InfoBrief

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Research Space at Academic Institutions Increased 4.7% between FY 2011 and FY 2013

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Research-performing colleges and universities increased their science and engineering (S&E) research space 4.7% from FY 2011 to FY 2013, according to the biennial Survey of Science and Engineering Research Facilities. Total research space increased 9.6 million net assignable square feet (NASF) over this period, from 202.2 million to 211.8 million (table 1) (see "Data Notes" for definitions). The rate of increase equaled the median growth (4.7%) for the 12 biennial survey cycles from FY 1988 to FY 2013 (figure 1).

TABLE 1. Science and engineering research space in academic institutions, by field and type of research space: FYs 2007–13
(Net assignable square feet in millions)

Field and type of research space	FY 2007	FY 2009	FY 2011	FY 2013
All research space	187.9	196.1	202.2 r	211.8
Agricultural and natural resources sciences	27.9	29.5	27.6	30.5
Biological and biomedical sciences	44.8	50.3	53.7 r	57.2
Computer and information sciences	4.8	5.2	5.0	4.3
Engineering	28.4	30.2	31.7	33.5
Health and clinical sciences	37.0	36.3	36.7	38.0
Mathematics and statistics	1.6	1.5	1.5 r	1.7
Physical sciences	28.7	28.5	29.6	30.7
Astronomy, chemistry, and physics	20.3	20.5	21.8	22.9
Earth, atmospheric, and ocean sciences	8.4	8.0	7.8	7.8
Psychology	4.9	5.2	5.5	5.5
Social sciences	6.0	5.5	5.7	5.7
Other	3.7	3.9	5.2	4.8
Research animal space	17.8	18.1	18.4 r	18.9

r = data significantly revised; replaces previously published value.

NOTES: Details may not add to totals due to rounding. Research animal space is listed separately and is also included in individual field totals. See the FY 2013 technical notes at http://www.nsf.gov/statistics/facilities/ for details on revised FY 2011 data.

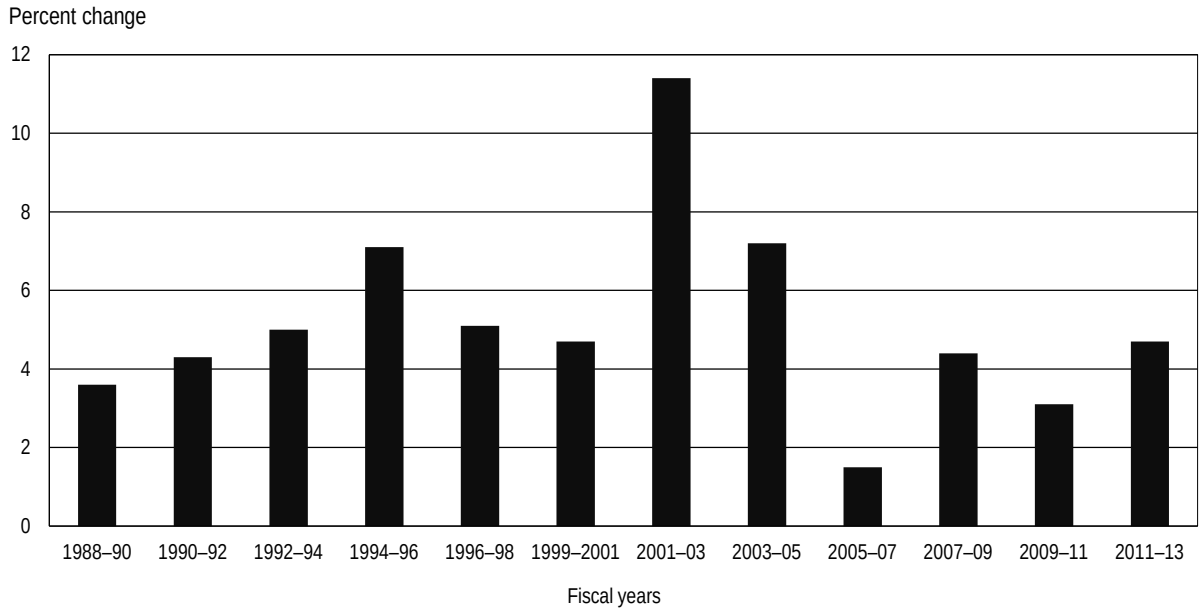
SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities.

