

OTHER INFORMATION

Management Reviews

Each quarter, NSF senior leadership reviews progress towards all performance goals of the agency in a data-driven review meeting led by the Chief Operating Officer and Performance Improvement Officer. The quarterly progress of the Agency Priority Goals (APGs) and performance goals are reviewed.

Alignment of Human Capital Efforts with Organizational Performance

In order to drive individual and organizational performance, NSF requires that the performance plans of all employees, executives, and the general workforce contain individual goals aligned with the agency's mission and strategic goals. NSF provides training and makes tools and templates available for all supervisors and employees on linking performance plans to agency mission, as well as providing assistance and training on the policies, processes, requirements, and timeframes for the development of performance plans and appraisals.

NSF also directly aligns its strategic human capital and accountability efforts to the agency goals identified in the NSF Strategic Plan. Agency performance goals currently outline specific human capital goals, and NSF uses HRStat as the agency reporting mechanism to articulate the nexus between NSF's strategic goals/objectives, including agency performance goals, and human capital initiatives at the agency. Senior leaders are briefed quarterly regarding the status of agency performance goals and the human capital initiatives aligned to those goals.

Strategies and Collaborations

No one standard strategy is used across NSF for achievement of goals. Goal leaders at NSF choose strategies tailored to their stakeholders' needs and their institutional capabilities. NSF goals often involve testing the impacts of new activities or new approaches to existing activities, so feedback mechanisms are built in. Use of analysis, evidence, and evaluation findings is also at the discretion of each individual goal leader, as is the decision to collaborate with other agencies or external entities or to invest in contract support for their activities. Performance at NSF is reviewed quarterly by NSF's Performance Improvement Officer, who reports on goal progress to NSF senior management.

NSF employs a balanced set of performance indicators, milestones, and measures. Due to the nature of NSF investments, the two mission-oriented goals, *Transform the Frontiers of Science and Engineering* and *Stimulate Innovation and Address Societal Needs through Research and Education*, tend to be output- or outcome-based. The management-oriented goal, *Excel as a Federal Science Agency*, contains efficiency and customer-service measures, but also output and outcome measures relating to long-term activities such as strategic human capital management and diversity and inclusion.

Advisory Committees and Committees of Visitors

Each directorate and office has an external advisory committee that typically meets twice a year to review and provide advice on program management, discuss current issues, and review and provide advice on the impact of policies, programs, and activities in the disciplines and fields encompassed by the directorate or office. In addition to directorate and office advisory committees, NSF has several committees that provide advice and recommendation on specific topics: astronomy and astrophysics; environmental research and education; equal opportunities in science and engineering; direction, development, and enhancements of innovations; polar programs; advanced cyberinfrastructure; international and integrative activities; the agency's merit review processes; and business and operations.

Committees of Visitors (COVs) are subcommittees of NSF directorate advisory committees. COV reviews provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions;

and (2) comments on how the outputs and outcomes generated by awardees have contributed to the attainment of NSF's mission and strategic outcome goals. COV reviews are conducted at regular intervals of approximately three years for programs and offices that recommend or award grants, cooperative agreements, and/or contracts and whose main focus is the conduct or support of NSF research and education in science and engineering. Approximately one-third of NSF's divisions are assessed each year.

A COV typically consists of up to 20 external experts, selected to ensure independence, programmatic coverage, and geographic balance. COV members come from academia, industry, government, and the public sector. They meet for two or three days to review and assess program priorities, program management, and award accomplishments or outcomes. Each COV prepares a report and the division or program that is being reviewed must prepare a response to the COV recommendations. These reports and responses are submitted to the parent advisory committee and to the Director of NSF. All reports and responses are public and posted on NSF's website.¹

In FY 2015, eight directorates and offices convened 16 Committees of Visitors (COVs), covering 12 divisions and nine programs. A list of the COVs performed is provided below. The chapters of the directorates also contain information on these COVs, as well as information on *ad hoc* reports.

