

NSF Receives 13 Percent Boost in FY 2001

(This analysis is part of a series of AAAS R&D Funding Updates on the FY 2001 congressional appropriations process. This analysis includes information on R&D in final FY 2001 NSF appropriations. The complete series of AAAS R&D Funding Updates, including continually updated analyses of R&D by agency in FY 2001 appropriations, is available on the AAAS R&D Web Site (<http://www.aaas.org/spp/R&D>) in the "FY 2001 R&D" or the "What's New" sections.)

On October 27, President Clinton signed into law a final FY 2001 VA-HUD appropriations bill (HR 5482) that gives a more than 13 percent increase to the National Science Foundation (NSF). In December, as part of the final FY 2001 appropriations bill, he signed into law a provision containing a 0.22 percent across-the-board cut for most domestic programs, including NSF; all figures in this analysis are adjusted to reflect this cut. The final bill **boosts NSF's budget by \$519 million or 13.3 percent to \$4.4 billion**. Although the Clinton Administration requested an even larger \$675 million increase, the final appropriation nevertheless represents the largest dollar increase in NSF's history and allows for increases of more than 20 percent for two NSF research directorates and more than 10 percent for most of the others. Total **NSF R&D climbs 13.2 percent to \$3.2 billion** (see Table; NSF R&D excludes education and training programs, and overhead costs). Although neither the information technology (IT) research initiative nor the new nanotechnology initiative received as much as NSF had requested, both initiatives received substantial increases over last year's funding.

The final VA-HUD bill provides nearly \$83 billion for discretionary programs, well above the FY 2000 total of \$79 billion but slightly below the \$84 billion Administration request. Similarly, the final bill provides NSF with a substantial increase over FY 2000, but falls short of the request. The bill also funds R&D programs in the National Aeronautics and Space Administration (NASA) and the Environmental Protection Agency (EPA), as well as other programs in the Department of Veterans Affairs and the Department of Housing and Urban Development.

When introducing his budget request in February, President Clinton made NSF the centerpiece of his budget for R&D, which placed a strong emphasis on achieving a better balance among science and engineering disciplines. Although a series of large increases for the National Institutes of Health (NIH) has resulted in an emphasis on biomedical and life sciences research in recent years within the federal research portfolio, the FY 2001 budget proposed large increases for R&D programs in non-life sciences disciplines. Because NSF is the only R&D funding agency responsible for the entire range of science and engineering disciplines, with a particular emphasis on fundamental research and non-life sciences disciplines, the budget request singled out NSF for an unprecedented \$675 million or 17.3 percent increase in its total budget to \$4.6 billion. The requested increase was spread across the breadth of NSF's research portfolio, with special attention to the agency's leading role in several multi-agency initiatives.

Congress falls \$156 million short of the request, for a total NSF budget of \$4.4 billion, but this is still a substantial increase of \$519 million or 13.3 percent over FY 2000. **NSF's R&D funding, which excludes NSF's education and training activities and overhead costs, totals \$3.2 billion in FY 2000, an increase of \$377 million or 13.2 percent (see Table)**. The final appropriation far exceeds the earlier House and Senate-proposed funding levels, which would have provided only a 4 percent and 10 percent increase, respectively, for NSF's R&D. This matches the pattern of other conference reports, which have generally provided far more for R&D programs than either the House or Senate bills, and in many cases more than the President's request. (For details of House appropriations for NSF, please see the June 8 AAAS R&D Funding Update; for details of Senate appropriations, please see the September 20 AAAS R&D Funding Update.)

The **Research and Related Activities (R&RA)** account, which funds most of NSF's R&D, receives \$3.3 billion, 13.0 percent or \$384 million above the FY 2000 funding level but \$198 million below the request. (Although the R&RA appropriation is not distributed by directorate, the report accompanying the final VA-HUD bill contains several paragraphs of instructions on how the money should be distributed; the directorate-level figures in the Table are AAAS interpretations of the congressional instructions, and are further adjusted to reflect the December across-the-board reduction.)

