

NSF EVALUATION AND ASSESSMENT CAPABILITY

\$8,860,000
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Overview

To develop a coordinated, agency-wide capacity for evidence-based program and policy decision-making, in FY 2013 NSF established an Evaluation and Assessment Capability (EAC) section in the Office of Integrative Activities. The need for such capability is reinforced by the Office of Management and Budget (OMB) memorandum,¹ M-15-11, that articulates the Administration's goals to: (1) harness data to improve agency results; (2) introduce and use high-quality, low-cost evaluations; and (3) strengthen agency capacity to use evidence in decision-making. Taken together, these activities will promote a culture of evaluation and assessment.

Total Funding for Evaluation and Assessment Capability

(Dollars in Millions)

FY 2015 Actual	FY 2016 Estimate	FY 2017 Request
\$6.84	\$8.86	\$8.86

Goals

The resources, expertise, and leadership of EAC will: (1) develop an effective 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 that informs data collection, methods, and tools for evaluating NSF-wide investments. EAC staff provide expertise for rigorous evaluations, and assessments across the agency, aiming to be cost-effective while also providing support for consistent high quality, data-driven decision-making.

Approach

The NSF EAC has three interdependent structural components with three distinct areas of activity and responsibility:

- **Agency-wide Independent Coordination for Evaluation:** EAC cultivates an evaluation and assessment culture across NSF. It will refine a set of evaluation principles and a flexible framework for evaluation that can be adapted by all directorates and offices. Initially, this flexible framework will be used to assess progress towards the goals of three types of NSF programs: (1) human capital development; (2) agency-wide priority areas; and (3) long-term strategic investments. Careful attention will be paid to local needs, priorities, and expertise within each directorate and/or office. EAC will serve as a clearing-house and resource for program evaluations and will maintain a centralized repository for such evaluations. To encourage the growth of an evaluation culture within NSF, EAC will develop training courses and other relevant materials to facilitate staff use of evaluation tools and concepts in decision-making.
- **Directorate and Office Evaluation Capacity:** There is varying capacity for monitoring, assessment, and evaluation of programs across the directorates and offices. EAC will collaborate with them to enhance their evaluation and assessment capacity. EAC will inform evaluation activities across the agency, widely publicize its evaluation expertise, principles, and practices, and develop resources and skills that meet specific needs. EAC will collaborate on evaluations of key Foundation-wide programs, provide advice on evaluation design and data issues, and recommend models or resources, as needed, for evaluations managed in directorates and offices.

¹ www.whitehouse.gov/sites/default/files/omb/memoranda/2015/m-15-11.pdf

- **Strategic Data Collection, Tool Development, and Management:** EAC will develop methods for using NSF administrative data in its evaluation and assessment activities, including portfolio analysis. EAC will collaborate with the Office of Budget, Finance, and Award Management (BFA) and the Office of Information and Resource Management (OIRM) to provide systematic analyses of NSF administrative data, including awards/awardees, agency staffing, and budgetary allocations. This systematic analysis will allow NSF to assess its own practices and policies and inform its decision-making. Further, through collaboration with the National Center for Science and Engineering Statistics (NCSES), EAC will determine how NCSES data and NSF administrative data can be better integrated with NSF's program evaluations to describe the nature and scope of NSF's research portfolio, how its investments contribute to changes in the scientific knowledgebase as well as the science, technology engineering and mathematics (STEM) workforce and also to describe the broader impacts of these investments on society. EAC will also develop and implement enhanced portfolio analysis and monitoring tools.

Two NSF-wide groups will routinely provide advice on EAC's activities. First, the EAC Steering Committee, consisting of assistant directors and office heads, will provide senior leadership and strategic direction for EAC. Second, the EAC Working Group, consisting of program directors and division directors from the directorates and offices, will inform routine operations of EAC, facilitate collaborations across the agency, and provide local perspectives on EAC activities.

Investment Framework

FY 2015 – FY 2016

NSF recruited a permanent section head for EAC in FY 2015 and a full complement of staff, including evaluators and data scientists. In collaboration with NCSES, a statistician is expected to be on board in FY 2016.

