National Science Foundation

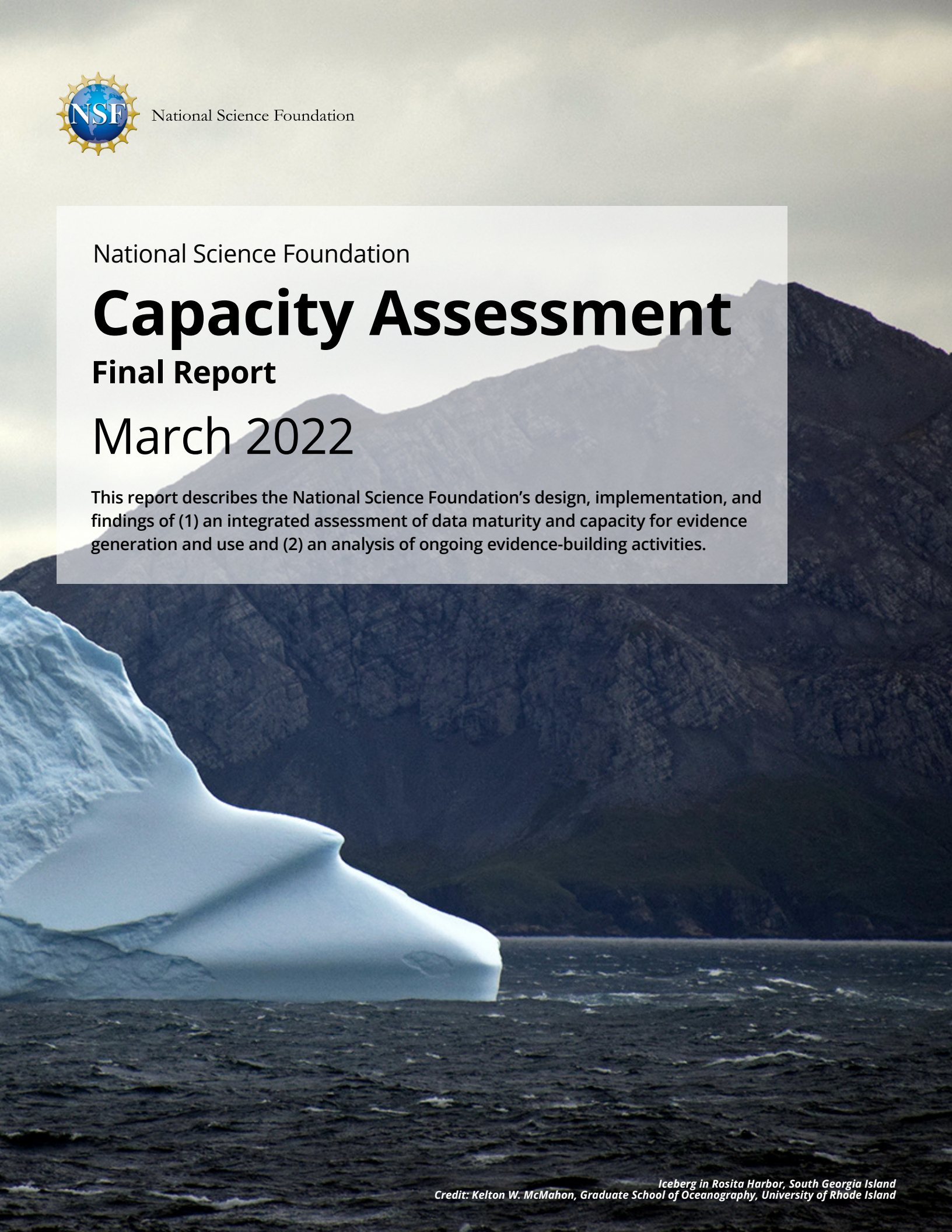
National Science Foundation

Capacity Assessment

Final Report

March 2022

This report describes the National Science Foundation's design, implementation, and findings of (1) an integrated assessment of data maturity and capacity for evidence generation and use and (2) an analysis of ongoing evidence-building activities.



Iceberg in Rosita Harbor, South Georgia Island
Credit: Kelton W. McMahon, Graduate School of Oceanography, University of Rhode Island

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Executive Summary

Spinning brown dwarf with narrow colored atmospheric bands
Credit: NASA/JPL-Caltech

This report presents the design and methodology of the National Science Foundation's (NSF) Capacity Assessment, findings from the analysis, and next steps to act on the findings. As designed, the Capacity Assessment complies with the Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act) and Federal Data Strategy. Findings will help guide improvements to bolster agency capacity to produce useful evidence for decision-making.

NSF's Capacity Assessment includes two components:

An organizational capacity assessment - Section 1 of this report

This assessment seeks to measure agency maturity in four foundational themes:

1. Building a culture that values data and promotes public use
2. Governing, managing, and protecting data
3. Promoting efficient and appropriate data use
4. Generating evidence and supporting evidence generation and use

The findings presented in this report are based on all 10 eligible Directorates and Offices, or 120 agency staff. Data were collected through focus groups and a review of supporting artifacts (documents that demonstrate existing policies, processes, or practices).

An analysis of NSF's inventory of evidence-building activities - Section 2 of this report

NSF compiled a comprehensive inventory of "statistics, evaluation, research, and analysis efforts" that were ongoing during fiscal year 2021 and met other selection criteria used to identify agency evidence-building efforts. This inventory is based on data collected through multiple sources: (1) NSF Directorates and Offices providing information to prepare the annual budget request; (2) Evaluation and Assessment Capability Section (EAC), which provides support to NSF Directorates and Offices; (3) information collection requests submitted to the Office of Management and Budget (OMB); and (4) grants, cooperative agreements, and contracts executed in support of agency evidence-building activities.

Findings from the organizational assessment show that NSF has a culture that values data and evidence, with leadership setting a strong tone regarding the Foundation's commitment to evidence-based decision-making. On average, NSF operates in the middle stages of data and evidence maturity for each foundational theme assessed (data culture, data governance, data use, and evidence generation and use). Variation in maturity across Directorates and Offices revealed pockets of excellence and innovation, with some NSF organizations operating at high levels of maturity. For example, these Directorates and Offices had well-established and enforced data governance processes or conducted studies to generate useful evidence for decision-making. Highly mature efforts may provide models to adopt or build on in developing an agencywide strategy that leverages NSF's culture of evidence in support of consistent practices and procedures.

Analysis of evidence-building activities shows that, in FY 2021, NSF is pursuing 39 formal activities. Most of these activities are conducted in support of the agency's mission, benefit stakeholders across the entire agency, address a variety of questions to meet a wide range of needs, and rely on methodologies (from rigorous program evaluations to exploratory policy analysis) that are well aligned with the research questions. Findings from the analysis of ongoing studies aligned with those of the organizational assessment and underscored both the value that NSF places on evidence and the need for some targeted improvements. The following emerged as the most salient candidates for agencywide improvements:

Establishing agencywide procedures and standards in areas such as documentation, quality reviews, and change management will support data science and analysis and the creation of sound tools to generate reliable and consistent findings.

Improving alignment of data architecture and goals for increased reliance on data will enable more flexible and independent data integration, analysis, and analytics tools development.

Developing an NSF data skills training plan or guidance on data-related training will help align upskilling efforts with NSF's vision for future data capabilities.

Providing guidance on evidence-generating activities will increase capacity across the agency to produce useful evidence for decision-making.

The main finding of the analyses presented in this report is important for the agency's future: NSF values data and has a strong culture of using evidence to inform decisions. Further embracing and strengthening, rather than changing, our culture is our next step. The question is, how? The distribution of organizational assessment scores and of evidence-building activities across NSF units suggests that NSF's data culture developed organically and in a decentralized manner over time. To further mature data and evidence capabilities, NSF will build on existing pockets of excellence to (1) formalize agencywide policies, standards, and procedures related to data and evidence and (2) advance efforts to upskill staff as part of our workforce strategy and in alignment with our Strategic Plan.

Introduction

This Capacity Assessment Report presents (1) the design and methodology of the National Science Foundation's (NSF) organizational maturity assessment (of data and evidence use and generation) and analysis of NSF's inventory evidence-building activities, (2) findings from both the organizational assessment and inventory analysis, and (3) planned next steps for the agency to act on the findings. These efforts respond to article nine of Title I of the Foundations for Evidence-Based Policymaking Act of 2018, Public Law No. 115-435 (Evidence Act), follow guidance provided by the Office of Management and Budget (such as OMB M-19-23 and OMB Circular A-11), and align with NSF's focus on generating and using evidence for decision-making. The goal of this Capacity Assessment is to produce actionable findings that can guide improvement efforts to bolster agency capacity to produce useful information to inform decisions. To this end, NSF's Capacity Assessment includes two components:

An organizational capacity assessment
Section 1 of this report

An analysis of NSF's inventory of evidence-building activities
Section 2 of this report

Aurora Australis and Milky Way over IceCube laboratory
Credit: Yuya Makino, IceCube/NSF

The design of this Capacity Assessment is based on…

…a careful review of existing legislation, OMB guidance, and agency needs and priorities to determine the goals of the Assessment and the range of capabilities needed to support agency efforts to generate and use evidence. The Assessment will also enable NSF to determine the extent to which agency efforts in the areas outlined in the Evidence Act—statistics, evaluation, research, and analysis—meet the criteria of coverage, high quality, appropriate methods, effectiveness (in meeting stakeholder needs), and independence.

…three foundational decisions to ensure the Assessment produced useful information and was conducted efficiently. Specifically, NSF decided to:

1. **Integrate efforts.** NSF designed an organizational capacity assessment that integrated two related efforts—the data maturity assessment required under the Federal Data Strategy and the capacity assessment required under the Evidence Act—to avoid redundancies, reduce burden, and build efficiencies.

2. **Assess capacity at two levels.** NSF designed two components—one focused at the organizational level and one at the activity level—to thoroughly examine the maturity of infrastructure, processes, and people capabilities supporting data and evidence generation and use.

