CHAPTER I: MANAGEMENT'S DISCUSSION AND ANALYSIS

AGENCY OVERVIEW

Mission and Vision

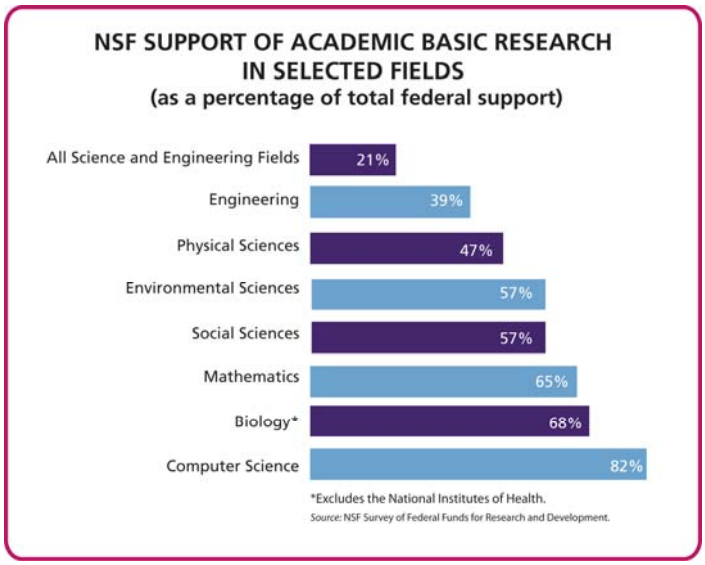
The National Science Foundation (NSF) was established in 1950 *"to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense."*[1] NSF funds the best ideas and most promising people—searching the frontiers of science and engineering to support cutting-edge research and the most promising approaches in education and learning. The Foundation seeks to support high-risk, potentially transformative research that will generate important discoveries, new technologies, and a dynamic workforce. To enable researchers and students to work at the forefront of research, NSF also funds advanced instrumentation and facilities. This catalytic role is reflected in the vision statement from NSF's Strategic Plan for FY 2006-2011: *Advancing discovery, innovation, and education beyond the frontiers of current knowledge and empowering future generations in science and engineering*.[2]

Investing in the Future

NSF is the only federal agency dedicated to the support of basic research across all fields of science and engineering and all levels of science and engineering education.

- NSF's annual budget represents 21 percent of the total federal budget for basic research conducted at America's colleges and universities.[3]
- In many fields, including computer science, mathematics, nonmedical biology, environmental sciences, and the social sciences, NSF is the principal source of federal academic support (*Figure 1*).
- Nearly 90 percent of NSF funding is allocated through a merit-based, competitive process. Each year, 46,000 members of the science and engineering community participate in the merit review process as panelists and proposal reviewers.[4]

Figure 1.



How NSF's Investments in Basic Research and Education Benefit Society

Investments in science and technology foster economic growth, create high tech, high wage jobs that allow U.S. workers to lead the global economy, improve the quality of life for all Americans, and

[1] The National Science Foundation Act of 1950 (Public Law 81-507).

[2] NSF's Strategic Plan for FY 2006-2011 is available at www.nsf.gov/about/performance/strategic_plan.jsp.

[3] Based on FY 2007 data from the NSF's Division of Science Resources Statistics, Survey of Federal Funds for Research and Development.

[4] For more information about NSF's merit review process, see *Report to National Science Board on the NSF's Merit Review Process, FY 2008* at www.nsf.gov/nsb/publications/landing/nsb0943.jsp

strengthen our national security.[5] NSF's investments produce both tangible and intangible benefits that keep the United States at the forefront of science and engineering *(Figure 2).*

New Knowledge: NSF's support for basic research is at the core of its mission of advancing the frontier of science and engineering. The quality of these investments is reflected in the fact that, since its inception in 1950, NSF has supported 187 Nobel laureates for their seminal work.[6] This broad and long-standing commitment sustains the nation's ability to generate and harness advances in science and technology.

World Class Facilities: State-of-the-art facilities provide unique capabilities at the cutting edge of science and engineering that expand the boundaries of technology and offer significant new research opportunities, often in totally new directions. NSF's polar research facilities, for example, provide access to the Earth's most extreme environments and advance discovery in fields as diverse as climate change, astronomy, geology, and biology.

New Tools, Methods, and Processes: The basic research supported by NSF is a proving ground for tools, methods, and processes that drive discovery and technology development. For example, fundamental work supported by NSF to create libraries of chemical compounds has since become a staple for drug design in the pharmaceutical industry.[7]

Insight into National and Global Challenges: The fundamental knowledge generated by NSF's investments has time and again proved vital in addressing national and global challenges. NSF-supported work on ocean/atmosphere dynamics, for example, has led to more accurate and useful predictions of the weather cycles known as El Niño and La Niña.[8]

Figure 2.
Examples of NSF Investments

New Knowledge	• Quantum computing • Nanotechnology • Computer visualization techniques • Metagenomics • Science of science and innovation policy • Plant genome mapping
World Class Facilities	• National Center for Atmospheric Research • U.S. South Pole Station • Alaska Region Research Vessel
New Tools, Methods, and Processes	• The TeraGrid allows researchers from all fields of science and engineering to apply high-performance computing power to their studies. • The new detailed satellite map of Antarctica, a fundamental tool for scientists in every discipline from biology to geology to glaciology, helps to answer scientific questions and plan field work in the vast unexplored tracts of Antarctica.
Insight into National and Global Challenges	• Green gasoline • Climate change • Environmental protection • Cybersecurity • Sustainable energy • Homeland security
A Highly Trained Workforce	NSF has supported: • 42,000 graduate research fellows since 1952 • 5,200 Ph.D. students have received integrative graduate education and research training since 1998 • 344,000 undergraduate and secondary-school students have received advanced technological education since 1994
Resources for Teachers and Students	• National Science Digital Library, an online digital library of resources for K–12 educators • Fun Works, a website for young people to explore career opportunities in science, technology, engineering, and mathematics • CYBERCHASE, an Emmy award-winning, groundbreaking multi-platform program for children in grades 3–on PBS KIDS GO! for grades 3–5 • MSPnet, an electronic learning community for the Math and Science Partnership Program

[5] See *A New Era of Responsibility - Renewing America's Promise*, at www.whitehouse.gov/omb/assets/fy2010_new_era/a_new_era_of_responsibility2.pdf, page 105.
[6] See www.nsf.gov/news/news_summ.jsp?cntn_id=100683 for a list of NSF-funded Nobel laureates.
[7] See *America's Investment in the Future* and *Nifty 50* at www.nsf.gov/about/history/history-publications.jsp.
[8] See footnote 7.

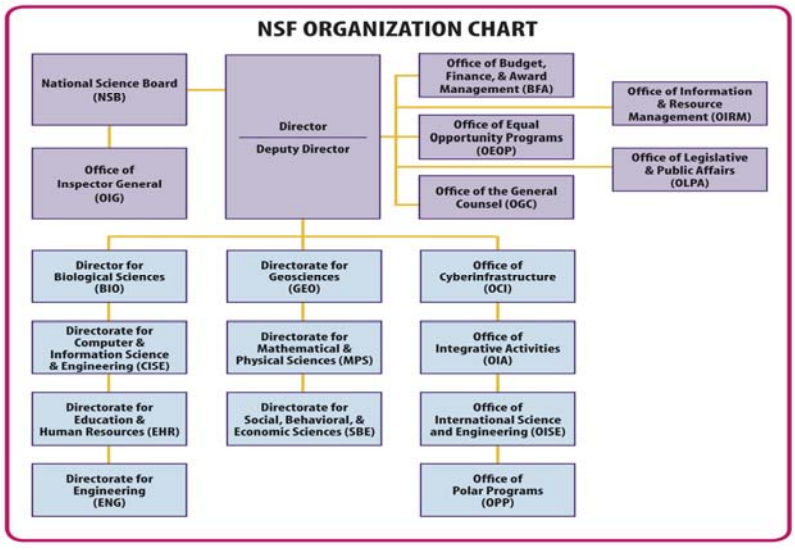
A Highly Trained Workforce: By supporting science, technology, engineering, and mathematics (STEM) education at all levels, NSF is working to build a highly trained future workforce that will help the United States maintain its world-class status in science and engineering. NSF directly supports the advanced education and research of over 60,000 graduate students and postdoctoral associates in science and engineering.

Resources for Teachers and Students: NSF supports approaches to teaching science, mathematics, and engineering. As an example, the NSF-supported Math and Science Partnership (MSP) Knowledge Management and Dissemination website (http://mspkmd.net) integrates findings from the MSP program into the larger knowledge base. The MSP Knowledge Management and Dissemination Project has primary responsibility for synthesizing findings in the K–12 arena in several areas, articulating the contribution of the MSP program to the knowledge base and identifying gaps, promising practices, and strategies for further investigation. Through this website, MSPs and the field at large can benefit from MSPs' research and development efforts.

Organizational Structure

NSF is an independent federal agency headed by a director (www.nsf.gov/od) appointed by the President and confirmed by the U.S. Senate. A 24-member National Science Board (NSB) meets five times a year to establish the overall policies of the Foundation (www.nsf.gov/nsb). NSB members—prominent contributors to the science and engineering research and education community—are also appointed by the President with the consent of the Senate. The NSF director is a member *ex officio* of the Board. Both the director and NSB members serve 6-year terms. The NSF workforce includes nearly 1,400 permanent staff.[9] NSF also regularly recruits visiting scientists, engineers, and educators as rotators who work at NSF for up to four years. The blend of rotators who infuse new talent and expertise into the agency and permanent staff is integral to NSF's mission of supporting the entire spectrum of science and engineering research and education at the frontier.[10] As shown in *Figure 3*, NSF's organizational structure aligns with the major fields of science and engineering (www.nsf.gov/staff/orgchart.jsp). In addition to the agency's headquarters located in Arlington, Virginia, NSF maintains offices in Paris, Tokyo, and Beijing to facilitate its international activities and an office in Christchurch, New Zealand, to support the U.S. Antarctic Program.

