A MESSAGE FROM THE DIRECTOR

I am pleased to share with you the *Annual Performance Report (APR)* of the National Science Foundation (NSF) for Fiscal Year (FY) 2008. This report focuses on the agency's performance achievements against our Strategic Plan and identifies important outcomes of our investments across all fields of science and engineering, and all levels of science and engineering education. It also describes significant achievements in improving the effectiveness and efficiency of agency operations.

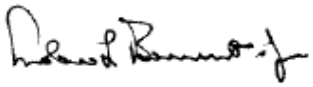
The outcomes, or returns on our investments, highlighted in this report are only a small portion of the discoveries and accomplishments reported throughout the year by NSF- supported principal investigators, which are featured on NSF's website (see Discoveries on http://www.nsf.gov). More information about the results of NSF's research spending and results is also available on the Research.gov website: http://www.research.gov/.

As you will see in the report, NSF successfully met all four of its strategic outcome goals in FY 2008. For three of the goals -- Discovery, Learning, and Research Infrastructure -- this success was based upon the external, expert review by the NSF Advisory Committee for GPRA Performance Assessment (AC/GPA). The AC/GPA determined that NSF had demonstrated significant achievement toward each goal. For NSF's Stewardship goal, the success is based on the accomplishment of a majority of the performance milestones and measures related to its programs and its operations and management of resources.

For a second year, NSF is participating in the Office of Management and Budget's Pilot Program for Alternative Approaches to Performance and Accountability Reporting, which contains the following components: the *FY 2008 Annual Financial Report (AFR)*, published on November 17, 2008; the *FY 2008 Citizens' Report*, which contains key performance and financial information; and the *FY 2008 Annual Performance Report*. All reports are available on NSF's website at http://www.nsf.gov/about/performance/.

I am pleased to report that the performance data in the *FY 2008 Annual Performance Report* are complete and reliable. All our performance goals were verified and validated by an independent management consulting firm, IBM Global Business Services. IBM completed a Verification and Validation (V&V) review of the performance data and information based on guidelines issued by the Government Accountability Office (GAO).

Thank you again for your interest in the National Science Foundation and the performance of its investments in science and engineering research and education.



Arden L. Bement, Jr.
Director

January 15, 2009

NATIONAL SCIENCE FOUNDATION
FY 2008 Annual Performance Report

The National Science Foundation: Who We Are and What We Do

The National Science Foundation (NSF), an independent agency created by Congress nearly 60 years ago, is the premier federal agency supporting basic research across all fields, and science and engineering education at all levels. Unlike many other federal agencies, NSF does not conduct research or directly operate its own laboratories. NSF funds scientists and engineers and educators at colleges and universities, as well as other institutions, through competitive, merit-based review of proposals. NSF also funds research centers, advanced instrumentation, and large facilities such as giant optical and radio telescopes, Antarctic research sites, high-end computer facilities, ships for ocean research, sensitive detectors of very subtle physical phenomena, and gravitational wave observatories. NSF is also the principal federal agency that promotes science and engineering education, and is the federal statistical agency that collects and analyzes data related to the entire science and engineering enterprise.

NSF's annual budget is about $6 billion, which represents less than four percent of the total federal budget for research and development. Nevertheless, the Foundation provides nearly half of the federal support for non-medical basic research at U.S. colleges and universities. In many fields, such as biology, computer science, environmental sciences, mathematics, and the social sciences, NSF is a major source of federal academic research, as illustrated in Figure 1.

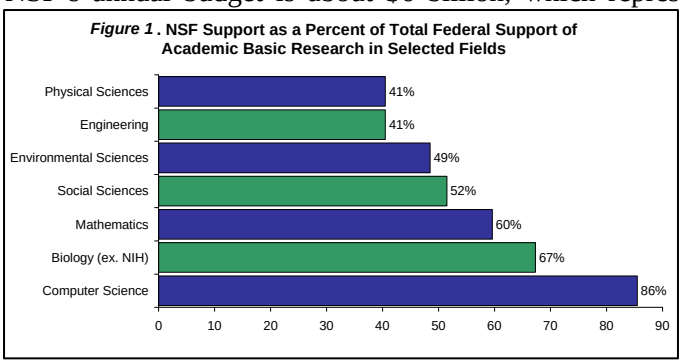


***Figure 1*. NSF Support as a Percent of Total Federal Support of Academic Basic Research in Selected Fields**

NSF's competitive, merit-based review process relies heavily on scientists, engineers, and educators throughout the world to provide rigorous and objective evaluation of the intellectual merit and broader impacts of proposals. In Fiscal Year 2008, about 248,000 persons served as ad-hoc reviewers for NSF proposals. Of that number, about 50,000 served on review panels.

