

## FY 2016 ANNUAL PERFORMANCE REPORT

In FY 2016, NSF tracked progress toward its three strategic goals using nine performance goals, two of which were Agency Priority Goals (APGs). Six of the nine goals fully achieved their targets in FY 2016 and three did not achieve one or more targets. Below is a tabular overview.

<b>Goal ID</b>	<b>Performance Goal</b>	<b>FY 2016 Result</b>
1	APG: Improve Graduate Student Preparedness	Achieved
2	APG: Invest Strategically in Public Participation in STEM Research	Achieved
3	Ensure that Key Program Investments are on Track	Achieved
4	Ensure that Research Infrastructure Investments are on Track	Not Achieved
5	Use Evidence to Guide Management Decisions	Achieved
6	Make Timely Award Decisions	Achieved
7	Foster a Culture of Inclusion	Not Achieved
8	Evaluate NSF Investments	Achieved
9	Increase the Percentage of Panelists Participating in Merit Review Virtually	Not Achieved

Multiple years of trend data are available for NSF's quantitative performance measures (Goals 4, 6, and 9). Other performance goals monitor progress towards multiyear goals, such as implementation of a new process (Goals 7 and 8) or monitoring of strategically important investments (Goals 1, 2, 3, and 5).

*Other Information*

**Goal 1: Improve Graduate Student Preparedness (Agency Priority Goal)**

Lead Organizations: Directorate for Geosciences, Directorate for Engineering.

**Goal Statement**

Improve STEM graduate student preparedness for entering the workforce.

**Measure, Milestone, or Deliverable**

<b>FY</b>	<b>Target</b>	<b>FY 2016 Result</b>
2016-2017	By September 30, 2017, NSF will fund at least three summer institutes and 75 supplements to existing awards to provide STEM doctoral students with opportunities to expand their knowledge and skills to prepare for a range of careers.	Supplements = 80 Summer Institutes = 1
<b>Trend Information</b>		
This is a new goal in FY 2016. The topic was identified through the 2015 Strategic Review process.		

**Discussion**

A strong global economy relies on the ability to capitalize on technical innovations that result from a skilled and agile STEM workforce. To achieve this, the Nation's scientific workforce must evolve and mature to include more doctoral level researchers in positions outside of academia. These positions require comprehensive preparation in science at the graduate level, as well as proficiency in other critical skills. However, Ph.D. training remains largely focused on preparation for the research component of academic careers with an emphasis on skills needed at research institutions.

The purpose of this APG is to provide opportunities for science and engineering doctoral students to acquire the knowledge, experience, and skills needed for highly productive careers, inside and outside of academe. To achieve this goal, NSF is taking two approaches: piloting support for summer institutes, to provide students with broad experiences in professional development areas, and supporting supplements to existing research awards, to enhance graduate education opportunities.

In the first year of this APG, NSF supported 80 supplements, exceeding its two-year goal to fund 75 supplements. NSF will continue to support supplements in year two of the goal. NSF also requested proposals for summer institutes. One award was made, with more anticipated in year two.

**Goal 2: Invest Strategically in Public Participation in STEM Research (PPSR) (Agency Priority Goal)**

Lead Organizations: Directorate for Computer and Information Sciences and Engineering, Directorate for Education and Human Resources.

**Goal Statement**

Build the capacity of the Nation to solve research challenges and improve learning by investing strategically in crowdsourcing and other forms of public participation in science, technology, engineering, and mathematics research (PPSR).

**Measure, Milestone, or Deliverable**

FY	Target	FY 2016 Result
2016-2017	By September 30, 2017, NSF will implement mechanisms to expand and deepen the engagement of the public in research.	EAGERs = 26 Supplements = 5
<b>Trend Information</b>		
This is a new goal in FY 2016. The topic was identified through the 2015 Strategic Review process.		

**Discussion**

Scientists, mathematicians, and engineers have involved the public in their research efforts to solve challenging problems for centuries. These types of activities have been referred to in a variety of ways. For this goal, PPSR is used as an overarching term that includes citizen science, crowdsourcing research, and similar activities. PPSR has grown significantly in the past decade, in part due to new technological tools that facilitate interactions between scientists and participants. Economic, societal, and technological trends are increasing the variety and value of what PPSR can accomplish. PPSR approaches can address new research questions and contribute to ongoing STEM research.