Figure 3.



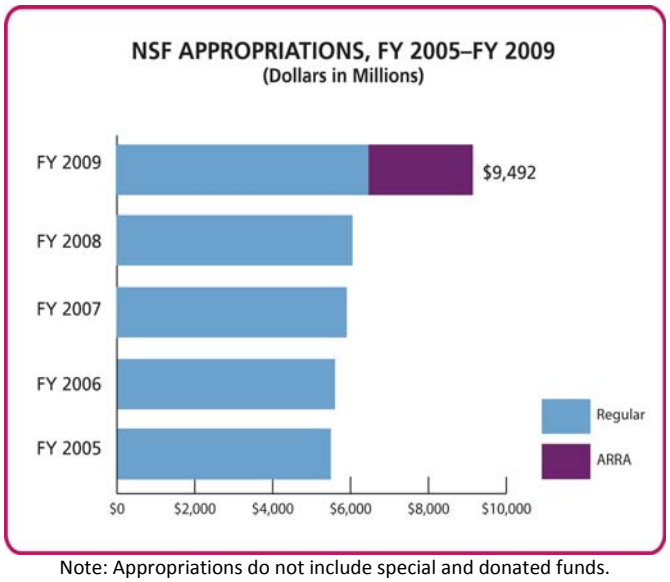
[9] Full-time equivalents.

[10] As of September 2009, temporary appointments included 164 under the Intergovernmental Personnel Act.

American Recovery and Reinvestment Act of 2009

NSF received $3.0 billion under the American Recovery and Reinvestment Act of 2009 (ARRA or Recovery Act). The legislation was enacted in February 2009 to stimulate and stabilize the economy. The Recovery Act included long-term investments intended "to increase economic efficiency by spurring technological advances in science and health,"[11] to generate new discoveries and breakthroughs. During the signing ceremony on February 17, 2009, President Obama noted, "I hope this investment will ignite our imagination once more, spurring new discoveries and breakthroughs in science, in medicine, in energy, to make our economy stronger and our nation more secure and our planet safer for our children."[12]

Figure 4.



Note: Appropriations do not include special and donated funds.

The $3.0 billion provided through the Recovery Act was in addition to NSF's FY 2009 appropriation of $6.5 billion (*Figure 4*). In keeping with the Administration's goals, NSF's Recovery Act spending plan:

- Creates and sustains research jobs through new awards, graduate research fellows, and early-career researchers.
- Encourages high-risk transformative research that has the potential to drive the nation's future economic growth.
- Meets facilities and infrastructure needs, including deferred maintenance.
- Strengthens the nation's overall cyberinfrastructure and enhances institutional broadband access connectivity.

As shown in *Figure 5*, two-thirds of NSF's Recovery Act funds ($2.0 billion) were allocated for core research, facilities, and infrastructure investments. The Recovery Act also specified funding levels for

[11] The American Recovery and Reinvestment Act of 2009 is available at www.gpo.gov/fdsys/pkg/PLAW-111publ5/content-detail.html.

[12] President Obama's remarks are available at www.whitehouse.gov/the_press_office/Remarks-by-the-President-and-Vice-President-at-Signing-of-the-American-Recovery-an/.

certain activities: the Major Research Instrumentation program, $300 million; the Academic Research Infrastructure (ARI) program, $200 million; and three programs in the Directorate for Education and Human Resources—Noyce Scholarships, Math and Science Partnerships, and a new Science Masters' Program—received a total of $100 million. A total of $400 million was provided for the Major Research Equipment and Facilities Construction account, which has funded three projects: the Alaska Region Research Vessel, the Advanced Technology Solar Telescope, and the Ocean Observatories Initiative.

Figure 5.

NSF Spending Plan for the American Recovery and Reinvestment Act of 2009

(dollars in millions)

Program/Activity	Funds Received	Funds Obligated *(as of 9/30/09)*	Number of Awards *(as of 9/30/09)*
Research & Related Activities (R&RA) ▪ Core Research, Facilities, and Infrastructure Investments ($2,000 million) ▪ Major Research Instrumentation ($300 million) ▪ Academic Research Infrastructure ($200 million)	$2,500	$2,063 *(83%)*	4,599
Education & Human Resources (EHR) ▪ Robert Noyce Scholarship Program ($60 million) ▪ Math and Science Partnership Program ($25 million) ▪ Science Masters' Program ($15 million)	$100	$85 *(85%)*	76
Major Research Equipment and Facilities Construction Program ▪ Alaska Region Research Vessel ($148 million) ▪ Advanced Technology Solar Telescope ($146 million) ▪ Ocean Observatories Initiative ($106 million)	$400	$254*(64%)*	2
Office of Inspector General	$2	$0.02 *(<1%)*	N/A
TOTAL	**$3,002**	**$2,402** *(80%)*	**4,677**

In FY 2009, NSF obligated $2.4 billion (80 percent) of its total ARRA funding, supporting 4,677 awards. ARRA enabled the funding of more than 300 proposals that had been declined earlier in the year due to budgetary constraints even though they were rated very good to excellent. *Figure 6* shows the goals and results of the Recovery Act Research and Related Activities (R&RA) program: 4,599 awards supporting 6,762 investigators in all 50 states and Puerto Rico. More than one-third (2,352) were new investigators or co-investigators. Funding new, young investigators is critical for developing our science and technology workforce and is an important goal of NSF's Recovery Act program. For more information about NSF's ARRA program activities see www.nsf.gov/recovery/ and www.Recovery.gov.

Figure 6.

NSF FY 2009 Recovery Act Performance Goals and Results for Research and Related Activities

Goals	Target	Achieved *(as of 9/30/09)*
Number of competitive R&RA awards	4,000	4,599
Number of competitive R&RA awards for Major Research Instrumentation and Academic Research Infrastructure	500	TBD in FY 2010
Number of investigators supported on competitive R&RA awards	6,400	6,762
Number of new investigators or co-investigators on competitive R&RA awards	2,400	2,352

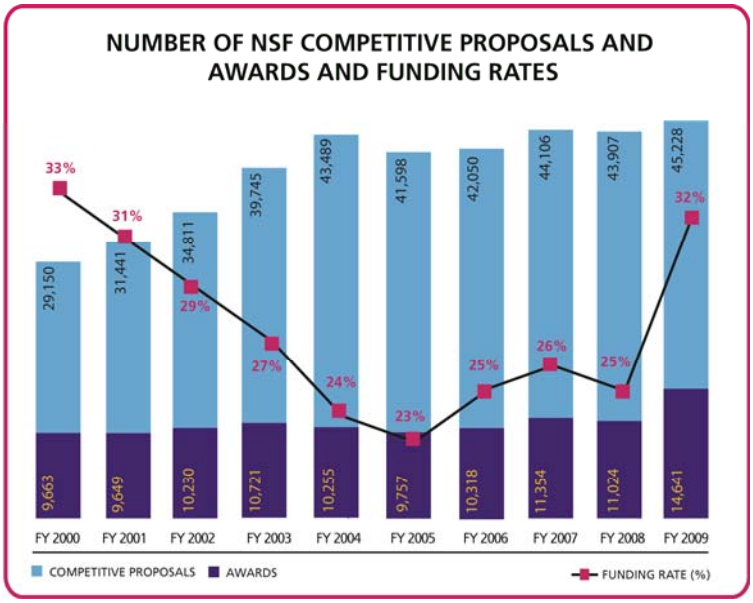
Notes:

TBD: To be determined. Performance targets and results for the ARRA Education and Human Resources program and the Major Research Equipment and Facilities Construction Program will be reported in the FY 2009 Annual Performance Report, which will be included in NSF's FY 2011 Budget Request to Congress.

FY 2009 Highlights

- NSF evaluated 45,228 proposals and made 14,641 new awards, of which 4,677 were funded by the Recovery Act (*Figure 7*).
- The Recovery Act boosted NSF's FY 2009 funding rate to 32 percent, the highest since FY 2000.
- Nearly 239,000 proposal reviews were conducted, involving almost 46,000 external reviewers.
- NSF awards were made to 1,967 colleges, universities, and other public and private institutions in 50 states and Puerto Rico.
- FY 2009 awards directly involved an estimated 241,000 people, including researchers, teachers, and students from kindergarten through graduate school.

Figure 7.

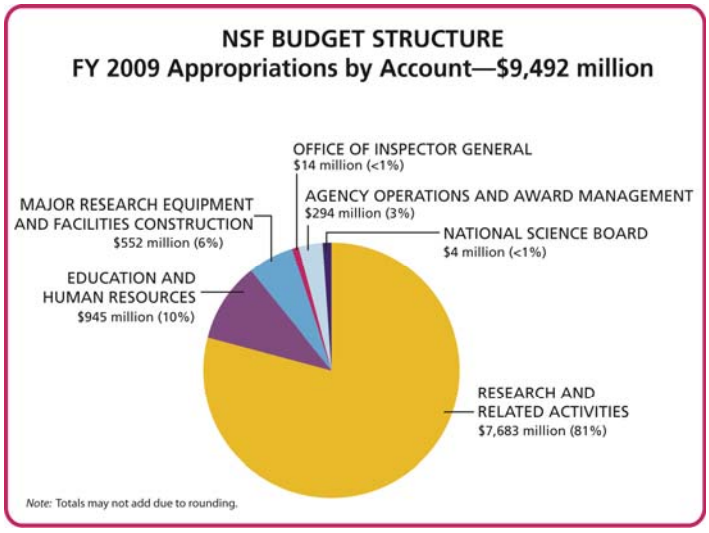


Investment Portfolio

NSF is funded primarily through six congressional appropriations (*Figure 8)*.

