SELECTED CROSSCUTTING PROGRAMS

NSF crosscutting programs include interdisciplinary programs and programs that are supported by multiple directorates. Examples of major crosscutting activities include the following:

ADVANCE
A budget of $21.65 million for ADVANCE in FY 2012, an increase of $630,000 above the FY 2010 Enacted level of $21.02 million, will fund transformative efforts to address the systemic barriers to women's full participation in academic science, technology, engineering, and mathematics (STEM). ADVANCE will broaden the spectrum of institutions participating in the program. Predominantly undergraduate institutions, teaching intensive colleges, community colleges, minority-serving institutions, and women's colleges will be reached through the IT-Catalyst program component, which provides support to institutions to undertake institutional self-assessment activities. The funding will also support new awards under the Institutional Transformation (IT) program component as well as an overall program evaluation and data collection to capture the impact of prior ADVANCE awards.

ADVANCE has begun the planning process for an evaluation of its program, focusing primarily on awards that have completed their funding cycles. The evaluation examines such questions as:

- What is the impact of ADVANCE on institutional transformation?
- What is the impact of ADVANCE on individuals in ADVANCE programs?
- What is the impact of ADVANCE beyond institutions (e.g., publications, new collaborations)?
- How and why have successful programs worked in specific institutional contexts?

Current plans for the evaluation design include a quasi experimental design using comparison data from the Survey of Doctorate Recipients, together with a case study approach that involves site visits and in-depth interviews with faculty and administrators, along with analysis of project documents. It is anticipated that the evaluation will begin in FY 2012.

Climate Change Education Program
The FY 2012 Request provides $10.0 million for the Climate Change Education (CCE) program, equal to the FY 2010 Enacted allocation. The Directorates for Education and Human Resources, Geosciences, Biological Sciences, and the Office of Polar Programs will support this Administration priority program. CCE is a multi-disciplinary, multi-faceted climate change education program that is enabling a variety of partnerships within formal and informal settings, including partnerships among K-12 education, higher education, the private sector, related non-profit organizations, and relevant education and/or climate-related policymakers. It will support individual investigators and multidisciplinary teams of STEM researchers and educators in a range of activities, including those with a local, regional, and/or global scope.

NSF has made an award to the National Research Council to implement an 18-month roundtable process that is examining key issues and needs inherent to climate change education. The roundtable is bringing together federal and state policymakers, educators, communications and media experts, and members from the business and scientific community. Insights gained through the roundtable are providing NSF with important foundational knowledge related to key aspects of CCE. These aspects include learning, the nature and scope of existing efforts, achievable and measurable goals, challenges and opportunities inherent in developing a national level CCE initiative, and areas where investments in FY 2012 may provide the greatest leverage. In addition, NSF is collaborating with NASA and NOAA to support annual tri-agency principal investigator meetings for climate change education-related awards and development of methods for evaluation of federal climate change education programs.

Enhancing Access to the Radio Spectrum
NSF's FY 2012 Request provides $15.0 million for Enhancing Access to the Radio Spectrum (EARS), a cross-cutting program whose purpose is to fund interdisciplinary research that can enhance the efficiency with which radio spectrum is used, and/or lead to improved access to wireless services for all Americans. EARS is a collaboration among the Directorates for Computer and Information Science and Engineering (CISE), Engineering (ENG), Mathematical and Physical Sciences (MPS), and Social, Behavioral, and Economic Sciences (SBE). It will fund innovative collaborative research that transcends the traditional boundaries of existing disciplinary programs.

Faculty Early Career Development (CAREER)
The FY 2012 Request provides $221.96 million for the CAREER program, which is a continuing Administration priority program. This is an increase of $25.57 million over the FY 2010 Enacted level of $196.39 million. This will result in approximately 60 more CAREER awards than in FY 2011. CAREER awards support exceptionally promising college and university junior faculty who are committed to the integration of research and education and who are most likely to become the leaders in their fields.

Graduate Fellowships and Traineeships
The FY 2012 Request provides $288.16 million for NSF's flagship graduate fellowship and traineeship programs. This funding will enable NSF to support an estimated 6,450 graduate students.

- $198.14 million for the Graduate Research Fellowship (GRF) program, an increase of $62.22 million over the FY 2010 Enacted of $135.92 million, will provide up to 3 years of support over a 5-year period to graduate students in all STEM fields. In FY 2012, 2,000 new fellows will be supported maintaining the doubling of new fellowships awarded as achieved in FY 2010. In order to maintain the competitiveness and fiscal integrity of the GRF program, NSF will increase the cost of education (COE) allowance in FY 2012 from $10,500 to $12,000. The new COE level is consistent with the America COMPETES Reauthorization Act of 2010. NSF will also begin implementing a multi-year plan to address inflationary pressures on the long-stagnant GRF stipend level, including initial funding in FY 2012 for a stipend increase to $32,000 that will be fully implemented in FY 2013. Additional stipend increases are planned beyond FY 2013.

NSF Graduate Research Fellowship Program

	Total Number of Fellows	Number of New Fellows	Projected Fellows on Tenure[1]
FY 2010 Enacted/Annualized FY 2011 CR Estimate	6,700	2,000	3,400
FY 2012 Estimate	7,800	2,000	4,200

[1]Fellowship tenure status is the period of time during which fellows actively utilize the fellowship award to pursue an advanced degree in the science, technology, engineering, or mathematics fields supported by the National Science Foundation.

