FY 2024 ANNUAL PERFORMANCE PLAN AND FY 2022 PERFORMANCE REPORT

Per the Government Performance and Results Act (GPRA) Modernization Act of 2010,[1] this chapter, together with the Overview, contains basic information about the National Science Foundation's (NSF's) mission and Strategic Plan, as well as NSF's fiscal year (FY) 2024 Annual Performance Plan and FY 2022 Annual Performance Report.

FY 2022-2026 Strategic Plan Framework: Strategic Goals and Objectives

NSF's Strategic Plan for FYs 2022-2026: *Leading the World in Discovery and Innovation, STEM Talent Development, and the Delivery of Benefits from Research*,[2] includes four strategic goals—Empower, Discover, Impact, and Excel—that form the core of the plan. These themes focus on expanding frontiers, engaging people, and delivering solutions. Under each goal are two strategic objectives, which together encompass all areas of agency activity.

FY 2022-2026 Strategic Framework, Strategic Goals, and Objectives

Strategic Goal	Strategic Objective
1. Empower: Empower STEM talent to fully participate in science and engineering	**1.1 Ensure accessibility and inclusivity –** Increase the involvement of communities underrepresented in STEM and enhance capacity throughout the nation.
	1.2 Unleash STEM talent for America – Grow a diverse STEM workforce to advance the progress of science and technology.
2. Discover: Create new knowledge about our universe, our world, and ourselves	**2.1 Advance the frontiers of research –** Accelerate discovery through strategic investments in ideas, people, and infrastructure
	2.2 Enhance research capacity – Advance the state of the art in research practice
3. Impact: Benefit society by translating knowledge into solutions	**3.1 Deliver benefits from research –** Advance resea8.8 (e)o (m)2 l1 (s)2 2rli–communi
4. Excel: Excel at NSF operations and management	**4.1 Strengthen at speed and scale –** Pursue innovative strategies to strengthen and expand the agency's capacity and capabilities
	4.2 Invest in people – Attract, empower, and retain a talented and diverse NSF workforce

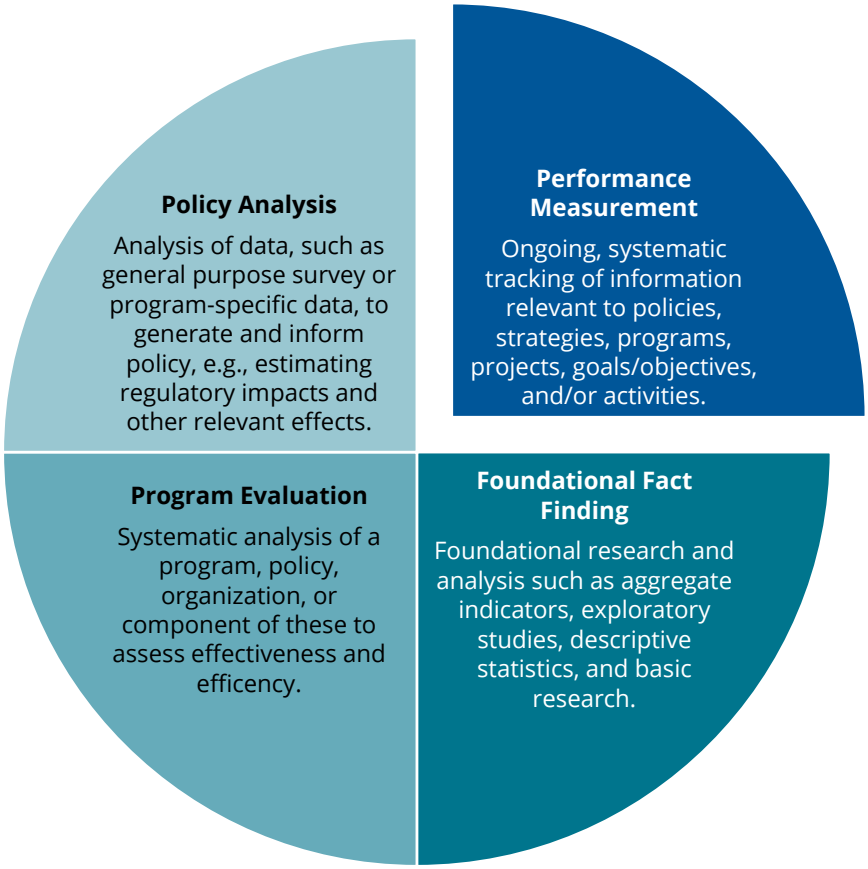
[1] The GPRA Modernization Act of 2010 is Public Law 111-352 and is available at: http://www.congress.gov/111/plaws/publ352/PLAW-111publ352.pdf.

[2] NSF's strategic plan is available at https://www.nsf.gov/news/special_reports/strategic_plan/

NSF Performance Management Framework

NSF's Annual Performance Plan and Report builds upon key aspects of the GPRA Modernization Act of 2010 and the Evidence Act.[3] These include Agency Priority Goals and Strategic Reviews, which enable agencies to consider data beyond annual output measures when evaluating agency performance, and a framework outlining four types of evidence. OMB's guidance defines four types of information used for Evidence Building: Foundational Fact Finding, Policy Analysis, Performance Measurement and Program Evaluation.

Components of Evidence
(Presented in OMB M-19-23 and M-21-27)[4]



[3] The Foundations for Evidence-Based Policymaking Act of 2018 (the Evidence Act) is available at https://www.congress.gov/bill/115th-congress/house-bill/4174.

[4] OMB Memorandum M-21-27 "Evidence-Based Policymaking: Learning Agendas and Annual Evaluation Plans" may be accessed at www.whitehouse.gov/wp-content/uploads/2021/06/M-21-27.pdf;
OMB Memorandum M-19-23 "Phase 1 Implementation of the Foundations for Evidence-Based Policymaking Act of 2018: Learning Agendas, Personnel, and Planning Guidance" may be accessed at www.whitehouse.gov/wp-content/uploads/2019/07/M-19-23.pdf

The Annual Performance Plan and Report presented in this chapter includes goals, indicators, and other information that relate directly to these components of evidence:

- *Annual Goals* are included in the "Performance Measurement" category of evidence and answer the question, "What progress is the implemented approach making toward objectives and goals, on key measures and against set targets?"
- *Other Information and Context* includes indicators in the "Foundational Fact Finding" category of evidence and answer the question, "What can we understand about the problem, existing approaches, and the target populations?"
- *Evaluation Highlights* are included in the "Program Evaluation" category of evidence and answer the questions, "To what degree is our implemented approach causing the desired outcomes/impact? How much effect? For whom? Under what conditions?

This multi-faceted framework will help to highlight how science and engineering research and education generate a dynamic set of impacts and benefits, and it will also provide valuable information and insights for strengthening NSF's programs and investments.

Strategic Goal 1, Empower: Empower STEM talent to fully participate in science and engineering

Strategic Objective 1.1: Ensure accessibility and inclusivity. Increase involvement of communities underrepresented in STEM and enhance capacity throughout the nation.

Annual Goal 1.1: Improve representation in the scientific enterprise [Agency Priority Goal][5]

Goal Statement: Increase both the number and proportion of proposals received 1) with principal investigators from groups underrepresented in STEM and 2) from underserved institutions by 10 percent over the FY 2020 baseline.

About this Goal: Among the awards NSF makes annually, the proportion of awards with principal investigators (PIs) from groups underrepresented in STEM is not on par with their representation in the STEM workforce, which in turn is below the relative proportions of the total population. The aim of this Agency Priority Goal (APG) is to improve representation in the scientific enterprise by pursuing actions that will lead to an increase in proposal submissions led by individuals from groups underrepresented in STEM and from underserved communities.

