

FY 2012 Appropriations for the National Science Foundation (NSF)

NSF FY 2012 Request

(numbers are in millions)

NSF	FY 2011 Final	FY 2012 Request	% Change from FY11	House Mark	Senate Mark	FY12 Minibus	% change FY 12 vs FY11
Research & Related Activities:							
Biological Sciences	711.5	794.5	11.7%				
Computer & Information Science & Engineering (CISE)	635.1	728.4	14.7%				
Engineering	762.7	908.3	19.1%				
Geosciences (GEO)	884.8	979.1	10.6%				
Earth Sciences	183.4	207.3	13.0%				
Ocean Sciences	351.9	384.6	9.3%				
Atmospheric and Geospace Sciences	257.6	286.3	11.1%				
NCAR	97.615	100.0	2.4%				
Integrative & Collaborative Education & Research	91.8	100.9	9.9%				
Mathematical & Physical Sciences (MPS)	1,308.3	1,432.7	9.5%				
Astronomical Sciences	236.4	249.1	5.4%				
Office of Cyberinfrastructure	209.9	236.0	12.4%				
Social, Behavioral & Economic Sciences	247.3	301.1	21.7%				
Office of Polar Programs	493.4	477.4	-3.2%				
Integrative Activities	260.2	336.2	29.2%				
Major Research Instrumentation		90.0					
Total, Research & Related Activities	5,563.8	6,253.5	12.4%	5,606.9	5,443.0	5,719.0	2.8%
Education & Human Resources	861.0	911.2	5.8%	835.0	829.0	829.0	-3.7%
Major Research Equip. & Facilities Construction	117.3	224.7	91.5%	100.0	117.0	167.1	42.5%
TOTAL, NSF	6,859.8	7,767.0	13.2%	6,859.8	6,698.0	7,033.1	2.5%

Education and Human Resources:

Program	FY 2011 Final	FY 2012 Request	FY 2012 House	FY 2012 Senate	Final
Research on Learning in Formal & Informal Settings	248.7	264.1			
Undergraduate Education	284.9	295.4			
Graduate Education	170.9	191.7			
Human Resource Development	156.5	159.9			

Major Research Equipment and Facilities Construction (MREFC) Account:

Project	FY 2011 Final	FY 2012 Request	FY 2012 House	FY 2012 Senate	Final
Ongoing Projects					
Atacama Large Millimeter Array (ALMA)	42.8	3.0		3.0	
Advanced Laser Interferometer Gravitational Wave Observatory (AdvLIGO)	46.3	20.9		20.9	
Advanced Technology Solar Telescope	13.0	10.0		10.0	
Ocean Observatories Initiative	14.3	102.8		83.0	
National Ecological Observatory Network (NEON)	--	87.9		--	

November 15, 2011: House and Senate [Conference Numbers and Language](#) in “Minibus” Bill:

- Within R&RA, the conferees support NSF’s termination and reduction proposals, except for the reduction to the radio astronomy program.
- Within R&RA, \$50 million is allowed to be transferred to the MREFC account.
- Within MREFC, the conferees expect NSF will dedicate funds first to the completion of projects that are already in the final stages of construction, with remaining funds allocated to projects in earlier phases of development.
- Within EHR: Cuts to particular programs were made not due to any dissatisfaction with the programs in question but rather because NSF would prefer to implement new initiatives. However, the conferees do not accept the proposed reductions to the Robert Noyce Scholarship Fund and the Math and Science Partnership Program.
- Within EHR: NSF is encouraged to find more effective mechanisms for disseminating the results of its education research to the K-12 STEM education community, which could include partnerships with nonprofits and professional associations, webinars, newsletters and workshops, drawing when possible on the resources of existing networks.

September 16, 2011: Senate Appropriations Committee Approves FY 2012 CJS bill

On September 15, the Senate Appropriations Committee approved four fiscal year (FY) 2012 appropriations bills: Defense; Legislative Branch; Financial Services; and Commerce, Justice, Science (CJS).

Given the priorities of the CJS Subcommittee leaders, Chairwoman Barbara Mikulski (D-MD) and Ranking Member Kay Bailey Hutchison (R-TX), NOAA and NASA fare relatively well in the Senate CJS bill. However, in light of budget constraints, NSF would receive a small cut.

