

ARCTIC RESEARCH

IN THE UNITED STATES

Alaska and Soviet Science A Symbiotic Relationship

Development of Alaska-Soviet ties over the past two years has proceeded at a phenomenal pace, evolving into an ever closer and more productive relationship. The University of Alaska has participated in this process, and its scientific work has benefited immeasurably from these results of *perestroika* and *glasnost*. For scientists on both sides, this is an era of exciting, high-paced scientific activities. Soviet and Alaska scientists are today engaged in dozens of cooperative research projects, and more are created all the time. With the establishment of a joint Soviet-American scientific center in the Soviet Far East and the involvement of other U.S. institutions, the future looks highly promising for continued and expanded bilateral and circumpolar collaboration.

Alaska-Soviet Bonds

Scientific ties are occurring in the context of broad-scale interactions between Alaska and its Soviet neighbors. This interaction covers not just science but the full gamut of common interests: commerce and business management, transportation and communication, medicine and health, housing and construction, education, environmental protection, culture and art, sports and recreation, media, religion and others.

Alaska's bonds with the Soviet Union, particu-

larly with the Far East and Siberia, are grounded on several factors:

- Close proximity: only some 50 miles separate the American and Eurasian land masses across the Bering Strait, and but three miles separate the two Diomedede Islands in the U.S. and the U.S.S.R.
- Similar physical and biological characteristics of geology, flora and fauna, marine environments, climate, resources endowments and other natural conditions
- Common history and related cultures: indigenous peoples on both sides of the Bering Strait share family ties, language, lifestyles and values; Russians ruled Alaska until 1867; Russian Orthodox churches abound through parts of Alaska
- Comparable problems of human habitation, economic development and environmental protection in the North and in remote regions

In addition, Alaska has emerged as a direct and convenient bridge between the U.S. and U.S.S.R. No longer do Alaskans have to go around the globe through Europe to reach their neighbors across the Bering Strait. Regular air linkages have now been established via charters. Bering Air, a commuter carrier, in 1990 flew over a hundred charter flights between Nome and Provideniya, on the opposite side of the Bering Strait.

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Aeroflot, the Soviet airline, this year carried thousands of passengers between Alaska and the U.S.S.R., with flights originating not only in the Far East (Magadan, Anadyr and Khabarovsk) but also as far away as Moscow and Kiev. During the summer, Aeroflot charters averaged more than one

flight next year through use of both U.S. and Soviet satellites.

These developments have been both a result of and a stimulant to interaction with Alaska's Soviet neighbors. The relationship now permeates the state's business, political and civic consciousness. From slow beginnings in early 1989, numerous joint business ventures have been established, dealing in import and export of goods, manufacturing, mining, tourism and other activities. They involve large and small businesses, Alaska Native corporations and petroleum and mining companies. Soviet guests are regular participants in various meetings, such as the annual judicial conference and the Alaska mining congress. Art exhibits and musical performances have become regular visitors across the border. State, local and federal officials are among the frequent travelers. Religious connections have been established; an ecumenical center is being jointly developed in Magadan. Students from school districts throughout Alaska have participated in exchanges with schools as far away as Moldavia in southwestern U.S.S.R. These are but examples of what is occurring between Alaska and the U.S.S.R.

The University of Alaska (UA) is among those actively engaged in Soviet activities. It is party to a student exchange agreement with the U.S.S.R. State Committee on Public Education and has individual agreements with institutions of higher learning. Soviet students are pursuing graduate as well as undergraduate studies at UA campuses in Anchorage, Fairbanks, and several rural communities and UA students are enrolled on the Soviet side. It is in the area of research, however, that the university is most thoroughly involved.