The biological and biomedical sciences constituted the largest share (27.0%) of all research space in FY 2013, which is just slightly more than the share it held in FY 2011 (26.6%) (table 1). This field, along with the agricultural and natural resources sciences, accounted for two-thirds of the 9.6 million NASF growth. Research space in the biological and biomedical sciences increased 6.5% (3.5 million NASF). Space in the agricultural and natural resources sciences increased 10.5% (2.9 million NASF).

Among other major fields of S&E, engineering research space increased 5.7% to 33.5 million NASF, space in the physical sciences increased 3.7% to 30.7 million NASF, and the health and clinical sciences saw a 3.5% net gain to 38.0 million NASF. Research space devoted to mathematics and statistics increased 13.3% to 1.7 million NASF, and net research space in the computer and information sciences fields declined by 14.0% to 4.3 million NASF.

Public doctorate-granting institutions accounted for 70.9% (150.1 million NASF) of S&E research space in FY 2013, whereas their private counter-

FIGURE 1. Science and engineering research space in academic institutions, change over 2-year period: FYs 1988–2013



NOTES: Space measured in net assignable square feet. The biennial survey cycle ran on even years from 1988 to 1998 and on odd years from 1999 to 2013.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities.

parts reported 24.4% (51.7 million NASF) of this space. Nondoctorate-granting institutions accounted for the remaining 4.7% (10.0 million NASF). Research space at medical schools continued to increase, reaching 48.6 million NASF, which was 2.1% greater than the space in FY 2011 and 31.0% greater than the space in FY 2003 (table 2).

TABLE 2. Science and engineering research space, by type of institution: FYs 2003–13

(Net assignable square feet in millions)

Type of institution	FY 2003	FY 2005	FY 2007	FY 2009	FY 2011	FY 2013
All institutions	172.7	185.1	187.9	196.1	202.2 r	211.8
Doctorate granting	164.2	177.0	180.4	187.8	193.9 r	201.8
Public	125.1	133.2	135.8	141.1	145.4	150.1
Private	39.1	43.8	44.5	46.7	48.5	51.7
Nondoctorate granting	8.5	8.1	7.5	8.3	8.2	10.0
Medical schools	37.1	40.1	43.8	44.3	47.6 r	48.6

r = data significantly revised; replaces previously published value.

NOTES: Details may not add to totals due to rounding. Medical schools are listed separately and are also included in individual institution totals. See the FY 2013 technical notes at http://www.nsf.gov/statistics/facilities/ for details on revised FY 2011 data.

SOURCE: National Science Foundation/National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities.

New Construction of Research Space

New construction of S&E research space that began in FYs 2012–13 declined 17.3%, compared with construction that started in FYs 2010–11. This decrease followed a general decade-long trend marked by a similar 18.2% decline in new construction between FYs 2008–09 and FYs 2010–11 (table 3). Construction projects for the biological and biomedical sciences accounted for 2.0 million NASF in FYs 2012–13. This was the largest amount of space initiated for any field. It was also the same amount of NASF begun for the biological and biomedical sciences in FYs 2010–11 as well as the same amount planned to start in FYs 2014–15. The health and clinical sciences and engineering combined to add 3.0 million NASF, resulting in these three S&E fields accounting for 74.6% of new research space construction in FYs 2012–13 (table 4). Overall, an estimated 8.8 million NASF of new research space construction are planned for FYs 2014–15.

Planned New Construction

Based on increased fulfillment rates over the past decade, academic institutions appear to be more accurately

TABLE 3. New construction of science and engineering research space in academic institutions, by type of institution and time of construction: FYs 2002–13

(Net assignable square feet in millions)

Type of institution	FYs 2002–03	FYs 2004–05	FYs 2006–07	FYs 2008–09	FYs 2010–11	FYs 2012–13
All institutions	15.5	10.1	8.8	9.9	8.1	6.7
Doctorate granting	14.7	9.4	8.4	9.3	7.8	6.4
Public	11.5	7.3	6.2	7.0	6.7	4.7
Private	3.2	2.1	2.2	2.3	1.1	1.7
Nondoctorate granting	0.8	0.7	0.4	0.5	0.2	0.3
Medical schools	5.0	2.7	2.5	2.5	2.3	1.3

NOTES: Details may not add to totals due to rounding. Medical schools are listed separately and are also included in individual institution totals.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities.

estimating their new research space construction starts. The amount of new research space construction actually started in FYs 2012–13 (6.7 million NASF) was 79.8% of the total 8.4 million NASF initially planned and reported in FY 2011.[2] In FY 2009, institutions planned to start 10.3 million NASF in FYs 2010–11, of which 78.6% was started during that period (8.1 million NASF). In FYs 2004–05, the equivalent percentage was 53.2%, followed by 64.2% in FYs 2006–07 and 69.2% in FYs 2008–09.

