DETAILED PERFORMANCE INFORMATION

SUMMARY OF RESULTS

Performance assessment is fundamental to the mission of NSF, permeating all agency processes. FY 2006 performance assessment at NSF was guided by the Government Performance and Results Act of 1993 (GPRA),[1] OMB's Program Assessment Rating Tool (PART),[2] and by NSF's *FY 2003–2008 Strategic Plan*.[3]

A summary discussion of NSF's performance results and assessment activities as well as a discussion of the integration of budget, performance, and cost is provided in Management's Discussion and Analysis, beginning on page I-10. This chapter provides detailed information on NSF's FY 2006 performance assessment activities and the results of the agency's FY 2006 GPRA performance goals. Following this Summary of Results are discussions of NSF's performance assessment and evaluation process, NSF's validation and verification (V&V) process, and detailed discussions on each of NSF's FY 2006 GPRA performance goals.

NSF's performance goals fall into two broad categories: long-term "Strategic Outcome Goals" and "Annual Performance Goals." Historically NSF has relied upon external committees of experts (see pages II-6 to II-8) to evaluate the results of its long-term investments. This is appropriate given the broad scope of science, engineering, and education research supported by NSF, and the extensive use of competitive merit review for selecting new awards. Evaluation of annual performance goals is related to internal practices, processes, and operations that support the mission.

> **Strategic Outcome Goals:** NSF's *FY 2003-2008 Strategic Plan* provides the programmatic framework that translates into the agency's four strategic outcome goals: *Ideas, Tools, People,* and *Organizational Excellence*. *Ideas, Tools,* and *People* focus on the long-term results of NSF's grants and programs. These goals represent the outcomes from NSF investments in science and engineering research and education. The strategic outcome goal of *Organizational Excellence* focuses on the administrative and management activities of the agency, and ensures that NSF is a capable and responsive organization that supports the accomplishment of the three other strategic outcome goals.
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> To assess NSF's long-term strategic outcome goals, NSF established an Advisory Committee for GPRA Performance Assessment (AC/GPA), comprised of experts in fields of science, engineering, and education to provide advice and recommendations to the Director regarding NSF's performance. The Committee meets annually to assess results and to comment on the quality and relevance of NSF's research and education award portfolio and on its high risk/transformative awards. Performance indicators are used to assess annual progress toward attainment of each of the long-term outcome goals. For each outcome goal, NSF judges itself successful when, in the aggregate, results reported demonstrate significant achievement for the majority of associated indicators. In FY 2006, the AC/GPA determined that NSF demonstrated

[1] For more information about GPRA, visit www.whitehouse.gov/omb/mgmt-gpra/gprptm.html.

[2] For more information about the Program Assessment Rating Tool (PART), visit www.whitehouse.gov/omb/expectmore/index.html.

[3] *NSF's FY 2003–2008 Strategic Plan* is available at www.nsf.gov/pubs/2004/nsf04201/FY2003-2008.pdf.

significant achievement in all performance indicators related to the four strategic outcome goals. The AC/GPA determined that quality and relevance were demonstrated for the achievement in all the performance indicators associated with *Ideas*, *Tools*, and *People*. In addition, using input from the Advisory Committee for Business and Operations, the AC/GPA determined that quality was demonstrated for *Organizational Excellence*.

Annual Performance Goals: NSF has integrated its GPRA and PART reporting. Our annual performance goals consist of performance measures associated with NSF's PART programs and an agency-wide efficiency goal related to time-to-decision on funding recommendations. The FY 2006 annual performance goals consist of nine new goals and 13 goals reported in previous years. The nine new goals are associated with the following PART programs: Polar Research Support, Tools, and Logistics; the Biocomplexity in the Environment priority area; and the Institutions and Collaborations programs under the *People* strategic outcome goal.

FY 2006 Results

NSF was successful for all four of its long-term strategic outcome goals: Ideas, Tools, People, and Organizational Excellence. The external Advisory Committee for GPRA Performance Assessment (AC/GPA) determined that NSF demonstrated significant achievement in all performance indicators related to these goals. The AC/GPA also determined that the Research & Development criteria of "Quality" and "Relevance" were demonstrated for the *Ideas*, *Tools*, and *People* goals, and that "Quality" had been demonstrated for *Organizational Excellence*. The Committee's report may be found at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06206. The FY 2006 AC/GPA evaluation process was also validated by an independent external verification and validation (V&V) review.[4]

In FY 2006, NSF was successful for 15 of its 22 annual performance goals (68 percent). We were successful in the goals relating to time-to-decision; increasing the number of graduate students funded through NSF's three flagship graduate student programs; increasing the number of applicants from minority serving institutions for the CAREER program for junior faculty; the six goals related to the Nanoscale Science and Engineering Program; the facilities operations goal; and the Polar research support goal. NSF was not successful in achieving goals related to increasing the number of applications to the Graduate Research Fellowship Program from groups that are underrepresented in the science and engineering workforce; increasing the percentages of proposals from academic institutions not in the top 100 of NSF funding recipients for the Research Institutions and Research Collaborations programs; increasing the percentages of proposals to the Biocomplexity in the Environment Program with at least one female or one minority investigator; the facilities construction goal; and the Polar research facilities goal.

FY 2002–2006 Results

Overall, in FY 2006, NSF achieved 19 of 26 performance goals (73 percent), including all four strategic outcome goals. A detailed explanation of each of NSF's FY 2006 performance goals is provided later in this chapter. A summary of the results of NSF's GPRA performance goals from FY 2002 through FY 2006 is shown in the chart below. NSF has successfully achieved all its strategic outcome goals in the last five years. With respect to our annual performance goals, NSF achievement has ranged from a low of 63 percent in FY 2003 to a high of 88 percent in FY 2004.

[4] For further information about the independent verification and validation review, see Appendix 4c.

FY 2002 – FY 2006 Performance Results Number and Percent of Goals Achieved					
	FY 2002	FY 2003	FY 2004	FY 2005	**FY 2006**
Strategic Outcome Goals	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)	**4 of 4 (100%)**
Annual Performance Goals	14 of 19 (74%)	10 of 16 (63%)	23 of 26 (88%)	14 of 17 (82%)	**15 of 22 (68%)**
Total	18 of 23 (78%)	14 of 20 (70%)	27 of 30 (90%)	18 of 21 (86%)	**19 of 26 (73%)**

Recent Performance Highlights

The results of many NSF-supported projects appear long after the initial investment. The discoveries highlighted here and throughout this report are the outcome of long-term support of research and education projects that emerged and were reported in FY 2006. Additional examples may be found in NSF's website at www.nsf.gov/discoveries/.

► **Solar Vehicles for Environmental Monitoring:** The RiverNet Project is designing sensor networks and systems to monitor complex or geographically large regions. One such development is the Solar Autonomous Underwater Vehicle (SAUV). The SAUV can submerge for up to 12 hours and dive to 500 meters. It features a unique solar panel that allows the vehicle to be deployed for weeks at a time; an on-board computer system to enable real-time mission adaptations; and networked communications to support multi-vehicle cooperation.

The new solar-powered autonomous underwater vehicle (SAUV-II) will be used for a variety of environmental monitoring tasks. *Credit: Arthur C. Sanderson and D. Richard Blidberg.*

The SAUV can be used in a variety of environmental monitoring tasks, including the detection and monitoring of hazardous events such as red tides and contaminant spills, or in assessing the impact of natural events such as earthquakes and volcanoes. A team of SAUV vehicles will be used for long-term observation of coastal and harbor regions in order to detect threats or introduction of hazardous substances. The SAUVs may also serve as an integral part of logistics for large-scale military operations with several vehicles facilitating land, sea, and air coordination.

► **Finding and Keeping Kids in the Earth Science Pipeline from 6th Grade to Post-college**: Researcher Alan Smith and his team at Cal State-San Bernadino have completed an ambitious project to recruit and retain underrepresented ethnic groups in the earth sciences from sixth grade to post-college. In an initial survey asking minority children why they were not majoring in geology, the top reasons were lack of exposure to the geosciences and lack of knowledge about geoscience careers. Armed with these results, the team conducted 169 outreach sessions over a three-year period that involved more than 12,000 contact hours with 5,700 students. Most students were middle or high school students, and three-quarters were from underrepresented groups in the geosciences (52 percent were Hispanic, 13 percent African American, 5 percent Native American, and 4 percent Pacific Islander).

Group activities included hikes to the San Andreas Fault and hands-on exercises related to plate tectonics and earthquakes. Hands-on activities were modified to enhance students' familiarity with the scientific method. Students began by making observations from and asking questions about maps of the Earth. One of the observations they often noted was that the coastlines of Africa and South America look like they would fit together. They also noticed the mid-ocean ridges and trenches on the sea floor. A computer animation of world seismicity was shown so that students could make observations about where earthquakes occur. Another activity was a bi-annual Global Positioning System (GPS) campaign. This campaign allowed students to work with scientists and use state-of-the-art GPS receivers to precisely determine the location of benchmarks on both sides of the San Andreas and San Jacinto faults. From these measurements, the students determined the bending of the tectonic plates that will eventually lead to slip along these faults as major earthquakes. Students worked with scientists to interpret the GPS data in terms of how fast the faults were slipping. Results were presented at meetings of the American Geophysical Union and the Southern California Earthquake Center. The data were also shared with the Southern California Earthquake Data Center (www.scecdc.scec.org) for use by other scientists around the country and world.

College-student outreach assistant working with middle schoolers to draw plate boundaries on a map showing earthquake locations. *Credit: Sally McGill.*

► **Collapsing Ice Shelf Reveals Seafloor Life:** Researchers have discovered an entirely unexpected ecosystem in the lightless depths just off the coast of the Antarctic Peninsula. When the Larsen Ice Shelf collapsed there in 2002, it suddenly revealed the seabed beneath, giving NSF-supported scientists a chance to survey the contents. They found marine life forms, such as thick bacterial mats, that were able to subsist without sunlight – which had been blocked by the ice above – and therefore without photosynthesis.

View of remnant tabular iceberg (from Larsen B) in front of the new fjord coast of Oscar II Land (photo taken February, 2005). *Credit*: *David Tewksbury.*

Such communities, called "chemotrophic" because their members obtain energy from oxidation of chemical compounds rather than deriving it from sunshine, had previously been seen only at warm volcanic locations and hydrothermal vent areas on the sea floor. Eugene Domack of Hamilton College and colleagues described their findings in publications during 2005. The scientists speculate that the bacteria may feed on seepage of methane gas from the seabed. The research also serves to further understanding of how ice shelves collapse and insight into potential sea level change associated with global warming.

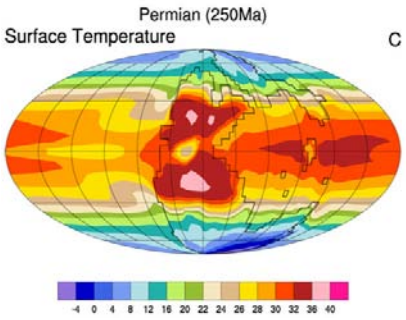
► **High School Students Compete in Protein Modeling:** In 2005, for the first time, the Wisconsin Science Olympiad included a competition in protein modeling. The competitors used tools and data from the Protein Data Bank, an international repository for protein information, to develop physical models of two proteins and answer questions about each protein's structure, function, and importance. Teams were scored on the accuracy of their models and their answers.

The event was conceived and organized by Gary Graper, a retired Madison West High School biology teacher, and the Center for BioMolecular Modeling at the Milwaukee School of Engineering.

Wisconsin Science Olympiad contestants used the Protein Data Bank and modeling kits to examine the relationship between protein structure and function. *Credit: RCSB Protein Data Bank.*

Funding came in part from NSF's Course, Curriculum, and Laboratory Improvement program. The protein modeling competition was one of over 30 individual and team events for the Wisconsin Division C High School 2005 regional and state Science Olympiad competitions. One of the central goals of the Science Olympiad is to "create a passion for learning science..." The success of the protein modeling event led to its proposal for inclusion in other state Science Olympiads in 2006 and in the national competition in 2007. As a result, students across the country will experience, as did the nine teams of Wisconsin students, the excitement of scientific discovery.

► **Climate Models Give Clue to Greatest Mass Extinction in Earth's History:** Scientists at the National Center for Atmospheric Research have used a computer model to simulate the Earth's climate at the time of the Permian Extinction, when 90 to 95 percent of all marine species and 70 percent of terrestrial species became extinct. The researchers used the Community Climate System Model, which integrates changes in atmospheric temperatures with ocean temperatures and currents. The work supports the theory that an abrupt and dramatic rise in atmospheric carbon dioxide triggered the extinction 251 million years ago.



Annual mean surface temperature (in degrees Celsius) simulated for the latest Permian from the Community Climate System Model, version 3. *Credit: National Center for Atmospheric Research.*

This large pulse of carbon dioxide seems to have come from an equally large burst of volcanic activity that played out over the relatively short span of some 700,000 years. According to the model, the resulting rise in carbon dioxide levels raised the temperature of the atmosphere, which in turn raised the temperature of the oceans' surface waters. Once this warming of the oceans reached a depth of 4,000 meters, it interfered with the seas' normal circulation process and kept oxygen from moving into the deep ocean. This lack of oxygen then killed the marine organisms that normally would have removed carbon dioxide from the atmosphere. The result: an even faster rise in carbon dioxide levels, thereby increasing the temperatures on land and in the ocean even further.

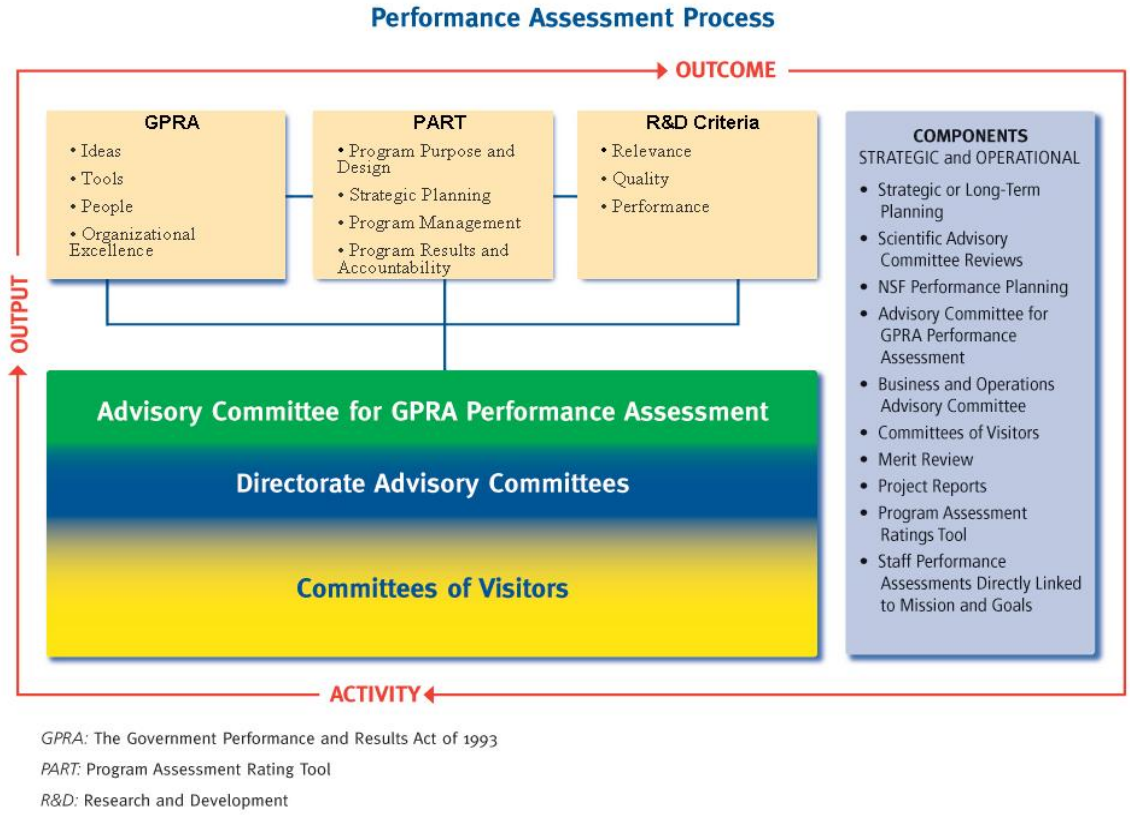
► **Engaging U.S. Undergraduate Engineers through Nanotech Research in Japan:** As part of the Rice University NanoJapan Program, a group of sixteen freshman and sophomore engineering majors is spending the summer conducting nanotechnology research in the best laboratories in Japan. By involving students in cutting-edge research projects early in their studies, NanoJapan aims to increase the number of U.S. students who choose to pursue graduate study in a nanotech-related field, while also cultivating a globally aware science and engineering workforce. The U.S. and Japan account for 57 percent of worldwide nanotechnology R&D spending, with Japan leading the way. Continued U.S. leadership in frontier nanoscale science, will require young American scientists and engineers to network with their Japanese peers. Students spend ten weeks in Japan participating in intensive Japanese language and intercultural skills training and hands-on research at a prestigious Japanese university, corporate or national laboratory. Students then build on their overseas experience with research presentations at a special one-week technology symposium in Texas. The NanoJapan Program is part of an innovative Partnership for International Research and Education award to Rice University. Eighty students will participate in the NanoJapan Program from 2006-2010.

