

# **State of Alaska FY2003 Governor's Operating Budget**

## **University of Alaska Fairbanks Organized Research Component Budget Summary**

## Component: Fairbanks Organized Research

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### Component Mission

As a major center for research and scholarship, the University of Alaska Fairbanks is committed to the mutual enhancement of teaching, research, creative activity, and public service. Scholarship which produces new knowledge instills a vigor into teaching which in turn stimulates inquiry and the quest for further answers to the unknown. The University seeks to use its particular location in the north as a natural laboratory for the study of questions and issues, whose solutions are not only applicable to Alaska problems but to a broader understanding of the global community. As part of a network of state research universities, UAF has an active program of basic and applied research resulting in a well-earned national and international reputation. Specific recognition has been achieved in space physics, marine science, high latitude biology, environmental sciences, engineering, and geophysics. The University has recognized programs in definition, exploration, development, and management of Alaska's renewable and non-renewable resources. It is the state's center for study of Alaska Native cultures and languages.

### Component Services Provided

The University of Alaska Fairbanks is among the top 75 National Science Foundation (NSF) funded research institutions in the United States and houses the University of Alaska system's organized research effort. Organized research consists of five major research institutes and several smaller laboratories, centers, and research facilities that bring in excess of \$60 million of non-state funds into Alaska annually. Research at the University of Alaska Fairbanks supports Alaska's major industries and examines problems particular to northern latitudes.

### Component Goals and Strategies

#### UA LEADS

Unity in promoting communication and collaboration.

Accountability to our students, faculty, staff, alumni, and the diverse peoples of Alaska.

Leadership for Alaska's people and institutions.

Excellence in our programs and services.

Accessibility for all Alaskans.

Dedication to serving community needs.

Stewardship of our resources.

### Key Component Issues for FY2002 – 2003

#### Unity in promoting communication and collaboration:

Form active collaborations with communities, organizations, businesses, and government to meet identified state, national, and global needs, as stated in UAF 2005 Strategic Plan.

Indicator: Increase the number of continuing education and professional development course offerings by 20 percent by 2005.

Indicator: Increase the number of vocational/technical offerings by 10 percent by 2005.

Indicator: Increase the number of students graduating with degrees in teacher education, health careers, process technology, and information technology by 5 percent over the next two years and 10 percent over the next four years in job areas specified.

Indicator: Increase the number of research projects funded by state agencies and Alaska corporations.

#### Accountability to our students, faculty, staff, alumni, and the diverse peoples of Alaska:

Provide high quality undergraduate education for traditional and non-traditional students, as stated in UAF 2005 Strategic Plan.

Indicator: Increase the percentage of baccalaureate, classic first-time freshmen (CFTF) returning for sophomore year 10 percent by 2005.

Indicator: Increase the number of students who enroll in developmental math (DEVM) and successfully complete a 100-level or above MATH course to 30 percent within three years, and increase the number of students who enroll in developmental English (DEVE) and successfully complete a 100-level or above ENGL course to 40 percent within three years. (Note: A successful finish is determined by the number of students who receive an A, B, C, or P (pass) grade in a relevant 100-level course within three years. In the fall of 1998, 187 developmental English students were enrolled and 65, or 35 percent, successfully finished by the spring of 2001. Similarly, 522 developmental math students were enrolled and 129, or 25 percent, successfully finished by the spring of 2001. Source: Ian Olson, Research Associate, UAF Planning, Analysis, and Institutional Research.)

Indicator: Increase students' satisfaction with the level of instructional effectiveness at UAF as measured by Noel-Levitz Student Satisfaction Survey. (Note: Instructional effectiveness assesses students' academic experience, the curriculum and the campus's overriding commitment to academic excellence; comprehensive scale of 1 - 7, least important to most important, covers such areas as variety of courses, effectiveness of faculty, adjuncts and graduate teaching assistants; at UAF full-time students surveyed reported satisfaction level at 4.91 in this area compared to 5.04 at other four-year public institutions; UAF students ranked the importance of instructional effectiveness to their college experience at 6.27. A high importance/low satisfaction rate indicates areas the institution might consider as an immediate priority for attention; at UAF the gap between importance and satisfaction is 4.91/6.27).

Indicator: Create faculty/staff handbooks. Address assessment issues, job classification, and inconsistent employee evaluation practices.

Indicator: Secure student records in a fireproof environment at all campuses.

### **Leadership for Alaska's people and institutions:**

Serve as a world leader in arctic research and related graduate education, as stated in UAF 2005 Strategic Plan.

Indicator: Increase doctoral degree production to 40 Ph.D. graduates per year to become a Doctoral/Research-Extensive University in the Carnegie classification by 2010.

Indicator: Increase external funding of research in arctic biology, climate change, resource development, fisheries, and ocean science, geosciences and atmospheric sciences by 10 percent by 2005.

Indicator: Address direct appointments of senior officials, which will include the review of governance provisions for appointments and ensure appointments follow outlined procedures.

### **Excellence in our programs and services:**

Serve as the premiere higher educational center for Alaska Natives, as stated in UAF Strategic Plan.

Indicator: Increase the number of Alaska Native students at UAF 10 percent by 2005.

Indicator: Bring the proportion of certificates and degrees awarded to Alaska Native students to reflect proportional enrollments at the institution.

Indicator: Create a plan to integrate the College of Rural Alaska and Fairbanks Campus.

### **Accessibility for all Alaskans:**

Serve as an academic gateway to the study of North Pacific and Circumpolar Northern land and seas, as stated in UAF 2005 Strategic Plan.

