March 21, 2003

Dr. Gary Waxmonsky
US Executive Secretary
US Russia Environment Committee
Environmental Protection Agency
1200 Pennsylvania Ave. NW
MC 2650R
Washington, DC 20460

Dear Dr. Waxmonsky:

We have completed the activities required by the grant "Science and Traditional Knowledge: International Exchange of Indigenous Peoples in Water Quality Monitoring and River Management between Russia and the United States". Please find enclosed the final report, a DVD copy of the documentary video produced on the exchange, and a CD of photos documenting activities.

Thank you for your support of this valuable endeavor. Please contact either of us if you have any questions regarding this report.

Sincerely,

Wendy Griswold
Project Manager
785-843-3659
grizmart@swbell.net

Larry Erickson, Ph.D.
Center Director
785-532-2380
lerick@ksu.edu

Science and Traditional Knowledge: International Exchange of Indigenous Peoples in Water Quality Monitoring and River Management between Russia and the United States

Final Report

Prepared by the
Center for Hazardous Substance Research
Kansas State University

March 21, 2003

Project Overview

In 1999, Gorno-Altaisk State University (GASU), Haskell Indian Nations University (HINU), Kansas State University (KSU), and the University of Kansas (KU) joined together to create a partnership to address water quality issues common to both the Russian Federation and the U.S. With initial funding from the U.S. Agency for International Development/Association Liaison Office, the partners engaged in exchange activities to develop a model program for community-based drinking water quality monitoring in remote villages in the Altai Republic of Russia, which would be culturally relevant to indigenous populations living in remote areas. This project provided the first international student and faculty exchange opportunity for HINU.

With additional support from the U.S. Environmental Protection Agency (EPA), the partnership provided training to Russian and U.S. partner institution participants in scientifically rigorous water quality assessment methodology, and in capturing and interpreting traditional ecological knowledge. The partners developed training modules for use by elementary and secondary schoolteachers and community groups who formed a water quality monitoring network in the Altai Republic. EPA support allowed the partners to initiate a technical environmental extension capacity at GASU.

Impacts of EPA Support

Funds provided by U.S. EPA for this initiative enabled the partners to increase number of participants and exchange opportunities; significantly increase the monitoring capacity in the Altai Republic through the purchase of water quality test kits and a spectrophotometer; expand the institutional capacities of GASU and HINU; provide opportunities for interaction with Russian and U.S. government representatives; and provide equipment and supplies for the production of a video documentary on the project for use in classroom instruction and community outreach.

Travel and Exchange Opportunities

In Summer 2001, two HINU faculty (George Godfrey, Pottawatomie; Dan Wildcat, Euchee) and seven HINU students (Dustina Edmo, Shoshone; Glen Gary, Lakota; Krystale Head, Cherokee; Stefanie Reyna, Taos Pueblo; Tina Scott, Creek; Sheldon Selwyn, Nakota; and Marie Spaola, Lakota) traveled to the Altai Republic. The purpose of the trip was to field test appropriate methods of water quality assessment in the area. The partners purchased 27 water quality testing kits for use during fieldwork and for limited distribution and use the Altai Republic.

During the summer 2001 fieldwork, the group collected water samples from Altai National Park water sources. They spent three days in the field and were joined by a group of approximately 70 high school students from all over the republic who were attending an environmental camp. Samples of water were collected from the local river, streams, and other natural sources. Results of the tests were given to representatives from the local natural reserve. Three water testing kits were also left for the reserve staff to use for future tests. Similar water sampling and testing was done at water sources such as

Lake Teletskoe, springs and wells in surrounding regions, and within the city of Gorno-Altaisk.

EPA funds also supported a request from Vera E. Mel'chenko, the scientific deputy director of the Katunsky Reserve, for Drs. Malkov (GASU) and Annett (KSU/HINU) to conduct a workshop on water quality and management of aquatic resources for her staff. The Katunsky Biosphere Reserve is part of the new World Heritage Site in the Altai established by IUCN/UNESCO under the World Heritage Convention for both cultural and natural resource values. Dr. Alexander Golubtsov of the Russian Academy of Sciences Severtsov Institute in Moscow, joined Drs. Malkov and Annett to assess the health of the fisheries and discuss water quality and fisheries management issues with reserve staff.