NanoJapan participant loads a sample into a CVD chamber at the University of Tokyo. *Credit: Dvir Kafri.*

NSF'S PERFORMANCE ASSESSMENT AND EVALUATION PROCESS

NSF has integrated the GPRA and PART processes with its long-standing external expert evaluation process through Advisory Committees (ACs) and Committees of Visitors (COVs). NSF relies on the judgment of these external experts to maintain high standards of program management, provide advice for continuous improvement of performance, and ensure openness to the research and education community served by NSF. With respect to broader issues, NSF often uses external third parties such as the National Academy of Sciences for outside review. NSF also convenes external panels of experts for special studies. A schedule of NSF's program evaluations can be found in Appendix 4a. A list of the external evaluations conducted in FY 2006 is provided in Appendix 4b.

NSF's performance assessment process is illustrated in the chart below. An explanation of the components of this performance assessment process follows.



GPRA: The Government Performance and Results Act of 1993

PART: Program Assessment Rating Tool

R&D: Research and Development

Committees of Visitors (COVs)

NSF's Committees of Visitors (COV) provide program assessments that are used both in program management and in annual GPRA reporting. Each COV typically consists of 5 to 20 external experts who review one or more programs over a two to three day period. These experts are selected to ensure independence, programmatic coverage, and balanced representation. They typically represent academia, industry, government, and the public sector. Approximately one-third of NSF activities are assessed each year. All COVs are asked to complete a report template with questions addressing how programs contribute to NSF's goals. Questions to COVs include: (A) the integrity and efficiency of the *processes* involved in proposal review, and (B) the results, including the quality, of NSF's investments.

In evaluating the results of those investments, COVs are asked to comment on program activities as they relate to NSF's strategic outcome goals, justify their assessment, and provide supporting examples or statements. COVs are subcommittees of NSF directorate advisory committees. Each COV prepares a report and the division or program that is being reviewed must prepare a response. COV reports, along with the NSF responses to their recommendations, are submitted to the parent advisory committee and to the Director of NSF. All COV reports and NSF responses are public documents posted on NSF's website.

Advisory Committees

Each directorate and office has an Advisory Committee that meets twice a year to provide guidance on priorities, address program effectiveness, and review Committee of Visitor COV) reports and NSF programs' responses to COV recommendations. Advisory Committees are chartered and hence subject to Federal Advisory Committee Act rules. Each division or cross-disciplinary program has a Committee of Visitors that meets once every three years to review and assess program priorities, program management, and award accomplishments or outcomes.

Advisory Committee for GPRA Performance Assessment

The Advisory Committee for GPRA Performance Assessment (AC/GPA) was established in June 2002 to provide advice and recommendations to the NSF Director regarding NSF's performance under GPRA. NSF is the only federal government agency that invites an external advisory committee to perform an analysis of its entire portfolio as part of the agency GPRA assessment process. The Committee, which is composed of scientists, engineers, and educators, reviews NSF's broad portfolio to determine NSF's annual progress towards meeting its strategic outcome goals. The AC/GPA's assessment of whether NSF has demonstrated significant achievement is based on the collective experience and expertise of the Committee following the review of approximately 900 outstanding accomplishments – "highlights" complied by NSF program officers and an array of COV reports and other data. After its meetings, the AC/GPA provides NSF with an evaluation of NSF performance with respect to the indicators associated with each strategic outcome goal. NSF's annual independent verification and validation report includes a review of the AC/GPA evaluation process.

The Advisory Committee for Business and Operations

The Advisory Committee for Business and Operations provides advice to the Director of the Office of Budget, Finance, and Award Management and to the Director of the Office of Information and Resource Management on issues related to the oversight, integrity, development, and enhancement for improved performance of NSF's business operations. These operations are critical for assuring that the agency effectively implements its research and education mission. Emphasis is placed on how NSF can most effectively meet its strategic goals and other statutory accountability requirements related to its business operations, including financial and administrative operations, award management, business policies and procedures, human resource development, and information and communications systems.

Project-level Assessment During Merit Review

While Advisory Committees and Committees of Visitors assess NSF programs at the portfolio level, assessment at the project or award level is conducted in two different ways. First, when submitting a proposal, applicants provide information on the results of previous NSF support. Such information is available to external experts who review the proposals based on NSF's merit review criteria. Program officers also review this information and take it into account when making recommendations on awards or declinations. Second, awardees are required to submit annual progress reports during the course of their awards. Such information is required before funds are released each year for continuing grants.

The merit review process involves several steps. When a proposal arrives at NSF, a program officer or team of program officers reviews the proposal and assigns it to at least three experts from outside NSF. Reviews are generally conducted by mail, in an advisory panel, or combination of mail and advisory panel. Reviewers and panelists use two general criteria: intellectual merit and broader impacts. The division leadership oversees the review process. Following merit review, the program officer makes a recommendation to award or decline the proposal, taking into account external reviews, panel discussion, and other factors such as portfolio balance and the availability of funding. Higher-level review of program officers' decisions is conducted. If an award is recommended, grants officers perform an administrative review. Large awards are also subject to further review at a higher level, by the Director's Review Board and the National Science Board.

PART Assessments

In 2002, OMB developed the Program Assessment Rating Tool (PART) as a systematic method for assessing the performance of program activities across the federal government. A PART review focuses on program purpose and design, strategic planning, program management, and program results and accountability. Each year, 20 percent of an agency's programs must undergo PART review. To date, all NSF's priority areas and programs under the current strategic plan that have undergone PART evaluations have received the highest rating of "Effective." The following chart shows the PART programs that have been evaluated; the ratings of the programs that were evaluated in the summer of 2006 will be available with the release of NSF's FY 2008 Budget Request to Congress in February 2007.

NSF PART Evaluations Investment Category/Priority Area	Budget Year	Result
Ideas		
Fundamental Science and Engineering	FY 2007	Effective
Federally Funded Research and Development Centers	FY 2007	Effective
Tools		
Facilities	FY 2005	Effective
Polar Tools, Facilities, and Logistics	FY 2006	Effective
People		
Individuals	FY 2005	Effective
Institutions	FY 2006	Effective
Collaborations	FY 2006	Effective
Priority Areas		
Information Technology Research	FY 2005	Effective
Nanoscale Science and Engineering	FY 2005	Effective
Biocomplexity in the Environment	FY 2006	Effective
For more information visit: www.whitehouse.gov/omb/expectmore		

Types and Sources of Performance Data and Information

Most of the data that underlie achievement assessments for the strategic outcome goals (with the exception of the *Organizational Excellence* goal) originate outside the agency and are submitted to NSF through the Project Reporting System, which includes annual and final project reports for all awards. Through this system, performance information/data such as the following are available to program staff, third party evaluators, and other external committees:

- Information on *Ideas:* Published and disseminated results, including journal publications, books, software, audio or video products created; contributions within and across disciplines; organizations of participants and collaborators (including collaborations with industry); contributions to other disciplines, infrastructure, and beyond science and engineering; use beyond the research group of specific products, instruments, and equipment resulting from NSF awards; and role of NSF-sponsored activities in stimulating innovation and policy development.
- Information on *Tools: P*ublished and disseminated results; new tools and technologies, multidisciplinary databases; software, newly-developed instrumentation, and other inventions; data, samples, specimens, germ lines, and related products of awards placed in shared repositories; facilities construction and upgrade costs and schedules; and operating efficiency of shared-use facilities.
- Information on *People: S*tudent, teacher and faculty participants in NSF activities; demographics of participants; descriptions of student involvement; education and outreach activities under grants; demographics of science and engineering students and workforce; numbers and quality of educational models, products and practices used/developed; number and quality of teachers trained; and student outcomes including enrollments in mathematics and science courses, retention, achievement, and science and mathematics degrees received.
- Information on *Organizational Excellence:* Information provided by NSF on diversity initiatives, diversity statistics, the NSF Academy and the government-wide eTraining Initiative; information on performance management system improvements, employee recognition activities, innovative capital studies within NSF, the development and implementation of a human capital management plan, and eGovernment human resource initiatives; information on technology enabled business processes, government-wide grants management initiatives, the ePayroll initiative, compliance with the FY 2003 Federal Information Security Management Act (FISMA) Compliance, Greater IT Security Awareness Training Throughout Foundation, and activities associated with GPRA performance assessment.

Most of the data supporting quantitative goals can be found in NSF's central systems. These central systems include the Enterprise Information System; FastLane, with its Project Reporting System and its Facilities Performance Reporting System; the Online Document System; the Proposal and Reviewer System; the Awards System; the Electronic Jacket; and the Financial Accounting System. These systems are subject to regular checks for accuracy and reliability.

Data/Information Limitations

With respect to the *Ideas, Tools*, and *People* strategic outcome goals, the AC/GPA is provided with access to recent Committee of Visitor reports and program assessments conducted by external programmatic expert panels, principal investigator project reports, award abstracts. Because it is impractical for an external committee to review the contributions to the associated performance goals by each of the 22,000 active awards, NSF program officers provided the Committee with nearly 900 summaries of notable results relevant to the performance indicators. Collections obtained from expert sampling of outstanding accomplishments ("highlights") from awards, together with COV reports and project reports, formed the primary basis for determining, through the recommendations of the external Advisory Committee for GPRA Performance Assessment, whether or not NSF demonstrated significant achievement in its strategic outcome goals for *Ideas*, *Tools*, and *People*. The approach to highlights

collection is a type of non-probabilistic sampling, commonly referred to as "judgmental" or "purposeful" sampling, which is best designed to identify notable examples and outcomes resulting from NSF's investments. It is the aggregate of collections of notable examples and outcomes that can, on their own, demonstrate significant agency-wide achievement in the strategic outcome goals. Nevertheless, the combination of COV reports, project reports, award abstracts, and notable accomplishments covers the entire NSF portfolio.

DATA VERIFICATION AND VALIDATION PROCESS

As in prior years, NSF used an independent, external consultant to conduct a verification and validation (V&V) review of all performance information and data reported in the FY 2006 PAR. IBM Global Business Services (IBM) conducted the V&V review based on guidelines issued by the Government Accountability Office.[5] GAO requires federal agencies to provide confidence that the policies and procedures underlying performance reporting are complete, accurate, and consistent. IBM assessed the validity of the data and reported results as well as verified the reliability of the methods used to collect, process, maintain and report data. IBM also reviewed NSF's information systems based on GAO standards for application controls. For the strategic outcome goals, IBM reviewed the processes NSF used to obtain external assessment of its goals.

In their October 2006 Report, IBM states:

> The National Science Foundation (NSF or the Foundation), as a federal agency, is subject to the performance reporting requirements of the Government Performance and Results Act (GPRA). In addition, NSF measures its programmatic performance using the Office of Management and Budget's Program Assessment Rating Tool (PART). These performance reporting requirements hold Federal agencies accountable for providing detailed information on their progress in meeting performance objectives. Accordingly, NSF measures itself against a series of GPRA and PART goals to help the agency achieve its mission and objectives.
>
> Government Accountability Office (GAO) auditing standards require Federal agencies to provide confidence that the policies and procedures underlying performance reporting are complete, accurate, and consistent. As such, NSF asked IBM Global Business Services to assess the validity of the data and reported results of its performance goals and to verify the reliability of the methods used to collect, process, maintain and report data for these performance measurement goals and objectives.[6] In this report, we detail the results of our review of NSF's GPRA and PART processes and results for FY 2006. We conducted a preliminary review after the third quarter and the formal review after the end of the fiscal year.
>
> NSF measures its annual performance against the four Strategic Outcome Goals of Ideas, Tools, People, and Organizational Excellence and 22 other performance goals. As of the end of FY 2006, we were able to verify the reliability of the processes and validate the accuracy of all four Strategic Outcome Goals as well as 21 of the 22 annual performance goals. Although we were able to only partially verify the reliability of the process for the remaining goal, we believe that NSF's reported outcome for this goal is consistent with the data collected.

[5] *GAO Guide to Assessing Agency Annual Performance Plans* (GAO/GGD-10.1.20)

[6] GAO defines "verification" as a means to check or test performance data in order to reduce the risk of using data that contains significant errors. GAO defines "validation" as a way to test data to ensure that no error creates significant bias.

Based on this comprehensive review, IBM has confidence in the systems, policies, and procedures used by NSF to generate the described performance measures. We strongly believe that NSF continues to take concerted steps to improve the quality of their systems and data on a yearly basis.

The executive summary of the IBM V&V Report may be found in Appendix 4c of this report.

STRATEGIC OUTCOME GOALS

The NSF Strategic Plan for FY 2003–FY 2008 established a programmatic framework for four long term strategic outcome goals: *Ideas*, *Tools*, *People*, and *Organizational Excellence*. The first three goals represent the outcomes from NSF investments in science and engineering research and education. The fourth goal focuses on the administrative and management activities of the agency, and ensures that NSF is a capable and responsive organization that supports the accomplishments of the other three strategic outcome goals.

To accomplish the NSF mission to promote the progress of science and engineering, NSF invests in the most capable people, supporting their creative ideas, and providing them with cutting-edge research and education tools. Within NSF, the agency strives to maintain a diverse, agile, results-oriented cadre of NSF knowledge workers and leadership in state-of-the-art business processes, tools, and technologies.

NSF's strategic outcome goals are defined as follows:

- *Ideas* – Discovery across the frontier of science and engineering, connected to learning, innovation, and service to society.
- *Tools* – Broadly accessible, state-of-the-art science and engineering facilities, tools, and other infrastructure that enable discovery, learning, and innovation.
- *People* – A diverse, competitive, and globally-engaged U.S. workforce of scientists, engineers, technologists, and well prepared citizens.
- *Organizational Excellence* – An agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices.

In FY 2006, the Advisory Committee for GPRA Performance Assessment (AC/GPA) determined that NSF demonstrated significant achievement in all performance indicators related to the four strategic outcome goals. The AC/GPA also determined that the Research & Development criteria of "Quality" and "Relevance" were demonstrated for the *Ideas*, *Tools*, and *People* goals, and that "Quality" had been demonstrated for *Organizational Excellence*. The AC/GPA evaluation process was validated by an independent external Verification and Validation review.[7] The AC/GPA report may be found at www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06206.

A summary of the strategic outcome goal results from FY 2002 through FY2006 is presented below.