3. **Measure both evidence generation and evidence use.** NSF intentionally decoupled evidence generation from evidence use to measure capacity in these distinct areas. As a result, the organizational assessment framework makes clear distinctions between capabilities for evidence generation versus use and instances where capabilities can impact both areas.

Appendix A shows the alignment of NSF's design with the Evidence Act requirements.

Section 1

Organizational Capacity Assessment

This section presents the framework, methods, and enterprise-level findings of NSF's organizational capacity assessment. Enterprise-level findings are based on all eligible NSF units (10 Directorates and Offices).

Rapidly rotating brown dwarf
Credit: International Gemini Observatory/NOIRLab/NSF/AURA/J. da Silva

A. Framework

NSF designed an organizational assessment focused on four themes: (1) building a culture that values data and promotes public use, (2) governing, managing, and protecting data, (3) promoting efficient and appropriate data use, and (4) generating evidence and supporting evidence generation and use. This assessment combines legislative requirements for evidence-building activities (focus of the Evidence Act) with foundational data capabilities (focus of the Federal Data Strategy). The assessment framework was developed collaboratively by NSF staff with subject matter and methodological expertise across three NSF units—the Evaluation and Assessment Capability (EAC) Section; the National Center for Science and Engineering Statistics (NCSES); and the Office of Budget, Finance, and Award Management (BFA)—as well as a contractor with deep expertise in maturity assessments. Together these collaborators form the assessment team.

Phase 1: Identify NSF Needs and Pilot the Framework

The assessment team reviewed industry and government maturity models, including the Federal Government Data Maturity (FGDM) model, the Capability Maturity Model Integration, the Stanford Data Governance Maturity Model, the DataFlux Maturity Model, and several others. The FGDM became the foundation for NSF's tailored model to cover measurement goals of the Evidence Act and Federal Data Strategy. Once approved by NSF's Evidence Act and Data Governance Steering Committee, the assessment team completed a pilot test with individuals from five NSF Directorates and Offices.

Phase 2: Hone the Framework and Diversify Perspectives

An after-action review with participants in the initial pilot test of the assessment led to revisions. These included removing redundant capability areas and questions, expanding the scoring rubric, and highlighting evidence generation and use in a separate theme within the framework (Theme 4). These revisions enabled NSF to streamline the number of capabilities from 50 to 36 while increasing usefulness of insights, particularly those pertaining to evidence generation and use. During the second phase, NSF also engaged data savvy Directorate and Office liaisons which increased the coverage and balance of perspectives in the assessment.

The final integrated data maturity and evidence capacity assessment framework is displayed in Exhibit 1.

Engaging stakeholders in design and implementation

The assessment team worked closely with Directorate and Office liaisons to (1) preview and receive feedback on the framework, (2) identify and recruit participants, and (3) organize presentations of Directorate- and Office-level findings.

Liaisons tended to be data analytics officers and other technical or data savvy staff across NSF. Their feedback, combined with that received during the first phase, increased the coverage and balance of perspectives in the design of the assessment. In addition, their participation enabled the successful implementation of the organizational capacity assessment across the agency.

Exhibit 1 – NSF Integrated Data Maturity and Evidence Capacity Assessment Framework

This framework is based on the Federal Government Data Maturity Model and adapted to integrate a focus on evidence generation and use. Information about the 36 capabilities identified in the framework was collected through (1) focus groups with agency staff and (2) artifacts provided by focus group participants.

4 Foundational Themes	12 Dimensions of Interest	36 People, Process, and Infrastructure Capabilities
Building a Culture that Values Data and Promotes Public Use	• Data Personnel • Data Culture	• Data Capacity Needs Assessment • Data Capacity Building • Use of Data to Guide Decision-Making • Data Demand and Use Frequency • Accountability and Public Confidence • Change Management
Governing, Managing, and Protecting Data	• Data Governance • Data Protection • Data Operations • Data Quality • Platform and Architecture • Data Inventory	• Operating Model • Policies and Standards • Privacy Considerations • Classification, Retention, and Disclosure • Data Requirements • Architectural Fit and Alignment • Data Tools • Data Quality Approach • Monitoring and Reporting • Metadata Management • Accessibility of Inventory
Promoting Efficient and Appropriate Data Use	• Analytics Capabilities • Data Access	• Collaboration and Sharing Spaces • Techniques for Insight • Managing Tiered Access • Open Data • Engage to Share Data Asset Knowledge
Generating Evidence and Supporting Evidence Generation and Use	• Generating High-Value Evidence • Supporting Evidence Generation and Use	• Ongoing Efforts • Evidence Relevance • Evidence Utility • Balance of Needs • Evidence Independence • Evidence Resourcing – Supply • Evidence Resourcing – Demand • Evidence Resourcing – Training and Development • Evidence Infrastructure • Evidence Policies • Evidence Procedures and Practices • Expectation of Use • Available Funding • Leadership Support

Theme 1
Building a Culture that Values Data and Promotes Public Use

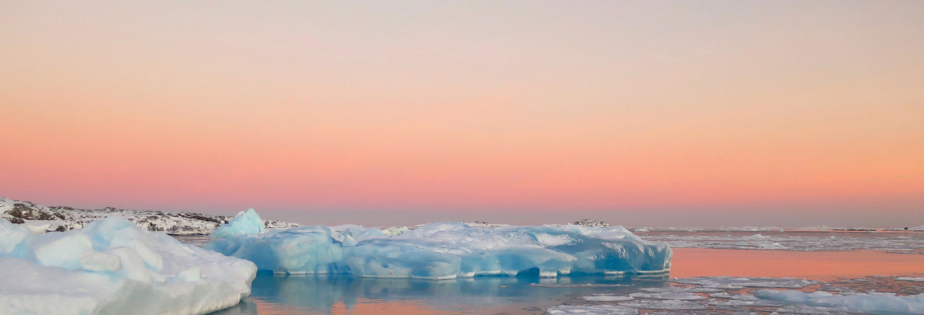
This theme focuses on NSF leadership and staff attitudes related to managing and using data to promote data skills and public accountability. Capabilities in this theme strongly support evidence-building areas, including generating learning priorities, designing and conducting studies, communicating findings, and documenting the use of findings. This theme assesses how well the agency:

- Incentivizes and supports learning among all staff
- Manages changes associated with learning, feedback, and improved data capabilities
- Creates a culture that promotes the robust management and use of data and evidence
- Ensures data maintained by the agency support performance measurement to help the public and external partners understand agency outcomes and decisions

Theme 2
Governing, Managing, and Protecting Data

This theme focuses on providing trusted, protected, and usable (well-documented) data that support business- and mission-driven information needs. Data governance, management, and protection capabilities are necessary to support NSF evaluation principles, such as high quality, rigor, and ethics. This theme assesses how well the agency:

- Governs data-related decisions across the data lifecycle
- Protects data through the appropriate use of leading data security standards, procedures, controls, and technology
- Identifies data quality issues and provides methods to remediate them
- Ensures that data requirements are specified upfront and incorporated as appropriate into the data lifecycle
- Provides the best-fit technology to support NSF's objectives through the ingestion, curation, storage, archival, dissemination, reporting, and analysis of data assets
- Provides comprehensive documentation for data assets in accessible repositories



Theme 3
Promoting Efficient and Appropriate Data Use

This theme focuses on providing data consumers access to the information needed to inform everyday decisions. Efficient and appropriate data use capabilities ensure NSF staff use data in decision-making. This theme assesses how well the agency:

- Equips staff with the analytical skills and tools needed to design, conduct, and facilitate the use of findings from studies
- Creates mechanisms to promote use of data in policy, planning, and operations
- Makes NSF data available and easy to access in a controlled and secure manner

Theme 4
Generating Evidence and Supporting Evidence Generation and Use

This theme focuses on activities that generate high-value evidence and appropriately supporting evidence generation and use. Going one step further than theme three, these capabilities provide NSF staff with the results of analyses (such as point estimates) to be used in decision-making, and also insights and actionable recommendations to make the best decision possible. This theme assesses how well the agency:

- Records ongoing evaluation and analysis activities to support organizational decisions
- Generates evidence that is relevant and responsive to users' needs
- Maintains independence and avoids bias in evidence generating activities
- Aligns staff with appropriate skills to its evidence-generation and use needs
- Provides guidance on evidence generation and drives an expectation of evidence use
- Delivers the requisite leadership support and financial resources to achieve goals related to evidence generation and use

Small icebergs and pancake ice near Palmer Station
Credit: Ken Keenan

B. Methodology

Melting ice in the Arctic Ocean
Credit: Zhangxian Ouyang, University of Delaware

Selecting Participants

NSF pursued a two-phased approach to selecting participants. In the first phase, the assessment team identified the universe of NSF Directorates and Offices to be included (10 units, six Directorates and four Offices). In the second phase, the assessment team identified key individuals within those units. Participants represented different roles across data and evidence generation and use (more details on page 12). Deep engagement within each Directorate or Office enabled the team to generate enterprise-level results and provide each Directorate and Office with its specific unit-level results.

NSF considered sampling NSF units—for example, stratifying units by type (such as Directorates versus Offices) or data/evidence capabilities (more or less mature)—but did not need to resort to sampling given widespread interest across eligible Directorates and Offices and deep engagement of liaisons who facilitated implementation.

The results presented in Section C are based on all eligible NSF units and individuals who participated. See Exhibit 2 for detailed information regarding participant selection and data collection.

