

INTEGRATIVE ACTIVITIES (IA)

\$295,930,000
+\$20,890,000 / 7.6%

IA Funding

(Dollars in Millions)

	FY 2009	FY 2009	FY 2010	FY 2010 Estimate	FY 2011 Request	Change Over		
	Omnibus	ARRA	ARRA			FY 2010	FY 2010 Estimate	Percent
	Actual	Actual	Estimate ¹			Estimate	Amount	
Total, IA	\$241.58	\$129.85	\$420.15	\$275.04	\$295.93	\$20.89	7.6%	
EPSCoR	133.00	30.00	20.00	147.12	154.36	7.24	4.9%	
Science and Technology Centers	1.26	-	-	13.40	26.30	12.90	96.3%	
Major Research Instrumentation	99.98	99.85	200.15	90.00	90.00	-	-	
Academic Research Infrastructure	-	-	200.00	-	-	-	N/A	
Communicating Science Broadly	4.30	-	-	4.00	4.00	-	-	
Graduate Research Fellowships	-	-	-	17.48	17.83	0.35	2.0%	
Science and Technology Policy Institute	3.04	-	-	3.04	3.04	-	-	
STAR METRICS	-	-	-	-	0.40	0.40	N/A	

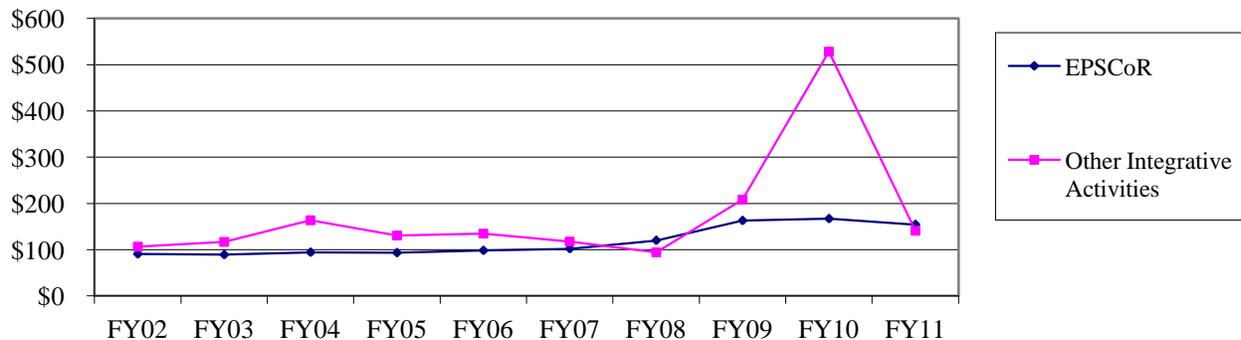
Totals may not add due to rounding.

¹ Within IA, NSF carried forward \$420.15 million from the ARRA appropriation because solicitations occurred late in FY 2009. Awards will be made in FY 2010.

IA supports emerging, cross-disciplinary, and potentially transformative research and education, recognizing the importance of integrative efforts to the future of science and engineering. IA is a source of federal funding for the acquisition and development of research instrumentation at U.S. academic institutions and for strengthening the research and educational infrastructure throughout the Nation. Additionally, IA invests in a number of integrative research and education centers and programs that enhance NSF research investments in discovery and workforce development. Support for communications programs synthesize for the general public NSF's contributions in science and engineering, and research and education.

IA Subactivity Funding

(Dollars in Millions)



IA in Context

IA programs are cross-disciplinary research and education activities, and initiatives that enhance scientific discovery, invest in research infrastructure, and strengthen the Nation's technically trained workforce. Moreover, the increasing complexity of today's challenges requires solutions that span traditional scientific and engineering disciplines. For example, NSF's investments in the Science and Technology Centers (STCs) create vital platforms to support interdisciplinary exchange and discovery. The STC

Integrative Partnerships program (STC) — which currently funds 17 centers nationwide — supports innovative, potentially transformative, and complex research and education projects that require large-scale, long-term efforts. STCs engage the Nation’s intellectual talent through partnerships between academia and other sectors including industry, national laboratories, and government. These collaborations create synergies that enhance innovation and the timely transfer of knowledge and technology from the laboratory to industry and policymakers; they support the training of the next generation of scientists, engineers and educators; and they foster the launch of spin-off companies and the creation of job opportunities. According to a National Academies’ assessment, *An Assessment of the National Science Foundation’s Science and Technology Centers Program*, STCs have outstanding records of research achievement as well as effective partnerships with the K-12 and informal education communities.

