

EXTRAMURAL FUNDING OPPORTUNITIES IN WOOD SCIENCE AND TECHNOLOGY

Competitive and special grants are means to direct research within the federal system. Formula funds, i.e., Hatch, regional, and McIntire-Stennis, supply the base from which such grant programs can be established. Competitive grants, generally, are developed from priorities established by advisory groups. They are supported by the executive branch in a manner similar to formula funding. They provide for a greater degree of tracking of both expenditures and research accomplishments than formula funds. Special research grants are a mechanism through which the legislative branch expresses research priorities, and they may be restricted to specific locations or areas.

The forestry community, particularly wood science and technology, was extremely fortunate in 1985 in that both competitive grants and special grants were established. The competitive grant amount is \$7.8 million, of which \$2.9 million is to be directed toward wood science topics. The special grant funding is slightly under \$3.0 million. When viewed with respect to formula funds, the combined grant funds amount is nearly double the money appropriated for forestry research. The McIntire-Stennis appropriation for fiscal year 1985 was \$13 million. Historically, about 2% of Hatch funds are designated for forestry-related projects, although in 1983, the latest year for which expenditure data are available, the percentage was 1.1%. Thus, fiscal year 1985 was a boon to forestry research in that money appropriated for forestry-related studies increased a relatively large amount even though formula funds decreased slightly.

Table 1 shows the magnitude of expenditures by region, using 1983 data. The totals reported for FY 1983 are shown here by research problem area (RPA). Predictably, expenditures in marketing research trail those in utilization and harvesting in the softwood regions and lead those in harvesting in the hardwood regions. There has been an increase in studies of the North Central and Eastern regions, examining hardwood export markets and fuelwood.

TABLE 1. *Forestry research.*

	Funding patterns, fiscal year 1983 × \$1,000			
	South	West	North central	Northeast
Utilization	4,274	3,210	2,169	2,226
Marketing	682	720	300	503
Harvesting	713	1,109	124	287

Fiscal 1983 funds are shown by region (Table 2) to provide a basis for examining the funding of wood science and technology research.

TABLE 2. *Forestry research.*

	Percentage of total regional funds, RPG 2.0 FY 1983			
	South	West	North central	Northeast
Utilization	17.1	11.7	14.8	17.9
Marketing	2.7	2.6	2.1	4.1
Harvesting	2.9	4.0	0.9	2.3

These data are the monies expended by universities reporting to the Current Research Information Service (CRIS). The breakdown of these funds is shown by subject matter and region. The figures shown are percentages of the total funds expended in NPG 2.0: Forest Resources. The amounts spent in marketing research in the Northeast region and in harvesting research in the West are quite notable. These data are probably attributable to the makeup of the faculties in the forestry academic units.

The West expends a smaller percentage of all funds in utilization research than the other regions. Perhaps surprisingly, the Northeast leads in two of the three categories in percent expenditures of total reported funds in RPG 2.0.

The total funds expended by the forestry research community was \$72.5 million in Fiscal Year 1983. As can be seen (Table 3), the formula funds provided about one in six dollars and were exceeded by USDA grants and contracts plus other federal sources of funds. Nonfederal dollars are state and industry funds. All federal funds are levered about 2:1.

TABLE 3. *Sources of funds—RPG 2.0 FY 1983.*

	×\$1,000
McIntire-Stennis	11,446
Hatch	1,214
Grants and contracts (USDA)	6,628
Other federal	6,614
Nonfederal	46,657

The pattern of RPG 2.0 funds (Forestry) is relatively consistent in that nearly 7% of all federal formula appropriations are associated with RPG 2.0 (Table 4). About 1% of the McIntire-Stennis funds go to other areas of research in the RPG system. A little over 1% of Hatch funds were expended in forestry research in FY 1983. The State Agricultural Experiment Stations are not very supportive of forestry research outside of the legislated funding under the McIntire-Stennis program. All of the above is preliminary to the development of grant programs. As stated earlier, grant programs are means to direct research and account for funds. They also are likely to be temporary.

