

Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions: Fiscal Year 2014

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Technical Notes

Survey Overview

Purpose. The Survey of Federal Science and Engineering (S&E) Support to Universities, Colleges, and Nonprofit Institutions (Federal S&E Support Survey) is the only source of comprehensive data on federal S&E funding to individual academic and nonprofit institutions.

Data collection authority. The information from this congressionally mandated survey is collected under the authority of the National Science Foundation Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010.

Survey contractor. Synectics for Management Decisions, Inc.

Survey sponsor. The National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF).

Key Survey Information

Frequency. Annual.

Initial survey year. FY 1963.

Reference period. FY 2014.

Response unit. Federal agencies.

Sample or census. Census.

Population size. The survey is a census of all federal agencies that obligate money to academic or nonprofit institutions or consortia for S&E R&D or the construction or maintenance of R&D facilities. In the survey cycle for data collection on FY 2014, the population is 19 federal agencies.

Twelve of the agencies are department-level federal agencies (the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, Interior, Justice [Office of Justice Programs], Labor, and Transportation) and seven are independent federal agencies (the Agency for International Development, the Appalachian Regional Commission, the Environmental Protection Agency, the

National Aeronautics and Space Administration, NSF, the Nuclear Regulatory Commission, and the Social Security Administration).

Sample size. Not applicable; the survey is a census.

Survey Design

Target population. The target population was all federal agencies that obligated money in FY 2014 to academic or nonprofit institutions or consortia for S&E R&D or the construction or maintenance of R&D facilities. For FY 2014, there were 19 agencies (12 federal departments and 7 independent agencies). Because multiple subdivisions of a federal department were in some cases requested to complete the survey, there were 55 respondents (2 federal departments, 46 department subdivisions, and 7 independent agencies).

Academic institutions are institutions of higher education in the United States that offer at least 1 year of college-level study leading toward a degree. Nonprofit institutions are legal entities other than universities and colleges, privately organized or chartered to serve the public interest, and exempt from most forms of federal taxation. Consortia are organizations formed by the membership of a number of institutions from one or more types of performers (e.g., academic, nonprofit) in order to promote and support efforts to enhance knowledge in one or more disciplines.

Sample frame. This survey is a census. Its population is derived from the federal agencies identified in the Survey of Federal Funds for Research and Development as providing R&D or R&D plant obligations to academic or nonprofit organizations.

Sample design. Not applicable.

Data Collection and Processing Methods

Data collection. The Federal S&E Support Survey uses a Web-based data collection system, but some agencies submit files offline that the survey contractor enters into the data collection system. The FY 2014 survey cycle began with an e-mail to each agency to verify contact information for each agency's survey point of contact. Data collection began 18 February 2015. Information was collected for the federal fiscal year 2014 (i.e., 1 October 2013 through 30 September 2014). The requested due date for data submissions was 22 April 2015; however, data collection was extended until all of the surveyed agencies provided complete and final data.

Mode. Web data collection system; however, some agencies submit data offline. The FY 2014 Federal S&E Support Survey requested information from 55 departments, subdivisions, or independent agencies, but three reported no funds. Of the remaining 52 respondents, 41 respondents (79%) submitted data through the Web data collection system, and 11 respondents (21%) submitted data offline.

Response rates. 100%.

Data editing. The Federal S&E Support Survey data are checked through both manual reviews and automated data checks that include a comparison of current-year obligations by category of

support and the corresponding prior-year obligations. Problems are referred back to the agency that submitted the data for correction.

Imputation. None.

Weighting. None.

Variance estimation. Not applicable.

Survey Quality Measures

Sampling error. Not applicable.

Coverage error. Occasionally, small amounts (less than \$100,000) of R&D may be obligated to a university or college by an agency other than the ones listed above, and these amounts are not captured by this survey.

Nonresponse error. Agencies are encouraged to estimate information when actual data are unavailable. The survey instrument allows respondents to enter data or skip data fields. NCSSES assumes a blank field is zero for estimation purposes. If a significant number of blank fields are incorrectly skipped by respondents, bias could result.

Measurement error. The major source of nonsampling error in this survey is measurement error. Agencies are not always able to provide the precise information requested. For example, federal agencies are not always able to identify which branch of a university receives funding from them. Thus, complete disaggregation by actual university may not be feasible for some universities.

Other problems include agency difficulties in matching program descriptions with the proper funding category (e.g., R&D, facilities and equipment for instruction in S&E) in the federal S&E support database. At least one agency has said that the “general support for S&E” and “other S&E” categories are a catchall for programs that do not fit anywhere else (See the “Report on the NSF Federal S&E Support Survey Issues Workshop” held on 20 May 1999).

Data Comparability

Data revisions. Annual data are available for FYs 1963-2014.¹ In some instances, prior-year data have been modified based on discrepancies noted during the consistency reviews of the data across years. To obtain accurate historical data, data users should use only the most recent publication, which incorporates corrections agencies have made in prior-year data. Do not use data published earlier.

Changes in survey coverage and population. Eight federal agencies supplied data for FYs 1963–67 (data collection began in 1965). Additional agencies have been included in the years since then. The survey has been conducted annually since 1968. The initial survey elicited information about academic institutions only. Information on nonprofit organizations was added in 1968.