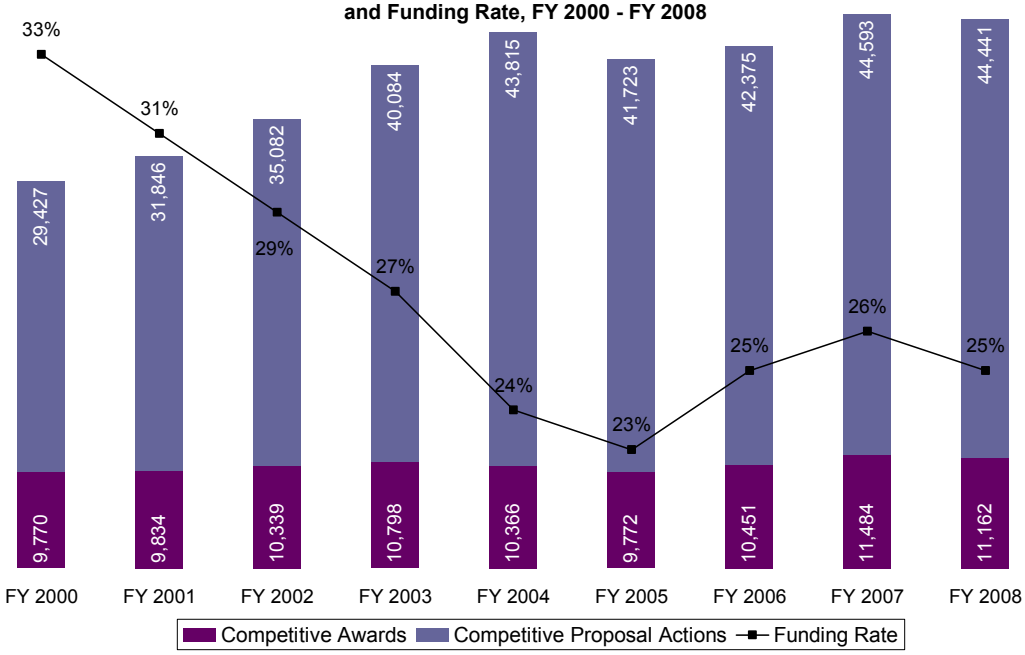
NSF's task of identifying and funding the most promising work is not a "top-down" process. Rather, NSF operates from the "bottom up," using a variety of mechanisms to generate proposals. About 80 percent of research proposals received are "unsolicited" submissions to programs that invite research ideas in promising and important areas. The remaining 20 percent are submitted in response to a specific program solicitation, which NSF uses to stimulate interest in a new area and develop a nascent scientific community. All funding opportunities are prominently displayed on NSF's website, www.nsf.gov

Proposals to NSF are evaluated using two criteria approved by the National Science Board: intellectual merit and broader impacts. Consideration is also given to how well the proposed activity fosters the integration of research and education and broadens opportunities to include a diversity of participants, particularly from underrepresented groups. Additional criteria, as stated in individual program announcements or solicitations, may also be required. About 97 percent of NSF's proposals are evaluated by external reviewers as well as by NSF staff[1].

[1] For more information about NSF's merit review process, see *Report to the National Science Board on the National Science Foundation's Merit Review Process, FY 2007* at http://www.nsf.gov/nsb/publications/2008/nsb0847_merit_review_2007.pdf

The competition for NSF funds is intense. To address this challenge, NSF is pursuing a variety of approaches that balance trade-offs between keeping the proposal workload at a productive and manageable level—for both NSF and the applicant community—and encouraging the free flow of ideas to NSF. Figure 2 illustrates the funding rate trend from FY 2000 through FY 2008.