Preliminary reports on an evaluation of Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) were received in FY 2015 with final reports expected in June 2016. NSF has initiated evaluations of human capital development programs and long-term strategic investments. In particular, multi-year evaluation and monitoring efforts for longitudinal data collection for the Graduate Research Fellowship Program (GRFP) and the Research Experience for Undergraduates (REU) are underway. A multi-year contract for an evaluation of the NSF Innovation Corps (I-Corps™) program was initiated in late FY 2015.

The NSF-wide Portfolio Analysis Tools Taskforce was convened in FY 2015 with representation from different types of programs. A needs assessment survey was conducted and an NSF-wide portfolio analysis tools requirements report was created. These activities have informed tool development and implementation, which will make these data analytic tools available to NSF staff in FY 2016. Specifically, the tools include both unsupervised and supervised techniques for mining textual data and their visualization. NSF has internal capacity to develop textual analysis tools based on unsupervised techniques that use word counts and proximity of terms in a document. The Division of Information Systems (DIS) is in the process of implementing such tools to make them available for use by NSF staff. For tools using supervised, thesaurus-based techniques, NSF is collaborating on joint tool development with National Institutes of Health (NIH). Initially this collaboration will include data sharing and pilot projects to develop thesauri that describe subsets of the NSF research portfolio.

FY 2017 Request

Within NSF, evaluation activities have traditionally been initiated and managed locally, within the directorate or office of the program being evaluated, and with little NSF-wide coordination. This distributed approach increases local knowledge and reinforces the NSF-wide expectation of evaluation of the impact

Evaluation and Assessment Capability

of its investments. In partnership with all directorates and offices, EAC will coordinate NSF's evaluation and assessment practices and harmonize the use of evaluation framework(s). Specifically, EAC will:

- Recommend policies and procedures for evaluation data collection and use, and methods for conducting evaluations and assessments in general, as well for specific types of programs; and
- Develop and maintain resources, including evaluation training programs, a website, and a repository for evaluation reports.

In FY 2016, EAC will collaborate with relevant working groups to develop evaluation frameworks and statements of work for contracts beginning in FY 2017. As mentioned earlier, these evaluations will focus on three types of NSF programs: (1) human capital development; (2) agency-wide priority areas; and (3) long-term strategic investments.

EAC will implement the Portfolio Analysis Tools Taskforce recommendations by continuing investments in tool development both in-house and in collaboration with NIH. Such tool development will build upon work begun in FY 2016 to include enhanced text mining and visualization tools as well as thesauri containing categories, concepts, and terms that describe the research portfolios of the various NSF divisions and directorates. EAC will identify, in collaboration with DIS, system requirements for implementing portfolio analysis tools that integrate NSF administrative data.

FY 2018 – FY 2019

EAC will use the lessons learned from pilot activities in FY 2016 and FY 2017 to scale up its evaluation efforts and achieve a steady state of programs that (1) undergo rigorous and independent evaluations, (2) use evaluations to inform program decisions, and (3) provide new knowledge regarding mid-course corrections and adjustments.

EAC staff, the EAC Working Group, and the EAC Steering Committee will implement a flexible evaluation framework. Ongoing discussions with these experts will continue to strengthen evaluation and assessment capability across NSF.

EAC will continue to develop and implement portfolio analysis tools. EAC will begin to use administrative and longitudinal data in its program evaluations. It will also continue to provide staff training and disseminate evaluation tools and methods.

Evaluation Framework

In addition to conducting evaluations and assessments of NSF programs, EAC will also use multiple sources of expertise, data, and metrics to assess its own performance. Expert review of EAC's activities and feedback from EAC's collaborators via customer satisfaction surveys will provide important input into EAC's performance. In addition, the EAC Steering Committee and the EAC Working Group will provide ongoing feedback on the quality of evaluation reports and the usefulness of the findings for NSF. Feedback on the findings of the evaluations will be built into future evaluation contracts.