

Chapter 2

Federal Research and Development in Alaska

- Approximately \$135 million of federal R&D funds are spent each year in Alaska.
- Alaska ranks 41st among the 50 states, District of Columbia, and Puerto Rico in terms of the amount of federal R&D dollars received annually.
- Approximately 4 percent of all federal funds spent in Alaska each year on matters other than the direct support of individuals (i.e., such entitlements as retirement, disability, and housing assistance) is spent on R&D.

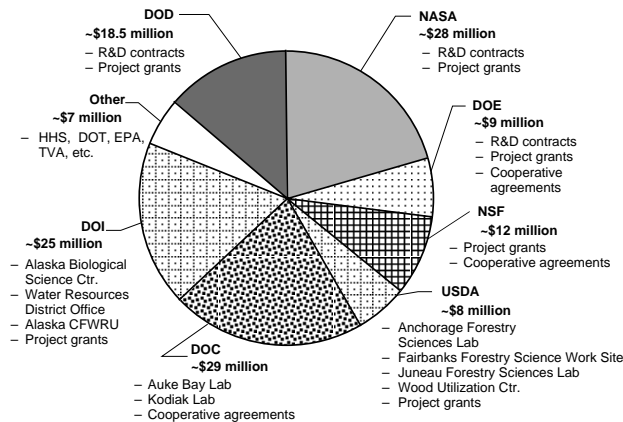


Figure 2.1 – Sources of Federal R&D Dollars Spent in Alaska (Total Federal R&D ~\$135 million)

BACKGROUND

In recent years, the federal government has spent in the neighborhood of \$135 million annually in Alaska on research and development (R&D) activities. On average, federal R&D dollars account for approximately 4 percent of all federal funds spent in Alaska each year on matters other than the direct support of individuals (i.e., such entitlements as retirement, disability, and housing assistance).

Most major federal agencies that currently support federal R&D efforts provide funding for R&D activities in Alaska. Foremost among these agencies are the Department of Commerce (DOC), the National Aeronautics and Space Administration (NASA), the Department of Interior (DOI), and the Department of Defense (DOD) which account for about 21, 20, 18, and 14 percent of all federal R&D dollars spent in the state, respectively. The National Science Foundation (NSF), the Department of Energy (DOE), and the Department of Agriculture (USDA) account for an additional 9, 6, and 6 percent, respectively. The remaining federal R&D dollars come collectively from the Department of Health and Human Services (HHS) and several other federal agencies.²

All federal R&D dollars spent in Alaska either cover the costs of operating federal R&D units in the state, including paying the salaries of federal R&D personnel working at these units, or are awarded as grants, contracts, or cooperative agreements to entities in the state. The following is an overview of what becomes of these federal R&D dollars once they arrive in Alaska.

FEDERAL R&D UNITS IN ALASKA

Anchorage, Alaska, is home to USDA's Anchorage Forestry Sciences Laboratory, HHS's Arctic Investigations Program, and DOI's Alaska Biological Science Center and Alaska District Office of Water Resources.

- The Anchorage Forestry Sciences Laboratory is a unit of the Pacific Northwest Research Station inside USDA's Forest Service.

² For a complete agency-by-agency breakdown of these R&D dollars, see Appendix C.

It conducts research on the moose, bear, and wolf populations of the region, the forestlands of Alaska, and the connection of tree pathogens to forest structure. Specific research activities of this laboratory include determining the relationship among competition, hunting, and predation to manage the wildlife populations for the greatest public good; improving forest inventory and monitoring techniques; and developing pheromone and silviculture for combating the spruce beetle. This federal R&D unit annually receives approximately \$1.4 million of federal R&D funds and has about four employees.

- The Arctic Investigations Program is a unit of the National Center for Infectious Diseases inside HHS's Centers for Disease Control (CDC), headquartered in Atlanta, Georgia. It conducts research by performing disease surveillance, identifying risk factors for infectious diseases, implementing intervention strategies, and monitoring of prevention and control programs. Using epidemiology, laboratory, computer, and statistical sciences, the center investigates causes and dynamics of infectious diseases affecting arctic and subarctic populations in order to prevent and control the spread of them. Specific research activities of this unit include prevention and control of acute hepatitis B and *Haemophilus influenzae* type b (Hib), development of systems for monitoring antibiotic-resistant bacteria, and development of research programs on infectious agents that cause cancer. The program's disease prevention priorities are Hib; *Streptococcus pneumoniae* (pneumococcus); *Helicobacter pylori*; respiratory syncytial virus; and hepatitis A, B, and C. This federal unit annually receives approximately \$2 million of federal R&D funds and has about 23 FTEs.
- The Alaska Biological Science Center is a unit of DOI's U.S. Geological Survey (USGS). It conducts research throughout Alaska on a variety of fish and wildlife species and ecosystems. Field studies on fish and wildlife resources are central to the center's research, complemented by laboratory-based genetic analyses. Specific research activities of this center include studying the eco-

logical effects of petroleum development and pollution; investigating the effects of sport and subsistence harvests of arctic waterfowl, Dungeness crab, marine mammals, and terrestrial mammals; and studying the impact of hatchery enhancements on wild fish stocks. This federal R&D unit annually receives approximately \$5.6 million of federal R&D funds and has about 79 FTEs.