Annual Goal 1.1: Improve representation in the scientific enterprise[6]		FY18	FY19	FY20	FY21	FY22	FY23	FY24
Number of proposals with PIs from groups underrepresented in STEM[7]	Target						14,208	N/A
	Results	N/A	N/A	12,916	13,846	13,127		
Proportion of proposals with PIs from groups underrepresented in STEM	Target						34.1%	N/A
	Results	N/A	N/A	31.0%	32.6%	34.4%		
Number of proposals from underserved institutions[8]	Target						6,786	N/A
	Results	N/A	N/A	6,169	6,623	6,000		
Proportion of proposals from underserved institutions	Target						16.3%	N/A
	Results	N/A	N/A	14.8%	15.6%	15.7%		

Discussion of FY 2022 Result: The FY 2022 target for the APG overall was to establish baselines for

[5] More information on the APG is available at: https://www.performance.gov/agencies/NSF/apg/goal-1/

[6] These FY 2020 baselines, FY 2021 results, and FY 2023 targets were recalculated at the end of FY 2022 to account for improvements in demographic data collection and institutional flags implemented throughout 2021 and 2022. Data as of 12/9/2022.

[7] Investigators in groups underrepresented in STEM include principal investigators who identify as women, members of racial/ethnic minorities underrepresented in STEM, or persons with disabilities.

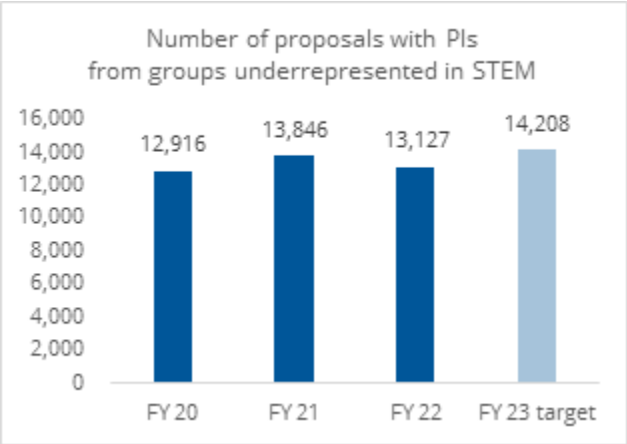
[8] Underserved institutions include awardees receiving less than $50 million in annual federal support for research and development, as measured in Federal obligations, that are either located in Established Program to Stimulate Competitive Research (EPSCoR) jurisdictions or are Minority Serving Institutions (MSIs). Institutions designated as a Minority-Serving Institution for NSF reporting are the following institution types: Disabled Serving, High African American Enrollment, Historically Black Colleges and Universities, High American Indian Serving, Native Alaskan Serving, Native Hawaiian Serving, Pacific Islander, Tribal Colleges, Majority Minority Serving, and Hispanic Serving.

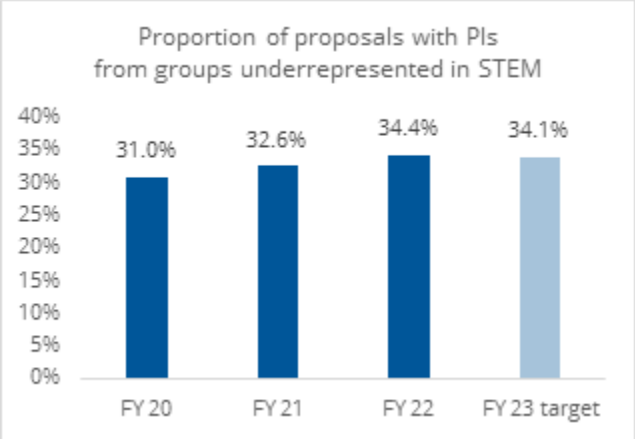
each of the indicators. The FY 2022 target of establishing baselines was met, as presented in the above table and charts below. The FY 2020 baselines, as well as FY 2021 results and FY 2023 targets, were recalculated at the end of FY 2022 to account for improvements in demographic data collection and institutional flags implemented throughout 2021 and 2022. Improved demographic data indicate that at the FY 2020 baseline, NSF was receiving a larger number and proportion of proposals with principal investigators from groups underrepresented in STEM than previously reported. While the absolute number of proposals with principal investigators from groups underrepresented in STEM decreased from FY 2021 to FY 2022, these results reflect an overall decrease in proposals NSF-wide. When factoring in this context, the proportion of these proposals is on track to meet the FY 2023 goal.

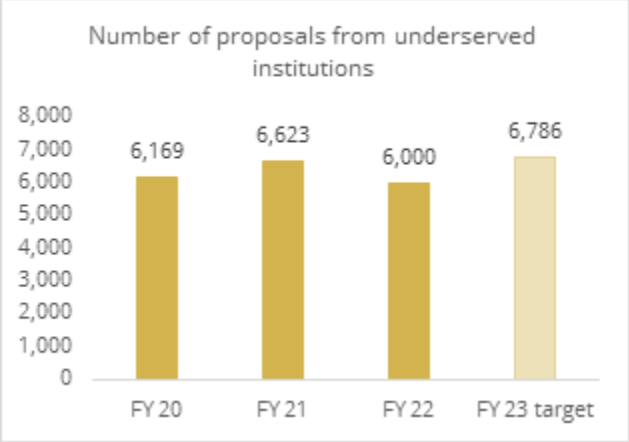
Discussion of FY 2023 Target: The proportion of proposals NSF receives from groups underrepresented in STEM has remained fairly consistent for the last decade or longer.[9] This APG seeks a meaningful increase in the number and proportion of proposals from these groups that is also realistic within the two-year timeframe. With the recalculation of the FY 2020 baselines, the FY 2023 targets, which are a 10 percent increase over the FY 2020 baselines, have increased accordingly. The APG for FY 2024-2025 will be developed in FY 2023.

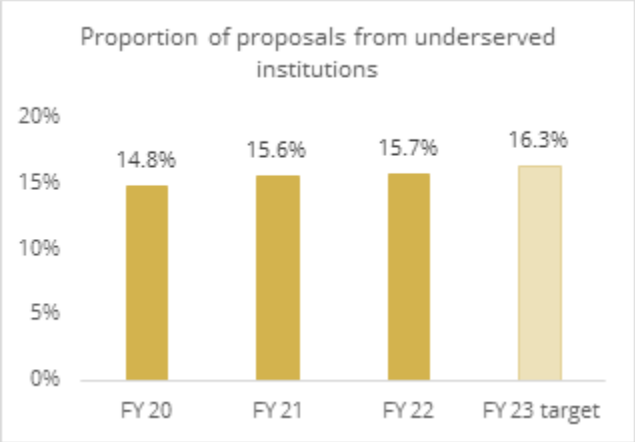
[9] See Figure 9, "Percentage of Proposals from and Awards to Women" and Figure 11. "Percentage of Proposal from and Awards to Researchers from Underrepresented Racial or Ethnics Groups," *Merit Review Process, Fiscal Year 2020 Digest* p. 18, 20. https://www.nsf.gov/nsb/publications/2021/merit_review/FY-2020/nsb202145.pdf

Agency Priority Goal: Improve Representation in the Scientific Enterprise, Key Indicators









Other Information and Context related to Strategic Objective 1.1

The information presented in the tables below provides useful context for this objective and its emphasis on addressing underrepresentation in STEM and expanding the geography of innovation.