The Major Research Instrumentation (MRI) program is a Foundation-wide, crosscutting program that strengthens the U.S. scientific enterprise by investing in state-of-the-art research instrumentation at our Nation’s institutions of higher education, research museums, and non-profit research organizations. Scientific advances in many fields are critically dependent on sophisticated instrumentation. The MRI program promotes the acquisition and development of instrumentation for shared use. The MRI program invests in the development of a diverse workforce and the next generation of instrumentation. The program facilitates academic/private sector partnerships that create new products with wide scientific and commercial impact. MRI funds impact a broad spectrum of institutions nationwide; for example, MRI supports teaching-intensive and minority-serving institutions, including Historically Black Colleges and Universities, Hispanic-Serving Institutions, Tribal Colleges and Universities, and community colleges, with proposal success rates comparable to those for research-intensive universities.

A leading-edge communications effort may contribute to public acceptance and support of science and engineering. “Traditional media” – television networks, newspapers, and magazines – are giving way to internet news sites, web logs, personal-device downloads, wireless transmissions, and the like, competing among a population that has become highly pluralized not only in its requirements for information, but also in its cultural demographics. In today’s technological culture, opportunities for learning abound in both community and personal settings. The Office of Legislative and Public Affairs’ (OLPA) effort, “Communicating Science Broadly Through Multi-media Platforms,” creates products and processes that make learning and understanding science, technology, engineering, and mathematics part of everyday life. By concentrating its informative efforts toward students and young people on the value of science in their lives, OLPA seeks to increase diversity among the Nation’s future scientists, engineers, and researchers.

The Experimental Program to Stimulate Competitive Research (EPSCoR) provides strategic programs and opportunities to build the research capacity of states that have historically received lesser amounts of NSF R&D funding. These programs are designed to catalyze sustainable improvements in R&D capacity and competitiveness, and to advance science and engineering capabilities in EPSCoR jurisdictions for discovery, innovation, and discovery-based economic development.

NSF supports science and technology policy studies undertaken on behalf of the President’s Council of Advisors on Science and Technology (PCAST) and the Office of Science and Technology Policy (OSTP) by the Science and Technology Policy Institute (STPI). OSTP and agencies of the National Science and Technology Council (NSTC) have recently undertaken an effort to develop a data-driven analytical capability for assessing impacts of the investments of federal science and technology agencies through the Science and Technology in America’s Reinvestment – Measuring the Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) project. Resources are also provided to develop a research-oriented community and to communicate methods, models, and outcomes in conjunction with STAR METRICS.

This is part of a government-wide effort in 2011 to strengthen the quality and rigor of Federal program evaluation and provide new resources and approaches for evaluation and assessment. NSF will work with evaluation experts at the Office of Management and Budget and the Council of Economic Advisers during the planning, design, and implementation stages of the project. NSF is committed to promoting strong, independent evaluation that can inform policy and program management decisions, and it will make the status and findings of this and other important evaluation activities publicly available online.

IA Funding for Centers

IA Funding for Centers						
(Dollars in Millions)						
	FY 2009	FY 2009			Change Over	
	Omnibus	ARRA	FY 2010	FY 2011	FY 2010 Estimate	
	Actual	Actual	Estimate	Request	Amount	Percent
Centers	\$1.26	-	\$13.40	\$26.30	\$12.90	96.3%
<i>Science and Technology Centers</i>	1.26	-	13.40	26.30	12.90	96.3%

Detailed information on individual centers can be found in the NSF-Wide Investments chapter.

STCs advance discovery and innovation in science and engineering through the integration of cutting-edge research, excellence in education, targeted knowledge transfer, and the development of a diverse, globally competitive U.S. workforce. Partnering with academic institutions, national laboratories, and industrial organizations, STCs support potentially transformative, complex research and education projects that require large-scale, long-term investment.

Centers

- A \$12.90 million increase in STC funding will support full funding for five new STCs that were funded at the 50 percent level in FY 2010 during their start-up phase;
- For the six STCs established in FY 2002, FY 2011 represents the tenth and final year of NSF support.