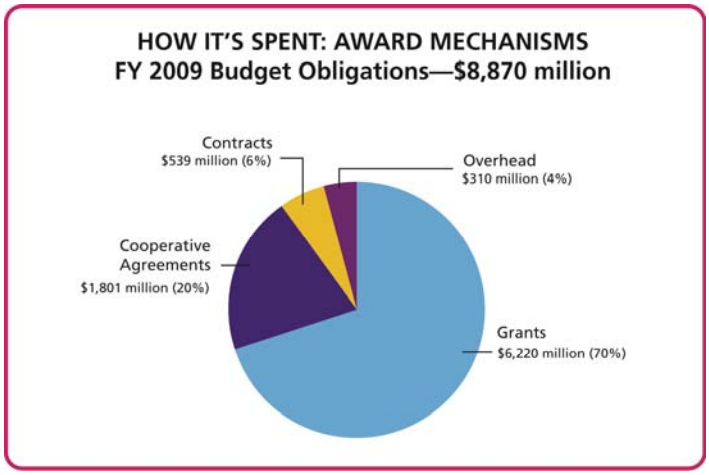
- NSF's largest appropriation is the Research and Related Activities Appropriation which accounted for 81 percent of the agency's FY 2009 funding. This account supports basic research and education activities at the frontiers of science and engineering including high-risk and transformative research.
- The Education and Human Resources appropriation supports activities that ensure a diverse, competitive, and globally engaged U.S. science, technology, engineering, and mathematics workforce and a scientifically literate citizenry.
- The Major Research Equipment and Facilities Construction appropriation supports the construction of unique national research platforms and major research equipment that enable cutting-edge research.
- The Agency Operations and Award Management appropriation supports NSF's administrative and management activities.
- Funding for the operation of the Office of Inspector General and for the National Science Board is each provided in separate appropriations.

Figure 8.



Note: Appropriations do not include special and donated funds.

Figure 9.

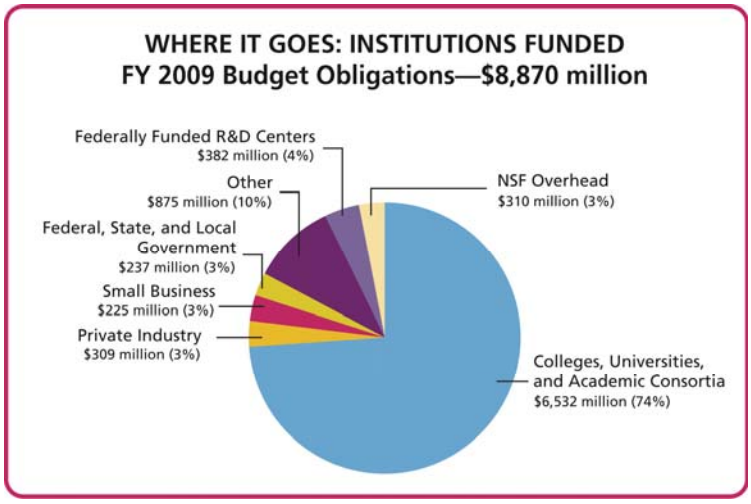


Ninety percent of NSF's FY 2009 projects were funded by grants or cooperative agreements (*Figure 9*).[13] Grants can be funded either as standard awards in which funding for the full duration of the project is provided in a single fiscal year, or as continuing awards, in which funding for a multi-year project is provided in increments. Cooperative agreements are used when the project requires substantial agency involvement during the project performance period (e.g., research centers, multi-use facilities, etc.)

[13] In Figure 9, FY 2009 obligations include regular ($6.5 billion) and Recovery Act funding ($2.4 billion). Total base and Recovery Act obligations of $8.9 billion plus Trust Funds ($56.8 million) and H1-B Nonimmigrant Petitioner Receipts ($89.1 million) equal Direct Obligations Incurred as shown on the Statement of Budgetary Resources ($9.0 billion).

Contracts are used to acquire projects, services, and studies (e.g., program evaluations) required primarily for NSF or other government use.

Figure 10.



Most NSF awards are to academic institutions *(Figure 10)*. Other recipients include nonprofit organizations such as other federal agencies, state and local governments, and international organizations. Awards are also provided to Federally Funded R&D Centers (FFRDCs). For-profit business recipients include private and small businesses.

Meeting Future Opportunities and Challenges

NSF continually strives to be a dynamic and agile organization that employs a range of programmatic and organizational mechanisms and strategies to fulfill its mission and goals. In FY 2010, NSF will focus efforts on developing a new strategic plan, to cover the period from FY 2010 through FY 2015. Associated with this will be efforts to improve performance assessment at NSF. The Advisory Committee for Government Performance Results Act (GPRA) Performance Assessment, for example, recommended that NSF "consider an assessment framework that uses multiple measures and methods, applied over various time scales…."

These and other management issues remain high priorities that are important to the agency's operational efficiency and effectiveness. The Office of Inspector General's (OIG's) statement of management challenges for FY 2009 covered five broad areas: Award and contract administration; human capital; budget, cost and performance integration; the U.S. Antarctic Program; and merit review. Many are fundamental issues that the agency is addressing on a continuing basis.

Figure 11 summarizes several key management challenges and some of the significant agency actions taken in the past year and anticipated actions to be taken in the near term. Appendix 3A provides the OIG's statement of management challenges for FY 2010 and Appendix 3B contains the Director's response, which includes a report of the significant actions taken in the past year by management with respect to each of the OIG's FY 2009 management challenges.

Figure 11.

Office of Inspector General (OIG) FY 2009 Management Challenges[14]

OIG's FY 2009 Management Challenge	Significant Actions Taken by NSF in FY 2009	NSF's Anticipated Next Steps
Post-Award Administration Policies	Assessed business performance of 30% of awardees managing 94% of NSF funds through advanced monitoring (30 site visits, 159 desk reviews) under the Award Monitoring and Business Assistance Program. Issued an updated *Proposal & Award Policies & Policies Guide* that incorporated revisions related to America COMPETES Act (ACA); updated *NSF Proposal and Award Manual.* Initiated planning for public-facing project report on outcomes of NSF-funded awards (per ACA), highlighting project results and other award products. Developed Division Director concur functionality in e-Jacket. Provided support to NSB report on cost sharing policies. Implemented information technology system hard edit to prohibit award close-out without grantee final cost share certification and Program Officer acceptance. Held effective practices forum meetings for NSF Centers programs to share management and other practices.	Work with the Recovery Act Steering Committee on updating Recovery Act policies and procedures document. Update proposal and award manuals to reflect changes in policies and procedures. Modify NSF Grant Conditions to require Principal Investigators (PIs) to submit a new type of final report on project outcomes. Modify *Research.gov* website to include the capability for PIs to report on end-of-project outcomes. Implement beta Division Director concur functionality in e-Jacket. Create automatic notification to awardees for final cost share certification.
Workforce Planning	Completed staffing plans for FYs 2009 –2010. Created administrative functions management (AFM) position summary and competency profiles; created learning maps within the Academy Learn system for all five AFM jobs. Evaluated existing workforce planning systems and identified systems requirements. Updated workload analysis model forecast for FYs 2009–2011. Piloted a new executive transition website. Piloted a knowledge management portal. Develop content for a comprehensive program management curriculum. Developed a list of e-business courses for NSF Program Officers on review analysis and finding reviewers. Achieved a 4.7%–10.5% improvement in workforce planning, performance management, recruitment of permanent, executive and rotator staff, and organizational development activities as indicated by the annual customer satisfaction survey.	Further efforts in the areas of staffing, management succession, and the use of rotators, which will be guided by the results of an upcoming comprehensive analysis these human capital issues. Develop content for the *New Executive Transition* website. Continue vetting e-business courses. Explore other alternatives for knowledge management retention for departing and replacing executives based on feedback from pilot. Roll out new briefing for all new employees about working at NSF and for federal government.
Broadening Participation in the Merit Review System	Finalized and published the Framework for Action, incorporating Advisory Committee comments. Established internal and external web pages for Broadening Participation. Published and updated Broadening Participation portfolio. Held workshop for tribal colleges and universities and other grants workshops for diverse institutions. Refined plan for Reviewer Services, integrating with other *Research.gov* services to broadening participation. Began implicit bias training module for NSF Program Officers.	Pilot the Reviewer Services module. Pilot implicit bias training and make it available for all Program Officers. Distribute OMB-approved reviewer questionnaire and measure merit review participation results.

[14] For a discussion of all the OIG FY 2009 management challenges and a more detailed list of the significant actions taken by the agency, see Appendixes 3A and 3B.

PERFORMANCE HIGHLIGHTS

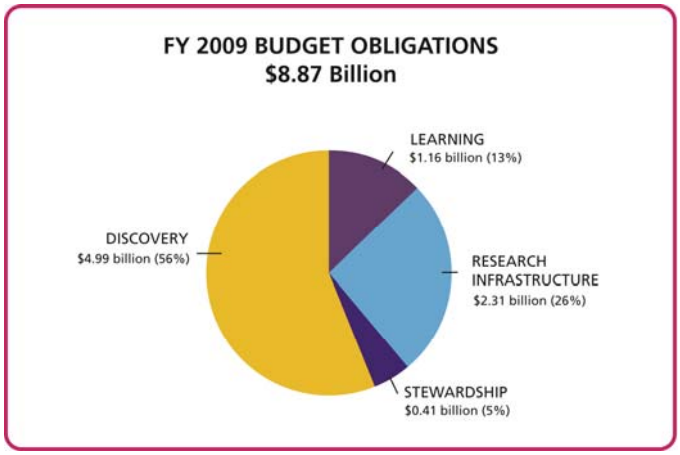
NSF's Strategic Plan for FY 2006–2011 (www.nsf.gov/pubs/2006/nsf0648/nsf0648.jsp) established four long-term strategic outcome goals for the agency's activities and performance: *Discovery*, *Learning*, *Research Infrastructure*, and *Stewardship*. The first three goals focus on NSF's long-term investments in science and engineering research and education. The fourth goal—*Stewardship*—is internally focused and emphasizes improving the effectiveness and efficiency of the agency's management practices. NSF's progress toward achieving its annual performance goals is determined using a combination of internal and external assessments including qualitative reviews and quantitative metrics.