¹ www.nsf.gov/od/oia/activities/cov/covs.jsp

Other Information

List of Committees of Visitors Meetings, FY 2014-FY 2017

| DIR | FY 2014 | FY 2015 | FY 2016 (planned) | FY 2017 (planned) |
|------------|---|--|---|---|
| BIO | Molecular and Cellular Biosciences Integrative Organismal Systems Emerging Frontiers | Environmental Biology | Biological Infrastructure | Molecular and Cellular Biosciences Integrative Organismal Systems |
| CISE | - | Computing and Communication Foundations Computer and Network Systems Information and Intelligent Systems | Advanced Cyberinfrastructure | - |
| EHR | Human Resource Development: ADVANCE | Research on Learning in Formal and Informal Settings Graduate Education: GK-12/IGERT/SfS Undergraduate Education: ATE Undergraduate Education: Noyce/S-STEM | EHR Core Research Undergraduate Education: TUES, STEP, WIDER, IUSE:EHR | Graduate Education Human Resource Development |
| ENG | Electrical, Communications and Cyber Systems Emerging Frontiers in Research and Innovation | Chemical, Bioengineering, Environmental and Transport Systems Civil, Mechanical and Manufacturing Innovations | Engineering, Education and Centers Industrial Innovation and Partnerships | Electrical, Communications and Cyber Systems Emerging Frontiers and Multidisciplinary Activities |
| GEO | Atmospheric and Geospace Sciences: Geospace Section Earth Sciences Ocean Sciences: Integrative Programs Section | Atmospheric & Geospace Sciences: NCAR and Facilities Section Ocean Sciences: Research and Education | Atmospheric and Geospace Sciences: programs TBD Polar Programs: programs TBD | Atmospheric and Geospace Sciences: programs TBD Earth Sciences: programs TBD Ocean Sciences: programs TBD |
| MPS | - | Astronomy Materials Research Physics | Chemistry Mathematical Sciences | - |

| DIR | FY 2014 | FY 2015 | FY 2016 (planned) | FY 2017 (planned) |
|-------------------------|---------------------------------------|---|-------------------------------|---|
| SBE | - | Office of Multidisciplinary Activities Behavioral and Cognitive Sciences | Social and Economic Sciences | - |
| OIA and OISE (was OIIA) | International Science and Engineering | Experimental Program to Stimulate Competitive Research (EPSCoR) | Major Research Infrastructure | Science and Technology Centers International Science and Engineering |

Other Information

Evaluations and Research

Evaluations at NSF are currently performed at the discretion of the individual directorate, office, or program being evaluated. For discussion of how NSF uses planned, current, and recently completed evaluations in its program decisions, refer to individual directorate and office chapters. A list of the evaluations completed in FY 2015 follows, along with a list of selected high-impact events (workshops, symposia, or other meetings resulting in publications) reported by directorates. For more details about how the results of these specific evaluations or events are being used to shape agency decisions, see the chapter of the sponsoring directorate. For more information about program evaluation and collection and management of NSF programmatic data, see the NSF-Wide Investments chapter section on NSF's Evaluation and Assessment Capability.

