

Chapter 40

Federal Research and Development in Puerto Rico

- Approximately \$59 million of federal R&D funds are spent each year in Puerto Rico.
 - Puerto Rico ranks 48th among the 50 states, District of Columbia, and Puerto Rico in terms of the amount of federal R&D dollars received annually.
 - Approximately 1 percent of all federal funds spent in Puerto Rico 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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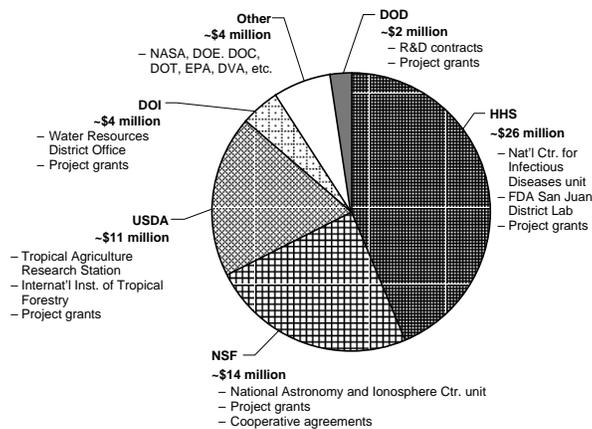


Figure 40.1 – Sources of Federal R&D Dollars Spent in Puerto Rico
(Total Federal R&D ~\$59 million)

BACKGROUND

In recent years, the federal government has spent in the neighborhood of \$59 million annually in Puerto Rico on research and development (R&D) activities. On average, federal R&D dollars account for approximately 1 percent of all federal funds spent in Puerto Rico 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 Puerto Rico. Foremost among these agencies is the Department of Health and Human Services (HHS), which accounts for 43 percent of all federal R&D dollars spent in the state. The National Science Foundation (NSF) and the Department of Agriculture (USDA) account for an additional 24 and 19 percent of all federal R&D dollars spent in Puerto Rico, respectively. The remaining federal R&D dollars come collectively from the Department of Interior (DOI), the National Aeronautics and Space Administration (NASA), and several other federal agencies.⁴⁰

All federal R&D dollars spent in Puerto Rico 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 Puerto Rico.

FEDERAL R&D UNITS IN PUERTO RICO

Arecibo, Puerto Rico, is home to NSF's National Astronomy and Ionosphere Center.

- The National Astronomy and Ionosphere Center (NAIC) is a federally funded research and development center (FFRDC) sponsored by the National Science Foundation, headquartered at Cornell University, and physically located in Puerto Rico. NAIC's Arecibo Observatory conducts research in astronomy

⁴⁰ For a complete agency-by-agency breakdown of these R&D dollars, see Appendix C.

and atmospheric sciences. It also develops new techniques and instruments for astronomical and atmospheric observations and data processing. The Arecibo Radio Telescope enables astronomers to detect the faint radio emissions from the universe. Experiments performed at the observatory help scientists measure the upper atmosphere composition, temperature, and densities. This federally owned and university operated unit annually receives a total of approximately \$12 million of federal R&D funds, close to \$9 million of which are spent in Puerto Rico. About 140 people are employed by NAIC in Puerto Rico.

Guaynabo, Puerto Rico, is home to DOI's Puerto Rico District Office of Water Resources.

- The Puerto Rico 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 Ground-Water Resources Assessment, Toxic Substances Hydrology, and Federal State Cooperatives programs. 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 \$1 million in federal R&D funds.

Mayagüez, Puerto Rico, is home to a unit of USDA's Tropical Agriculture Research Station.

- The Tropical Agriculture Research Station is a unit of USDA's Agricultural Research Service (ARS) located on the campus of the University of Puerto Rico. It conducts fundamental re-

search on tropical plants and studies crops. Specific research activities of the unit include studies to enhance sorghum germplasm and investigation of different ways to increase resistance and improve the quality of dry beans. This federal R&D unit annually receives approximately \$2.4 million in federal R&D dollars and has about 37 FTEs.

Rio Piedras, Puerto Rico, is home to USDA's International Institute of Tropical Forestry.

- The International Institute of Tropical Forestry is a unit of USDA's Forest Service. It conducts research on tropical American forestry management practices. Specifically, the unit studies ways to decrease the impacts and extent of tropical deforestation and strengthen tropical forest management. This federally R&D unit receives approximately \$2.9 million in federal R&D dollars and has about 73 employees.

