



Agency Priority Goal | Action Plan | FY 2022-2023

Improve Representation in the Scientific Enterprise

Goal Leader(s):

Sylvia Butterfield, Assistant Director (Acting), Directorate for Education and Human Resources
Alicia Knoedler, Office Head, Office of Integrative Activities

Goal Overview

Goal statement

- Impact: Improve representation in the scientific enterprise by making changes that will lead to an increase in proposal submissions from underrepresented and underserved applicants and communities.
- Achievement: By September 30, 2023, NSF will increase both the number and proportion of proposals received from underrepresented and underserved 1) investigators and 2) institutions by 10 percent over the FY 2020 baselines.

Problem to Be Solved

- Among the awards NSF makes annually, the proportion of awards to investigators 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.
- Internal analyses indicate that investigators from underrepresented groups do well in the merit review process, and that this gap originates at the application level—proposals submitted to NSF do not reflect the diversity of the STEM workforce (let alone the population as a whole).

What Success Looks Like

- The aim of this APG is to improve representation in the scientific enterprise by pursuing actions that will lead to an increase in proposal submissions from underrepresented and underserved applicants and communities, including both individual principal investigators and institutions.

Goal target(s)

Achievement statement		Key indicator(s)	Quantify progress			Frequency
By...	We will...	Name of indicator	FY 23 Target	FY 20 Baseline	FY 21 Actual	Update cycle
09/30/23	Increase the number of proposals from underrepresented and underserved investigators by 10% over FY 2020 baseline.	Number of investigator proposals	12,725 (+1,157)	11,568	11,903 (+335)	Annually
09/30/23	Increase the proportion of proposals from underrepresented and underserved investigators by 10% over FY 2020 baseline.	Proportion of investigator proposals	29.78% (+2.71 percentage points)	27.07%	27.29% (+0.22 percentage points)	Annually
09/30/23	Increase the number of proposals from underrepresented and underserved institutions by 10% over FY 2020 baseline.	Number of institution proposals	7,017 (+638)	6,379	6,752 (+373)	Annually
09/30/23	Increase the proportion of proposals from underrepresented and underserved institutions by 10% over FY 2020 baseline.	Proportion of institution proposals	16.42% (+1.49 percentage points)	14.93%	15.48% (+0.55 percentage points)	Annually

- **Underrepresented and underserved investigators** include the lead researchers (principal investigators) on proposals who identify as:
 - Female¹
 - A member of a racial and/or ethnic group historically underrepresented in STEM including African American/Black, American Indian/Alaska Native, Hispanic/Latino, and Native Hawaiian/Pacific Islander.
 - Persons with disabilities

- **Underrepresented and underserved institutions** include post-secondary educational institutions and other entities receiving NSF award funding classified as Minority-Serving Institutions (MSIs), or that are located in states, territories, or commonwealths that have historically received relatively small amounts of NSF funding (i.e., EPSCoR jurisdictions). For this Agency Priority Goal target we are focusing on the subset of these institutions considered “emerging research institutions” (ERIs) that have received an average of \$50 million or less in federal research funds over the past 3 years.² For the duration of this goal, we will be focused on institutions that fall in these categories based on information available at the beginning of FY 2022, so that the results are not affected by changes in categorization during this period.

¹ Gender breakdown varies significantly by discipline, but overall, across all of the science and engineering fields that NSF supports, only 30 percent of proposals come from female investigators, according to NSF’s 2020 Merit Review Report (https://www.nsf.gov/nsb/publications/2021/merit_review/FY-2020/nsb202145.pdf).

² MSIs are defined under Part F of the Higher Education Act (20 U.S. Code § 1067q – “Investment in historically Black colleges and universities and other minority serving institutions”). For more information see: <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>. The Established Program to Stimulate Competitive Research (EPSCoR) was designed to strengthen research and education in the sciences and engineering with a focus on states, territories, and commonwealths, that have historically received lesser amounts of NSF Research and Development funding. For more information see <https://www.nsf.gov/od/oia/programs/epscor/>.