TABLE 4. New construction of science and engineering research space in academic institutions, by field, type of research space, and time of construction: FYs 2012–15

(Net assignable square feet in millions)

	Started in FY 2012 or FY 2013		Planned to start in FY 2014 or FY 2015	
Field and type of research space	Number of institutions	Total NASF	Number of institutions	Total NASF
All research space	142	6.7	130	8.8
Agricultural and natural resources sciences	24	0.4	22	0.5
Biological and biomedical sciences	57	2.0	47	2.0
Computer and information sciences	20	0.2	8	0.5
Engineering	55	1.4	39	1.6
Health and clinical sciences	44	1.6	37	1.9
Mathematics and statistics	5	*	4	*
Physical sciences	36	0.8	40	1.7
Astronomy, chemistry, and physics	21	0.6	30	0.9
Earth, atmospheric, and ocean sciences	21	0.2	15	0.8
Psychology	5	*	8	0.1
Social sciences	6	0.1	4	0.1
Other	13	0.1	9	0.3
Research animal space	36	0.7	na	na

* = value > 0 but < 50,000 net assignable square feet. na = not applicable; data were not collected on planned new construction of research animal space on the FY 2013 survey.

NASF = net assignable square feet.

NOTES: Details may not add to totals due to rounding. Research animal space is listed separately and is also included in individual field totals.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities.

New Construction Funding Sources

Twenty-four percent of the nation's 588 research-performing colleges and universities (142 institutions) reported new construction of S&E research space in FYs 2012–13 at a total cost of $5.5 billion (table 5). This was the lowest estimated expenditure on new research space construction since FYs 1998–99. The federal government provided 5.7% ($313.5 million) of the total cost for new S&E research space in FYs 2012–13. Three-quarters of federal funding ($235.8 million) went to public doctorate-granting institutions. State and local governments provided 26.9%, or just under $1.5 billion. Over two-thirds of the funding ($3.7 billion) for new S&E research space came from the institutions' own funds and other sources. Private doctorate-granting institutions relied on institutional funds and other sources (92.3%) to a much greater extent than their public counterparts (55.3%) when funding their new research space construction.

Repair and Renovation

Academic institutions spent $3.7 billion on major repairs and renovation of S&E research space started in FYs 2012–13 (table 6). Improvements to biological and biomedical space comprised 29.1% of those costs. Health and clinical sciences (26.3%); engineering (15.8%);

TABLE 5. Source of funds for new construction of science and engineering research space in academic institutions, by type of institution: FY 2012 or FY 2013
(Millions of dollars)

Type of institution	All sources	Government		Institutional funds and other sources[a]
		Federal	State and local	
All institutions	5,502.8	313.5	1,477.6	3,711.7
Doctorate granting	5,281.4	306.8	1,368.5	3,606.1
Public	3,427.6	235.8	1,296.5	1,895.2
Private	1,853.8	71.0	72.0	1,710.8
Nondoctorate granting	221.4	6.7	109.1	105.6

[a] Institutional funds and other sources include an institution's operating funds, endowments, private donations, tax-exempt bonds and other debt financing, and indirect costs recovered from federal and nonfederal sources.

NOTE: Details may not add to totals due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities, FY 2013.

and astronomy, chemistry, and physics (14.2%) also accounted for substantial shares of overall costs for repair and renovation of research space.

Institutions anticipate $3.4 billion in costs for planned repair and renovation with start dates in FYs 2014–15. They expected to spend about $902 million improving research space in the biological and biomedical sciences and $817 million in the health and clinical sciences. In addition to these slated improvements, academic institutions reported another $5.4 billion in deferred repair and renovation projects included in their institutional plans, as well as $2.9 billion not included in their institutional plans. As table 6 shows, the ratio between planned projects and deferred repair and renovation projects varies greatly by field.

Research Space at the Largest Institutions

Of the 588 institutions surveyed, the top 25 institutions reporting the most research space accounted for 30.9% of all research space in FY 2013 (table 7). These 25 institutions accounted for 31.6% of all research space in FY 2011. They also accounted for 52.3% of all research space in the agricultural and natural resources sciences in FY 2013.[3] Otherwise, their share of space in other fields fell mostly within the range of 23.3% (biological and biomedical sciences) and 31.7% (health and clinical sciences). "Other field of S&E" was the one exception, at 41.5%.