Exhibit 2 – Participant Selection and Data Collection

Participant Selection	
Phase I: NSF units	10 Directorates/Offices
Included	• Office of the Director, Office of Integrative Activities, EAC • Office of Budget, Finance, and Award Management • Office of Information and Resource Management • Directorate for Biological Sciences • Directorate for Computer and Information Science & Engineering • Directorate for Education and Human Resources • Directorate for Engineering • Directorate for Geosciences • Directorate for Mathematical and Physical Sciences • Directorate for Social, Behavioral and Economic Sciences, National Center for Science and Engineering Statistics (Themes 1-3 only)
Excluded	**1.** Four smaller NSF units within the Office of the Director (Office of the General Counsel, Office of Legislative and Public Affairs, Office of Diversity and Inclusion, Office of International Science and Engineering) that receive data- and evidence-related support from those included in this assessment **2.** Two NSF units ineligible for this assessment due to their oversight or consultative functions—namely, the Office of the Inspector General and National Science Board
Phase II: Participant selection within NSF units (adjusted to variation in organizational structures)	Some Directorates/Offices have data and evidence-building capabilities concentrated in one subdivision (division/section/front office), while others have capabilities distributed across subdivisions (with staff assigned to divisions/programs). Where capabilities are concentrated/centralized, that subdivision was included (for example, the EAC Section in the Office of Integrative Activities). Where those capabilities are decentralized, selected staff across subdivisions within that Directorate or Office participated to ensure adequate representation (for example, Directorate for Engineering).
Data Collection	
Phase I (completed in 2020)	Pilot test with four focus groups comprised of 21 individuals across five Directorates and Offices
Phase II (completed all data collection by Spring 2021)	15 focus groups comprised of 72 individuals across seven NSF units (five Directorates and two Offices)
Phase III (completed in Summer 2021)	12 focus groups, including seven comprised of 27 individuals from two NSF units (one Directorate and one Office), and five additional theme four-specific focus groups comprised of nine individuals from five Directorates

Collecting Data

Data for this assessment were collected through focus groups and supporting artifacts:

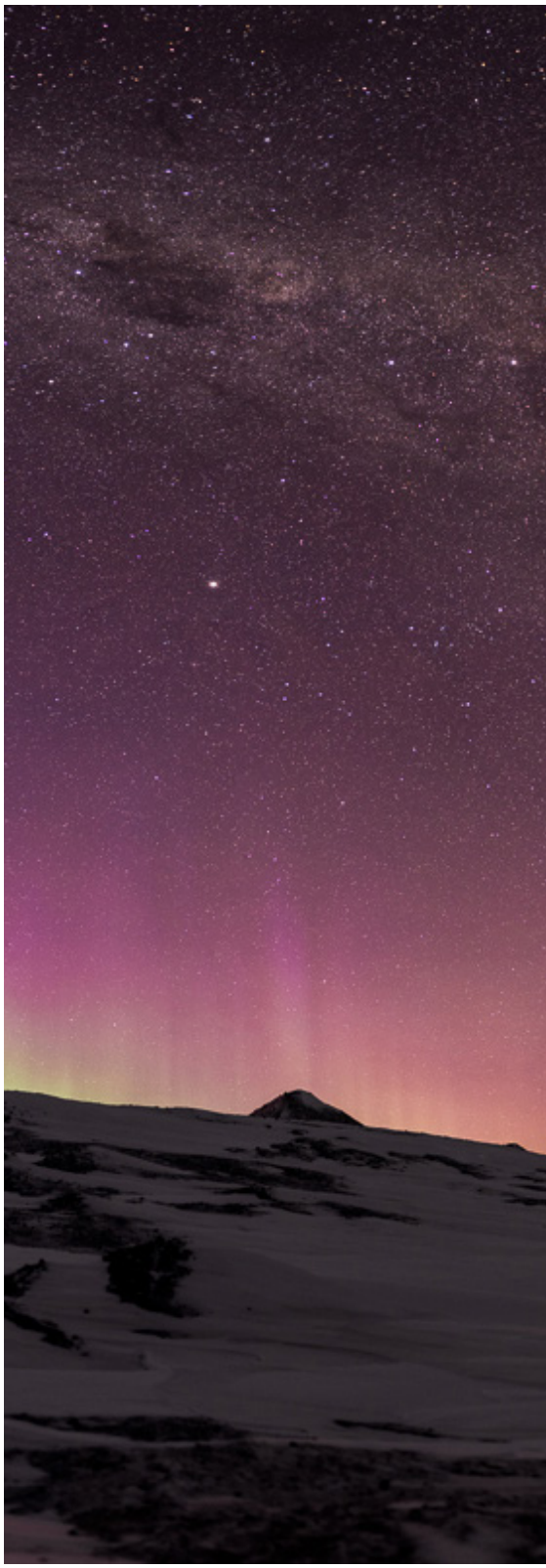
Focus groups. By relying on focus groups, NSF sought to (1) maximize valuable, balanced insights through robust dialogue; (2) minimize burden on participating Directorates and Offices; (3) enable probing to ensure a common understanding of key terminology; and (4) develop an approach that can be replicated as part of a cycle of recurring assessments to monitor progress.

Through the focus groups, the assessment team gathered insights related to the current state of people, process, and infrastructure capabilities from representatives of each participating Directorate and Office. To do so, facilitators asked questions to walk participants through the set of capabilities that comprise the dimensions and themes of the framework and prompt participants to discuss their presence or absence, relative maturity, roadblocks to increasing maturity, and ideas for improvement.

Focus group meetings lasted approximately 90 minutes and included three to eight participants in each group. Participants generally joined one of three groups designed for:

- Raw data managers, such as individuals that collect, store, protect, and document data
- Curated data users, such as individuals who use data to produce results or inform decisions
- Evidence generators and users, such as individuals completing studies in NSF's learning agenda, disseminating findings (internally or externally), or using them for decisions

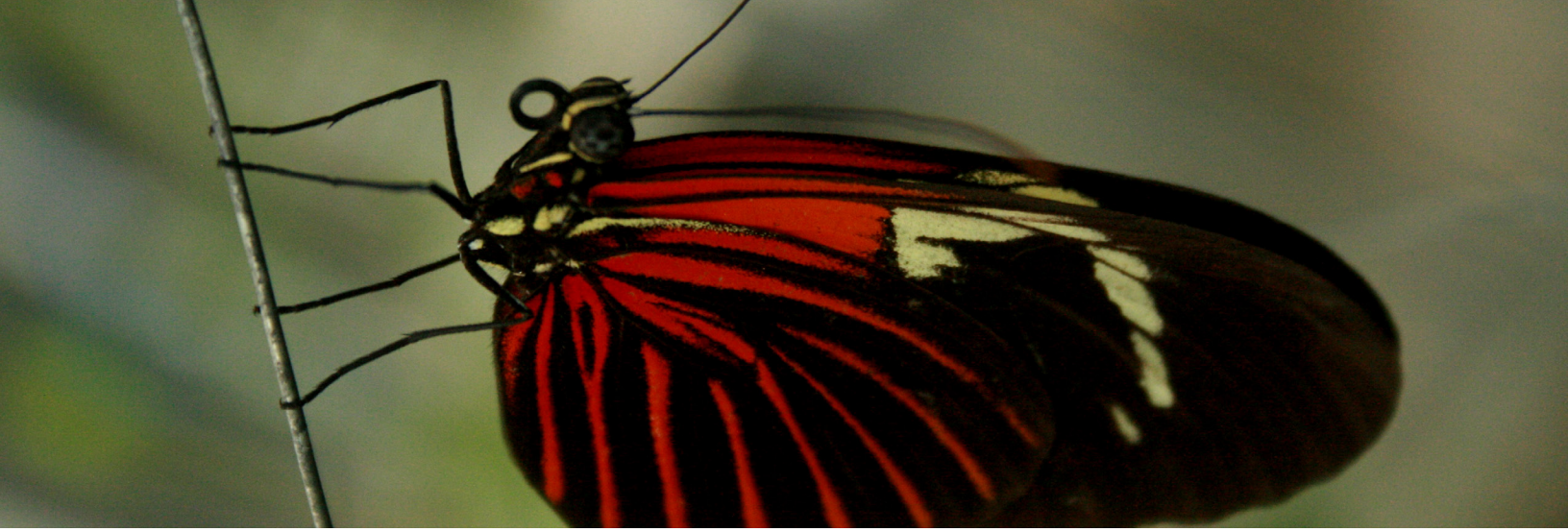
Some Directorates and Offices elected to have individuals participate in more than one focus group when their job duties spanned multiple roles. Directorate and Office leadership generally joined the evidence generators and users focus group.



Milky Way in winter night sky near McMurdo Station
Credit: Joshua Swanson

Artifacts. To support assertions regarding capabilities, participants were given the opportunity to provide artifacts—that is, documentation reflecting capabilities in practice. Artifacts include standards, policies, standard operating procedures (SOPs), job aids, and other written materials of varying levels of formality. The assessment team provided each participating NSF Directorate and Office with a list of artifacts of interest at the assessment kickoff meeting and, for the duration of data collection, accepted additional documentation arising from the focus groups. For example, during focus group meetings, if individuals referred to a standard approach to data or metadata management, the assessment team requested a copy of the SOP outlining that approach. The assessment team's review of these artifacts provided an important source of information for analysis.

Gentoo penguin leaping off ice flow into Mikkelsen Harbor
Credit: Kelton W. McMahon, Graduate School of Oceanography, University of Rhode Island



Using butterfly wing color patterns to study genotype-phenotype relationships
Credit: Riccardo Papa, Department of Biology, University of Puerto Rico

Assigning Maturity Ratings

The assessment team developed a six-point scale to rate capabilities based on current state maturity, relying on the contractor team's knowledge of industry data maturity standards and approaches in use by other maturity models and other agencies. The scale provides ratings ranging from *Not Initiated to Optimizing* (Exhibit 3).

Exhibit 3 – NSF Organizational Capacity Assessment Maturity Scale

Maturity	Rating	Characteristics
Optimizing	5.50 – 6.00	People, process, or technology capabilities are fully embedded into the operational culture of the organization with a mechanism for continuous improvement.
Performing	4.50 – 5.49	People, process, or technology capabilities are expected by the organization and are monitored using defined metrics.
Piloting	3.50 – 4.49	People, process, or technology capabilities have been established based on best practices but are not widely accepted or used.
Defining	2.50 – 3.49	Planning and/or activities to define the people, process, or technology capabilities are underway, or capabilities are being defined and validated with stakeholders.
Initiating	1.50 – 2.49	Issues being debated, use cases being discussed, and/or ad hoc activities being performed related to people, process, or technology capabilities.
Not Initiated	1.00 – 1.49	No evidence of issues being debated, use cases being discussed, or ad hoc activities being performed related to people, process, or technology capabilities.