Foundation for Alaska-Soviet Research Cooperation

Since Alaska is the United States' only territory located in the Arctic and Subarctic, it is not surprising that the University of Alaska has a special focus on the unique environments and conditions of the North. Today, more than 20 UA research centers deal with the particular conditions and scientific opportunities found in the polar and circumpolar region. They include the Institute of Arctic Biology, the Geophysical Institute, the Institute of Marine Science, the Institute of Northern Engineering, the Institute of Social and Economic Research, the Institute for Circumpolar Health Studies, the Center for High Latitude Health Research, the Alaska Native Language Center, the Agricultural and Forestry Experiment Station, the Alaska

a week, and on occasion three Soviet planes at a time could be seen at Anchorage International Airport. Fairbanks also had direct flights from Khabarovsk and Yakutsk. Under an agreement signed by Presidents Bush and Gorbachev, regular air service by Alaska Airlines and Aeroflot between Anchorage and Magadan/Khabarovsk will begin in 1991.

Ties have also been facilitated by establishment of direct telephone service from Alaska to Provideniya and Anadyr in the northeastern U.S.S.R. Alascom, the state's largest long-distance carrier, is scheduled to expand telecommunications con-



Professor Michael Krauss of Alaska Native Language Center explains the sound system of their Inupik language to Soviet Eskimo students at Herzen Pedagogical Institute in Leningrad.

Center for International Business, the Alaska Cooperative Wildlife Research Unit and the Arctic Environmental Information and Data Center.

These and other university centers have ongoing scientific collaboration with Soviet colleagues and institutions, as well as with individuals and organizations in the U.S. and other parts of the world.

Much of the Alaska-Soviet activity is carried on, or at least had its beginnings, under national agreements between the United States and the Soviet Union. Key among these are

- The agreement for scientific cooperation between the U.S. National Academy of Sciences and the U.S.S.R. Academy of Sciences, first signed in 1959
- The agreement on scientific research between the U.S. and U.S.S.R. governments, first executed in 1972 and now specifically providing for cooperation in Arctic issues, and this year for the first time including social sciences
- The environmental protection agreement, entered into in 1972 and renewed ever since, including Arctic and Subarctic ecosystems and other Arctic issues

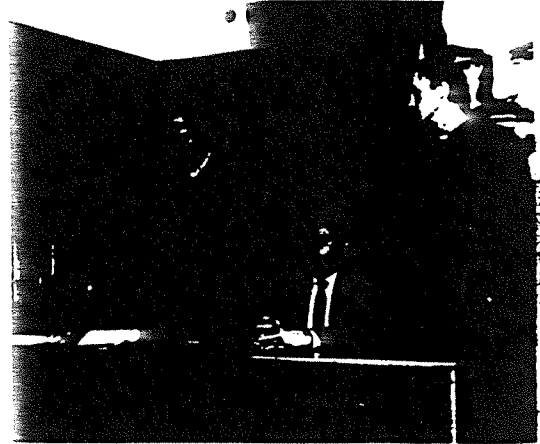
Under these and related agreements, contacts were established with Soviet scientists and institutions that have continued or been renewed in the present. Examples include the two-decade relationships of the Institute of Arctic Biology (IAB), Fairbanks, with the Institute of Biological Problems of the North (IBPN), Magadan, and of the Institute of Social and Economic Research, Anchorage, with the Institute of Economics and Industrial Production, Novosibirsk.

Some of IAB's faculty have a 30-year record of work with the Soviets (e.g., Ken Philip), while others, such as David Klein and Stephen MacLean, have been at it for 15-20 years. Among those who have had long-term contacts with the Soviets is Michael Krauss, director of the University of Alaska's Alaska Native Language Center. He has worked over a period of 20 years with academic colleagues, institutions and Eskimos and other indigenous peoples in the Soviet Union. While he has worked both in Moscow and Leningrad, his present concentration is increasingly in the Soviet Far East. Krauss' collection and analysis of Russian publications and archival materials has been applied to the benefit of both Alaskan and Soviet Natives.

Most of the contemporary research cooperation has been born over the past few years. A pioneer in the rebirth of Alaska-Soviet ties was Ted Mala, who took advantage of the political changes begun by Mikhail Gorbachev and established contacts with the medical-health community in the U.S.S.R. This led to his initiation of an Alaska-

Iberia medical program and the creation three years ago of the University of Alaska's Institute for Circumpolar Health Studies.