Figure 2. **Number of NSF Competitive Proposals and Awards and Funding Rate, FY 2000 - FY 2008**



In Fiscal Year 2008, NSF awards went to more than 1,900 colleges, universities, and other institutions, and supported more than 197,000 people (researchers, postdoctoral fellows, trainees, students, and teachers). Information on the numbers of actions and awards, as well as funding rates, is available on each Directorate's homepage on the NSF website: www.nsf.gov

NSF uses three kinds of funding mechanisms: grants, cooperative agreements, and contracts. Most of NSF's projects support scientific and engineering research and education, and are funded through grants or cooperative agreements. A grant may be funded as a standard award, in which funding for the full duration of the project, generally one to five years, is awarded in a single fiscal year) or a continuing award (in which funding of a multi-year project is usually provided in annual increments). Cooperative agreements are used when the project requires substantial agency involvement during the project performance period (e.g. research centers, multi-user facilities). Contracts are used to acquire products, services, and studies (e.g. program evaluations) required primarily for NSF or other government use. In Fiscal Year 2008, NSF devoted 41 percent of its total budget to new standard and new continuing grants. The use of standard and continuing grants shows NSF's flexibility in balancing current and future obligations.

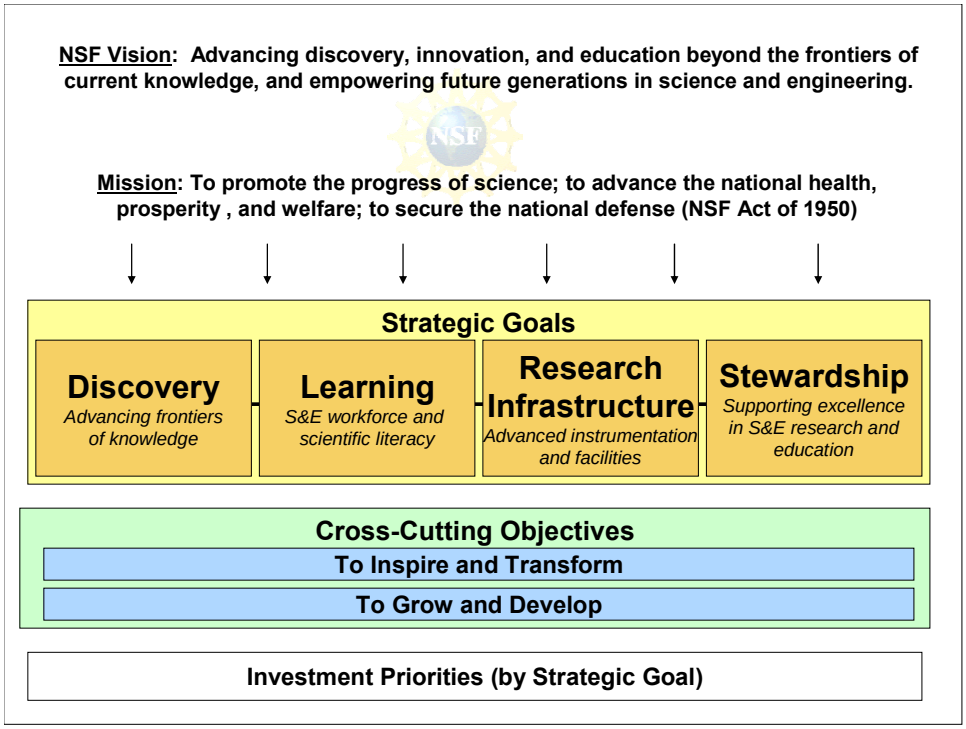
With about 11,000 new awards issued each year, NSF's portfolio is continually realigned and refocused on the most promising ideas and emerging talents. Roughly one-third of NSF's 500 program officers are on temporary assignments from their home institutions, bringing their wisdom, input, and guidance. NSF is committed to supporting research conducted at the nation's colleges and universities, which ensures that the pursuit of new knowledge occurs in tandem with the development of the next generation of scientists, engineers, and educators. The integration of research and education is a hallmark of the National Science Foundation.

Goals and Objectives

NSF's leadership in advancing the frontiers of science and engineering research and education is demonstrated, in part, through internal and external performance assessments. The results of this process provide stakeholders and taxpayers with vital information about the return on their investments. In Fiscal Year 2008, performance assessment at NSF was guided by the Government Performance and Results Act of 1993 (GPRA) and by NSF's *FY 2006–2011 Strategic Plan*.[2]

To accomplish its mission to promote the progress of science and engineering, NSF invests in the best ideas generated by scientists, engineers, and educators across all fields of research and education. NSF's Strategic Plan establishes four overarching strategic outcome goals by which NSF measures its annual performance: *Discovery*, *Learning*, *Research Infrastructure*, and *Stewardship*. The four goals establish an integrated strategy to deliver new knowledge, meet vital national needs, and work to achieve the NSF vision. The first three goals focus on NSF's long-term investments in science and engineering research and education. The fourth goal, *Stewardship*, focuses on improving the effectiveness and efficiency of the agency's operations and services to the science, engineering, and education community.