NSF Funding to Minority-Serving Institutions: Table 1.1.1 includes the number of, and total funding for, new awards to minority-serving institutions (MSIs).[10] MSIs make considerable contributions to educating and training science leaders, contributing to U.S. economic growth and competitiveness. However, NSF usually receives comparatively fewer grant proposals from, or involving, scholars at, MSIs. NSF is aiming to address these disparities through the APG and though new activities such as GRANTED,[11] which focuses on addressing systemic barriers within the nation's research enterprise by improving research support and service capacity at emerging, developing and underserved research institutions, as well as other ongoing programs and activities devoted to broadening participation.

Table 1.1.1: NSF Funding to Minority Serving Institutions[12]		FY18	FY19	FY20	FY21	FY22
Number of new awards funded to MSIs	Actuals	1,669	1,593	1,673	1,795	1,692
Percent of all new NSF awards	Actuals	14.2%	14.2%	13.7%	15.8%	15.4%
Total funding for new awards to MSIs (millions)	Actuals	$981	$1,020	$1,023	$1,147	$1,201
Percent of all new NSF funding	Actuals	13.2%	13.3%	13.2%	14.1%	14.1%

NSF Funding to Institutions in EPSCOR States: Table 1.1.2 displays the number of, and total funding amounts for, new awards funded to institutions in EPSCoR (Established Program to Stimulate Competitive Research) jurisdictions. These are important indicators for gauging NSF's efforts to expand the geography of innovation, as the EPSCoR program seeks to strengthen STEM capability in jurisdictions that have historically received a smaller share of NSF funding.

Table 1.1.2: NSF Funding to Institutions in EPSCOR Jurisdictions[13]		FY18	FY19	FY20	FY21	FY22
Number of new awards funded to institutions in EPSCoR jurisdictions	Actuals	1,565	1,508	1,687	1,621	1,573

[10] MSIs include the following institution types: Disabled Serving, High African American Enrollment, Historically Black Colleges and Universities, High American Indian Serving, Native Alaskan Serving, Native Hawaiian Serving, Pacific Islander, Tribal Colleges, Majority Minority Serving, and Hispanic Serving.

[11] GRANTED stands for Growing Research Access for Nationally Transformative Equity and Diversity.

[12] Results were generated using the MSI filter for the NSF by the Numbers dashboard as of January 4, 2022. The dashboard may be accessed at https://tableau.external.nsf.gov/views/NSFbyNumbers/NumbersbyState.

[13] Results were generated using the EPSCoR filter for the NSF by the Numbers dashboard as of January 4, 2023. The dashboard may be accessed at https://tableau.external.nsf.gov/views/NSFbyNumbers/NumbersbyState.

Percent of all new NSF awards	Actuals	13.4%	13.4%	13.9%	14.3%	14.3%
Total funding for new awards to institutions in EPSCoR jurisdictions (millions)	Actuals	$820	$909	$974	$1,034	$1,107
Percent of all new NSF funding	Actuals	11.1%	11.8%	12.6%	12.7%	13.0%

In the future, NSF also plans to report on the number of, and total funding amounts for, emerging research institutions.[14]

NSF Funding to Principal Investigators from Groups Underrepresented in STEM: NSF's APG is to increase the number and proportion of proposals submitted by investigators underrepresented in STEM and from underserved institutions as that is the first step to improving representation among these groups. The number of awards to principal investigators from groups underrepresented in STEM is an important indicator that NSF's efforts to increase proposal rates are yielding increased investments in underserved communities.

Table 1.1.3: NSF Awards to Principal Investigators from Groups Underrepresented in STEM[15]		**FY18**	**FY19**	**FY20**	**FY21**	**FY22**
Number of new awards to PIs who identify as women (% of all new awards)	Actuals	3,271 (28%)	3,282 (29%)	3,620 (30%)	3,656 (32%)	3,362 (31%)
Number of new awards to PIs who identify as members of racial/ethnic groups underrepresented in STEM (% of all new awards)	Actuals	914 (8%)	877 (8%)	973 (8%)	1,099 (10%)	976 (9%)
Number of new awards to PIs who identify as persons with disabilities (% of all new awards)	Actuals	156 (1%)	146 (1%)	173 (1%)	147 (1%)	149 (1%)

[14] Section 10002 of the CHIPS and Science Act of 2022 defines Emerging Research Institution as an institution of higher education with an established undergraduate or graduate program that has less than $50,000,000 in Federal research expenditures. The text of the CHIPS and Science Act is available at https://science.house.gov/imo/media/doc/the_chips_and_science_act.pdf.

[15] Data as of 12/7/2022.

Other Information and Context related to Strategic Objective 1.2

Although NSF is only one of many federal, non-profit, and private entities involved in growing the STEM workforce, knowledge of general workforce and demographic trends among those in STEM occupations informs the strategies NSF deploys in this area. The NSF-based National Center for Science and Engineering Statistics (NCSES) maintains comprehensive information on data and trends within the U.S. science and engineering workforce. NCSES reports highlight data that are particularly relevant to this Strategic Objective and its emphasis on growing a diverse STEM workforce.

Table 1.2.1 provides overall figures for the U.S. STEM Workforce and shows it has grown over the past several years both in total and as a share of overall U.S. employment.

Table 1.2.1: U.S. STEM Workforce[18]		**2015**	**2016**	**2017**	**2018**	**2019**
Total U.S. employees in STEM occupations (in millions)	Actuals	32.5	33.2	34.1	34.8	36.1
Percent of total US Employees	Actuals	22.0%	22.2%	22.5%	22.7%	23.2%

Table 1.2.2: Demographic composition of the STEM Workforce: 2011 and 2021[19]		**2011**	**2021**
Women	Actual	32.4%	35.2%
White	Actual	73.8%	64.2%
Black or African American	Actual	6.9%	8.6%
American Indian/Alaska Native	Actual	0.3%	0.6%
Hispanic or Latino	Actual	10.7%	14.6%
Asian	Actual	6.9%	10.3%
At least one disability	Actual	3.1%	2.9%

Data on the participation in the STEM Workforce by demographic group was published in the January 2023 report, *Diversity and STEM: Women, Minorities, and Persons with Disabilities*. Based on that report, women made up about one-third of the STEM workforce in 2021, less than their representation in the employed U.S. population (48 percent). In addition, Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives collectively represented 24 percent of the STEM workforce in 2021, though 30 percent of the employed U.S. population.[20]

[18] National Center for Science and Engineering Statistics, *The STEM Labor Force of Today: Scientists, Engineers, and Skilled Technical Workers*, 2021. Table SBLR-2, "Employed adults in the United States, by workforce type: 2010-19." The report is available at https://ncses.nsf.gov/pubs/nsb20212/executive-summary

[19] National Center for Science and Engineering Statistics, *Diversity and STEM: Women, Minorities, and Persons with Disabilities,* 2023. Figure 2-2, "STEM workforce ages 18-74, by sex, ethnicity, race, and disability status: 2011 and 2021." The report is available at https://ncses.nsf.gov/pubs/nsf23315/report/the-stem-workforce#growth-in-the-stem-workforce-between-2011-and-2021

[20] National Center for Science and Engineering Statistics, *Diversity and STEM: Women, Minorities, and Persons with Disabilities,* 2023. Figure 1-1, "Characteristics of the U.S. population ages 18-74, by labor force status: 2021." The report is available at https://ncses.nsf.gov/pubs/nsf23315/report/the-stem-workforce#growth-in-the-stem-workforce-between-2011-and-2021

Strategic Goal 2, Discover: Create new knowledge about our universe, our world, and ourselves.

Strategic Objective 2.1: Advance the frontiers of research. Accelerate discovery through strategic investments in ideas, people, and infrastructure.

