

Final NSF Budget Disappoints

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

Highlights

- A large increase for the National Science Foundation (NSF) as part of the Administration's American Competitiveness Initiative (ACI) made it through the President's request, a House appropriation, a Senate appropriation, and an authorization bill but faltered in the late scramble to write the 2008 omnibus appropriations bill. **The final NSF budget of \$6.0 billion for fiscal year (FY) 2008 would be a 2.0 percent increase over 2007**, well short of the 8 to 10 percent increases in earlier bills and the request (see Table).
- NSF's research directorates receive increases well short of expected inflation, and some could see outright cuts.
- **NSF R&D investments (excluding education, training, and overhead costs) would total \$4.5 billion in 2008, up just 1.1 percent (see Table) to fall short of inflation. NSF R&D funding would be well below 2004 and 2007 levels in real terms.**
- NSF's Education and Human Resources (E.H.R.) budget, after years of steep budget cuts, would increase 3.3 percent in 2008 to \$722 million, less than requested.

NSF R&D in FY 2008 Final Appropriations

On December 26, President Bush signed into law the FY 2008 omnibus appropriations bill (HR 2764) that had cleared Congress a week earlier, bringing the 2008 appropriations process to a close. The omnibus bill included a final version of the FY 2008 Commerce-Justice-Science appropriations bill that was billions of dollars less than earlier House or Senate versions of the bill providing funding for the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), and the Department of Commerce. **The final 2008 appropriation for NSF is \$6.0 billion after adjusting for across-the-board reductions and rescissions in the omnibus bill, well short of earlier House, Senate, and requested appropriations for a 2.0 percent or \$116 million increase over 2007 (see Table).**

Nearly two years 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, built on congressional approval of most of NSF's 2007 increase with a second year of increases. The House and Senate went along with these proposals and even added to them in their respective appropriations bills, but faced presidential veto threats for exceeding his overall domestic budget total by \$22 billion. In December, Congress jettisoned the extra \$22 billion in domestic funding to win the President's signature, and significantly rearranged spending priorities in the omnibus appropriations bill cobbled together in mid-December. Among the casualties was the ACI, which received far less than requested so that Congress could shift money to domestic priorities that were proposed for cuts in the President's request. In the end, NSF won a total budget of \$6.0 billion, just \$116 million or 2.0 percent more than 2007, nearly \$400 million less than the request and nearly \$600 million less than earlier appropriations (see Table).

After adjusting for inflation, the 2008 NSF increase would fall short of both 2004 and 2007 funding levels (see Figure 1). After peaking in 2004, NSF funding fell in 2005 and 2006 but rose in 2007; the final 2008 appropriation would see NSF lose ground once again. And once again, the NSF budget would fall far short of authorized funding levels. As recently as August, President Bush and Congress agreed on an America COMPETES Act which, among other things, authorized increases for NSF in 2008 through 2010 (see Figure 1). But the final 2008 appropriation falls well short of the authorization and puts the ten-year doubling plan for NSF in doubt, just as earlier appropriations failed to live up to an authorized five-year doubling plan that was signed into law in 2002 (see Figure 1).

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 \$4.5 billion, a gain of just 1.1 percent or \$48 million that represents a real cut (see Figure 1), after cuts in 2005 and 2006 and a rebound in 2007.

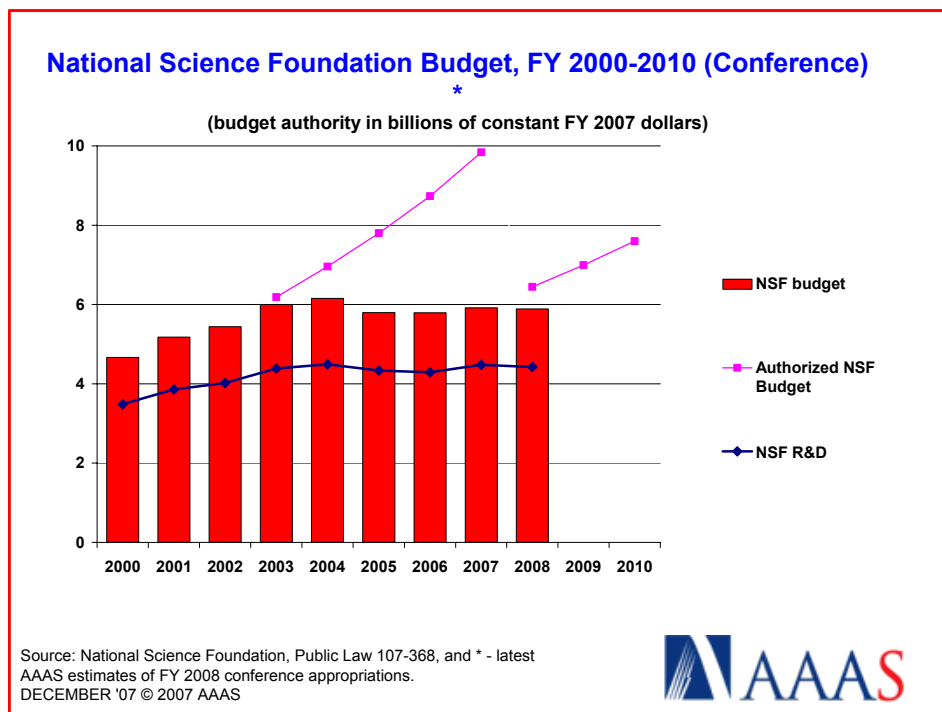


Figure 1. (click on the image for PDF)