Figure 4. **NSF Strategic Framework**



NSF's performance assessment framework and process is based on this strategic framework. For more information, see pages 5 – 7.

[2] NSF's *FY 2006–FY 2011 Strategic Plan* is available at www.nsf.gov/pubs/2006/nsf0648/nsf0648.jsp.

Summary of Fiscal Year 2008 Performance Goal Results

In Fiscal Year 2008, the National Science Foundation:

- **successfully met its performance objectives by demonstrating *significant achievement* for the three long-term, qualitative, strategic outcome goals in its 2006-2011 Strategic Plan: *Discovery*, *Learning*, and *Research Infrastructure*, according to an independent evaluation by the NSF Advisory Committee for GPRA Performance Assessment; [3]**

- **achieved 22 out of 23 annual performance milestones and measures under the fourth strategic outcome goal of *Stewardship*;**

- **met 17 out of 23 targets (74 percent) in its Program Assessment Rating Tool (PART) performance measures.**

Figure 5 illustrates that the Foundation achieved success under its three long-term strategic outcome goals during the Fiscal Years 2004 – 2008, as evaluated by the AC/GPA. It also indicates success for the Stewardship goal during Fiscal Years 2007 and 2008, the two years in which this goal became effective under the current Strategic Plan. Figure 6 on the next page shows five-year results for NSF's PART performance measures. Detailed information on the results of all goals may be found in Appendices A through C.

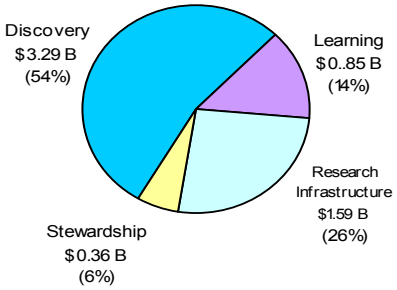
Figure 5. **Strategic Outcome Goals and Results**

Performance Goal	Results
DISCOVERY Foster research that will advance the frontiers of knowledge, emphasizing areas of greatest opportunity and potential benefit, and establishing the nation as a global leader in fundamental and transformational science and engineering.	● FY 2004 ● FY 2005 ● FY 2006 ● FY 2007 ● FY 2008
LEARNING Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.	● FY 2004 ● FY 2005 ● FY 2006 ● FY 2007 ● FY 2008
RESEARCH INFRASTRUCTURE Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure, and experimental tools.	● FY 2004 ● FY 2005 ● FY 2006 ● FY 2007 ● FY 2008
STEWARDSHIP Support excellence in science and engineering research and education through a capable and responsive organization.	● FY 2007 ● FY 2008

[3] For more information about the evaluation see the *Report of the Advisory Committee for GPRA Performance Assessment, FY 2008* at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08064.

Figure 6. PART Performance Measures Number and Percent Achieved, FY 2004 – FY 2008					
	FY 2004	**FY 2005**	**FY 2006**	**FY 2007**	**FY 2008**
Annual Performance Measures	23 of 26 (88%)	14 of 17 (82%)	15 of 22 (68%)	14 of 20 (70%)	17 of23 (74%)

Figure 7.
FY 2008 Budget Obligations
$6.08 Billion*



**Totals may not add due to rounding.*

In Fiscal Year 2008, grants for research and education under *Discovery*, *Learning*, and *Research Infrastructure* accounted for 94 percent of NSF's investment portfolio (*Figure 7).*[4] Outcomes under these goals are assessed annually by an external review panel, the Advisory Committee for GPRA Performance Assessment (AC/GPA), composed of experts in various disciplines and fields of science, engineering, mathematics, and education.[5] *Stewardship* accounts for six percent of NSF's portfolio, and includes several performance milestones and measures of efficiency and effectiveness that are monitored within the agency. Examples of *Stewardship* performance areas are time to decision (proposal dwell time), merit review, customer service, broadening participation, post-award monitoring, E-Government, IT security, and management of NSF's large facilities.