During May 2002, four faculty and administrators and four students from GASU visited their Kansas partners at four educational institutions, Haskell Indian Nations University, the University of Kansas, Bethany College, and Kansas State University. Participants in the exchange were Yuri Tabakaev, rector; Victor Lukyanenko, dean of foreign languages and director of international programs; Nikolai Malkov, biology professor; Vera Aleinikova, dean, chemistry and biology department; and students Oxana Kolbeshkina, biology; Victor Mamrashev, chemistry; Maria Usova, languages; and Julia Mekechinova, languages.

The group spent several days at Bethany College in Lindsborg, Kansas, hosted by Dr. Mikhail Korenman, a chemistry professor and director of international programs. Dr. Korenman worked with GASU students and faculty and two Haskell students in advanced water chemistry techniques, including an analysis of water samples from the Altai Republic and samples collected from rivers in Kansas. Faculty and students received training in laboratory analyses, including use of a spectrophotometer; in using a portable water chemistry lab; and in software to collect and record data. In addition to being trained in water chemistry analysis, the group filmed a training video in Russian on how to use a spectrophotometer and water quality test kits. Dr. Korenman also provided Dr. Aleinikova with teaching materials used in his chemistry classes.

The group spent several days at Kansas State University in Manhattan, Kansas. During this time, faculty met with the dean of agriculture and representatives from the Agricultural Extension Program. Their discussions focused on potential collaboration regarding the impact of grazing on water quality, grazing land management, and resource management. Drs. Vera Aleinikova and Larry Erickson discussed the next steps for addressing water quality issues in the Altai Republic and developing educational programs in order to continue water quality work beyond the end of the current project.

Monitoring and Institutional Capacity

The scientific capabilities of GASU were significantly impacted by this project. The chemistry and biology department received a donation of water quality analysis equipment from Bethany College. This equipment included three sets of pH meters, oxygen meters, temperature probes, and calculators for use in on-site field sampling of

water sources. Use of this equipment and water test kits gives GASU the opportunity to test water quality on a regular basis, which they had not been able to do previously.

A spectrophotometer was purchased for GASU using funds provided by the EPA. The spectrophotometer will allow GASU to do more scientific and more accurate tests at the university labs and during fieldwork.

One hundred water quality test kits were purchased with EPA funds and supplied to GASU for distribution to schools in the Altai Republic. Instructions for the test kits were translated into Russian by GASU language students during their visit to Kansas. The instructions are supplemented by introductory material tailored to the GASU water quality monitoring program which will be published in both the Russian and Altaian languages.

In addition, the GASU chemistry and biology department was provided with several publications focused on informing citizens about water quality. These publications included EPA documents from the Office of Water Quality, such as "Private Drinking Water Wells," "Total Maximum Daily Load Program," "Water on Tap: A Consumer's Guide to the Nation's Drinking Water," and "Drinking Water and Health: What You Need to Know."

Curriculum offerings at GASU have also benefited from EPA support:

- Nikolai Malkov teaches an ecology course in four departments (biology, agriculture, geography, and languages). Information from the water quality monitoring project has been incorporated into each course.

- Vera Aleinikova created a new course on water chemistry. Methods of field analysis using the test kits are taught in this course, and the spectrophotometer will be used for demonstrations.

Results of the water quality analyses conducted during summer 2001 were presented by Victor Mamrashev, GASU student, in the Ecological-Biosphere Competition among universities of the Siberian Region in Novosibirsk, during spring 2002. Mr. Mamrashev presented an overview of the ALO project and data from field work he conducted with the help of HINU students. The meeting was attended by representatives from 11 universities, and GASU was awarded sixth place in the competition.

Two GASU students are conducting their diploma works based on this project's activities.

A video documentary of the exchange has been posted online for use in Dan Wildcat's World Geography course at HINU (http://www.seekpeace.com/civil/hinugasu.mov). Copies of this documentary have been placed in the libraries at HINI and KSU and the Slavic Languages and Literatures collection at the University of Kansas. It has also been made available for class use online at http://www.engg.ksu.edu/HSRC/international/altai.html. (Streaming Video: Community-

Based Drinking Water Quality Analysis: A partnership between Gorno-Altaisk State University and Haskell Indian Nations University).