Goal Team

Steering Group

• **Membership:**

- Includes executive agency leadership from several offices key to NSF's diversity, equity, inclusion, and accessibility work.
- Office of Equity and Civil Rights
- Office of Integrative Activities *goal co-lead
- Directorate for Education and Human Resources *goal co-lead
- Directorate for Social, Behavioral, and Economic Sciences

• **Duties:**

- Sets strategic direction, approves reports, briefs internal and external stakeholders

Strategy Leads

• **Membership:**

- Leaders from across NSF directorates and offices who are knowledgeable and committed to advancing equity issues.
- **Duties:**
- Monitors strategy progress
- Prepares reports and briefings to NSF leadership, the National Science Board, and Office of Management and Budget

Strategy Team Members

• **Membership:**

- Subject-matter and technical experts
- **Duties:**
- Under direction of the Leadership Group, works to implement the strategies outlined in the action plan.

Ex-officio Support

• **Membership:**

- NSF Performance team and other staff-level individuals
- **Duties:**
- Supports implementation through meetings of the Steering Group and establishing processes for compiling and clearing reports.

Goal Strategies

In order to successfully increase the number and proportion of proposals from underrepresented and underserved investigators and institutions, NSF will need to employ the following comprehensive set of strategies:



Policy

Ensure the NSF policy, funding opportunities, and program guidance reflect diversity, equity, inclusion, and accessibility (DEIA) expectations.



Data Analytics

Leverage data and analytics to enhance NSF's understanding of APG goals and broader DEIA activities.



External Engagement

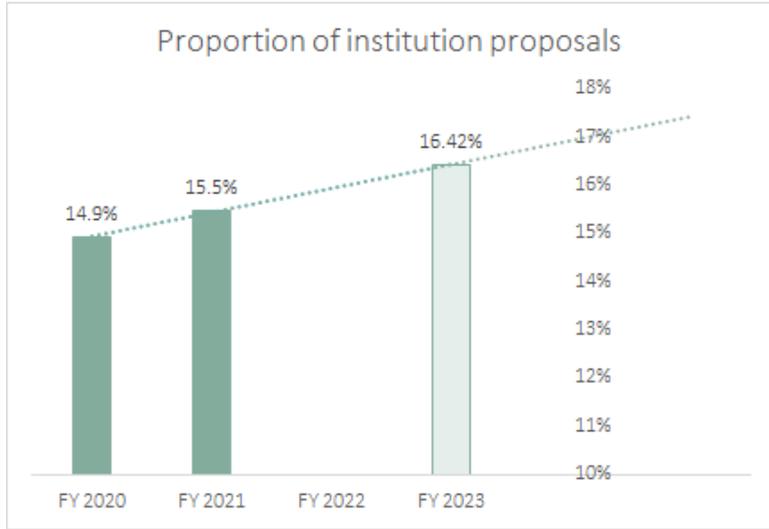
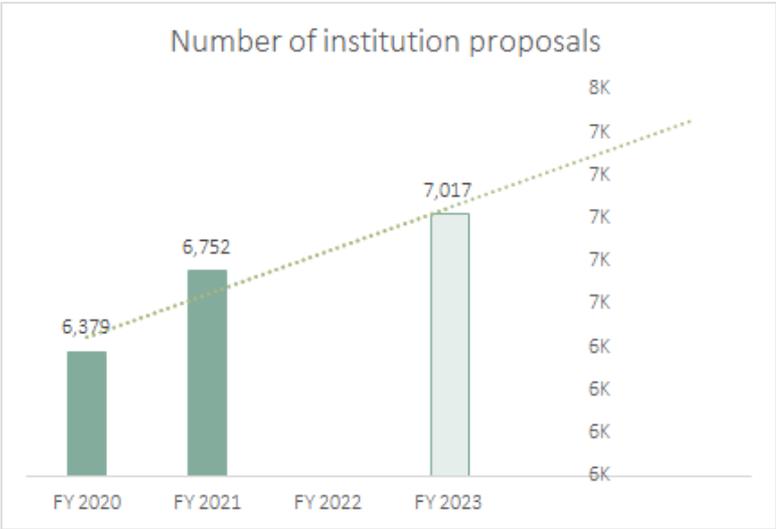
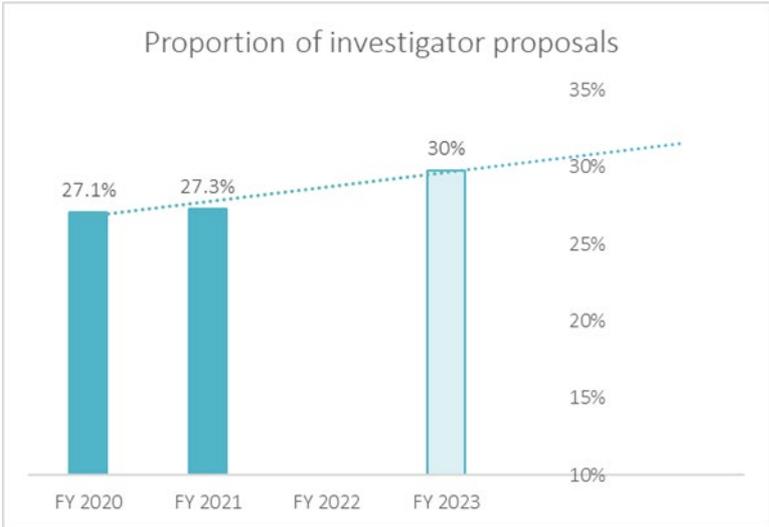
Improve ability of underrepresented and underserved investigators and institutions to identify funding opportunities and support application for those opportunities through effective engagement.



