

NSF Budget Up 10 Percent In House Plan

AAAS R&D Funding Update on NSF R&D in FY 2008 House Appropriations

Highlights

- **House appropriators would endorse the Bush Administration's requested increase for the National Science Foundation (NSF) and would add to it for education programs. The House would give NSF \$6.5 billion for its budget in 2008, a 10.0 percent increase (see Table).** Most research directorates would receive increases between 4 and 9 percent for the second year in a row.
- **NSF R&D investments (excluding education, training, and overhead costs) would total \$4.9 billion in the House, matching the request for an 8.7 percent increase to an all-time high in real terms.**
- All the research directorates would be able to increase average award sizes, numbers of research grants, and success rates for research grant applications in 2008.
- NSF's Education and Human Resources (E.H.R.) budget, after years of steep budget cuts, would soar 17.8 percent in the House appropriation to \$823 million in 2008.

NSF R&D in FY 2008 House Appropriations

On July 12, the House Appropriations Committee approved its version of the FY 2008 Commerce-Justice-Science appropriations bill (HR 3093) providing funding for the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), and the Department of Commerce. The full House is expected to debate and approve the bill by the end of July. The Senate Appropriations Committee has drafted its own version (S 1745). The House bill contains nearly \$54 billion in 2008 discretionary spending for its programs, \$3.2 billion more than the current year and \$2.3 billion more than the President's request. **Included in the bill is an appropriation of \$6.5 billion for NSF, \$80 million more than a large requested increase and a full \$593 million or 10.0 percent more than the current year funding level** (see Table). The Senate would provide even more, for a total of \$6.6 billion.

Over a year ago, President Bush announced in his FY 2007 budget a proposal to substantially increase funding for key physical sciences research agencies over ten years as part of an "American Competitiveness Initiative" (ACI), designed in part to address a growing wave of concern about the state of U.S. innovation. The National Science Foundation (NSF) was one of three ACI agencies (the others are the DOE Office of Science, and the National Institute of Standards and Technology laboratories) selected for a ten-year doubling trajectory in the Administration plan. The FY 2008 NSF budget, released in February, builds on congressional approval of most of NSF's 2007 increase with a second year of increases. The House would add significantly to NSF's request for education and human resources programs to bring the total NSF budget to \$6.5 billion, \$593 million or 10.0 percent more than the final 2007 funding level (see Table). The increases would go to NSF's entire range of science and engineering disciplines. (For more on the 2008 request for NSF, see Chapter 6 of *AAAS Report XXXII: R&D FY 2008* or the February 21 AAAS R&D Funding Update. For details of Senate appropriations for NSF, see the July 3 R&D Funding Update.)

After adjusting for inflation, the 2008 increase in both the NSF request and now the House appropriation would enable NSF funding to narrowly reach an all-time high (see Figure 1). After peaking in 2004, NSF funding fell in 2005 and 2006 but would rise for the second year in a row in 2008.

NSF's R&D funding, which excludes NSF's education and training activities and overhead costs (such as polar logistics and administrative salaries), would total \$4.9 billion, a gain of \$388 million or 8.7 percent in the House 2008 appropriation that would bring the R&D total slightly above 2004 in inflation-adjusted terms (see Figure 1), after cuts in 2005 and 2006 and a rebound in 2007. The Senate would provide \$18 million more than the House for an even larger R&D increase.

