

Chapter 4

Federal Research and Development in Arkansas

- Approximately \$120 million of federal R&D funds are spent each year in Arkansas.
 - Arkansas ranks 42nd among the 50 states, District of Columbia, and Puerto Rico in terms of the amount of federal R&D dollars received annually.
 - Approximately 3 percent of all federal funds spent in Arkansas 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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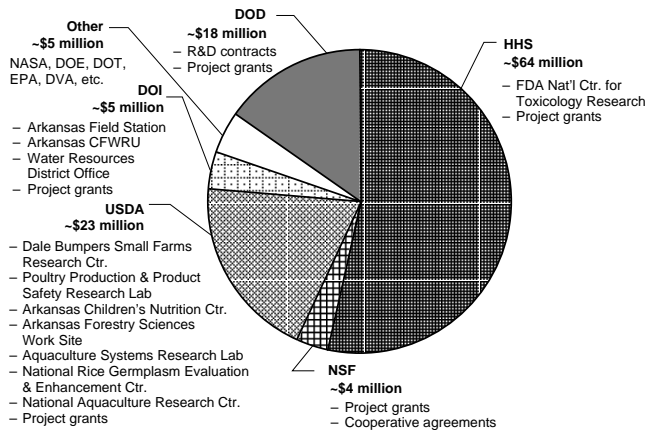


Figure 4.1 – Sources of Federal R&D Dollars Spent in Arkansas (Total Federal R&D ~\$120 million)

BACKGROUND

In recent years, the federal government has spent in the neighborhood of \$120 million annually in Arkansas on research and development (R&D) activities. On average, federal R&D dollars account for approximately 3 percent of all federal funds spent in Arkansas 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 Arkansas. Foremost among these agencies is the Department of Health and Human Services (HHS), which accounts for 53 percent of all federal R&D dollars spent in the state. The Department of Agriculture (USDA) and the Department of Defense (DOD) account for an additional 19 and 15 percent of the federal R&D dollars in Arkansas, respectively. The remaining federal R&D dollars come collectively from the Department of Interior (DOI), the National Science Foundation (NSF), and several other federal agencies.⁴

All federal R&D dollars spent in Arkansas 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 Arkansas.

FEDERAL R&D UNITS IN ARKANSAS

Booneville, Arkansas, is home to USDA's Dale Bumpers Small Farms Research Center.

- The Dale Bumpers Small Farms Research Center is a unit of USDA's Agricultural Research Service (ARS). It examines the scientific basis for efficiently managing small-farm ecosystems and develops innovative and appropriate technologies to enhance the efficiency, sustainability, and productivity of small

⁴ For a complete agency-by-agency breakdown of these R&D dollars, see Appendix C.

farms. Specific research activities include identifying viable alternative crops for small farms, improving the productivity of ruminants, and minimizing erosion and runoff losses. The research activities of the unit contribute to ARS's national programs on soil resource management, grazingland management, animal production systems, and integrated farming systems. This federal R&D unit annually receives approximately \$2.1 million and has about 20 FTEs.

Fayetteville, Arkansas is home to DOI's Arkansas Field Station and Arkansas Cooperative Fish and Wildlife Research Units and USDA's Poultry Production and Product Safety Research Laboratory.

- The Arkansas Field Station is a unit of the Northern Prairie Wildlife Research Center inside DOI's U.S. Geological Survey (USGS). This unit is located on the campus of the University of Arkansas. It conducts research on grassland ecology in the south-central Great Plains region. Specific research activities of this unit focus on the development of a long-term monitoring program for grassland birds of the Great Plains National Parks. This federal R&D unit annually receives approximately \$72,000 of federal R&D funds and has one FTE.
- The Arkansas Cooperative Fish and Wildlife Research Unit is unit of DOI's USGS. The unit is located on the campus of the University of Arkansas. It conducts research on fish and wildlife ecology. Specific research activities of this unit include studying the effects of forest management on scrub-successional and forest-interior birds, population parameter estimation, avian reproductive ecology, habitat selection of birds, waterfowl life history dynamics, American woodcock, wood thrush, Bachman's sparrow, and webless game birds. The unit also provides scientific training in fisheries and wildlife management techniques to students at the graduate level. This federal R&D unit annually receives approximately \$165,000 of federal R&D funds and has about two FTEs.
- The Poultry and Food Science Research Laboratory is a unit of USDA's ARS. The lab is located on the campus of the University