Internal Engagement/Capacity Building

Provide NSF staff and proposal reviewers with the knowledge and resources to effectively support DEIA in the proposal review and award process.

Key indicators



Key milestones – Policy

Strategy 1: Increase the number of programs that include diversity, equity, inclusion, and accessibility (DEIA) expectations in funding opportunities and program guidance.

Objective: Ensure that NSF policy, funding opportunities, program guidance, and the merit review process reflect expectations that underscore the agency’s commitment to DEIA. Incorporate language, tools, resources, and practices that support DEIA, especially for underrepresented and underserved investigators and institutions, and mechanisms to hold NSF programs accountable.

In order to improve consistency in the way programs across NSF incorporate and convey expectations around DEIA, there is a need to infuse these principles into funding opportunities and program guidance. For example, in a recent analysis of program documents published from 2018-2021, NSF found that fewer than 15 percent of such documents included DEIA language related to racial equity, and only about 40 percent of solicitations for grant proposals included such language. Making available sample DEIA language that satisfies complex policy and legal requirements, for example, will facilitate adoption of such language in funding opportunities, and provide accountability for ensuring DEIA expectations are met. More prominent and consistent use of DEIA expectations across NSF would signal to the scientific community that DEIA is an NSF priority and encourage more submissions from individuals and institutions underrepresented and underserved in the scientific enterprise.

Milestone Summary

Key Milestone	Milestone Due Date	Milestone Status	Comments
Develop sample DEIA expectations language based on examples from key federal policy documents, such as Executive Orders, agency policy documents, funding calls, and program guidance documents.	Q1, FY 2023		
Disseminate pre-approved funding opportunity and program guidance language throughout the agency for voluntary use.	Q2, FY 2023		
Approve and incorporate DEIA expectations in NSF grants policy documents.	Q4, FY 2023		

Key milestones – Data Analytics

Strategy 2: Establish data analytics capabilities to track key indicators and monitor progress towards achievement of the APG goal

Objective: Leverage data and analytics to enhance NSF’s understanding of APG goals and broader DEIA activities.

In order to track progress toward the APG goal of increasing proposals, there is a need to improve data collection on key demographic factors of individual investigators, as well as institutional characteristics, such as NSF proposal submission rates, proposal outcomes, and funding rates. In addition, NSF will develop metrics and methods to assess the impacts of other APG strategies, such as external engagement and policy changes. Finally, the agency will increase accessibility to, and transparency of, these data for use in enhancing agency-wide DEIA efforts.