- $62.47 million for the Integrative Graduate Education and Research Traineeship (IGERT) program, a decrease of $6.76 million from the FY 2010 Enacted of $69.23 million. This decrease reflects reduced support provided through the Research and Related Activities account. Determining the appropriate framework for R&RA contributions to IGERT will be a focus of upcoming efforts associated with NSF's implementation of the IGERT-related provisions of the recently-enacted

America COMPETES Reauthorization Act of 2010. IGERT will support comprehensive Ph.D. programs that are innovative models for interdisciplinary education and research and that prepare students for academic and non-academic careers. Funding will support an estimated 1,450 IGERT trainees. In 2009 Abt Associates, Inc. completed a survey of over 800 IGERT graduates in order to investigate the short-term professional outcomes of IGERT graduates and assess whether the IGERT program has prepared funded graduate students for successful STEM-related careers and developed their capacity for research, teaching, and leadership.

- $26.95 million for the NSF Graduate STEM Fellows in K-12 Education (GK-12) program, a decrease of $27.36 million from the FY 2010 Enacted of $54.31 million. The GK-12 program was initiated in 1999, and during the subsequent years more than 300 projects have been funded throughout the Nation. The GK-12 program is not holding a new competition in FY 2011 and will terminate in FY 2012; because (1) the program has achieved its goal of providing models for potential adopters to consider, along with evaluation data, in developing their efforts; and (2) the program design limits the ability of participants to gain in-depth experience in K-12 teaching to impact pupil learning. The FY 2011 Request amounts for both R&RA and EHR will be used to cover FY 2011 out-year commitments for grants made in prior years. Funding to cover remaining out-year commitments will be funded by EHR. FY 2012 funding will support an estimated 800 GK-12 graduate fellows.

Long-Term Ecological Research (LTER)
The FY 2012 Request provides $29.80 million, an increase of $1.86 million above the FY 2010 Enacted level of $27.94 million. LTER supports fundamental ecological research that requires long time periods and large spatial scales. This program supports a coordinated network of more than two dozen field sites that focus on: 1) understanding ecological phenomena that occur over long temporal and broad spatial scales; 2) creating a legacy of well-designed and documented ecological experiments; 3) conducting major syntheses and theoretical efforts; and 4) providing information necessary for the identification and solution of environmental problems. LTER field sites represent a diversity of habitats in continental North America, the Caribbean, Pacific Ocean, and the Antarctic, including coral reefs, deserts, estuaries, lakes, prairies, various forests, alpine and Arctic tundra, urban areas, and production agriculture. The National Ecological Observatory Network (NEON) will begin construction in FY 2011, the first year of a six-year construction project. NEON infrastructure will be co-located at eleven LTER sites. This co-location will permit the integration of the historic long-term LTER research into NEON and allow scientists to scale the site based research to regional and continental scales. Increased support in FY 2012 covers planned periodic increases to cover higher costs as sites are renewed.

Research at the Interface of the Biological, Mathematical, and Physical Sciences (BioMaPS)
The FY 2012 Request provides $76.14 million for the BioMaPS program, an interdisciplinary partnership between the Directorates for Biological Sciences, Mathematical and Physical Sciences, and Engineering. BioMaPS seeks to discover fundamental new knowledge at the intersections of the biological, mathematical and physical sciences and engineering in order to enable innovation in national priorities such as clean energy, climate science, and advanced manufacturing that are essential to the Nation's prosperity, economic competitiveness, and quality of life.

Research Experiences for Teachers (RET)
The FY 2012 Request for NSF's RET program totals $4.82 million, a decrease of $820,000 below the FY 2010 Enacted level of $5.64 million. Funding will provide pre-service and in-service K-12 teachers with discovery-based learning experiences.

Research Experiences for Undergraduates (REU)
The FY 2012 Request for NSF's REU program totals $65.97 million, a decrease of $690,000 from the FY 2010 Enacted of $66.66 million. The request for FY 2012 reflects the importance of undergraduate research experiences to building students' interest and competence in STEM disciplines, and it is consistent with the external evaluation of REU by SRI International, which found that undergraduate students who participate in hands-on research are more likely to pursue advanced degrees and careers in STEM. REU supplements support active research participation by undergraduate students in any area of research funded by NSF by providing supplements to research grants. REU sites involve students in research who might not otherwise have the opportunity, particularly those from institutions where research programs are limited. A significant fraction of the student participants come from outside the host institutions. REU grants involve students at all stages of undergraduate education, including the freshman and sophomore levels, which enhances retention and graduation rates in STEM. The program encourages partnerships between community colleges and baccalaureate degree-granting institutions to provide research opportunities for community college STEM students and faculty. This emphasis will continue in FY 2012 as a means of broadening participation in STEM and fostering educational pathways and transfer opportunities for students in STEM programs.

Research in Undergraduate Institutions (RUI)
The FY 2012 Request for NSF's RUI program totals $37.45 million, an increase of $130,000 million above the FY 2010 Enacted level of $37.32 million. The RUI activity supports research by faculty members of predominantly undergraduate institutions through the funding of (1) individual and collaborative research projects, (2) the purchase of shared-use research instrumentation, and (3) Research Opportunity Awards for work with NSF-supported investigators at other institutions.

Science and Technology Centers (STCs)
The FY 2012 Request for the Science and Technology Centers program totals $50.75 million, a decrease of $7.02 million below the FY 2010 Enacted level of $57.77 million. For additional information, see the NSF Centers Programs section of this chapter.