of Arkansas. It conducts research on poultry production and product safety. Specific research activities of this laboratory include studying avian bone development and maturation, a metabolic disease in chickens known as ascites, and a disease in turkeys known as turkey osteomyelitis. Other research activities focus on a disease activity known as proventriculitis, increasing the intestinal strength of poultry, and determining the effect the use of poultry waste as fertilizer has on surface and groundwater. This federal R&D unit annually receives approximately \$1.3 million of federal R&D funds and has about 12 FTEs.

Jefferson, Arkansas, is home to HHS's National Center for Toxicological Research and the Arkansas Regional Laboratory.

- The National Center for Toxicological Research (NCTR) is a unit of HHS's Food and Drug Administration (FDA). It conducts research to support and anticipate the FDA's regulatory needs. Specifically, the center conducts research designed to define the biological mechanisms underlying the toxicity of products regulated by the FDA. This research is designed to understand the critical biological events involved in the expression of toxicity and to develop methods to improve assessment of human exposure, susceptibility, and risk. Co-located with this unit is the FDA's Arkansas Regional Laboratory, which also conducts some R&D on matters of general concern to the FDA. Together these federal units annually receive approximately \$32.2 million of federal R&D funds and have about 218 FTEs directly involved in R&D activities.

Little Rock, Arkansas, is home to USDA's Arkansas Children's Nutrition Center, DOI's Arkansas District Office of Water Resources, and a Department of Veterans Affairs (DVA) R&D unit.

- The Arkansas Children's Nutrition Center is a unit of USDA's ARS. It conducts research on the diet of children from birth to adolescence to optimize their nutrition and health, both as children and later as adults. Controlled human studies are conducted with a focus on metabolic, endocrinologic, and im-

munologic factors to determine the role of diet in human health and development. Specific research activities of this center examine such matters as the connection between nutrition/diet and brain function and the effect of specific nutrients on body functions. This federal R&D unit annually receives approximately \$5.7 million of federal R&D funds and has about two FTEs.

- The Arkansas 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 \$853,000 in federal R&D funds.
- While the principal focus of the John L. McLellan Memorial Hospital, the VA Medical Center in Little Rock, 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 277 projects with total funding of approximately \$3.5 million. These R&D activities focus on a wide range of topics, including diabetes, schizophrenia, and aging.

Monticello, Arkansas is home to USDA's Arkansas Forestry Sciences Work Site.

- The Arkansas Forestry Sciences Work Site, a unit of the Southern Research Station within USDA's Forest Service, is located on the campus of the University of Arkansas at Monticello. While the unit is headquartered in Monticello, research is also conducted at Crossett, Hot Springs, Jessieville, Jasper, and Fayetteville. Specific research activities of this unit include developing a better understanding of the environmental factors and ecological processes influencing the establishment and growth of forest reproduction to develop silvicultural alternatives for upland forests in the Midsouth as well as studying the effects of silvicultural treatments on forest stands and interactions between stands, which is needed to make landscape-level decisions. This federal R&D unit annually receives approximately \$1.2 million of federal R&D funds and has about 15 employees.

Pine Bluff, Arkansas is home to USDA's Aquaculture Systems Research Laboratory.

- The Aquaculture Systems Research Laboratory is a unit of the USDA's ARS. The laboratory is on the campus of the University of Arkansas at Pine Bluff and conducts research on the components of aquaculture production systems to improve the efficiency of freshwater fish farming, including cultural and processing methods to enhance and sustain product quality. Specific research activities of this unit focus on such matters as assessing various scenarios to optimize profit potential from the production of channel catfish, improving and developing postharvest procedures to enhance the marketability of farm-raised fish, and conducting engineering-related studies to improve the general efficiency and profitability of fish farming. This federal R&D unit annually receives approximately \$495,000 of federal R&D funds and has about three FTEs.