Annual Goal 2.1: Ensure that Major Facility Infrastructure Investments are on Track

Goal Statement: Ensure program integrity and responsible stewardship of Major Facility investments which have a Total Project Cost (TPC) greater than $100 million. Keep negative cost and schedule variance at or below 10 percent for all (100 percent) of the Major Facility projects in the Construction Stage that are more than 10 percent complete.

About This Goal: Modern and effective research infrastructure is critical to maintaining U.S. international leadership in science and engineering. NSF's major multi-user research facilities (Major Facilities) are transformative in nature, with the potential to shift the paradigm in scientific understanding. Realizing the benefits of new Major Facility investments is based on ensuring their timely completion within budget and planned scope. The use of Earned Value Management (EVM) is required for all Major Facilities in the Construction Stage. Cost and schedule variance are key EVM indicators of whether a project is on track relative to the project plan. For Major Facilities, NSF performs oversight activities of the recipient's EVM System (EVMS) that ensure reliability of these metrics which also reinforces the importance of recipient project management and accountability. Therefore, these metrics provide an indication of the effectiveness of NSF's oversight of projects in construction. This goal only considers the percentage of Major Facility projects under construction that are more than 10 percent complete for which negative cost and schedule variance are both at or below 10 percent. Projects that are less than10 percent complete are not considered because EVM data are less meaningful early in the project.

Annual Goal 2.1: Ensure that Major Facility Infrastructure Investments are on Track		FY18	FY19	FY20	FY21	FY22	FY23	FY24
Major Facility Construction Projects: Percent Meeting Cost and Schedule Targets	Target	100%	100%	100%	100%	100%	100%	100%
	Results	100%	100%	75%	40%	40%		

Discussion of FY 2022 Result: Beginning in FY 2020, the COVID-19 pandemic had a negative impact on projects in construction. In FY 2022, five projects were in the Construction Stage and therefore tracked against this goal: the Vera C. Rubin Observatory (Rubin), Regional Class Research Vessels (RCRV), Antarctic Infrastructure Modernization for Science (AIMS), Compact Muon Solenoid (CMS), and A Toroidal LHC Apparatus (ATLAS). As of September 30, 2022, all five reported being on track for cost performance, and two (Rubin and AIMS) are on track for schedule performance. Going forward CMS and ATLAS will be re-baselined to adjust for delays due to the COVID-19 pandemic,[21] and the schedule for RCRV will be addressed in a revision to plans based on continued impacts of Hurricane Ida on the local labor market. As the poor performance on these metrics were driven by events beyond the control of the project or NSF (COVID-19 pandemic and damage from a major hurricane), NSF has continued to monitor the situation, but no corrective actions were necessary.

[21] AIMS was re-baselined in July 2022.

Discussion of FY 2023 and FY 2024 Targets: In FY 2023, NSF plans to re-baseline the remaining projects in the Construction Stage to adjust for delays caused by the COVID-19 pandemic which will re-set the performance targets and the corresponding EVM metrics.

Consistent with prior years, NSF aims to keep negative cost and schedule variance at or below 10 percent for 100 percent of Major Facilities in the Construction Stage that are more than 10 percent complete. The re-baselining for projects that will occur in FY 2023 will likely lead to improved schedule performance in FY 2024 and beyond.

Other Information and Context related to Strategic Objective 2.1

NSF's Strategic Plan frames the motivation for this goal and objective as follows: "Fundamental research is a capital investment for the nation. Basic research leads to new knowledge. It provides scientific capital. It creates the fund from which the practical applications of knowledge must be drawn. New products and new processes do not appear full-grown. They are founded on new principles and new conceptions, which in turn are painstakingly developed by research in the purest realms of science."

The three indicators described below are meant to illustrate NSF's contribution to the funding of scientific capital described in the quote above. These are under development, and we plan to include them in future drafts of the annual performance report.

- Number of highly-cited papers (top 10 percent) that reference NSF support.

  Publication of research in peer-reviewed literature is a primary mechanism for disseminating new science and engineering knowledge, enabling the use of discoveries for invention and innovation to expand science and technology output. Citations are an important measure of the impact of publications, and over the past decade, the U.S. has contributed nearly twice as many highly cited articles as would be expected given its overall publication output.[22]

- Number of highly-cited papers (in the top 10 percent) associated with facilities in NSF's major or mid-scale research infrastructure portfolios.

  NSF invests in major facilities and mid-scale infrastructure to open new avenues for research and discovery, and the bibliometric outputs associated with these investments are therefore a useful gauge of their impact.

- Number and geographic diversity of patents, licenses, and startups generated from the Directorate for Technology, Innovation and Partnership (TIP)-supported work.[23]

[22] For more information, see: The State of U.S. Science and Engineering 2022 | NSF - National Science Foundation. https://ncses.nsf.gov/pubs/nsb20221/u-s-and-global-science-and-technology-capabilities

[23] Note: the data for this indicator are anticipated to come from project reports and are not currently available.

Strategic Objective 2.2: Enhance research capability. Advance the state of the art in research practice.

Annual Goal 2.2: Ensure that Mid-Scale Infrastructure Investments are on Track

Goal Statement: Track cost and schedule performance during implementation for Mid-scale Research Infrastructure projects that have a Total Project Cost (TPC) above $20.0 million, are more than 10 percent complete and are using Earned Value Management (EVM) principles.

About This Goal: Modern and effective research infrastructure is critical to maintaining U.S. international leadership in science and engineering. NSF's Mid-Scale Research Infrastructure programs are intended to meet the research community's needs for modern research infrastructure at a scale that is otherwise difficult for individual institutions to acquire. The objectives are to transform scientific and engineering research fields with new infrastructure while simultaneously training early-career researchers in the development, design, implementation, and use of cutting-edge infrastructure. Projects in this portfolio have costs that fall below the $100 million threshold for a Major Facility project but exceed $4.0 million.[24] Use of EVM is optional on Mid-scale Research Infrastructure projects and generally requires more scaling and tailoring when used. For mid-scale projects costing more than $20.0 million to implement, tracking project performance through EVM metrics is one method for ensuring proper NSF oversight and stewardship of Federal funds.

Annual Goal 2.2: Ensure that Mid-Scale Infrastructure Investments are on Track		FY20	FY21	FY22	FY23	FY24
Mid-Scale Research Infrastructure Projects: Percent Meeting Cost and Schedule Targets	Target	Track cost and schedule for all defined projects	Track cost and schedule for all defined projects	100%	100%	100%
	Results	N/A	Achieved	60%		

Discussion of FY 2022 Result: In FY 2022, the performance of six Mid-scale Research Infrastructure projects with total project costs greater than $20 million was tracked using EVM; five of these projects were more than 10 percent complete and therefore constitute the FY 2022 portfolio for this target: the Ice Cube Neutrino Observatory Upgrade (ICNO-U), the Laser Interferometer Gravitational-Wave Observatory A+ Upgrade (LIGO A+), the High Magnetic Field Beamline (HMF), Network for Advanced NMR (NAN) and Grid-Connected Testing Infrastructure for Networked Control of Distributed Energy Resources (DERConnect). All five projects reported being on track for cost performance and three (LIGO A+, HMF and DERConnect) are on track for schedule performance. The other two projects are experiencing schedule delays due to the COVID-19 pandemic.

Discussion of FY 2023 and FY 2024 Targets: Consistent with the approach in FY 2022, NSF aims to keep negative cost and schedule variance at or below 10 percent for Mid-scale Research Infrastructure projects that utilize EVM and are more than 10 percent complete. One additional project (Research Data Ecosystem (RDE)) will pass the 10 percent complete threshold in FY 2023. In FY 2023 and 2024, these projects may begin to achieve target performance as supply chain issues lessen for NAN and ICNO-U transitions to new project management systems with revised EVM data reporting.

