

Chapter 7

Federal Research and Development in Connecticut

- Approximately \$819 million of federal R&D funds are spent each year in Connecticut.
 - Connecticut ranks 22nd among the 50 states, District of Columbia, and Puerto Rico in terms of the amount of federal R&D dollars received annually.
 - Approximately 9 percent of all federal funds spent in Connecticut 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.
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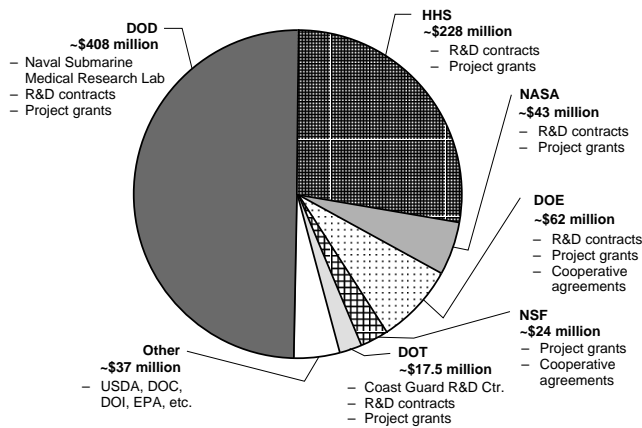


Figure 7.1 – Sources of Federal R&D Dollars Spent in Connecticut
(Total Federal R&D ~\$819 million)

BACKGROUND

In recent years, the federal government has spent in the neighborhood of \$820 million annually in Connecticut on research and development (R&D) activities. On average, federal R&D dollars account for approximately 9 percent of all federal funds spent in Connecticut 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 Connecticut. Foremost among these agencies are the Department of Defense (DOD) and the Department of Health and Human Services (HHS), which account for 50 and 28 percent of all federal R&D dollars spent in the state, respectively. The Department of Energy (DOE), the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF) account for an additional 8, 5, and 3 percent of the federal R&D dollars spent in Connecticut, respectively. The remaining federal R&D dollars come collectively from the Department of Transportation (DOT), the Department of Agriculture (USDA), the Department of Commerce (DOC), and several other federal agencies.⁷

All federal R&D dollars spent in Connecticut 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 Connecticut.

FEDERAL R&D UNITS IN CONNECTICUT

East Hartford, Connecticut, is home to Department of Interior's (DOI's) Connecticut District Office of Water Resources.

- The Connecticut 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 Re-

⁷ For a complete agency-by-agency breakdown of these R&D dollars, see Appendix C.

sources 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 \$448,000 in federal R&D funds.

Groton, Connecticut, is home to DOD's Naval Submarine Medical Research Laboratory and DOT's U.S. Coast Guard Research and Development Center.

- The Naval Submarine Medical Research Laboratory is a unit of DOD. It conducts R&D to enhance auditory and visual operator performance, health and physical standards, and closed environment atmospheric monitoring. Specifically, the laboratory conducts R&D to optimize crew survival rates in damaged submarines and to determine the effectiveness of contaminant control procedures by measuring concentrations of volatile organic compounds, oxygenated compounds, and ozone. This federal unit receives about \$3.8 million in federal funds, about \$2.7 million of which are spent on in-house activities, and has about 26 civilian personnel.
- The U.S. Coast Guard Research and Development Center is a unit of DOT's Coast Guard. It conducts research to develop hardware and systems to increase the quality and productivity of operations. Specific research activities of this center include im-

proving search and rescue capabilities, studying survival suit leeway, developing search planning theory, researching sensor fusion and ocean current data blending, studying fuel cell propulsion and robotics, and developing energy conservation technology. Other R&D activities include a study on the probability of detection of high-seas drift nets using the Navy's Sound Surveillance System. This federal R&D unit annually receives approximately \$13.7 million in federal R&D funds and has about 73 civilian employees.

Hamden, Connecticut is home to USDA's Northeastern Center for Forest Health Research.

- The Northeastern Center for Forest Health Research is a unit of the Northeastern Research Station inside USDA's Forest Service. It conducts research on the impact of insects on forest health. Specific research activities of this center include studying the biology of insect pests and their interaction with plants and environmental stressors and investigating the pathology and microbial control of insects that impact the health of eastern forests. With the help of an additional work unit in Durham, New Hampshire, the center also studies how the interactions of pathogens, stressors, and hosts create disturbances in forests. These federal R&D units annually receive approximately \$2.8 million in federal R&D funds and have about 32 employees.

Milford, Connecticut is home to DOC's Milford Laboratory.