TABLE 4. *Percentages of total formula appropriations.*

Year	M-S	RPG 2.0	
		M-S	Hatch
1970	6.42	5.32	1.72
1975	8.12	7.39	1.38
1980	7.73	6.78	1.56
1981	7.86	6.56	1.59
1982	7.70	6.81	1.53
1983	7.70	6.94	1.11

Extramural funding opportunities can take three forms in the present grant programs. There are existing USDA grants and contracts that are outside of the purview of CSRS. The three existing CSRS programs are 1) competitive grants, 2) small business innovation research (SBIR) programs, and 3) special grants.

The Fiscal Year 1985 competitive grant program is the initial such program. It was inserted into the U.S. Forest Service budget to be administered by the Office of Grants and Program Systems OGPS-CSRS. There has been some concern about this program, centered primarily around the issue of harvesting research. The Office of Grants and Program Systems views its role as supporting basic research programs. Although there are harvesting studies that can and should be regarded as "basic" research, those who read the request for proposals (RFP) had to work hard to include harvesting within the guidelines developed in that RFP. Table 5 shows those areas of research. Four hundred seventy-five proposals were received with the following breakdown. The requests totaled \$124.1 million.

TABLE 5. *Competitive grant program.*

Conducted by Office of Grants and Program Systems	
A. Biology—basic mechanisms—forest organisms and systems	
1) Genetic structure and function	(80)
2) Mechanisms of interactions in forest systems	(207)
B. Improved utilization of wood and wood fiber	
1) Wood chemistry and biochemistry	(67)
2) Physical/mechanical properties of wood and basic processing technology	(78)
3) Structural wood engineering	(33)

Values in parentheses are number of proposals in each category. There were 8 harvesting and 2 economics proposals submitted.

The SBIR program dealing with forest-related resources has had about 40 proposals during each of the three years of the programs existence in subtopic areas: 1) increase growth and yield, 2) increase utility of material, 3) reduce ecological insults, and 4) develop new products or technologies. Presently, there are three Phase I grants dealing with forestry and one Phase II grant. This program has been successful in attracting a working relationship between industry and universities. Universities may subcontract with the entrepreneur for one-third of the Phase I grant, which has a maximum of \$50,000 for six months to examine the feasibility of an idea. The followup proposal may be supported for two years with a maximum budget of \$250,000. One-half of the Phase II budget may be subcontracted to a university. This cooperation is to be encouraged because many inventors need the proposal writing skills found in a university to elucidate their ideas. Also needed are statistical skills, and in some cases budget jugglers and interpretive skills, as shown in Fig. 1.

Presently, federal policies regarding the roles in research to be played by federal agencies are shown in Fig. 2. The interactive zone is one of cooperation. While industry does a great deal of basic research, and the federal government is active in development work, the concept still holds that high risk basic research is a proper area for federal funding, while commercial aspects are certainly not in its purview.

Formula funds provide a stable program through which a cadre of scientists can maintain and enrich skills and long-term projects can be supported. The history of the McIntire-Stennis funds is one of small incremental growth paralleling the Hatch funds appropriations. Thus, these grant programs have provided the forestry research community with an incentive to break out of a stable situation. Every effort should be made to demonstrate known capabilities so that