[24] Although Mid-Scale Research Infrastructure projects begin at the threshold of $4 million, this goal tracks those most likely to propose using Earned Value Management principles, with total project costs of $20 million or more.

Strategic Goal 3, Impact: Benefit society by translating knowledge into solutions.

Strategic Objective 3.1: Deliver benefits from research. Advance research and accelerate innovation that addresses societal challenges.

Annual Goal 3.1: Grow Partnerships

Goal Statements:

- 3.1a: Increase funding invested from industry and non-profits that NSF programs leverage to support the science, technology, engineering, and mathematics (STEM) enterprise.
- 3.1b: Increase funding invested from other federal agencies that NSF programs leverage to support the science, technology, engineering, and mathematics (STEM) enterprise.

About this Goal: Partnerships are essential to growing research and innovation ecosystems across the country. They further the geography as well as the demography of innovation, key priorities for NSF, the National Science Board, and the U.S. STEM community as a whole. This is a new goal to support the FY 2022-2026 Strategic Plan, and measures NSF's ability to leverage funding from partnerships. It builds on prior efforts including the FY 2020-2021 Agency Priority Goal, "Strategic Engagement in Partnerships," which sought to enhance the impact of NSF's investments through engaging in public and private partnerships, as well as the FY 2018-2019 Agency Priority Goal to, "Expand Public and Private Partnerships." The culmination of these Agency Priority Goals was an NSF-wide partnerships strategy, including outreach, process improvement, and communications aspects. This new iteration of the goal focuses on partnerships that are shaping research directions, cultivating co-design and co-creation of research-based solutions, and accelerating piloting, prototyping, and eventual translation of knowledge gained through NSF's research portfolio to address the Nation's most pressing technological, societal, and economic needs.

Targets and Results: NSF will conduct baselining in FY 2023 and set out-year targets following that process.

Discussion of FY 2022 Result: Not applicable. There was no goal target established for FY2022.

Discussion of FY 2024 Target: The FY 2024 targets will be established following baselining in FY 2023. The measures will include funding resulting from partnerships with (1) industry and non-profits, and (2) other federal agencies, and will be attributed to the year in which they are committed to specific NSF investments.

Other Information and Context related to Strategic Objective 3.1

Partners and Partnerships Counts: In addition to strategically increasing the funding NSF leverages through its partnerships, the agency monitors the number of direct partnerships in which Directorates and Offices engage and the number of distinct partners. In FY 2022, NSF entered into 57 new direct partnerships spanning 31 partners. For the purposes of this metric, FY 2022 new direct partnerships are defined as formal agreements between NSF and other external organizations (federal agency, industry, non-profit, international) resulting in a solicitation, Dear Colleague Letter, or other such funding opportunity issued in FY 2022. The number of partners reported for FY 2022 are therefore a count of the distinct, external organizations associated with these FY 2022 new direct partnerships.

Accelerate innovation that addresses societal challenges: Strategic Objective 3.1, also reflects NSF's commitment to supporting use-inspired research and the translation of research results to the market and society. This strengthens the intense interplay between foundational and use-inspired work, enhancing the full cycle of discovery and innovation. NSF's Strategic Plan emphasizes the importance of engaged research as part of achieving objective 3.1 to, "Advance research and accelerate innovation that addresses societal challenges." Specifically, the plan discusses, "supporting mechanisms and training for researchers in techniques to promote the beneficial uptake of the results of their use-inspired research; and diversifying the research workforce to bring a broader range of perspectives to the generation of research questions."

NSF's I-Corps: This program connects NSF-funded science and engineering research with the technological, entrepreneurial, and business communities, fostering a national innovation ecosystem that links scientific discovery with technology development, societal needs, and economic opportunities. Through I-Corps training, academic researchers can reduce the time needed to translate a promising idea from the laboratory to the marketplace or other relevant societal setting.

Table 3.1.1: Number and diversity of entrepreneurs trained through I-Corps		FY 2017-2018	FY 2019-2020	FY 2021-2022
Total trained	Actuals	1,628	1,928	2,173
Number (percentage) who identified as women	Actuals	338 (21%)	411 (21%)	516 (24%)
Number (percentage) who identified as a member of a group underrepresented in STEM[25]	Actuals	437 (27%)	568 (30%)	683 (31%)

Small Business Innovation Research (SBIR): NSF is one of 11 federal agencies that provides research and development funding to small businesses through the SBIR program. The SBIR program at NSF exists to transform scientific and engineering discoveries into products and services with commercial and societal impact. Further, the program supports participation in innovation and entrepreneurship by women and by socially and economically disadvantaged persons.

[25] Groups underrepresented in STEM include individuals who identify on their I-Corps project proposals as 1) women, 2) race as Black or African American, American Indian, Alaska Native, and/or Native Hawaiian or other Pacific Islander, 3) of Hispanic origin, and/or 4) having a disability.

Table 3.1.2: Number and diversity of small businesses receiving start-up funds through SBIR		2018	2019	2020	2021	2022
Total new awards (Phase 1 and 2)	Actuals	353	421	436	414	359
Number (percentage) of awards to women-owned small businesses	Actuals	72 (20%)	94 (22%)	68 (16%)	82 (20%)	54 (15%)
Number (percentage) of awards to socially and economically disadvantaged small businesses	Actuals	42 (12%)	67 (16%)	42 (10%)	46 (11%)	50 (14%)
Number (percentage) of awards to Historically Underutilized Business Zones (HUBZone)	Actuals	27 (8%)	34 (8%)	19 (4%)	26 (6%)	19 (5%)

In the future, NSF plans to report the number and diversity of fellows supported through the NSF Entrepreneurial Fellowships, which will be awarded for the first time in FY 2023.

Strategic Objective 3.2: Lead globally. Cultivate a global science and engineering community based on shared values and strategic cooperation.

Information and Context related to Strategic Objective 3.2

NSF's commitment to leading globally reflects the critical importance of research and innovation as drivers of future growth. Through its programming, NSF facilitates international scientific collaborations on all seven continents and provides opportunities for researchers to enhance their work through international cooperation. The table below presents data on NSF awards with international collaborations.

Table 3.2.1: International collaborations		FY18	FY19	FY20	FY21	FY22
Number of NSF awards that include collaborations with international partners	Actual		1,368	1,330	1,398	1,211

Evaluation Highlight

Evaluation of International Research Experiences for Students (IRES) program, Office of International Science and Engineering.[26] (Results published in September 2020) The IRES program, managed by the Office of International Science and Education (OISE), supports international research experiences for U.S. undergraduate and graduate students pursuing degrees in science or engineering. This evaluation included a survey of program participants. It found that:

- Just over half of IRES participants were women and about a quarter belonged to an ethnic or racial group underrepresented in STEM.
- Nearly all IRES participants currently hold a postsecondary degree, including half who obtained a graduate degree since participating in IRES. About one quarter of students who participated in IRES as undergraduates subsequently earned a master's degree or doctorate; many of these students received support from NSF's Graduate Research Fellowship Program.
- The majority of IRES participants remained globally engaged after the program ended and are currently members of the STEM workforce.

In addition, most IRES participants reported that the IRES program had shaped their professional goals. Participants often indicated that IRES encouraged them to pursue further education (such as graduate school or postdoctoral studies) or that it helped them solidify their interest in science or engineering.

[26] The report from the evaluation is available at https://nsf-gov-resources.nsf.gov/2022-08/IRES%20Survey%20Analysis%202020.pdf.