Indicator: Increase the number of UAF students participating in exchange programs in the circumpolar north 10 percent by 2005.

Indicator: Increase the number of faculty who carry out academic activities in other circumpolar nations 5 percent by 2005.

Indicator: Increase the number of international students at UAF from circumpolar northern nations.

Indicator: Address space issues to ensure that there is adequate instructional, research and office space.

### **Dedication to serving community needs:**

Improve the responsiveness of undergraduate education to student and community needs, as stated in UAF 2005 Strategic Plan.

### **Stewardship of our resources:**

Serve as a model to demonstrate how gender, racial and cultural diversity can strengthen a university and society, as stated in UAF 2005 Strategic Plan.

Indicator: Bring the female-male ratio of new faculty hires to 50/50 by 2005.

Indicator: Require each UAF unit to post its annual recruitment and retention reports on the unit's website.

Indicator: Increase the proportion of new faculty hires from under-represented minority populations.

Address salary compression for faculty and staff.

## **Major Component Accomplishments in 2001**

### **Unity in promoting communication and collaboration:**

Dr. Peter Schweitzer (anthropology) was elected chair of the council of International Arctic Social Sciences Association (IASSA) at the Fourth International Congress of Arctic Social Sciences in Quebec City in May of 2001. The secretariat of IASSA will be housed at UAF from fall 2001 through 2004 and the Fifth International Congress of Arctic Social Sciences will be held in Fairbanks in 2004.

Assistant Professor Bill Bristow of the Electrical and Computer Engineering Department continued his work on the construction and testing of a major radar facility referred to as the SuperDARN Radar Network designed to study upper atmospheric phenomena, including the effects of solar phenomena on radio transmission.

Three Geophysical Institute scientists traveled to Antarctica to install equipment designed to help the Comprehensive Nuclear Test Ban Treaty Organization enforce the treaty, which prohibits the explosion of nuclear devices. The scientists assembled and tested an infrasonics network at Windless Bight Station, located near McMurdo Station.

The Geophysical Institute's Alaska Synthetic Aperture Radar (SAR) Facility, together with the Lt. Governor's office and the State Geologist from the Department of Natural Resources, held two workshops to provide technology transfer to Alaska and define the process for distributing \$3.4 million in funds ear-marked by U.S. Senator Ted Stevens for this purpose. A third workshop is planned. The level of interest and support was clearly demonstrated by the attendance of Senator Stevens, Dan Goldin, and Ghassem Asrar as keynote speakers. Other State and Federal agencies were represented such as NOAA, USGS, DOT, FAA, U.S. Fish and Wildlife, ADFG, the Lt. Governor's office, and Tribal representatives from Native corporations and communities.

A 3-year, \$15 million cooperative agreement was signed with the National Science Foundation to support the goals of the International Arctic Research Center, which are to study climate change and its global feedback and impacts, in Alaska and the entire Arctic through planning, fostering, and conducting international cooperative arctic research of the highest possible quality. Four major projects were initiated and have made good progress.

IARC is leading a major project funded by the eight Arctic nations, entitled "Arctic Climate Impact Assessment" (ACIA). Its goal is to evaluate and synthesize the likely consequences of future climate variability, climate change, and increased ultraviolet radiation. The project is examining possible future impacts on the environment and its living resources, on human health, and on economic activities. The assessment is providing fundamental information, which is useful not only to Alaskans, but to all the people of the Arctic.

IARC's Community Arctic Modeling Project (CAMP) is an interdisciplinary initiative to produce demonstrable improvements in model simulations of arctic climate, in order to predict future changes. CAMP consists of systematic intercomparisons of current Arctic climate models, and experiments to improve the models relevant to the Arctic. Collaboration with major climate modeling centers around the world is an integral part of CAMP's strategic plan. For the Arctic Climate Impact Assessment, CAMP is providing 21st-century arctic climate scenarios from state-of-the-art climate models.

The Arctic Ocean is one of the least-known regions of the world but is critical in understanding climate change. The IARC is leading a major international field project, the Nansen-Amundsen Bays Observation System (NABOS), to measure the transport of heat, salt and water mass from the North Atlantic into the Arctic Ocean and to assess the role of the North Atlantic in maintaining the climate of the Arctic.

The Institute of Northern Engineering Water & Environmental Research Center (WERC) partnered with the UAF Institute of Arctic Biology (IAB) to accept a leading role in organizing the Frostfire Experiment, a collaborative effort among the US Forest Service and the Alaska Department of Natural Resources.

The Arctic Energy Technology Development Laboratory (AETDL) maintains contact with Alaska energy producers and users, conducting periodic meetings with these organizations, including Alyeska, Usibelli Coal Mine, Williams Refinery, the Denali Commission, Alaska Industrial Development Corporation, Alaska Science and Technology Foundation, Alaska Village Electric Corporation, D Riven Corporation, Alaska Oil and Gas Association, Chugach Electric, Golden Valley Electric, and others. The AETDL will be forming a strategic advisory board formed from leaders in the above organizations to direct the research conducted under AETDL.

UAF partnered with libraries at UAA, UAS, the Alaska State Library, and major public and school library systems throughout Alaska to provide stable funding through the UA operating budget for the Databases for Alaskans project. The Databases for Alaskans provides access to articles from over 2000 academic journals, magazines and newspapers to all Alaskans via the Internet. This especially important public service makes information resources available to Alaska's K-12 schools as well as UA students and faculty.

The Division of Computing and Communication initiated installation of a wireless LAN and IP telephony at the Toolik Lake Research facility.

Marine Advisory Program faculty assisted Sheldon Jackson University in teaching courses for the Seafood Science Program.