Each Directorate/Office received a maturity rating for each capability based on an analysis of focus group discussions and a review of relevant artifacts. Capability-level maturity ratings were averaged to produce ratings at the dimension and theme levels. Multi-level maturity ratings facilitate identification and prioritization of both broad areas of focus and specific targets for improvement to drive increased maturity.

The assessment team provided a briefing to each participating Directorate/Office to walk through the assessment ratings and discuss some of the key observations supporting the ratings. These briefings gave participants an opportunity to provide feedback and begin discussing potential next steps to act on assessment findings within their respective Directorate/Office.

Finding the cause of the little Ice age
Credit: Gifford H. Miller, INSTAAR, University of Colorado Boulder

Quality Assurance Approach

The assessment includes a quality assurance approach that leverages quality reviews, socialization activities, and a strong partnership between NSF and contractor teams. Quality assurance activities include:

- Building data validation checks into assessment tools and templates
- Completing multiple levels of review to integrate subject matter expertise and verify alignment with agency quality standards
- Obtaining iterative feedback on work products from key stakeholders (e.g., NSF assessment team members, Directorate/Office liaisons)

C. Enterprise-Level Findings

Key Takeaways

Exhibit 4 presents high-level findings that highlight strengths and opportunities for improvement. These findings are supported by the detailed assessment results summarized below.

Exhibit 4 – Key Takeaways from NSF's Organizational Capacity Assessment

Drawing on its culture, which values data, will help NSF mature data capabilities and promote increased use of evidence in decision-making

Establishing procedures and standards in areas such as documentation, quality reviews, and change management will enable easier access to data and tools, promote consistency across the agency, and facilitate analysis and tools development to generate reliable findings

Improving alignment of data architecture and goals for increased reliance on data will enable more flexible and independent data integration, analysis, and analytics tools development

Developing an NSF data skills training plan or guidance on data-related training will help align upskilling efforts with NSF's vision for future data capabilities

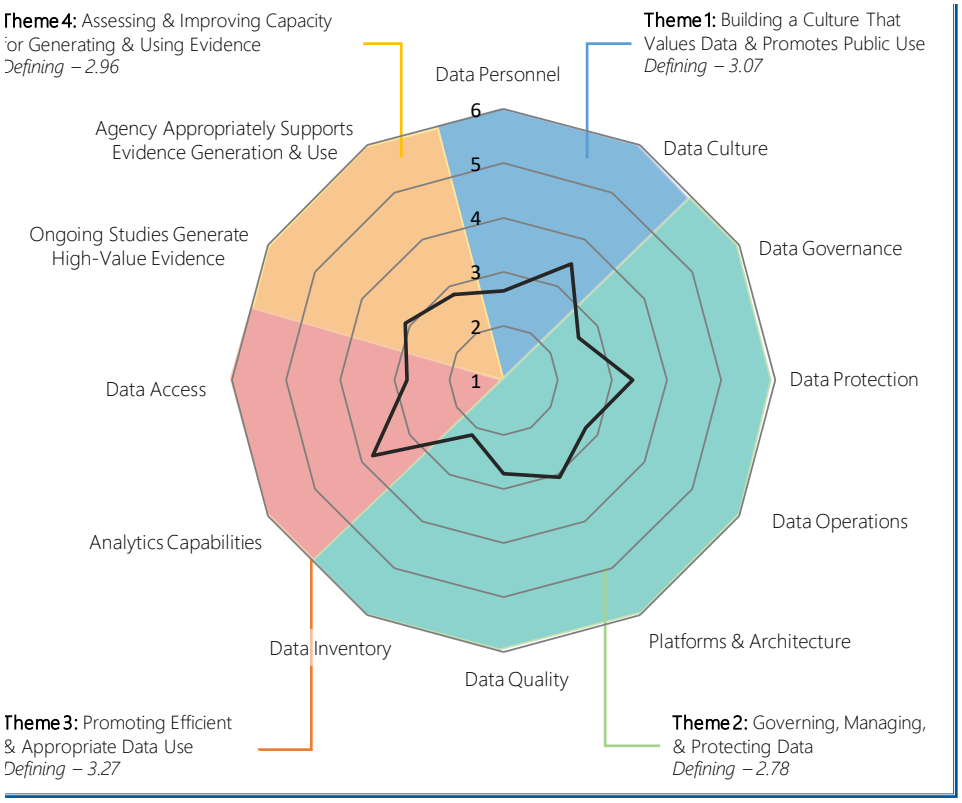
Filling gaps in guidance for accessing and using data will decrease the learning curve and help staff work more efficiently (examples: data access and quality procedures, tools rollout and change management, analysis documentation)

Helicopter transporting fossil specimen in Antarctica
Credit: Eva Koppelhus

Enterprise-Level Maturity Ratings

The three data collection phases of the organizational capacity assessment resulted in an enterprise-level view of maturity at the dimension and theme levels (Exhibit 5). These enterprise-level maturity ratings represent unweighted averages of capability ratings across participating NSF Directorates and Offices.

Exhibit 5 – NSF Maturity Ratings by Dimension



At each maturity level, people, process, or technology capabilities are...

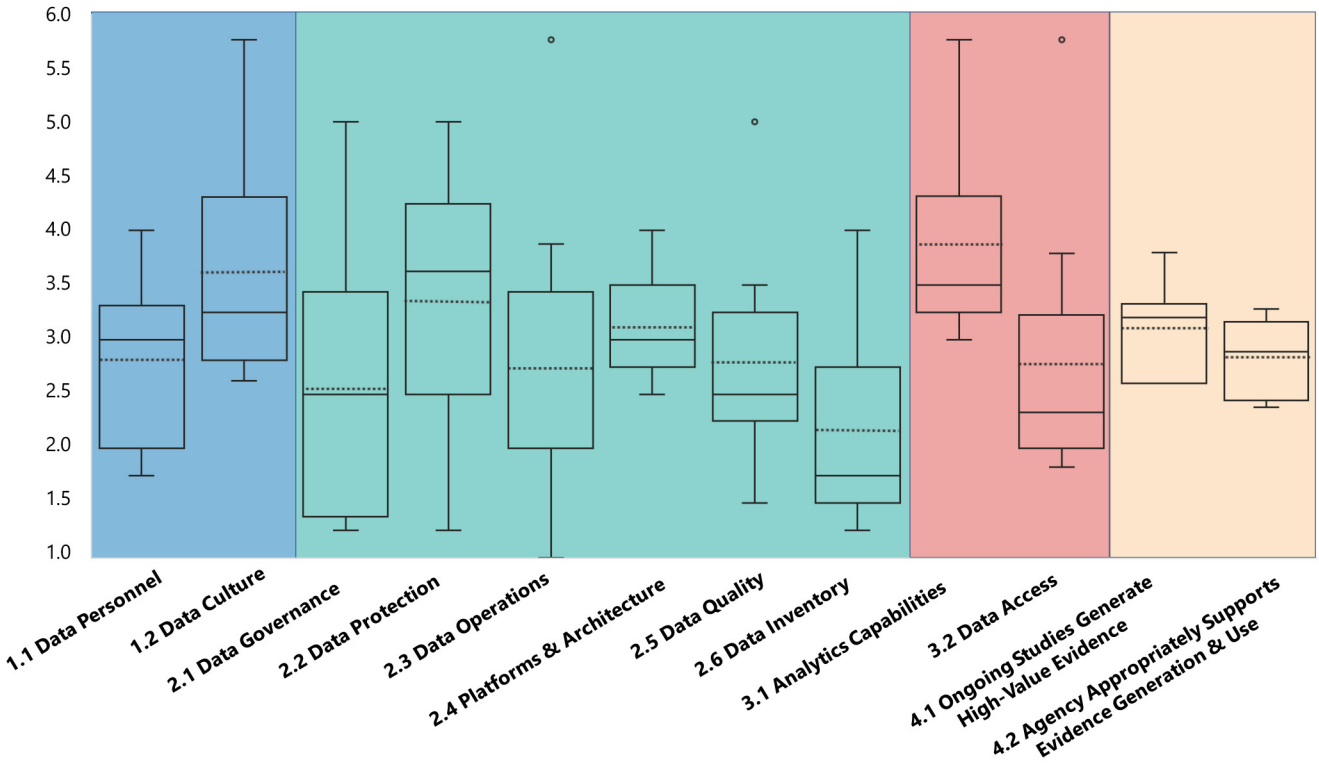
Optimizing 5.50 – 6.00	...fully embedded and continuously improved.
Performing 4.50 – 5.49	...expected, monitored, and widely used.
Piloting 3.50 – 4.49	...functioning in some parts of the team/organization.
Defining 2.50 – 3.49	...being planned, formalized, and/or validated.
Initiating 1.50 – 2.49	...under discussion or performed only on an ad hoc basis.
Not Initiated 1.00 – 1.49	...not defined or in place.

Objectivity and Independence

This assessment was designed and implemented by a team that included NSF staff and contractors. NSF staff ensured that the assessment was tailored to meet NSF needs and that appropriate staff (in target roles or positions) were identified for participation. To ensure that the findings reported are free of bias, and therefore uphold the principle of objectivity and independence in NSF's Evaluation Policy, the analysis of data collected and the development of maturity ratings were conducted by contractor staff without any NSF involvement.

NSF operates mostly in the middle (defining and piloting) stages of data and evidence maturity across the dimensions (Exhibit 5). However, these average ratings conceal large variation across Directorates and Offices (Exhibit 6). The variability in ratings reveals pockets of excellence and innovation—Directorates and Offices across NSF supporting the design, development, pilot testing, deployment, and use of data analytics and studies to generate useful evidence for decision-making. These efforts may provide a good foundation to develop a strategy for improvements.