In FY 2009, NSF updated its performance assessment framework, which will be refined and finalized as NSF revises its strategic plan in FY 2010. NSF's FY 2009 Annual Performance Report (APR) will include a detailed discussion of the new performance assessment framework and the results of each of the agency's FY 2009 GPRA performance goals; its assessment methodology; metrics; relevant external reviews; and additional performance information, such the verification and validation of NSF's performance data. NSF's APR will be included in the agency's FY 2011 Budget Request to Congress, which will be transmitted on February 1, 2010.

FY 2009 Results

- *Figure 12* shows NSF's FY 2009 budget by strategic goal. More than half of NSF's budget supported the *Discovery* goal—to foster research that will expand the frontier of knowledge. The *Discovery*, *Learning*, and *Research Infrastructure* goals together accounted for 95 percent of NSF's FY 2009 investment portfolio.[15]
- NSF's *Stewardship* goal accounted for 5 percent of NSF's budget in FY 2009. The *Stewardship* goal addresses issues such as the merit review process, improving customer service, and broadening participation.

Figure 12.



- Since 2005, NSF has achieved all its annual strategic outcome goals and an average of 74 percent of its other annual GPRA goals *(Figure 13)*.

Figure 13.

NSF FY 2005-2009 Performance Scorecard

(number and percent of goals achieved)

Goals	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Strategic Outcome Goals	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)	3 of 3 (100%)
Other Annual Goals	14 of 17 (82%)	15 of 22 (68%)	14 of 20 (70%)	17 of 23 (74%)	TBD

[15] A notable facet of many NSF investments is that they serve multiple purposes. For example, research projects in programs categorized under the *Discovery* goal often provide funds that involve graduate students, thus they contribute to the *Learning* outcome. Such indirect investments are important to the attainment of NSF's mission.

Strategic Outcome Goal 1: Discovery

Foster research that will advance the frontiers of knowledge, emphasizing areas of greatest opportunity and potential benefit, and establishing the nation as a global leader in fundamental and transformational science and engineering by:

- Promoting transformational, multidisciplinary research.
- Investigating the human and social dimensions of new knowledge and technology.
- Furthering U.S. economic competitiveness through basic research that can lead to new, valuable, and marketable technologies.
- Fostering research that improves our ability for sustainable living on Earth.
- Advancing fundamental research in computational science and engineering, and in fundamental, applied, and interdisciplinary mathematics and statistics.

FY 2009 Assessment

- **Advisory Committee Review:** To evaluate research and education outcomes under *Discovery*, NSF convened an external expert group, the Advisory Committee for GPRA Performance Assessment (AC/GPA), to determine whether the agency has demonstrated significant achievement under this goal. The AC/GPA determined that NSF met this standard for *Discovery* in FY 2009.
- **Qualitative Performance Information:** Fifteen completed external evaluations have been conducted on NSF programs in FY 2009. Seven of these were directly relevant to *Discovery* programs. Scope, findings, recommendations, and follow-up on all evaluations will be in the FY 2009 APR.
- **NSF Committees of Visitors (COVs):** COVs evaluate approximately one-third of NSF's activities each year. Eighteen COVs were conducted on *Discovery* programs in FY 2009. COV reports and the program's responses are available on the NSF website after approval by the appropriate Advisory Committee.

Funding Trend

NSF Obligations for *Discovery,* FY 2005–2009					
	FY 2005	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**
$ in billions	$2.74	$2.83	$3.20	$3.29	$4.99
% of NSF budget	50%	50%	54%	54%	56%

Verification and Validation:

Validation of the AC/GPA process was completed by an independent external management consultant, IBM Global Business Services.[16]

For More Information :

See NSF's FY 2009 APR which will be included in NSF's FY 2011 Budget Request to Congress. The FY 2011 Budget Request will be available February 1, 2010, at www.nsf.gov/about/performance.

[16] The executive summary of the FY 2009 IBM Global Business Services *NSF Performance Measurement Verification and Validation Report* is available at www.nsf.gov/about/performance/FY2009_NSF_V_and_V_Report_Exec_Summary.pdf.

Strategic Outcome Goal 2: Learning

Cultivate a world-class, broadly inclusive science and engineering workforce and expand the scientific literacy of all citizens by:

- Building strong foundations and foster innovation to improve K–12 teaching, learning, and evaluation in science and mathematics.
- Advancing the fundamental knowledge base on learning, spanning a broad spectrum from humans to animals and machines.
- Developing methods to effectively bridge critical junctures in science, technology, engineering, and mathematics (STEM) education pathways.
- Preparing a diverse, globally engaged STEM workforce.
- Integrating research with education and building capacity.
- Engaging and informing the public in science and engineering through informal education.

FY 2009 Assessment

- **Advisory Committee Review:** To evaluate research and education outcomes under *Learning*, NSF convened an external expert group, the AC/GPA, to determine whether NSF has demonstrated significant achievement under this goal. The AC/GPA determined that NSF had met this standard for *Learning* in FY 2009.
- **External Evaluations:** Fifteen external evaluations have been conducted on NSF programs in FY 2009, of which seven were *Learning* programs. Scope, findings, recommendations, and follow-up on all evaluations will be in the FY 2009 APR.
- **NSF Committees of Visitors (COVs):** COVs evaluate approximately one-third of NSF's activities each year. Nine COVs were conducted on *Learning* programs in FY 2009. COV reports and the program's responses are available on the NSF website after approval by the appropriate Advisory Committee.

Funding Trend

NSF Obligations for *Learning,* FY 2005–2009					
	FY 2005	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**
$ in billions	$1.06	$1.04	$0.79	$0.85	$1.16
% of NSF budget	19%	18%	13%	14%	13%

Verification and Validation:

Validation of the AC/GPA process was completed by an independent external management consultant, IBM Global Business Services.[17]

For More Information :

See NSF's FY 2009 APR which will be included in NSF's FY 2011 Budget Request to Congress. The FY 2011 Budget Request will be available February 1, 2010, at www.nsf.gov/about/performance.

[17] See footnote 16.

Strategic Outcome Goal 3: Research Infrastructure

Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure, and experimental tools by:

- Filling the gaps in our ability to provide enabling research infrastructure.
- Identifying and supporting the next generation of large research facilities.
- Developing a comprehensive, integrated cyberinfrastructure to drive discovery in all fields of science and engineering.
- Strengthening the nation's collaborative advantage by developing unique networks and innovative partnerships.

FY 2009 Assessment

- **Advisory Committee Review:** To evaluate research and education outcomes under *Research Infrastructure,* NSF convened an external expert group, the AC/GPA, to determine whether NSF has demonstrated significant achievement under this goal. The AC/GPA determined that NSF met this standard for *Research Infrastructure* in FY 2009.
- **External Evaluations:** One external evaluation of a *Research Infrastructure* program was completed in FY 2009. Scope, findings, recommendations, and follow-up will be in the FY 2009 APR.
- **NSF Committees of Visitors (COVs):** COVs evaluate approximately one-third of NSF's activities each year. Four COVs were conducted on *Research Infrastructure* programs in FY 2009. COV reports and the program's responses are available on the NSF website after approval by the appropriate Advisory Committee.

Quantitative Assessments: Construction of Future Facilities

Earned Value Management is a project management technique used to monitor the progress of all types of construction projects. It uses two key metrics—cost variance and schedule variance—to track how close the project is to its planned cost and schedule. This information will be reported in the FY 2009 APR.

Funding Trend

NSF Obligations for *Research Infrastructure,* FY 2005-2009					
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
$ in billions	$1.40	$1.47	$1.58	$1.59	$2.31
% of NSF budget	26%	26%	27%	26%	26%

Verification and Validation

Validation of the AC/GPA process was completed by an independent external management consultant, IBM Global Business Services.[18]

For More Information:

See NSF's FY 2009 APR which will be included in NSF's FY 2011 Budget Request to Congress. The FY 2011 Budget Request will be available February 1, 2010, at www.nsf.gov/about/performance.

[18] See footnote 16.

Strategic Outcome Goal 4: Stewardship

Support excellence in science and engineering research and education through a capable and responsive organization.

Under *Stewardship*, eight performance areas focus on the agency's efficiency and effectiveness in its internal operations and management and in delivering essential services to its constituents in the science, engineering, and education community. The performance areas are:

- **Time-to-Decision:** Inform 70 percent of applicants of a decision within six months.
- **Merit Review:** Improve the transparency and quality of the merit review process.
- **Customer Service:** Improve customer service to the science, engineering, and education communities.
- **Broadening Participation:** Expand efforts to increase participation from underrepresented groups and diverse institutions throughout the United States in all NSF activities and programs.
- **Management of Large Facilities:** Ensure the efficient and effective management of the construction and operation of large facilities.
- **Post-Award Monitoring:** Fully implement NSF's program of post-award financial and administrative monitoring.
- **Strategic Information Technology (IT) Initiatives:** Provide new tools/capabilities (formerly e-Government).
- **IT Security:** Conduct a successful FISMA (Federal Information Security Management Act) IT Program Review.

FY 2009 Assessment

Results of the *Stewardship* performance goals will be included in NSF's FY 2009 annual performance report, which will be incorporated into NSF's FY 2011 Budget Request to Congress.