To achieve this APG, NSF will use three specific mechanisms to fund proposals that explicitly include PPSR approaches:

1. Early-concept Grants for Exploratory Research (EAGERs) are designed as "high risk-high payoff" awards with the potential to quickly further our understanding of how PPSR is leveraged to support scientific discovery and the public's engagement with research.
2. Supplements to existing awards provide opportunities (1) to include PPSR approaches in projects that are appropriate for PPSR but haven't already incorporated PPSR approaches and (2) for other projects to deepen their use of PPSR approaches.
3. Research Coordination Networks support communication and coordination across disciplinary, organizational, institutional, and geographic boundaries.

In the first year of this APG, NSF issued two Dear Colleague Letters to solicit EAGERs and supplements that include PPSR, and funded 26 EAGERs and five supplements. NSF also conferred and participated with other federal agencies in the Federal Community of Practice for Citizen Science and Crowdsourcing meetings.

## Other Information

### **Goal 3: Ensure that Key Program Investments are on Track**

Lead Organization: Office of Budget, Finance, and Award Management.

#### **Goal Statement**

Ensure that key NSF-wide program investments are implemented and on track.

#### **Measure, Milestone, or Deliverable**

<b>FY</b>	<b>Target</b>	<b>Result</b>
2016	Monitor the progress of the following NSF-wide investments using a common set of milestones and indicators: NSF INCLUDES, INFEWS, and UtB.	Achieved
<b>Trend Information</b>		
2015	Monitor the progress of Cognitive Science & Neuroscience, CEMMSS, CIF21, SaTC, and SEES using a common set of milestones and indicators.	Achieved
2014	Monitor the progress of CEMMSS, CIF21, I-Corps™, INSPIRE, SaTC, and SEES using a common set of milestones and indicators.	Not achieved (4 of 6 monitored)
2011-2013	New goal in FY 2014	

#### **Discussion**

NSF instituted this goal in FY 2014 to track the interim progress of major investments towards their long-term goals. Each year, NSF highlights a number of cross-agency investments in the NSF-Wide Investments chapter of its Budget Request to Congress. Although the overall impact of these investments will not be realized for many years, tracking near-term indicators of implementation and progress can help the agency make formative changes or course corrections.

In FY 2016, NSF successfully monitored the progress of three NSF-wide investments (NSF INCLUDES, INFEWS, and Understanding the Brain) using a common set of indicators and reviewed the results with senior leaders. The indicators that NSF chose to measure were programmatic inputs and outputs that can provide valuable signals to managers and leaders about a program's vitality and potential success, as they address whether the program is being administered as planned or whether the program is generating enough interest from the community.

The following were tracked quarterly in FY 2016:

- Input indicator: progress towards the investment's funding level target.
- Output indicators: solicitations issued, proposals received, awards made.
- Program-specific activities: e.g. PI meetings, workshops, and/or evaluation contract deliverables.

These measures enabled managers and leaders to quickly gauge the status of a program's implementation, interest from the scientific community, whether the review process resulted in awards in a timely manner, and whether the program has met its internal goals for short-term outcomes. Tracking these measures over time provided managers and leaders with the opportunity to assess whether mid-course corrections were needed to improve program management and/or the overall direction of the investment.

**Goal 4: Ensure that Research Infrastructure Investments are on Track**

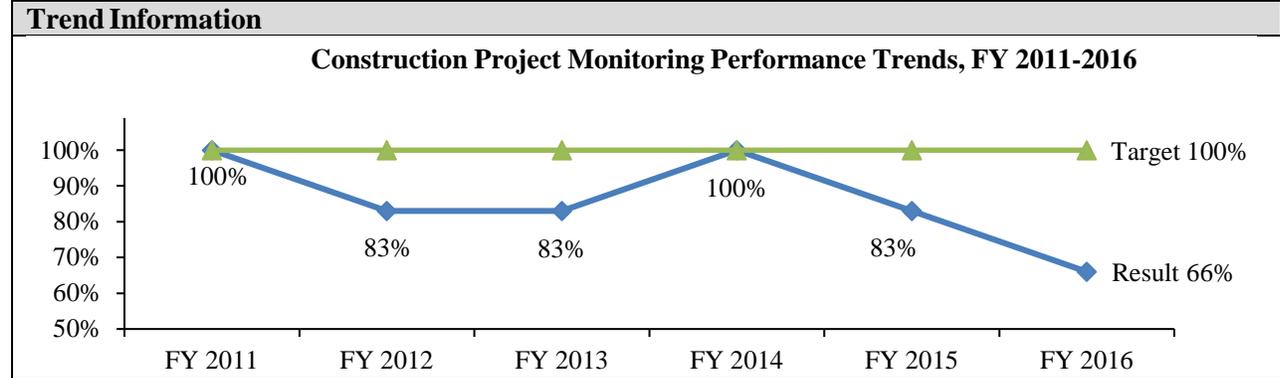
Lead Organization: Large Facilities Office, Office of Budget, Finance, and Award Management.