Exhibit 6 – Variability of Maturity Ratings, by Dimension



Reading the chart

- The **length of the box** represents the distance between the lower and upper quartiles.
- The **solid line** in the box marks the median value.
- The **dashed line** marks the average.
- The **"whiskers"** represent minimums and maximums (unless there is an outlier).
- The **open dot** represents an outlier, a data point that is more than 1.5 times the length of the box away from its respective quartile.

Note: A box with no whiskers or outliers means the lower and/or upper quartile is equal to the minimum and/or maximum.

Theme-Level Observations

Below are highlighted observations currently under discussion within the agency.

Theme 1
Building a Culture that Values Data and Promotes Public Use

- Leadership sets a strong tone at the top on data-driven decision-making.
- Directorates and Offices are energized about data and analytics.
- Leadership is aware of the need to build data skills capacity strategically.
- Data skills training plans are informal or ad hoc.
- There is room to improve training and guidance on use of available data and tools.

Theme 2
Governing, Managing, and Protecting Data

- Agency has active engagement in enterprise-level data governance groups.
- Many data tools are available to staff, but adoption is uneven at present.
- Many staff members only interact with data policies and standards during NSF annual training courses.
- Requirements for and feedback on new Directorate- and Office-level data assets and analyses are inconsistent or ad hoc.
- Staff take initiative on data quality checks; most data quality checks are ad hoc and completed manually.

Theme 3
Promoting Efficient and Appropriate Data Use

- NSF fosters innovation and collaboration through a robust set of learning communities to support informal mentoring and training.
- Teams actively balance privacy considerations and opportunities for external dissemination.
- Most teams have a few skilled data practitioners; leadership acknowledges the need to broaden base of data analytics skills.
- Agency-level approach to tiered access (a security model with trust tiers that determine access) has not been applied to Directorate/Office-level data assets in a consistent manner.

Theme 4
Generating Evidence and Supporting Evidence Generation and Use

- Agency developed an inventory of ongoing evaluation and analysis activities.
- Agency is working to increase the value of generating evidence through identifying, prioritizing, completing, and considering results of evidence-generating activities in a more formal and consistent manner.
- Capacity is a limiting factor in the ability to engage in evidence generation and use.
- Leadership is vocal about supporting evidence-related activities but aligning resources with goals is a challenge.

Conclusions

The organizational assessment demonstrates NSF's commitment to data maturity and evidence generation and use. Although NSF has a strong data culture and staff with strong analytical capabilities, the enterprise-level ratings indicate several areas for improvements. NSF is already encouraging the development of strategies and prioritization of improvements to increase data maturity and evidence generation and use (as explained in the Next Steps section).

Linking Key Observations to Capacity Assessment Requirements

Below are selected examples of insights aligned with Capacity Assessment requirements.

Considering the extent to which NSF's "evaluations, research and analysis efforts, and related activities" are…

Supporting and balancing agency needs	• Use of evidence in decision-making appears to be highly valued and supported by leadership; supervisors and leaders expect team members to participate in evidence-related activities and use available evidence to support decision-making wherever possible. • Teams view NSF's annual strategic review process as an effective mechanism to obtain deeper insights into leadership priorities and identify research topics for the year.
Using appropriate methodologies	• There is high interest across the agency in upskilling on evidence generation and use. • Agency should consider identifying and further publicizing existing trainings (internal and external) to enable agency staff to learn more about evidence generation methods and responsible use of evidence.

Determining current agency capacity for…

Planning and implementing evaluation activities, disseminating best practices and findings, and incorporating employee views and feedback	• There are currently limited staff within Directorates/Offices who have the requisite time and expertise to support evidence generation activities. • Some assessment participants were either unaware of, or unfamiliar with, NSF guidance on evidence-related activities.
Carrying out capacity-building activities in order to use evaluation research and analysis approaches and data in the day-to-day operations	• Assessment participants noted that their teams need additional staff to support demand for evaluation, research, and analysis in support of the mission. • NSF may want to consider assessing its current resource capacity and conducting a gap analysis to identify and prioritize the gaps in key evidence-related capabilities.

Section 2

Analysis of NSF's Inventory of Evidence-Building Activities

Per the Evidence Act, this section summarizes NSF's "assessment of the coverage, quality, methods, effectiveness, and independence of the statistics, evaluation, research, and analysis efforts of the agency."

Researchers in Puerto Rico study butterfly wing colors to understand genotype-phenotype connections
Credit: Riccardo Papa, Department of Biology, University of Puerto Rico

A. Methodology

As required by the Evidence Act, NSF's inventory of evidence-building activities includes "statistics, evaluation, research, and analysis" activities ongoing in FY 2021 (Exhibit 7). These include activities active between October 2020 (the beginning of the fiscal year) and April 2021, when data collection for this analysis was conducted. When appropriate, throughout this document, we use the terms "activities" and "studies" interchangeably to refer to these evidence-building activities.

Exhibit 7 – Activities included in and excluded from NSF's inventory of evidence-building efforts

Included

Evidence-building activities focused on NSF decisions and investments

Evaluation of an NSF program, policy, strategy, initiative, or operations

Statistics, such as the funding rate, at any level (e.g., agency, directorate, division, program)

Research, including landscaping studies and literature reviews

Analysis, such as desk reviews to create logic models, workforce analyses, and Committee of Visitors' reports

Excluded

Activities not focused on NSF, not controlled by NSF, or that form part of regular operations

NSF grant-funded activities that are not focused on NSF's programs, operations or work

Activities not focused on NSF, such as state-of-the-field reviews and nationally representative statistical surveys

Grants/cooperative agreement project-level evaluations where NSF has no direct control over the execution of the work

Routine operational activities, including risk and budget analyses

Rufous hummingbird
Credit: Sarah Frey, Oregon State University

Data Sources

Data for this initial inventory were collected from existing sources:

- Yearly data call to NSF Directorates and Offices in support of the preparation of the annual budget request
- EAC supported projects (evaluations and other types of evidence-building activities)
- Approved OMB Paperwork Reduction Act information collection requests
- Active NSF grants, cooperative agreements, and contracts in support of evidence-building activities

And verified by:

- EAC liaisons at NSF Directorates and Offices. A list of activities verified to date is presented in Appendix B.

Document Review

For each study or activity, existing documentation was collected and reviewed to code each activity along the dimensions shown below, as NSF aligned the Evidence Act requirements with the principles in NSF's Evaluation Policy. For example, the required assessment of using "methods and combinations of methods that are appropriate to...the corresponding research questions being addressed" is aligned with the NSF principle of high quality and rigor. Appendix A provides a detailed description of this alignment.

Documentation reviewed included, when available, statements of work, project plans, work plans, analysis plans, quality assurance plans, dissemination plans, and information collection request packages. These enabled NSF to assess the following characteristics through a desk review of documents (constraints are discussed in the limitations section below):

9 characteristics of relevance and utility

These characteristics focus on classifying activities by typology, focus, stakeholders, and use.

6 characteristics of high quality and rigor

These measure the design and execution of the activity, considering the balance of needs.

1 characteristic of independence and objectivity

This characteristic reflects our assessment of insulation from undue influence.

5 characteristics of transparency and reproducibility

A focus on transparency and reproducibility signals a commitment to quality, replication, and dissemination.

1 characteristic of ethics

This indicates compliance with applicable federal laws as well as protection of human subjects.

Limitations

The Evidence Act requirements for this analysis are ambitious. In particular, the constructs of interest as aligned with the NSF Evaluation Principles—such as utility and ethics—are difficult to measure. This is particularly true for the "current" efforts that are the target of this analysis as stipulated in the Evidence Act. For example, it is difficult to assess ethical conduct or level of rigor of work that is in the design or exploratory phases. And even if measured, these may change over time. In addition, for this first response to these requirements, NSF sought to rely on existing data sources to avoid developing an approach that increased burden on stakeholders. This necessarily generated some limitations in the depth of information available, as the analysis relies heavily on original plans (available through proposals or work plans for studies conducted), instead of final reports. For these reasons, the coding schemes created for analysis are constrained in their ability to measure the target characteristics of ongoing evidence-building activities. Ethics—for instance—is reduced to one data point. Albeit an important one—compliance with legislation and human subject protections as documented in requests for clearance—this measure fails to capture other agency efforts to promote ethical conduct, such as well-enforced procedures to identify conflicts of interest. The methodological approach adopted for this analysis aimed to balance several factors, such as the resources invested, burden generated, reproducibility over time, and potential utility of the findings. This valuable initial experience will provide a solid foundation to consider revisions in the future as NSF seeks to monitor its portfolio of evidence-building activities.

Quality Assurance

The design of this analysis, the coding schemes developed, and the estimates generated were submitted to quality assurance review by independent researchers (that is, researchers not involved in the design or analysis) with appropriate technical expertise, extensive research experience, and knowledge of the Evidence Act. The first review focused on (1) alignment of the analytic approach (including the coding schemes) with the Evidence Act requirements and (2) assessment of a sample of documents for agreement with the codes assigned to them. This quality assurance review found agreement across all constructs except for one: degree of rigor. Upon review, staff concluded that many activities were too new for degree of methodological rigor to be determined with high reliability. As a result, this dimension was excluded. Instead, the measure of degree of rigor focused only on the alignment between the proposed methodology and the research question(s). The second review focused on reproducing all estimates reported here for accuracy. They were all verified.