FY 2002 – FY 2006 Strategic Outcome Goal Results
Number and Percent of Goals Achieved

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Strategic Outcome Goals	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)	4 of 4 (100%)

[7] For further information about the independent external verification and validation review, see Appendix 4c.

Strategic Outcome Goal 1

IDEAS: Discovery across the frontier of science and engineering, connected to learning, innovation, and service to society.

FY 2002–FY 2006 Performance Results				
FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
G	G	G	G	G
Green (G) indicates success				

Indicators	Results
NSF's performance is successful when, *in the aggregate*, results reported in the period FY 2006 demonstrate significant achievement in the majority of the relevant indicators: ▸ (Contributions) Enable people who work at the forefront of discovery to make important and significant contributions to science and engineering knowledge. ▸ (Collaborations) Encourage collaborative research and education efforts across organizations, disciplines, sectors, and international boundaries. ▸ (Connections) Foster connections between discoveries and their use in the service of society. ▸ (Underrepresented Individuals and Institutions) Increase opportunities for underrepresented individuals and institutions to conduct high quality, competitive research and education activities. ▸ (Identifying New Opportunities) Provide leadership in identifying and developing new research and education opportunities within and across S&E fields. ▸ (Cross-disciplinary) Accelerate progress in selected S&E areas of high priority by creating new integrative and cross-disciplinary knowledge and tools, and by providing people with new skills and perspectives. ▸ (Identifying New Opportunities) Support innovative research on learning and teaching that provides a scientific basis for improving science, technology, engineering, and mathematics education at all levels.	NSF has demonstrated significant achievement in all indicators.

Investments in *Ideas* support cutting-edge research that yield new and important discoveries and promote the development of new knowledge and techniques within and across traditional boundaries. These investments enable NSF to meet its mission of promoting the progress of science while at the same time helping to maintain the nation's capacity to excel in science and engineering, particularly in academic institutions. The results of NSF-funded research projects provide a rich foundation for broad and useful applications of knowledge and the development of new technologies. Support in this area also promotes the education and training of the next generation of scientists and engineers by providing them with an opportunity to participate in discovery-oriented projects.

FY 2006 Result: NSF achieved this goal. NSF is the only agency to invite an external advisory committee, the Advisory Committee for GPRA Performance Assessment (AC/GPA), to review its entire portfolio as part of the agency GPRA assessment process. The AC/GPA determined that NSF has demonstrated significant achievement for each of the performance indicators associated with this goal.

Implications for the FY 2007 Performance Plan: This goal has been updated in NSF's new Strategic Plan for FY 2006-FY 2011.

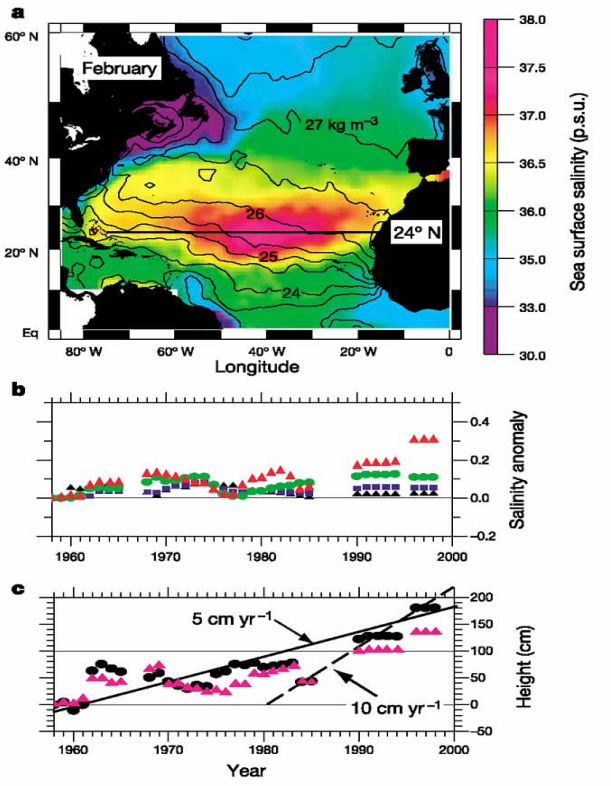
Comments from the Advisory Committee for GPRA Performance Assessment (AC/GPA):

The following statements are excerpted from the FY 2006 AC/GPA Report that may be found at www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06206. This report contains additional comments and examples in support of significant achievement for each indicator.

> The NSF portfolio is deep and rich in ideas. From novel discoveries in the basic sciences and engineering to educational advancements across the STEM disciplines, NSF has demonstrated continued commitment to its basic goals of pursuing the highest quality research, in novel and transformative ways, while broadening the participation in science and engineering of people from all parts of society. The breadth and depth of research topics supported by the NSF spans a vast array from cutting edge climate research in remote regions of our planet to fundamental discoveries in the engineering of nanoscale materials and biologicals. It is clear that programs throughout NSF are supporting high quality research at a variety of institutions, from a diverse group of investigators, and of a potentially transformative nature in a significant number of cases.
>
> The reach of NSF cuts across all disciplines, all educational sectors, and extends significantly across international boundaries as evidenced by the large-scale interdisciplinary and internationally focused projects that have been funded. The global impact of NSF's reach is readily apparent from the portfolio of funded projects reviewed by the advisory committee.
>
> The relevance of NSF-sponsored research to societal needs is dramatic and direct as evidenced by the research on such topics as identifying terrorism targets; producing more energy-efficient, environmentally sound materials; and assessing and reducing costs associated with structures built to withstand earthquakes. The impact of these research projects will be local, national, and potentially global from the various types of research projects that are underway.
>
> There is good evidence that many sectors of NSF can demonstrate progress toward broadening participation. There is also evidence that some directorates are not demonstrating clear commitment to this goal in ways that can be tangibly measured. We urge that more uniformity be applied across directorates with regard to reporting on this goal.
>
> NSF appears to be leading the effort to identify and develop new research and educational opportunities that cut across various science and engineering fields. Examples of large-scale, cross-cutting projects indicate a high level of commitment by NSF to novel, sometimes high-risk, research and dissemination efforts. New tools, new perspectives and integration across the disciplines have been demonstrated in a variety of projects from information technology to biotechnology. Combinations of approaches from the different disciplines are providing novel opportunities to solve large-scale problems.
>
> And finally, the impact of projects designed to improve STEM education at all levels is manifested in a variety of projects that take full advantage of the scientific method as a means of engaging students at all levels in the excitement of scientific inquiry. Making science and mathematics accessible and interesting to students of all ages is a goal of a number of projects sponsored by NSF. Indeed this will position NSF well for responding to the National Academies report *Rising Above the Gathering Storm*, and we look forward to even more creative programming efforts on the part of NSF with regard to STEM education. In particular, efforts to address similar challenges in engineering education need to be enhanced significantly. We believe the NSF has the opportunity to be a significant driver in the improvement and enhancement of STEM education generally and engineering education most particularly.

Recent Performance Highlights: The following are some results reported in FY 2006 by the science and engineering research and education community supported by NSF. These examples demonstrate NSF leadership in emerging science and engineering research frontiers and how new discoveries can benefit society and improve the quality of life for all citizens. Additional results may be found at www.nsf.gov/discoveries/.

► **Saltier Tropical Oceans and Fresher Ocean Waters Near the Poles Show Further Signs of Global Climate Change's Impacts:** Tropical ocean waters have become dramatically saltier over the past 40 years, while oceans closer to Earth's poles have become fresher, according to a recent study led by Ruth Curry of the Woods Hole Oceanographic Institution and funded by NSF. Curry and her colleagues reached this conclusion by comparing recent and historical records of salinity over the entire Atlantic Ocean. They found that tropical and subtropical regions of the Atlantic have become markedly saltier since 1861, when record-keeping began, while the waters in high latitudes of the North and South Atlantic have generally become fresher.

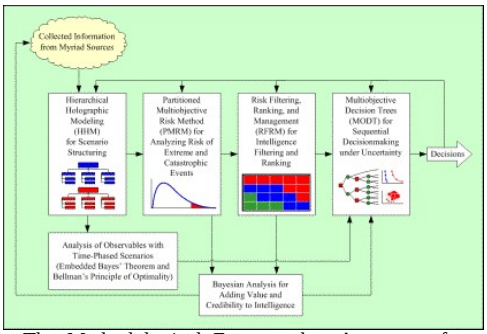


Map of the Nordic Seas with ocean circulation. Surface currents are shown as solid pathways; deep currents are dashed; water temperature is colored. *Credit: Ruth Curry/WHOI.*

This is presumably the result of increased evaporation from the ocean as Earth's temperature goes up. The scientists estimated that evaporation rates over the tropical Atlantic have increased by five percent to ten percent over the past four decades. Moreover, they found that the salinity trends have accelerated since 1990, a period that encompasses ten of the warmest years on record.

The findings are particularly significant as pressure on freshwater resources has become critical in many areas of the world. An acceleration of the changes could affect the distribution, severity, and frequency of droughts, floods, and storms. It could also fuel global warming by rapidly adding more water vapor, itself a heat-trapping greenhouse gas, to the atmosphere. And it could continue to freshen North Atlantic Ocean waters to a point that could disrupt ocean circulation, heavily dependent on gradients in salinity, and trigger further worldwide climate changes.

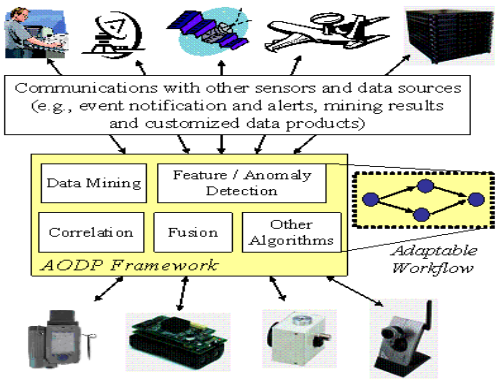
► **A Scenario-based Method for Identifying Terrorism Targets:** Yacov Haimes and his colleagues at the University of Virginia have developed a scenario-based "game" for identifying and prioritizing security vulnerabilities related to critical infrastructure. The game is built around an interactive, multidimensional analysis method called the hierarchical holographic method (HHM) developed by the same team. The team has refined and extended this innovative risk-assessment methodology by working on real terrorism-assessment problems. By combining research and development with application studies, the risk assessment method is



The Methodological Framework: A process for scenario-based tracking used to identify and prioritize security vulnerabilities of critical infrastructure. *Credit: Yacov Haimes, University of Virginia.*

simultaneously tested, improved, and used to help solve a pressing national problem.

Working with the Virginia Department of Transportation, the researchers have used the game to identify security vulnerabilities around a gubernatorial inauguration. And working with the Department of Homeland Security, they have used it to aid decision analysis associated with the department's color alert system. They have also analyzed risks to U.S. Army critical infrastructure to help prioritize protection of critical army assets.

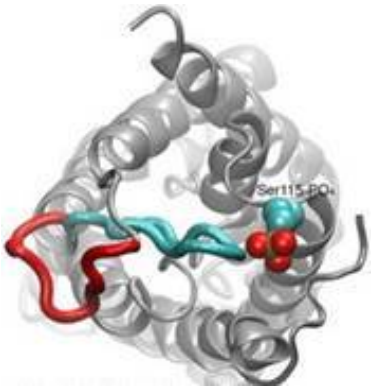


The AODP tool provides a framework to link components of a sensor network for on-board real-time data analysis and mining, event detection and autonomous behavior. *Credit: Information Technology and Systems Center, University of Alabama in Huntsville, 2004.*

► **Smart Sensors React Cooperatively:** The Adaptive On-Board Data Processing (AODP) research team is developing a unique approach for processing, integrating, and mining data acquired by a sensor network. The software will be used to detect complex phenomena based on information from multiple sensors deployed in settings that range from outer space to the ground.

Ideally, multiple processes in a sensor network should act independently, yet be able to coordinate and integrate their findings and results. For example, if one sensor detects a feature or an anomaly, it should automatically alert other sensors to increase their monitoring of a specific area. Final outcomes of the AODP research will include a method to enable sensor networks that are autonomous, intelligent, and applicable to a wide range of environments; data analysis and mining components that can be used in intelligent sensor networks; a processing system capable of adaptable workflow execution within the sensor network; and creation of a sensor network testbed for continued research and development.

► **Gating Mechanism in Plant Water Channels Visualized:** Scientists now know the three-dimensional structure of a plant aquaporin – a specialized protein that creates a "water channel" to regulate the flow of water in and out of the plant's cells. The collaborative effort involved experts in protein structure and computer modeling. Together, the team was able to gain a detailed understanding of the structure and function of the gating mechanism used by spinach aquaporins.



Scientists determined the three-dimensional structure of plant aquaporins – specialized proteins that regulate the flow of water in and out of the plant's cells. *Credit: Klaus Schulten, University of Illinois at Urbana-Champaign.*

Although aquaporins are present in all life forms, land plants use them to control the flow of water through their water channels. In effect, the plants use them as gates that open and close in response to drought, flooding, and biochemical signals like pH. Without these gates for example, the flower in the office window would not survive the weekend without watering. Knowing how the molecular gates function will help scientists determine how the closed structure might be stabilized or destabilized, thereby leading to new strategies to help plants conserve water in drought conditions, or alternatively, stop them from taking up too much water when fields are flooded.

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Strategic Outcome Goal 2

TOOLS: Broadly accessible, state-of-the-art, science and engineering facilities, tools, and other infrastructure that enable discovery, learning, and innovation.

FY 2002–FY 2006 Performance Results				
FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
G	G	G	G	G
Green (G) indicates success				

Indicators	Results
NSF's performance is successful when, *in the aggregate*, results reported in the period FY 2006 demonstrate significant achievement in the majority of the relevant indicators: ▸ (Expand Access) Expand opportunities for U.S. researchers, educators, and students at all levels to access state-of the-art S&E facilities, tools, databases, and other infrastructure. ▸ (Next Generation Facilities and Platforms) Provide leadership in the development, construction, and operation of major, next-generation facilities and other large research and education platforms. ▸ (Cyberinfrastructure) Develop and deploy an advanced cyberinfrastructure to enable all fields of science and engineering to fully utilize state-of-the-art computation. ▸ (Data Collection/Analysis) Provide for the collection and analysis of the scientific and technical resources of the U.S. and other nations to inform policy formulation and resource allocation. ▸ (Instrument technology) Support research that advances instrument technology and leads to the development of next-generation research and education tools.	NSF has demonstrated significant achievement in all indicators.

As the issues researchers face increasingly involve phenomena at or beyond the limits of our measurement capabilities, their study requires the use of new generations of powerful tools. NSF investments provide state-of-the-art tools for research and education, such as distributed instrumentation networks and arrays, multi-user facilities, digital libraries, accelerators, telescopes, research vessels, aircraft, and earthquake simulators. In addition, funding devoted to the *Tools* strategic outcome area provides resources needed to support large surveys and databases as well as computational and computing infrastructures for all fields of science, engineering, and education.

NSF provides support for large multi-user facilities that meet the need for state-of-the-art, world-class research platforms vital to new discoveries and the progress of research. NSF support may include construction, upgrades, operations, maintenance, and personnel needed to assist scientists and engineers in the conduct of research at such facilities. NSF consults with other agencies and international partners to avoid duplication and optimize capabilities for American researchers.

All of these investments enable NSF to meet its mission of promoting the progress of science, while responding specifically to direction in the NSF Act of 1950 to foster and support the development and use of computer and other scientific and engineering methods and technologies, primarily for research and education in the sciences and engineering.

FY 2006 Result: NSF achieved this goal. NSF is the only agency to invite an external advisory committee, the Advisory Committee for GPRA Performance Assessment (AC/GPA), to review its entire

portfolio as part of the agency GPRA assessment process. The AC/GPA determined that NSF has demonstrated significant achievement for each of the performance indicators associated with this goal.

Implications for the FY 2007 Performance Plan: This goal has been updated in NSF's new Strategic Plan for FY 2006-FY 2011.