Two directorates receive increases of approximately 20 percent over the past year. The big winner is the **Computer and Information Science and Engineering (CISE)** directorate, which receives \$483 million for an increase of 24.5 percent. Although CISE requested an even larger \$529 million appropriation, the final budget should allow CISE to dramatically expand both its core research programs and its participation in a key Administration initiative. Congress allocates \$215 million for funding within R&RA, most of which is in CISE, for the **information technology research (ITR)** initiative. This program funds basic, long-term IT research and is the heart of NSF's lead role in the multi-agency Information Technology R&D initiative. Although the \$215 million appropriation falls short of the request for \$280 million, it is more than double the \$90 million for FY 2000. Another big winner is the **Social, Behavioral, and Economic Sciences (SBE)** directorate, which receives \$176 million, slightly more than the request, for an increase of 20.6 percent. The bill includes new funds to start a Children's Research Initiative within SBE, with instructions for NSF to expand this effort in the FY 2002 budget request and in future years.

Another Administration initiative, the new **Nanotechnology** initiative, receives \$150 million for NSF's leading role in the multi-agency effort, far above the FY 2000 funding level of \$97 million though substantially less than the request for \$217 million. Most of NSF's nanotechnology effort will be funded through the Mathematical and Physical Sciences (MPS) directorate (up 11.4 percent to a \$844 million total) and the Engineering (ENG) directorate (up 8.3 percent to \$414 million). (The nanotechnology initiative receives an estimated \$418 million in FY 2001 for all agencies, a 55 percent increase over the \$247 million FY 2000 total.) MPS also receives \$94 million for astronomical sciences facilities support, \$15 million more than NSF had requested.

The only account within R&RA to decline is Integrative Activities (IA), which receives \$111 million, \$18 million less than FY 2000. The final VA-HUD bill boosts funding for **Major Research Instrumentation** program within IA to \$75 million, \$25 million more than both FY 2000 and the request. The program supports the acquisition and development of research instrumentation in academic institutions. But IA's Opportunity Fund, a program to support small-scale, innovative, and cross-disciplinary projects outside directorate boundaries, receives no funds although NSF had requested \$32 million. Also, IA funding declines because funding for the **Biocomplexity in the Environment (BE)** initiative, funded at \$50 million in IA in FY 2000, moves to the Biological Sciences (BIO) and Geological Sciences (GEO) directorates in FY 2001. The BE initiative receives \$75 million in FY 2001, which falls short of the \$124 million request despite the 50 percent boost over FY 2000.

The **Major Research Equipment** account, which funds construction of large-scale scientific facilities, receives \$121 million, less than the \$139 million request but nearly a third more than FY 2000. The final bill provides the requested \$45 million in FY 2001 for the Terascale Computing Systems project, part of the Information Technology R&D initiative. The FY 2000 budget of \$36 million provided funds to build an initial terascale (trillions of operations per second) computing site, while the FY 2001 appropriation provides funds to build a second site. Congress trims the request by providing no funds for the requested new starts of the EarthScope and the National Ecological Observatory Network, but the other projects, which include the Large Hadron Collider, upgrades for the South Pole Station, and the Network for Earthquake Engineering Simulation, receive their full requested funding.

NSF's **Education and Human Resources** programs receive \$786 million, well above both FY 2000 and the \$729 million request. The earlier Senate bill had taken NSF to task for not providing sufficient support for smaller research institutions and minorities, and added funding for NSF programs in these areas. The final

bill generally follows the Senate's lead. The final bill boosts funding for the Experimental Program to Stimulate Competitive Research (EPSCoR) from \$60 million to \$75 million and adds another \$10 million to fund the Office of Innovative Partnerships. Both programs assist research institutions and states that have traditionally been underrepresented in federal R&D funding. The final VA-HUD bill also boosts funding for NSF programs for minorities, and raises funding for the Graduate Research Fellowships program from \$52 million to \$55 million. This increase should allow NSF to raise the annual stipend from \$16,200 to \$18,000 while allowing 900 awards in the next competition instead of a planned decrease to 850. There are also increases for several programs targeted to various categories of minority-serving institutions and scientists and engineers from underrepresented minorities.