Interactions with Governmental Representatives

One of the most important goals of the overall program is to find ways to implement results of this work in a sustainable fashion that will have direct, quantifiable impact on the health of the people of the republic, conservation of natural resources, and economic development of the region. Several meetings were conducted with community leaders, conservation officials, politicians, and the business community to explain the program, obtain input on ways to implement a water quality assessment network, and to learn about how different stakeholders view our work.

Meetings with Local Governments

- A series of meetings were held between the mayor and vice mayor of Gorno-Altaisk, the capital of the Altai Republic, and faculty and administrators from GASU and U.S. partners
- Drs. Annett and Malkov visited the southern region of the Altai Republic for discussions about water quality and aquatic resource conservation with local village leaders, government officials, and officials from the border guard stations who manage the region along the Chinese and Mongolian borders.
- Information about the project, as well as the final report from the previous USAID sponsored project on sustainable development, was distributed throughout the Kosh-Agach district and the Ukok Quiet Zone (UNESCO World Heritage Site).
- GASU toured a local elementary and secondary school in Lindsborg, Kansas, providing opportunities for the Russian partners to learn more about techniques used in science education in American schools.
- HINU delegation toured schools in Gorno-Altaisk to learn about techniques used in science education in Russian schools.

Meetings with Tribal Governments

- The group toured a riverbank filtration project that has been set up by the Prairie Band Pottawatomie Nation, and discussed how this could be used as one possible solution to water quality issues in the Altai Republic.

Meetings with Republic Representatives

- Drs. Annett and Malkov met with Vassiliy Manyshev, the head of the Federal Committee on the Environment for the Altai Republic, to discuss cooperative work with his ministry.
- Representatives from U.S. partners and GASU held discussions with the First Deputy Head of the Republic, Yurij Vasilievich Antaradonov, about the potential for enlisting the Altaian language schools in the water quality monitoring program.
- The partners met with the Minister of Culture, the Chairman of the Altai Republic Parliament, and heads of the Kazakh and Azerbaijani Cultural Centers to discuss the participation of diverse ethnic groups in the project.

- The HINU exchange delegation met with the Altai Republic's minister of economy.
- Drs. Malkov and Annett led discussions in Ust-Koksa and the Katunsky Reserve with dozens of reserve staff (ranging from the deputy director for science and the reserve director, to wardens, conservation staff, and personnel involved with the development of ecotourism associated with the reserve), local politicians, and villagers.
- The rector of GASU is a member of the Altai Republic parliament and as a lawmaker he has many contacts with local MPs and government officials. The project has been discussed with a number of members of the parliament and the government of the Altai Republic (including the head of the Republic, Mikhail Lapshin, and his first deputies). In part, because of these discussions, the newly adopted law on natural resources reflects concern for the purity of drinking water in communities and the desire to make existing laws work.

Meetings with Regional Administrators in Russia

The rector of GASU has participated in regional and national meetings concerning the administration of elementary and secondary schools in Russia. He presented the results of these panel meetings to the participants in our program, and discussed ways in which the USAID/ALO funded project could also enhance science education in the republic's schools.

Meetings with U.S. Government Agencies

- Reports from the USAID funded program implemented by Ecologically Sustainable Development were presented by the Russian partners to Dr. Annett for distribution. The Russian language report from this previous project provides a plan for ecologically sound land management practices and economic development, and was the impetus for development of the water quality project funded by ALO. Dr. Annett carried the reports back to Moscow and presented them to Evelyn Wheeler, First Secretary for Technology and the Environment at the American Embassy; the USAID mission; and brought additional copies back to the U.S. for distribution.
- American partners met with the USAID Mission at the American Embassy in Moscow and apprised them of the progress that had been made during each phase of the project, providing them with copies of the six-month and twelve-month reports and other materials generated in the course of the project (a total of seven meetings).
- The HINU faculty and students traveling to the Altai Republic in Phase II met with the USAID Mission staff at the American Embassy in Moscow to discuss the tribal college system and traditional knowledge.
- American partners met with NEH, USDA, and USAID officials in Washington, D.C., during Phase I of the project to discuss potential supplemental funding sources.
- Discussions were initiated between the partners and representatives of the ARIOS-Kansas project. ARIOS-Kansas is the Kansas branch of the Russian-

American Association for the Development and Integration of Educational Systems.