Comments from the Advisory Committee for GPRA Performance Assessment (AC/GPA): The following statements are excerpted from the FY 2006 AC/GPA Report that may be found at www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06206. This report contains additional comments and examples in support of significant achievement for each indicator.

> To accomplish NSF's mission, NSF must not only invest in people and ideas, but it must also invest in the necessary TOOLS to support those people and ideas – so that the overall job can be accomplished both efficiently and effectively. The Committee's assessment for the TOOLS strategic outcome goal is that NSF has attained significant achievement in all indicators. The Committee also concluded that the projects contained in the TOOLS portfolio exhibited both high quality and high relevance.
>
> Based upon the Committee's findings, and as supported by the "nuggets" from various new and ongoing research projects and review of the many documents and resources made available to the Committee during the term of its review of NSF performance, the TOOLS subgroup has unanimously concluded that NSF has demonstrated both relevance and quality. The R&D programs under the TOOLS performance indicator are important investments and appropriate and deemed to be of very high quality. Based on evidence provided directly to the Committee, it was not possible to independently gauge overall "performance" because we were only provided with a sample of the best nuggets, not a representative sample of all work performed. However, our review of the COV reports, which did evaluate representative samples of all projects, indicates that performance was also excellent across the board. Our concerns in the indicator related to next generation facilities and platforms are discussed more fully below.
>
> The current NSF strategic plan for FY 2005 (2003 – 2008) dated September 30, 2003, is in place and includes a "GPRA Goal Structure" aimed at balancing expenditures for IDEAS, TOOLS, PEOPLE, and ORGANIZATIONAL EXCELLENCE. The amount budgeted for TOOLS, when compared to the needs for the other performance indicators set forth in the strategic plan, was 25% of the total NSF budget. During 2005, of the total NSF budget, which amounted to $5.4 billion, TOOLS equaled $1.375 billion. Thus, if expenditures can be used as a rough measure of performance, assuming expenditures were appropriately controlled, and we are confident they were, TOOLS expenditures met the performance goal in terms of allocation of resources. Alignment between strategic plan goal structure and FY 2005 expenditures was therefore achieved from a budget and expenditure standpoint.

In its recommendations to NSF, the AC/GPA suggested that NSF encourage more innovative, high risk or "bold" research, in addition to basic research, to balance the agency portfolio and enhance national competitiveness. Noting that it is important to balance innovation (converting knowledge into dollars) against basic research (converting dollars into knowledge), the Committee stated that "…the goal of supporting paradigm-shifting leading edge research, invention, and knowledge creation can remain a key part of the portfolio. However, the [Committee] recommends balancing the research portfolio to include more emphasis on innovation."

Recent Performance Highlights: The following are some results reported in FY 2006 by the science and engineering research and education community supported by NSF. These examples demonstrate NSF leadership in emerging science and engineering research frontiers and how new discoveries can benefit society and improve the quality of life for all citizens. Additional results may be found at www.nsf.gov/discoveries/.

NEES investigators at UCSD's Seven Story Test Model. *Credit: Prof. Jose Restrepo, Department of Structural Engineering, University of California at San Diego.*

► **Cost Effective and Earthquake Resistant:** By applying innovative, intelligent design strategies, structural engineers at the University of California, San Diego, have successfully shown that new light-weight construction techniques are as earthquake-resistant as bulkier, more expensive methods. By erecting a seven-story test building on a giant outdoor shake table – which is part of the NSF-supported Network for Earthquake Engineering Simulation (NEES) – the engineers duplicated the force of California's devastating 1994 Northridge Earthquake. Data from this test confirmed that novel designs and carefully placed reinforcements are just as effective at withstanding earthquake damage as the heavily reinforced, "hardened" buildings required by California building codes. Full-scale tests of such large buildings have previously not been possible because of weight, space, and technical limitations of smaller indoor shake tables. The NEES shake table at UCSD can actually support a building roughly 10 times heavier than the one tested in this study.

► **Gemini Telescopes Expand Their Capability:** The powerful suite of instruments within each of the Gemini telescopes now follow a queue system, making the structures the most flexibly scheduled ground-based telescopes ever.

Gemini South telescope at twilight. *Credit: Gemini Observatory.*

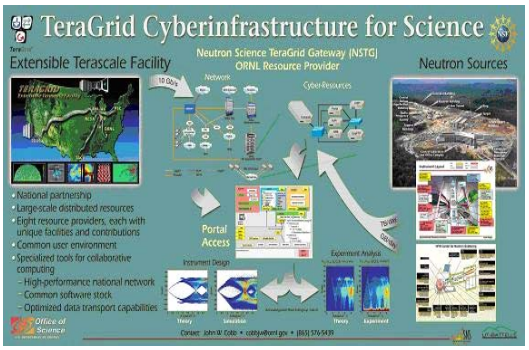
Each cluster of imaging and spectroscopic instruments permits Gemini scientists to observe over a remarkably broad spectrum, from the optical through the near-infrared and into the mid-infrared regions of the electromagnetic spectrum. Because of its technique of queue observing, Gemini can use any of these instruments at any point during a night, allowing observers to fine-tune their efforts to the nightly weather and sky conditions. Switching between instruments takes no longer than moving to a new target. This unique and powerful multi-instrument queue brings a new level of efficiency to Gemini operations.

► **Center for Remote Sensing of Ice Sheets:** A group of NSF-supported researchers at the Center for Remote Sensing of Ice Sheets (CReSIS) are developing new sensors, platforms, and cyberinfrastructure tools that will lead to a better understanding of Antarctic and Greenland ice sheets and how they contribute to sea level change. Because of the immense size and complexity of these ice sheets, data from satellite and airborne platforms, combined with ground-based measurements and observations, are needed to accurately assess them. One of the new radar-based sensors can produce a high-resolution map of layers within the ice, and has produced the first image of 3-km thick ice. The technological innovations will provide long-term benefits to the polar community and also have wide applications outside of the polar community.

Collecting data in Greenland. *Credit: CReSIS, University of Kansas.*

The tools being developed under CReSIS will lead to a better understanding of polar ice sheets and how they contribute to sea level change. Because of the immense size and complexity of these ice sheets, data from satellite and airborne platforms, combined with ground-based, in-situ measurements and observations, are needed to accurately assess their mass balance state. Technological innovations are being made in three areas, including sensors, platforms, and cyberinfrastructure. The next generation of researchers should reflect the diversity of our society. To this end, the Center is working closely with two minority-serving institutions, Haskell Indian Nations University in Lawrence, Kansas, and Elizabeth City State University in Elizabeth City, North Carolina. The Center is conducting extensive outreach and education programs to attract minority students to careers in science and technology.

► **Neutron Science Gateway:** Researchers at the Department of Energy's Oak Ridge National Laboratory and at NSF's TeraGrid project have developed the Neutron Science TeraGrid Gateway (NSTG), a Web-based "science community portal." Many such community portals have emerged in recent years as scientists have struggled to coordinate widely scattered teams working on massive experimental data sets. The idea is to provide a single point of access to all the data, as well as to the many types of data-analysis and simulation tools developed by the community as a whole.



Neutron Science Gateway. *Credit: John W. Cobb, ORNL.*

In the case of the NSTG portal, the data are currently coming from the High Flux Isotope Reactor at Oak Ridge, where scientists from around the United States are using neutron scattering to explore basic issues in chemistry, materials, nanotechnology, biosciences, and earth science. But eventually – and this has been the NSTG's primary purpose all along – the data will be coming from the DOE's much more powerful Spallation Neutron Source (SNS), now nearing completion in Oak Ridge. Scientists have already used the analysis and simulation tools available in NSTG to refine the design of an instrument planned for deployment on the SNS: a high resolution Chopper Spectrometer called Sequoia.

Strategic Outcome Goal 3

***PEOPLE:* A diverse, competitive, and globally-engaged U.S. workforce of scientists, engineers, technologists, and well-prepared citizens.**

FY 2002–FY 2006 Performance Results				
FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
G	G	G	G	G
Green (G) indicates success				

Indicators	Results
NSF's performance is successful when, *in the aggregate*, results reported in the period FY 2006 demonstrate significant achievement in the majority of the relevant indicators: ▸ (Greater Diversity) Promote greater diversity in the science and engineering workforce through increased participation of underrepresented groups and institutions in all NSF programs and activities. ▸ (Global S&E Workforce) Support programs that attract and prepare U.S. students to be highly qualified members of the global S&E workforce, including providing opportunities for international study, collaborations and partnerships. ▸ (Continuous Learning) Develop the Nation's capability to provide K-12 and higher education faculty with opportunities for continuous learning and career development in science, technology, engineering, and mathematics. ▸ (Public Understanding of Science) Promote public understanding and appreciation of science, technology, engineering, and mathematics, and build bridges between formal and informal science education.	NSF has demonstrated significant achievement in all indicators.

Leadership in today's knowledge economy requires world-class scientists and engineers and a national workforce that is scientifically, technically, and mathematically strong. Investments in *People* aim to improve the quality and reach of science, engineering, and mathematics education and enhance student achievement. Each year, NSF supports almost 200,000 people – teachers, students, and researchers at every educational level and across all disciplines in science and engineering. Embedded in all NSF programs are efforts to build a more inclusive, knowledgeable, and globally engaged workforce that fully reflects the strength of the nation's diverse population. Because science and engineering increasingly address global questions of significant societal importance, today's research requires globally-engaged investigators working collaboratively across agencies and international organizations to apply the results of research to long-standing global challenges.

FY 2006 Result: NSF achieved this goal. NSF is the only agency to invite an external advisory committee, the Advisory Committee for GPRA Performance Assessment (AC/GPA), to review its entire portfolio as part of the agency GPRA assessment process. The AC/GPA determined that NSF has demonstrated significant achievement for each of the performance indicators associated with this goal.

Implications for the FY 2007 Performance Plan: This goal has been updated in NSF's new Strategic Plan for FY 2006-FY 2011.

Comments from the Advisory Committee for GPRA Performance Assessment (AC/GPA): The following statements are excerpted from the FY 2006 AC/GPA Report that may be found at

www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06206. This report contains additional comments and examples in support of significant achievement for each indicator.

The NSF People Strategic Outcome Goal, which is to create "a diverse, competitive and globally-engaged U.S. workforce of scientists, engineers, technologists and well-prepared citizens," is central to ensuring that our nation continues to enjoy the high quality of life and security that this and previous generations worked so hard to create.

The Committee found significant achievement for each indicator established for the assessment. Based on the review of project accomplishments (nuggets), COV reports, and other relevant materials, the quality of projects and programs was determined to be high and relevant to the People Strategic Outcome Goal. Many of the projects reviewed have high relevance to the development of a strong workforce and to public understanding of science. Projects contributing to the People goal were found to include goals and accomplishments considered to be bold and at the frontiers of science, engineering, and education.

The Committee is concerned that focused investment in people occurs primarily in EHR. Our preliminary analysis indicates that programs in the science and engineering directorates specifically targeted at creating a diverse competitive and globally-engaged U.S. workforce of scientists, engineers, technologists and well-prepared citizens ranges from ~ two to 14% of the total budget. We would recommend that every directorate explore the potential for additional opportunities to contribute to NSF's workforce-for-the-21st-century goals.

Looking to the future, the Committee expressed concern about the direction of the workforce development that must be the cornerstone of the growth of science within the nation. NSF has been admirable in establishing a culture within which a growing number of underrepresented groups are included in the future of science. There is concern, however, that this inclusion often is limited to the first layer of response, namely, the mere number of people from these groups. As the need for a well developed workforce increases, greater efforts must be made to ensure true inclusion of all people and institutions. Partnerships with minority-serving institutions must be infrastructure and science partnerships, not solely external student research opportunities. Student training must be the right balance between rigor and exposure. Funding must have the appearance of a true meritocracy, where the ideas are more important than the institution in which one resides. Innovative science teaching models must not only be discussed and developed, but also implemented. The mission of NSF clearly establishes the goals of a diverse workforce in science. While we applaud NSF commitment to this goal and are very pleased in the programs established, we look forward in anticipation to the innovative and proactive solutions for which NSF is known, so that in the near future the need for specific diverse workforce programs will be eliminated.

We are heartened that NSF continues to recognize the importance of strengthening the STEM workforce by striving to attract more US citizens into STEM fields. Many youngsters have the impression, however, that they can earn better salaries in other fields, such as medicine, law, or business. We suggest that NSF collaborate with experts in marketing to mount or support more-aggressive campaigns that demonstrate not only the excitement of these careers but also the opportunity to earn lucrative salaries and advance into other careers as well.

In this context, we recommend strongly that NSF intensify efforts to identify, nurture, and develop the next generation of leaders of the STEM workforce, those who will provide the vision and set the agenda for the nation's future scientific, technological, and hence economic leadership, and the benefits to humankind that these will afford. Without leadership, the enterprise cannot go forward.

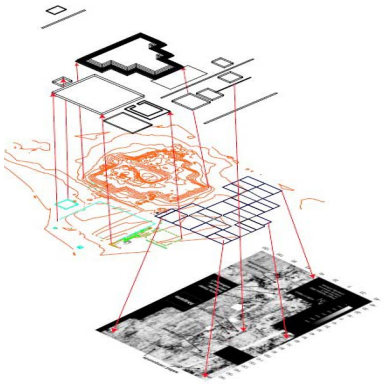
Recent Performance Highlights: The following are some results reported in FY 2006 by the science and engineering research and education community supported by NSF. These examples demonstrate NSF leadership in emerging science and engineering research frontiers and how new discoveries can benefit society and improve the quality of life for all citizens. Additional results may be found at www.nsf.gov/discoveries/.

► **Using "Squishy Materials" to Teach Physics:** Is peanut butter a liquid or a solid? At times it seems like a solid: a glob of peanut butter will hold its shape over a period of time. Over a longer time, however, it will flow like a liquid. Materials that behave in this manner are called complex fluids. Some of them change from solid-like to liquid-like, and vice versa, in response to changes in pressure. Many household items are examples, such as creams, shampoo, toothpaste, and ketchup. At Emory University, researchers study the physics of complex fluids to better understand their behavior. The group is interested in learning how a material's microscopic structure relates to its macroscopic behavior, such as determining how easy is it for a material to spread, flow, or compress – especially in confined spaces.

Postdoctoral fellow Dr. Denis Semwogerere shows a microscopic view of a squishy material. *Credit: Dr. Eric Weeks, Emory University.*

The Emory researchers have used activities involving "squishy materials" to interest schoolchildren in science. The laboratory has hosted groups from kindergarten through 8th grade, and children have the opportunity to study properties of these materials through age-appropriate hands-on activities. The excitement of doing physics research is conveyed to the children during these visits. The laboratory also has a popular website that contains extensive information on using complex fluids to teach freshman students (no matter which major they are pursuing) about current physics research while providing researchers particle tracking software and associated tutorials.

► **Computing and Mapping Archaeological Structures in Three Dimensions:** In a development that could change the way archaeologists conduct excavations, a multidisciplinary team of computer scientists and applied mathematicians has given them the ability to preview sites where the structures of interest are still underground. By precisely mapping the electric and magnetic fields at ground level on the site, and by simultaneously probing into the earth with a downward-looking radar system known as "Georadar," the researchers were able to precisely locate buried architectural and related features. The resulting data were used to produce subterranean atlases that cover several square kilometers in Tiwanaku, Bolivia, and Machu Picchu, Peru. Each atlas serves as an indication of where to dig and as a repository for comparing structures and studying differences in historical periods.



Computer scientists have produced detailed underground atlases of archaeologically significant sites. *Credit: University of Pennsylvania and University of Arkansas, 2005.*

A team of undergraduate students was also active in the project. Students from the University of Pennsylvania, the University of Arkansas, and Denver University spent two months at the research sites.