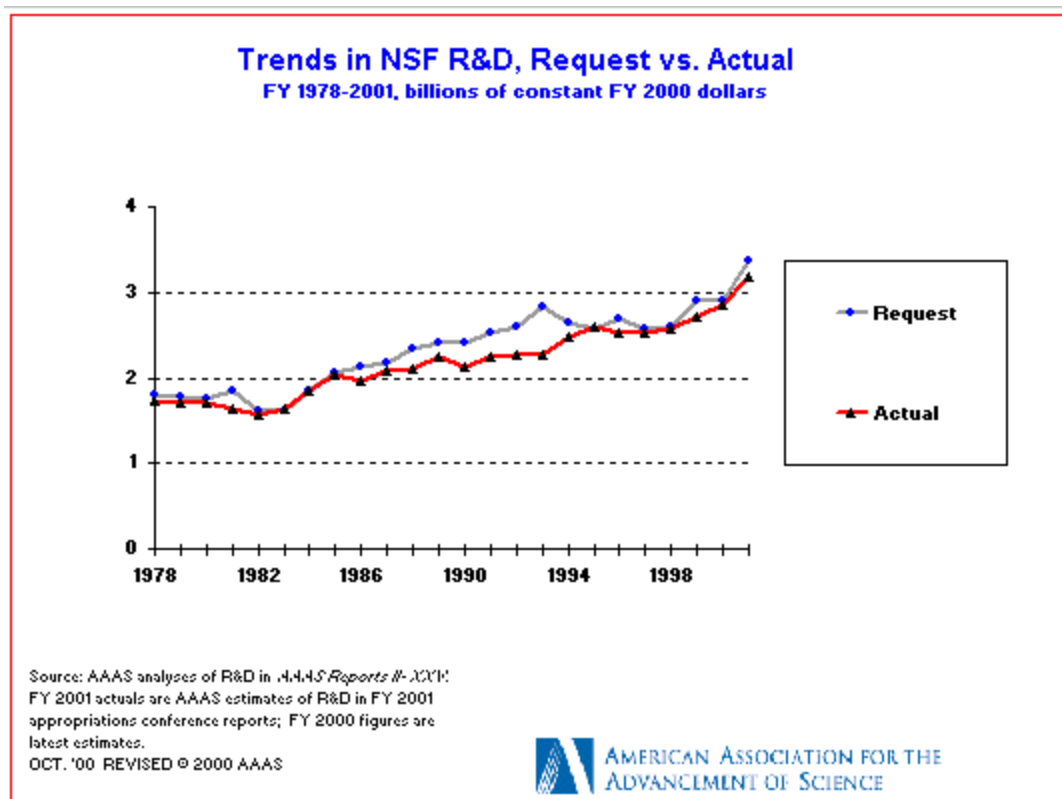


Figure 1.

The generous FY 2001 appropriation continues the recent trend of large increases for NSF. Figure 1 shows the recent history of NSF's budget for R&D and compares the final appropriated budgets with the requests. The lower line shows that the NSF budget grew steadily in the 1980s and until FY 1995, but then stagnated and even declined because of severe budget pressures in the mid-1990s as the federal government restrained discretionary spending to achieve a balanced budget. But the chart also shows that the NSF budget resumed its long-term growth trend after FY 1998, when the government entered the current age of surpluses. **The FY 2001 increase brings NSF R&D to an all-time high.** The upper line shows that nearly every year, NSF has requested more than Congress ended up appropriating, a trend that holds true in FY 2001.

NSF is the only federal agency with responsibility for research in all major science and engineering fields. As shown in Figure 2, NSF has a **balanced research portfolio** covering the breadth of science and engineering. In most fields, NSF is the largest or second-largest source of federal funding.

Although well balanced, NSF's mix of support for various disciplines has varied over time. The long-term growth trend in NSF's budget has not affected all disciplines equally. Figure 3 shows recent **trends in NSF**

support for selected disciplines. While NSF support for physical sciences, life sciences, and environmental sciences has stagnated or declined in recent years, NSF budget increases have mostly fed dramatic increases in NSF support for the engineering sciences and mathematics/computer sciences, corresponding to growing NSF interest in information technology research and increased support for engineering research centers and other engineering-related projects. The large increases of FY 2000 and FY 2001, which are not pictured in Figure 3, should eventually show up in the data as large increases for NSF support across all the disciplines, though support for the computer sciences will continue to increase faster than support for other disciplines.