Meetings with Non-Governmental Organizations

- During the Phase II Summer 2001 exchange, Haskell students Stefanie Reyna and Marei Spaola attended a meeting of the Gorno-Altaisk Rotary Club Chapter at the invitation of the club's former president.
- Reyna and Spaola gave a presentation on their trip to the Altai Republic to the Oskaloosa Rotary Club Chapter in Kansas.
- During the summer 2002 exchange, faculty from the GASU delegation were guests at a Manhattan Rotary luncheon.
- Drs. Malkov and Annett conducted a workshop on water quality and management of aquatic resources at the Katunsky Biosphere Reserve, part of the new World Heritage Site in the Altai Republic established by IUCN/UNESCO under the World Heritage Convention for both cultural and natural resource values
- GASU and HINU faculty toured the Kansas River and met with RiverKeeper program representatives to discuss techniques and strategies for preserving rivers and protecting water quality. The American partners were subsequently asked to provide training in water quality monitoring and education to members of NGOs interested in conserving rivers in Kansas. The RiverKeeper and the Friends of the Kaw will host a canoe trip for the Siberian delegation during their summer 2003 visit to Kansas.
- Dr. Annett met with project directors at the Academy for Educational Development (AED) to discuss possible ways in which AED could work with the partners to extend the current project.
- Dr. Annett made a presentation on the USAID/ALO project at a meeting of the Society for International Development, attended by representatives from USDA, AED, and several Washington-based NGOs and CSOs in March 2001.
- HINU representatives have met with the Wetlands Preservation Committee to report on the Haskell/GASU exchange.

Future Plans

The water chemistry test kits provided by EPA funds were distributed among schools in several districts of the Altai Republic including Kosh Agach, Ulagan, Ongudai, Turachak, Maima, and Chemal. These districts were chosen because of the strength of their science education programs, their locations in the republic, and their degree of concern about water quality degradation. An effort was made to also include school districts with large Altaian populations (Kosh Agach, Ulagan, and Ongudai). Four secondary schools in Gorno-Altaisk (National Lyceum, Gymnasia #3, City Lyceum, and Republican Lyceum) also received kits. In addition, seven districts in the neighboring Altai Krai have received test kits. Teachers and students in the participating districts have received training in use of the test kits, and will monitor water in their districts during both the fall and spring semesters. Data will be provided to Dr. Aleinikova at GASU for archiving and analysis.

Dr. Aleinikova and her students will analyze the data during their visit to Kansas in June 2003 when they will be participants in the K-State/KU NSF-UMEB project (National Science Foundation, Undergraduate Minorities in Environmental Biology Program. "Recruiting Native Americans into the Environmental Sciences," Ray Pierotti, KU, and Larry Erickson, KSU. $443,000. NSF Proposal Number 0203404). Drs. Larry Erickson and Mikhail Korenman will work with Dr. Aleinikova and her students to create an online database. They will also make plans for a visit by Dr. Erickson and his colleagues during summer 2004 to continue the NSF-UMEB project on stream remediation.

Data from the water quality monitoring program will be used as a case study for our new USAID/ALO grant ("Media relations for science reporting and environmental advocacy: facilitating higher education leadership and administrative transformation at GASU," Larry Erickson, Victor Lukyanenko, and Mike Cuenca, co-PIs. $125,000. Partnering with Higher Education for International Development 2002 Special Request for Applications.). We plan to use the activities funded by the new ALO media grant to facilitate dissemination of information about water quality in the Altai Republic.

Dr. Aleinikova will present the scientific results of the water quality monitoring program during the 1st International Forum of Analytics and Analysts in Voronezh, Russia, June 2-6, 2003 (http://www.vgta.vrn.ru/forum/inf-engl.htm). Drs. Aleinikova (GASU) and Korenman (Bethany) will co-author a paper on results of the water quality work conducted in May 2002. This paper will be submitted to the International *Ecological Congress Journal* for publication.

A delegation from GASU will visit Kansas in June 2003 to complete work on a project focused on graze land management and its impacts on water quality funded by USDA and the NSF-UMEB program (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-Altaisk State University, Russia." Dan Wildcat, HINU and Nikolai Malkov, GASU. $44,987.). These new grants will allow us to significantly advance the water quality monitoring work initiated by the original EPA/USAID-ALO funded project and to initiate remediation programs in areas with degraded water sources.