- The Alaska District Office of Water Resources is a unit of DOI's USGS. It oversees the R&D activities of USGS's National Water-Quality Assessment (NAWQA), Ground-Water Resources Assessment, Toxic Substances Hydrology, and Federal State Cooperatives programs. The NAWQA program conducts research on the nation's surface and groundwater resources to better understand the effect of pesticides, erosion, and bacterial contamination on water quality. The Ground-Water Resources Assessment Program studies groundwater systems to develop models and simulations to better understand the workings of these systems. The Toxic Substances Hydrology program studies the behavior of toxic substances in hydrologic environments. These research activities investigate subsurface contamination at local releases and aquatic ecosystem contamination on a watershed and regional scale. The Federal State Cooperatives program studies the effects of agricultural chemicals, floods, droughts, and waste disposal on water supply and groundwater quality. This federal unit annually receives approximately \$2 million in federal R&D funds.

Fairbanks, Alaska, is home to USDA's Fairbanks Forestry Science Work Site and DOI's Alaska Cooperative Fish and Wildlife Research Unit.

- The Fairbanks Forestry Sciences Work Site is a unit of the Pacific Northwest Research Station inside USDA's Forest Service. This unit is on the campus of the University of Alaska in Fairbanks. It conducts research to understand and manage the impact of climate, fire, and permafrost on the forest resources of the interior

of Alaska. Specific research activities of this work site include the Long-Term Ecological Research program, which investigates ecological processes operating at long time scales and over very broad spatial scales. This federal R&D unit annually receives approximately \$600,000 of federal R&D funds and has about two employees.

- The Alaska Cooperative Fish and Wildlife Research Unit is part of DOI's USGS. It is on the Fairbanks campus of the University of Alaska. It conducts research on fisheries and aquatic ecology of freshwater in interior and arctic Alaska, as well as ecological studies of other Alaskan wildlife. Specific research activities of this unit include studying the impact of oil and related northern development on wildlife resources. This federal R&D unit annually receives approximately \$400,000 of federal R&D funds and has about four FTEs.

Juneau, Alaska, is home to USDA's Juneau Forestry Sciences Laboratory and DOC's Auke Bay Laboratory.

- The Juneau Forestry Sciences Laboratory is a unit of the Pacific Northwest Research Station inside USDA's Forest Service. It conducts research on how to balance the conflicting needs of the logging, fishing, and sport hunting industries with the need to preserve the habitat of all forms of wildlife. Specific research activities of this laboratory include studies of the effects of landslides on aquatic habitats in streams, the role played by the presence of large wood and trees in streams, and the connection between riparian birds and mammals. This federal R&D unit annually receives approximately \$3.6 million of federal R&D funds and has about 39 employees.
- The Auke Bay Laboratory is a unit of the Alaska Fisheries Science Center inside DOC's National Oceanic and Atmospheric Administration (NOAA). It conducts research on stock identification, groundfish assessment, marine salmon interactions, ocean-carrying capacity, habitats, and the aftermath of the *Exxon Valdez* oilspill. Specific research activities focus on

U.S./Canada salmon issues, salmon net pen and aquaculture, and fish habitat studies throughout Alaska. This federal unit annually receives approximately \$8.5 million of federal R&D funds and has approximately 71 FTEs, only a portion of whom are involved in R&D activities.

Kodiak, Alaska, is home to DOC's Kodiak Laboratory.

- The Kodiak Laboratory is a unit of the Northwest Fisheries Science Center inside DOC's NOAA. The laboratory coordinates research activities with the center in conservation biology, environmental conservation, fishery resource analysis and monitoring, fish ecology, and resource enhancement and utilization techniques. It also conducts research on the populations and ecosystems of shellfish and groundfish. This federal unit annually receives approximately \$1.2 million of federal R&D funds and has about 12 FTEs, only a portion of whom are involved in R&D activities. It also annually receives an additional \$273,000 of federal R&D funds and another two FTEs from the Northwest Fisheries Science Center.

Sitka, Alaska, is home to USDA's Wood Utilization Center.