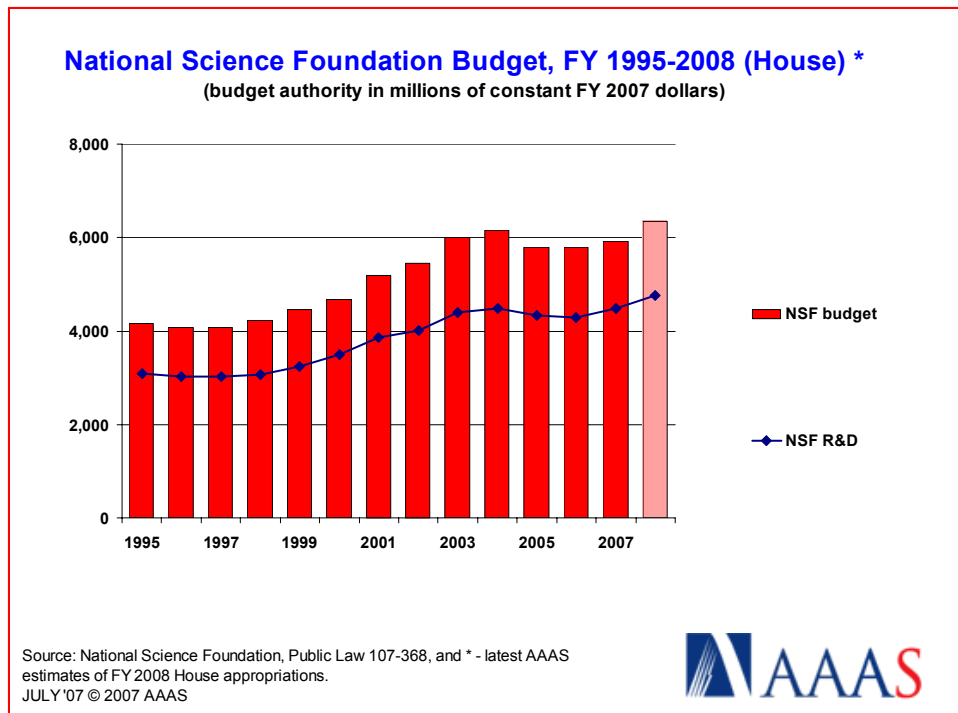


Figure 1. (click on the image for PDF)

NSF's main **Research and Related Activities (R&RA)** account, which funds nearly all of NSF's basic and applied research and contains NSF's discipline-based research directorates, would climb 7.9 percent to \$5.1 billion in the House bill (see Table). Most research directorates would receive increases between 4 and 9 percent for the second year in a row after several years of flat or declining funding (see Figure 2). The House would agree to large requested increases for some key programs: the new Office of Cyberinfrastructure (OCI), a recent spin-off from the Computer and Information Science and Engineering (CISE) directorate, would see its funding climb 9.6 percent to \$200 million. OCI supports the procurement, development, and operation of state-of-the-art cyberinfrastructure resources for the entire research community. Its sister CISE directorate would gain 9.0 percent. OCI and CISE would take the lead in a new Cyber-enabled Discovery and Innovation (CDI) initiative to develop computationally based concepts and tools to deal with complex systems. The Mathematical and Physical Sciences (MPS) and Engineering (ENG), strong supporters along with CISE and OCI of the physical sciences, would gain 8.9 percent and 8.7 percent, respectively. Moving away from the physical sciences, the gains become smaller, dropping to 6.3 percent for the Geosciences (GEO) directorate (to \$792 million) down to modest increases for the Biological Sciences (BIO) directorate (up 4.1 percent) and Social, Behavioral, and Economic Sciences (SBE; up 3.9 percent). The Senate's bill would offer similar increases to the directorates.

Within R&RA, the Integrative Activities (IA) account would climb 18.0 percent to \$271 million, primarily from a \$24 million or 27.2 percent increase in Major Research Instrumentation (MRI), a program to distribute competitively awarded instrumentation grants to institutions for state-of-the-art research instrumentation that would be too costly to be funded through regular NSF research awards. The Experimental Program to Stimulate Competitive Research (EPSCoR) would move to IA and receive \$115 million, \$8 million more than the request. EPSCoR assists research institutions and states that have traditionally been underrepresented in federal R&D funding to build research capacity. The program is

currently open to 24 states, Puerto Rico, and the U.S. Virgin Islands; collectively, the EPSCoR states received just 10.4 percent of NSF R&D funds in FY 2004.

The Office of Polar Programs (OPP), which funds polar research but also provides logistical support for research activities at both poles and maintains the South Pole Station, would receive the requested \$465 million, a boost of 6.1 percent. The OPP increase would build on a larger increase in 2007 to ramp up research during the International Polar Year (2007-2008) and for increased logistics costs to support that research. Away from the poles, NSF would invest a new \$17 million in oceans research in GEO to address important issues in ocean research identified recently by a multi-agency Ocean Research Priorities Plan.

The House would encourage NSF to create a new \$10 million program devoted to ‘transformative research,’ or research that is revolutionary and on the cutting edge. Although language accompanying the House bill notes that much of NSF’s research portfolio could be considered transformative, the House nevertheless encourages NSF to create a program specifically devoted to this type of research.