Performance Assessment Framework

Assessing the Outcomes of the Long-Term Strategic Outcome Goals: Discovery, Learning, and Research Infrastructure

As stated above, in Fiscal Year 2008 NSF successfully demonstrated significant achievement of its three strategic outcome goals, according to the independent evaluation by the external review panel, the Advisory Committee for GPRA Performance Assessment.

The value of external expert review has been affirmed in two studies by the National Research Council of the National Academies. In a 2001 report, the Committee on Science, Engineering, and Public Policy (COSEPUP) stated, "Because we do not know how to measure knowledge while it is being generated and when its practical use cannot be predicted, the best we can do is ask experts in the field—a process called *expert review*—to evaluate research regularly while it is in progress." In a 2008 report, a COSEPUP committee states, "EPA and other agencies should

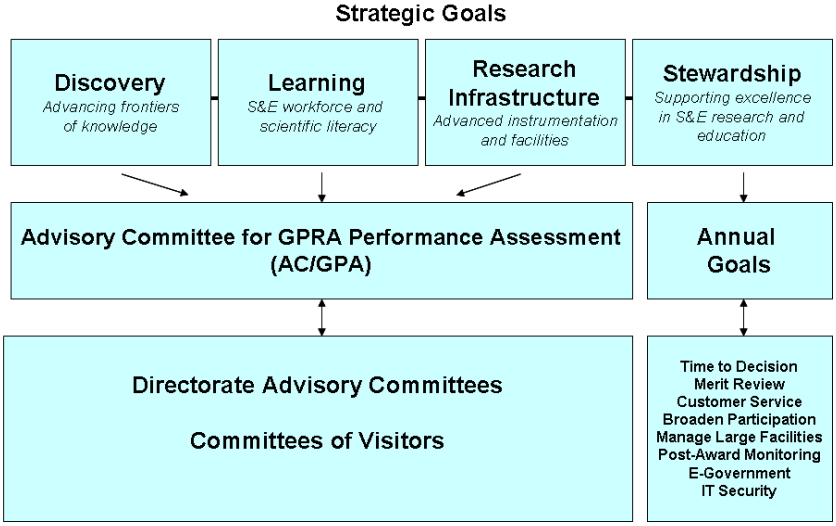
[4] Base obligation of $6.08 billion plus Trust Funds ($49 million), H1-B Nonimmigrant Petitioner Receipts ($121 million), and upward adjustments posted against expired authority in FY 2008 ($5 million) equals Direct Obligations Incurred as shown on the Statement of Budgetary Resources ($6.26 billion).
[5] The Fiscal Year 2008 AC/GPA report is available at www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08207.

use expert-review panels to evaluate the *investment efficiency* of research programs." COSEPUP adds that "*Investment efficiency* is used …to indicate whether an agency is 'doing the right research and doing it well.'"[6]

As shown in Figure 8, NSF uses a multi-layer assessment approach, integrating qualitative and quantitative performance goals. Central to performance assessment of agency-wide strategic goals is the Advisory Committee for GPRA Performance Assessment, which reviews outcomes on an annual basis. No less important, however, are the advisory committees for each of the Directorates and Offices, and the Committees of Visitors for each Division or crosscutting program, all of which provide independent advice on program management and conduct review of program outcomes. As noted above, the fourth strategic outcome goal, Stewardship, is focused on performance areas that are critical to the agency's efficient and effective operations and that also provide essential services to the science, engineering, and education community.

Figure 8.

NSF Performance Assessment Framework



Advisory Committee for GPRA Performance Assessment (AC/GPA)

The AC/GPA provides advice and recommendations to the NSF Director regarding NSF's performance under GPRA. NSF is the only federal agency that invites an external advisory committee to perform an analysis of its entire portfolio as part of the agency GPRA assessment process. Outcomes from basic research are unpredictable and difficult to quantify, with impacts often emerging many years after the research was conducted. Because GPRA requires agencies to report annually on progress toward achieving its goals, the AC/GPA conducts an annual review of reported outcomes.