Sunrise over the Arctic
Credit: Kim Kenny

B. Findings

Inventory

NSF's inventory of evidence-building activities includes:

39 activities spanning **9** Directorates and Offices

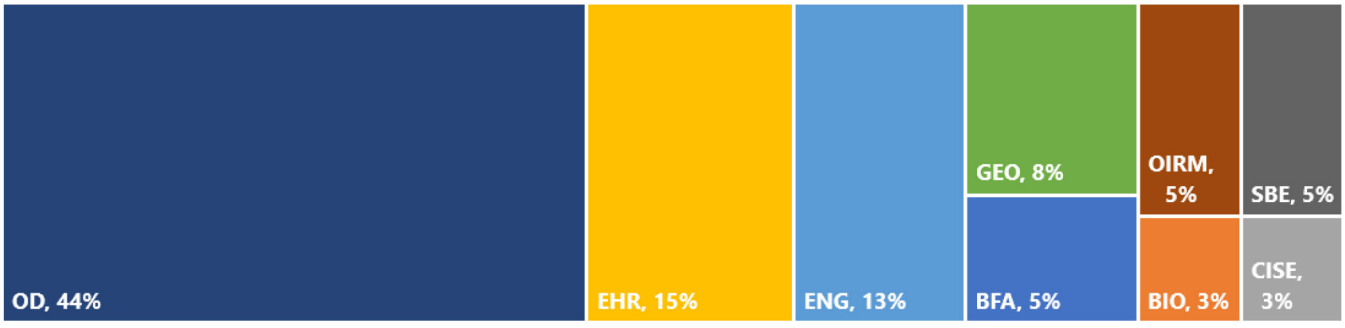
- **25** External contracts
- **12** Internal efforts
  - **2** Grants and cooperative agreements

The sections below provide an analysis of the characteristics of these efforts along the required dimensions and aligned with the NSF Evaluation Policy Principles.

Relevance and utility

Current evidence-building activities support most Directorates and Offices at NSF, particularly the Office of the Director (OD). Ongoing activities support the needs of 8 of 9 Directorates and Offices. Nearly three quarters of the studies originate in three units—namely, the Office of the Director (44 percent) and the Directorates for Education and Human Resources (15 percent) and Engineering (13 percent) (Exhibit 8). This is to be expected, as the Office of the Director is home to several offices and focuses on work that is of value agencywide, which is a criterion for prioritizing evidence-building efforts. Similarly, the Directorate for Education and Human Resources is a hub for agency initiatives to grow and diversify the workforce; monitoring and evaluating these initiatives has been a longstanding agency priority.

Exhibit 8 – Distribution of FY 2021 evidence-building activities by Directorates and Offices



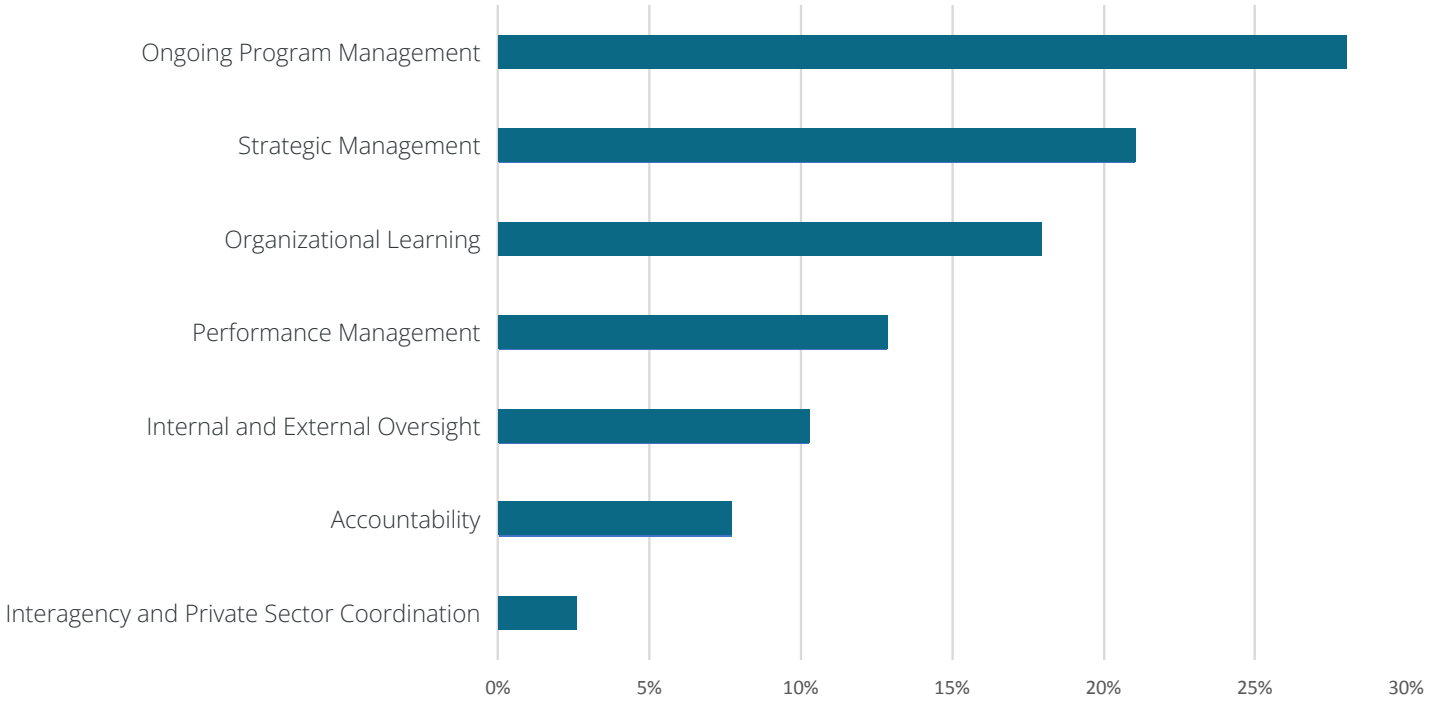
Source: NSF analysis of its FY 2021 inventory of evidence-building activities.

Notes: N=39. OD=Office of the Director, EHR = Directorate for Education and Human Resources, ENG=Directorate for Engineering, GEO=Directorate for Geosciences, BFA= Office of Budget, Finance and Award Management, OIRM = Office of Information and Resource Management, SBE = Directorate for Social Behavioral and Economic Sciences, BIO = Directorate for Biological Sciences, CISE = Directorate for Computer and Information Science and Engineering. Percentages in graphics add up to more than 100 percent due to rounding.

The studies in NSF's portfolio of evidence-building activities address a variety of questions related to the agency's mission and operations. Some questions focus on the efficacy of agency policies and programs (such as NSF's Anti-Harassment Conference Policy and the Convergence Accelerator program), others focus on describing activities (such as the prevalence and characteristics of projects related to nanotechnology), and yet others focus on people (for example, on counting and describing the demographic characteristics and educational and employment outcomes of participants in NSF programs). Questions about agency operations often focus on improving service delivery (a good example is whether removing proposal deadlines reduces proposals' dwell time, on average).

The agency's mission drives evidence-building activities at NSF. Most studies (33 studies or 85 percent) support mission-strategic research, with 27 focused on programs and 6 focused on policy (not shown in graphs for simplicity). The remaining evidence-building efforts (6 or 15 percent) are focused on operations, such as statistics on funding rates. Analyzing these studies by areas of focus highlighted in the Evidence Act and shown in Exhibit 9 shows that these efforts address a wide range of needs. The most common needs relate to agency performance management (ongoing program management, strategic management, organizational learning, and performance management).

Exhibit 9 – Distribution of activities highlighted in the Evidence Act

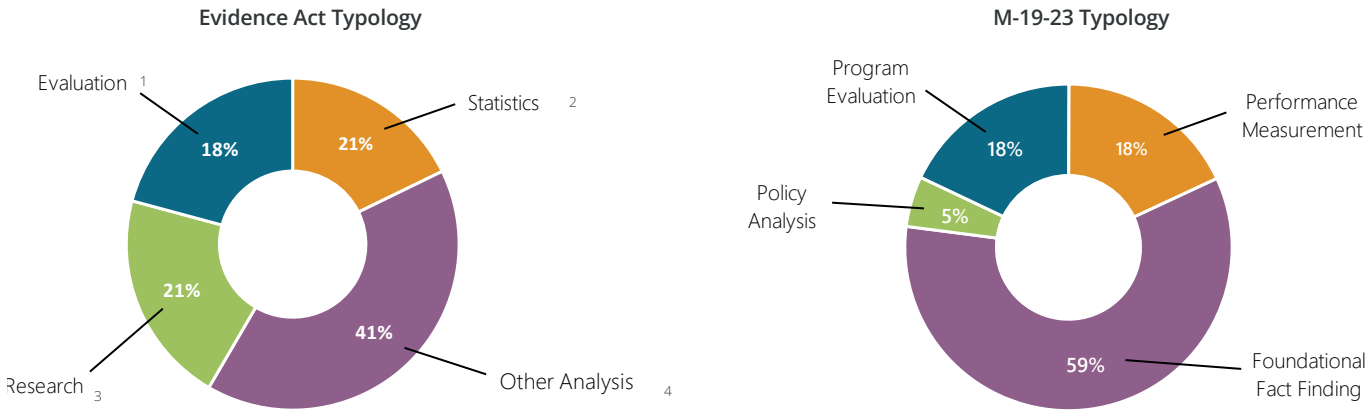


Source: NSF analysis of its FY 2021 inventory of evidence-building activities

Note: N=39.

Most current efforts are foundational fact-finding studies, that is, research and analysis efforts that are mostly descriptive or exploratory. Current studies were coded using two different typologies – one included in the Evidence Act itself and the other in OMB guidance (OMB M-19-23). Using the Evidence Act typology, evaluations and statistics make up 39 percent of the reported activities (see Exhibit 10, left graph). Research and other types of analyses make up the remainder. Using the classification defined in OMB M-19-23, the majority of activities (59 percent) are foundational fact finding while program evaluation and performance measurement account for 18 percent each. The remaining two studies are policy analyses (5 percent) (see Exhibit 10, right graph). Of the evaluations included in either typology, four are summative evaluations and one is a formative evaluation.

Exhibit 10 – Characteristics of activities



Source: NSF analysis of its FY 2021 inventory of evidence-building activities

Notes: N=39 for each graph. Values may not add to 100% due to rounding.

[1] Evaluations are systematic assessments of the effectiveness or efficiency of programs, policies, strategies, or organizations. Example: Evaluating the Sustainability of the NSF ADVANCE Program.

