

Chapter 20

Federal Research and Development in Maine

- Approximately \$79 million of federal R&D funds are spent each year in Maine.
- Maine ranks 46th among the 50 states, District of Columbia, and Puerto Rico in terms of the amount of federal R&D dollars received annually.
- Approximately 2 percent of all federal funds spent in Maine 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.

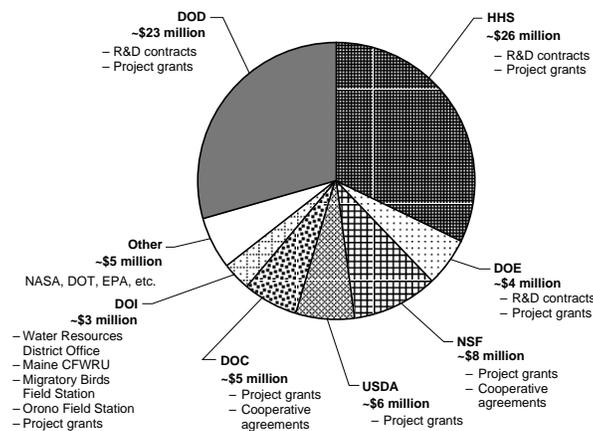


Figure 20.1 – Sources of Federal R&D Dollars Spent in Maine (Total Federal R&D ~\$79 million)

BACKGROUND

In recent years, the federal government has spent in the neighborhood of \$79 million annually in Maine on research and development (R&D) activities. On average, federal R&D dollars account for approximately 2 percent of all federal funds spent in Maine 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 Maine. Foremost among these agencies are the Departments of Health and Human Services (HHS) and Defense (DOD), which account for 32 and 29 percent of all federal R&D dollars spent in the state, respectively. The National Science Foundation (NSF), and the Departments of Agriculture (USDA), Commerce (DOC), and Energy (DOE) account for an additional 10, 7, 6, and 5 percent of all federal R&D dollars spent in Maine, respectively. The remaining federal R&D dollars come collectively from the Department of Interior (DOI), the National Aeronautics and Space Administration (NASA), the Environmental Protection Agency (EPA), and several other federal agencies.²⁰

All federal R&D dollars spent in Maine 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 Maine.

FEDERAL R&D UNITS IN MAINE

Augusta, Maine, is home to DOI's Maine District Office of Water Resources.

- The Maine District Office of Water Resources is a unit of DOI's U.S. Geological Survey (USGS). It oversees the R&D activities of USGS's National Water-Quality Assessment (NAWQA),

²⁰ For a complete agency-by-agency breakdown of these R&D dollars, see Appendix C.

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 \$251,000 in federal R&D funds.

Orono, Maine, is home to DOI's Maine Cooperative Fish and Wildlife Research Unit, Migratory Birds Field Station, and Orono Field Station.

- The Maine Cooperative Fish and Wildlife Research Unit is part of DOI's USGS. It is on the Orono campus of the University of Maine. It conducts research on fish and wildlife and provides graduate-level training, including research experience, in fish and wildlife management. Specific research activities of this unit include quantifying the functional relationships between selected wildlife species and their habitats and assessing the status of selected waterbirds. This federal R&D unit annually receives approximately \$203,000 in federal R&D funds and has about two FTEs.
- The Migratory Birds Field Station is a unit of the Patuxent Environmental Science Center inside DOI's USGS. It conducts research on the effect of high mercury levels in fish from many lakes in this region on bald eagles. Specific research activities of this unit are focused on identifying habitat and food-chain impacts, such as localized high mercury concentrations. Such

studies help to maintain the eagle population. This federal R&D unit annually receives approximately \$227,000 in federal R&D funds and has about three FTEs.

- The Orono Field Station is a unit of the Leetown Science Center inside DOI's USGS. It conducts research on developing ways to restore the Atlantic salmon, which has been proposed for inclusion on the Endangered Species List as either threatened or endangered. Specific research activities of this unit include studying habitat needs and migratory routes and examining populations of wild Atlantic salmon for the presence of unique genetic differences. This federal R&D unit annually receives approximately \$141,000 in federal R&D funds and has one FTE.

FEDERAL R&D GRANTS TO MAINE ENTITIES

Every major institution of higher education in Maine 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, DOD, and USDA to individual faculty members and therefore ultimately inure to the benefit of such institutions as the University of Maine system. The table below shows the number of R&D grants active in FY 1998, highlighting those made by NSF, DOD, and USDA to parties at this institution and estimates of the total dollars transferred to them in FY

Table 20.1 – Sources of Federal R&D Grants to Higher Education in Maine

Institution	NSF		DOD		USDA		Other Agencies		Total	
	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#
U of Maine	\$3M	57	\$3M	9	\$3M	125	\$5M	28	\$14M	219
Other	\$1M	26	0	0	<\$1M	1	<\$1M	6	\$1M	33
Total	\$4M	83	\$3M	9	\$3M	126	\$5M	34	\$15M	252

1998 pursuant to the terms of these grants. Among the grants in the “Other Agencies” category going to the University of Maine are ones from DOC (\$2 million), NASA (\$1 million), and HHS (\$1 million).

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 Maine also receive federal R&D grants each year. Foremost among these institutions that received R&D grants in FY 1998 are the Jackson Laboratory in Bar Harbor (\$25 million), Bigelow Laboratory for Ocean Sciences in West Boothbay Harbor (\$2 million), the Maine Medical Center in Portland (\$1 million), and the Maine State Department of Human Services in Augusta (\$1 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 Maine received seven SBIR awards totaling close to \$1 million. Examples include a \$750,000 award from DOE to Biode, Inc., in Bangor for work on “piezoelectric” biosensors for bacterial detection and speciation and a \$75,000 award from DOC to Sensor Research and Development in Orono to develop a low-cost prefire detector.

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 Maine are ones valued at more than \$2.1 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 Maine every year to foster research in water and water-related problems.

OTHER FEDERAL R&D ACTIVITIES IN MAINE

Several entities in Maine also receive notable sums in the form of contracts or cooperative agreements from federal agencies for specific R&D efforts. The majority of these funds go from DOD to Fiber Materials, Inc., which in FY 1998 received close to \$3.5 million for support of the Army's Atmospheric Interceptor Technology (AIT) program. In addition, Sensor Research and Development (\$2 million), Intermat, Inc. (\$2 million), the Maine State Department of Human Services (\$2 million), and the Jackson Laboratory (\$1 million) received significant R&D contracts from federal agencies in FY 1998. Note that these amounts are in addition to the federal R&D grants also received by Jackson Laboratory and the Department of Human Services. The University of Maine (\$100,000) also receives contracts from various federal agencies to conduct R&D for the federal government. Although this amount is notable, it does not come close to eclipsing the funds that this institution receives from federal R&D grants.

A total of \$1.3 million of federal R&D dollars was also received in FY 1998 by entities located in Maine in the form of cooperative agreements. The largest of these cooperative agreements (\$400,000 in FY 1998) came from NSF to the Maine Science and Technology Foundation in Augusta to develop the Maine EPSCoR (Experimental Program to Stimulate Competitive Research) strategic implementation plan. Other federal agencies awarding cooperative agreements to Maine-based entities include DOC and USDA.