Milestone Summary

Key Milestone	Milestone Due Date	Milestone Status	Comments
Establish definitions and metrics around DEIA for underrepresented investigators and institutions. Establish initial baselines for key indicators.	Q2, FY 2022	completed	
Expand pilot to improve demographic data collection from investigators across NSF.	Q3, FY 2022		
Improve the linkage in NSF systems between data on institutional characteristics and other NSF proposal and award data.	Q4, FY 2022		
Develop and disseminate data-related tools/resources that can be used to improve DEIA activities and achievement of the APG goal to increase proposals.	Q3, FY 2023		

Key milestones – External Engagement

Strategy 3: Extend intentional, coordinated, and strategic outreach to underrepresented and underserved investigators and institutions.

Objective: Improve ability of underrepresented and underserved investigators and institutions to identify funding opportunities and support application for those opportunities through effective engagement.

NSF successfully engages with investigators and institutions that have a track record of obtaining NSF awards. To increase applications from underrepresented and underserved communities, however, the agency needs to more broadly recognize, reach out to, and build relationships with investigators and institutions that are underrepresented across NSF awards, through initiatives such as the Established Program to Stimulate Competitive Research (EPSCoR), Centers of Research Excellence in Science and Technology (CREST), and the new Growing Research Access for Nationally Transformative Equity and Diversity (GRANTED).³ There are many promising initiatives in motion across NSF, but they could be strengthened through integrated and strategic engagement activities and a harmonized collection of resources that are accessible to our external stakeholders (specifically underrepresented and underserved investigators). Combined, these efforts will improve coordination and dissemination of resources that help the community identify appropriate funding opportunities.

Milestone Summary

Key Milestone	Milestone Due Date	Milestone Status	Comments
Gather NSF documents, program guides, and lessons learned on effective outreach to underrepresented and underserved investigators and institutions.	Q4, FY 2022		
Conduct listening sessions and workshops with institutions that historically have had low participation in NSF programs.	Q2, FY 2023		
Create resources to present and make accessible the information from the engagement strategies.	Q3, FY 2023		
Update NSF's webpage to help investigators better identify funding opportunities of interest and connect with relevant NSF staff.	Q4, FY 2023		

³ GRANTED is a new initiative that will improve the Nation's research support and service capacity at emerging and underserved research institutions through a variety of mechanisms to further NSF's reach in advancing the geography of innovation and engaging groups underrepresented in STEM.

Key milestones – Internal Engagement and Capacity Building

Strategy 4: Build NSF capacity to support DEIA and broaden participation of underrepresented and underserved investigators and institutions in NSF programs.

Objective: Provide NSF staff and proposal reviewers with the knowledge and resources to effectively support diversity, equity, inclusion, and accessibility (DEIA) in the merit review process.

In order to improve DEIA across NSF's programs and encourage proposal submissions from individuals and institutions underrepresented and underserved in STEM fields, the agency will engage in culture change activities at all levels of the organization. One dimension of this work will be to invest in change management and to ensure that DEIA policies, processes, and resources are readily accessible to NSF staff and proposal reviewers. Additionally, NSF will enhance the recruitment of program officers and proposal reviewers from the underserved and underrepresented institutions of focus for this APG.

Milestone Summary

Key Milestone	Milestone Due Date	Milestone Status	Comments
Perform environmental scan and gap analysis of existing NSF resources for addressing DEIA issues in NSF programs.	Q4, FY 2022		
Develop resources for NSF program officers and external proposal reviewers on how to equitably engage with research proposals from underserved institutions.	Q2, FY 2023		
Disseminate the resources, and establish practices to ensure continued dissemination of policies, resources, and best practices across NSF.	Q3, FY 2023		

Narrative – FY 22 Q2

In the second quarter of FY 2022, NSF assembled a cross-function team that developed and briefed leadership on the APG Action Plan. In addition, NSF began seeking additional staff from across the agency to serve on four Strategy Teams (Policy, Data Analytics, External Engagement, and Internal Engagement/Capacity Building) for implementation of the APG.

In the data area, the Data Analytics team, with guidance from the Steering Group, established clear definitions and metrics for underrepresented investigators and institutions. They also calculated initial baselines for the key indicators.