Strategic Goal 4, Excel: Excel at NSF operations and management.

Strategic Objective 4.1: Strengthen at speed and scale. Pursue innovative strategies to strengthen and expand the agency's capacity and capabilities.

Annual Goal 4.1: Provide robust and reliable IT services.

Goal Statement: Ensure availability of IT resources for NSF staff and the broader research community. (Uptime)

About This Goal: The availability of information technology (IT) systems is integral to delivering excellent, equitable, and secure Federal services and customer experience. NSF prioritizes availability of IT services, and coordinates downtime for critical maintenance and service releases to minimize disruption. This goal supports the President's Management Agenda pillars of "Strengthening and empowering the Federal workforce," and, "Delivering excellent, equitable, and secure Federal services and customer experience," by ensuring that critical information and IT systems are available to support staff and NSF awardees in their pursuit of NSF's mission. Maintaining reliable, secure operations of NSF's IT systems also supports the Foundation's ability to strengthen at speed and scale and to expand the agency's capacity and capabilities around functions where the use of IT is most critical.

This specific goal measures NSF's success in keeping critical IT systems available aside from pre-planned system outages for maintenance and upgrades (i.e., scheduled downtime). NSF's goal is to meet or exceed 99.6% availability of systems aside from a set number of hours of planned downtime per year. Unexpected downtime due to a system issue or incident will lead to reductions in NSF's IT systems availability percentage.

Annual Goal 4.1 Provide robust and reliable IT services		FY18	FY19	FY20	FY21	FY22	FY23	FY24
NSF IT systems availability (downtime hours)	Target		99.5% (469)	99.6% (469	99.6% (469)	99.6% (469)	99.6% (469)	99.6% (375)
	Result	N/A	99.9%	99.8%	99.8%	99.8%		

Discussion of FY 2022 Result: NSF exceeded the FY 2022 IT systems availability goal, achieving 99.8 percent as actual availability over the target of 99.6 percent within planned downtime of 469 hours. During FY 2022, NSF monitored IT systems availability daily, and worked to quickly identify, address, and remediate any incidents or issues to restore user access to IT systems and functions.

Discussion of FY 2024 Target: Consistent with prior years, NSF aims to maintain or exceed 99.6% availability for IT systems, excluding planned downtime. However, in FY24, NSF has reduced the planned number of downtime hours from 469 hours to 375 hours. Dropping the overall downtime target will result in NSF reducing the time scheduled for system upgrades and planned maintenance from about 9 hours per week to approximately 7.2 hours per week. To ensure consistency with the new target, NSF will carefully plan scheduled downtime for FY 2024.

Other Information and Context related to Strategic Objective 4.1

In order for NSF to strengthen at speed and scale, the agency will need to capitalize on emerging data analytics capabilities and expand its capacity for analysis and knowledge management. NSF's data strategy will outline the paradigm and activities needed to achieve the vision of an agency where everyone is empowered to leverage data and analytics to support NSF's mission.

In support of this work, NSF will track progress against implementation of the data strategy; a specific indicator will be defined in FY 2023 after the strategy is final.

Evaluation Highlight

Understanding the Use and Potential Effects of a No-Deadlines Approach.[27] (Results published in May 2022) NSF has long explored strategies for improving the efficiency of the funding process for its grants programs while maintaining its commitment to research excellence, quality, and fairness. One approach theorized for improving efficiency is eliminating deadlines for proposal submissions.

NSF receives more than 40,000 competitive grant proposals every year. Each proposal undergoes a merit review by external experts selected by NSF program officers who manage the programs to which proposals are submitted. Programs across five NSF directorates and in at least 173 other organizations—including foundations, biotechnology and pharmaceutical companies, universities, and government—use a no-deadlines approach in solicitations.

The empirical literature on no-deadlines approaches to grant solicitations is limited and focused on non-rigorous approaches. The most common outcome of no-deadline approaches reported at NSF is a reduction in proposal volume. This reduction did not appear to be concentrated among specific types of institutions or investigators, but NSF staff voiced interest in further examining outcomes related to the diversity of the portfolio.

[27] The full report on Understanding the Use and Potential Effects of a No Deadline Approach is available at https://nsf-gov-resources.nsf.gov/2022-05/NDL%20Literature%20Review%20Final%20508c_0.pdf.

Strategic Objective 4.2: Invest in people. Attract, empower and retain a talented and diverse NSF workforce.

In order to achieve the objective to attract, empower, and retain a talented and diverse NSF workforce, NSF aims to be a "Top 5" agency among common indicators of employee satisfaction. NSF will also demonstrate its commitment to fostering an inclusive and engaging workplace through a goal to increase employee engagement in diversity, equity, inclusion, and accessibility (DEIA) activities.

Annual Goal 4.2a: Implement the Human Capital Operating Plan

About this Goal: Establishing NSF's 2022-2026 Human Capital Operating Plan is critical to achieving NSF Strategic Objective 4.2: Invest in people. Attract, empower, and retain a talented and diverse NSF workforce. The Human Capital Operating Plan outlines the human capital initiatives and actions that will be undertaken to accomplish two annual performance goals for FY 2024: 1) Rank among the top five mid-size agencies in the annual Best Places to Work rankings published by the Partnership for Public Service; and 2) Rank among the top five CFO Act agencies for Human Capital in the annual benchmarking assessment conducted by GSA.

Goal Statements 4.2a:

- 4.2a(1): Track progress in NSF's Best Places to Work[28] ranking, which assesses employee attitudes about the agency's human capital policies and programs that result in employee satisfaction with their job and the organization as a whole.
- 4.2a(2): Track progress of NSF's benchmarking score for Human Capital Functions, which assesses hiring manager attitudes about the agency's human capital policies and programs that result in the organization's ability to find, hire, develop, engage, retain and reward the people needed to accomplish the agency's mission. Data are collected as part of GSA's Customer Service Survey of Federal employees.

Annual Goal 4.2a Implement the Human Capital Operating Plan		FY18	FY19	FY20	FY21	FY22	FY23	FY24
NSF Ranking in Best Places to Work Among Mid-Size Agencies	Target						Top 5	Top 5
	Results					2nd		
NSF Benchmarking Score for Human Capital Functions among CFO Act/CHCO Agencies	Target						Top 5	Top 5
	Results					1st		

Discussion of FY 2022 Result: NSF's FY 2022 goal was to submit the draft FY 2022-2026 Human Capital Operating Plan to the Office of Personnel Management, which it achieved.

Discussion of FY 2024 Target: NSF's ability to "attract, empower, and retain a talented and diverse NSF

[28] The annual Best Places to Work in the Federal Government rankings, produced by the nonprofit, nonpartisan Partnership for Public Service and Boston Consulting Group, measure employee engagement and satisfaction government-wide as well as at individual departments, agencies and subcomponents. See more information at https://bestplacestowork.org/

workforce" is predicated upon employees' satisfaction with their jobs and their organization – assessed by the annual Federal Employee Viewpoint Survey and reported via the Best Places to Work rankings. It is also predicated upon the satisfaction of NSF supervisors and leadership with the agency's human capital policies, programs, and operations – assessed and reported by GSA's Customer Service Survey of Federal employees. Ranking in the top five of both areas will ensure that NSF is able to curate the workforce needed to achieve the mission and strategic objectives of the agency. The human capital strategies, initiatives, and actions that will be undertaken to achieve the FY 2024 performance targets are found in the agency's Human Capital Operating Plan.

Annual Goal 4.2b: Foster a Culture of Inclusion

Goal Statement 4.2b: Cultivate a workplace environment that proactively supports, engages, and recognizes all members of the workforce.