External Evaluations Completed in FY 2015

| DIR | Program, Topic, or Area Evaluated | Name of Evaluation | Evaluator | Link to report |
|-----|---|---|---|--|
| EHR | Advancing Informal Science Learning (was Informal Science Education) | Evaluation of the Informal Science Education (ISE) Program | SRI International | Not Yet Available |
| EHR | Innovative Technology Experiences for Students and Teachers (ITEST) | Evaluation of the Innovative Technology Experiences for Students and Teachers (ITEST) Program | SRI International | Not Yet Available |
| EHR | National STEM Digital Library/ Distributed Learning (NSDL) | Evaluation of the National STEM Digital Library/Distributed Learning (NSDL) Program | Guardians of Honor | Not Yet Available |
| EHR | Research and Evaluation on Education in Science and Engineering (REESE) | Evaluation of the National Science Foundation's Research and Evaluation on Education in Science and Engineering (REESE) Program | Westat | Not Yet Available |
| GEO | Ocean Sciences | Sea Change: Decadal Survey of Ocean Sciences 2015-2025 | National Research Council | www.nap.edu/catalog/21655 |
| GEO | Antarctic and Southern Ocean research | A Strategic Vision for NSF Investments in Antarctic and Southern Ocean Research | National Academies of Sciences, Engineering, and Medicine | www.nap.edu/catalog/21741 |
| MPS | Large Synoptic Survey Telescope | Optimizing the U.S. Ground-Based Optical and Infrared Astronomy System | National Research Council | www.nap.edu/catalog/21722 |
| SBE | Replicability | Social, Behavioral, and Economic Sciences Perspectives on Robust and Reliable Science | Subcommittee on Replicability in Science, SBE AC | www.nsf.gov/sbe/AC_Materials/SBE_Robust_and_Reliable_Research_Report.pdf |

Selected Meetings, Symposia, and Workshops in FY 2015

| DIR | Workshop Name | Link to report |
|----------------|--|--|
| BIO | The Nuts and Bolts of Bioengineered Systems: A workshop on Standards in Synthetic Biology | http://147.156.205.24/synbioworkshop/?tag=synbioworkshop |
| BIO | NIMBioS: National Institute of Mathematical Biosynthesis: A Workshop on Computational Advances in Microbiome Research (CAMR) | www.nimbios.org/workshops/WS_microbiome |
| BIO | The Pathway to a Roadmap: Phytobiomes 2015: Designing a New Paradigm for Crop Improvement | www.phytobiomes.org/activities/Pages/Phytobiomes-2015.aspx |
| BIO | Physics of Wear, Tear, Aging and Failure in Living and Nonliving Systems | http://physicsoflivingsystems.org/workshops/physicsofweartearaging/ |
| BIO | Interactive Mentoring Activities for Grantsmanship Enhancement | http://grantome.com/grant/NSF/MCB-1513415 |
| BIO | 9 th Annual q-bio conference | q-bio.org/wiki/The_Ninth_q-bio_Conference |
| CSE | A New Age of Computing and the Brain | http://cra.org/ccc/wp-content/uploads/sites/2/2014/12/BRAIN-Report.pdf |
| CSE | Toward a Science of Autonomy for Physical Systems | http://cra.org/ccc/wp-content/uploads/sites/2/2015/07/Science-of-Autonomy-June-2015.pdf |
| CSE | Continuing Innovation in Information Technology: A Workshop | http://sites.nationalacademies.org/CSTB/CurrentProjects/CSTB_086055 |
| ENG | Frontiers of Additive Manufacturing Research and Education | www.wilsoncenter.org/sites/nsfamenv/index.html |
| ENG | Advanced Manufacturing for the Oil and Gas Energy Industry | http://ise.tamu.edu/nsf2014/PDFs/NSF-OGWorkshop-Report_Feb_2015.pdf |
| ENG | Rebooting the IT Revolution: A Call to Action | www.src.org/newsroom/rebooting-the-it-revolution.pdf |
| MPS, ENG, CISE | Rise of Data in Materials Research | http://riseofdata.org/ |
| MPS | Enabling Resiliency in Energy Water and Food Systems for Society: Addressing the Scientific, Technological and Societal Challenges of the Energy, Water and Food Nexus | www.nsf.gov/mps/che/workshops/uarizona_few_nexus_workshop_report_final.pdf |
| MPS | Closing the Human Phosphorous Cycle Workshop | www.nsf.gov/mps/che/workshops/phosphorus_cycle_report_final.pdf |
| MPS | Evidence-Based Practices for Broadening Participation in the Chemical Sciences | http://csp.umn.edu/wp-content/uploads/2015/07/Final-Report-CCI-Diversity-Forum.pdf |
| MPS | DOE/NSF Materials Genome Initiative (MGI) Principal Investigators' Meeting | www.orau.gov/mgi2015 |
| MPS | Mathematical Sciences Internships: Building Career Pathways | www.ipam.ucla.edu/reports/2015-nsf-ipam-mathematical-sciences-internship-workshop-report |
| MPS | Mathematical Sciences Challenges in Quantum Information | www.sites.google.com/site/mathqinfo2015/home |
| MPS | Interdisciplinary Approaches to Biomedical Data Science Challenges | www.samsi.info/workshop/interdisciplinary-approaches-biomedical-data-science-challenges-samsi-innovations-lab-july- |

