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.

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 is also advised by external committees on specific topics. Recent examples include: 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 four 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-fourth 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 2018, five directorates or offices convened nine COVs, covering all or part of seven divisions and one office. A table of the COVs performed in recent years and planned through FY 2020 is provided on the next page. The chapters of the directorates also contain information on these COVs, as well as information on *ad hoc* reports.

Evaluations and Research

Evaluations at NSF are currently performed at the discretion of the individual directorate, office, or program being evaluated. A list of the evaluations completed in FY 2018 follows. For more details about how the results of these specific evaluations are being used to shape agency decisions, see the chapter of the sponsoring directorate. Directorate chapters also contain a list of selected high-impact events (workshops, symposia, or other meetings resulting in publications) that inform their decision-making. For more information about program evaluation and collection and management of NSF programmatic data, see the Office of Integrative Activities chapter's section on NSF's Evaluation and Assessment Capability.

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

External Evaluations Completed in FY 2018 and the first quarter of FY 2019

DIR	Name of Evaluation	Evaluator	Link to report
CISE	Growth of Computer Science Undergraduate Enrollments	National Academies	www.nap.edu/catalog/24926/assessing-and-responding-to-the-growth-of-computer-science-undergraduate-enrollments
CISE	Data Science for Undergraduates: Opportunities and Options	National Academies	www.nap.edu/catalog/25104/data-science-for-undergraduates-opportunities-and-options
CISE	Quantum Computing: Progress and Prospects (published FY 2019)	National Academies	www.nap.edu/catalog/25196/quantum-computing-progress-and-prospects
ENG	Environmental Engineering for the 21st Century: Addressing Grand Challenges (published FY 2019)	National Academies	www.nap.edu/catalog/25121/environmental-engineering-for-the-21st-century-addressing-grand-challenges
GEO	Science Engineering and Education for Sustainability Portfolio Evaluation	Manhattan Strategy Group	Not public. See OIA and GEO narratives.
GEO	Geoscience Education Evaluation	2M Research	Not public. See OIA and GEO narratives.
SBE	Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine	National Academies	www.nap.edu/catalog/24994/sexual-harassment-of-women-climate-culture-and-consequences-in-academic
SBE	Measuring the 21st Century Science and Engineering Workforce Population: Evolving Needs	National Academies	www.nap.edu/catalog/24968/measuring-the-21st-century-science-and-engineering-workforce-population-evolving

List of Committees of Visitors Meetings, FY 2015-FY 2020

DIR	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019 (planned)	FY 2020 (projected)
BIO	Environmental Biology (DEB)	Biological Infrastructure (DBI)	-	Molecular and Cellular Biosciences (MCB) Integrative Organismal Systems (IOS)	DEB	DBI
CISE	Computing and Communication Foundations (CCF) Computer and Network Systems (CNS) Information and Intelligent Systems (IIS)	-	-	Advanced Cyberinfrastructure	-	CCF CNS IIS
EHR	Research on Learning in Formal and Informal Settings (DRL) Graduate Education (DGE): GK-12/ IGERT/SFS Undergraduate Education (DUE): ATE DUE: Noyce/S-STEM	-	Human Resource Development (HRD) EHR Core Research DUE: TUES, STEP, WIDER, IUSE: EHR	-	DGE DUE	DRL HRD
ENG	Chemical, Bioengineering, Environmental and Transport Systems (CBET) Civil, Mechanical and Manufacturing Innovations (CMMI)	Engineering, Education and Centers (EEC) Industrial Innovation and Partnerships (IIP)	-	Electrical, Communications and Cyber Systems (ECCS) Emerging Frontiers and Multidisciplinary Activities	CBET CMMI	EEC IIP

DIR	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019 (planned)	FY 2020 (projected)
GEO	Atmospheric and Geospace Sciences (AGS): NCAR and Facilities Ocean Sciences (OCE): Research and Education	AGS: Atmosphere Section (AS)	Education and Diversity Programs Earth Sciences (EAR)	AGS: Geospace OCE: Integrative Programs	AGS: Facilities OCE: Research Programs	AGS: multiple programs
MPS	Astronomy (AST) Materials Research (DMR) Physics (PHY)	Chemistry (CHE) Mathematical Sciences (DMS)	-	-	AST DMR PHY	CHE DMS
SBE	Office of Multidisciplinary Activities (SMA) Behavioral and Cognitive Sciences (BCS)	Social and Economic Sciences (SES)	-	-	SMA BCS	SES
OPP, OIA, and OISE	Established Program to Stimulate Competitive Research (EPSCoR)	Major Research Infrastructure (MRI) Office of Polar Programs (OPP): Antarctic Sciences OPP: Arctic Sciences	-	International Science and Engineering National Academies: Board on International Science Organizations	-	EPSCoR MRI OPP: Antarctic Sciences OPP: Arctic Sciences

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]

In FY 2018, NSF contracted with Nexight Group to perform the independent verification and validation. Nexight assessed the validity of NSF data and verified the reliability of the methods used to collect, process, maintain, and report that data. Nexight's FY 2018 report concluded:

> The Nexight Team was able to verify the reliability of the processes used to generate the performance measure results for seven performance goals. Although some of the measures have issues that should be addressed in future years, the data collection processes for all measures adhere to the five V&V criteria—Complete, Consistent, Accurate, Timely, and Valid—and are sufficient to ensure that the results are usable. The Nexight Team was also able to confirm the reported results for most of the performance measures under the seven goals.
>
> Overall, the Nexight Team verifies that NSF relies on sound data collection practices, internal controls, and manual checks of system queries to ensure accurate performance reporting. Based on the V&V assessment, the Nexight Team has confidence in the systems, policies, and procedures used by NSF to calculate results for its performance measures. NSF continues to take concerted steps to improve the quality of its systems and data. The Nexight Team confirms NSF's commitment to ensuring the accuracy of its reported Government Performance and Results Act (GPRA) results, and the reliability of its processes for collecting, processing, maintaining, and reporting data for its performance goals.[3]

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. 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] Nexight Group with Energetics Incorporated, *National Science Foundation Performance Measurement Verification and Validation Report, Fiscal Year 2018*. November 2018.

3. 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.

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.