We are currently seeking additional funds to purchase chemicals to restock the water testing kits so that we can continue the monitoring work initiated last year with EPA funds.

Budget report

Science and Traditional Knowledge
Fiscal Status for period 6/25/01-12/31/02

Categories	Total Approved Budget	Expenditures	Remaining Funds
1. Personnel	0	0	0
2. Fringe Benefits	0	0	0
3. Travel	$11,499.39	$11,499.39	0
4. Equipment	4452.12	4452.12	0
5. Supplies	6259.77	6259.77	0
6. Contractual	19079.87	19079.87	0
7. Construction	0	0	0
8. Other	11,470.40	11,470.40	0
9. Total Direct Charges	52761.55	52761.55	0
10. Indirect Costs	14,013.45	14,013.45	0
11. Total	66,775	66,775	0

Appendices

A. Test kit translation

Introduction

Oh, sacred Waters,
Be our protection
Satisfy our thirst
Give us happiness
Which is higher than any treasure
Higher than all world rulers.
Oh, Waters, give us the blessed consolation.

"Rigveda", sacred Indian book

Nature is sacred for native Altaian people. Mountain tops and passes, huge Siberian pines, animals and birds are addressed as human beings. Still, rivers, lakes and springs occupy a special place in the life and folk-lore of the Altaians. Practically every river and lake has a legend or a story devoted to it. One can recognize a sacred spring seeing pieces of cloth tied to the trees nearby. Water is the highest treasure of nature for the Altaians.

Water is the most precious resource, which provides the existence of all living beings on the Earth. Living organisms are connected by thousands of threads with water. The Mongolian proverb says: "A man starts to value water only after the last spring dies".

Water is most sensitive to pollution. Household and industrial waters turn clear rivers, which were rich in fish, into muddy pits filled with poison and microbes. Excessive abundance of blue-green water plants leads to a low content of oxygen in water and to a slow dying of life in a water reservoir. Water quality issues and observance of necessary sanitary norms is considered one of the basic priorities, which can provide sustainable economic and ecological development of the Altai Republic. Following are the translated instructions from the water quality kits being distributed in the Altai Republic (LaMotte Low Cost Water Monitoring Kit 5886).

Предисловие

О, священные воды,
Будьте нашей защитой
Утолите нашу жажду,
Дайте нам счастье,
Которое выше всех ценностей
Выше всех правителей мира,
О, воды, дайте нам
Святое утешение.
Ригведа
Священная древнеиндийская
Книга

Природа священна для алтайцев. Горные вершины и перевалы, огромные кедры, животные и птицы были одушевленными для них. И все-таки реки, озера и родники занимают особое место в жизни и фольклоре алтайцев. Практически каждой реке и озеру посвящена легенда. Священные источники легко узнать по полоскам белой материи, привязанным к рядом стоящим деревьям. Вода самый дорогой дар природы для алтайцев.

Вода – самый драгоценный ресурс, обеспечивающий существование всего живого на Земле. Живые организмы связаны с водой тысячами нитей. Монгольская пословица говорит: « Человек начинает ценить воду только после высыхания последнего родника.»

Вода очень чувствительна к загрязнению. Бытовые и промышленные стоки превращают богатые рыбой реки в грязные канавы полные яда и микробов. Увеличенное количество сине-зеленых водорослей приводи к пониженному содержанию кислорода в воде и медленному исчезновению жизни водного резервуара. Вопросы качества воды и соблюдение необходимых санитарных норм являются одним из основных приоритетов, который может обеспечить устойчивое экономическое и экологическое развитие Республики Алтай.

Dissolved-oxygen Procedure

Определение содержания кислорода в воде

1. Измерьте температуру образца воды при помощи шкалы.
2. Зачерпните пробиркой воду, чтобы вода покрывала ее до краев.
3. Опустите две таблетки реактива на растворенный кислород в воду.
4. Закройте пробирку крышкой. Убедитесь, чтобы в воде не было пузырьков воздуха.
5. Взболтайте содержимое до полного растворения реактива. Это может занять 4 минуты.
6. Подождите 5 минут до появления цвета.
7. Сравните полученный цвет образца воды с таблицей для определения содержания кислорода. Результаты опыта запишите в промилле.