Data Verification and Validation

It is NSF's practice to follow Government Accountability Office (GAO) guidance and engage external contractors to conduct an independent validation and verification (V&V) review of its annual performance information, data, and processes. The guidance from GAO indicates that agencies should "...describe the means the agency will use to verify its performance data..." and "...provide confidence that [their] performance information will be credible."² NSF will continue this process in FY 2016 and FY 2017.

In FY 2015, IBM Global Business Services (IBM) assessed the validity of NSF data and verified the reliability of the methods used to collect, process, maintain, and report that data, and reviewed NSF's information systems based on GAO standards for application controls. IBM's FY 2015 report concluded:

Based on the FY 2015 Verification and Validation (V&V) review, IBM was able to fully verify the reliability of the processes and validate the accuracy of results reported for all of NSF's eleven³ annual performance goals.

Overall, IBM verifies 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 the V&V assessment, IBM has confidence in the systems, policies, and procedures used by NSF to calculate results for its performance measures that contained targets. NSF continues to take concerted steps to improve the quality of its systems and data. IBM confirms NSF's commitment to ensuring the accuracy of its reported GPRA results, and the reliability of its processes for collecting, processing, maintaining, and reporting data for its performance goals.⁴

The data and information required to measure progress towards NSF's performance goals fall into three broad categories.

1. NSF automated administrative systems. Performance monitoring can be a valuable secondary function of such systems. Reporting can include data from systems that:
Store and approve publications such as solicitations announcements, and Dear Colleague Letters;
 - Collect transactional data about proposal and award management;
 - Perform financial transactions;
 - Store human resources data; or
 - Permit keyword search of abstract or full texts of proposals and awards.The data were used either directly or for achieving milestones that involve the writing of a report. While not all goals require a high level of accuracy, data from these systems are highly reliable.
2. Reports on internal activities. Milestone achievement is often determined from review of records of certain activities and events. Records of this sort tend to be compiled from review of the evidence provided by goal leaders.
3. Data requests of external parties. Qualitative or quantitative information is solicited directly from awardees.

² GAO, *The Results Act: An Evaluator's Guide to Assessing Agency Annual Performance Plans*, GAO/GGD-10.1.20 (Washington, D.C.: April 1998), pp. 40-41.

³ One FY 2014 goal, Data-Driven Management Reviews (Goal 10 in FY 2014), did not have complete data at the time of the FY 2014 V&V and was instead V&V'd in FY 2015.

⁴ IBM Global Business Services, *National Science Foundation Performance Measurement Verification and Validation Report, Fourth Quarter Final Report Fiscal Year 2015*. October 23, 2015.

Management Challenges

A discussion of agency management challenges can be found in the FY 2015 Agency Financial Report.⁵

Burden Reduction/Unnecessary Plans and Reports to Congress

The GPRA Modernization Act of 2010 requires that agencies identify which of the plans and reports they provide to Congress are outdated or duplicative of other required plans and reports. The complete list of reports that NSF suggested for consolidation or elimination can be found on performance.gov.

Lower-Priority Program Activities

The President's Budget identifies the lower-priority program activities, where applicable, as required under the GPRA Modernization Act (31 U.S.C. 1115(b)(10)). The public can access the volume at www.whitehouse.gov/omb/budget.

Use of Non-Federal Parties

No non-federal parties were involved in preparation of this Annual Performance Report.

Classified Appendices Not Available to the Public

None

⁵ www.nsf.gov/pubs/2016/nsf16002/

Other Information