► **Marine Advanced Technology Education Center Organizes Remotely Operated Vehicle Competition for Students:** In June 2005, students from around the United States gathered at the NASA Johnson Space Center's Neutral Buoyancy Lab for the fourth annual international Student Remotely Operated Vehicle (ROV) competition.

The competition is coordinated every year by the Marine Advanced Technology Education (MATE) Center at Monterey Peninsular College in Monterey, Calif., and the Marine Technology Society's ROV Committee. MATE is an NSF-funded Advanced Technological Education Center of Excellence.

The Polar Submersibles ROV team gets wet in a practice session in Fairbanks, Alaska. *Credit: Patrick Endres.*

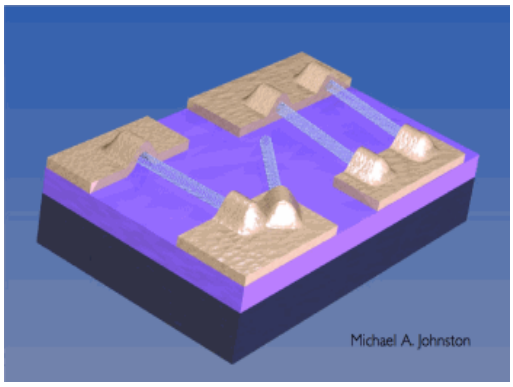
More than 2,000 students, from middle schoolers to college seniors, have participated in the competition since it began in 2001. Currently more than 60 organizations and 70 industry professionals support the events by contributing funds, facilities, equipment, building materials, and time and technical expertise as team mentors, judges, and technical advisors. The MATE center is partnering with the National Office for Integrated and Sustained Ocean Observations and the Ocean Research Interactive Observatory Networks (ORION) Program to challenge teams to develop ROVs to support ocean-observing systems in the 2006 competition.

► **Silicon Chips With Nanotube "Sprinkles" Show Promise for Electronics:** University of Pennsylvania's Danvers Johnston, a student in NSF-supported Integrative Graduate Education and Research Traineeship program, and his advisor, physicist Charlie Johnson, have developed a new method of depositing carbon nanotubes on the surface a silicon chip – a technique that could help pave the way toward high-quality nanoelectronic devices.

First, the scientists suspend the raw nanotube material in water, explains Johnston. And then, he says, "We dip the chips into nanotubes, much like dipping an ice cream cone in candy." Tests on the chip show the nanotubes that cling to its surface retain their unique electronic properties.

Even though commercial use of carbon nanotubes in electronics is probably a decade away, the technique opens the door for other solution-based methods that could one day be used to sort the nanotubes and select those that exhibit desired properties.

Illustration of an electronic circuit produced by Johnston *et al's* method. Carbon nanotubes connect gold contact pads across a silicon surface. *Credit: Yury Gogotsi and Dawn Bonnell.*



Strategic Outcome Goal 4

***ORGANIATIONAL EXCELLENCE:** An agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices.*

FY 2002–FY 2006 Performance Results				
FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
G	G	G	G	G
Green (G) indicates success				

Indicators	Results
NSF's performance is successful when, *in the aggregate*, results reported in the period FY 2006 demonstrate significant achievement in the majority of the relevant indicators: ▸ Human Capital Management--develop a diverse, capable, motivated staff that operates with efficiency and integrity. ▸ Technology-enabled Business Process--utilize and sustain broad access to new and emerging technologies for business application. ▸ Performance Assessment--develop and use performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness. ▸ Merit Review--operate a credible, efficient merit review system.	NSF has demonstrated significant achievement in all indicators.

Excellence in managing NSF's activities is critical to achievement of NSF's mission-oriented outcome goals. Long-term investment categories include *human capital*, which produces a diverse, agile, results-oriented cadre of knowledge workers committed to enabling the agency's mission and to constantly expanding their abilities to shape the agency's future; *business processes*, which produce effective, efficient, strategically-aligned business processes that integrate and capitalize on the agency's human capital and technology resources; and *technologies and tools*, which produce flexible, reliable, state-of-the-art business tools and technologies designed to support the agency's mission, business processes, and customers.

FY 2006 Result: NSF achieved this goal. External experts provided examples of significant achievement during FY 2006. See the comments by the AC/GPA and the examples they selected as indicative of achievement of this goal.

Implications for the FY 2007 Performance Plan: This goal has been updated in NSF's new Strategic Plan for FY 2006-FY 2011.

Comments from the Advisory Committee for GPRA Performance Assessment (AC/GPA): The following statements on *the Organizational Excellence* goal, which take into account the findings of the Advisory Committee for Business and Operations (AC/B&O), are excerpted from the FY 2006 AC/GPA Report. This report contains additional comments and examples in support of significant achievement for each indicator; see www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06206.

> The OE strategic outcome goal was added to the NSF Strategic Plan for FY 2003-2008 and helped to recognize the linkages between excellence in advancing science and excellence in organizational development. NSF's merit review process is the keystone for award selection,

through which NSF achieves its goals. All proposals for research and education projects are evaluated using two criteria: the intellectual merit of the proposed activity and its broader impacts. Specifically addressed in these criteria are the creativity and originality of the idea, the development of human resources, and the potential impact on the research and education infrastructure. Ensuring a credible, efficient system requires constant attention and openness to change.

The Advisory Committee for Business and Operations (AC/B&O) provides an assessment of the first three OE indicators (Human Capital, Technology-enabled Business Processes, and Performance Assessment), and the AC/GPA conducts an assessment of the Merit Review indicator. To perform this latter assessment, the 2006 AC/GPA used data and information from the:

- 2005 Committee of Visitors reports addressing Merit Review and Organizational Excellence
- 2005 Report to the National Science Board on the National Science Foundation's Merit Review Process (NSB-06-21)
- 2005 Report of the National Science Board on the National Science Foundation's Merit Review System (NSB-05-119)
- 2006 AC/B&O Assessment

Overall Findings: In conjunction with the findings of the AC/B&O and our own review of the Merit Review indicator, the OE subgroup concludes that the NSF has demonstrated significant achievement and quality in all four indicators of *Organizational Excellence*.

Overview (including highlights taken from the Report to the NSB on the NSF Merit Review Process): The merit review system is highly effective, trusted, and respected by participants within the science community. The process is thorough and has well-designed contingencies for handling non-procedural issues and allows for continuous improvement. This is indeed an impressive accomplishment given the heterogeneity of the NSF portfolio (single investigator grants, center grants, facilities/research infrastructure grants) and the diversity of peer review mechanisms (mail review only, panel review only, combination of mail and panel review, combination of mail and site visit review, inter-division and directorate review, etc.). It is even more impressive given that proposal pressure has increased by 38% from 2001 to 2004 (in 2005 a slight decrease in proposal number occurred) leading to a declining success rate (33 % in 2000 to 23% in 2005). Despite severe budget constraints over the past five years, NSF has maintained an excellent and diverse program balance including single investigator grants, multi-investigator grants, center grants, and facilities grants and grants that promote high risk/high payoff "potentially transformative" grants. This success of this last category reflects the high quality of scientific knowledge and judgment of program managers and the Directorate/Division leaders. Statistically, there is no evidence of demographic bias in the award of grants during the period 2000-2005, which is an important result. The falling success rate is of concern, although the rate of decline is less for new awards (8%) than for those who have had prior awards (12%). Another important point is the percentages of standard grants and center/facilities/other grants have not changed significantly (2%) over the past five years. It is difficult to measure efficiency given that expected outcomes are generalized in solicitations, reports, and strategic goals.

The AC/GPA recommendations on *Organizational Excellence* focus on improving the reviewer management system, particularly with regard to reviewer and program officer training; the merit review

criteria, particularly explaining more clearly the broader impacts criterion; reducing program officer workload; and program officer training in general.

Recent Performance Highlights: The following are some of the results and achievements reported in FY 2006, which demonstrate NSF leadership in continuous improvement in the area of *Organizational Excellence*.

In the 2006 NSF Report to Employees, the Director and Deputy Director noted that NSF is recognized throughout the federal government as a leader for implementing outstanding results-oriented management practices and establishing collaborative partnerships with the scientific and federal communities. Among the accomplishments cited in this report are:

- NSF continues to maintain "Green" ratings for excellent management practices. NSF has sustained a "Green" rating for financial performance and eGov on the President's Management Agenda (PMA) scorecard for over four years. In FY 2006, NSF was only one of three federal agencies to achieve four or more "Green" ratings in the five primary PMA initiatives. NSF has also achieved "Green" ratings for its two PMA programmatic initiatives of Eliminating Improper Payments and R&D Investment Criteria.

- NSF received its eighth consecutive unqualified "clean" audit opinion.

- In both the Department of Treasury's Financial Management Service Scorecard and the CFO Council Metric Tracking System which tracks core financial metrics, NSF continued to have the most consistently high scores among all federal agencies.

- NSF is the only agency to receive the highest rating of "Effective" in all of its Program Assessment Rating Tool (PART) program evaluations from OMB.

- NSF received an "A" grade in the House Committee on Government Reforms study of 24 agencies' security practices.

- After NSF co-chaired the Grants Management Line of business (GMLoB) task force, OMB selected NSF as one of the initial three consortia leads.

- NSF's was awarded a Webby Award in a competition that Time Magazine calls the "online Oscars." NSF's website was named the "People's Choice" among the best government websites.

- NSF's *FY 2005 Performance Highlights* report received a League of American Communications Professionals (LACP) Honors Award at the 2005 Vision Awards. In a field of almost 2,000 entrants, NSF placed in the top 15 percent, and had the distinction of being the only federal government agency to be recognized for five years of distinction in its annual reports.

- NSF implemented AcademyLearn, a web-based learning management system to increase workforce productivity and aid in agency operations. AcademyLearn gives all employees access to approximately 2,000 professional and personal development online courses and provides proprietary e-business online tutorials.

ANNUAL PERFORMANCE GOALS

NSF has integrated its GPRA reporting with the Program Assessment Rating Tool (PART) evaluation process designed by the Office of Management and Budget (OMB). NSF's annual performance goals consist of the performance measures associated with NSF's PART programs and an agency-wide efficiency goal related to time-to-decision on funding recommendations. The FY 2006 annual performance goals consist of nine new goals and 13 goals reported in previous years. Those nine new goals are associated the following PART programs: Polar Research Support, Tools, and Logistics; the Institutions and Collaborations programs under the *People* strategic outcome goal; and Biocomplexity in the Environment.

The PART process has become a central component of NSF's performance framework. The PART examines program performance through a series of questions on program purpose and design, strategic planning, program management, and program results/accountability. After a program has been evaluated, follow-up actions or improvement plans are established, and the agency reports on its progress under those plans. NSF's PART evaluations were conducted on the investment categories identified in the FY 2003 – FY 2008 Strategic Plan.

To date, of the nearly 800 PART programs that have been evaluated across federal agencies, only 15 percent received the highest rating of "Effective." All 10 NSF programs have received the highest rating of "Effective." Summaries, detailed assessments, and improvement plans of NSF's PART programs may be found at www.whitehouse.gov/omb/expectmore/index.html.

The improvement plans associated with NSF's PART programs focus on performance goals and reporting, the merit review process, and yearly project reports by principal investigators. In the past year, NSF has made changes to its FastLane project reports tracking system to provide notification to all investigators that annual reports are due 90 days in advance of the 12-month anniversary date or expiration date of the award. NSF has also convened focus groups and gathered recommendations on improvements to the merit review system.

In FY 2006, NSF achieved 68 percent or 15 of its 22 annual performance goals. All time-to-decision goals were met, including the Foundation-wide goal and those for Individual Researcher, Research Institutions, and Research Collaborations under the *People* goal; and the two priority areas of Nanoscale Science and Engineering and Biocomplexity in the Environment (BE). NSF met two important *People* goals: increasing the number of graduate students supported in the Foundation's three flagship programs—Graduate Research Fellowships (GRF), Integrative Graduate Education and Research Traineeships (IGERT), and the Graduate Teaching Fellows in K-12 Education (GK-12) Program; and increasing the number of applications from investigators at minority serving institutions for the Faculty Early Career Development (CAREER) Awards program. In addition, NSF met the facilities operations goal, as well as the Polar research support goal.

NSF did not meet three of its goals under *People*: increasing the number of applicants for the GRF Program from groups that are underrepresented in the science and engineering workforce, and increasing the number of proposals from academic institutions not in the top 100 of NSF funding recipients for the Research Institutions and Research Collaborations programs. NSF did not meet its goals for increasing the percentage of proposals from female and minority investigators in the BE Program. In addition, NSF did not meet the goal for facilities construction, acquisition, and upgrade, and the goal for Polar research facilities cost and schedule variance.

With reference to goals not met, it is important to point out the following:

- For the Graduate Fellowships Broadening Participation goal, although the number of applicants from groups that are underrepresented in the science and engineering workforce did not increase, the percentage of applicants from those groups did increase in FY 2006.

- For the goals relating to increasing the percentage of proposals to the Research Institutions and Research Collaborations programs from academic institutions not in the top 100 of NSF funding recipients, the goal is ambitious, given the conflicting demand to decrease the number of program solicitations for research opportunities in an attempt to improve the NSF-wide funding rate for proposals. In addition, there is a lag time between taking action to increase broadening participation, for example through outreach, and receiving proposals at NSF.

- For the BE goals related to proposals from female and minority investigators, there are special circumstances. For example, since only two of the five BE programs (in the engineering and geosciences areas) requested proposals during FY 2006, the drop in percentage of proposals from female and minority investigators was not unexpected.

- For the facilities construction goal, only 3 of the 11 projects did not meet the goal, due primarily to changes in scope and schedules and unplanned costs. Action on these issues will be taken during future rebaselining of project performance measurements.

- For the Polar research facilities goal, the South Pole Station Modernization (SPSM) is reporting against cost and schedule baselines that will be revised when NSF receives its FY 2007 appropriation. The McMurdo Power Plant will also be rebaselined in the coming months. Once rebaselined, the cost and schedule performance for these projects will improve, resulting in lower variances than those reported for FY 2006.

NSF plans to address these factors and will continue to report progress in achieving the goals in the future. With regard to the PART programs, NSF's improvement plans are updated twice yearly in the spring and fall. As noted on the previous page, these PART improvement plans are available at www.whitehouse.gov/omb/expectmore/index.html.

A summary of FY 2006 results is presented in the following chart.

FY 2002 – FY 2006 Performance Results
Number and Percent of Goals Achieved

	FY 2002	FY 2003	FY 2004	FY 2005	**FY 2006**
Annual performance goals	14 of 19 (74%)	10 of 16 (63%)	23 of 26 (88%)	14 of 17 (82%)	**15 of 22 (68%)**

A detailed explanation of the FY 2006 result for each annual performance goal follows, with information on the PART Program to which it is related if appropriate, the specific measure and its purpose, and the implications for NSF's FY 2007 performance plan. If the goal was not achieved, an explanation is provided, along with statements about actions being taken to eliminate or reduce shortfalls in the future.