**Goal Statement**

Ensure program integrity and responsible stewardship of major research facilities and infrastructure.

**Measure, Milestone, or Deliverable**

FY	Target	Result
2016	Construction Project Monitoring: For all MREFC facilities under construction that are over 10 percent complete, keep negative cost and schedule variance at or below 10 percent.	Not achieved (2 of 3 projects were within cost and schedule variances)



**Discussion**

The Major Research Equipment and Facilities Construction (MREFC) account supports the acquisition, construction, and commissioning of major research facilities and equipment that provide unique capabilities at the frontiers of science and engineering. Performance of construction projects funded by the MREFC account is monitored using the Earned Value Management (EVM) system. EVM is an integrated management control system for assessing, understanding, and quantifying what a contractor or field activity is achieving with program dollars. Monitoring cost and schedule is a standard measure of performance for construction projects. Projects that are under ten percent complete are not considered eligible for this goal because EVM data is less meaningful statistically in the very early stages of a project.

Two of the three projects that were over ten percent complete by the end of FY 2016 were on track. At the end of FY 2016, the Daniel K. Inouye Solar Telescope (DKIST) was 71 percent complete and the Large Synoptic Survey Telescope (LSST) was 33 percent complete. Both projects had cost and schedule variances well below the ten percent thresholds.

Explanation of Unmet Goal

The FY 2016 goal was not met because of cost and schedule issues associated with the National Ecological Observatory Network (NEON). These are discussed further in the NEON section of the MREFC Chapter of this Request.

## Other Information

### **Goal 5: Use Evidence to Guide Management Decisions**

Lead Organization: Office of Information and Resource Management

#### **Goal Statement**

Use evidence-based reviews to guide management investments.

#### **Measure, Milestone, or Deliverable**

<b>FY</b>	<b>Targets</b>	<b>Result</b>
2016	<u>HRStat</u> 1. Establish indicators to assess progress of three workforce initiatives designed to meet the objectives of the Opportunities for Action in NSF's FY 2014 Strategic Review for Strategic Goal 3, Objective 1. 2. During FY 2016, focus at least two evidence-based reviews on the three identified workforce initiatives. <u>PortfolioStat</u> 3. NSF's information technology (IT) governance boards will evaluate and prioritize proposed investments for FY 2018. 4. NSF's IT governance boards will use cost and schedule data for ongoing investments to inform investment decisions for FY 2018.	All targets achieved
<b>Trend Information</b>		
2015	HRStat: 2 targets <sup>5</sup> PortfolioStat: 2 targets <sup>1</sup>	All targets achieved
2014	HRStat: 2 targets <sup>1</sup> PortfolioStat: 2 targets <sup>1</sup>	All targets achieved
2011-2013	New goal in FY 2014	

#### **Discussion**

HRStat and PortfolioStat are processes in which agency leaders conduct regular data-driven reviews of human resources and IT portfolio information. HR Stat targets focus on development and refinement of a human capital management dashboard for senior management use, and on the reporting of those data to management in formal meetings. Portfolio Stat targets monitor NSF's IT investment evaluation process.

#### HR Stat

In fulfillment of Target 1, the Strategic Human Capital Management dashboard was updated in FY 2016 to provide additional data about priority initiatives in the focus areas of employee engagement, recruitment and retention, diversity and inclusion, and workload. Consistent with the FY 2014 Strategic Review, NSF set a goal of retaining 70 percent of its permanent workforce onboard at the end of FY 2015 through the headquarters relocation at the end of FY 2017. The retention rate for that population is 90 percent through the end of FY 2016. HRStat meetings in Q1, Q2, and Q4 satisfied Target 2 in FY 2016.