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 increase just 0.7 percent to \$4.8 billion (see Table). Most research directorates would have received increases between 4 and 9 percent for the second year in a row in earlier budget plans, but now none of them are likely to even keep pace with inflation in 2008 and some could see outright cuts depending on how NSF allocates the total R&RA appropriation in coming weeks (see Figure 2). There could be modest 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, could see its funding increase 2.3 percent to \$187 million. OCI supports the procurement, development, and operation of state-of-the-art cyberinfrastructure resources for the entire research community. Its sister CISE directorate could gain 1.7 percent. The Mathematical and Physical Sciences (MPS) and Engineering (ENG), strong supporters along with CISE and OCI of the physical sciences, could gain just 1.6 percent and 1.4 percent, respectively. Moving away from the physical sciences, the gains could turn into cuts, for the Geosciences (GEO) directorate (down 0.8 percent to \$739 million) or the Biological Sciences (BIO) directorate (down 2.9 percent to \$591 million) and Social, Behavioral, and Economic Sciences (SBE; down 3.1 percent). Because NSF has flexibility in

deciding how to apportion R&RA funding among the directorates, these increases and cuts could be smoothed out by the time NSF finalizes its 2008 spending plans.

Within R&RA, the Integrative Activities (IA) account could climb 10.3 percent to \$253 million to become the one bright spot. There could be a large 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. One of the few specific allocations in the NSF appropriation is \$115 million within IA for the Experimental Program to Stimulate Competitive Research (EPSCoR), \$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, could receive \$434 million, down slightly from 2007. The OPP funding would build on a large increase in 2007 to fund research during the International Polar Year (2007-2008) and to fund logistics costs to support that research.

The omnibus bill retains language from the House appropriations bill encouraging NSF to create a new program devoted to ‘transformative research,’ or research that is revolutionary and on the cutting edge. Although language accompanying the omnibus bill notes that much of NSF’s research portfolio could be considered transformative, the bill nevertheless encourages NSF to create a program specifically devoted to this type of research but declines to specify an amount.

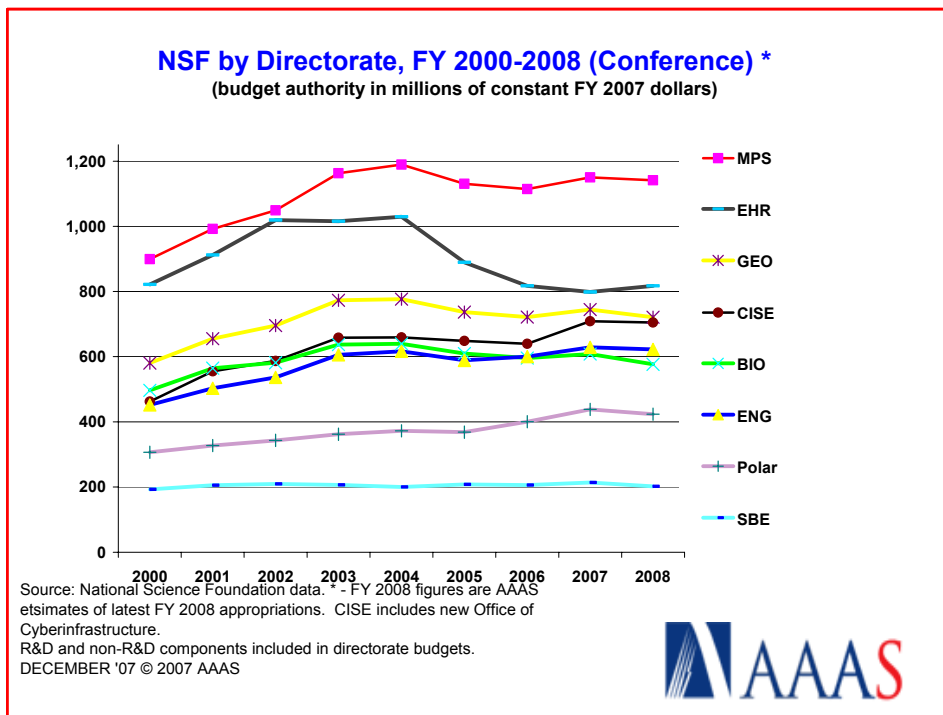


Figure 2. (click on the image for PDF)

Funding for NSF research directorates would fall behind inflation in 2008 and most directorates would remain well below 2004 levels in real terms because of real cuts in 2005 and 2006 and now 2008 (see Figure 2).