In collaboration with the Japanese Science and Technology Department, and private industries in Alaska, School of Mineral Engineering faculty members are working on a research and demonstration project on "gas pipeline" integrity in permafrost.

### **Accountability to our students, faculty, staff, alumni, and the diverse peoples of Alaska:**

The Institute of Northern Engineering (INE) ensures accountability by making sure its researchers and students meet (and often surpass) established criteria for solid scientific research in the national and international community. Faculty publish in respected journals and represent the university and the state at national and international conferences. For FY01, INE researchers published more than 30 research-generated articles in national and international journals.

### **Leadership for Alaska's people and institutions:**

CLA's Traditional Knowledge Systems in Alaska has been supported by the National Science Foundation as an extension of funding for the Alaska Rural Systemic Initiative for another five years.

The Geophysical Institute's Alaska SAR Facility (ASF) is developing Digital Elevation Models (DEMs) and ancillary data at appropriate scales for regions of interest within Alaska and is working with the State of Alaska to develop a long-term strategy for acquiring and updating maps of the State. These efforts will lead to acquisitions with coverage between Fairbanks and the Canadian border-along the transportation corridor, as well as the Okmok and Augustine volcanoes.

A recently funded project through the National Institute of Health will provide for the establishment of an Alaska Basic Neuroscience Program (ABNP) at Institute of Arctic Biology and UAF. This program will focus on neuroscience research related to the health of the Alaska Native population

As a result of the global climate change work conducted at IARC, Senator Ted Stevens held a hearing of the Senate Appropriation Committee on Global Climate Change on the UAF campus in May. The purpose was to determine, on the basis of the best available science, what is occurring and what it means for the people of Alaska and the Arctic. Many leading arctic scientists made presentations, as did the heads of major federal agencies, such as NASA, NOAA, and NSF, who reported on their plans for future studies of climate change. Following the hearing, Senators Stevens and Byrd co-sponsored a Senate bill that would establish "a major research effort" in this area.

Dr. Doug Goering, who is also an engineering focus area leader for EPSCoR, participated in an Alaska advisory committee formed to find common ground among the goals of the Alaska EPSCoR program, the AK Science & Technology Foundation, and the University of Alaska Fairbanks. INE maintains a UAF Engineering/EPSCoR resource web page (<http://www.uaf.edu/ine/epscor.html>) in support of this project.

Institute of Northern Engineering (INE) researcher David Barnes acts as liaison between the Alaska Dept. of Environmental Conservation and the University of Alaska Fairbanks, coordinating research needs and projects.

The INE Water & Environmental Research Center co-sponsored the American Water Resources Association 2000 Spring Conference - Water Resources in Extreme Environments - in Anchorage. Dr. Douglas Kane, Acting Director of INE, served as Technical Chairman of the conference and edited the 340 page conference proceedings.

INE WERC's Dr. Larry Hinzman completed a publication for the National Science Foundation (ARCUS) titled The Hydrologic Cycle and its Role in Arctic and Global Environmental Change: A Rationale and Strategy for Synthesis Study. Rapidly emerging data sets, technologies, and modeling resources provide an unprecedented opportunity to move forward with this program. The publication is available in pdf format at: <http://www.arcus.org/ARCSS/hydro/index.html>.

In April of 2001 researchers Dr. Matt Nolan and INE graduate student Peter Prokein participated in the Anne Wien Elementary School Noyes Slough Day. They used Synthetic Aperture Radar (SAR) maps and computer modeling to present 3D visualizations of the Fairbanks area. The application was used to describe the local water cycle, and how it relates to Fairbanks.

UAF's Rasmuson Library partnered with the UAA Consortium Library and UAS Egan Library to begin the UA Electronic Library, a program of funding scholarly journals and other research materials for use by UA students and faculty via the Internet. Through this program more than 2000 full-text scholarly journals in many fields (especially nursing, teacher training, logistics, and natural resources management) are available at student and faculty desktops, precisely where and when they are most needed.

Dr. Jim Kruse began work as the Museum's first-ever Curator of Entomology, a position supported by the National Science Foundation's \$1.1 million grant to create the Arctic Archival Observatory at the Museum (FY00). Dr. Kruse will be responsible for building the new collection and starting a Museum-based research program. Because of their short life cycles, insects are strong indicators of global climate change.

Glenn Juday, a professor in the School of Agriculture and Land Resources Management plant ecology, is measuring carbon uptake in Alaska forests to determine the market value of "carbon credits" in an exchange system. An international exchange for carbon credits already exists, and the United States is negotiating to make land cover uptake and storage of carbon dioxide a feature of any treaty on limiting greenhouse gasses that may contribute to global warming. Alaska will be a major player in this arena.

Students with Future Farmers of America, along with Jeff Werner, a research associate with SALRM, recently hosted the FFA national convention in Fairbanks. Dr. Larry Case, a federal program specialist in agriculture education and the

national FFA advisor, addressed the students. A training event for student officers at the high school level called BLASTOFF (Building Leaders and State Teams of Officer Training) was held at UAF in June.

Personnel from the USDA Agricultural Research Service are expanding a research unit that partners with scientists from SALRM and the Cooperative Extension Service. Research scientists Dennis Fielding and Sultan Begna of the ARS are currently examining pest management applications and crop responses to different stresses. Additional ARS personnel will be joining the Alaska unit to form a total complement of six researchers and a research leader.

SFOS Dillingham agent Kimberly Williams organized a salmon science symposium in Dillingham to address the western Alaska salmon crisis. Designed to address the problem of declining salmon returns in western Alaska, the Salmon Science Symposium was held in Dillingham on May 2-4, 2001. It was attended by scientists, educators, local and regional leaders, fishermen, advisory and policy members, and representatives of a number of organizations and agencies.