Data Accuracy & Reliability

Data on the number and proportion of proposals from investigators and institutions are from NSF's Enterprise Information System (EIS), as of March 8, 2022. EIS is a reporting and analysis system that provides trend analysis, financial management, and personnel information on a variety of topics, organized into modules. The EIS is refreshed on a regular update cycle using data from NSF's core transactional systems including those related to accepting and awarding proposals, and NSF's financial system.

NSF data on principal investigator demographics have two limitations; some individuals do not answer demographic questions, while others answer that they do not wish to disclose this information. In recent years, this has resulted in NSF not knowing the gender, disability status, or race and ethnicity of at least 25 percent of principal investigators. To address the first issue, one of NSF's strategies under this APG is to improve response rates to better gauge the effectiveness of our efforts to increase proposals from underrepresented and underserved investigators.

For the definition of an underrepresented and underserved institution, NSF relied on the Department of Education's list of Minority Serving Institutions, current as of February 2022. The list of EPSCoR states is defined by NSF, using the FY 2022 update. Emerging research institutions (ERIs) are defined as those receiving \$50 million or less in federal research funds over the past three years, based on data from the FY 2019 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.⁴

⁴ <https://www.nsf.gov/statistics/srvyfedsupport/>

Additional Information

Contributing Programs

Program Activities:

- **Broadening Participation** at NSF includes a portfolio of programs solely focused or with an emphasis on increasing participation from underrepresented groups and diverse institutions throughout the United States in all NSF activities and programs.⁵ Specifically, NSF is committed to broadening participation by:
 - Preparing a diverse, globally engaged STEM workforce;
 - Integrating research with education, and building capacity;
 - Expanding efforts to broaden participation from underrepresented groups and diverse institutions across all geographical regions in all NSF activities; and
 - Improving processes to recruit and select highly qualified reviewers and panelists that reflect the Nation's diversity.

The Broadening participation portfolio provides numerous examples of the types of programmatic elements, resources, and engagement strategies that can be adopted more widely across NSF to achieve the APG. Moreover, both Broadening Participation and the APG support NSF's Strategic Plan Objective 1.1 – Ensure accessibility and inclusivity: Increase the involvement of communities underrepresented in STEM and enhance capacity throughout the nation.⁶

- **GRANTED:** Growing Research Access for Nationally Transformative Equity and Diversity, or GRANTED, is a new initiative that will improve the Nation's research support and service capacity at emerging and underserved research institutions. The GRANTED initiative will use a variety of mechanisms to further NSF's reach in advancing the geography of innovation and engaging groups underrepresented in STEM.

⁵ More information on Broadening Participation is available at <https://www.nsf.gov/od/broadeningparticipation/bp.jsp>

⁶ NSF's FY 2022-2026 Strategic Plan, Leading the World in Discovery and Innovation, STEM Talent Development, and the Delivery of Benefits from Research is available at https://www.nsf.gov/about/performance/strategic_plan.jsp

Stakeholder / Congressional Consultations

National Science Board: This APG complements a priority of the National Science Board to close the STEM talent gap in part by accelerating progress in increasing the diversity of the science and engineering workforce to be representative of the U.S. population as a whole.⁷

Committee on Equal Opportunities in Science and Engineering (CEOSE): CEOSE is a panel of external advisors to NSF on policies, programs, practices, and activities to encourage full participation of women, underrepresented racial/ethnic populations and persons with disabilities within all levels of the nation's STEM enterprise. By elevating the goal of improving representation in the scientific enterprise to among the agency's highest priorities, the APG aligns with a recommendation CEOSE made in its 2019-2020 Biennial Report to Congress: "CEOSE recommends that NSF demonstrate and promote bold leadership actions to create, integrate and make visible elements within and across its programs to enhance broadening participation of underrepresented and underserved groups in STEM."⁸

⁷ More information can be found in the National Science Board's Vision 2030 report: <https://www.nsf.gov/nsb/NSBActivities/vision-2030.jsp>

⁸ More information on CEOSE and its 2019-2020 Biennial Report to Congress is available at <https://www.nsf.gov/od/oia/activities/ceose/>