Over the past several years, direct contacts have multiplied and with them have come numerous proposals for scientific collaboration. They



Villagers listen to proposal for construction of new Soviet-American sausage plant.

have resulted in a broad gamut of cooperative activities, covering subjects as diverse as anthropology, archeology, biology, oceanography, upper atmospheric physics, permafrost, volcanology, economics and business, mineral engineering, alcohol addiction, aviation technology, and search and rescue activities.

Soviet-related research projects are carried out under a variety of sponsorships. Many fall under the aegis of Federal agencies and bilateral agreements, such as sea mammal research with the U.S. Fish and Wildlife Service and work with the National Park Service on the Beringian Heritage International Park. Occasionally projects evolve from direct personal relations and entrepreneurship. Most university work, however, falls under

agreements with branches of the U.S.S.R. Academy of Sciences and other Soviet institutions.

A computerized inventory of these research activities is being prepared and will be made available on an updated basis beginning in spring of 1991. The purpose of the following is to review some of UA's many formal arrangements with the Soviets and to briefly describe a few of the pertinent activities.



Reindeer herder's winter tent called a tyraga.

Agreements with Soviet Institutions

Given their physical proximity and their focus on Arctic and Subarctic systems, Alaskan scientists have naturally been inclined to deal with Soviet scientists having similar interests in Siberia and the Far East. This commonality of interests has resulted in two umbrella agreements between the Siberian and Far Eastern branches of the U.S.S.R. Academy of Sciences and the University of Alaska state-wide system; additional agreements fall under individual university campuses (University of Alaska—Anchorage, University of Alaska—Fairbanks and University of Alaska—Southeast).

General Agreements

The purpose of the general agreements is to encourage and facilitate the establishment of collaborative research. Contained within the agreements are scheduled work programs and specific tasks outlined between scientists in a broad array of disciplines.

General Agreement for International Cooperation Between University of Alaska and Siberian Branch, U.S.S.R. Academy of Sciences

The agreement provides for cooperative efforts,

information exchanges and contacts leading to cooperative scientific activities consisting of exchanges in literature, visits, field work, lectures, joint research projects and preparation of scientific articles and books. It delineates and schedules collaborative work in archeology—ethnography, economics, botanical research, animal genetics and other areas. Some of these involve field research studies, some of which were completed this past summer.

General Agreement for International Cooperation Between University of Alaska and Far Eastern Branch, U.S.S.R. Academy of Sciences

This agreement enumerates research institutes and centers and provides for the exchange of information and contacts leading to cooperative scientific activities and joint research. A series of exchange visits of research scientists and administrators has led to executed and pending agreements in economics, geology, marine biology and other areas. As discussed later, the two parties are jointly sponsoring the international research center in Magadan.

Biological Sciences

Agreement for Cooperation in Arctic Biology Between Institute of Arctic Biology, University of Alaska—Fairbanks, and Institute of Biological Problems of the North, Far Eastern Branch, U.S.S.R. Academy of Sciences

IAB and its faculty have a long record of work with Soviet colleagues. The current agreement between IAB and IBPN targets studies of biogeography and history of Beringian biota, productivity of northern ecosystems, principles and methods of environmental conservation in the Far North, and human ecology, and details topics under each subject. The program involves an exchange of students. IAB staff researchers also participate in programs with the medical and agricultural academies of the U.S.S.R.

Memorandum of Understanding Between Department of Biological Sciences, University of Alaska—Anchorage, and Institute of Biological Problems of the North, Far Eastern Branch, U.S.S.R. Academy of Sciences

The suggested research scope covers gene control during development, coronary physiology of mammalian smooth muscle, immunophysiology, tumor virology and molecular biology of proteins and DNA, secondary productivity of polychaetous annelids and shorebird predation, nutrient recycling and primary productivity of tree-line habitats.

and biology of lichens relative to reindeer productivity. Exchanges have taken place and some of the research is ongoing. Department members are also participating in the Alaska-Siberia Medical Program discussed below.