Biochemical Oxygen Demand (BOD)

Биохемическое потребление кислорода (БПК)

БПК – это определение количества растворенного кислорода, используемого бактериями при распаде органических отходов. Из-за того, что в загрязненных реках и стоячей воде бактериями потребляется большое количество кислорода, возникает его недостаток для развития других водных организмов.

BOD Procedure

Определение БПК

1. Зачерпните пробиркой воду, аккуратно закройте пробирку крышкой, оставляя в ней как можно меньше воздуха.
2. Оберните пробирку алюминиевой фольгой и оставьте в темном месте при комнатной температуре на 5 дней.
3. Разверните пробирку, опустите две таблетки реактива на растворенный кислород.
4. Закройте пробирку крышкой. Убедитесь, чтобы в воде не было пузырьков воздуха. Взболтайте содержимое до полного растворения реактива. Подождите 5 минут.
5. Сравните полученный цвет образца воды с эталонами цветов.

Разницу между уровнем растворенного кислорода в незакрытой фольгой пробирке и закрытой и составляет биохемическое потребление кислорода в образце воды.

Nitrate

Нитраты

Нитрат необходим водным растениям и животным для образования белка. Распад отмерших растений и животных организмов освобождает нитрат в водную среду. Содержание нитрата в воде ускоряет процесс роста и разложения растений, тем самым снижая уровень кислорода в воде. Сточные воды – это главная причина повышения содержания нитрата в водной среде, в то время как удобрения и стоки вод с сельскохозяйственных полей тоже ведут к его увеличению. Питьевая вода с высоким содержанием нитрата влияет на способность крови человека принимать кислород. Вы обязательно должны провести профессиональное тестирование питьевой воды на содержание нитрата.

Nitrate Procedure

Нахождение нитратов

1. Наполните пробирку водой до шкалы 5 мл.
2. Опустите в пробирку одну таблетку реактива на нитрат.
3. Закройте пробирку крышкой и взболтайте содержимое до полного растворения реактива.
4. Подождите 5 минут до появления красного цвета.
5. Сравните полученный цвет образца воды с эталонами цветов. Результаты опыта запишите в промилле.

pH

pH

Измерение pH – это измерениие качества воды на кислотность и основность. Шкала pH изменяется от 0 (повышенная кислотность), до 14 (повышенная основность), где 7 – нормальный показатель. Нормой pH в воде является 6.5 – 8.2. Большинство водных организмов адаптируются к особому уровню содержания pH и могут погибнуть при его малейшем изменении.
На содержание pH могут повлиять воды промышленных отходов, воды с сельскохозяйственных земель, а также неправильная организация добычи полезных ископаемых.

pH Procedure

Нахождение pH

1. Наполните пробирку водой до шкалы 10 мл.
2. Опустите в пробирку одну таблетку реактива на pH.
3. Закройте пробирку крышкой и взболтайте содержимое до полного растворения реактива.
4. Сравните полученный цвет образца воды с эталонами цветов. Результаты опыта запишите в промилле.

Phosphate

Фосфаты

Фосфат необходим для роста ростений и животных, поскольку он является основным элементом метаболических реакций. Повышенное содержание фосфата может вызвать отклонение от нормального роста растения, что приведет к повышению активности бакотерий и снижению уровня растворенного кислорода в воде.
Фосфаты появляются вместе с отходами жизнедеятельности человека, в связи с промышленным загрязнением, стоками вод с сельскохозяйственных угодий и т.д.

Phosphate Procedure

Нахождение фосфатов

5. Наполните пробирку водой до шкалы 10 мл.
6. Опустите в пробирку одну таблетку реактива на фосфат.
7. Закройте пробирку крышкой и взболтайте содержимое до полного растворения реактива.
8. Подождите 5 минут до появления голубого цвета.
9. Сравните полученный цвет образца воды с эталонами цветов. Результаты опыта запишите в промилле.

B. Publications

Calhoon, J. A., Wildcat, D. R., Annett, C., Pierotti, R., & Griswold, W. (accepted for Special Edition: Programs that work). Creating Meaningful Study Abroad Programs for American Indian Post-Secondary Students. Journal of American Indian Education.