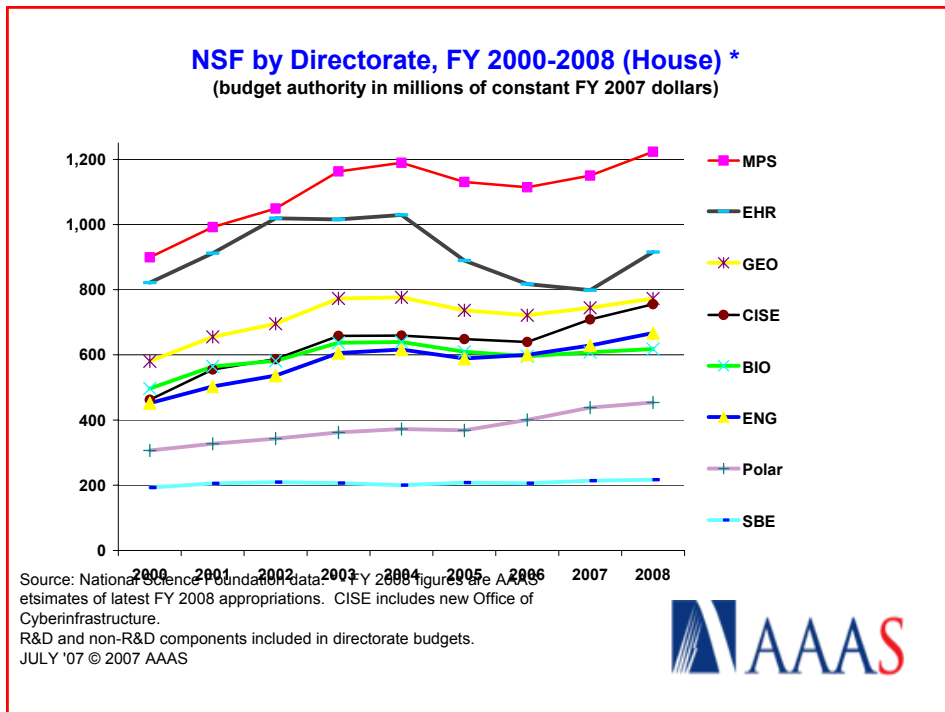


Figure 2. (click on the image for PDF)

Even after the substantial 2007 and 2008 increases, funding for several research directorates would remain below 2004 levels in real terms because of budget cuts in 2005 and 2006 (see Figure 2). In real terms, funding for the Geosciences (GEO) and Biological Sciences (BIO) would remain below 2004 levels, while the computer sciences, social sciences, mathematics and physical sciences, polar, and engineering directorates would reach new highs, though just narrowly.

In the House appropriation, the Major Research Equipment and Facilities Construction (MREFC) account would receive the requested \$54 million boost to \$245 million in 2008 to fund 7 projects (see Table). MREFC funds only the construction of large scientific facilities; smaller facilities projects, planning and design for future facilities, research instrumentation grants, and facilities operations are funded in R&RA by the research directorates. Although final plans for 2007 have not been announced, NSF will try to initiate three projects in 2007 (the Ocean Observatories Initiative, the National Ecological Observatory Network, and the Alaska Region Research Vessel) if sufficient funds are available. In 2008, NSF would start the Advanced Laser Interferometer Gravitational Wave Observatory (AdvLIGO), an upgrade to the

existing LIGO in Washington and West Virginia of the world's most sophisticated optical interferometers, with a \$33 million allocation.

The House would add money to an already-substantial requested increase for NSF education and human resources programs to bring funding to \$823 million, \$124 million or 17.8 percent more than the current year, but still 19 percent below 2004 levels in real terms after steep cuts in 2005 and 2006 and flat funding in 2007 (see Figure 2). In a reversal of past budgets, NSF would sustain the Math and Science Partnerships (MSP) program as a joint Department of Education (ED)-NSF program after seeking to transition the program to an Education-only one in previous years. The NSF contribution was \$139 million in 2004 but has declined steadily since then and declined further to just \$46 million in 2007; the 2008 request would stay at \$46 million, but the House would provide \$66 million, which could allow \$50 million for new grants. The ED portion of the program remains at \$182 million in 2008. The large education appropriation should allow most programs to expand in 2008, with particular attention to the new Robert Noyce Scholarship program (\$46 million) and \$10 million to create a new program for educators to train them in earth observations and in using earth observation data on climate change.

NSF Funding Mechanisms

The large proposed increases for the research directorates could mean a second year of gains to reverse recent declines in competitively awarded research grants. Looking only at competitively awarded research grants, NSF's core funding mechanism, NSF expects to fund 7,435 research grants next year, an 8 percent increase, while at the same time increasing the average award size to \$147,200 (up 3.0 percent) after several years of flat funding. After several years of declining success rates, NSF projects that it will fund 21 percent of research grant proposals, up slightly from 20 percent in 2007. The broad-based increases would allow every research directorate (excluding the new OCI) to increase the three key measures of the number of research grants, the average grant size, and the projected success rate.