IA Administration Priority Programs and NSF Investments

IA Administration Priority Programs and NSF Investments						
(Dollars in Millions)						
	FY 2009	FY 2009			Change Over	
	Omnibus	ARRA	FY 2010	FY 2011	FY 2010 Estimate	
	Actual	Actual	Estimate	Request	Amount	Percent
Graduate Research Fellowships (GRF)	-	-	\$17.48	\$17.83	\$0.35	2.0%
Science, Engineering, and Education for Sustainability (SEES)	N/A	N/A	26.50	26.50	-	-

IA's FY 2011 budget will invest in key NSF programs that support students, early-career researchers, and the next generation of environmentally engaged scientists and engineers. Specific IA investments include:

- \$17.83 million for the Graduate Research Fellowship program in FY 2011; and

- \$26.50 million in FY 2011, utilizing EPSCoR programs, for the NSF-wide Science, Engineering, and Education for Sustainability (SEES) portfolio to integrate efforts in climate and energy science and engineering.

For more information on Administration priority programs and NSF investments, please refer to the Overview and NSF-wide Investments sections.

Program Evaluation and Performance Improvement

The Performance Information chapter provides details regarding the periodic reviews of programs and portfolios of programs by external Committees of Visitors and directorate/office Advisory Committees. Please see this chapter for additional information.

A number of program evaluation and performance improvement activities are underway or planned for in FY 2010 and FY 2011.

- Activities to evaluate the STC program will continue and be augmented. A review of the STC program, organized by the American Association of the Advancement of Science, initiated in FY 2009, will be concluded in early FY 2011. The review will assess outcomes and major impacts of the program since FY 2000 and provide guidance to NSF on future directions. In FY 2010, an STC education directors workshop was held at which participants shared evaluation resources and exchanged information on how to strengthen the contributions of STCs to K-16 science education. In addition, a Committee of Visitors (COV) for the STC program will be convened in FY 2011 to assess the quality and integrity of program execution.
- OIA will convene a Committee of Visitors for MRI in FY 2010 to assess the quality and integrity of program execution. The 2005 MRI COV report found that the MRI program supports “extremely high-risk projects that present important opportunities to explore new scientific ideas.” The FY 2010 COV will also review how results from MRI-funded activities advance NSF’s mission and strategic goals. In FY 2010, OIA plans to initiate an assessment of the accumulative impact of MRI investments on science and engineering across the full range of NSF-supported disciplines. OIA also plans to conduct site visits to selected institutions as part of OIA’s post-award management of awards funded through the American Recovery and Reinvestment Act of 2009 (ARRA).
- Oversight and reviews of awards for the Academic Research Infrastructure competition (a one-time initiative called for in ARRA) will be undertaken in FY 2011 to ensure that NSF and ARRA-specific post-award requirements are met.
- EPSCoR will identify and charge an independent, external organization with conducting an evaluation of the NSF EPSCoR program. This evaluation will focus on progress in research competitiveness, infrastructure development, broadened participation in science and engineering, and STEM workforce development within EPSCoR jurisdictions. Eligibility criteria for participation in NSF EPSCoR programs will be examined to identify changes that would enhance the effectiveness of the NSF EPSCoR investment toward strengthening research and education in science and engineering throughout the United States.

**EXPERIMENTAL PROGRAM TO STIMULATE
COMPETITIVE RESEARCH (EPSCoR)**

**\$154,360,000
+\$7,240,000 / 4.9%**

EPSCoR Funding
(Dollars in Millions)

	FY 2009	FY 2009	FY 2010	FY 2010	FY 2011	Change Over	
	Omnibus	ARRA	ARRA			FY 2010	FY 2010
	Actual	Actual	Estimate ¹	Estimate	Request	Amount	Percent
EPSCoR	\$133.00	\$30.00	\$20.00	\$147.12	\$154.36	\$7.24	4.9%
Co-Funding	41.14	-	-	31.18	41.00	9.82	31.5%
Outreach	0.54	-	-	1.50	1.50	-	-
Research Infrastructure Improvement (RII)	91.31	30.00	20.00	114.44	111.86	-2.58	-2.3%

Totals may not add due to rounding.