- The Milford Laboratory is a unit of the Northeast Fisheries Science Center inside DOC's National Oceanic and Atmospheric Administration (NOAA). It researches aquaculture and habitat-related work. Specifically, the laboratory studies the culture of fish and shellfish in order to develop methods suitable for commercial use as well as for stock enhancement and restoration. This federal unit annually receives approximately \$2 million of federal R&D dollars and has about 28 FTEs, only a portion of whom are involved in R&D activities.

West Haven, Connecticut, is home to a Department of Veterans Affairs (DVA) R&D unit.

- While the principal focus of the VA Connecticut Healthcare System facility, the VA Medical Center in West Haven, is providing medical care to veterans, it is also the location of a number of research activities. In a recent year, this federally owned and operated facility was the site of 486 projects with total funding of approximately \$12 million. These R&D activities focus on a wide range of topics, including psychiatry, alcoholism, drug abuse, posttraumatic stress disorders, and emission-computed tomography.

FEDERAL R&D GRANTS TO CONNECTICUT ENTITIES

Every major institution of higher education in Connecticut 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 HHS, NSF, DOE, and DOD to individual faculty members and therefore ultimately inure to the benefit of such institutions as Yale University, the University of Connecticut (UConn), Wesleyan University, and the Connecticut State University system (CSU). The table below shows the number of R&D grants active in FY 1998, highlighting those made by

Table 7.1 – Sources of Federal R&D Grants to Higher Education in Connecticut

Institution	HHS		NSF		DOE		DOD		Other Agencies		Total	
	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#
Yale	\$196M	823	\$13M	207	\$10M	24	\$6M	30	\$2M	45	\$227M	1,129
U of Conn	\$29M	164	\$8M	135	\$1M	12	\$3M	24	\$5M	95	\$46M	430
Wesleyan	\$2M	13	\$1M	26	0	0	0	0	<\$1M	2	\$3M	41
CSU	\$2M	5	<\$1M	1	0	0	0	0	<\$1M	1	\$2M	7
Other	\$2M	14	\$1M	13	<\$1M	1	<\$1M	1	<\$1M	6	\$3M	35
Total	\$231M	1,019	\$22M	382	\$11M	37	\$8M	55	\$8M	149	\$280M	1,642

HHS, NSF, DOE, and DOD to parties at the various institutions and estimates of the total dollars transferred to them in FY 1998 pursuant to the terms of these grants. Nearly all of the grants in the “Other Agencies” category going to Yale University are from NASA. The comparable grants going to UConn include \$2 million each from USDA and the Department of Education.

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, such as the School of Medicine at the UConn Health Center.

Several other nonacademic institutions in Connecticut also receive a significant amount of federal R&D grants each year. Foremost among these institutions that received R&D grants in FY 1998 are Haskins Laboratories, Inc., in New Haven (\$3 million), Travelers Insurance Co. in Hartford (\$3 million), John B. Pierce Foundation Laboratory, Inc., in New Haven (\$2 million), and Steven Winter Associates, Inc., in Norwalk (\$1.5 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 Connecticut received 96 SBIR awards totaling \$25 million. Examples include a \$750,000 award from DOD (Air Force) to Advanced Optical Technologies in East Hartford to develop an automated system for accurately tracking and measuring multiple targets in six dimensions and a \$600,000 award from NASA to Advanced Technology Materials, Inc., in Danbury for work on lightweight and inexpensive hydrogen-specific sensors.

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 Connecticut are ones valued at more than \$1.8 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 Connecticut every year to foster research in water and water-related problems.

OTHER FEDERAL R&D ACTIVITIES IN CONNECTICUT

Several entities in Connecticut 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 these funds go from DOD to Electric Boat Corp. (a subsidiary of General Dynamics) in Groton, which in FY 1998 received close to \$1.7 billion in R&D contracts from the Navy for the design, development, and construction of *Seawolf*-class and new *Virginia*-class (NSSN Program) nuclear attack submarines. In addition, United Technologies Corp. (\$49 million), Analysis & Technology, Inc. (\$37 million), Hughes Danbury Optical Systems, Inc. (\$10 million), and Sonalysts, Inc. (\$6 million), received large R&D contracts from federal agencies in FY 1998. Yale University (\$1 million) and UConn (\$250,000) also received contracts from various federal agencies to conduct R&D for the federal government. Although these amounts are notable, they do not come close to eclipsing the funds that these institutions receive from federal R&D grants.

A total of \$28 million of federal R&D dollars was also received in FY 1998 by entities located in Connecticut in the form of cooperative agreements. By far, the largest of these agreements (\$13 million in FY 1998) came from DOE to Energy Research Corp. in Danbury for work on design improvement of molten carbonate fuel cells. Other federal agencies awarding cooperative agreements to Connecticut-based entities include DOD and DOC.