### **Excellence in our programs and services:**

The resources that are assembled in each cultural region through the Alaska Rural Systemic Initiative are being entered into a curriculum resource collection maintained through the Alaska Native Knowledge Network, housed at UAF. The listing of resources is available on the Internet at <http://www.ankn.uaf.edu>.

Land cover on the Seward Peninsula is changing from grass- like tundra to become shrubbier. These changes will be correlated with a warming climate that is occurring on the time-scale of decades and will influence summer exchange of heat with atmosphere about as much as the change from shrub tundra to forest, which takes a century or more.

The National Science Foundation reviewed the Bonanza Creek Long-Term Ecological Research Program and concluded, "the high quality of this program makes the University of Alaska a premier institution for boreal and arctic ecological research". It is an important milestone for the University of Alaska to be recognized in this light by the nation's leading funding agency for basic research.

The National Science Foundation has funded the University of Alaska for a five-year graduate training program in Regional Resilience and Adaptation. This program will train students to address regional problems to find solutions that are ecologically, economically, and culturally sustainable. The program will focus primarily on Alaska issues in ways that seek a more sustainable future for the state.

Drs. Vikas Sonwalkar and John Kelley have initiated a seminar series on fisheries acoustics, which they conduct by television through the UA/Alaska Telecommunications Network with students, federal, and state agency staff in Fairbanks, Anchorage, and Juneau. Recently, they have extended this course to the University of Washington via Internet 2.

INE researcher Dr. Hong Liang was invited by the Centre National de la Recherche, Scientifique to conduct research at the Ecole Centrale de Lyon for the summer 2001. Her past and current research in surface science and tribology on ice and low temperature materials surface will benefit Alaskans by improving driving safety in winter conditions and encouraging state-of-the-art manufacturing techniques in Alaska.

The INE Energy Research Center continued its work in evaluating fuel cells and prototype reformers used to provide electric power. These technologies may prove useful in providing future power needs for Alaska industry and bush communities. This research led to publication in an internationally respected professional journal, The International Journal of Hydrology Energy.

INE/WERC researchers are conducting space-borne measurements of soil moisture in a project funded by a military end-user. As part of this project, researchers are developing new techniques to measure soil moisture from space in order to improve vehicle trafficability in remote areas, using a system that has day/night capability in any weather.

The School of Fisheries and Ocean Sciences worked closely with the Alaska Sea Life Center to assist in establishing a strong scientific research program in close collaboration with faculty at the University. Research faculty have been hired through the University to assist in developing the in-house research program in Seward.

**Accessibility for all Alaskans:**

The Geophysical Institute offered a free public "Science for Alaska" lecture series January through February 2001. Scientists gave multi-media presentations on topics such as the aurora, earthquakes, dinosaurs, bears, and sea ice. The lectures were a great success, with 5,190 people in attendance in Fairbanks and Anchorage.

Nearly 100 Alaska Native middle school students, elders and teachers from the rural villages of Noatak, Galena, Kotzebue and Buckland visited the Geophysical Institute and Poker Flat Research Range during March and April 2001 to participate in two programs offered as part of U.S. Department of Education grants awarded to the Geophysical Institute Education Outreach Office. Students and teachers participated in activities designed to teach them how professionals solve real-life problems by using science and math skills.

INE researchers make their expertise available to members of the Alaska public on a daily basis. Through public and professional seminars, presentations at public schools in communities all over Alaska, and individual phone calls, INE researchers disseminate information and answer questions about water quality issues, well drilling, building on permafrost, and various other subjects.

**Dedication to serving community needs:**

The Koyukon Athabaskan Dictionary, an encyclopedic dictionary of Koyukon, the Athabaskan Indian language of the middle Yukon River was published by the Alaska Native Language Center. The book is the culmination of over 70 years of research.

National Institute of Health/National Institute of Alcohol Abuse and Addiction awarded a RO1 research grant to the Department of Psychology for a three-year study of Alaska Native Pathways to Sobriety. This is one of only two RO1 research grants in the state of Alaska.

In partnership with the Fairbanks Native Association and Tanana Chiefs Conference, funded by the Substance Abuse and Mental Health Administration of the National Institutes of Health, Drs. G. Mohatt and J. Allen will serve as evaluators and direct the training component of a \$1.5 million children's mental health system of care for Alaska Native children in Interior Alaska.

Civil and Environmental Engineering Department (CSEM) faculty were selected by the Federal Aviation Administration for funding in the FAA's Air Transportation Center of Excellence in General Aviation through Embry-Riddle University.

The machine shop of the Geophysical Institute continues to develop two devices used to automatically remove pin bones from salmon. These devices, which machinists spent 3 years perfecting, will enable fish processors to better use species that are less valued, such as pink and chum salmon.

Twelve Geophysical Institute researchers are developing innovations in forecasting weather, both in Earth's atmosphere and in space through the University Partnering with Operational Support program. The UPOS program allows researchers to help devise and improve space weather and tropospheric-weather tactical decision aids used by the U.S. armed forces.

Scientists at the Geophysical Institute have teamed with other researchers to study the Carboniferous Lisburne Group. The researchers' mission is to find a predictable pattern between the folds and fractures of the Lisburne. These folds and fractures determine where oil is located.

IAB Researchers, Perry Barboza and John Blake have developed a new formula for musk ox and reindeer feed that may help make large animal farming a more viable industry. As a result of their work, UAF has signed a licensing agreement with Alaska Garden and Pet Supply to produce and distribute the product, which will help animal herders in parts of rural Alaska.