The AC/GPA is comprised of about 20 members, each of whom has strong academic credentials and substantial experience in academia, government, and/or industry. About one-third of the members are also members of NSF Directorate or Office advisory committees, providing

[6] *Implementing the Government Performance and Results Act for Research: A Status Report* is available at www.nap.edu/catalog.php?record_id=10106 and *Evaluating Research Efficiency in the U.S. Environmental Protection Agency* is available at www.nap.edu/catalog.php?record_id=12150.

valuable linkages to those bodies. The Committee works closely with NSF staff during the three or four months prior to their annual meeting to ensure that they receive performance information for programs across the Foundation. The Committee is charged with reviewing NSF's investments in research and education to determine whether NSF demonstrated significant achievement in meeting its strategic outcome goals of Discovery, Learning, and Research Infrastructure. The Committee submits a report annually to the Director that evaluates NSF performance under each strategic goal. NSF's annual independent verification and validation report includes a review of the AC/GPA assessment process.

The AC/GPA uses evaluation criteria, or performance indicators, to evaluate outcomes from NSF's grant programs in research, education, and research infrastructure. The indicators take into account the support of potentially transformative research, stimulating innovation, developing successful models for teaching and learning, achieving active support of undergraduate and graduate students in research projects, and fostering research at large facilities or with advanced instrumentation that could not have been carried out without NSF support.

In its Fiscal Year 2008 Report, the AC/GPA concluded:

> **It is the unanimous judgment of the 2008 Advisory Committee for GPRA Performance Assessment (AC/GPA) that the National Science Foundation successfully met its performance objectives by demonstrating *significant achievement* for each of the three long-term, qualitative, strategic outcome goals in its 2006-2011 Strategic Plan.**[7]

The Committee recommended that, in the future, NSF take a longer view in assessing outcomes of research and education investments and find ways to track the careers of the people it supports. NSF is responding to those recommendations and will report back to the Committee at its June 2009 meeting.

Appendix A of this report contains the highlights selected by the Committee to represent outcomes reported in Fiscal Year 2008 from investments in *Discovery*, *Learning*, and *Research Infrastructure*. These highlights are only a small portion of the total number of highlights written by NSF program officers each year and many are based on annual and final project reports submitted by principal investigators. For more information, see http://www.nsf.gov/discoveries/

Advisory Committees and Committees of Visitors (COVs)

Advisory committees and Committees of Visitors (COVs) provide guidance on priorities and program effectiveness. Each division or crosscutting program has a Committee of Visitors (COV) that meets once every three years. Advisory committees are chartered by NSF and hence subject to Federal Advisory Committee Act (FACA) rules. COVs are subcommittees of advisory committees. COV recommendations must be addressed by NSF management, and appropriate actions are taken to comply. COVs also evaluate outcomes of NSF investments as they relate to NSF's strategic outcome goals. COV reports, along with the NSF responses to their recommendations, are submitted to the appropriate directorate or office advisory committee and to the Director of NSF. All COV reports and NSF responses are public documents posted at: www.nsf.gov/od/oia/activities/cov/covs.jsp.

[7] http://www.nsf.gov/pubs/2008/nsf08064/index.jsp

Assessing the Outcomes of Stewardship

Stewardship is defined in the NSF Strategic Plan as *supporting excellence in science and engineering research and education through a capable and responsive organization.* The performance areas focus on the agency's efficiency and effectiveness not only in its internal operations and management but also in delivering essential services to its constituents in the science, engineering, and education community.

In Fiscal Year 2008, NSF achieved 22 out of 23 milestones and measures associated with the eight performance areas under Stewardship:

Time to Decision	Management of Large Facilities
Merit Review	Post-Award Monitoring
Customer Service	E-Government
Broadening Participation	IT Security

Appendix B contains detailed results under these performance areas. Highlights of major accomplishments are:

Time to Decision (Proposal Dwell Time)

Every year since 2002, the Foundation has exceeded its "time to decision" goal of informing at least 70 percent of principal investigators of funding decisions within six months of receipt of the proposal. In Fiscal Year 2008, 78 percent of all proposals were processed within six months. This performance measure is aimed not only at the efficiency of the NSF staff but also at providing valuable service to the science and engineering community to keep them informed of the progress of their proposals. See Figure 3 on page 2.

Merit Review

Through intensive staff efforts, NSF revised the Committee of Visitors (COV) report instructions to provide more clarity and consistency in the COV examination of the merit review process. NSF also achieved its target that for 95 percent of proposals, a written context statement will be provided to the Principal Investigator that describes the process by which the proposal was reviewed and the context in which the decision to recommend funding or a declination was reached.

Customer Service

The Foundation improved access to NSF funding data by putting data on actions and awards on each Directorate home page, with specific data for each Division and an overall funding rate for the Directorate.