[2] Statistics includes work focused on providing statistical estimates and do not contain in-depth analysis and conclusions found in evaluation or research studies. Example: National Nanotechnology Initiative Program Analysis.

[3] Research includes studies that seek to answer a research question(s) but are not evaluations. Example: Merit Review Survey.

[4] Other types of analyses include desk reviews to create logic models, workforce analyses, and portfolio reviews by Committee of Visitors. Many of these projects are exploratory analyses that provide background information for future evaluations. Example: Geoscience Education and Diversity Programs Committee of Visitors.

Regardless of the program or NSF unit originating the study, findings are likely to be useful across the Foundation. Evidence-building activities may be designed to produce evidence that applies to:

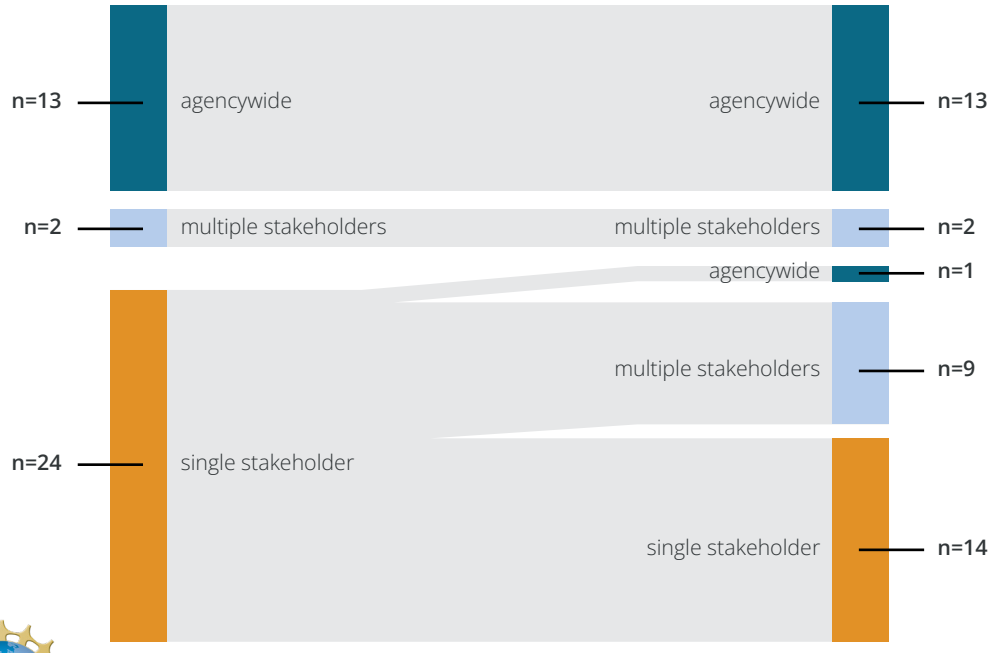
- A single stakeholder – for example, a single program, such as the Centers for Chemical Innovation Program, or division, such as Committee of Visitor portfolio reviews
- Multiple stakeholders – for example, an intervention that is implemented across multiple directorates, such as the Research Experiences for Undergraduates Program
- The agency as a whole – such as policies that apply across the Foundation

The review of current activities revealed that, at the planning stage, most of them (62 percent) were focused solely on the stakeholder commissioning the study, a small share (5 percent) on multiple stakeholders, and a third (33 percent) on agencywide efforts (Exhibit 11). This finding aligns with the earlier one indicating that nearly half of the studies are initiated by the Office of the Director.

However, even if a study is commissioned by or conducted for a single stakeholder, findings may be relevant across the Foundation. Coded as the potential relevance of each evidence-building activity based on topic or programmatic overlaps, the results suggest that ongoing studies may indeed generate findings that would be useful to multiple stakeholders. For example, the evaluation of an innovation training program may be commissioned in response to the needs of one program, but results may be potentially useful for other programs related to technology transfer. Coding and analyzing potential relevance suggests that 42 percent of the evidence-building activities originated by single stakeholders (10 of 24) may be relevant to multiple stakeholders or the entire Foundation (Exhibit 11). Consequently, nearly 60 percent of ongoing studies will potentially benefit multiple agency stakeholders, including programs, divisions, and directorates. This finding underscores the value of single stakeholder initiatives and the importance of dissemination activities.

Exhibit 11 – Relevance of activity to stakeholder groups

The left-hand vertical axis shows the distribution of the planned relevance of the current activities. The right-hand vertical axis shows how this distribution changes if results are shared with other relevant stakeholders.



Source: NSF analysis of its FY 2021 inventory of evidence-building activities.

A single stakeholder activity is defined as relevant to a single program, for example, the Secure and Trustworthy Cyberspace Program, or division, such as Committee of Visitor portfolio reviews. A multiple stakeholder activity is a specific type of intervention that is replicated across multiple units at NSF, such as the Research Experiences for Undergraduates Program (REU). Agencywide activities focus on topics relevant to the entire Agency, such as anti-harassment policies that apply across the Foundation.

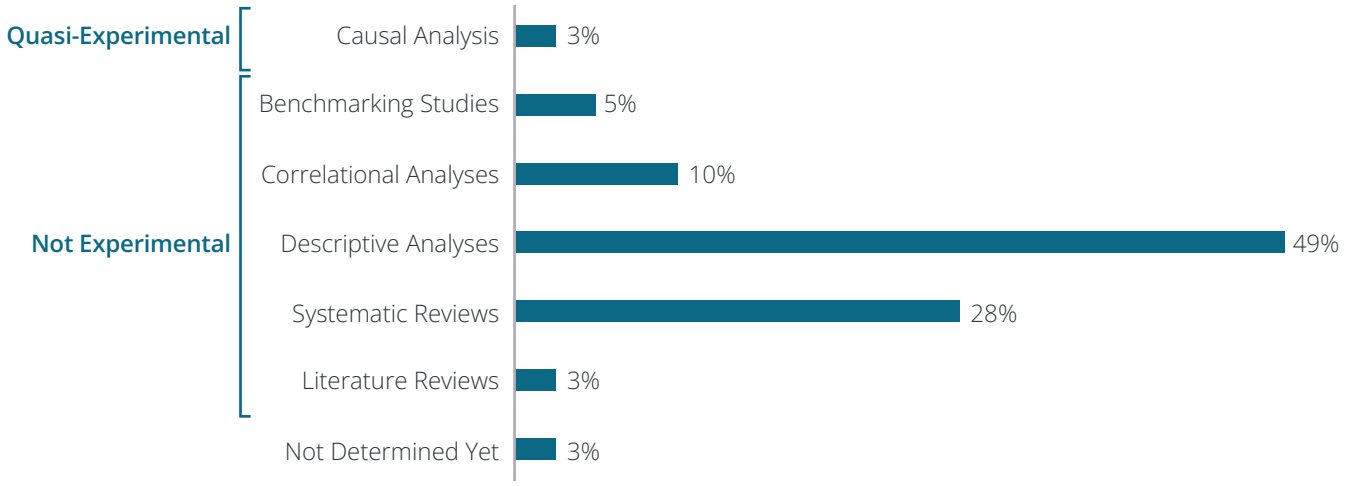
High quality and rigor

Most current NSF studies are non-experimental and often rely on descriptive analyses. The characteristics of evidence-building activities pursued (say, an impact versus a descriptive study) will vary based on the goals, available time, resources, and data needed. Analysis of current NSF studies revealed that, in FY 2021, most (37 out of 39, or 95 percent) are non-experimental, meaning that they do not seek to establish causal relationships (Exhibit 12). More specifically, among current studies:

- Nearly half are descriptive analyses
- Nearly one third are systematic reviews
- One study is quasi-experimental (to estimate impacts) and two use benchmarking (to contextualize estimates)
- The remaining are correlation analyses and reviews of the literature

Studies use methodologies that are well-aligned with the research questions. Two-thirds of current studies rely solely on either quantitative methods (49 percent) or qualitative methods (18 percent). The remaining third (31 percent) use both qualitative and quantitative methods. (One study is in the design phase and does not yet have a confirmed methodology.) Most importantly, nearly all studies (90 percent) use methodologies that are appropriate and sufficiently rigorous for answering the given questions. For example, an analysis of partnerships seeks to describe the types and prevalence of partnerships in projects and programs across the Foundation. This study appropriately uses a non-experimental approach and a descriptive methodology. Another study is a formative evaluation that seeks to establish participant demographic characteristics and education and workforce outcomes compared to benchmarks of interest. To answer this question, a non-experimental approach with benchmarking is being employed.

Exhibit 12 – Methodologies of evidence-building activities



Source: NSF analysis of its FY 2021 inventory of evidence-building activities

Notes: N=39. One study is in the planning phase and exact methods have not been determined. Percentages do not add to 100 due to rounding.

Nearly half of FY 2021 NSF studies have quality assurance plans in place. The last measure used to assess (potential for) high quality was the existence of documented quality assurance plans, which nearly half of the studies (18 or 46 percent) had. The absence of a quality assurance plan does not necessarily imply that the given effort will not be subjected to quality assurance (this report is illustration of that fact), but does increase the risk that such reviews may be overlooked. This is an area where developing agencywide guidance may help, as suggested by findings of the organizational capacity assessment.

Independence and objectivity

Independence and objectivity are influential factors in deciding whether studies are conducted internally or externally. NSF strives to ensure the credibility and usefulness of its evidence-building activities. To this end, many factors are considered when planning a study. These include availability of staff with relevant expertise and without conflicts of interest; access to data; security and privacy; and available financial resources. In FY 2021, consideration of these factors resulted in a portfolio of studies that are mostly being conducted externally (31 or 79 percent), with close oversight from NSF staff. The remaining evidence-building activities are being conducted internally by staff with appropriate expertise (such as, social scientists, science analysts, or data analytics officers) either in the NSF units interested in the results or in other units that can provide expert support with independence and objectivity.[1] For example, the analysis of partnerships, which requires a deep understanding of NSF data systems, is being conducted internally by staff that are not otherwise involved in NSF's portfolio of partnership projects or programs. In contrast, the evaluation of NSF's agencywide harassment prevention efforts is being conducted externally.