#### Portfolio Stat

NSF's IT governance bodies (the Enterprise Architecture Working Group, Capital Planning and Investment Control Working Group, and the IT Resources Board) prepared the FY 2018 IT budget request and prioritized the IT investment portfolio. To inform their investment decisions, cost and schedule data were presented to the governing bodies throughout the course of the fiscal year. Major investments reviewed included Enterprise BI, Public Access, and Proposal Management Efficiencies.

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<sup>5</sup> For the full target language from previous years, please refer to the FY 2015 Performance Report in the FY 2017 NSF Budget Request ([nsf.gov/about/budget/fy2017/pdf/56\\_fy2017.pdf](http://nsf.gov/about/budget/fy2017/pdf/56_fy2017.pdf)).

**Goal 6: Make Timely Award Decisions**

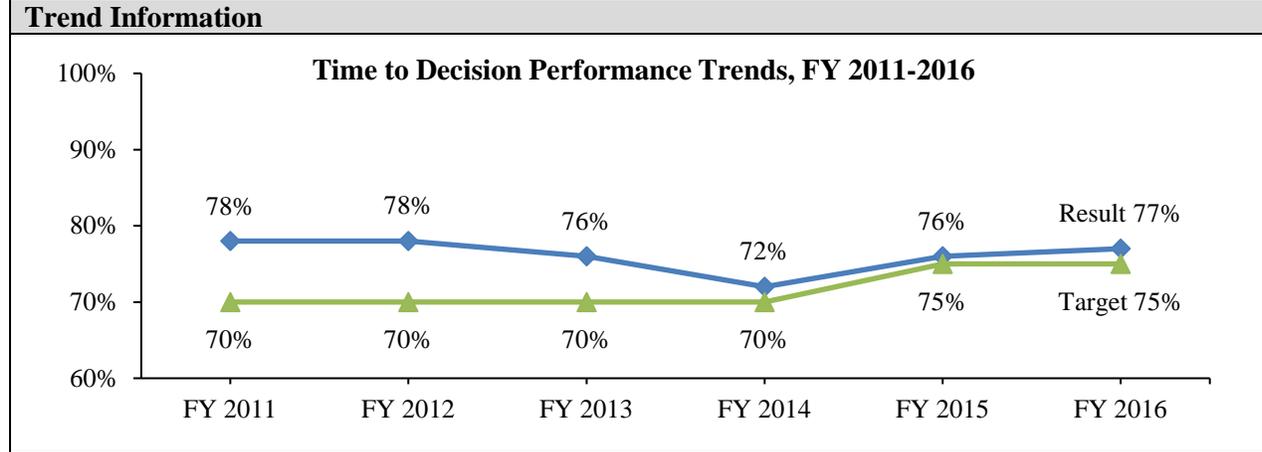
Lead Organization: Office of Integrative Activities.

**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.

**Measure, Milestone, or Deliverable**

FY	Target	Result
2016	75 percent.	Achieved. Result = 77 percent.



**Discussion**

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. One of the most significant issues raised in customer satisfaction surveys is the time it takes NSF to process proposals. Too long a time period inhibits the progress of research as it delays the funding process, but too short a time period may weaken the merit review process by forcing premature decisions. The six-month target seeks to strike a balance between the need of the investigator for timely action and the need of NSF for a credible merit review system.

**Goal Change History**

In FY 2015, this target was raised from 70 percent to 75 percent to be more in line with the historical trend of achievement at or above this level. The exception of FY 2014, in which NSF exceeded the 70 percent target by a historically low margin, was likely due to Foundation-wide delays in proposal processing after the lapse in funding authority in October 2013. The FY 2016 result of 77 percent was in line with historical achievement levels.

## Other Information

### **Goal 7: Foster a Culture of Inclusion**

Lead Organization: Office of Diversity and Inclusion (ODI), Office of the Director.

#### **Goal Statement**

Foster a culture of inclusion through change management efforts resulting in change leadership and accountability<sup>6</sup>.