Agreement to Conduct Joint Research in Botany Between University of Alaska Museum-Fairbanks, and Central Siberian Botanical Garden, U.S.S.R. Academy of Sciences

The current agreement continues a work program begun in 1983 on study of the origin and evolution of vascular flora of Asia and America. A binational database for plant collections, floristic analysis and mapping is being compiled in the publications of scientific papers and monographs, and there are annual expeditions for collecting plant specimens.

Botanical research demonstrates the value of Alaska-Soviet scientific collaboration. In this instance, understanding the northern environment entails studying historical geographical similarities and disparities. The University of Alaska Museum has developed an extensive herbarium collection in order to study geographical comparisons relating to the land bridge once connecting the two continents. David Murray, Professor of Botany and curator of the herbarium at the University Museum, began dried-plant exchanges with Soviet botanists in 1969. Today the museum's collection numbers close to 9000, pressed and mounted to

flowers in the Altai Mountains of Siberia. It is called by a different name but strongly resembles the Alaskan *Senecio*. The presence of the flower is a puzzle, Murray reports, as it raises questions about past land connections. "When were we in that close contact and what caused a wide separation? Why wouldn't there be more of this species in between Alaska and Siberia in the Far East?" Murray and others are working to find answers to such questions.

Medical and Health Research

Broad scope and wide participation characterize cooperative studies of human activities in the North. Agreements involve several institutes on the Soviet side and bring together both biomedical scientists and health professionals.

Agreement for Alaska-Siberia Medical Research Program Between the University of Alaska-Anchorage, and Siberian Branch, U.S.S.R. Academy of Medical Sciences

This program is divided into a series of projects developed jointly by teams of interested scientists. On the AMS side, participants come from the Institutes of Cytology and Genetics, Internal Medicine, Physiology and others. U.S. participants include not only University of Alaska researchers from Anchorage and Fairbanks, but also professionals from the University of Washington, the Sleep Disorder Center of the Seattle Providence Medical Center, and other affiliations.

Components of the Alaska-Siberia Medical Program currently include a series of discrete projects, each conducted by a team of Soviet-American specialists: alcoholic behavior and genetic predisposition, nutrient intake of Chukotka and Alaska natives, seasonal affective disorder (SAD), chemical and structural studies on brain circuits and nerve fiber growth, comparative studies of lactoterm from Alaska and Siberian Natives, influence of cold adaptation on chemical control of ventilation, and addictive behavior in Alaska and Siberia and implications for research in circumpolar nations. Papers presented in October 1990 at the Arctic Science Conference in Anchorage reported on several of these comparative studies.

Agreement on Circumpolar Health Studies Between Institute of Circumpolar Health Studies, University of Alaska-Anchorage, and Institute of Biological Problems of the North, Far Eastern Branch, U.S.S.R. Academy of Sciences

The agreement, which also includes the State of



Domesticated reindeer outside of Anadyr.

form a permanent record. Murray has been classifying the collection, some of which he collected in remote regions of Siberia and the Far East. Some specimens are slightly different but are more closely related to plants in Alaska than are other plants in North America. For instance, Murray found members of the *Senecio* class of sun-



*Yupik woman at winter
camp, -55°C*

Alaska and Magadan Oblast departments of health, is an ongoing program in which scheduled North-related topics cover physiological aspects of human adaptation, peculiarities of human nutrition and health, immune systems and mechanisms of immuno-deficiency, medical anthropology and human health, demographics and epidemiology of Northeast U.S.S.R. and Alaska, and social and psychological aspects of health. A major component of the program are the medical exchanges, which focus on areas of mutual concern, such as trauma and orthopedics, maternal and childhood care, crisis intervention, nontraditional health care techniques, delivery of rural health care services and treatment of alcoholism.

Social Science Research

Two principal agreements cover research on economic and social topics.

