields are polluted, the pollutants get into our bodies through the animal and plant tissues we eat, harming our health.

Contamination levels are growing year by year, because the quantities of chemicals we release into the environment are so big they can't be decomposed naturally. That's why it is so important to find effective and cheap methods of decomposing, or at least of collecting those chemicals.

This is what professor Davis and a number of other professors and students are doing. Their particular task is to find a way to clean up soils from octane boosters and anticorrosion color additives. They achieved significant results using plant alpha-alpha and some bacterial cultures. I think some principles could be applied to solve ecological problems we have in Altai Republic.

I also had some interesting tours. I visited Konza Prairie LTER. Visiting the Environmental Protection Agency in Kansas City and the nuclear reactor of Kansas State University were of particular interest to me.

When we visited the EPA, we were told about its management and work. It was especially interesting to me as a chemist and future ecologist to see modern powerful equipment (but one odd thing I noticed was that no one used the equipment at that time), to become acquainted with the analytical methods they use there.

I was surprised to know that the nuclear reactor was operated by students. I touched it! I was standing over its glowing heart! "How boring!" you might say, but it was very exciting for me.

What can I say in conclusion? I met old friends and got some new. I bought and was presented a number of interesting books (I'm going to use one of them to pass the exam and enter post-graduate school). I had a great opportunity to improve my English, because this time I was not accompanied by a translator and had to speak myself (during our previous trip, students who did not speak English properly always had interpreters—students of foreign languages department nearby, so we avoided speaking by any means). And finally I draw an inspiration for my future scientific work.