Funding Trend

NSF Obligations for *Stewardship,* FY 2005–2009

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
$ in billions	$0.28	$0.31	$0.32	$0.36	$0.41
% of NSF budget	5%	6%	5%	6%	5%

Verification and Validation

A verification and validation review was conducted by an independent external management consultant, IBM Global Business Services.[19]

For More Information

See NSF's FY 2009 APR which will be included in NSF's FY 2011 Budget Request to Congress. The FY 2011 Budget Request will be available February 1, 2010, at www.nsf.gov/about/performance.

[19] See footnote 16.

Results and Education Highlights

The following are some of the NSF-supported research results reported in FY 2009. Additional results can be found at www.nsf.gov/discoveries.

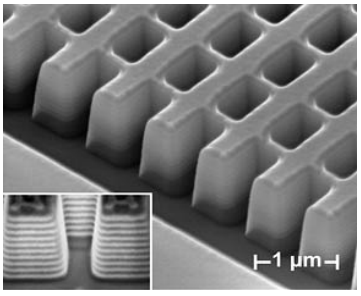
► The ***Elementary School Teachers*** project involves innovative, hands-on science education. Faculty members and lab personnel from the University of Oklahoma work as facilitators, encouraging elementary school teachers without prior knowledge of the field (biology of the fruit fly) to conduct their own research, raise questions, develop hypotheses, and test those hypotheses. The project, which involves a summer science camp for the teachers, has been expanded to include sixth graders, who get hands-on experience with brain research. These teachers and students develop an interest in scientific work through active engagement in the scientific process of discovery. The project provides a replicable approach for science education and university collaboration with pre-K–12 education. Through integration with the Experimental Program to Stimulate Competitive Research plan for Oklahoma, it demonstrates the potential for broader impacts to researchers across the state and can serve as a vehicle for broadening participation.

Left to right: Stephen Hinkle (Norman, Oklahoma, Independent School District) and John Tauber (University of Oklahoma undergraduate student) sort fruit flies under the microscope. *Credit: Bing Zhang*

Green gasoline sits above water in this flask. *Credit: Virent Energy Systems, Inc.*

► ***Green gasoline*** is a mixture of chemical compounds that is nearly identical to standard gasoline, yet it comes from biomass, not petroleum. Researchers around the world are working on different approaches to creating green gasoline. Approaches range from harnessing microbes to customizing catalysts (materials that speed up reactions without sacrificing themselves in the process). Each approach is being optimized to efficiently produce desired hydrocarbons. Scientists and engineers have made a number of recent breakthroughs, including the conversion of wood chips into high-octane fuel components and the conversion of sugar (potentially derived from plants) into gasoline, diesel, and jet fuel materials, and precursors for pharmaceuticals and plastics. In the flask at the left, the gasoline and water were produced in a process that converts a sugar-water mixture into hydrocarbons using specialized crystal catalysts called zeolites. The process was developed by Randy Cortright at Virent Energy Systems with support from NSF's Small Business Technology Transfer program.

► ***Metamaterials:*** When light waves travel from one medium to another, their speed and direction change in a phenomenon known as positive refraction. Thanks to scientists and engineers working with metamaterials, or materials that have been artificially engineered to have properties not normally found in nature, there are literally new directions for light to go. The scientific world was stunned recently when papers based on NSF-supported research at the Nanoscale Science and Engineering Center at the University of California, Berkeley demonstrated the creation of three-dimensional metamaterials that exhibit negative refraction at short wave lengths, including some in the visible spectrum. To create bulk samples of metamaterials, the researchers designed two new nanoscale fabrication techniques. These developments could lead to dramatic advances in applications such as antennas, high-performance computers, and radar-evading stealth technologies.



Above is a scanning electron microscope image of a fabricated structure developed by NSF-supported researchers at the University of California, Berkley. *Credit: Xiang Zhang Group, University of California,*

MANAGEMENT ASSURANCES

NSF FY 2009 Federal Managers' Financial Integrity Act Statement of Assurance

The National Science Foundation (NSF) management is responsible for establishing and maintaining effective internal control and a financial management system that meets the objectives of the Federal Managers' Financial Integrity Act of 1982 (FMFIA) and the Office of Management and Budget (OMB) Circular A-123, *Management's Responsibility for Internal Control*. The FMFIA requires agencies to provide an annual statement of assurance on the effectiveness of their management, administrative, and accounting controls (Section 2) and conformance of their financial management systems (Section 4).

NSF has evaluated the effectiveness of internal control over programs and operations to ensure agency compliance with applicable laws and regulations (FMFIA, Section 2) and whether financial management systems conform to federal financial system standards (FMFIA, Section 4). Based on the results of this evaluation, NSF provides reasonable assurance that as of September 30, 2009, its internal controls over programs and operations were operating effectively to ensure compliance with applicable laws and regulations. No material weaknesses were found in the design or operation of internal controls under Section 2 of FMFIA and no system non-conformances were found under Section 4 of FMFIA.

In addition, NSF is leveraging established OMB Circular A-123 and FMFIA assessment methodologies and approaches to assist in assessing the applicable entity-wide controls, documenting the applicable processes, and identifying and testing the key controls applicable to the American Recovery and Reinvestment Act funding.

In accordance with Appendix A of OMB Circular A-123, NSF conducted an assessment of the effectiveness of internal control over financial reporting, which included the safeguarding of assets and compliance with applicable laws and regulations. Based on the results of this assessment for the period ending June 30, 2009, NSF provides reasonable assurance that internal control over financial reporting was operating effectively and no material weaknesses were found in the design or operation of the internal controls.

Arden L. Bement, Jr.
Director

November 13, 2009

Internal Control Assessment

NSF's Accountability and Performance Integration Council (APIC) serves as the Senior Assessment Team responsible for documenting, testing, monitoring, and reporting on internal controls. APIC's responsibility includes the assessment of internal controls for program and operational performance designed to ensure compliance with laws and regulations. APIC also directs the assessment of internal controls over financial reporting. APIC is chaired by the Chief Financial Officer (CFO) and includes four Assistant Directors/Office Heads, the Chief Human Capital Officer, the Chief Information Officer, and the General Counsel. The CFO is responsible for providing executive secretariat support to the Chief Operating Officer (COO) for coordination and analysis of NSF's annual assessment of internal controls. The CFO provides the findings from the agency-wide review to the COO and the Senior Management Round Table (SMaRT) for consideration.

The APIC Internal Control Working Group (ICWG) assessed and evaluated NSF's compliance with OMB Circular A-123 requirements as of June 30, 2009, and determined that none of the deficiencies found rise to the level of a material weakness. The ICWG recommended corrective actions for the deficiencies that were identified. The ICWG considered the nature of each deficiency, the existence of a compensating control, the dollar value of transactions potentially affected by the deficiency, the level of risk, and the likelihood that an error may not be prevented or detected. Overall, APIC concluded that none of the deficiencies identified within the various business processes rose to the level of a material weakness.

Office of the Inspector General (OIG) Assessment

The Chief Financial Officers Act of 1990 requires financial statements be prepared and audited annually. This audit is the responsibility of the OIG. For FY 2009, the NSF OIG contracted with Clifton Gunderson LLP for the audit of the agency's financial statements. For FY 2009, NSF received an unqualified audit opinion. The audit report noted no material weaknesses while including one significant deficiency related to the monitoring of cost reimbursement contracts.

Independent Verification and Validation of Property, Plant, & Equipment (PP&E)

The U. S. Antarctic Program (USAP) accounts for approximately 89 percent of NSF's PP&E balance as of June 30, 2009. The multi-year contract between NSF and Raytheon Polar Services Company (RPSC), states that RPSC is responsible for acquiring, maintaining, and performing a physical inventory of USAP property. NSF relies upon RPSC, an outside contractor, to maintain all related source documentation and record amounts for the PP&E activities it conducts. NSF had an independent entity verify and validate the property reports NSF receives from RPSC to obtain an unbiased evaluation and to avoid over reliance on RPSC. This verification and validation project includes capital equipment, construction-in-progress, and freight costs.

Certification and Accreditation (C&A) Assessment

NSF policy, in accordance with federal law, OMB guidance, and the NIST SP 800-37, *Risk Management Guide for Information Technology Systems*, requires all major applications and general support systems to be certified and accredited. During 2009, NSF conducted a C&A assessment of its core Financial Accounting System (FAS). The C&A assessment determined that the FAS controls in place provide adequate security.

Implementation of the American Recovery and Reinvestment Act

Under the Recovery Act, NSF received $3.0 billion to fund investments in science and engineering research and education and has until September 30, 2010 to obligate these funds.[20] NSF established new funding and accountability policies and processes for its Recovery Act program and has made them available to the public on the agency's website at www.nsf.gov/recovery and on *Recovery.gov*. With such a significant increase in agency funding, NSF enhanced controls on the awards process through the agency's existing internal control Senior Management Council and by leveraging existing assessments required by OMB Circular A-123, in accordance with OMB M-09-15 guidance.

Federal Managers' Financial Integrity Act of 1982 (FMFIA)

FMFIA amended the Accounting and Auditing Act of 1950, requiring ongoing evaluations and reports on the adequacy of the systems of internal accounting and administrative control. Managers are required to identify material weaknesses related to programs and operations—Sections 2 and 4 of FMFIA—and provide a single FMFIA report.

- Section 2 of FMFIA requires agencies to assess and report annually on the reasonable assurance as to the effectiveness of their internal controls to ensure compliance with applicable laws; protect against loss from waste, fraud, and abuse; and ensure receivables and expenditures are properly recorded. The reasonable assurance is a statement assuring NSF's internal controls are achieving their intended objectives.
- Section 4 of FMFIA requires agencies to assess and report annually on the reasonable assurance that all financial and mixed financial systems are in conformance with government-wide requirements. These financial system requirements are presented in OMB Circulars A-127 and A-130.

