

Chapter 18

Federal Research and Development in Kentucky

- Approximately \$112 million of federal R&D funds are spent each year in Kentucky.
- Kentucky ranks 43rd 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 Kentucky 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.

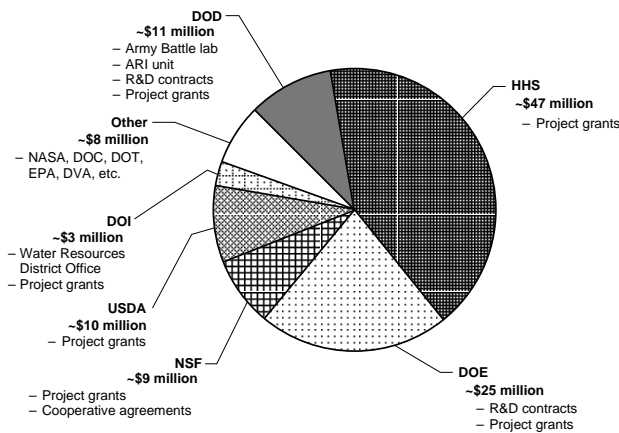


Figure 18.1 – Sources of Federal R&D Dollars Spent in Kentucky (Total Federal R&D ~\$112 million)

BACKGROUND

In recent years, the federal government has spent in the neighborhood of \$112 million annually in Kentucky on research and development (R&D) activities. On average, federal R&D dollars account for approximately 1 percent of all federal funds spent in Kentucky 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 Kentucky. Foremost among these agencies is the Department of Health and Human Services (HHS), which accounts for 42 percent of all federal R&D dollars spent in the state. The Department of Energy (DOE), the Department of Defense (DOD), the Department of Agriculture (USDA), and the National Science Foundation (NSF) account for an additional 22, 10, 9, and 8 percent of all federal R&D dollars spent in Kentucky, 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.¹⁸

All federal R&D dollars spent in Kentucky 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 Kentucky.

FEDERAL R&D UNITS IN KENTUCKY

Fort Knox, Kentucky, is home to a unit of DOD's Army Research Institute for Behavioral and Social Sciences and Mounted Maneuver Battlespace Battle Laboratory.

- The Armored Forces Research Unit is a unit of DOD's Army Research Institute for Behavioral and Social Sciences headquartered in Alexandria, Virginia. Additional sites are located in Fort

¹⁸ For a complete agency-by-agency breakdown of these R&D dollars, see Appendix C.

Rucker, Alabama; Fort Benning, Georgia; Fort Leavenworth, Kansas; Fort Bragg, North Carolina; Orlando, Florida; Fort Hood, Texas; Heidelberg, Germany; and Boise, Idaho. This unit conducts R&D on improved training methods and training technologies focusing on the armor force. This federal unit receives approximately \$1.7 million in federal R&D dollars, only a portion of which is spent on in-house R&D activities, and employs about 13 civilian personnel directly involved in R&D activities.

- The Mounted Maneuver Battlespace Battle Laboratory is a unit of the Army inside DOD. It is one of 11 battle laboratories established to define the horizontally integrated capabilities required to operate and field an effective Army. It conducts research on mounted maneuvers at the brigade level and below as they pertain and relate to full dimension operations of the current and future Army. Specific research activities of this laboratory focus on such matters as unmanned vehicle, semi-autonomous reconnaissance operations on the digitized battlefield, the future combat system constructive experiment, and small, low-cost interceptor devices. This federal unit annually receives about \$1.7 million of federal R&D funds, only a portion of which is spent in-house, and has three civilian personnel.

Lexington, Kentucky, is home to a Department of Veterans Affairs (DVA) R&D unit.

- While the principal focus of the Lexington 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 286 projects with total funding of approximately \$1 million. These R&D activities focus on a wide range of topics, including fluorouracil, neoplasms, chemotherapy, and cerebrovascular disorders.

Louisville, Kentucky, is home to DOI's Kentucky District Office of Water Resources and a DVA R&D unit.

- The Kentucky 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), 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 \$737,000 in federal R&D funds.
- While the principal focus of the Louisville 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 149 projects with total funding of approximately \$1.5 million. These R&D activities focus on a wide range of topics, including sepsis, pneumonia, congestive heart failure, diabetes, and microcirculation.

FEDERAL R&D GRANTS TO KENTUCKY ENTITIES

Every major institution of higher education in Kentucky 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 Ken-

tucky, the University of Louisville, and Kentucky State University (KSU). 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 the various institutions and estimates of the total dollars transferred to them in FY 1998 pursuant to the terms of these grants. Among the grants in the “Other Agencies” category going to the University of Kentucky is one for \$1 million from DOD, with the remainder split among EPA, DOE, and NASA. Most of the comparable grants going to the University of Louisville come from DOD and EPA.

Table 18.1 – Sources of Federal R&D Grants to Higher Education in Kentucky

Institution	HHS		USDA		NSF		Other Agencies		Total	
	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#
U of Kentucky	\$40M	258	\$6M	160	\$6M	143	\$3M	58	\$55M	619
U of Louisville	\$9M	58	0	0	\$1M	22	\$2M	13	\$11M	93
KSU	0	0	\$2M	26	0	0	<\$1M	1	\$2M	27
Other	<\$1M	8	<\$1M	2	<\$1M	4	\$1M	9	\$1M	23
Total	\$49M	324	\$8M	188	\$7M	169	\$6M	81	\$70M	762

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 Kentucky also receive federal R&D grants each year. Foremost among the institutions that received R&D grants in FY 1998 are Administar in Louisville (\$2 million), the Conference of Radiation Program Directors in Frankfort (\$1 million), and Murty Pharmaceuticals in Lexington (\$500,000).

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 extra-

mural R&D of more than \$100 million. In a recent year, small businesses in Kentucky received seven SBIR awards totaling close to \$2 million. Examples include a \$750,000 award from HHS to Speech Technology and Applied Research Co. in Lexington to develop a device for enhancing artificial larynx speech and a \$100,000 award from NSF to K&S Scientific, Inc., in Bowling Green for work on a pulsed neutron-based online coal analyzer.

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 Kentucky are ones valued at more than \$6.8 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 Kentucky every year to foster research in water and water-related problems.

OTHER FEDERAL R&D ACTIVITIES IN KENTUCKY

Several entities in Kentucky also receive notable sums in the form of contracts or cooperative agreements from federal agencies for specific R&D efforts. A large portion of these funds go to Innovative Productivity, Inc., which in FY 1998 received close to \$3 million to operate the Manufacturing Technology Transfer Center for the Navy. In addition, Keco Industries, Inc. (\$1 million), A&P Technology, Inc. (\$1 million), and Murty Pharmaceuticals (\$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 Murty Pharmaceuticals. The University of Kentucky (\$3 million) also receives 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 this institution receives from federal R&D grants.

A total of \$3 million of federal R&D dollars was also received in FY 1998 by entities located in Kentucky in the form of cooperative agreements. The largest of these cooperative agreements came from DOE and NSF (one each for \$750,000 in FY 1998) to the University of Kentucky in Lexington to fund EPSCoR (Experimental Program to Stimulate Competitive Research) activities. Another cooperative agreement supports one of NSF's Materials Research Science and Engineering Centers—the Advanced Carbon Materials Center at the University of Kentucky. Other federal agencies awarding cooperative agreements to Kentucky-based entities include USDA and the Department of Interior.