Transparency and reproducibility

About half of current studies have written plans to disseminate findings and data. A commitment to disseminating findings and data (with supporting documentation) to appropriate audiences signals transparency and supports reproducibility. One way to assess this commitment in current studies is to measure whether these studies have written dissemination plans. Such plans state expectations for release, identify target audiences, and provide other relevant information, such as the expected timeline and documentation to be released. These plans are influenced by many factors, particularly privacy and security concerns. About half of the FY 2021 studies (20 or 51 percent) have a written dissemination plan. These include plans to release findings and data externally (3), internally (5), or a combination of both (12 dissemination plans include intended release of some findings internally only and others externally as well) (Exhibit 13). Almost a quarter (9 or 23 percent) of these plans included the production of documents to support reproducibility. The absence of a dissemination plan does not necessarily imply that findings or data will not be released, but it may signal that plans for such release are not being prioritized early on as they may depend on the usefulness of the findings and/or the quality of the data collected. The advent of the learning agenda may help promote the development of dissemination plans, as conversations regarding use and dissemination are taking place in the very early stages of developing learning agenda questions.

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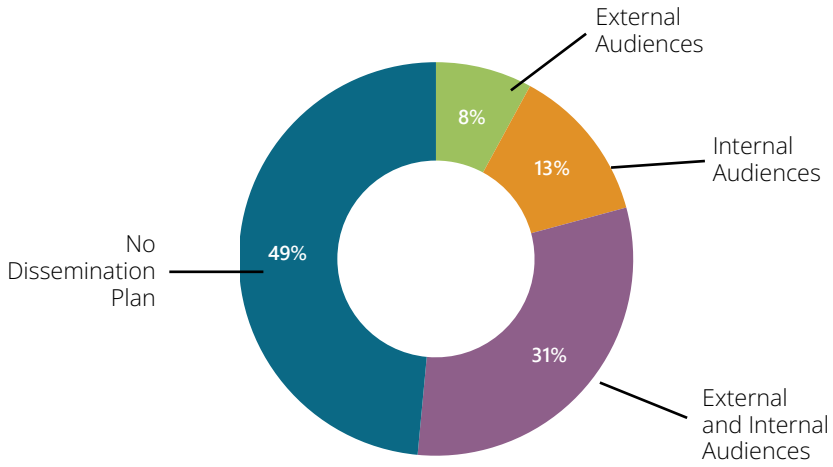
[1] One activity is still in the planning stages.

Exhibit 13 – Target audiences of dissemination plans



Source: NSF analysis of its FY 2021 inventory of evidence-building activities

Note: N=39. The "no dissemination plan" category includes one study that is too nascent to have a plan in place.

Ethics

NSF is complying with an important legislative mechanism to promote the protection of human subjects and reduction of burden on the public (in addition to the utility of data collections). One aspect of ethics that is measurable is compliance with federal laws and regulations, in particular the Paperwork Reduction Act (PRA) which governs many evidence-building activities. More than a third of NSF's FY 2021 evidence-building activities (36 percent) are subject to PRA OMB approval. These either have received OMB clearance for their data collection activities (10 or 26 percent) or have documented plans to submit information collection requests to OMB (4 or 10 percent).

Conclusions

Consistent with the results of the organizational assessment, the analysis of the inventory of NSF's FY 2021 studies demonstrates the Foundation's commitment to evidence-building activities. These activities are designed to meet a wide range of agency needs, from rigorous program evaluations to exploratory policy analysis, and use methods that are well aligned with their research questions. Consequently, they are often and appropriately non-experimental. As NSF leverages the yearly development of learning agendas engaging staff across the agency and external stakeholders, the balance of technical approaches is likely to change, particularly in favor of studies that support causal inferences and include quality assurance and dissemination plans.

Next Steps

Aurora Australis over Amundsen-Scott South Pole Station
Credit: Patrick Cullis; Source: U.S. Antarctic Program photo Library

NSF has begun disseminating the capacity assessment results to staff across the agency, starting with the agency's Leadership Team and the EAC Coordination Group, which is comprised of representatives from every unit at NSF. Based on findings and consultations with leadership and staff, NSF is developing a draft strategy to drive improvements and increase maturity levels over the next few years. This strategy will establish areas of short- versus long-term focus, improvement targets, timelines, and initiatives to close gaps between actual and target maturity levels.

Over FY 2022-FY 2023, NSF will focus on data governance, protections, operations, and personnel. Actions in these areas range from policy development (such as a data quality policy) to guidance (on topics such as non-response bias analysis) to hands-on trainings to upskill staff (such as a tailored training with NSF administrative data to leverage text analytics and external data for monitoring and evaluation). NSF will consider expanding the capacity assessment in FY 2023 to highlight the areas of statistics, evaluation, research and analysis. NSF will also update the improvement strategy for FY 2024-FY 2025. To ensure a successful expansion, the assessment team has documented the methodological approach and, as the final step of this assessment, will be designing the next one.

Appendix A – Requirements Coverage

The table below shows the alignment between the Capacity Assessment requirements of Title I of the Evidence Act and the two components of NSF's Capacity Assessment.

Evidence Act Requirements (9A-D)	Evidence Act Requirements *(4 evidence types & 5 criteria)*	Evaluation Policy Principles	Organizational Capacity Assessment	Activity Capacity Assessment
A list of activities and operations of the agency that are currently being evaluated and analyzed (9)(A)	Statistics			●
	Evaluations			●
	Research			●
	Analysis			●
The extent to which the evaluations, research, and analysis efforts and related activities support the needs of divisions within the agency (9)(B)	Coverage: Relevance		●	●
	Coverage: Utility		●	●
The extent to which the evaluations, research, and analysis efforts and related activities address an appropriate balance of needs for learning and management, performance and strategic management, interagency and private sector coordination, and oversight and accountability (9)(C)	Coverage: Balance of Needs	Relevance & Utility		●
The extent to which the agency uses methods and combinations of methods that are appropriate to agency divisions and the corresponding research questions being addressed (9)(D)	Quality/Methods: Methodological Fit			●
	Quality/Methods: Methodological Rigor	High Quality & Rigor		●
	Quality/Methods: Quality Assurance			●
	Independence and Objectivity	Independence and Objectivity / Transparency and Reproducibility	●	●
	Independence and Objectivity: Reproducibility		●	●
The extent to which evaluation and research capacity is present within the agency to include personnel and agency processes for planning and implementing evaluation activities, disseminating best practices and findings, and incorporating employee views and feedback (9)(E)	Effectiveness: Dissemination	Transparency and Reproducibility	●	●
	Ethics: Research Conduct	Ethics	●	●
	Effectiveness (supply): Evidence		●	
	Builders and Brokers/Translators		●	
	Effectiveness (demand): Evidence Users		●	
	Capacity for Effectiveness: Infrastructure		●	
	Capacity for Effectiveness: Policies, procedures, practices		●	
The extent to which the agency has the capacity to assist agency staff and program offices to develop the capacity to use evaluation research and analysis approaches and data in the day-to-day operations (9)(F)	Capacity for Effectiveness: Culture		●	
	Capacity for Effectiveness: Funding		●	
	Capacity for Effectiveness: Leadership Support		●	

Appendix B – List of Evidence-Building Activities

The list below displays NSF's "statistics, evaluation, research, and analysis" activities ongoing between October 2020 and April 2021, when data collection for this analysis was conducted.

Anti-Harassment Conference Policy Evaluation
Anti-Harassment Term and Condition Study
Assessing LSAMP Two-Year College Activities Through Analysis of National Student Clearinghouse Data
Board on International Scientific Organizations (BISO) Theory of Change
Capacity Assessment Inventory
Convergence Accelerator Participant Surveys
Customer Satisfaction Survey for the NSF Electronic Research Administration Forum
Data Analytic and Assurance Services (Organizational Assessment)
Data Collection and Analytic & Technical Support Services
Directorate for Social, Behavioral and Economic Sciences Office of Multidisciplinary Activities Committee of Visitors
Division of Biological Infrastructure Committee of Visitors
Division of Earth Sciences Committee of Visitors
Division of Human Resource Development Committee of Visitors
Education and Training Application (ETAP)
Evaluating the Sustainability of the NSF Advance Program
Evaluation of Emerging Frontiers in Research and Innovation - Research Experience and Mentoring Program
Evaluation of NSF's Secure and Trustworthy Cyberspace
Evaluation of the Convergence Accelerator
Evaluation Support Services for the NSF INCLUDES Initiative
Exploration of Partnerships
Exploring Convergence Research: An Initial Examination of What It Means and What It Hopes To Accomplish
Geoscience Education and Diversity Programs Committee of Visitors
Graduate Research Fellowship Program Pilot Data Collection
I-Corps: Virtual Training, Evaluation, and Tracking of Program Impact
Intergovernmental Personnel Act (IPA) Program Annual Report
Linking of the SDR To the NSF Grants Database
Marketing/Outreach Survey: NSF SBIR/STTR Program
Merit Review Analyses and Assessment (PI and Reviewer Survey)
Merit Review Report (Funding Rates)
Minority-serving Institutions Report
National Nanotechnology Initiative Program Analysis
NSF Audience Survey
NSF International Research Experiences for Undergraduates: A Comparative Analysis of the IRES and REU Programs

NSF Research Traineeship (NRT) Program

PMIAA Workforce Development

Program-Level Database and Associated Support for Engineering Research Center (ERC) program in ENG/EEC and Nanotechnology Science and Engineering Center (NSEC) Program

Proposal Panel Experiments

Recommendations For Enabling Earth Science Through NSF'S Geophysical Facility—A Portfolio Review of EAR Seismology and Geodesy Instrumentation

Strategic Review of the "Missing Millions"

National Science Foundation

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Iceberg in Rosita Harbor, South Georgia Island
Credit: Kelton W. McMahon, Graduate School of Oceanography, University of Rhode Island