Tables that summarize the results of NSF's financial statement audit and internal control review can be found in Appendix I.

[20] ARRA also provided $2.0 million to the NSF OIG. For more information about NSF's Recovery Act funding, see page I-4.

FINANCIAL DISCUSSION AND ANALYSIS

NSF's goals for financial management are to deliver the highest level of business services to our customers and stakeholders through effective internal controls and efficient work processes and to provide reliable and timely financial information to support sound management decisions. NSF is committed to the principles of accountability, excellence, and transparency. The result is an established record of effectiveness in federal financial management documented by clean audit opinions and a leadership role in government-wide grants management activities. In FY 2009, areas of focus included the following:

- The American Recovery and Reinvestment Act of 2009 (ARRA or Recovery Act) introduced additional accountability and reporting requirements for the $3.0 billion received by NSF under the Recovery Act.[21] NSF developed a multi-phase approach for compliance and quality assurance. Accountability and transparency were fundamental requirements for the awarding, monitoring, tracking, and reporting of Recovery Act funds.
- The escalating pace of change in the federal environment is an opportunity to improve financial management performance. Changes currently affecting NSF include new technology, new accountability legislation, and restructured financial functions. In FY 2009, NSF continued to make progress in modernizing its aging financial accounting system. The modernization initiative will provide the agency with state-of-the-art financial and business management capabilities that ensure stewardship of NSF resources in support of science and engineering research and education.
- NSF continued to explore better ways to provide meaningful information to our stakeholders and the general public. A concise, four-page *NSF Highlights*[22] document was produced as an information tool for the new Administration's transition team. The document received a Certificate of Achievement from the Association of Government Accountants for high quality citizen-centric accountability reporting.
- NSF successfully transitioned its travel and bank cards through the GSA Smart Pay II program to a new bank. The conversion was seamless and impacted the majority of employees, providing them significantly improved card services and increased federal rebates for the agency.

NSF has a fiduciary and stewardship responsibility to efficiently and effectively manage its federal funds and to comply with federal guidance on financial management. As part of this responsibility, the agency prepares annual financial statements in conformity with generally accepted accounting principles (GAAP) for U.S. federal government entities and subjects them to an independent audit to ensure their integrity and reliability in assessing performance. For FY 2009, NSF received an unqualified audit opinion. The audit reported noted no material weaknesses while including one significant deficiency related to the monitoring of cost reimbursement contracts. NSF made progress in FY 2009 in implementing a process for performing contract audits and additional actions are currently underway to address audit concerns in this area.

Understanding the Financial Statements

NSF's FY 2009 financial statements and notes are presented in accordance with OMB Circular No. A-136, *Financial Reporting Requirements* dated June 10, 2009. NSF's current year financial statements and notes are presented in a comparative format. The Stewardship Investment schedule presents

[21] The Recovery Act provided $3.0 billion to NSF for programmatic activities and $2.0 million to the Office of Inspector General for oversight activities. See page I-4 for more information on NSF's Recovery Act funding.

[22] *NSF Highlights* is available at www.nsf.gov/about/performance/nsf2008Highlights.pdf.

information over the last five years. *Figure 14* summarizes the significant changes in NSF's financial position in FY 2009.

Figure 14.

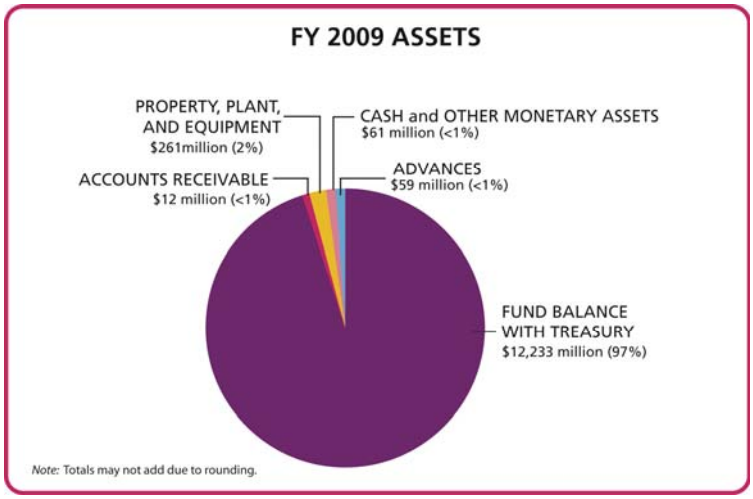
Significant Changes in NSF's Financial Position in FY 2009[23]

(dollars in thousands)

Net Financial Condition	FY 2009	FY 2008	Increase/ (Decrease)	% Change
Assets	$12,627,129	$9,055,028	$3,572,101	39.4%
Liabilities	$521,544	$555,048	($33,504)	-6.0%
Net Position	$12,105,585	$8,499,980	$3,605,605	42.4%
Net Cost	$6,002,380	$5,944,807	$57,573	1.0%

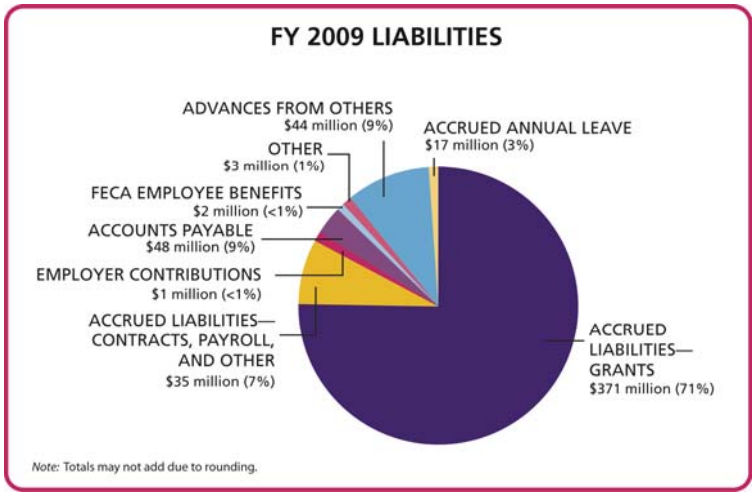
Balance Sheet: The Balance Sheet presents the total amounts available for use by NSF (assets) against the amounts owed (liabilities) and amounts that comprise the difference (net position). NSF's total assets are largely composed of *Fund Balance with Treasury*. A significant balance also exists in the *General Property, Plant and Equipment (PP&E)* account (*Figure 15).*

Figure 15.



In FY 2009, total assets increased 39.4 percent over FY 2008 assets. The bulk of the increase occurred in the *Fund Balance with Treasury* account, which grew by $3.6 billion in FY 2009. *Fund Balance with Treasury* is funding available from which NSF is authorized to make expenditures and pay amounts due through the disbursement authority of the Department of Treasury. It is increased through appropriations and collections and decreased by expenditures and rescissions. The FY 2009 increase is nearly entirely attributable to the $3.0 billion in ARRA funds appropriated to NSF in FY 2009. While NSF had obligated $2.4 billion of ARRA funding by September 30, 2009, the majority of the ARRA appropriations remained in *Fund Balance with Treasury* due to the nature and timing of scientific grant expenditures.

Figure 16.

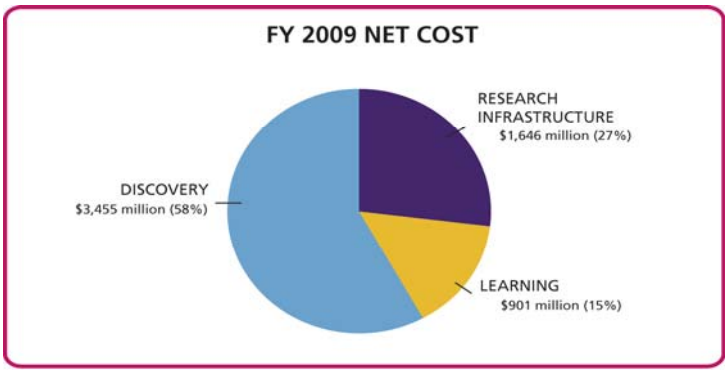


[23] The change in total assets and net position primarily reflects the increase in ARRA funding of $3.0 billion.

NSF's *Total Liabilities* decreased by 6 percent in FY 2009. NSF's largest liability account is *Accrued Liabilities-Grants* (*Figure 16).* This account represents amounts owed to NSF grantees for expenses incurred but not submitted to NSF as of the date of the financial report. While *Accrued Liabilities–Grants* increased slightly in FY 2009 due to the new ARRA-funded grants, the increase was offset by a significant decrease in the *Advances from Others* account. *Advances from Others* represents payments received in advance from other federal agencies, through interagency agreements, where those funds have not been fully expended. In FY 2009, NSF changed from operating on an advance basis to a reimbursable basis. Using a reimbursable basis, funds are collected primarily from other agencies upon completion of work instead of in advance, therefore NSF's *Advances* account decreased.

Statement of Net Cost: This statement presents the annual cost of operating NSF programs. The net cost of each specific NSF program operation equals the program's gross cost less any offsetting revenue. *Intragovernmental Earned Revenues* are recognized when these related program or administrative expenses are incurred and deducted from the full cost of the programs to arrive at the *Net Cost of Operation*.

Figure 17.



Approximately 95 percent of all current year NSF costs incurred were directly related to the support of the *Discovery, Learning,* and *Research Infrastructure* strategic goals. Costs were incurred for indirect general operation activities (e.g., salaries, training, and activities related to the advancement of NSF information systems technology) and activities of the National Science Board (NSB) and the Office of Inspector General (OIG). These costs were allocated to the *Discovery, Learning,* and *Research Infrastructure* strategic goals and account for 5 percent of the total current year *Net Cost of Operations (Figure 17).* These administrative and management activities are the focus of the agency's *Stewardship* strategic goal.