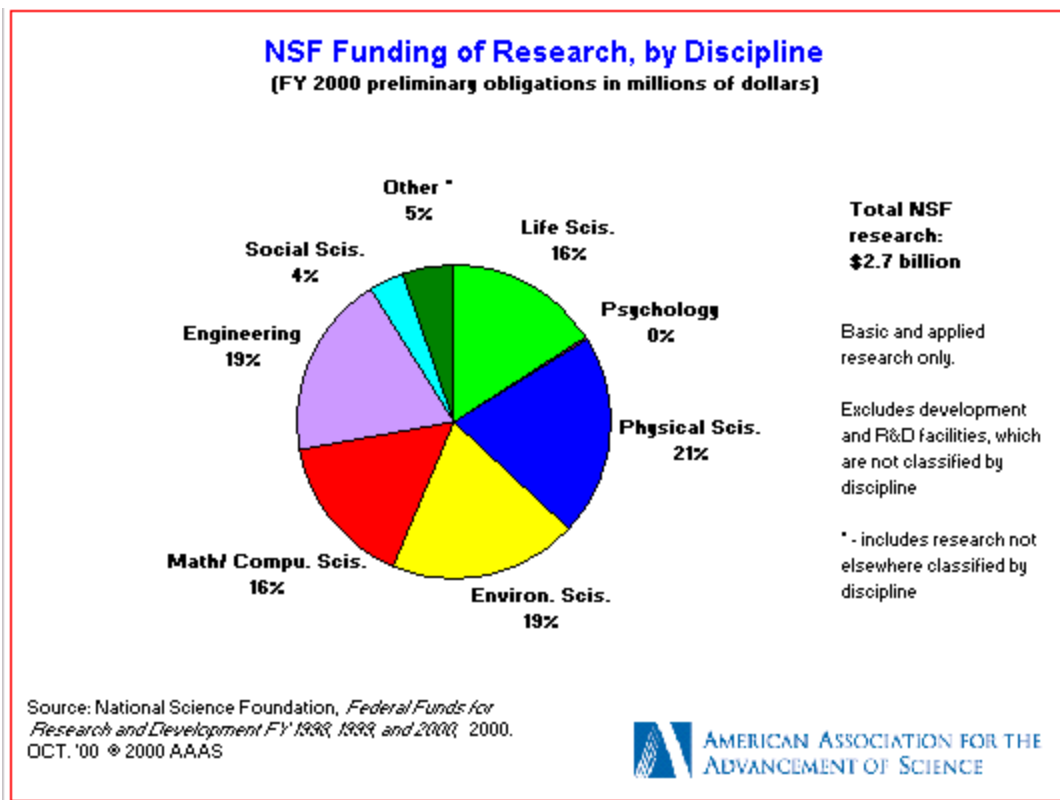


Figure 2.

The large increase for NSF in FY 2001 may be the first year of an effort by NSF congressional supporters in Congress to double the NSF budget in five years. Over the summer, several Senators led an effort to publicly commit Congress to that goal, patterning their effort after a similar commitment made three years ago by NIH supporters to double the NIH budget over five years, an effort that has so far stayed on track. The FY 2001 budget increase could be seen as the first installment of a series of 14 to 16 percent increases, but NSF appropriations will still have to be decided annually by future Presidents and Congresses.

The final VA-HUD bill emerged from conference in October, and was approved by the House and Senate on October 19. Attached to the bill is a revised version of the Energy-Water bill, which had been vetoed by the President. President Clinton signed the VA-HUD/Energy-Water bill into law on October 27, but the funding levels were modified on December 21 when the President signed the Labor-HHS bill into law. The Labor-HHS bill contains a provision reducing all appropriations in the VA-HUD bill by 0.22 percent.