Broadening Participation

The Foundation published its portfolio of broadening participation programs on the NSF website (http://www.nsf.gov/od/broadeningparticipation/bp.jsp) and initiated the development of sophisticated, modern tools and capabilities to expand the pool of reviewers for NSF proposals.

NSF also introduced a standard orientation module for review panels that includes information on mitigation of implicit bias in the merit review process.

Management of Large Facilities

All of NSF's 19 large operational facilities met the goal of keeping operating time lost to less than 10 percent. The Foundation also completed Business System Reviews of the University-National Oceanographic Laboratory System (UNOLS) – Research Fleet, the Advanced Modular Incoherent Scatter Rader (AMISR), and the IceCube Neutrino Observatory.

Post-Award Monitoring

NSF completed all post-award tasks and financial monitoring through on-site visits and desk reviews according to the Foundation's risk-based identification model. NSF also completed all projected Federal Cash Transaction (FCTR) testing for the fiscal year.

E-Government

NSF delivered an initial release of Research.gov to the general public and grantee organizations. Research.gov offers a Policy Library, Research Headlines and Events, and Research Spending and Results information for NSF and NASA awards. The Foundation also completed all of its major E-Government implementation milestones.

IT Security

NSF successfully completed its Federal Information Security Management Act (FISMA) IT Program review, which ensured that 100 percent of the Foundation's major applications and general support systems are certified and accredited. In addition, 100 percent of NSF's IT systems are installed in accordance with security configurations and all have privacy impact assessments.

Summary of Program Assessment Rating Tool (PART) Results

All of NSF's programs have undergone PART review. Of the more than 1,000 PART programs that have been evaluated across federal agencies, 19 percent have received the highest rating of "Effective." Ten of NSF's eleven PART evaluations received an "Effective" rating, while the most recent evaluation of the K-12 Math and Science Education program received a rating of "Moderately Effective." NSF's PART evaluations are available on Expectmore.gov (http://www.whitehouse.gov/omb/expectmore/)

Each PART evaluation contains several long-term outcome measures as well as annual output and efficiency measures. When PART was introduced in 2003, NSF's PART evaluations were grouped into program categories that aligned with the agency's existing strategic plan. However, those program alignments did not carry over into the current strategic plan, adopted in 2006. As a result, some of NSF's PART performance measures were revised to align with the new plan. Please see Appendix C for detailed information on all of NSF's PART evaluations.

The figure below indicates how NSF's PART evaluations are aligned, in general, with the current strategic plan's outcome goals of *Discovery*, *Learning*, and *Research Infrastructure*.

Figure 9. **NSF PART Evaluations and NSF Strategic Outcome Goals**

PART Evaluation	Strategic Outcome Goal
Capability Enhancement of Researchers, Institutions and Small Businesses	Discovery Research Infrastructure
Fundamental Science and Engineering	Discovery
Science and Engineering Centers Programs	Discovery
K-12 Math and Science Education	Discovery; Learning
Support for Individual Researchers	Learning
Support for Research Institutions	Learning
Support for Small Research Collaborations	Learning
Construction and Operations of Research Facilities	Research Infrastructure
Federally Funded Research and Development	Research Infrastructure
Investment in Research Infrastructure and Instrumentation	Research Infrastructure
Polar Research Tools, Facilities and Logistics	Research Infrastructure

PART Targets Not Met

In Fiscal Year 2008, six of the 23 PART targets were not met. In Appendix C, explanations are given for each target not met, as well as improvement plans to achieve the targets in the future. The six PART targets not met were:

- the time-to-decision goal for NSF centers. This measures the time from receipt of a pre-proposal to the time when an invitation is issued to a prospective center to submit a full proposal (Science and Engineering Centers PART); page C-5;
- the percentage of proposals for education grants (submitted to the Directorate for Education and Human Resources, or EHR) from outside the top 100 institutions that NSF funds (Support for Small Research Collaborations PART and Support for Research Institutions PART); page C-7;
- the percentage of SBIR (Small Business Innovation Research) Program Phase I awards to new investigators (Capability Enhancement of Researchers, Institutions, and Small Businesses PART); page C-11;
- the percentage of non-academic partners for NSF centers. Non-academic partners include other government agencies, national laboratories, research museums, industry, schools, and research institutions in foreign countries (Science and Engineering Centers PART); page C-12;
- the number of graduate students funded through the Graduate Research Fellowship Program, the Integrative Graduate Education and Research Traineeship (IGERT) Program, and the Graduate Teaching Fellows in K-12 (GK-12) Program (Support for Individual Researchers PART); page C-13;
- the schedule variance for one of NSF's major multi-user facilities, the Scientific Ocean Drilling Vessel (Construction and Operations of Research Facilities PART); page C-14.