Results of FY 2006 Annual Performance Goals: 15 of 22 Goals (68%) Were Achieved	
●	1. Time-to-Decision
■	2. Facilities Construction, Acquisition, and Upgrades
●	3. Facilities Operation and Management
●	4. Polar Research Support
■	5. Polar Research Facilities
■	6. Graduate Fellowships: Broadening Participation
●	7. CAREER Awards: Broadening Participation
●	8. U.S. Students Receiving Fellowships
●	9. Individual Researchers: Time-to-Decision
■	10. Research Institutions: Proposals From Outside the Top 100 Institutions NSF Funds
●	11. Research Institutions: Time-to-Decision
■	12. Research Collaborations: Proposals From Outside the Top 100 Institutions NSF Funds
●	13. Research Collaborations: Time-to-Decision
●	14. Nanotechnology Network Users
●	15. Nanotechnology Network Nodes
●	16. Nanoscale Science and Engineering: Time-to-Decision
●	17. Nanoscale Science & Engineering: Proposals with Female Investigators
●	18. Nanoscale Science & Engineering: Proposals with Minority Investigators
●	19. Nanoscale Science & Engineering: Proposals with Multiple Investigators
■	20. Biocomplexity in the Environment: Proposals with Female Investigators
■	21. Biocomplexity in the Environment: Proposals with Minority Investigators
●	22. Biocomplexity in the Environment: Time-to-Decision
Key:	
●	Achieved goal
■	Did not achieve goal

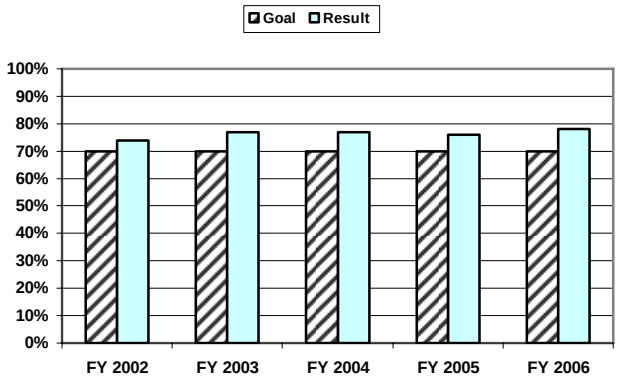
ANNUAL PERFORMANCE GOAL1: TIME-TO-DECISION (DWELL TIME)

Measure: For 70 percent of proposals, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or receipt date, whichever is later.

Purpose: To make proposal decisions available in a timely manner in order that investigators may more effectively plan activities.

FY 2006 Result: NSF achieved this goal. Considering the complexity and numbers of proposals received by NSF and the relative constancy of the number of staff to handle the review and recommendation of proposals, this is an ambitious goal for NSF as a whole, as it is increasingly difficult to maintain dwell time while performing quality merit review. This measure is a proxy for efficiency.

	Goal	Result
FY 2002	70%	74%
FY 2003	70%	77%
FY 2004	70%	77%
FY 2005	70%	76%
FY 2006	70%	78%



Implications For The FY 2007 Performance Plan:
This goal will be continued in FY 2007.

ANNUAL PERFORMANCE GOAL 2:
FACILITIES CONSTRUCTION, ACQUISITION, AND UPGRADES

PART Program: Construction and Operations of Research Facilities
PART ID: 10001145

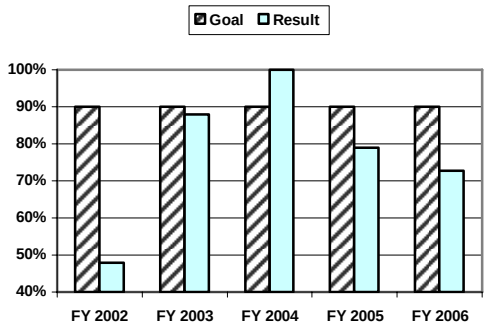
Measure: Percent of Construction, Acquisition, and Upgrade Projects with Negative Cost and Schedule Variances of Less Than 10 percent of the Approved Project Plan.

Purpose: To keep construction, acquisition, and upgrade project on time and within budget.

This measure reflects investments in the construction, acquisition, and upgrade of NSF-funded facilities. Investments in development and construction of state-of-the-art facilities and platforms are implemented consistently with planned cost and schedule. In FY 2002, NSF undertook a comprehensive internal review of the facilities goals. In FY 2003, NSF improved the construction goals by combining cost and schedule performance into a single goal. The revised goal assesses performance based on Earned Value Management, a widely accepted project management tool for measuring progress that recognizes that cost or schedule data alone can lead to distorted perceptions of performance. Beginning in FY 2004, Polar facilities were included in a separate Program Assessment Rating Tool (PART) evaluation and are not included under this goal for Facilities.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2002	90%	48%
FY 2003	90%	88%
FY 2004	90%	100%
FY 2005	90%	79%
FY 2006	90%	73%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: Three of the 11 construction projects did not meet this goal. One of the projects did not meet the *cost* goal due to scope and schedule changes and unplanned costs. Two of the projects did not meet the *schedule* goal: one due to errors in time distribution on the project, and the other principally due to deferral of some equipment purchases, in order to manage risk, until firm pricing for all project activities could be established. NSF will continue to work with project managers to help avoid obstacles to successful performance by requiring all projects funded by the Major Research Equipment and Facilities Construction appropriation to provide quarterly financial reports comparing budgeted expenditures to actual expenditures.

ANNUAL PERFORMANCE GOAL 3:
FACILITIES OPERATION AND MANAGEMENT

PART Program: Construction and Operations of Research Facilities
PART ID: 10001145

Measure: Percent of Operational Facilities that keep Scheduled Operating Time Lost to Less than 10 percent.

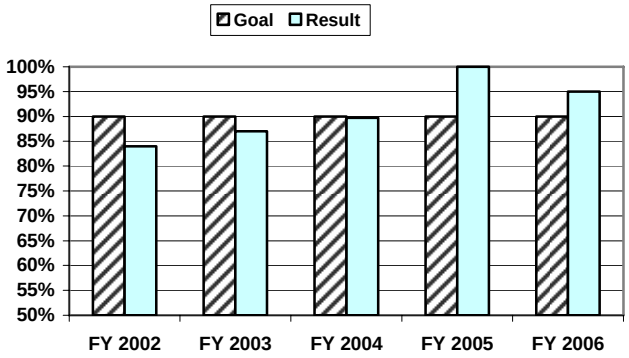
Purpose: To minimize lost operating time at NSF-funded facilities.

This measure reflects investments in the operation of state-of-the-art facilities and platforms. A modern and effective research infrastructure is critical to maintaining U.S. leadership in science and engineering. The future success of entire fields of research depends upon their access to new generations of powerful research tools. Increasingly, these tools are large and complex, and have a significant information technology component.

To provide the flexibility necessary for NSF to report realistic goals for operational large facilities, the level of success is maintained at 90 percent of those facilities. Beginning in FY 2005, the threshold for reporting was raised to $8 million per year, to provide consistent definitions of "large facilities." After several years of tracking this goal, it appears that facility managers are improving their ability to estimate and perhaps mitigate against unscheduled downtime.

FY 2006 Result: NSF achieved this goal.

	Goal	Result
FY 2002	90%	84%
FY 2003	90%	87%
FY 2004	90%	90%
FY 2005	90%	100%
FY 2006	90%	95%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 4:
POLAR RESEARCH SUPPORT

PART Program: Polar Research Tools, Facilities and Logistics
PART ID: 10002326

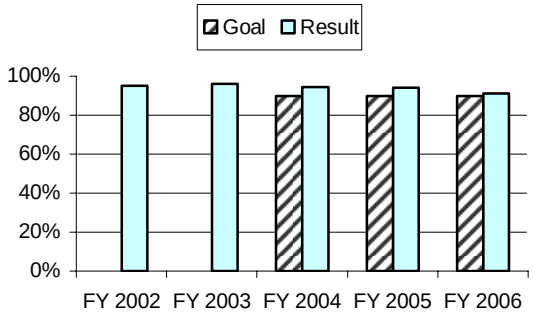
Measure: Percent of person (or project) days planned for Antarctic research for which the program is able to provide the necessary research support. (NEW GOAL FOR FY 2006)

Purpose: To maximize PI research time while on location in Antarctica.

This measure accounts for the number of days that the investigator was able to conduct research at the South Pole Station because the necessary research support was provided. It excludes research conducted off site in preparation for deployment to the Pole and lost time due to circumstances beyond the program's control (e.g. severe weather). Research support for the 181 current projects includes lab operation; facilities engineering, maintenance, and construction; communications operations; remote field camp support; cargo and passenger transportation; and housing management and janitorial services. This measure is a proxy for efficiency and compares results to original estimates.

FY 2006 Result: NSF achieved this goal. Research support data is compiled by the primary support contractor, Raytheon Polar Services Company (RPSC), based on post-trip surveys completed by investigators. In FY 2006, since only 52 principal investigators, or 29 percent, submitted surveys, RPSC extrapolated across the total project population to report results.

	Goal	Result
FY 2002	N/A	95%
FY 2003	N/A	96%
FY 2004	90%	94%
FY 2005	90%	94%
FY 2006	90%	91%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 5: POLAR RESEARCH FACILITIES

PART Program: Polar Research Tools, Facilities and Logistics
PART ID: 10002326

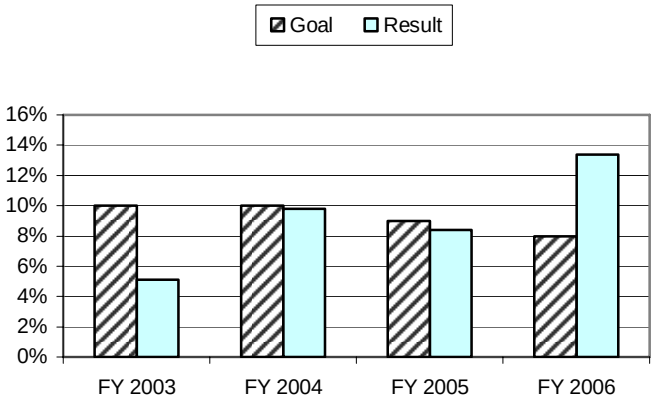
Measure: Percent of construction cost and schedule variances of major projects as monitored by Earned Value Management for Polar Facilities. (NEW GOAL FOR FY 2006)

Purpose: To keep polar construction projects on time and within budget.

This is a measure against planned cost and schedule for construction projects with a total project cost of at least $5 million. The result is an average of cost and schedule variances.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2003	10%	5%
FY 2004	10%	10%
FY 2005	9%	8%
FY 2006	8%	13%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: Two of the three Polar facilities projects did not meet this goal. One was due to reporting against an outdated cost and schedule baseline that will be revised when NSF receives its FY 2007 appropriation. The other was due to unplanned work (redesign of footing installation, reworking of the foundation, and resetting of the generators due to unforeseen site conditions) that caused cost increases and schedule delays. Once re-baselined, the cost and schedule performance for these projects will improve, resulting in lower variances than those reported for FY 2006.

ANNUAL PERFORMANCE GOAL 6:
GRADUATE FELLOWSHIPS: BROADENING PARTICIPATION

PART Program: Support for Individual Researchers
PART ID: 10001148

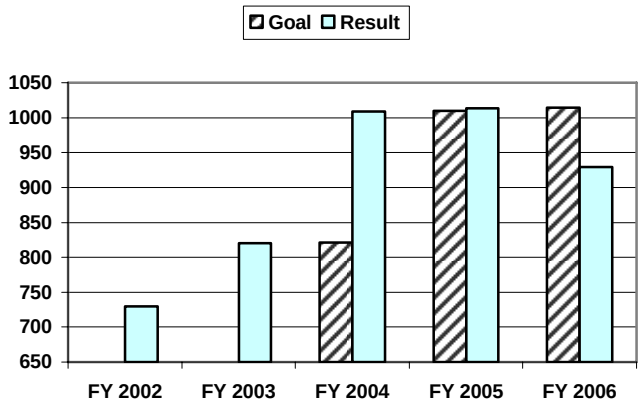
Measure: Number of applicants for the Graduate Research Fellowships Program (GRFP) from groups that are underrepresented in the science and engineering workforce.

Purpose: To increase the number of minority and/or underrepresented applicants submitting GRF proposals and to broaden participation in NSF STEM programs.

Graduate Research Fellowships are NSF's flagship investment in graduate education and training, and outreach efforts to increase the number of applicants from groups that are underrepresented in the science and engineering workforce are an ongoing priority within the Foundation. As with all demographic goals, the data come from voluntary self-reporting. Therefore, the number of applicants from underrepresented groups may actually be higher.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2002	N/A	730
FY 2003	N/A	820
FY 2004	821	1009
FY 2005	1010	1013
FY 2006	1014	929



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: Although the number of applicants from groups that are underrepresented in the science and engineering workforce did not increase from FY 2005 to FY 2006, the percentage of applicants did increase. In FY 2005, NSF received 9,133 applications, of which 1,013, or 11.09 percent were from groups that are underrepresented in the science and engineering workforce. In FY 2006, the number of applicants was only 8,162, of which 929, or 11.38 percent, were from those groups. There was a surge of applicants following the increase of the stipend to $30,000 in FY 2004, which lowered the success rate. The FY 2006 data suggest a decline in the number of applicants that is consistent with the community's awareness of the reduced success rate for this program. These trends are mirrored in the underrepresented populations. NSF will continue to encourage proposals from these groups.

ANNUAL PERFORMANCE GOAL 7:
CAREER AWARDS: BROADENING PARTICIPATION

PART Program: Support for Individual Researchers
PART ID: 10001148

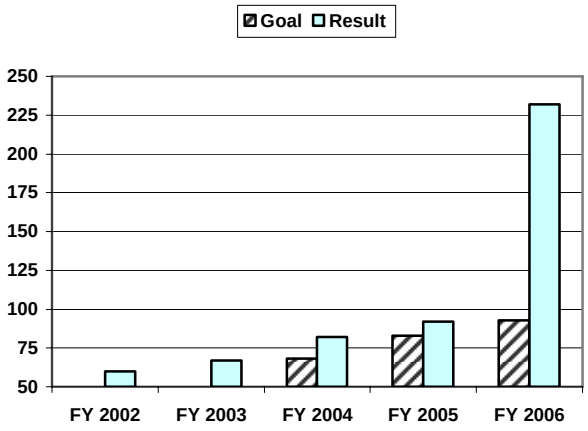
Measure: Number of applications for Faculty Early Career Development (CAREER) awards from investigators at minority serving institutions (MSIs).

Purpose: To develop and foster young faculty and to broaden the institutional base of applicants at MSIs.

The Faculty Early Career Development (CAREER) Program is an NSF-wide activity that supports junior faculty within the context of their overall career development. It combines in a single program the support of research and education of the highest quality and in the broadest sense. This premier program emphasizes the importance the Foundation places on the early development of academic careers dedicated to stimulating the discovery process in which the excitement of research is enhanced by inspired teaching and enthusiastic learning. Each year NSF selects nominees for Presidential Early Career Awards for Scientists and Engineers (PECASE) from among the first-year awardees supported by the CAREER Program. PECASE awards recognize outstanding scientists and engineers who are in the early stages in their careers, and show exceptional potential for leadership at the frontiers of knowledge. CAREER is NSF's flagship investment in the development of young faculty, and broadening the institutional base of applicants to the program is a continuing priority. Outreach efforts have specifically focused on attracting faculty from minority-serving institutions and from a broader geographic base.

FY 2006 Result: NSF achieved this goal. The dramatic rise in the number of applications may be due to an updating in FY 2006 of the list of minority serving institutions based on Department of Education data cross-referenced with NSF institution registrations. During that process, several institutions were added or dropped, with the net result that 119 more institutions were counted as MSIs in FY 2006. An MSI is defined as a Historically Black College and University (HBCU), a Hispanic-serving institution, or a Tribal College.

	Goal	Result
FY 2002	N/A	60
FY 2003	N/A	67
FY 2004	68	82
FY 2005	83	92
FY 2006	93	232



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 8:
U.S. STUDENTS RECEIVING FELLOWSHIPS

PART Program: Support for Individual Researchers
PART ID: 10001148

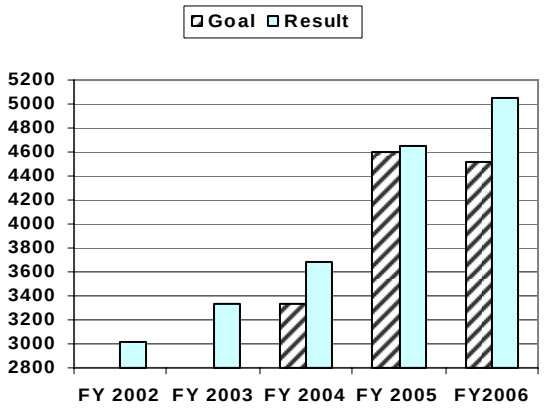
Measure: Number of graduate students funded through fellowships or traineeships from Graduate Research Fellowships (GRF), Integrative Graduate Education and Research Traineeships (IGERT), and Graduate Teaching Fellows in K-12 Education (GK-12).