Outlook and Next Steps

The full House is expected to debate and approve the Commerce-Justice-Science bill within the next week, although final approval may be delayed by a crowded House floor schedule. The Senate Appropriations Committee has drafted its own version, but has not scheduled time to debate it. Congress will try to send a final version of the bill to President Bush before the October 1 start of FY 2008. The President has threatened to veto any 2008 appropriations bill that exceeds his request, as the House version does by \$2.3 billion, so the bill may have to go through several rewrites and revotes before it can become law.

(This analysis is one of a series of AAAS R&D Funding Updates on FY 2008 congressional appropriations. The complete series of AAAS R&D Funding Updates, including continually updated analyses of R&D in FY 2008 appropriations, is available on the AAAS R&D Web Site (<http://www.aaas.org/spp/rd>) in the "FY 2008 R&D" or the "What's New" sections.)

- July 20, 2007
AAAS R&D Budget and Policy Program
1200 New York Avenue, NW
Washington, DC 20005
(202) 326-6607
AAAS R&D Web site: <http://www.aaas.org/spp/rd>



Table. NSF R&D in FY 2008 House Appropriations

**Table. National Science Foundation
House Appropriations Committee Action on R&D in the FY 2008 Budget
(budget authority in millions of dollars)**

	FY 2007 Estimate	FY 2008 Request	FY 2008 Senate	Action by House				
				FY 2008 House	Chg. from Request		Chg. from FY 2007	
					Amount	Percent	Amount	Percent
Research and Related Activities (R&RA) 1/ :								
Mathematical and Physical Sciences	1,150	1,253	1,253	1,253	0	0.0%	103	8.9%
Engineering	629	683	683	683	0	0.0%	55	8.7%
Biological Sciences	608	633	633	633	0	0.0%	25	4.1%
Geosciences	745	792	810	792	0	0.0%	47	6.3%
Computer and Info. Science and Eng.	527	574	574	574	0	0.0%	47	9.0%
Office of Cyberinfrastructure	182	200	200	200	0	0.0%	18	9.6%
Social, Behavioral and Econ. Scis.	214	222	222	222	0	0.0%	8	3.9%
International Office	41	45	45	45	0	0.0%	4	10.8%
US Polar Programs 2/	438	465	465	465	0	0.0%	27	6.1%
Integrative Activities 3/	230	263	269	271	8	3.0%	41	18.0%
Arctic Research Commission	1	1	1	1	0	0.0%	0	2.8%
Total R&RA 1/	4,764	5,132	5,156	5,140	8	0.2%	376	7.9%
Major Research Equipment	191	245	245	245	0	0.0%	54	28.2%
Education and Human Resources R&D	63	69	79	76	7	9.6%	13	20.8%
Less Non-R&D in R&RA 1/	-536	-590	-592	-591	0	0.1%	-55	10.2%
TOTAL NSF R&D	4,482	4,856	4,888	4,870	14	0.3%	388	8.7%
Non-R&D Programs and Activities:								
Non-R&D in R&RA 1/	536	590	592	591	0	0.1%	55	10.2%
Other Education and Human Res. (Total E.H.R. Budget)	635	681	772	746	65	9.6%	111	17.5%
	698	751	851	823	72	9.6%	124	17.8%
Agency Ops. & Award Management 4/	247	286	286	286	0	0.0%	39	15.7%
National Science Board	4	4	4	4	0	0.0%	0	2.0%
Inspector General	11	12	12	12	0	0.0%	1	8.8%
Total NSF Non-R&D Activities	1,434	1,573	1,665	1,639	66	4.2%	206	14.3%
Total NSF Budget	5,916	6,429	6,553	6,509	80	1.2%	593	10.0%

AAAS estimates based on FY 2008 appropriations bills. Includes conduct of R&D and R&D facilities.
FY 2007 and FY 2008 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.

1 R&RA funds are not appropriated by directorate. The FY 2008 House directorate figures are AAAS estimates based on report language in the FY 2008 appropriations bill.

2 All figures include transfers of polar icebreakers costs to the Coast Guard.

3 Includes proposed transfer of EPSCOR program from E.H.R. to R&RA in all years.

4 Formerly Salaries & Expenses.

July 20, 2007 - AAAS estimates of House Appropriations Committee-approved appropriations.

These figures may be amended or rejected by the full House.