- The Wood Utilization Center is a unit of the Pacific Northwest Research Station inside USDA's Forest Service. It conducts research to determine the scale of logging and forest product manufacturing that is consistent with the environmental and economic objectives of southeast Alaska. Specific research activities of this laboratory include identifying the type and scale of harvesting operations and manufacturing facilities consistent with timber resources, economic conditions, market opportunities, and economic development objectives of communities in southeast Alaska. This federal R&D unit is in the process of being developed, so information on its federal R&D funding and its staffing are not yet tracked separately.

FEDERAL R&D GRANTS TO ALASKA ENTITIES

Every major institution of higher education in Alaska is the recipient of significant federal R&D dollars each year through grants made by federal agencies to faculty, graduate students, and research centers. The vast majority of the R&D grants are made by NSF, DOC, NASA, and USDA to individual faculty members and therefore ultimately inure to the benefit of such institutions as the University of Alaska. The table below shows the number of R&D grants active in FY 1998, highlighting those made by NSF, DOC, NASA, and USDA to parties at this institution and estimates of the total dollars transferred to them in FY 1998 pursuant to the terms of these grants. Most of the grants in the “Other Agencies” category going to the University of Alaska are from HHS and DOD (close to \$1 million each).

Table 2.1 – Sources of Federal R&D Grants to Higher Education in Alaska

Institution	NSF		DOC		NASA		USDA		Other Agencies		Total	
	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#
U of Alaska	\$7M	100	\$4M	11	\$2M	33	\$2M	35	\$3M	23	\$17M	202
Other	<\$1M	1	0	0	0	0	0	0	<\$1M	2	<\$1M	3
Total	\$7M	101	\$4M	11	\$2M	33	\$2M	35	\$3M	25	\$17M	205

These activities are particularly significant because they fund much of the “basic research” so critical to expanding our knowledge and understanding of fundamental scientific phenomena. In addition, these funds account for a substantial portion of the dollars available each year to various academic departments within these institutions.

Several other nonacademic institutions in Alaska also receive a significant amount of federal R&D grants each year. Foremost among these institutions in Alaska that received R&D grants in FY 1998 are Ketchikan Public Utilities in Ketchikan (\$10 million) and the Alaska Department of Community and Regional Affairs in Anchorage (\$2 million).

Scattered among these grants, as well as among the contracts discussed in the section below, are small business innovative research (SBIR) awards. These are special awards made by the SBIR programs supported by the 10 federal agencies with annual budgets for extramural R&D of more than \$100 million. In a recent year, small businesses in Alaska received three SBIR awards totaling \$263,000. Examples include a \$90,000 award from NSF to Imlach Consulting Engineering in Anchorage for work on a reliable low-cost support system for flywheel energy storage and a \$70,000 award from EPA to Hydro-Solutions and Purification in Fairbanks to develop a prototype for the effective removal of selenium in wastewater utilizing enhanced iron co-precipitation.

Also included among these grants are formula grants from federal agencies. Formula grants differ from the much more common project grants in that the money transmitted through formula grants is allocated to a state or one of its subdivisions in accordance with a distribution formula prescribed by law or regulation. Among the formula grants benefiting Alaska are ones valued at more than \$1.3 million from USDA's Cooperative State Research, Education, and Extension Service (CSREES) to State Agricultural Experiment Stations, forestry schools, and veterinary colleges for the support of research in agriculture, forestry, and animal health and disease. Similarly, a modest formula grant goes from DOI's USGS to the Water Resources Research Institute in Alaska every year to foster research in water and water-related problems.

OTHER FEDERAL R&D ACTIVITIES IN ALASKA

Several entities in Alaska also receive notable sums in the form of contracts or cooperative agreements from federal agencies for specific R&D efforts. By far the majority of the funds go to the University of Alaska, which in FY 1998 received close to \$6 million in R&D contracts, primarily to operate and manage NASA's Alaska Synthetic Aperture Radar (SAR) Facility. In addition, the Prince William Sound Science Center (\$1 million) and ABR, Inc. (\$1 million), received significant R&D contracts from federal agencies in FY 1998.

A total of \$10 million of federal R&D dollars was also received in FY 1998 by entities located in Alaska in the form of cooperative agreements. The largest of these cooperative agreements (\$2 million in FY 1998) came from DOE to Kotzebue Electric Association in Kotzebue to test wind turbines in the Arctic environment. Another of these cooperative agreements (\$1.6 million in FY 1998) came from DOC to the University of Alaska to operate the Cooperative Institute for Arctic Research (CIFAR). Other federal agencies awarding cooperative agreements to Alaska-based entities include DOC and the Department of Interior.