Purpose: To increase the amount of graduate student support through three principal programs: GRF, IGERT, and GK-12.

The **Graduate Research Fellowship (GRF) Program** provides three years of support for graduate study leading to research-based master's or doctoral degrees and is intended for students at the early stages of their graduate study. The program invests in graduate education for a cadre of diverse individuals who demonstrate their potential to successfully complete graduate degree programs in disciplines relevant to NSF's mission. The **Integrative Graduate Education and Research Traineeship (IGERT) program** aims to educate U.S. Ph.D. scientists and engineers who will pursue careers in research and education, with the interdisciplinary backgrounds, deep knowledge in chosen disciplines, and technical, professional, and personal skills to become, in their own careers, leaders and creative agents for change. The program establishes innovative new models for graduate education and training that transcends traditional disciplinary boundaries. It also facilitates diversity in student participation and preparation, and contributes to the development of a diverse, globally-engaged S&E workforce. The **Graduate Teaching Fellows in K-12 Education (GK-12) program** provides funding to graduate students in science, technology, engineering, and mathematics (STEM) disciplines to acquire additional skills to prepare them for professional and scientific careers in the 21st century. Through interactions with teachers in K-12 schools, graduate students can improve communication and teaching skills while enriching STEM instruction in K-12 schools.

FY 2006 Result: NSF achieved this goal.

	Goal	Result
FY 2002	N/A	3011
FY 2003	N/A	3328
FY 2004	increase	3681
FY 2005	4600	4648
*FY 2006	4525	5049



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

* The FY 2006 number is revised from the FY 2006 Congressional Budget Request to report only graduate students directly funded. Previous results included all students participating in the GK-12 program.

ANNUAL PERFORMANCE GOAL 9:
INDIVIDUAL RESEARCHERS: TIME-TO-DECISION

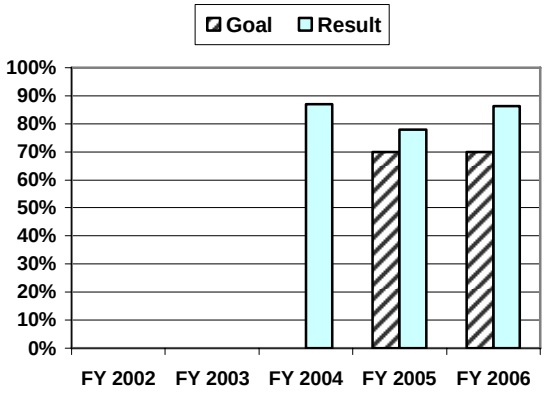
PART Program: Support for Individual Researchers
PART ID: 10001148

Measure: For 70 percent of proposals submitted to the Individuals Program, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or target date, or receipt date, while maintaining a credible and efficient merit review system, as evaluated by external experts. (NEW GOAL FOR FY 2006)

Purpose: To make proposal decisions available in a timely manner in order that investigators may more effectively plan activities.

FY 2006 Result: NSF achieved this goal. Considering the complexity and numbers of proposals coming into NSF, and the relative constancy of the number of staff to handle the review and recommendation of proposals, the goal is ambitious for the Foundation as a whole, as well as for the Individual Researchers PART Program, as it is increasingly difficult to maintain dwell time while performing quality merit review. This measure is a proxy for efficiency.

	Goal	Result
FY 2002	N/A	N/A
FY 2003	N/A	N/A
FY 2004	N/A	87%
FY 2005	70%	78%
FY 2006	70%	86%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 10:
RESEARCH INSTITUTIONS: PROPOSALS FROM OUTSIDE THE TOP 100 INSTITUTIONS NSF FUNDS

PART Program: Support for Research Institutions
PART ID: 10002324

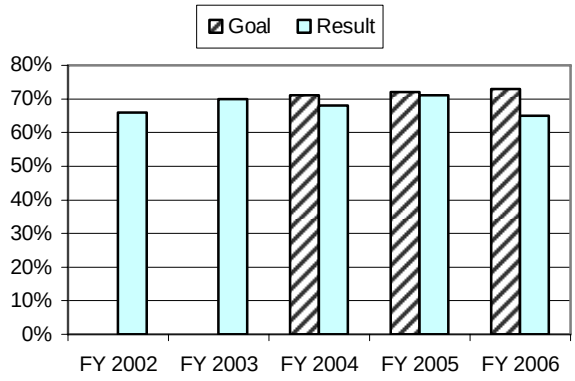
Measure: Percent of Research Institutions proposals received from academic institutions not in the top 100 of NSF funding recipients. (NEW GOAL FOR FY2006)

Purpose: To broaden participation by proposing institutions.

The top 100 NSF funded recipients are determined by calculating the total dollar amount of the Foundation's obligation to each institution. This list is then restricted to those recipients that have been identified as academic institutions. Finally, the list is ranked according to the dollar amount of the Foundation's obligation and the academic institutions.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2002	N/A	66%
FY 2003	N/A	70%
FY 2004	71%	68%
FY 2005	72%	71%
FY 2006	73%	65%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: This goal was adopted in FY 2004 for the Research Institutions PART Program. The goal is ambitious, and it was made more challenging by the recent agency-wide effort to decrease the number of program solicitations for research opportunities in an attempt to improve the NSF-wide funding rate for proposals. There is also a lag time between taking action to increase broadening participation (e.g. through outreach) and receiving proposals. NSF will continue its efforts to encourage proposals from investigators at academic institutions not in the top 100 of NSF funding recipients.

ANNUAL PERFORMANCE GOAL 11:
RESEARCH INSTITUTIONS: TIME-TO-DECISION

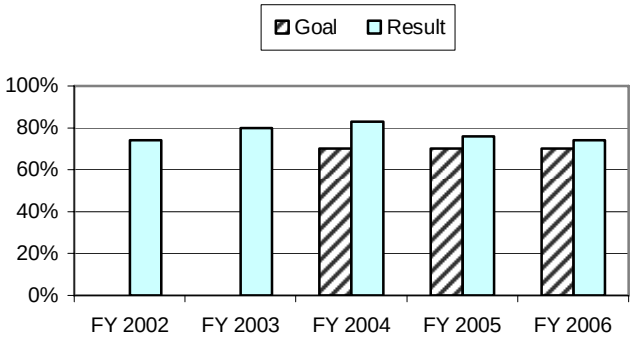
PART Program: Support for Research Institutions
PART ID: 10002324

Measure: For 70 percent of proposals submitted to the Research Institutions Program, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or target date, or receipt date, while maintaining a credible and efficient merit review system, as evaluated by external experts. (NEW GOAL FOR FY 2006)

Purpose: To make proposal decisions available in a timely manner in order that investigators may more effectively plan activities.

FY 2006 Result: NSF achieved this goal. Considering the complexity and numbers of proposals coming into NSF, and the relative constancy of the number of staff to handle the review and recommendation of proposals, the goal is ambitious for NSF as a whole, as well as for the Research Institutions PART Program, as it is increasingly difficult to maintain dwell time while performing quality merit review. This measure is a proxy for efficiency.

	Goal	Result
FY 2002	N/A	74%
FY 2003	N/A	80%
FY 2004	80%	83%
FY 2005	70%	76%
FY 2006	70%	74%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 12:
RESEARCH COLLABORATIONS: PROPOSALS FROM OUTSIDE THE TOP 100 INSTITUTIONS NSF FUNDS

PART Program: Support for Small Research Collaborations
PART ID: 10002322

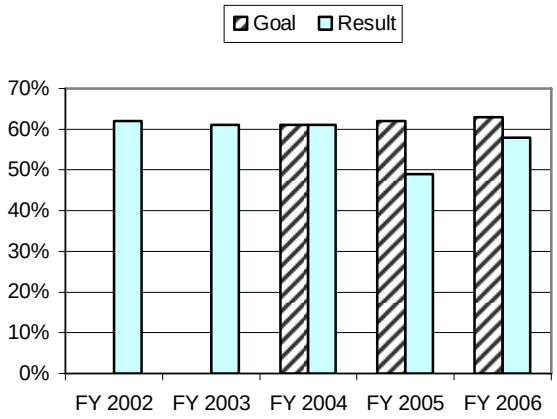
Measure: Percentage of Research Collaborations proposals received from academic institutions not in the top 100 of NSF funding recipients. (NEW GOAL FOR FY 2006)

Purpose: To broaden participation by proposing institutions.

The top 100 NSF funded recipients are determined by calculating the total dollar amount of the Foundation's obligation to each institution. This list is then restricted to those recipients that have been identified as academic institutions. Finally, the list is ranked according to the dollar amount of the Foundation's obligation and the academic institutions.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2002	N/A	62%
FY 2003	N/A	61%
FY 2004	61%	61%
FY 2005	62%	49%
FY 2006	63%	58%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: This goal was adopted in FY 2004 for the Small Research Collaborations PART Program. The result for FY 2006 is an improvement over that for FY 2005. The goal is ambitious, and it was made more challenging by the recent agency-wide effort to decrease the number of program solicitations for research opportunities in an attempt to improve the NSF-wide funding rate for proposals. There is also a lag time between taking action to increase broadening participation (e.g. through outreach) and receiving proposals. NSF will continue its efforts to encourage proposals from investigators at academic institutions not in the top 100 of NSF funding recipients.

ANNUAL PERFORMANCE GOAL 13:
RESEARCH COLLABORATIONS: TIME-TO-DECISION

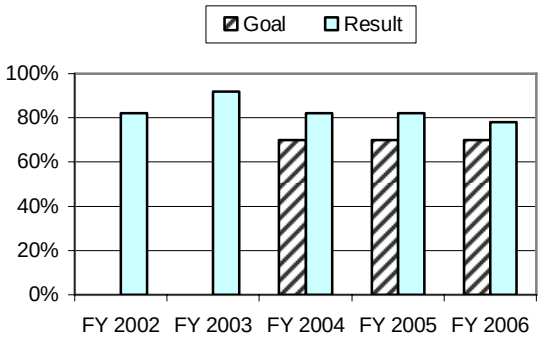
PART Program: Support for Small Research Collaborations
PART ID: 10002322

Measure: For 70 percent of proposals submitted to the Research Collaborations Program, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or target date, or receipt date, while maintaining a credible and efficient merit review system, as evaluated by external experts. (NEW GOAL FOR FY 2006)

Purpose: To make proposal decisions available in a timely manner in order that investigators may more effectively plan activities.

FY 2006 Result: NSF achieved this goal. Considering the complexity and numbers of proposals coming into NSF, and the relative constancy of the number of staff to handle the review and recommendation of proposals, the goal is ambitious for the Foundation as a whole, as well as for the Small Research Collaborations PART Program, as it is increasingly difficult to maintain dwell time while performing quality merit review. This measure is a proxy for efficiency.

	Goal	Result
FY 2002	N/A	82%
FY 2003	N/A	92%
FY 2004	70%	82%
FY 2005	70%	82%
FY 2006	70%	78%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 14: NANOTECHNOLOGY NETWORK USERS

PART Program: Nanoscale Science and Engineering Research
PART ID: 10001147

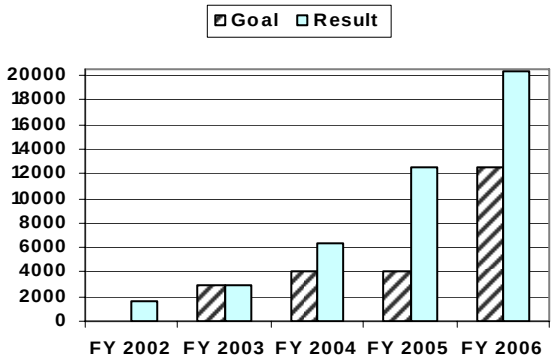
Measure: Number of users accessing National Nanofabrication Users Network/National Nanotechnology Infrastructure Network (NNUN/NNIN) and Network for Computational Nanotechnology (NCN) sites.

Purpose: To establish an infrastructure to improve access to nanotechnology facilities and services, thereby increasing the number of users. Estimates are based upon current budget estimates.

The **National Nanotechnology Infrastructure Network (NNIN)** is an integrated national network partnership of user facilities serving the resources needs of nanoscale science, engineering, and technology. It provides users across the nation – in academia, small and large industry, and government – with open access, both onsite and remotely, to leading-edge tools, instrumentation, and capabilities for fabrication, synthesis, characterization, design, simulation, and integration to help enable their individual research projects. The NNIN also has extensive education, training, and outreach activities. The NNIN supersedes the National Nanofabrication Users Network (NNUN), initiated in 1994 and for which NSF support concluded at the end of 2003. The **Network for Computational Nanotechnology (NCN)** supports research and provides an infrastructure that combines facilities and experts in nanoscale science and engineering, with a focus on three specific areas of nanotechnology. NCN provides electronic mediums for research and education through online simulation services, course, tutorials, seminars, debates, and facilities for collaboration. The use of the networks far exceeded expectation due, in part, to the great interest in the field of nanotechnology.

FY 2006 Result: NSF achieved this goal. The use of the networks far exceeded expectation due, in part, to the great interest in the field of nanotechnology, but also because of the introduction of a new interactive framework for nanoscale modeling and simulation.

	Goal	Result
FY 2002	N/A	1700
FY 2003	3000	3000
FY 2004	4000	6350
FY 2005	4000	12462
FY 2006	12500	20374



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 15: NANOTECHNOLOGY NETWORK NODES

PART Program: Nanoscale Science and Engineering Research
PART ID: 10001147

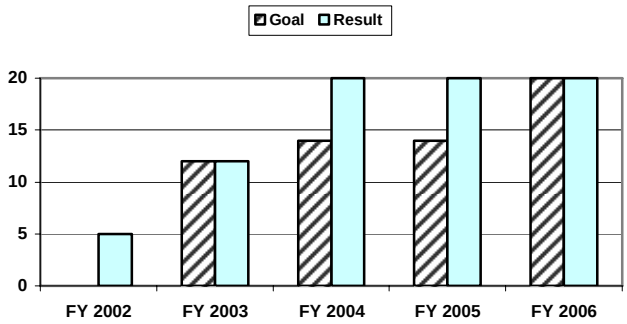
Measure: Number of nanotechnology nodes that comprise infrastructure.

Purpose: To support and enhance infrastructure through the maintenance of the total number of facility nodes within the nanotechnology networks funded by NSF.

NNIN nodes are defined as both large and small individual user facilities, geographically distributed and with diverse and complementary capabilities to design, create, characterize, and measure novel nanoscale structures, materials, devices, and systems.

FY 2006 Result: NSF achieved this goal.

	Goal	Result
FY 2002	N/A	5
FY 2003	12	12
FY 2004	14	20
FY 2005	14	20
FY 2006	20	20



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 16:
TIME-TO-DECISION: NANOSCALE SCIENCE AND ENGINEERING

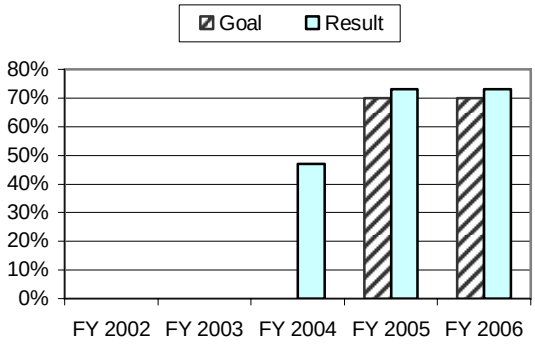
PART Program: Nanoscale Science and Engineering Research
PART ID: 10001147

Measure: For 70 percent of proposals submitted to the Nanoscale Science and Engineering Program, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or target date, or receipt date, while maintaining a credible and efficient merit review system, as evaluated by external experts.