Calhoon, J.A., W.M. Griswold, J.L. Ivie, and C.A. Annett. “Water Monitoring Project Links Indigenous Students from Kansas and Altai.” Journal of the Initiative for Social Action and Renewal in Eurasia, Spring 2002, volume 5, Issue 1, pages 28-29. URL: <http://www.isar.org/isar/archive/GT/GT14griswold.html>

Griswold, W.M. and C.A. Annett. “Kansas-Siberia partnership addresses drinking water quality issues in rural and indigenous communities.” International Ecological Congress Journal, Spring 2002, volume 5, number 2, pages 39-41.

C. Newspaper Articles

The Lawrence-Journal World, Volume 141, Number 310, November 6, 1999, “Water expertise flows to Siberia,” by Dave Ranney. (http://www.webarchives.net/november_1999/group_hopes_for_russian_exchange.htm)

Earth Medicine, Volume 6, Number 2, Fall 1999, “HINU and Siberian university partner to assess water quality.”

The Indian Leader, Volume 104, Issue 6, November 13, 2000, "Altai exchange program," by Glen Gary, student participant in the ALO exchange program.

The Lawrence-Journal World, April 23, 2001, "Haskell delegation building warm relationship with Siberians, by Dave Ranney. (http://www.ljworld.com/section/citynews/story/50279).

The Lawrence Journal-World, May 14, 2002, "Russian visitors tour wetlands," by Dave Ranney (http://www.ljworld.com/section/citynews/story/92855).

Lindsborg News Record, May 23, 2002, "Siberians bring water from home for tests at BC."

The Altaidyn Cholmony (Altaian language newspaper) and the TV news in Gorno-Altaisk reported on the March 2001 visit by U.S. partners.

1999 – Zvezda Altaya (The Altai Star). Title – "Joint project of the universities." Victor Lukyanenko and Nikolai Malkov were featured. The article contained a description of the project and the prospects of its development. Also included was information on the purpose of the project, universities, USAID, and U.S. partners.

March 2001—Zvezda Altaya (The Altai Star). Title – "The festival in the city." The article was about the Nauryz (Moslem) festivities in the city of Gorno-Altaisk. The author noted, "That was a very nice surprise to be greeted by a representative of the Euchee Tribe who wished warm sun and clear water to the Altaian people."

Summer 2001—Zvezda Altaya (The Altai Star). An article about the Haskell students. The article presented information about the project, English language classes, and the chance for GASU students to go to the U.S.

Summer 2001 – Ulala (The Altaian language newspaper). An interview with Dustina Edmo, HINU student from the Shoshone-Bannock Nation.

2002—Post Scriptum. The article reported on a press conference held at the university after the GASU delegation's May visit to the U.S. where results of the trip and its benefits to the university, faculty, students, and water quality was discussed.

2002—Zvezda Altaya (The Altai Star). Title – "The grant of the future." Nikolai Malkov and Victor Lukyanenko were interviewed about their recent trip to the U.S. The article focused on how we live on a very small planet, which needs the concern of ecologically minded people.

2002—Zvezda Altaya (The Altai Star). An article about GASU biology students. Of specific interest is the mention of Lena Vysotskaya, who received a monetary award from

the Altai Republic government and the World Wildlife Federation for her work based on fieldwork accomplished with Nikolai Malkov and Cynthia Annett, and related to the USAID/ALO project.

2002—Zvezda Altaya (The Altai Star). Title — "To the ecological well being." Interview with Cynthia Annett and Wendy Griswold on the conclusion of the initial project and future collaborations.

D. TV/Video Broadcasts

March 2001 – Nauryz interview, GTRK (State Television/Radio Company)

Summer 2001 – Republic's anniversary interview, GTRK (State Television/Radio Company)

Summer 2001 – Interview of Dustina Edmo, GTRK (State Television/Radio Company)

Summer 2001 – Dance performance (at gymnasium and celebration), GTRK (State Television/Radio Company) and Planet Services Company

June 2002 – Press conference held by university – attended by over 80 people, including some from different parts of the republic, GTRK (State Television/Radio Company)

2002 – Community meeting at the gymnasium to discuss the recent visit of GASU representatives to Kansas (was video taped).

2002 – Lena Vysotskaya on television about her participation in the field trip, GTRK (State Television/Radio Company)

E. Online Resources

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

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

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