#### **Measure, Milestone, or Deliverable**

<b>FY</b>	<b>Target</b>	<b>Result</b>
2016	1. By September 30, 2016, ODI will conduct the new IQ process with two NSF organizational units. 2. Improve the two NSF organizational units' New IQ Self-Survey Scores by five percent above established baseline.	No targets achieved
<b>Trend Information</b>		
2015	Attain six of six essential elements of a model EEO agency, perform two compliance desk reviews under antidiscrimination laws.	Not Achieved (4/6 elements, 2 desk reviews)
2014	Attain six of six essential elements of a model EEO agency, perform two compliance desk reviews under antidiscrimination laws.	Not Achieved (5/6 elements, 0 desk reviews)
2013	Attain five of six essential elements of a model EEO agency.	Achieved
2012	Attain four of six essential elements of a model EEO agency.	Achieved
2011	Attain three elements of a model EEO agency.	Achieved

#### **Discussion**

Fostering inclusive work environments and realizing the full potential of the workforce's diversity requires agencies to employ effective management practices. The Office of Personnel Management (OPM), in partnership with the Department of Veterans Affairs, developed the New Inclusion Quotient (New IQ) in FY 2013 to measure and drive inclusive intelligence in the federal workplace. Inclusive intelligence is defined as intentional, deliberate, and proactive acts that ensure that people feel they belong and are uniquely valued.

OPM has recently developed a process to supplement use of the New IQ by using change management tools to help agencies support diversity and inclusion more fully. The expected outcome of the process is that the leaders will improve the employee engagement levels of their employees, resulting in an increase in the overall New IQ scores and corresponding FEVS scores over time. NSF has realized slippage in its FEVS inclusion-related results over several years, and recognizes that having a workforce comprised of a mix of permanent and temporary rotator staff requires targeted efforts. In addition, NSF's workforce is challenged on another inclusion front with the administrative and scientific staffs' feelings about uniqueness and belongingness. NSF anticipates that implementing the New IQ process in several of NSF's organizational units will initiate a set of behavior changes that can become habits throughout the Foundation.

#### **Explanation of Unmet Goal**

NSF's plan to choose two divisions in which to implement the New IQ in FY 2016 was delayed due to staffing transitions at NSF and delays in administration of the New IQ pulse (interim) survey.

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<sup>6</sup> NSF has had a performance goal relating to diversity and inclusion since FY 2011. Former goals were largely focused on NSF's efforts to attain "Model EEO Agency" status. For information on earlier versions of this goal, including full goal language, refer to the FY 2015 Performance Report in the FY 2017 NSF Budget Request ([nsf.gov/about/budget/fy2017/pdf/56\\_fy2017.pdf](https://www.nsf.gov/about/budget/fy2017/pdf/56_fy2017.pdf)).

**Goal 8: Evaluate NSF Investments**

Lead Organization: Office of Integrative Activities.

**Goal Statement**

Enable consistent evaluation of the impact of NSF investments with a high degree of rigor and independence.

**Measure, Milestone, or Deliverable**

FY	Target	Result
2016	By September 30, 2016, NSF will have developed three illustrative models of evaluation frameworks in the following three areas: 1. investments in the development of U.S. science and engineering human capital, 2. investments in established NSF-wide priorities, and 3. long-term strategic investments.	All targets achieved
<b>Trend Information</b>		
2015	1. By September 2015, the Evaluation and Assessment Capability will have developed evaluation quality principles and disseminated them to all directorates. 2. These quality principles will be followed by all new evaluation projects across the agency. 3. NSF will have incorporated logic models/theory of change in the language that describes the rationale for all new programs.	No targets achieved
2011-2014	New goal in FY 2015	

**Discussion**

The Evaluation and Assessment Capability (EAC), housed in the Office of Integrative Activities, provides NSF with the independent capacity to operate from a basis of evidence in program and policy decisions. The EAC has three multi-year goals: 1) encourage a culture of evidence-based planning and policy-making; 2) encourage increased rigor, independence, and consistency in all evaluations and assessments; and 3) develop and implement a coordinated evaluation framework.

In FY 2016, EAC developed plans for continuous program and portfolio improvement, targeted to activities carried out in three key areas of NSF investment.