Agreement on Scientific Cooperation Between Institute of Social and Economic Research, University of Alaska—Anchorage, and Department of Comprehensive Research of Natural and Economic Systems, Far Eastern Branch, U.S.S.R. Academy of Sciences

University of Alaska and Institute of Economics and Industrial Production, Siberian Branch, U.S.S.R. Academy of Sciences

ISER's Alaska-Soviet activities began in the late 1960s with extensive literature and some faculty exchanges with institutes and universities in Novosibirsk, Moscow, Irkutsk, Leningrad, Khabarovsk and Magadan. The current program involves direct research collaboration as well as exchanges dealing with social and economic change, patterns of governance and administration, environmental protection and comparative area studies. Focusing on specific problems of developing Northern and Arctic regions, topics under the Siberian agreement cover methods of utilizing resources, development of production and enterprises, effects of economic decisions on land and people, management of economic policies, budgeting, interaction between government and enterprises, technological and economic problems of resource exploitation, provision of infrastructure, problems of social development on demography, migration and quality of life.

In an attempt to facilitate bilateral trade and investment, one case study by ISER's John Tichotsky is looking at how the Soviet economic system functions in a joint venture between the Soviet Agricultural Ministry and Indian Valley Meats of Alaska. He is studying three aspects: the Soviet economy in general, joint ventures between an American small business operation and the Soviet government, and how Alaskans in particular can do business with the Soviets. Indian Valley Meats struck one of the first Alaskan joint ventures after *glasnost*: it involved setting up a plant in Chieu-

ana, located in the Soviet Far East, for making reindeer sausage. The plant is built and in operation, and the study may provide insight on the barriers and successes involved in an early joint venture in a remote area of the Soviet Far East.

Geophysical Research

The Geophysical Institute, the university's largest research organization, has extensive ties with researchers around the world. Two agreements illustrate current involvements with the U.S.S.R.

Cooperative Agreement Between Geophysical Institute, University of Alaska-Fairbanks, and Polar Geophysical Institute, U.S.S.R. Academy of Sciences

The current agreement continues a program initiated in 1984. The program is directed at joint observation campaigns, standardization and exchange of instruments and data, exchange of visits and joint meetings. The two institutes are currently collaborating in the analysis of satellite data. The agreement also provides for cooperative participation in Geospace Environmental Monitoring, International Solar Terrestrial Program and other programs.

Cooperative Agreement Between Geophysical Institute, University of Alaska-Fairbanks, and Permafrost Institute, Siberian Branch, U.S.S.R. Academy of Sciences

This agreement addresses problems critical to all northern regions. It is directed toward developing and analyzing permafrost data bases, including mathematical modeling of geocryological processes by applying numerical and analytical methods to the solution of environmental and engineering problems; utilization and development of remote sensing techniques for geographic, environmental and geocryological photointerpretation of landscapes in permafrost zones from aerial and space photos; investigation of the physics and chemistry of frozen soils and permafrost; and problems of construction on permafrost.

Agricultural Research

The final example of University of Alaska interaction with Soviet science lies in the area of agriculture.

Agreement on Scientific and Technical Cooperation Between Agricultural and Forestry Experiment Station, University of Alaska-

Fairbanks, and V.I. Lenin All-Union Academy of Agricultural Sciences, Siberian Branch

Cooperative agricultural research dates back to the 1960s and was quite active in the 1970s. The present agreement calls for joint research, trading of samples of agricultural crops, exchange of scientists and students, and other cooperation on intensive agricultural production in extreme natural and climatic conditions. The detailed program of



scientific and technical cooperation includes the topics of grasses and cereals, agricultural practices, reindeer and Yakut horses. Many of these activities underway include the exchange of seeds and other samples. An active cooperation program also exists between the Plant Materials Center, Alaska State Division of Agriculture, and the Institute of Biological Problems of the North.

Joint Soviet-American Research Center

There are many other agreements and activities that could be described, such as those of the university's Institute of Marine Science with the U.S.S.R. Academy of Sciences' Institute of Marine Biology of the Kola Scientific Centre in Murmansk and its Institute of Marine Biology of the Far Eastern Branch in Vladivostok. It is hoped,

however, that those listed above give a flavor of the variety and scope of interaction between the University of Alaska and Soviet institutions. One more agreement needs to be mentioned, for it provides promise of further strengthening U.S.—U.S.S.R. scientific relations: the Agreement for the Establishment of the Soviet—American Scientific Research Center in Magadan, U.S.S.R., between the University of Alaska and the Far Eastern Branch, U.S.S.R. Academy of Sciences.