Statement of Changes in Net Position: The Statement of Changes in Net Position presents the agency's cumulative net results of operation and unexpended appropriations for the fiscal year. NSF's *Net Position* increased by $3.6 billion (42 percent) in FY 2009. The increase is reflected in the *Appropriations Received* account, which grew by approximately $3.4 billion over FY 2008. The increase is due to the new Recovery Act appropriations. *Appropriations Received* is increased by appropriations from Congress and decreased when those appropriations are expended. In FY 2009, NSF obligated the majority of the Recovery Act appropriation funds, however, since scientific research progresses at a normal and steady rate, significant expenditures are not expected in the early months of research. Therefore, the bulk of the Recovery Act appropriations remain in an obligated but unexpended state in the *Appropriations Received* account on NSF's *Net Position*.

Statement of Budgetary Resources: This statement provides information on how budgetary resources were made available to NSF for the year and the status of those budgetary resources at year-end. For FY 2009, *Total Budgetary Resources* increased by $3.4 billion due to the new Recovery Act funding appropriated in the fiscal year. New *Budget Authority-Appropriation* for the Research and Related Activities, Education and Human Resources, and Major Research Equipment and Facilities Construction accounts were $7,683 million, $945 million, and $552 million, respectively. The combined new *Budget Authority–Appropriation* in FY 2009 for the NSB, OIG, and Agency Operations and Award Management

accounts totaled $312 million. Total *Obligations Incurred* in FY 2009 also increased significantly, by $2.8 billion, due predominantly to the $2.4 billion of new Recovery Act grants awarded in the fiscal year.

Stewardship Investments: NSF-funded investments yield long-term benefits to the general public. NSF investments in research and education produce quantifiable outputs, including the number of awards made and the number of researchers, students, and teachers supported or involved in the pursuit of -science and engineering research and education. The FY 2009 increase in *Research and Human Capital Activities* reflects increased agency funding.

Limitations of the Financial Statements

In accordance with the revised guidance provided in OMB Circular No. A-136, NSF discloses the following limitations of the agency's FY 2009 financial statements, which appear in Chapter II of this report: The financial statements have been prepared to report the financial position and results of operations of NSF, pursuant to the requirements of 31 U.S.C. 3515(b). While the statements have been prepared from NSF books and records in accordance with GAAP for federal entities and the format prescribed by OMB, the statements are, in addition to the financial reports, used to monitor and control budgetary resources which are prepared from the same books and records. The statements should be read with the realization that they are for a component of the U.S. government, a sovereign entity.

Budgetary Integrity: NSF Resources and How They Are Used

NSF is funded primarily through six Congressional appropriations which totaled $6.5 billion in FY 2009. In addition, under the Recovery Act, NSF received $3.0 billion. The OIG received $2.0 million in Recovery Act funding, to provide oversight of the agency's Recovery Act funds. Other FY 2009 revenue sources included $119.3 million in reimbursable authority, $88.7 in H-1B Nonimmigrant Petitioner Fee collections, and $47.4 million in donations to support NSF activities.[24] NSF made investments in fundamental science and engineering research and education in support of the Foundation's three strategic outcome goals of *Discovery*, *Learning*, and *Research Infrastructure*. Five percent of NSF's budget was for *Stewardship* activities that focus on internal agency operations and award management activities.

In FY 2009, non-Recovery Act funding investment priorities included the Cyber-enabled Discovery and Innovation program; undergraduate education; and high risk, high reward research. Major programs funded included CAREER, NSF's flagship program for young faculty; Graduate Research Fellowships; Major Research Instrumentation; and Research on Learning in Formal and Informal Settings. NSF also supported interagency research and development (R&D) priorities: the Networking and Information Technology R&D, the National Nanotechnology Initiative, the U.S. Climate Change Science Program, and Homeland Security. The major research facilities and equipment projects supported were the Advanced Laser Interferometer Gravitational-Wave Observatory (LIGO), Atacama Large Millimeter Array, IceCube Neutrino Observatory, and Advanced Technology Solar Telescope. NSF's Recovery Act funding provided support for over 4,600 awards in FY 2009. For more information on NSF's Recovery Act program, see page I-4. At the time this report was being prepared, NSF had not yet received its FY 2010 appropriations.

Improper Payments Information Act of 2002

The Improper Payments Information Act (IPIA) of 2002 and OMB Circular A-123, Appendix C, *Management's Responsibility for Internal Control: Requirements for Effective Measurement and*

[24] Donations of $47.4 million include $567,512 of interest earned on the donations received in FY 2009.

Remediation of Improper Payments,[25] require agencies to review all programs and activities, identify those that are susceptible to significant erroneous payments, and determine an annual estimated amount of erroneous payments made in those programs. From FY 2006 to FY 2008, NSF received relief from the annual IPIA reporting due to the very low improper payment rates reported in its FY 2004 and FY 2005 Annual Financial Reports. However, during this relief period, NSF remained vigilant in its monitoring of and continued risk-based grant expenditure sampling for improper payments in support of the NSF post-award grant monitoring program. These efforts were successful in ensuring that NSF's program remained low risk.

In FY 2009**,** NSF conducted a statistical review of its FY 2008 Federal Financial Report transactions received from grant recipients. Consistent with prior year results, the occurrence of NSF improper payments continues to be well below the significant standard of improper payments, which is defined by OMB guidance as exceeding $10 million and 2.5 percent of total outlays. Details of NSF's IPIA reporting can be found in Appendix 2. Beyond FY 2009, NSF intends to continue its grant expenditure sampling process for monitoring improper payments and its internal risk-based approach, as part of NSF's integrated and comprehensive grant monitoring program strategy.

Financial System Strategy

The goal of NSF's Financial Accounting System (FAS) is to provide quality business services to our customers through effective funds control and efficient award processes and to provide reliable and timely financial data to enable management to make informed decisions. FAS is a custom-developed online, near real-time system that provides the full spectrum of financial transaction functionality required by a grants-making agency. In addition, FAS complies with government-wide rules and regulations for financial management systems.

FAS is integrated with NSF's core business systems, including the Proposal and Reviewer System, Awards System, Guest (panelists) Travel and Reimbursement System, e-Travel System, and the FastLane System, which supports grants management. FAS supports both the grant and core financial processes and is used to monitor, control, and ensure the management and financial accountability of 25,000 active awards with 1,967 external grantee institutions. FAS processes electronic payments of funds to grantees in a seamless, controlled environment through FastLane and uploads information to FastLane so grantees can check fund availability in near real-time. FAS reporting capabilities include online look-ups to verify funds, commitment and obligation tracking, and the ability to generate daily, weekly, monthly, and quarterly reports that provide up-to-date financial information about NSF operations for program and grantee decision support. All FAS-generated reports are posted electronically and are available to staff via *Report.web,* an application that streamlines information distribution. In addition, information from FAS is captured and used in NSF's Enterprise Information System.

Although NSF's ability to meet interface and integration requirements of any government-wide initiative (e.g., e-Travel and e-Learning), to adopt new legislative, regulatory, and policy requirements as they are promulgated, and to implement required technical upgrades is resource dependent, NSF is committed to sustaining maximum capacity of the system and still remain current with all the laws and regulations. The Financial Management Line of Business (FMLoB) continues to define government-wide standards that all agencies will be required to implement. Consistent with NSF's e-Government Implementation Plan, FAS will remain in a steady-state phase until it is replaced with a new financial management system. In order to meet the new requirements, NSF has begun its planning phase of its financial and property management system initiative to replace FAS. Key elements for the future financial management system are to ensure that NSF continues to fully support the integrated grant financial requirements and to

[25] OMB A-123, Appendix C can be found at www.whitehouse.gov/omb/assets/omb/circulars/a123/a123_appx-c.pdf.

include a property management system within the financial system framework. During this planning phase, NSF has started documenting current business processes and developing functional and technical requirements. The agency has also begun to identify the interrelationships between the FMLoB and the Grants Management Line of Business (GMLoB), to ensure that core requirements will be identified to support NSF's status as a GMLoB Consortia Lead for grants management.

Key Financial Metrics

This section presents selected key financial measures of NSF's core business of awarding grants and our progress in associated electronic processes.

Treasury Scorecard: Since inception of the Department of Treasury's Financial Management Service Scorecard in FY 2004, NSF has consistently received the highest rating for accuracy and timeliness of our financial reporting. The most recent ratings are shown in *Figure 18*.

Figure 18.
U.S. Department of Treasury Financial Management Scorecard

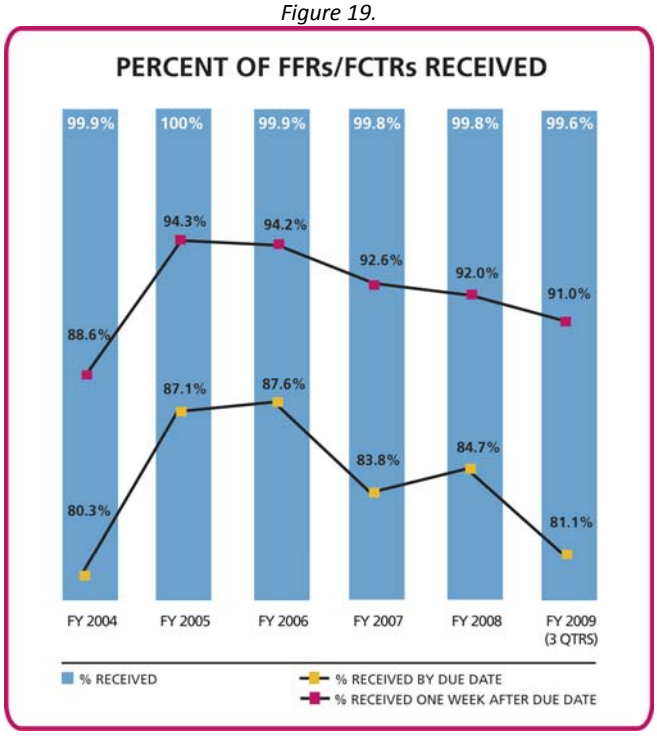
Category	Standard	Results *(as of 6/30/09)* *
Accuracy of Reporting**	*Green* : If differences are outstanding for less than 3 months. *Yellow:* If differences are older than 3 months but less than 6 months. *Red:* If differences are older than 6 months.	G
Timeliness of Reporting*	*Green* : If original and supplemental reporting are completed by the third workday. *Yellow:* If original report is submitted by the 3rd workday and supplemental report submitted on the 4th workday. *Red:* If original report is submitted after the 3rd workday and/or supplemental submitted after the 4th workday.	G

*Most current data available.