San Juan, Puerto Rico is home to HHS's San Juan District Laboratory and the Dengue Branch of the Division of Vector-Borne Infectious Diseases and a Department of Veterans Affairs (DVA) R&D unit.

- The San Juan District Laboratory is a unit of HHS's Food and Drug Administration. It conducts research on the safety and efficacy of human drugs. This federal unit receives approximately \$163,000 in federal R&D dollars and has one FTE directly involved in R&D activities.
- The Dengue Branch of the Division of Vector-Borne Infectious Diseases (DVBID) in Fort Collins, Colorado, is a unit of the National Center for Infectious Diseases inside HHS's Centers for Disease Control and Prevention (CDC), which is headquartered in Atlanta, Georgia. It conducts research to provide laboratory and clinical diagnoses and national and international surveillance, prevention, and control of dengue and dengue hemorrhagic fever as well as providing laboratory reference and diagnostic services to local, state, national, and international health agencies. It is organized in three sections: Epidemiology,

Diagnostic and Reference, and Entomology. Specific research activities of this branch include investigating dengue epidemics and providing aid; conducting field and laboratory research on the biology, behavior, and control of *Aedes aegypti* and other mosquito vectors of dengue; and developing new community-based intervention strategies for prevention of epidemic dengue. The Dengue Branch also serves the diagnostic and reference functions of the World Health Organization's Collaborating Center for Reference and Research on Dengue Hemorrhagic Fever. This federal unit annually receives approximately \$517,000 of federal R&D funds and has about 16 FTEs.

- While the principal focus of the San Juan VA Medical Center 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 99 projects with total funding of approximately \$25,000. These R&D activities focus on a wide range of topics, including renal physiology, endocrinology, dental implants, infectious diseases, urology, hematology-oncology, cardiology, and hypertension.

FEDERAL R&D GRANTS TO PUERTO RICO ENTITIES

Every major institution of higher education in Puerto Rico 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, USDA, and NSF to individual faculty members and therefore ultimately inure to the benefit of such institutions as the University of Puerto Rico (U of Puerto Rico), the Ponce School of Medicine (PSM), and Universidad Central Del Caribe (UCDC). The table below shows the number of R&D grants active in FY 1998, highlighting those made by HHS, USDA, and NSF to parties at these institutions and estimates of the total dollars transferred to them pursuant to the terms of these grants. Among the grants in the "Other Agencies" category going to the University of Puerto Rico are ones from NASA (\$2 million), DOD (\$1 million), and DOC (\$1 million).

Table 40.1 – Sources of Federal R&D Grants to Higher Education in Puerto Rico

Institution	HHS		USDA		NSF		Other Agencies		Total	
	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#
U of Puerto Rico	\$18M	46	\$4M	64	\$4M	50	\$5M	33	\$31M	193
PSM	\$4M	5	0	0	0	0	<\$1M	2	\$4M	7
UCDC	\$3M	5	0	0	0	0	0	0	\$3M	5
Other	\$1M	5	<\$1M	1	<\$1M	2	<\$1M	2	\$1M	10
Total	\$26M	61	\$4M	65	\$4M	52	\$6M	37	\$40M	215

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 Puerto Rico also receive federal R&D grants each year. Foremost among the institutions that received R&D grants in FY 1998 are Seguros de Servicio de Salud in San Juan (\$200,000), San Juan City Hospital (\$200,000), and the Governor’s Office of Elderly Affairs (\$150,000).

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, one small business in Puerto Rico received an SBIR award. This was an \$86,000 award from HHS to Innovaciones Psicoeducativas in Rio Piedras for work on the identification of learning and developmental disabilities.

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 Puerto Rico are ones valued at more than \$3.8 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 Puerto Rico every year to foster research in water and water-related problems.

OTHER FEDERAL R&D ACTIVITIES IN PUERTO RICO

Several entities in Puerto Rico also received notable sums in the form of contracts or cooperative agreements from federal agencies for specific R&D efforts. The two contracts active in FY 1998 went to the University of Puerto Rico, which received close to \$200,000 from DOD (Army) and HHS.

A total of \$2.5 million of federal R&D dollars was also received in FY 1998 by entities located in Puerto Rico in the form of cooperative agreements. By far the largest of these cooperative agreements (\$2 million in FY 1998) came from NSF to the University of Puerto Rico in San Juan to fund the Puerto Rico Collaborative for Excellence for Teacher Preparation (PR-CEPT). Other federal agencies awarding cooperative agreements to Puerto Rico-based entities include the Department of Commerce and USDA.