Types and Sources of Performance Data and Information

Most of the information that informs the external expert review and assessment of outcomes under the strategic outcome goals originate outside the agency and are submitted to NSF by principal investigators through the Project Reporting System, which includes annual and final project reports for all awards. Through this system, performance information and data are available to program staff, third party evaluators, and other external committees.

Examples of types of information and data are:

- Information on *Discovery:* Published and disseminated results, including journal publications, books, software, audio or video products; 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 *Learning:* Student, 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 *Research Infrastructure:* Published 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 major multi-user facilities.

Most of the data supporting the annual quantitative performance goals may 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 Program Information Management System (PIMS); 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

In its annual review, the AC/GPA examines recent Committee of Visitor reports and program assessments conducted by external expert panels, principal investigator project reports, and award abstracts. Because it is impractical for an external committee to review the contributions to the performance goals by each of the more than 20,000 active awards, NSF program officers provide the Committee with summaries of notable results each fiscal year. These summaries of results, or "highlights," from awards, are a primary source for the AC/GPA determination of whether NSF demonstrated significant achievement in the strategic outcome goals of *Discovery, Learning,* and *Research Infrastructure*. 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 of the strategic goals. Nevertheless, taken together, the highlights, COV reports, project reports, award abstracts, and other reports of notable accomplishments covers the entire NSF portfolio.

Data Verification and Validation

As in prior years, NSF engaged an independent, external consultant to conduct a validation and verification (V&V) review of its annual performance information and data. IBM Global Business Services (IBM) completed a V&V review of the performance data and information reported for all the FY 2008 goals except three *Stewardship* goals: Post-Award Monitoring, E-Government, and IT Security. These three goals were examined as part of NSF's Internal Controls review and it was determined that a second review by IBM would be redundant.

For the strategic outcome goals, IBM reviewed the processes NSF used to obtain external assessment of its goals. IBM's V&V review is based on guidelines issued by GAO that require federal agencies to provide confidence that the policies and procedures underlying performance reporting are complete, accurate, and consistent. (See *GAO Guide to Assessing Agency Annual Performance Plans*, GAO/GGD-10.1.20.) 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. The FY 2008 Performance Measurement Verification and Validation Report, dated October 22, 2008, concludes:

> "Based on this verification and validation (V&V) review, we were able to verify the reliability of the processes and validate the accuracy of 23 of 24 annual performance goals. Due to unreported results, we were unable to verify and validate the remaining performance goal. In addition, we were able to verify and validate the reliability of the assessment processes for NSF's three Strategic Outcome Goals.
>
> Overall, we verify that NSF relies on sound business practices, internal controls, and manual checks of system queries to ensure accurate performance reporting. NSF maintains adequate documentation of its processes and data to allow for an effective V&V review. Based on this comprehensive review, IBM has confidence in the systems, policies, and procedures used by NSF to generate results for the described performance measures. NSF continues to take concerted steps to improve the quality of their systems and data. We commend NSF for this effort to confirm the reliability of its GPRA data and results, and the quality of its processes for collecting, processing, maintaining, and reporting data for its performance goals."[8]

[8] IBM Global Business Services. *National Science Foundation Government Performance and Results Act and Program Assessment Rating Tool: Fiscal Year 2008 – Performance Measurement Verification and Validation Report.* October 22, 2008.

Additional Information

Program Evaluations

See Appendix D for information on program evaluations.

Information on Use of Non-Federal Parties

The NSF Annual Performance report was prepared solely by NSF staff. External, non-federal sources of information used in preparing the report include:

- Reports from awardees demonstrating results
- Reports prepared by Committees of Visitors assessing NSF programs
- Reports prepared by an external, independent management consulting firm to validate and verity the procedures used to collect, process, maintain, and report performance goals. In Fiscal Year 2008 that firm was IBM Global Business Services.
- Reports from facilities managers on construction cost and schedules and operations.

Classified Appendixes not Available to the Public

None