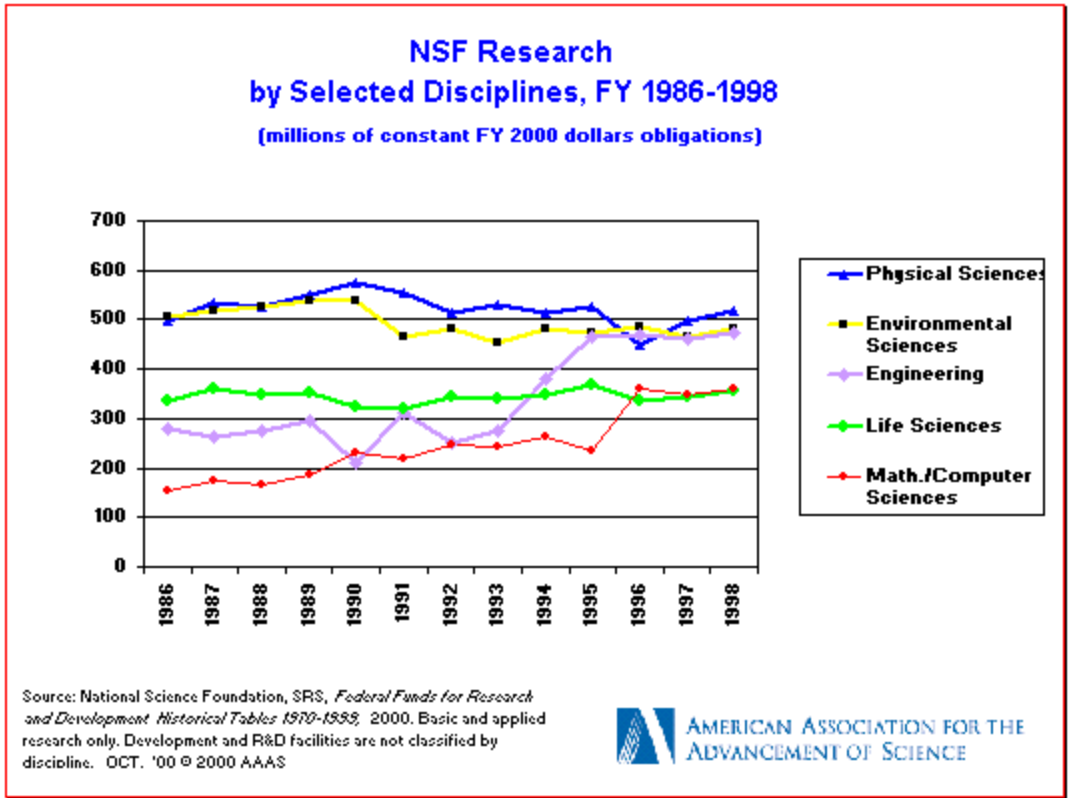


Figure 3.

- January 4, 2001

AAAS R&D Budget and Policy Program
 1200 New York Ave, NW
 Washington, DC 20005
 (202) 326-6607; -6600
 science_policy@aaas.org
 www.aaas.org/spp/R&D

**Table. National Science Foundation
R&D in the FY 2001 Budget (FINAL)
(budget authority in millions of dollars)**

	FY 2000 Estimate	FY 2001 Request	Final FY 2001 Appropriations				
			FY 2001 FINAL	Chg. from Request		Chg. from FY 2000	
				Amount	Percent	Amount	Percent
Research and Related Activities ¹ :							
Mathematical and Physical Sciences	758	881	844	-37	-4.2%	86	11.4%
Engineering	382	457	414	-43	-9.4%	32	8.3%
Biological Sciences	414	511	476	-35	-6.8%	62	14.9%
Geosciences	488	583	556	-27	-4.7%	68	13.9%
Computer and Info. Science and Eng.	388	529	483	-46	-8.6%	95	24.5%
Social, Behavioral and Econ. Scis.	146	175	176	1	0.7%	30	20.6%
US Polar Programs	253	285	282	-3	-1.1%	29	11.6%
Integrative Activities	129	119	111	-8	-6.9%	-18	-14.1%
Total Research and Related Activities ¹	2,958	3,541	3,343	-198	-5.6%	384	13.0%
Major Research Equipment	94	139	121	-17	-12.4%	28	29.8%
Education and Human Resources R&D	121	110	118	9	7.8%	-2	-1.9%
Less Non-R&D in R&RA ¹	-309	-358	-342	17	-4.6%	-32	10.5%
Total NSF R&D	2,863	3,431	3,240	-190	-5.5%	377	13.2%
Non-R&D Programs and Activities:							
Non-R&D in R&RA ¹	309	358	342	-17	-4.6%	32	10.5%
Other Education and Human Res.	570	619	667	48	7.8%	97	17.0%
Salaries and Expenses	149	158	161	3	1.7%	12	7.8%
Inspector General	5	6	6	0	-0.2%	1	15.0%
Total NSF Non-R&D Activities	1,034	1,142	1,176	34	3.0%	142	13.7%
Total NSF Budget	3,897	4,572	4,416	-156	-3.4%	519	13.3%

AAAS estimates based on FY 2001 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2000 and FY 2001 request figures based on OMB R&D data and supplemental agency budget data.

Figures are rounded to the nearest million. Changes calculated from unrounded figures.

FY 2001 FINAL figures adjusted to reflect 0.22 percent across-the-board cut.

¹ R&RA funds are not appropriated by directorate. The FY 2001 Final directorate figures are preliminary AAAS estimates based on language in the FY 2001 appropriations bill.

December 20, 2000 - FINAL FY 2001 funding levels.