Alaska is the only state in the USA where permafrost affects most people's everyday life. The stability of permafrost guarantees the stability of the engineering structures built on it, while permafrost degradation creates numerous problems for infrastructure in Alaska. A Permafrost Observatory is being established by IARC at Barrow, Alaska, where present permafrost temperatures will be compared with relevant measurements during the 1950s to early 1960s.

The Arctic Energy Technology Development Laboratory (AETDL) is working to create a unified university structure for conducting energy research. Coordination between the UAF School of Mineral Engineering and INE is an integral part of this task, along with coordination with Statewide Federal relations.

In partnership with the UAF School of Fisheries and Ocean Sciences, INE researchers are participating in the NEWNET project, supported by the Battelle-Pacific Northwest National Laboratory in collaboration with the Los Alamos Laboratory and the Alaska Department of Environmental Conservation. The objective of this project is to conduct a research and monitoring program related to threats from aging Russian nuclear power plants. An essential part of this program is a mentoring program for Alaska Native and other minority undergraduate students in science, math, and engineering (one student is majoring in electrical engineering).

Faculty researchers Douglas Goering and John Zarling, through the INE Transportation Research Center, have worked with the Alaska Department of Transportation (DOT) on the design of the Loftus Road Extension project in Fairbanks. Design features include stabilization of roadways over permafrost and instrumentation for long-term monitoring of road bed temperatures.

The INE Energy Research Center is collaborating with the Alaska Cold Climate Housing Research Center to evaluate indoor air quality in interior Alaska homes with special attention to ventilation issues and radon.

INE WERC has installed and maintains numerous long-term and short-term meteorological stations throughout the state. FY01 work included evaluation and repair of existing stations and installation of three new stations. The short-term stations provide detailed data to AK DOT planners so that they may upgrade or maintain airport runways in remote villages. These data are valuable to weather forecasters and pilots of Alaska.

INE researcher Dr. Matt Nolan designed and heads a project that produces 3D visualizations of mountain passes in Alaska in order to improve aircraft safety. These visualizations of historically dangerous Alaska mountain passes will be used by airplane pilots unfamiliar with the area.

A wastewater treatment method using controlled wetlands, designed by Ph.D. candidate David Maddux, may provide a solution to sewage treatment in rural Alaska villages. The controlled wetlands act as biological filters and because they are low cost and low maintenance, are uniquely suited to Alaska's rural communities.

The occurrence of paralytic shellfish poisoning (PSP) is a major obstacle for effective shellfish farming in Alaska. Marine Advisory Program aquaculture specialist Ray RaLonde is working with the industry on the application of effective methods for in situ testing for the toxin. Dr. Gerry Plumley is working on the PSP problem from a molecular biological perspective.

Ray RaLonde received favorable attention for his contribution to the Water Quality and Aquatic Environment Monitoring Workshop series, held primarily for environmental personnel and Village Council members. He lectured on water chemistry, physical habitat assessment, Paralytic Shellfish Poison testing, and design of Tribal monitoring programs to over 100 rural Alaska Natives, and provides ongoing advice to Native American Fish and Wildlife Society staff.

Research conducted by School of Fisheries and Ocean Sciences (SFOS) scientists applies directly to the needs of offshore oil and gas development in the Arctic. Dr. Tom Weingartner is conducting studies of ocean circulation in the nearshore Beaufort Sea (Prudhoe Bay) that have a direct bearing on offshore oil development. The results of these under ice measurements will be used in connection with engineering design for offshore pipelines and fields. This work is supported by the Alaska Department of Environmental Conservation, the Minerals Management Service (through the UAF Coastal Marine Institute), and British Petroleum.

Research conducted through the UAF Coastal Marine Institute, a partnership with the Minerals Management Service, has addressed issues relating to environmental monitoring for seismic exploration and offshore drilling.

### **Stewardship of our resources:**

A team of college faculty led by Professor Terry Chapin of the Biology and Wildlife department successfully competed for the funding of a major grant to support graduate students. The Integrative Graduate Education and Research Traineeship (IGERT) grant will fund students in the interdisciplinary area of Sustainability across natural, life, and social sciences at UA. Proposals funded in the IGERT program of NSF are innovative, research-based, graduate education, and training activities in critical, emerging areas of science and engineering.

Honeywell has signed a 10-year lease with Poker Flat Research Range, sealing a deal that will provide a new building for range use and research dollars for Geophysical Institute scientists. This contract will provide funding for hiring graduate students, buying equipment, and funding investigations into the ionosphere.

INE uses its Facilities and Administrative funds to support its researchers and research units. In FY01, INE supplied \$363,000 in cash matching and equipment purchase to researchers, including Dr. Hong Liang (student support and equipment match) and to research units, including the Energy Research Center.

Researchers Dr. Vikas Sonwalkar and Dr. John Kelley conducted fisheries acoustics research and training to support the state of Alaska Riverine Fish Census effort. Riverine fisheries acoustics is a merging technology that can greatly benefit management of the state's anadromous fish.

Drs. David Barnes and John Kelley are participating in the Consortium for Risk Evaluation with Stakeholder Participation (CRESP), a project directed to the study of the potential risk of leaking of radionuclides from the former nuclear test site on Amchitka Island. It is also collaborative with the Alaska Department of Environmental Conservation and the Aleutian/Pribilof Island Association. Faculty from the several departments and institutes at the UAF and UAA participate in this project. An important objective of this project is to relate all research components to stakeholder participation and ultimate stewardship concerns about the safety of the marine food.