Data Notes

Data Sources and Availability

The data presented in this InfoBrief were obtained from the Survey of Science and Engineering Research Facilities, conducted by the National Science Foundation's (NSF's) National Center for Science and Engineering Statistics. The survey is a census of all 588 colleges and universities that

TABLE 6. Costs for repair and renovation of science and engineering research space in academic institutions, by field, type of research space, and time of repair and renovation: FYs 2012–15
(Millions of dollars)

Field and type of research space	Started in FY 2012 or FY 2013	Planned to start in FY 2014 or FY 2015	Deferred projects	
			Included in institutional plan	Not included in institutional plan
All research space	3,745.9	3,385.0	5,382.0	2,901.9
Agricultural and natural resources sciences	147.4	145.9	356.3	269.9
Biological and biomedical sciences	1,089.2	901.7	1,151.9	601.5
Computer and information sciences	60.2	55.6	24.5	79.3
Engineering	592.4	593.5	610.2	477.9
Health and clinical sciences	983.5	817.3	1,319.0	542.5
Mathematics and statistics	54.1	20.2	73.0	26.6
Physical sciences	641.5	620.9	1,003.5	562.1
Astronomy, chemistry, and physics	531.6	499.2	753.4	422.8
Earth, atmospheric, and ocean sciences	109.8	121.7	250.1	139.3
Psychology	65.6	59.7	298.1	123.8
Social sciences	89.1	143.5	278.0	212.5
Other	22.8	26.5	267.6	5.7

NOTE: Details may not add to totals due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities, FY 2013.

expended at least $1 million in S&E research and development funds in FY 2012. The response rate for this survey was 98.8%. Data on computing and networking capacity were also collected from FY 2003 to FY 2013. This component of the survey will not be continued after the FY 2013 data collection cycle.

NSF discontinued collection from biomedical institutions in FY 2011, which resulted in revision to the data for that year. For more details, see the technical notes published with the detailed statistical tables.

The full set of detailed tables will be available in the report *Science and Engineering Research Facilities: Fiscal Year 2013* at http://www.nsf.gov/statistics/facilities/. Please contact the author for more information. Current survey data for individual institutions are available from the WebCASPAR database system, a Web tool for retrieval and analysis of statistical data on science and engineering resources (https://ncsesdata.nsf.gov/webcaspar/).

Definitions

Net assignable square feet (NASF) is the sum of all areas on all floors of a building assigned to, or available to be assigned to, an occupant for a specific use, such as research or instruction. NASF is measured from the inside faces of walls.

Research space is the NASF of space in buildings within which research activities take place. Research facilities are located within buildings. A building is a roofed structure for permanent or temporary shelter of persons, animals, plants, materials, or equipment. Structures should be included if they are (1) attached to a foundation, (2) roofed, (3) serviced by a utility, exclusive of lighting, and (4) a source of significant maintenance and repair activities.

TABLE 7. Twenty-five institutions reporting the most FY 2013 research space in all fields: FYs 2011 and 2013

(Net assignable square feet in thousands)

Rank	Institution	FY 2011	FY 2013
	All institutions	202,152	211,811
	Leading 25 institutions	63,925	65,501
1	U. GA	3,526	3,777
2	U. MN, Twin Cities	3,531	3,673
3	Johns Hopkins U.	3,144	3,265
4	U. FL	3,038	3,110
5	U. IL, Urbana-Champaign	4,631	3,109
6	OH State U.	1,447	2,973
7	U. CA, Davis	2,927	2,930
8	TX A&M U., College Station	2,443	2,895
9	U. WI, Madison	2,936	2,774
10	PA State U., University Park and Hershey Medical Ctr.	2,929	2,733
11	U. CA, Los Angeles	2,632	2,718
12	NC State U.	2,636	2,695
13	U. CA, San Diego	2,421	2,555
14	Harvard U.	2,334	2,482
15	U. CA, Berkeley	2,535	2,382
16	Yale U.	2,079	2,307
17	U. KY	2,230	2,287
18	U. NE, Lincoln	2,224	2,277
19	MI State U.	2,274	2,254
20	MS State U.	2,152	2,157
21	Cornell U.	2,071	2,121
22	WA State U.	1,948	2,055
23	U. CA, San Francisco	1,974	2,053
24	MA Institute of Technology	2,070	2,023
25	U. MI, Ann Arbor	1,793	1,897

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Science and Engineering Research Facilities.

Notes

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2. Data on planned construction for prior years are available in the full set of detailed statistical tables.

3. Data on institutional rankings by field are available in the full set of detailed statistical tables.

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