Although it is unlikely Senate appropriations bills will move to the floor, Congress may try to wrap up the FY 2012 appropriations process by fashioning an omnibus by mid-November, giving lawmakers time to focus entirely on deficit reduction negotiations before the end of the calendar year. In the near term, Congress is expected to pass a continuing resolution (CR) to fund the federal government beyond the start of the new fiscal year on October 1. The current proposed CR would provide ongoing funding at the FY 2011 enacted levels with a 1.409 percent across-the-board reduction assessed in every program, including defense, to fund the government on an annualized basis that comports to the \$1.043 trillion overall cap on discretionary spending for FY 2012 enacted in the Budget Control Act (debt limit agreement) last August.

NSF would be funded at \$6.698 billion overall, \$162 million or 2.4 percent below the FY 2011 level and House mark and \$1.069 billion below the President's request for FY 2012. Within this amount the Committee recommends funding NSF's Research and Related Activities (R&RA) account at \$5.443 billion, \$121 million or 2.2 percent below the FY 2011 funding level and \$164 million below the House mark. The Committee supports NSF's prioritization of advanced manufacturing, cyberinfrastructure, and robotics and is also supportive of NSF's new Innovation Corps (I-Corps), NSF-funded scientific research facilities and instruments, and efforts with respect to cybersecurity research. The Committee accepts NSF's proposal for terminations and reductions to several programs, including: Deep Underground Science and Engineering Laboratory, Graduate STEM Fellows in K-12 Education, National STEM Distributed Learning (Digital Library), Research Initiation to Broaden Participation in Biology, Synchrotron Radiation Center, and Science of Learning Centers.

The Major Research Equipment and Facilities Construction (MREFC) account would be funded at \$117 million, \$17 million above the House mark and level with the FY 2011 level. This number is significantly lower than the President's budget request of \$225 million, but would include funding at the requested level for the following projects: the Advanced Laser Interferometer Gravitational-Wave Observatory; the Atacama Large Millimeter Array; and the Advanced Technology Solar Telescope. The Ocean Observatories Initiative (OOI) would be funded at \$83 million. Notably, the report includes language allowing NSF to transfer up to \$100 million from the R&RA account to, "fully fund OOI or begin work on the National Ecological Observatory Network."

The Education and Human Resources (EHR) account would be funded at \$829 million, \$32 million below the FY 2011 level and \$6 million below the House mark. The Committee would provide the FY 2011 level of \$55 million for the Robert Noyce Scholarship program and would provide an additional \$20 million above the request level to expand the Federal Cyber Service: Scholarships for Service program. Similar to House language, the Committee encourages NSF to make certain that the review of Graduate Research Fellowship Program applications are done solely on merit and "not rejected for reasons unrelated to the quality and merits of the proposed research." On the topic of broadening participation programs, the Committee states, "One size will not fit all," and supports NSF's separate request for Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation, and the Tribal Colleges and Universities Program. The

Committee has no objection to moving the Research in Disabilities Education (RDE) and Research on Gender in Science and Engineering (GSE) programs to the Division of Research on Learning in Formal and Informal Settings, but states that these programs shall remain separate and funded at the FY 2011 level. The Committee “strongly encourages” NSF to support the Professional Science Master’s program, originally authorized in the America COMPETES Act and funded through the American Recovery and Reinvestment Act. The Committee recommends that NSF include PSM in future budget requests.

July 19, 2011: House Appropriations Committee Approves FY 2012 CJS bill

Despite the low likelihood that the House versions of the fiscal year (FY) 2012 appropriations bills will be enacted into law, the House Appropriations Committee approved the Commerce, Justice, Science, and Related Agencies (CJS) Appropriations bill July 7.

The bill would provide NSF with \$6.860 billion overall, the same level as FY 2011 and a decrease of \$907 million or 12 percent below the President’s request for FY 2012. Within this amount, \$43 million over the FY 2011 level is provided to NSF’s Research and Related Activities account, with the Education and Human Resources (EHR) and Major Research Equipment and Facilities Construction (MREFC) accounts expected to be down from FY 2011 levels once additional details are released.

Lewis-Burke Associates Analysis of President’s FY 2012 Request:

The National Science Foundation (NSF) would receive \$7.767 billion in the President’s FY 2012 budget request, an increase of \$894 million or 13.0 percent above the FY 2010 enacted level. (If the \$54 million transfer to the Coast Guard for icebreaking services in FY 2010 is included in the FY 2010 baseline, the increase would be 12.1 percent.) The proposed FY 2012 increase would keep NSF on the path for doubling, although the pace and final target have slowed compared to the plan the Obama Administration released in 2010. This is consistent with last year’s goal to reach \$10.9 billion in FY 2017.