- Since FY 1990 NSF has not published data on detailed field of S&E for obligations in R&D and fellowship, traineeship, and training grant programs (FTTGs) to academic institutions.
- Since FY 1990 the Department of Defense has reported research obligations separate from development obligations.
- Beginning with the FY 1993 annual report, NSF no longer publishes data collected for non-S&E support to universities and colleges.
- Beginning with the FY 1998 survey, NSF collects S&E obligations for U.S. Service schools.
- Beginning with the FY 1999 survey, NSF no longer collects data for Federally Funded Research and Development Centers (FFRDCs).

Changes in questionnaire. A Web-based data collection system was developed for the FY 1998 survey cycle.

Changes in reporting procedures or classification.

- Starting with FY 2009 survey, survey information has been requested in actual dollars rather than rounded in thousands.
- As of the FY 2013 cycle, the criteria used to determine nonprofit institutions for the Federal S&E Support Survey was broadened from Internal Revenue code 501(c)(3) organizations to Internal Revenue Code 501(c) organizations.

Definitions

The terms used throughout the survey have remained relatively unchanged from the FY 1971 survey cycle to the present. Note that the variables in this survey use definitions comparable for R&D and R&D plant to those used by the Office of Management and Budget and the Survey of Federal Funds for Research and Development (Federal Funds Survey).

Facilities and equipment for instruction in S&E include all programs whose principal purpose is to provide support for construction, acquisition, renovation, modification, repair, or rental of facilities, land, works, or equipment for use in instruction in S&E.

If the instructional facilities are part of a larger facility devoted to other purposes as well, the funds should be distributed among the categories of support involved as appropriate. In general, the other category most likely to be involved is R&D plant.

FTTGs include all fellowship, traineeship, and training grant programs that are directed primarily toward the development and maintenance of the scientific and technical workforce. The total amounts pertaining to such awards (stipends and cost-of-education allowances) are reported in terms of the institution at which the recipient performs research and/or study.

Excluded are projects that support research and educational institutes, seminars, and conferences such as teacher-training activities provided through teacher institutes, short courses, research participation, and in-service seminars; activities aimed at the development of educational techniques and materials for use in S&E training; and programs that provide special opportunities for increasing the scientific knowledge and experience of precollege and undergraduate students. These activities are to be reported either under category 6 (other S&E) or not reported if they are not S&E-related.

General support for S&E includes activities that provide support for nonspecific or generalized purposes related to scientific research and education. Such projects are generally oriented toward academic departments, institutes, or institutions as a whole. “General support” implies a spectrum of varying types of support. At one extreme is support provided without any specification of purpose other than that funds be used for scientific activities. Another kind of general support is to be found in projects that provide funds for activity within a specified field of S&E but without specifying an explicit purpose. The distinguishing feature of general support for S&E projects is that they permit a significant measure of freedom as to purpose (research, faculty support, education, institutional support, etc.).

R&D includes all direct, indirect, incidental, or related costs resulting from or necessary to performing R&D by private individuals and organizations under grant, contract, or cooperative agreement. Demonstration projects designed to test or prove whether a technology or method is, in fact, workable are considered to be within the scope of R&D if they are designed to produce new information and are accomplished within a given time period. The following activities are excluded from R&D but should be reported under one or more of the other five S&E categories:

- Routine product testing
 - Quality control
 - Topographical mapping and surveys
 - Collection of general-purpose statistics
 - Experimental production
 - Demonstrations designed to exhibit new technologies or methods or to disseminate information thereon
 - Scientific and technical information activities
 - R&D facilities and fixed equipment
- *Research* is systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objectives of the sponsoring agency. In basic research, the objective of the sponsoring agency is to generate knowledge of the underlying foundations of phenomena and of observable facts without specific applications toward processes or products in mind. In applied research, the objective of the sponsoring agency is the creation of knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.

- *Research equipment* is any item (or interrelated collection of items comprising a system) of nonexpendable tangible property or software having a useful life of more than 2 years and an acquisition cost of \$500 or more that is used wholly or in part for research. Research equipment is included under R&D.
- *Development* is systematic application of knowledge and understanding gained from research directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes.

Advanced technology development represents DOD budget activity category 6.3.

Major systems development represents DOD budget activity categories 6.4 through 6.7 (demonstration and validation, engineering and manufacturing development, management and support, and operational system development).

R&D plant includes all projects whose principal purpose is to provide support for construction, acquisition, renovation, modification, repair, or rental of facilities, land, works, or fixed equipment for use in scientific or engineering R&D. A facility is to be interpreted broadly to include any physical resource important to the conduct of research or development. All costs—direct, indirect, and related expenditures—are to be included.

If the R&D facilities are part of a larger facility devoted to other purposes as well, the funds should be distributed among the categories of support involved as appropriate. In general, another category that is likely to be involved is category 3 (facilities and equipment for instruction in S&E). Excluded from the R&D plant category are expendable research equipment and office furniture and equipment and all other activities (i.e., those not specifically related to S&E). See the definition of “research equipment.”

Other S&E include all academic S&E activities that cannot be meaningfully assigned to one of the five categories previously set forth. Among the types of activities to be included in this category are support for scientific conferences and symposia, teacher institutes, and activities aimed at increasing the scientific knowledge of precollege and undergraduate students.

¹ The data from this survey are published annually in the series Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions (<http://www.nsf.gov/statistics/fedsupport/>). Data for major data elements are available for FY 1963 onward. Data from this survey are also available in the Academic Institutional Profiles (<http://ncesdata.nsf.gov/profiles/>) and in the WebCASPAR data system (<https://ncesdata.nsf.gov/webcaspar/>).