



National Center for Science and
Engineering Statistics

Survey

Survey of Science and Engineering Research Facilities | 2021

The Survey of Science and Engineering Research Facilities is a congressionally mandated, biennial survey that collects data on the amount, construction, repair, renovation, and funding of research facilities at U.S. colleges and universities.

Survey Description

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Survey Overview (FY 2021 survey cycle)

Purpose

The Survey of Science and Engineering Research Facilities is a congressionally mandated survey. It is the primary source of information on the amount and cost of space at science and engineering (S&E) research facilities located at U.S. research-performing colleges and universities. The survey is the basis of public data used by Congress, higher education associations, state governments, academia, and architectural and engineering firms.

Data collection authority

The information is solicited under the authority of the National Science Foundation Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010. The Office of Management and Budget control number is 3145-0101, expiring on 31 August 2022.

Major changes to recent survey cycle

- Changes were made to the lists of disciplines included in the fields of S&E to better coordinate field totals in national academic surveys. The fields of S&E that changed names and the disciplines that were moved between fields are listed below:
- The disciplines of veterinary biomedical and clinical sciences and veterinary medicine have been moved from the health sciences to agricultural sciences.
- The discipline of agricultural economics has been moved from agricultural sciences to the social sciences field.
- The discipline of nutrition sciences has been moved from being a multidisciplinary field within the “other” field of S&E to the biological and biomedical sciences field.
- The discipline of foods, nutrition and wellness studies has been moved from the non-S&E field to the biological and biomedical sciences field.
- The discipline of natural resources economics has been moved from the natural resources and conservation field to the social sciences field.

Key Survey Information

Frequency	Biennial.
Initial survey year	1986
Reference period	FY 2021
Response unit	Establishments. U.S. academic institutions reporting at least \$1 million in R&D expenditures in the Higher Education Research and Development (HERD) Survey.
Sample or census	Census.
Population size	A total of 584 institutions in FY 2021.
Sample size	Not applicable
Key variables	<p>Key variables of interest are listed below.</p> <ul style="list-style-type: none">• Amount and type of science and engineering research space• Current expenditures for projects to construct and to repair and renovate research facilities• Condition of research facilities• Planned construction and repair and renovation of research facilities• Source of funds (federal, state and local, institutional) for construction and for repair and renovation of research facilities• Research animal facilities

Survey Design

Target population

Research-performing colleges and universities in the United States with \$1 million or more in R&D expenditures in S&E in the prior fiscal year.

Sampling frame

This survey is a census. The population is identified through the HERD Survey of the previous fiscal year. In the FY 2021 survey cycle, there were 584 academic institutions, of which 568 (97%) responded.

Sample design

All eligible units are surveyed.

Data Collection and Processing

Data collection

The FY 2021 survey was conducted by Westat under contract to the National Center for Science and Engineering Statistics (NCSES). Surveys are distributed to institutional coordinators at each institution. These coordinators are individuals knowledgeable about the requested information who collect the responses from various offices and complete the survey. The data collection period was October 2021 through May 2022.

Data processing

Several procedures were used to clean and edit the data. For example, the Web survey contained numerous programmed edit checks that alerted respondents to inconsistent or missing data via edit messages. These included alerting respondents if their individual data did not sum to the total. Also, once respondents submitted their final data, a second set of edit checks was conducted. Finally, comparisons were made between an institution's FY 2021 data and the data from the previous survey. Respondents were contacted regarding any apparently inconsistent, missing, or unclear data.

Estimation techniques

This survey is a census. Imputation was performed for missing items from nonresponding institutions to make population estimates.

Data missing because of unit nonresponse and item nonresponse were imputed using a regression-model approach with the following predictors: (1) institutional control (private or public), (2) highest degree granted (doctorate or nondoctorate), (3) existence of a medical school, (4) R&D expenditures for the prior fiscal year, and (5) total net assignable square feet (NASF) for the prior fiscal year. In addition to the core predictors, regression models for specific survey items included data from responses to other survey items and the institution's FY 2019 responses, where available.

Survey Quality Measures

Sampling error

This survey is a census, so no sampling error exists.

Coverage error

Coverage is high because institutions meeting the population requirements are identified from the HERD Survey. Institutions were investigated individually to ensure there was no duplication.

Nonresponse error

The unit nonresponse was 2.7% (16 of 584) for the FY 2021 survey. Item nonresponse ranged from 0% to 3% for all items. Nonresponding institutions (unit nonrespondents) were not included in the item nonresponse calculations.

Measurement error

The most likely source of measurement error results from institutions estimating the requested data. Respondents may estimate their data for several reasons, including estimating data that are not included in the institution's database or because some figures are estimates by their nature (e.g., out-year budget figures).

Measurement error may also occur because institutions may define their database elements differently from the definitions used on the survey. For example, an institutional database may identify research space based on a primary-use criterion, whereas the survey requests that space be prorated according to all uses. The survey question on the condition of research space is a subjective question that may be rated differently across respondents.

Data Availability and Comparability

Data availability

Survey data are compiled for the defined fiscal year, the preceding fiscal year, and planned activities for 2 succeeding fiscal years.

Data comparability

This survey was first conducted in 1986. Small improvements were made to the survey questions over time. Although data comparability was generally not affected, any specific impact is accounted for in the technical notes for each survey. The FY 2001 survey was very limited and composed of only two questions that corresponded to questions in the prior survey cycles.

The questionnaire was extensively redesigned for implementation in the FY 2003 survey. A comprehensive description of the redesigned survey can be found in *Redesign of Survey of Science and Engineering Research Facilities: 2003*. To the extent possible, the FY 2003 survey was redesigned for comparability over time.

Questions were added on computing and networking capacity beginning with the FY 2003 survey cycle. Following each survey cycle, the computing and networking capacity questions in Part 2 of the survey were evaluated for current relevance and updates in technology. The computing and networking capacity questionnaire was discontinued prior to the FY 2015 survey cycle after an in-depth investigation concluded that it was no longer feasible, appropriate, or cost-effective to proceed with collection of these data.

Changes were made to the fields of S&E and to the lists of disciplines included in the fields for the FY 2007, FY 2015, FY 2017, and FY 2021 surveys to better coordinate field totals in national academic surveys. The changes for FY 2007 were extensive enough that comparisons with pre-2007 data at the S&E field level are not advised. S&E field-level data are comparable for 2007 to the present.

Data Products

Publications

Detailed tabular data from this survey are published biennially in the series *Science and Engineering Research Facilities*. Information from this survey is also included in *Science and Engineering Indicators*.

Electronic access

Microdata beginning with the FY 2007 survey are available in NCSES [data tools](#). Public use files beginning with FY 2003 are available at https://www.nsf.gov/statistics/srvyfacilities/pub_data.cfm. Due to a confidentiality pledge, microdata from this survey for years 1988 through 2001 are not available.