About this Goal: NSF values diversity and recognizes that a culture of inclusion is a critical driver in achieving its scientific mission. Fostering inclusive work environments and realizing the full potential of the workforce's diversity requires the implementation of thoughtful strategies focused on creating meaningful, sustainable, and measurable change. This holistic approach to diversity and inclusion is supported by Executive Order 14035, "Diversity, Equity, Inclusion, and Accessibility (DEIA) in the Federal Workplace," which requires that federal agencies develop DEIA Strategic Plans, and regularly measure and report on the effectiveness of DEIA initiatives.

Annual Goal 4.2b Foster a Culture of Inclusion		FY22	FY23	FY24
NSF Ranking in Best Places to Work Among Mid-Size Agencies	Target	Increase participation by 10% over FY 2021	Establish three new Employee Resource Groups above FY22 baseline of 3; total = 6 or more ERGs.	To be determined in FY 2023.
	Results	28% increase		

Discussion of FY 2022 Result: NSF places a high premium on diversity, equity, inclusion, and accessibility. Attracting, retaining, and cultivating diverse leaders and staff enhances the organization's collective ability to deliver on its scientific mission. Cultivating a workplace environment that proactively supports, engages, and recognizes all members of the workforce is necessary to fostering a culture of inclusion that engages the talent of the entire NSF workforce and helps empower individuals to realize their full potential.

Establishing additional opportunities for workforce engagement in DEIA activities is key to achieving a diverse and inclusive workplace. As part of its efforts to cultivate a workplace environment that proactively supports, engages, and recognizes all members of its workforce, the Office of Equity and Civil Rights hosted 12 special emphasis program events coordinated with 10 Federally recognized National special observances. Special observances are events and activities designed to enhance cross-cultural and cross-gender awareness and promote harmony, pride, teamwork, and esprit de corps among members of the workforce. They are conducted to recognize the continuous achievements of all Americans to American culture and to increase awareness, mutual respect, and understanding. In accordance with this goal, the focus of these special observances is on encouraging interaction, not just recognition.

The FY 2022 measure for this goal focused on increasing the percent of agency-wide engagement in special emphasis program observances and diversity and inclusion-related activities, which includes agency Employee Resource Group (ERG) membership totals. This measure provides an indication of progress toward the goal fostering a culture of inclusion. The stated target for the measure is a 10 percent increase in the number of participants over the FY 2021 total number. The FY 2021 total number of participants at special emphasis program events and ERG membership was 1,005. The FY 2022 total number of participants at special emphasis program events and ERG membership was 1,288. This represents an increase of 28% in FY 2022.

Discussion of FY 2024 Goal and Target: Establishing additional opportunities for workforce engagement in DEIA activities is critical to achieving a diverse and inclusive workplace. In FY 2023, NSF established a new Chief Diversity and Inclusion Officer role to lead the agency's efforts in workforce engagement around DEIA. One of that position's duties will be to carry out NSF's DEIA Strategic Plan and establish goals to foster a culture of inclusion in the years to come.

Other Information and Context related to Strategic Objective 4.2

Evaluation Highlight

National Science Foundation's Rotator Study.[29] (Results published in June 2022) This study focused on NSF's use of the Intergovernmental Personnel Act (IPA), which allows for scientists, engineers, and educators from other government agencies, non-profit organizations, and colleges and universities to join the National Science Foundation (NSF) as temporary staff members. The study found that the geographic diversity of IPAs has been increasing over time, in keeping with NSF's efforts to expand knowledge in science, engineering, and learning geographically.

In addition, the increasing percentage of IPAs from institutions other than doctorate institutions suggests an increasing diversity in the background of IPAs beyond the traditional high research universities, to include those employed at institutions that grant only bachelor's degrees or bachelor's and master's degrees as well as institutions outside the traditional academic institution universe. While reducing the cost of the IPA program to the Foundation is a goal in itself, requiring cost sharing in the IPA program may also help the Foundation strengthen partnerships between NSF and institutions.

[29] The report for NSF's Rotator Study is available at https://nsf-gov-resources.nsf.gov/2022-06/IPA%20Rotator%20Study_508c.pdf.

Cross-cutting Areas

Cross-cutting Annual Goal

Annual Goal 5.1: Make Timely Proposal Decisions

Goal Statement: Inform applicants whether their proposals have been declined or recommended for funding within 182 days, or six months, of deadline, target, or receipt date, whichever is later.

About This Goal: Time to decision or "dwell time" is the amount of time that passes between receipt of a proposal and notification to the principal investigator about the funding decision. At the time of this goal's establishment in the early 2000s, one of the most significant issues raised in customer satisfaction surveys was the time it took NSF to process proposals, with only around 50 percent of proposals receiving responses within 6 months of submission or deadline. Too long a time period inhibits the progress of research as it delays the funding process, but too short a time period may inhibit review quality, and some complex proposals go through a multi-stage review and approval process that requires longer than six months. Since this goal was introduced, NSF's response times have improved. In choosing a target, NSF seeks to strike a balance between the need of the principal investigators for timely action and the need of NSF for a credible and efficient merit review system. For a number of years, the dwell time target was 70 percent. In 2015, the target was raised to 75 percent; however, as the data in the table below show, as the complexity of programs and proposals has increased, with more interdisciplinary projects proposed, the 75 percent goal is no longer realistic. Therefore, the target for FYs 2023 and 2024 is being returned to 70 percent.

Annual Goal 5.1: Make Timely Proposal Decisions		FY18	FY19	FY20	FY21	FY22	FY23	FY24
Percent of proposals declined or recommended for funding within 182 days or six months.	Target	75%	75%	75%	75%	75%	70%	70%
	Result	72%	61%	68%	65%	66%		

Discussion of FY 2022 Result: NSF did not meet the target in FY 2022. In recent years, the growth in the complexity of proposals has resulted in additional time for review, and the 75 percent target has become difficult to achieve.

Discussion of FY 2024 Target: Reflecting the changing nature of proposals and consistent with recent changes to help principal investigators avoid conflicts of commitment, a target of 70 percent has been adopted for FY 2023 and FY 2024. Specifically, NSF has added a step to the award process in which potential awardees are asked to submit updated statements of current and pending support prior to the finalization of an award recommendation, which lengthens the award process.

Other Crosscutting Information and Context

A principal mechanism for cross-cutting activities at NSF is the use of NSF-wide investments. For FY 2023 and FY 2024, NSF will monitor the extent to which NSF is able to meet its annual funding targets for key NSF-wide investments. The percentage of the annual targeted funding that is obligated by the end of the year is an indication of NSF's effectiveness in moving through the program investment process and ensuring that key investments are implemented and on track. NSF will identify themes in FY 2023 related to key areas of interest for NSF and the Administration and will track annual obligations against these key areas.

Revised or Retired Measures

NSF retired the measure to Ensure Key Program Investments are on Track by fully obligating funds from the American Rescue Plan Act, as those funds expired in FY 2022. NSF achieved its goal with 100 percent of American Rescue Plan funds obligated by the end of FY 2022.

Other Information

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."[30] In FY 2022, 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 2022 report concluded that, "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."[31]

[30] 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.

[31] Nexight Group with Energetics Incorporated, *National Science Foundation Performance Measurement Verification and Validation Report, Fiscal Year 2022 Report*. December 2022.

FY 2022 Strategic Objective Progress Update

In FY 2022, NSF conducted its first assessment of the eight Strategic Objectives in its FY 2022-2026 Strategic Plan, in response to the requirement of the GPRA Modernization Act of 2010. This review informed NSF's classification among three categories of the level of progress made towards select Strategic Objectives: noteworthy progress, in need of focused improvement, or neither (making typical progress).