SFOS is involved in several projects dealing with the sea lion/fisheries interaction problem. This is perhaps the most critical issue facing the industry today. For example, scientists at Kodiak are looking at the food availability and utilization for Steller sea lions in the rookery and haul-out areas. In the Bering Sea, scientists are looking at the entire ecosystem, and assessing changes in response to climatic variability. The Gulf of Alaska GLOBEC study is looking at the oceanographic regime of the northern Gulf of Alaska, emphasizing the relationship with pink salmon.

The Fishery Industrial Technology Center and the Institute of Marine Science, in cooperation with the Agricultural Research Service, Department of Agriculture, are working with the Oceanic Institute of Hawaii on a project funded by the Agricultural Research Service. The purpose is to devise improved food products for aquaculture from fish waste. Testing of the products is done in Hawaii and, for fresh water species, at the University of Idaho.

During the past year, several SFOS faculty played a direct role through service on the North Pacific Fisheries Management Council Scientific and Statistical Committee (Hills, Tyler, Quinn), on Plan Teams (Haldorson, Norcross, Shirley), the Reasonable and Prudent Alternatives Committee (Hills) and Essential Fish Habitat Committee (Smiley).

The Institute of Marine Science and the Fisheries Division are engaged in a seven-year interdisciplinary program designed to assess the influence of climate variation on the Gulf of Alaska marine ecosystem. This program focuses on the factors that affect the survival of first year pink salmon on the Gulf of Alaska shelf.

The crisis in the Alaska pollock fishing industry as a result of the declining western Steller sea lion population has resulted in an influx of research funds to Alaska sea lion research. SFOS Sea Grant Director Ron Dearborn moderated an interagency meeting held in Seattle to address the research needs and plans. A number of ongoing and proposed research projects are or will be addressing the issue.

In partnership with British Petroleum, Dept. of Energy and three other universities, School of Mineral Engineering faculty are working to develop new technology and processes for reforming natural gas to liquid (GTL). This UAF-BP-DOE strategic alliance enables the industry to obtain Alaska project-specific research inputs from UAF scientists in specialized areas and offers a model of cooperative research between industry (BP), and academic research centers.

The Marine Mining Technology Center Arctic Seas Division in the School of Mineral Engineering is addressing issues of importance to Alaska in the areas of development of a geographical information system, reserve and cut-off grade estimation of offshore gold placers of the Nome district. These linked projects will provide information to guide the sustainable development in the Nome area.

The Economics Department finished a project for Alaska Sea Grant and the Minerals Management Service in which it valued the sport fishery for halibut and salmon in the lower Cook Inlet. Specifically, the model was designed to predict changes to net benefits and regional economic activity that could arise from changes in biomass or regulatory changes affecting catch limits.

The Risk Management Agency (RMA) of the United States Department of Agriculture provides cost-effective means of managing risk for agricultural producers in order to improve the economic stability of agriculture. In light of poor fishing seasons in western Alaska from 1997 through 1999, and at the request of the U.S. Congress (Senator Ted Stevens), the RMA is working with the University of Alaska Fairbanks Agricultural and Forestry Experiment Station and the Economics Department to examine the feasibility of providing a similar program for Alaska fishers.

### **Statutory and Regulatory Authority**

No statutes and regulations.

**Fairbanks Organized Research**  
**Component Financial Summary**

*All dollars in thousands*

<b>Non-Formula Program:</b>	<b>FY2001 Actuals</b>	<b>FY2002 Authorized</b>	<b>FY2003 Governor</b>
<b>Component Expenditures:</b>			
71000 Personal Services	42,478.8	45,009.1	44,783.2
72000 Travel	4,300.7	3,684.4	4,235.1
73000 Contractual	22,035.3	22,556.8	32,294.3
74000 Supplies	6,684.6	8,104.8	7,708.7
75000 Equipment	13,829.7	5,308.6	3,983.6
76000 Land/Buildings	324.9	200.0	0.0
77000 Grants, Claims	905.2	1,034.0	838.0
78000 Miscellaneous	905.6	10,037.9	11,526.2
<b>Expenditure Totals</b>	<b>91,464.8</b>	<b>95,935.6</b>	<b>105,369.1</b>
<b>Funding Sources:</b>			
1002 Federal Receipts	38,376.3	41,056.4	48,770.7
1003 General Fund Match	1,737.4	1,737.4	1,737.4
1004 General Fund Receipts	10,283.3	9,495.4	10,628.8
1007 Inter-Agency Receipts	4,985.4	5,023.1	5,174.4
1010 University of Alaska Interest Income	0.0	0.0	0.0
1015 U/A Dormitory/Food/Auxiliary Service	0.0	0.0	0.0
1025 Science & Technology Endowment Income	2,630.0	2,630.0	2,630.0
1038 U/A Student Tuition/Fees/Services	0.0	0.0	0.0
1039 U/A Indirect Cost Recovery	7,934.2	8,445.6	8,276.7
1048 University Restricted Receipts	25,518.2	27,547.7	28,151.1
<b>Funding Totals</b>	<b>91,464.8</b>	<b>95,935.6</b>	<b>105,369.1</b>

## Fairbanks Organized Research

### Proposed Changes in Levels of Service for FY2003

Research efforts in climate change and fisheries will expand due to infusion of federal funding into International Arctic Research Center and School of Fisheries and Ocean Sciences. The opportunity for expansion was created by increases in federal funding, but the actual increases are also the result of UAF scientists faring well in the proposal competitions for the funds.