Discussion of tests of early maturing varieties of barley from Siberia.

The newly created Joint Center is designed to provide a research support base and to facilitate scientific collaboration and coordination in the Soviet Far East and Siberia. It is located in Magadan, the major city in northeastern U.S.S.R. With existing flights to Anchorage and regular air service between the two cities scheduled for 1991, the center is strategically located to help link U.S. and U.S.S.R. researchers.

The Joint Center's facilities and support will be available to other institutions and scientists in both the United States and the Soviet Union. Laboratories, offices and meeting rooms, computer and communication facilities, and administrative support will serve groups and individuals conducting research there or using the center as a base of field operations. The center also will be used for education and training. An important element of the center will be direct satellite telecommunications connections to the University of Alaska in Anchorage and Fairbanks. Other research institutions may be given access to the U.S.S.R. through the university.

The Joint Center is initially being accommodated on two floors of the new Institute of Biological Problems of the North (IBPN) research complex being constructed in Magadan. The first

stage, scheduled for completion in early 1991, will include a general laboratory, a computing and communications center, a computing instruction laboratory, a conference room, offices and storage facilities. The total IBPN complex will also provide dining rooms, an international conference hall, mechanical shops, a garage and other facilities.

The center is being developed on a shared basis. The U.S.S.R. Academy of Sciences is providing the building, utilities and other infrastructure, and support services. The U.S. side is assisting with interior finish (including wall panels, floor covering, dropped ceilings and lights) and equipment for the center, including computers, reproduction equipment and communications. Corporate donations of materials, supplies and equipment assist such participation by the University of Alaska, Alaska Pacific University, Anchorage, is helping to equip a visitors office suite and conference room with the aid of private donations.

While the physical facility is being developed in Magadan, the Alaska counterpart is located in the University of Alaska's Office of Soviet Relations (OSR) in Anchorage. The IBPN and OSR directors serve as codirectors of the Joint Center.

Even prior to completion of the physical plant, scientific cooperation is being facilitated through the Joint Center. Procedures have been established to expedite invitations, visa processing and transportation for groups and individuals traveling to the other country. Thus, invitation requests are routinely exchanged between IBPN for the Soviet side and OSR on the U.S. side. The latter also provides information services on flights to the U.S.S.R. and assists with travel and visa arrangements.

Both conceptually and in practice, the Joint Center is more than just an arrangement between regional partners. Policy and financial support is provided by the Presidium of the U.S.S.R. Academy of Sciences and the U.S.S.R. and Russian Republic governments in Moscow. Participation in its activities is anticipated by research institutes throughout the Soviet Far East and Siberia, as well as by some in European Russia. U.S. universities have already expressed an interest in utilizing the center. Contacts and travel assistance have been given to a number of researchers from other institutions.

The first formal agreement to use the center for U.S.—U.S.S.R. scientific cooperation was executed in November 1990 by the Institute of Arctic Studies and the School of Medicine of Dartmouth College, the International Health Institute of Brown University, the Institute of Biological Problems of the North, and the Joint Center. The University of

Alaska is expected to participate in the program, which will deal principally with human ecology and resource management.

The university has actively supported establishment of the Joint Center in the expectation that the center will evolve into an ever-more-useful communication, transportation and service base for American and Soviet scientists working in northern regions. It will likely, over time, become an integral part of a circumpolar network of northern centers. That, in turn, will strengthen the university's research capability and enhance its role in the North.

Conclusion

The University of Alaska is committed to U.S.-U.S.S.R. collaboration because it provides both scientific and social benefits to Alaska and its Soviet neighbors. Cooperative research programs already cover a wide range of subject matter, and the results of joint projects to date give promise of continuing productive relationships. It is, therefore, safe to expect that the university will play a continuing role in expanding interactions of Alaska and the United States scientists with colleagues and institutions in the Soviet Union.