Purpose: To make proposal decisions available in a timely manner in order that investigators may more effectively plan activities.

FY 2006 Result: NSF achieved this goal. Considering the complexity and numbers of proposals coming into NSF, and the relative constancy of the number of staff to handle the review and recommendation of proposals, the goal is ambitious for the Foundation as a whole, as well as for the Nanoscale Science and Engineering PART Program, as it is increasingly difficult to maintain dwell time while performing quality merit review. This measure is a proxy for efficiency.

	Goal	Result
FY 2002	N/A	N/A
FY 2003	N/A	N/A
FY 2004	N/A	46%
FY 2005	70%	73%
FY 2006	70%	73%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 17: NANOSCALE PROPOSALS WITH FEMALE INVESTIGATORS

PART Program: Nanoscale Science and Engineering Research
PART ID: 10001147

Measure: Percent of Nanoscale Science and Engineering (NS&E) proposals with at least one female principal investigator (PI) or Co-PI.

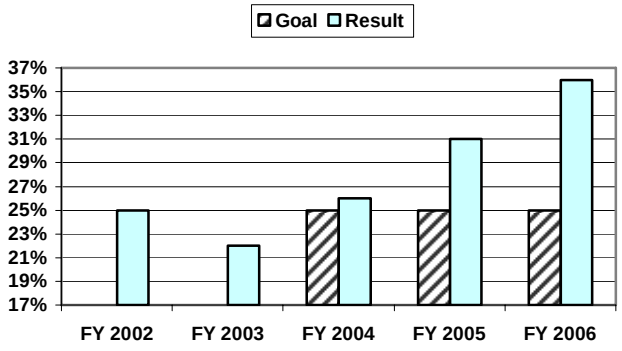
Purpose: To increase the number of female PIs or Co-PIs submitting NS&E proposals.

The Nanoscale Science and Engineering priority area encompasses the systematic organization, manipulation, and control of matter at atomic, molecular, and supramolecular levels. Novel materials, devices, and systems – with their building blocks on the scale of nanometers – shift and expand possibilities in science, engineering, and technology. A nanometer (one-billionth of a meter) is to an inch what an inch is to 400 miles. With the capacity to manipulate matter at this scale, science, engineering, and technology are realizing revolutionary advances, in areas such as individualized pharmaceuticals, new drug delivery systems, more resilient materials and fabrics, catalysts for industry and order-of-magnitude faster computer chips.

NS&E research promises a better understanding of nature, a new world of products beyond what is now possible, high efficiency in manufacturing, sustainable development, better healthcare, and improved human performance. NSF has a continued commitment to increasing participation of female investigators in this priority area.

FY 2006 Result: NSF achieved this goal.

	Goal	Result
FY 2002	N/A	25%
FY 2003	N/A	22%
FY 2004	25%	26%
FY 2005	25%	31%
FY 2006	25%	36%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 18:
NANOSCALE PROPOSALS WITH MINORITY INVESTIGATORS

PART Program: Nanoscale Science and Engineering Research
PART ID: 10001147

Measure: Percent of Nanoscale Science and Engineering (NS&E) proposals with at least one minority principal investigator (PI) or Co-PI.

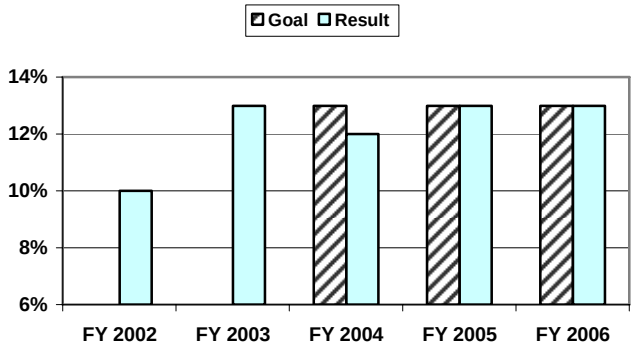
Purpose: To increase the number of minority and/or underrepresented PIs or Co-PIs submitting NS&E proposals.

The Nanoscale Science and Engineering priority area encompasses the systematic organization, manipulation, and control of matter at atomic, molecular, and supramolecular levels. Novel materials, devices, and systems–with their building blocks on the scale of nanometers – shift and expand possibilities in science, engineering, and technology. A nanometer (one-billionth of a meter) is to an inch what an inch is to 400 miles. With the capacity to manipulate matter at this scale, science, engineering, and technology are realizing revolutionary advances, in areas such as individualized pharmaceuticals, new drug delivery systems, more resilient materials and fabrics, catalysts for industry and order-of-magnitude faster computer chips.

Nanoscale science and engineering research promises a better understanding of nature, a new world of products beyond what is now possible, high efficiency in manufacturing, sustainable development, better healthcare, and improved human performance. NSF has a continued commitment to increasing participation of female investigators in this priority area.

FY 2006 Result: NSF achieved this goal.

	Goal	Result
FY 2002	N/A	10%
FY 2003	N/A	13%
FY 2004	13%	12%
FY 2005	13%	13%
FY 2006	13%	13%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 19:
NANOSCALE PROPOSALS WITH MULTIPLE INVESTIGATORS

PART Program: Nanoscale Science and Engineering Research
PART ID: 10001147

Measure: Foster collaboration among investigators in Nanoscale Science and Engineering and track this through the percent of Nanoscale Science and Engineering (NS&E) proposals that are multi-investigator proposals.

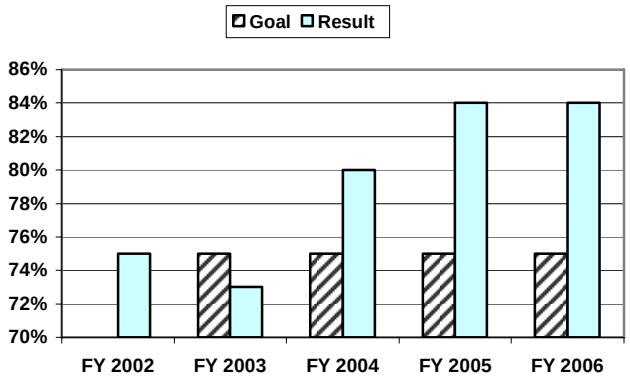
Purpose: To increase the collaboration among investigators that may not have otherwise occurred.

The Nanoscale Science and Engineering priority area encompasses the systematic organization, manipulation, and control of matter at atomic, molecular, and supramolecular levels. Novel materials, devices, and systems – with their building blocks on the scale of nanometers – shift and expand possibilities in science, engineering, and technology. A nanometer (one-billionth of a meter) is to an inch what an inch is to 400 miles. With the capacity to manipulate matter at this scale, science, engineering, and technology are realizing revolutionary advances, in areas such as individualized pharmaceuticals, new drug delivery systems, more resilient materials and fabrics, catalysts for industry and order-of-magnitude faster computer chips.

Nanoscale science and engineering research promises a better understanding of nature, a new world of products beyond what it is now possible, high efficiency in manufacturing, sustainable development, better healthcare and improved human performance. The NSF NS&E priority area strives to foster collaborations among investigators that may not have otherwise occurred.

FY 2006 Result: NSF achieved this goal.

	Goal	Result
FY 2002	N/A	75%
FY 2003	75%	73%
FY 2004	75%	80%
FY 2005	75%	84%
FY 2006	75%	84%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ANNUAL PERFORMANCE GOAL 20:
BIOCOMPLEXITY IN THE ENVIRONMENT: PROPOSALS WITH FEMALE INVESTIGATORS

PART Program: Research on Biocomplexity in the Environment
PART ID: 10002320

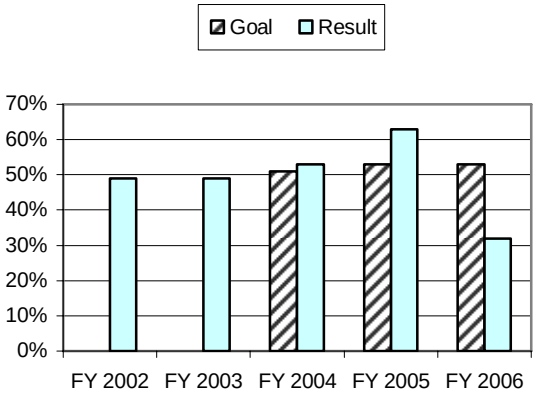
Measure: Percent of Biocomplexity in the Environment (BE) proposals with at least one female PI or co-PI for BE solicitation. (NEW GOAL FOR FY 2006)

Purpose: To encourage proposals to the BE Program from female investigators.

The Biocomplexity in the Environment (BE) Program promotes comprehensive, integrated investigations of environmental systems using advanced scientific and engineering methods. The concept of biocomplexity stresses the richness of biological systems in an environmental context. The BE Program emphasizes research with a high degree of interdisciplinarity, a focus on complex environmental systems that includes non-human biota or humans, and a focus on systems with high potential for exhibiting non-linear behavior.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2002	N/A	49%
FY 2003	N/A	49%
FY 2004	51%	53%
FY 2005	53%	63%
FY 2006	53%	32%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: The Biocomplexity in the Environment program was established as a priority area for the Foundation in FY 2000, with the intention that it would extend through FY 2007. The goal of increasing the percentage of proposals from female investigators was established in FY 2004, and the goal was met that year as well as in FY 2005. Since three of the five BE programs did not request proposals in FY 2006 and the only solicitations that did were in the engineering and geoscience areas, the drop in percentage of proposals from female investigators in FY 2006 was not unexpected. Renewed attempts were made to encourage proposals from female investigators in the last series of program solicitations held in FY 2006 for awards that would begin during FY 2007.

ANNUAL PERFORMANCE GOAL 21:
BIOCOMPLEXITY IN THE ENVIRONMENT: PROPOSALS WITH MINORITY INVESTIGATORS

PART Program: Research on Biocomplexity in the Environment
PART ID: 10002320

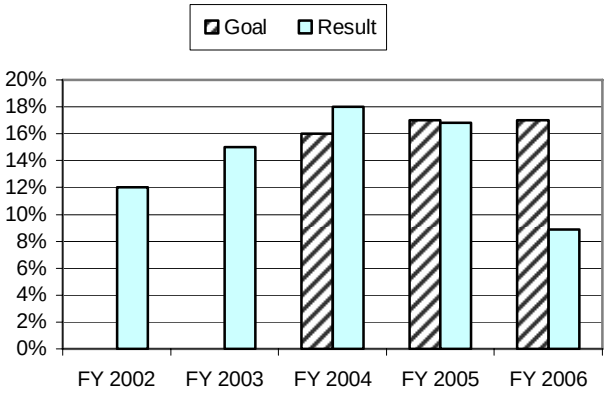
Measure: Percent of Biocomplexity in the Environment (BE) proposals with at least one minority PI or co-PI for BE solicitation. (NEW GOAL FOR FY 2006)

Purpose: To encourage proposals to the BE Program from minority investigators.

The Biocomplexity in the Environment (BE) Program promotes comprehensive, integrated investigations of environmental systems using advanced scientific and engineering methods. The concept of biocomplexity stresses the richness of biological systems in an environmental context. The BE Program emphasizes research with a high degree of interdisciplinarity, a focus on complex environmental systems that includes non-human biota or humans, and a focus on systems with high potential for exhibiting non-linear behavior.

FY 2006 Result: NSF did not achieve this goal.

	Goal	Result
FY 2002	N/A	12%
FY 2003	N/A	15%
FY 2004	16%	18%
FY 2005	17%	17%
FY 2006	17%	9%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

Why We Did Not Meet This Goal: The Biocomplexity in the Environment program was established as a priority area for the Foundation in FY 2000, with the intention that it would extend through FY 2007. The goal of increasing the percentage of proposals from minority investigators was established in FY 2004, and the goal was met that year as well as in FY 2005. Since three of the five BE programs did not request proposals in FY 2006 and the only solicitations that did were in the engineering and geoscience areas, the drop in percentage of proposals from minority investigators in FY 2006 was not unexpected. Renewed attempts were made to encourage proposals from minority investigators in the last series of program solicitations held in FY 2006 for awards that would begin during FY 2007.

ANNUAL PERFORMANCE GOAL 22:
BIOCOMPLEXITY IN THE ENVIRONMENT: TIME-TO-DECISION

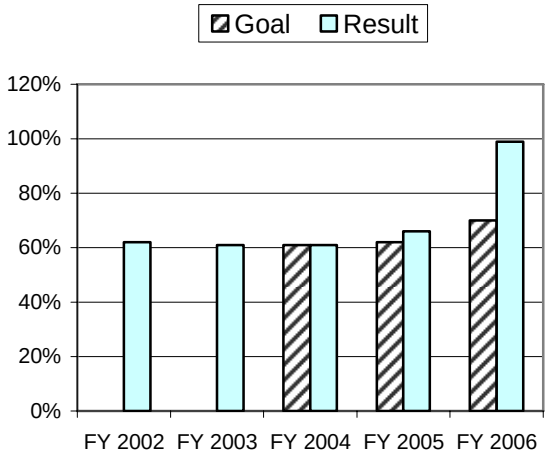
PART Program: Research on Biocomplexity in the Environment
PART ID: 10002320

Measure: For 70 percent of proposals submitted to the Biocomplexity in the Environment (BE) Program, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or target date, or receipt date, whichever is later, while maintaining a credible and efficient merit review system, as evaluated by external experts. (NEW GOAL FOR FY 2006)

Purpose: To make proposal decisions available in a timely manner in order that investigators may more effectively plan activities.

FY 2006 Result: NSF achieved this goal. Considering the complexity and numbers of proposals coming into NSF, and the relative constancy of the number of staff to handle the review and recommendation of proposals, the goal is ambitious for the Foundation as a whole, as well as for the Biocomplexity in the Environment PART Program, as it is increasingly difficult to maintain dwell time while performing quality merit review. This measure is a proxy for efficiency.

	Goal	Result
FY 2002	N/A	62%
FY 2003	N/A	61%
FY 2004	61%	61%
FY 2005	62%	66%
FY 2006	70%	99%



Implications For The FY 2007 Performance Plan: NSF is currently in the process of developing a new performance evaluation and reporting framework to align with our new strategic plan that was implemented September 30, 2006. NSF is working with OMB to develop a new program structure for the agency's PART reviews as well as new performance goals. NSF is using the results of our FY 2006 performance goals to help inform this process. The agency's new performance goals will be reported in our FY 2008 President's Budget Request to Congress, which will be available in February 2007.

ADDITIONAL INFORMATION

Information on Use of Non-Federal Parties

This GPRA performance report was prepared solely by NSF staff.

Non-federal external sources of information we used in preparing this report include:

- Reports from awardees demonstrating results.
- Reports prepared by evaluators – Committees of Visitors (COV) and Advisory Committees – in assessing our programs for progress in achieving Outcome Goals.
- Reports prepared by a consulting firm to assess the procedures we use to collect, process, maintain, and report performance goals and measures.
- Reports from facilities managers on construction/upgrade costs and schedules and on operational reliability.

Specific examples:

Highlights or sources of examples shown as results may be provided by Principal Investigators who received support from NSF.

NSF uses external committees to assess the progress of our programs toward qualitative goal achievement. External evaluators provide us with reports of programs, and provide feedback to us on a report template we prepare. Examples are COV and AC reports that provide an independent external assessment of NSF's performance.

We engaged an independent third-party, IBM Global Business Services, to conduct a verification and validation review of the data and information used in reporting the quantitative annual performance goals. For NSF's four strategic outcome goals which are not measured quantitatively, IBM reviewed the process employed by the external Advisory Committee for GPRA Performance Assessment. This additional independent review helped to eliminate potential reporting bias that can develop in self-assessments. It also provides assurance as to the credibility of performance reporting information and results.

Classified Appendixes not Available to the Public

None

Analysis of Tax Expenditures

None

Waivers of Administrative Requirements

None