Table of FY 2022 Strategic Objective Rankings

2022-2026 Strategic Goals	2022-2026 Strategic Objectives	Agency Ranking
Empower: Empower STEM talent to fully participate in science and engineering	1.1 Ensure accessibility and inclusivity. Increase involvement of communities underrepresented in STEM and enhance capacity throughout the nation.	Focus Area for Improvement
	1.2 Unleash STEM talent for America. Grow a diverse STEM workforce to advance the progress of science and technology.	Noteworthy Progress
Discover: Create new knowledge about our universe, our world, and ourselves.	2.1 Advance the frontiers of research. Accelerate discovery through strategic investments in ideas, people, and infrastructure.	Not ranked in FY 2022
	2.2 Enhance research capability. Advance the state of the art in research practice.	Not ranked in FY 2022
Impact: Benefit society by translating knowledge into solutions.	3.1 Deliver benefits from research. Advance research and accelerate innovation that addresses societal challenges.	Noteworthy Progress
	3.2 Lead globally. Cultivate a global science and engineering community based on shared values and strategic cooperation.	Not ranked in FY 2022
Excel: Excel at NSF operations and management.	4.1 Strengthen at speed and scale. Pursue innovative strategies to strengthen and expand the agency's capacity and capabilities.	Not ranked in FY 2022
	4.2 Invest in people. Attract, empower, and retain a talented and diverse NSF workforce.	Not ranked in FY 2022

Process Overview

This report provides a summary of the FY 2022 Strategic Review Process conducted by NSF in response to the requirement of the GPRA Modernization Act 2010 Section 1116(f). OMB Circular A-11 (260.2) specifies that: *"Annually, agency leaders should review progress on each of the agency's Strategic Objectives established by the agency Strategic Plans and updated annually in the Annual Performance Plan. These reviews should inform strategic decision-making, budget formulation, and near-term agency actions, as well*

as preparation of the Annual Performance Plan and Annual Performance Report." The process described below was developed utilizing the guidance in sections 260.8-260.25 of OMB Circular A-11.

Two Components: Topic Reviews and Dashboard Development

NSF's Strategic Review Process uses the results of existing assessments, evaluations, and reports as well as other sources of evidence. Internal dashboards for each of the Strategic Objectives in the NSF Strategic Plan are updated. These Objectives are crosscutting and do not mirror NSF's organizational structure, and the major strategic issues often facing NSF seldom fit within a single Strategic Objective, so NSF also scans the environment for topics and conducts crosscutting topical reviews as necessary. These are performed as a cross-agency activity, without concentrating on single organizational units or individual programs.

Both elements of the process draw upon comprehensive assessment processes that already are in use at NSF. For example, the annual Merit Review Report to the National Science Board describes all annual outputs. The Committee of Visitors (COV) process, in which external experts assess NSF programmatic activities approximately every four years, is also comprehensive. Instead of duplicating these efforts, the Strategic Review process at NSF complements them by making use of the information they generate when appropriate (e.g., reviewing their recommendations or using their data in a topic review, and using them as sources of evidence for a dashboard).

FY 2022 Process Adjustments

After using the Strategic Review resources to support the development of the Strategic Plan in 2021, NSF returned to the process described above in 2022. NSF performed two topical reviews in FY 2022. One was on the development of the GRANTED program and identified three opportunities for action or improvement. The other was on divestment of major facilities and identified six opportunities for action or improvement.

FY 2022 Strategic Objective Rankings Justification

Noteworthy Progress

Over the past year, NSF has continued progress made in prior years to address longstanding disparities in the STEM workforce, in support of Strategic Objective 1.2 to grow a diverse STEM workforce to advance the progress of science and technology. In addition, NSF has recently made strides in delivering benefits from research in support of Strategic Objective 3.1 to advance research and accelerate innovation that addresses societal challenges, the most notable example being the establishment of the Directorate for Technology, Innovation and Partnerships (TIP) in March 2022. NSF rated both these objectives as attaining noteworthy progress in FY 2022.

Focus Area for Improvement

NSF ranked Objective 1.1, Ensure accessibility and inclusivity, as a focus area for improvement. This decision reflects the evolution and the elevation in the awareness and understanding of issues related to diversity, equity, inclusion, and accessibility (DEIA) over the past two years at a national level as well as at NSF and within the communities NSF serves. NSF has taken steps to address longstanding disparities throughout the STEM enterprise, but is designating this as a focus area to underscore the importance of taking a coordinated, agency-wide approach in response. This, along with notable successes underpinning the ranking of 1.2 as Noteworthy Progress, is more fully described in NSF's most recent response to the OIG Management Challenge, "Increasing Diversity in Science & Engineering Education and Employment." NSF's response to this challenge was provided to the OIG in

Fall 2021 and published as an appendix to the Annual Financial Report in November 2021, with an update on this challenge published in Fall 2022.

Management Challenges Progress Report

In October 2021, the OIG identified eight areas representing challenges for NSF in FY 2022: (1) Increasing Diversity in Science & Engineering Education and Employment, (2) Overseeing the United States Antarctic Program (USAP), (3) Overseeing Grants in a Changing Environment, (4) Managing the Intergovernmental Personnel Act Program, (5) Overseeing Major Multi-User Research Facilities, (6) Mitigating Threats Posed by Foreign Government Talent Recruitment Programs, (7) Mitigating Threats Posed by the Risk of Cyberattacks, and (8) Managing Transformational Change.[32]

Management's report on the significant activities undertaken in FY 2022 to address these challenges is included in Appendix 2B: Management Challenges – NSF's Response of this Agency Financial Report (AFR).[33] The report also discusses activities planned for FY 2023 and beyond. The following are highlights of the agency's significant actions and planned next steps to address the FY 2022 OIG Management Challenges.

Other Information

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

Committee of Visitors Reviews

NSF relies on the judgment of external experts to maintain high standards of program management, to provide advice for continuous improvement of NSF performance, and to ensure openness to the research and education community served by the Foundation. Committee of Visitor (COV) reviews provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations; and (2) program-level technical and managerial matters pertaining to proposal decisions.

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. Lists of recent COVs are available at: https://www.nsf.gov/od/oia/activities/cov/

Alignment of Human Capital Efforts with Organizational Performance

[32] Management Challenges for the National Science Foundation in Fiscal Year 2022 can be accessed at https://oig.nsf.gov/sites/default/files/reports/2022-10/Management-Challenges-NSF-FY-2022_0.pdf

[33] Appendix 2B is available at https://www.nsf.gov/pubs/2023/nsf23002/pdf/08-chap3-appendices.pdf

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. The Annual Performance Plan for FY 2024 incorporates human capital goals established in the agency's Human Capital Operating Plan, which is updated annually. The performance goals in the plan cascade from NSF's 2022-2026 Strategic Plan; most notably, Strategic Goal 4: Excel and Strategic Objective 4.2: Invest in people – attract, empower, and retain a talented and diverse NSF workforce. The agency continues to use its HRStat[34] program to report on and articulate the nexus between NSF's strategic goals and objectives, including annual goals, and human capital initiatives at the agency. Senior leaders are briefed quarterly regarding the status of annual performance goals and the human capital initiatives aligned to those goals.

Lower-Priority Program Activities

The President's Budget identifies the lower-priority program activities, 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

[34] HRStat is a strategic human capital performance evaluation process that identifies, measures, and analyzes human capital data to inform the impact of an agency's human capital management on organizational results with the intent to improve human capital outcomes. For more information, see: https://www.opm.gov/policy-data-oversight/human-capital-management/hr-stat/#url=Overview