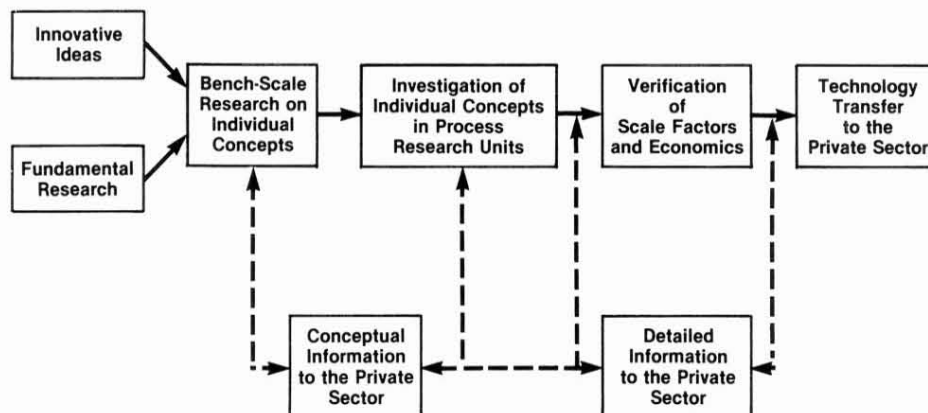


FIG. 1. Idealized flow chart of the research planning and execution process.

supporters of these grant programs may have the data needed to continue and expand that support.

At present, special grants are the creation of the legislative branch. Congress funds special grants that often dictate the location of the research and sometimes specifically designate the research topic. The special grant called "Wood Utilization Research" was called for in the August 1983 Office of Technology Assessment (OTA) report, "Wood Use: U.S. Competitiveness and Technology." Three schools: OSU, MSU, and Purdue, in response to this report, submitted a grant proposal in the appropriation process. Seven areas were listed in this original proposal to Congress: 1) harvesting and transportation, 2) timber manufacturing and processing, 3) wood-base composite materials, 4) structural engineering, 5) protection and preservation of wood, 6) wood chemistry and 7) economic evaluation and technology transfer. The special grant is for three million dollars in Fiscal Year 1985 (special grants can be expended through a five year period). The

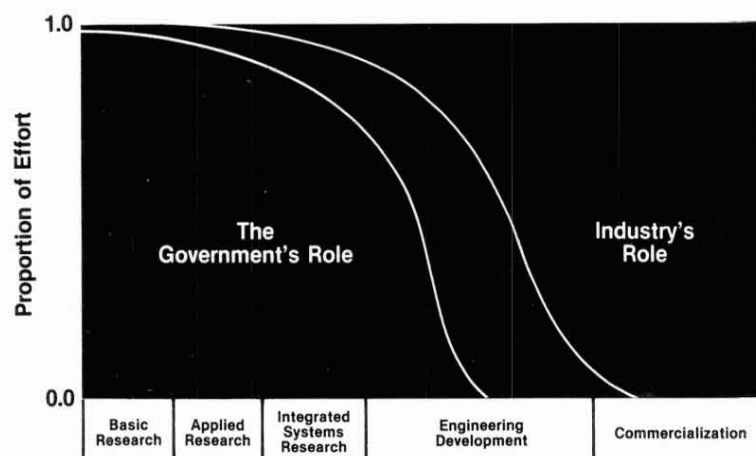


FIG. 2. Research roles of institutions—The curves shift horizontally with the area of research and the branch of the government.

Cooperative State Research Service (CSRS) called for and received proposals in each area, with appropriate budgets and work plans. Annual progress reports have been requested. Two other institutions are active in this program; Auburn University School of Forest Resources and Michigan State University Department of Forestry are subcontractors to Mississippi State University and to Purdue, respectively.

Academic scientists are obligated to encourage students to avoid studies performed solely for the sake of the scientist or for a specific niche within a discipline. Students and colleagues should be encouraged to view applications of knowledge and communication with the public as acceptable and satisfying professional accomplishments. We must find a voice to promote understanding by influential publics. The consequences of silence are the loss of support, contained funding opportunities, and increased interdisciplinary conversations that lead to terminal science. The current year funding for wood science and technology is the direct result of working with influential publics. The profession can gain by using this example to forge definite plans, to formulate goals, and to specify objectives to avoid being active only in a small arena playing to a limited public. While formula funds form the base of operations, it is a knowledgeable public that will strengthen the promotion of good science that is both basic and applied.

WAYNE K. MURPHEY
Forest Products Technologist
USDA, CSRS
Washington, D. C.