Preparing for Alaska's Economic Success: Applied Research and Technology Transfer-  
Based on Alaska's global location and developed talent, UA has many opportunities including access to polar orbiting satellites, proximity to locations throughout the western hemisphere, and cold regions research. Additional funding will allow UAF to take advantage of those opportunities and initiate future development of state and academic programs at the university.

Preparing for Alaska's Economic Success: Finance and e-Commerce-  
New funding will be used for New Economy/e-Commerce Studies and Finance Education at UAF.

Preparing for Alaska's Economic Success: Natural Resources & Alaska Fisheries Investment-  
New funding will be used for a Marine Advisory Program Agent for western and interior Alaska, to be located in Bethel, and for Fisheries and Salmon Ecology Studies. Both programs will contribute to the university's ability to address critical fisheries research and education needs.

Additionally, a Wildlife Faculty position and a faculty in the School of Agriculture and Land- Resources Management will meet current demand for development of leaders in natural resource management.

Preparing for Alaska's Economic Success: Engineering-  
The proposed funding will increase the opportunities for engineering students by building the engineering education infrastructure at the University of Alaska through acquisition of faculty in critical areas and development of a new doctoral degree in engineering. Equipment needs will also be addressed. Summer workshops on technology will be held on the UAF campus to increase the knowledge of Alaska high school teachers for the engineering and computer science professions.

### Summary of Component Budget Changes

#### From FY2002 Authorized to FY2003 Governor

*All dollars in thousands*

	<u>General Funds</u>	<u>Federal Funds</u>	<u>Other Funds</u>	<u>Total Funds</u>
<b>FY2002 Authorized</b>	<b>11,232.8</b>	<b>41,056.4</b>	<b>43,646.4</b>	<b>95,935.6</b>
<b>Adjustments which will continue current level of service:</b>				
-U of A Distribution of ACCFT Salary Increase Systemwide 45-2-010	2.1	0.0	0.2	2.3
-U of A Distribution of United Academics Salary Increase Systemwide 45-2-011	45.4	31.1	60.9	137.4
-U of A Distribution of AHECTE Salary Increase Systemwide 45-2-012	32.3	0.1	2.3	34.7
-U of A Distribution of Non Bargaining Salary Increase Systemwide 45-2-013	1,053.6	40.1	398.5	1,492.2
-UA Non-Discretionary Fixed Costs 45-2-015	0.0	817.2	715.6	1,532.8

	<u>General Funds</u>	<u>Federal Funds</u>	<u>Other Funds</u>	<u>Total Funds</u>
-UA Reallocation of Federal Receipt Authority within UAF 45-2-033	0.0	6,825.8	0.0	6,825.8
-UA Reallocation of Interest Income Receipt Authority within UAF 45-2-036	0.0	0.0	-2.0	-2.0
-UA Reallocation of Dorm, Food & Auxiliary Receipt Authority within UAF 45-2-037	0.0	0.0	-42.3	-42.3
-UA Reallocation of Student Tuition& Fees Receipt Authority within UAF 45-2-038	0.0	0.0	-197.4	-197.4
-UA Transfer Interest Income and Indirect Cost Recovery Authority to SWS 45-2-032	0.0	0.0	-350.0	-350.0
<b>FY2003 Governor</b>	<b>12,366.2</b>	<b>48,770.7</b>	<b>44,232.2</b>	<b>105,369.1</b>

## Fairbanks Organized Research

## Personal Services Information

	Authorized Positions		Personal Services Costs	
	<u>FY2002</u> <u>Authorized</u>	<u>FY2003</u> <u>Governor</u>		
Full-time	338	488	Annual Salaries	25,143,638
Part-time	34	42	Premium Pay	0
Nonpermanent	0	0	Annual Benefits	6,975,121
			Labor Pool(s)	14,543,851
			<i>Less 4.03% Vacancy Factor</i>	<i>(1,879,410)</i>
<b>Totals</b>	<b>372</b>	<b>530</b>	<b>Total Personal Services</b>	<b>44,783,200</b>

## Position Classification Summary

Job Class Title	Anchorage	Fairbanks	Juneau	Others	Total
Assistant To	0	1	0	0	1
[No valid job title]	0	16	0	0	16
Able Seaperson	0	3	0	0	3
Accountant	0	3	0	0	3
Accounting Tech	0	1	0	0	1
Accounting Technician	0	11	0	1	12
Administrative Assis	0	2	0	0	2
Administrative Assistant	0	13	0	2	15
Administrative Asst	0	1	0	0	1
Administrative Clerk	0	0	0	1	1
Administrative Clerk SP/OR	0	1	0	0	1
Aide	0	1	0	0	1
Analyst	0	1	0	2	3
Analyst Porgrammer	0	1	0	0	1
Analyst Programmer	0	3	0	0	3
Applications Special	0	1	0	0	1
Assist Professor	0	1	0	0	1
Assistant Coach	0	1	0	0	1
Assistant Director	0	3	0	0	3
Assistant Director (Admin)	0	1	0	0	1
Assistant Manager	0	1	0	0	1
Assistant Prof R-OR	0	1	0	0	1
Assistant Professor	0	26	0	1	27
Assistant to	0	1	0	0	1
Assistant To	0	1	0	0	1
Assistant to (Nonexempt)	0	1	0	0	1
Assistant To (Nonexempt)	0	2	0	0	2
Associate Professor)	0	1	0	0	1
Associate Director	0	1	0	0	1
Associate Professor	0	24	1	3	28
Compositor	0	1	0	0	1
Consultant (Exempt)	1	0	0	0	1
Cook	0	2	0	0	2
Coordinator (Exempt)	0	14	0	1	15
Coordinator (Nonexempt)	0	4	0	0	4
Coordinator (Non-exempt)	0	1	0	0	1
Crafts & Trades I	0	1	0	3	4
Crafts & Trades II	0	7	0	0	7
Crafts & Trades III	0	5	0	0	5
Crafts & Trades III (CT3)	0	0	0	1	1
Data Base Specialist	0	1	0	0	1
Data Control Clerk	0	1	0	0	1