** FMS 224, SF1218/1221, and FMS 1219/1220.

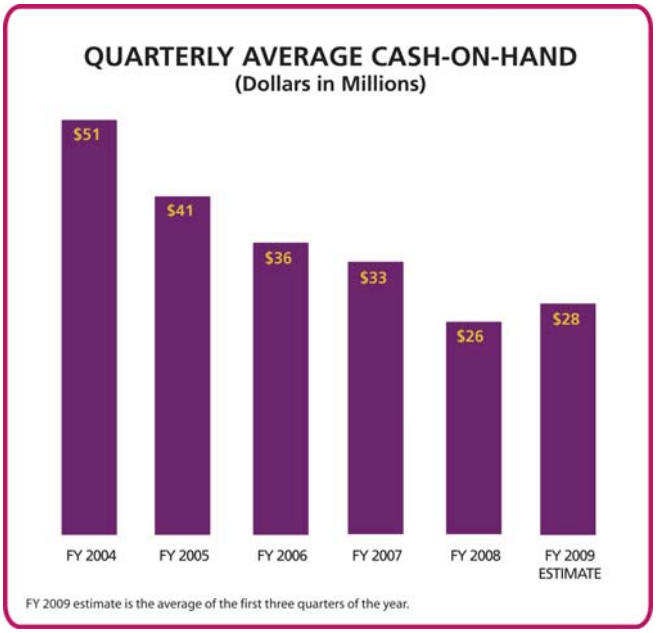
Federal Cash Transaction Report (FCTR) and Federal Financial Report (FFR): Grantees are required to report the status of funds received from NSF on a quarterly basis through the submission of a FFR report. (The FCTR report was discontinued as of January 1, 2009.) The reports are prepared and submitted electronically to NSF by the grantee either through the FastLane Financial Function or *Research.gov*. NSF follows up with preparers to ensure receipt of reports, as evidenced by the increase in report submissions received by one week after the due date. By the end of the quarter, nearly 100 percent of grantees had submitted their reports. As shown in *Figure 19*, through the third quarter of FY 2009, 81 percent of NSF grantees had submitted their FFR reports by the due date and 91 percent of grantees had submitted their FCTR or FFR reports within one week after the due date.

Figure 19.



Cash-on-Hand: *Figure 20* shows the results of NSF's increased emphasis on enhanced FFR/FCTR monitoring activities implemented in January 2005. Unexpended federal cash held by grantees has decreased by over $20 million, from a quarterly average of $51 million in FY 2004 to an estimated quarterly average of $28 million in FY 2009. This decrease has been due to improved cash management by grantees as a result of the effective NSF monitoring activities.

Figure 20.



Chief Financial Officers (CFO) Council Metric Tracking System (MTS) Financial Management Indicators: NSF continues to receive high scores for the MTS financial management indicators. In FY 2009, NSF received high ratings ("Green") in five of six indicators: Fund Balance with Treasury, Amount in Suspense Greater Than 60 Days, Electronic Payments, Percent of Invoices Paid on Time, and Interest Penalty Paid. NSF received a "Red" rating for Delinquent Accounts Received From Public Over 180 Days. Agencies receive a "Red" rating for Delinquent Accounts Received From the Public Over 180 Days when the percentage of delinquent debt over 180 days old exceeds 20 percent of total accounts receivable. In the case of the NSF, the total amount of receivables on the books is very small and therefore subject to large percentage swings when a small number of debts either become delinquent or are resolved. In FY 2009, three debts ($80,000, $35,000, and $10,000) became over 180 days delinquent. Since total agency accounts receivable are only $298,000, the otherwise immaterial delinquencies over 180 days resulted in the NSF's high percentage of delinquent debt. Detailed information about each indicator and NSF's performance is available at www.fido.gov/mts/cfo/public.

Recent Trends: The following table summarizes some key agency workload and financial indicators. Obligations are a direct result of each year's appropriation while expenses reflect multiple years of prior obligations. The large increases in obligations incurred, the number of competitive awards, the number of grant payments, the dollar amount of grant payments as well as the average annual award size reflect NSF's Recovery Act funding, which provided an additional $3.0 billion to NSF's FY 2009 regular appropriations of $6.5 billion.

Figure 21.

Recent Trends

	FY 2006	FY 2007	FY 2008	FY 2009	% Change FYs 2006–2009
Obligations Incurred *	$5,878.1	$6,169.2	$6,361.9	$9,140.9	55.5%
NSF Expenses (Net of Reimbursements)*	$5,595.8	$5,636.1	$5,944.8	$6,002.4	7.3%
Stewardship (Expenses) *	$321.1	$276.0	$283.3	$332.6	3.6%
Full-time Equivalents (includes OIG)	1,277	1,310	1,339	1,388	8.7%
Competitive Proposals	42,050	44,106	43,907	45,228	7.6%
Competitive Awards	10,318	11,354	11,024	14,641	41.9%
Average Annual Award Size *(competitive awards)*	$153,545	$154,494	$162,024	$171,561	11.7%
Average Award Duration *(competitive awards, in years)*	2.70	2.63	2.58	2.63	-0.03
Number of Grant Payments	19,714	19,074	19,481	25,723	30.5%
Dollar Amount of Grant Payments*	$4,884.5	$4,909.9	$5,122.5	$8,540.1	74.8%

** Dollars in millions*

Future Business Trends and Events

NSF is continuously faced with increased expectations for oversight, transparency, and accountability. To meet these expectations, NSF is taking a holistic view of financial management, going beyond improving its automated systems to integrating grants management, budget execution, and business services at the programmatic level and beyond. As we monitor resources, we will continue to focus on discerning the value of the goods and services we get in return for our expenditures. The areas on which NSF will focus in both the immediate and long-term future are described in the following section.

Internal Control Quality Assurance: To foster unprecedented levels of accountability and transparency in government spending of Recovery Act funds, NSF implemented a multi-phase internal control process. In FY 2009, Phase I identified the necessary controls. In Phase II, which will be implemented in FY 2010, NSF will continue its baseline assessment and address the management findings from the agency's FY 2009 internal control review of the ARRA program policies and processes. Agencies must ensure the quality and completeness of recipient reporting on Recovery Act-funded projects. NSF will undertake an internal control review of the agency's recipient reporting in accordance with reporting requirements of Section 1512 of the Recovery Act. Recipient reporting will provide information about who has received NSF Recovery Act funds, the amount and purpose of the award, and completion status, which will include data on the number of jobs created and retained.

NSF has cleared 20 of the 32 findings noted in FY 2008 Management Action Plans. To gain efficiencies, we streamlined the internal control business processes and external audit cycle memos by combining documentation. The combined documents will be updated annually and will continue to gain efficiencies in the upcoming years through both time and money savings. NSF will continue efforts to clear the remaining findings from the FY 2008 Management Action Plans.

NSF has begun an effort to value the real property belonging to the U.S. Antarctic Program. The analysis of real property and construction-in-progress assets includes buildings and land improvements. Various engineering and cost recognition methodologies are being used to determine the original cost basis of the facilities. This project is a significant undertaking for the agency but, when completed, will allow NSF to address future accountability issues more efficiently.

Financial Assistance Reporting: OMB approved the FFR as the replacement for existing grant recipient financial reports with full implementation to be completed by all federal agencies not later than October 1, 2009. The FFR simplifies reporting requirements, procedures, and associated business processes by using a standardized pool of data elements as defined by the Grants Policy Committee of the Federal CFO Council. NSF first implemented the FFR in FastLane Financial Functions as an optional grantee expenditure report during July 2007 and made the FFR the required financial report in January 2009. Additionally, NSF developed an FFR within its *Research.gov* initiative that has been used by grantees and will be offered to other federal research-oriented agencies. NSF's FFR will assist OMB in advancing Federal Grants Streamlining initiatives. It will also reinforce NSF leadership within the federal grants management arena and maintain the customized integration of business processes and systems inherent in NSF's end-to-end systems.

Financial Service Offerings of the NSF FMLoB: NSF is in the planning phase of its financial and property management system initiative, iTRAK. Subject to the availability of funds, iTRAK will replace the current legacy FAS and provide the agency with state-of-the-art financial and business management capabilities. During the planning phase of iTRAK, NSF will develop its future business processes and functional and technical requirements for the new system. The Federal System Integration Office (FSIO) core system requirements and standard business process will be used as the foundation for this effort.

iTRAK planning will comply with the FMLoB requirements and guidelines as well as the revised OMB Circular A-127, *Financial Management Systems,* requirements mandating the use of FSIO-certified commercial off-the-shelf (COTS) systems for core financials and the adoption of FSIO standard government business processes. The initiative also addresses a prior-year property plant and equipment audit finding. One of the key success factors for iTRAK is ensuring that data migrating to the new system has been cleansed. To that end, the iTRAK core team is developing a data readiness strategy and will be working with data owners across the agency to ensure the integrity of the data being migrated to the new system.