Stuttgart, Arkansas, is home to USDA's National Rice Germplasm Evaluation and Enhancement Center and National Aquaculture Research Center.

- The National Rice Germplasm Evaluation and Enhancement Center, also known as the Dale Bumpers National Rice Re-

search Center, is a unit of USDA's ARS located on the campus of the University of Arkansas. It conducts research to help the U.S. rice industry stay competitive in the global marketplace by assuring high crop yields, superior grain quality, pest resistance, and stress tolerance. Specific research activities focus on such areas as utilizing molecular genetics and molecular biology, grain chemistry, and plant physiology to better evaluate and enhance the quality of rice germplasm maintained and distributed by the center. This federal R&D unit, in combination with the National Aquaculture Research Center described immediately below, annually receives approximately \$2.9 million of federal R&D funds and has about 26 FTEs.

- The National Aquaculture Research Center is a unit of USDA's ARS located on the campus of the University of Arkansas. It conducts research to develop methods for commercially producing fish on flooded fields in rotation with rice crops. The center's primary interest is on warmwater aquaculture species, such as hybrid striped bass, tilapia, carp, eels, ornamental species, and baitfish. Specific research activities of this center focus on such areas as the use of chemicals in aquaculture, the effect of diet on fish flavor, the connection between fish disease and water quality, and the rearing of zooplankton. The staffing and funding for this federal R&D unit is included in those presented for the Dale Bumpers National Rice Research Center described immediately above.

FEDERAL R&D GRANTS TO ARKANSAS ENTITIES

Every major institution of higher education in Arkansas 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, NSF, and DOD to individual faculty members and therefore ultimately inure to the benefit of such institutions as the University of Arkansas system. The table below shows the number of R&D grants

active in FY 1998, highlighting those made by HHS, USDA, NSF, and DOD 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 Arkansas came from the Department of Education, NASA, and the Department of Transportation.

Table 4.1 – Sources of Federal R&D Grants to Higher Education in Arkansas

Institution	HHS		USDA		NSF		DOD		Other Agencies		Total	
	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#	Amount	#
U of Arkansas	\$22M	125	\$8M	285	\$4M	57	\$3M	11	\$2M	31	\$39M	509
Other	<\$1M	1	<\$1M	2	0	3	0	0	<\$1M	4	<\$1M	10
Total	\$22M	126	\$8M	287	\$4M	60	\$3M	11	\$3M	35	\$39M	519

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 Arkansas also receive a significant amount of federal R&D grants each year. Foremost among the institutions that received R&D grants in FY 1998 are Arkansas Blue Cross & Blue Shield in Little Rock (\$2 million), Arkansas Children’s Hospital in Little Rock (\$2 million), the Arkansas State Department of Health in Little Rock (\$1 million), and Biotechnical Services, Inc., in North Little Rock (\$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 Arkansas received three SBIR awards totaling \$1 million. Examples include a \$750,000 award from DOE to Hot Metal Molding,

Inc., in Arkadelphia for work on using thermal transformation technology to produce semisolid formable alloys and a \$75,000 award from NSF to Parallel Quantum Solutions in Fayetteville to develop personal computer-based integrated software and hardware for quantum chemistry modeling.

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 Arkansas are ones valued at more than \$5 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 Arkansas every year to foster research in water and water-related problems.

OTHER FEDERAL R&D ACTIVITIES IN ARKANSAS

Several entities in Arkansas 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 to BEI Sensors & Systems Company in North Little Rock, which in FY 1998 received close to \$1 million from NASA for an R&D contract to design, develop, and fabricate the scanner unit for the Space-Readiness Coherent Lidar Experiment (SPARCLE).

A total of \$2 million of federal R&D dollars was also received in FY 1998 by entities located in Arkansas in the form of cooperative agreements. The largest of these cooperative agreements (\$1 million in FY 1998) came from NSF to the University of Arkansas to fund EPSCoR (Experimental Program to Stimulate Competitive Research) activities. Other federal agencies awarding cooperative agreements to Arkansas-based entities include USDA and the Department of Interior.