Overall, the majority of the funding increase at NSF would be directed to research and facilities programs, not education programs. Some initiatives from the last few years would be continued, such as the expansion of the Graduate Research Fellowship program and the Science, Engineering, and Education for Sustainability initiative.

The budget request would also call for several terminations. Of note, the National STEM Distributed Learning Program (NSDL); the Synchrotron Radiation Center; the agency-wide Graduate STEM Fellows in K-12 Education program; and the Deep Underground Science and Engineering Laboratory (DUSEL) would not receive funding in FY 2012.

Research and Related Activities

New and Priority Initiatives within R&RA:

Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE): Designed to support transformative research through interdisciplinary proposals, INSPIRE awards would support senior and junior investigators, and small groups of researchers, to enable interdisciplinary research breakthroughs and identify barriers to interdisciplinary research. This new initiative would be funded at \$12 million in FY 2012 through NSF’s Integrated Activities account.

Research at the Interface of Biological, Mathematical, and Physical Sciences (BioMaPS): This new \$76 million program would be a collaboration between the Biological Sciences, Engineering, and Mathematical and Physical Sciences Directorates with the goal of integrating research to gain a better understanding of biological systems, then use that understanding to develop new technologies, particularly in clean energy.

Science, Engineering, and Education for Sustainability (SEES): The FY 2012 budget request would continue the SEES initiative which includes both climate and energy research and education programs. The initiative would receive \$998 million in FY 2012, 51.0 percent or \$337 million above what NSF invested in programs in these areas in FY 2010. Focus areas for FY 2012 would include research on Sustainable Energy Pathways (SEP), targeted awards in the Partnerships for International Research and Education (PIRE) program, and a postdoctoral fellowship program in sustainable solutions.

Both SEES and BioMaPS would be part of a larger \$576 million investment NSF would make in clean energy research.

Advanced Manufacturing: As part of a larger Administration effort, NSF would continue its support of advanced manufacturing through increased investments (\$190 million) in emerging opportunities that include cyber-physical systems, advanced robotics research, scalable nanomanufacturing, sensor and model-based manufacturing, educational activities, and industry-university cooperation.

Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21): CIF21 would be a new agency-wide \$117 million initiative that would develop comprehensive, integrated, sustainable, and secure cyberinfrastructure to accelerate research and capabilities in computational and data-intensive science and engineering.

Continued Investment in Young Researchers: The FY 2012 President's budget request would continue the emphasis on the pipeline of students choosing science and engineering careers by providing increases for the Graduate Research Fellowship (GRF) program and the Faculty Early Career Development (CAREER) program. The GRF program would receive \$198 million (45.8 percent over FY 2010), which would support 2,000 new graduate student awards. NSF would also increase the cost of education allowance in FY 2012 from \$10,500 to \$12,000, as mandated in the America COMPETES Reauthorization Act, and begin a multi-year plan to address inflationary pressure on the GRF stipend level. The CAREER program would receive \$222 million (13 percent over FY 2010) and would support an additional 60 CAREER awards, totaling 606 new awards for FY 2012 if funded.

Other Programs of Interest

Agency-Wide Programs: NSF has several multidisciplinary and agency-wide programs that receive particular attention from universities. In addition to the programs described above, highlights of cross-NSF programs in the FY 2012 President's budget request include:

- Major Research Instrumentation (MRI): The MRI program would receive \$90 million in FY 2012, the same level as in FY 2010.
- Science and Engineering Beyond Moore's Law (SEBML): NSF continues to sharply ramp up investment in the multi-directorate SEBML initiative that was begun in FY 2009. FY 2012 funding would be \$96 million, 106 percent above the FY 2010 level.
- Experimental Program to Stimulate Competitive Research (EPSCoR): EPSCoR would increase 9.1 per-cent to \$160 million in FY 2012.

Centers: NSF provides large-scale multidisciplinary awards through a variety of center programs which, in most cases, do not run competitions every year. The status of some of these center programs are:

- Engineering Research Centers (ERCs): Funding for the ERC program would increase \$26 million, up to \$81 million to support the first class of three new Nanoscale Engineering Research Centers which will transition nano-devices created at Nanoscale Science and Engineering Centers (NSECs) to the systems level and commercialization. Funding for the Nanoscale ERCs is the result of a reallocation of funding from the 2011 graduating NSECs.
- Materials Centers (MPS): The Materials Research Centers and Teams (MRCT) program (a restructuring of the Materials Research Science and Engineering Centers program) funds Centers of Excellence for Materials Research and Innovation (CEMRIs) and Materials Interdisciplinary Research Teams (MIRTs). In total for FY 2012, 21 to 23 centers and 10 to 12 team awards would be supported. FY 2011 is a competition year (competitions are held triennially) and so it is not expected that FY 2012 would have a MRCT competition.
- Nanoscale Science and Engineering Centers: The original class of NSECs receives final funding in FY 2010. Approximately \$16 million will be reallocated to the ERC program to support the first Nano-scale ERCs, with the remaining \$30 million in FY 2012 supporting the 13 continuing NSECs.