1. Human Capital: The statement of work for a contract awarded to monitor Research Experience for Undergraduates (REU) students articulates the criteria for what constitutes evidence for evaluating the REU program. It proposes a variety of methods that could be employed to generate such evidence and how they might be used to assess success.
2. NSF-wide priorities: As of the end of FY 2016, a contract was underway that builds upon a preliminary report on the feasibility of an evaluation of the Secure and Trustworthy Cyberspace (SaTC) program. The preliminary report establishes the evaluation framework to be used for the evaluation.
3. Long-term strategic investments: A contract to conduct an evaluation of the I-Corps program is underway. The research questions, design, and methods for obtaining and using evidence are discussed in the description of the evaluation framework developed by the contractor.

**Goal 9: Increase the Percentage of Panelists Participating in Merit Review Virtually**

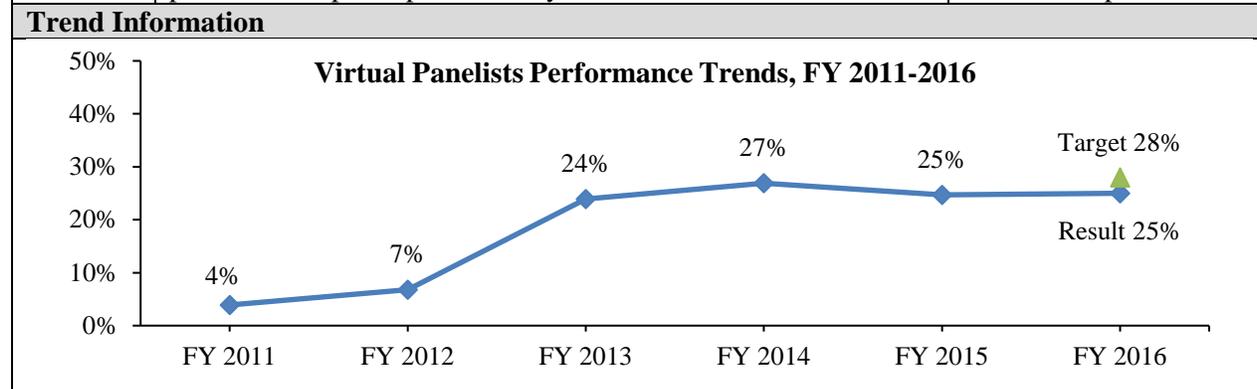
Lead Organization: Office of Integrative Activities, Office of the Director.

**Goal Statement**

Increase the percentage of proposal review panelists that participate virtually while maintaining the quality of the merit review process.

**Measure, Milestone, or Deliverable**

FY	Target	Result
2016	By September 30, 2016, at least 28 percent of merit review panelists will participate virtually.	Not achieved. Result = 25 percent.



**Discussion**

NSF makes extensive use of panels of reviewers to evaluate proposals, holding around 1900 panels annually. Review panels provide ample opportunity to test new methods and practices. One such practice, the use of virtual meeting technology to supplement or replace in-person panels<sup>7</sup>, was piloted at NSF from the early 2010s under the assumption that face-to-face panels impose a significant time burden on reviewers. NSF has had a performance goal relating to virtual panel usage since FY 2012<sup>8</sup>. Usage of virtual panelists peaked in FYs 2013 and 2014 due to several factors: a response to reductions in travel budgets; development of training materials; and management’s encouragement to utilize virtual panels as a viable reviewer participation mechanism. However, in that time period and subsequently, surveys have consistently shown higher satisfaction ratings with in-person participation on the part of reviewers and NSF staff.

**Explanation of Unmet Goal**

The 28 percent target was a “stretch” level and not in line with projections for likely FY 2016 virtual panelist usage. Setting a stretch goal did not play a role in driving performance in this area.

<sup>7</sup> The term “virtual panelist” refers to a panel reviewer who does not travel to a common location but instead participates via teleconference, videoconference, or an online meeting technology.

<sup>8</sup> For four years, the goal tracked a pilot project that measured the number of “wholly virtual” panels, i.e. panels that used only virtual panelists. For more information about earlier versions of this goal, refer to the FY 2015 Annual Performance Report in the FY 2017 NSF Budget Request ([nsf.gov/about/budget/fy2017/pdf/56\\_fy2017.pdf](http://nsf.gov/about/budget/fy2017/pdf/56_fy2017.pdf)).