¹ Within EPSCoR, NSF carried forward \$20.0 million from the ARRA appropriation because solicitations occurred late in FY 2009. Awards will be made during FY 2010.

EPSCoR utilizes three major investment strategies to achieve its goal of improving the R&D competitiveness of researchers and institutions within EPSCoR jurisdictions. These strategies are:

- **Research Infrastructure Improvement (RII):**

RII Track-1 awards provide up to \$4.0 million per year for up to five years. They are designed to improve the research competitiveness of jurisdictions by strengthening their academic research infrastructure in areas of science and engineering supported by the National Science Foundation and critical to the particular jurisdiction’s science and technology initiative or plan. These scientific and engineering areas are identified by the jurisdiction’s EPSCoR governing committee as having the best potential to improve the jurisdiction’s future R&D competitiveness.

RII Track-2 awards provide up to \$2.0 million per year for up to three years as collaborative awards to consortia of EPSCoR jurisdictions to support innovation-enabling cyberinfrastructure of regional, thematic, or technological importance. These awards facilitate the enhancement of discovery, learning, and economic development of EPSCoR jurisdictions through the use of cyberinfrastructure and other technologies.

- **Co-Funding of Disciplinary and Multidisciplinary Research:**

EPSCoR co-invests with NSF directorates and offices in the support of meritorious proposals from individual investigators, groups, and centers in EPSCoR jurisdictions that are submitted to the Foundation’s research and education programs, and crosscutting initiatives. These proposals are merit reviewed in NSF disciplinary programs and recommended for award, but cannot be funded without the combined, leveraged support of EPSCoR.

- **Outreach and Workshops:**

The EPSCoR Office solicits requests for support of workshops, conferences, and other community-based activities designed to explore opportunities in emerging areas of science and engineering, and to share best practices in strategic planning, diversity, communication, cyberinfrastructure, evaluation, and other capacity-building areas of importance to EPSCoR jurisdictions.

In general, 65 percent of the EPSCoR portfolio is available for new research awards. The remaining 35 percent funds continuing awards made in prior years.

Factors Influencing the Allocation Across EPSCoR

The allocation across EPSCoR program activities reflects the relative reach and impact of these investment strategies that are designed to catalyze sustainable growth in research competitiveness across EPSCoR jurisdictions. The FY 2011 decrease to RII and increase in Co-funding activities relative to the FY 2010 funding level reflects a rebalancing of the EPSCoR portfolio following full implementation of RII Track-2 and the ARRA-supported RII Intercampus and Intracampus Cyber Connectivity programs in FY 2009 and FY 2010. The FY 2011 Request level of \$154.36 million for EPSCoR is consistent with the three-year growth trend for the R&RA account for FY 2009 through FY 2011.

- RII awards support complex, multifaceted, statewide activities that develop the human, physical, and cyberinfrastructure essential to building the capacity of institutions and investigators to compete more effectively for NSF research funding. These awards broaden participation in STEM activities by institutions and individuals, foster collaborative partnerships, and promote development of a technically engaged workforce.
- Co-funding facilitates broader integration of EPSCoR scientists and engineers in the entire spectrum of Foundation research and education programs and initiatives. This strategy is implemented with particular attention to proposed research projects that develop human and physical infrastructure.
- Outreach travel to EPSCoR jurisdictions enables NSF staff from all directorates and offices to work with the EPSCoR research community regarding NSF opportunities, priorities, programs, and policies. Such travel also serves to more fully acquaint NSF staff with the science and engineering accomplishments, ongoing activities, and new directions and opportunities in research and education in EPSCoR jurisdictions.

Number of People Involved in EPSCoR Activities

	FY 2009		FY 2010		FY 2011
	FY 2009 Estimate	ARRA Estimate	FY 2010 Estimate	ARRA Estimate	
Senior Researchers	482	53	533	90	558
Other Professionals	222	83	246	25	256
Postdoctorates	72	-	80	10	84
Graduate Students	514	34	569	60	596
Undergraduate Students	442	3	489	60	512
K-12 Students ¹	-	-	-	-	600
K-12 Teachers ¹	-	-	-	-	1,829
Total Number of People	1,732	173	1,917	245	4,435

¹ Beginning in FY 2011, EPSCoR will begin reporting the number of K-12 students and teachers supported.