Education and Human Resources

The NSF Education and Human Resources (EHR) account would receive \$911 million in the FY 2012 budget request, an increase of \$38 million or 4.4 percent above the FY 2010 enacted level. In recent years, proposed EHR increases have usually been lower than the increases proposed for the R&RA account (comparing percentages), but Congress often increases the EHR funding levels during the appropriations process.

The Obama Administration continues to emphasize the important role of science, technology, engineering, and mathematics (STEM) education in improving U.S. economic competitiveness. However, this emphasis does not translate into significant increases in NSF education programs, especially K-12 education programs. The Administration's focus remains on activities at the Department of Education, programs to evaluate existing efforts and scale them up, and efforts to inspire and leverage investments made by private organizations and state and local governments.

New investments in EHR would include:

- Widening Implementation and Demonstration of Evidence-based Reforms (WIDER): This new \$20 million program would have the goal of scaling-up improved undergraduate STEM education practices.
- Teacher Learning for the Future (TLF): This new \$20 million research program would focus on improving training of teachers as the structure of formal education changes.
- Community Colleges: Support for community colleges would be a priority across EHR, with proposed funding of \$100 million in FY 2012, an increase of \$25 million or 33.3 percent over FY 2010.

Another area that is within EHR and would receive significant new funding is the effort to increase participation in STEM by traditionally underrepresented groups. The budget request would increase

funding for activities in this area to \$160 million in FY 2012, 15.2 percent above the FY 2010 enacted level. Unlike the FY 2011 request, there is not a proposed consolidation of existing programs into one new activity—this was specifically prohibited by Congress in the America COMPETES Reauthorization Act. Instead the budget request would propose the realignment of Human Resource Development Division programs into two theme areas:

- **Broadening Participation at the Core (BPAC):** The goal of this area would be to amplify efforts and targeted investments at minority-serving institutions to support broadening participation. This effort would include a request for a \$20 million pilot program, Transforming Broadening Participation through STEM, to seek innovative solutions for broadening participation at the undergraduate level, including increased engagement with Hispanic-serving institutions.
- **Research and Education Infrastructure:** This effort would focus on expanding opportunities for under-represented groups in STEM disciplines at the graduate, post-doctorate, and professional levels. This theme would encompass the ADVANCE, Alliances for Graduate Education and the Professoriate (AGEP), and the Centers of Research Excellence in Science and Technology (CREST) programs.

Other programs of interest in EHR include:

- **Integrative Graduate Education and Research Traineeships (IGERT) program:** The IGERT program would receive \$62 million in FY 2012 (from EHR and R&RA), a decrease of \$7 million or 9.8 percent, from FY 2010.
- **Robert Noyce Teacher Scholarship Program:** The Noyce program would receive \$45 million in FY 2012, \$10 million or 18.2 percent less than the FY 2010 level.
- **Math and Science Partnerships:** The Math and Science Partnership Program would receive \$48 million in FY 2012, \$10 million or 17.2 percent less than the FY 2010 level.
- **STEM Talent Expansion Program (STEP):** The STEP program would receive \$36 million in FY 2012, \$3 million or 9.2 percent more than the FY 2010 level.

Major Research Equipment and Facilities Construction (MREFC)

The NSF Major Research Equipment and Facilities Construction (MREFC) account would receive \$225 million in the FY 2012 budget request, an increase of \$107 million or 91.6 percent above the FY 2010 enacted level. The significant increase is reflective of adjustments NSF would need to make to the MREFC account should a year-long CR be enacted for FY 2011.

In FY 2012, funds are requested for five ongoing MREFC projects: Advanced LIGO (AdvLIGO), the Advanced Technology Solar Telescope (ATST), the Atacama Large Millimeter Array (ALMA), the Ocean Observatories Initiative (OOI), and the National Ecological Observatory Network (NEON). As previously noted, NSF would not seek funding for DUSEL.