Job Class Title	Anchorage	Fairbanks	Juneau	Others	Total
Data Specialist	0	3	0	0	3
Director (Academic)	0	4	0	0	4
Director (Academic) SP/OR	0	1	0	0	1
Director (Admin)	0	6	0	0	6
Director (Admin/Non Executive)	0	1	0	0	1
Director(Admin/ Non Executive)	0	1	0	0	1
Director(Admin/Non Executive)	0	1	0	0	1
Drafter	0	1	0	0	1
Editor	0	1	0	0	1
Editorial Assistant	0	3	0	0	3
Engineer	0	6	0	1	7
Engr Ctr Manager ASF	0	1	0	0	1
Executive Officer	0	4	0	0	4
Executive Secretary SP/SF	0	1	0	0	1
Facilitator	0	2	0	0	2
Field Operations Assistant	0	1	0	0	1
Field Operations Supervisor	0	1	0	0	1
First Mate	0	0	0	1	1
Fiscal Officer	0	2	0	0	2
Graphics Artist (Exempt)	0	1	0	0	1
Human Resource Generalist	0	2	0	0	2
Information Officer	0	1	0	0	1
Instructor	0	2	0	0	2
Lab Assistant	0	8	0	1	9
Lab Technician	0	5	0	2	7
Language Specialist	0	1	0	0	1
Launch Officer	0	1	0	0	1
Library Assistant	0	3	0	0	3
Library Technician	0	1	0	0	1
Maint Service Worker	0	2	0	2	4
Maint Service Worker III (MSW3	0	1	0	0	1
Maint Service Worker III MSW3	0	0	0	1	1
Maint Service Worker IV (MSW4)	0	1	0	0	1
Maint Svcs Worker IV (MSW4)	0	1	0	0	1
Manager	0	20	0	2	22
Marine Chief Engineer	1	0	0	1	2
Marine Engineer First Asst	0	0	0	1	1
Master (Ship)	0	0	0	1	1
Micro Computer Specialist	0	1	0	0	1
Micro Computer Technician	0	1	0	0	1
Micro Computer Technology	0	1	0	0	1
Office Manager	0	1	0	0	1
Operations Ctr Manager ASF	0	1	0	0	1
Operations Socialist (Exempt)	0	1	0	0	1
Personnel/Payroll Tech	0	1	0	0	1
Post Doc Fellowship	0	1	0	0	1
Post Doc Fellowship SP-OR	0	1	0	0	1
Post Doc. Fellowship	0	1	0	0	1
Post Doctoral Fellow	0	2	0	0	2
Professor	0	34	5	6	45
Professor (Res)	0	1	0	0	1
Professor SP/OR	0	1	0	0	1
Professor SP-OR	0	2	0	0	2
Program Analyst I	0	1	0	0	1
Program Development Spec	0	1	0	0	1
Program Manager	0	1	0	0	1
Programmer	0	11	0	0	11
Programmer Analyst	0	3	0	0	3

<b>Job Class Title</b>	<b>Anchorage</b>	<b>Fairbanks</b>	<b>Juneau</b>	<b>Others</b>	<b>Total</b>
Project Engineer	0	3	0	0	3
Property Officer	0	1	0	0	1
Public Relations Coordinator	0	0	1	0	1
Publication Info Specialist	0	1	0	0	1
Purchasing Clerk	0	2	0	0	2
Quality Control Engineer	0	1	0	0	1
Research Asst Professor	0	1	0	0	1
Research Professor	0	1	0	0	1
Research Analyst	0	12	0	0	12
Research Assistant	0	2	0	1	3
Research Assoc Professor	0	3	0	0	3
Research Associate	0	20	0	1	21
Research Associate Professor	0	1	0	0	1
Research Associate	0	1	0	0	1
Research Asst Professor	0	1	0	0	1
Research Faculty	0	2	0	0	2
Research Professor	1	5	0	0	6
Research Technician	0	21	0	2	23
Sci Ctr Manager ASF	0	1	0	0	1
Seismic Data Manager	0	1	0	0	1
Steward	0	0	0	1	1
Superintendent	0	1	0	0	1
Supervisor	0	1	0	0	1
Supervisor (Exempt)	0	7	0	2	9
Supervisor (Nonexempt)	0	2	0	0	2
Supervisor (Non-Exempt)	0	1	0	0	1
Support Svcs Spec (Exempt)	0	0	0	1	1
Support Svcs Specialist	0	1	0	0	1
System Analyst	0	7	0	0	7
System Programmer	0	1	0	0	1
System Programmer SP/OR	0	1	0	0	1
System Software Engineer	0	1	0	0	1
System/Network Manager	0	1	0	0	1
System/Software Engr	0	1	0	0	1
Systems Analyst	0	1	0	0	1
Systems Programmer	0	6	0	0	6
Systems Software Engineer	0	11	0	0	11
Systems Software Engr	0	1	0	0	1
Systems/Software Engineer	0	13	0	1	14
Systems/Software Engineer	0	1	0	0	1
Technical Secretary	0	3	0	0	3
Technician	0	15	0	3	18
<b>Totals</b>	<b>3</b>	<b>474</b>	<b>7</b>	<b>46</b>	<b>530</b>