The Major Research Equipment and Facilities Construction (MREFC) account would receive \$220 million in 2008, an increase of \$29 million or 15 percent but \$25 million less than the request. MERFC would fund

7 projects in 2008, although the omnibus bill does not specify how much money each project would receive (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. NSF initiated three projects in 2007 (the Ocean Observatories Initiative, the National Ecological Observatory Network, and the Alaska Region Research Vessel) and 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, in 2008.

Congress trimmed the request for NSF education and human resources programs but still managed to award a slight increase of 3.3 percent to \$722 million, far below the nearly 20 percent increases in earlier House and Senate appropriations bills. Education and human resources funding in 2008 would remain more than 20 percent below 2004 levels in real terms after steep cuts in 2005 and 2006 and flat funding in 2007 (see Figure 2). The education appropriation should allow most programs to expand slightly in 2008, with particular attention to the new Robert Noyce Scholarship program (\$15 million). But funding for this and other programs would fall far short of the amounts envisioned in the America COMPETES Act, which formally authorized the Noyce Scholarship and other programs and suggested ambitious funding levels for them.

NSF Funding Mechanisms

The large proposed 2008 increases for the research directorates could have meant a second year of gains to reverse recent declines in competitively awarded research grants, but the final 2008 appropriation is likely to lead to further declines instead. Looking only at competitively awarded research grants, NSF's core funding mechanism, NSF expected to fund 7,435 research grants in 2008, 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 hoped to fund 21 percent of research grant proposals, up slightly from 20 percent in 2007. But with the final 2008 appropriation falling so short of the request, the number of research grants could remain flat or even fall, and the average award size could fall as well. And success rates are likely to remain below 20 percent for most directorates.

Outlook and Next Steps

The 2008 NSF budget is now law, and NSF will shortly announce how it plans to apportion its funding among its directorates. It remains to be seen whether the 2008 appropriation is a temporary setback in the ACI vision of a growing NSF budget, or whether there is a chance for NSF increases to get back on track in the 2009 budget. The first indication will be the President's FY 2009 budget request due in early February.

(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.)

- January 2, 2008
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Table. NSF R&D in FY 2008 House-Senate Conference

**Table. National Science Foundation
House-Senate Conference on R&D in the FY 2008 Budget
(budget authority in millions of dollars)**

	FY 2007 Estimate	FY 2008 Request	House-Senate Conference				
			FY 2008 CONF.	Chg. from Request Amount	Chg. from Request Percent	Chg. from FY 2007 Amount	Chg. from FY 2007 Percent
Research and Related Activities (R&RA) 1/ :							
Mathematical and Physical Sciences	1,150	1,253	1,169	-84	-6.7%	19	1.6%
Engineering	629	683	637	-46	-6.7%	9	1.4%
Biological Sciences	608	633	591	-42	-6.7%	-17	-2.9%
Geosciences	745	792	739	-53	-6.7%	-6	-0.8%
Computer and Info. Science and Eng.	527	574	535	-39	-6.7%	9	1.7%
Office of Cyberinfrastructure	182	200	187	-13	-6.7%	4	2.3%
Social, Behavioral and Econ. Scis.	214	222	207	-15	-6.7%	-7	-3.1%
International Office	41	45	42	-3	-6.7%	1	3.4%
US Polar Programs 2/	438	465	434	-31	-6.7%	-4	-1.0%
Integrative Activities 3/	230	263	253	-10	-3.7%	24	10.3%
Arctic Research Commission	1	1	1	0	-6.7%	0	-4.1%
Total R&RA 1/	4,764	5,132	4,795	-336	-6.6%	31	0.7%
Major Research Equipment	191	245	220	-25	-10.3%	29	15.0%
Education and Human Resources R&D	63	69	67	-3	-3.9%	4	6.0%
Less Non-R&D in R&RA 1/	-536	-590	-551	39	-6.6%	-15	2.8%
TOTAL NSF R&D	4,482	4,856	4,530	-325	-6.7%	48	1.1%
Non-R&D Programs and Activities:							
Non-R&D in R&RA 1/	536	590	551	-39	-6.6%	15	2.8%
Other Education and Human Res. (Total E.H.R. Budget)	635	681	655	-26	-3.9%	19	3.1%
Agency Ops. & Award Management 4/	247	286	280	-5	-1.9%	33	13.6%
National Science Board	4	4	4	0	-2.0%	0	-0.1%
Inspector General	11	12	11	-1	-8.0%	0	0.1%
Total NSF Non-R&D Activities	1,434	1,573	1,502	-72	-4.6%	68	4.7%
Total NSF Budget	5,916	6,429	6,032	-397	-6.2%	116	2.0%

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.

FY 2008 Conference figures adjusted to reflect undistributed rescissions in the omnibus bill.

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

December 17, 2007 - AAAS estimates of House-Senate Conference appropriations.

These appropriations may be rejected by the House or Senate, and may be vetoed by the President.