

APRIL 1, 2017 – SEPTEMBER 30, 2017

SEMIANNUAL REPORT TO CONGRESS



NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL
NSF-OIG-SAR-57

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by Congress in 1950 “to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense....” NSF consists of the National Science Board (NSB) and the Director, which establish agency policies and provides oversight of its activities. NSF is vital because it supports basic research and people to create knowledge that transforms the future.

With an annual budget of approximately \$7.5 billion in FY 2017, it is the funding source for approximately 24 percent of all federally supported basic research conducted by America’s colleges and universities. In many fields such as mathematics, computer science, and the social sciences, NSF is the major source of Federal backing.

ABOUT THE OFFICE OF INSPECTOR GENERAL

NSF’s Office of Inspector General (OIG) promotes effectiveness, efficiency, and economy in administering the Foundation’s programs; detects and prevents fraud, waste, and abuse within NSF or by individuals that receive NSF funding; and identifies and helps to resolve cases of research misconduct. OIG was established in 1989, in compliance with the *Inspector General Act of 1978*, as amended. Because the Inspector General reports directly to the NSB and Congress, the Office is organizationally independent from the agency.

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FROM THE INSPECTOR GENERAL

I am pleased to present our semiannual report, which summarizes the work and accomplishments of our office during the second half of fiscal year 2017.

In this report, we focus on the impact of our work on the Foundation and how our findings have inspired action to improve the Foundation's efforts to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense. To meet the President's agenda, the Foundation strives to become more effective and efficient. As it does so, we have become stronger, yet still independent, partners by providing valuable information, insights, and perspectives to improve programs and operations and help NSF accomplish its goals.

We are making a difference. In this report, we lead with our work on NSF's management of large facilities, or major multi-user research facilities — an inherently risky portfolio due to the complex nature of these facilities, the associated high construction and operating costs, and the need to apply equal emphasis on sound business practices and innovative science in the awarding of cooperative agreements for such facilities. By strengthening and augmenting existing policies and procedures in response to recommendations from our office and the National Academy of Public Administration, NSF has improved its oversight over major facilities. The Foundation is now challenged to ensure that those new controls are appropriately and consistently applied.

Beyond our focus on major facilities, much of our work this reporting period addressed the “business” side of NSF. In addition to work in grants administration, we examined whether the Foundation was ready for the relocation to Alexandria, Virginia, identifying some areas needing improvement. NSF completed its move to its new headquarters in early October. We will continue to monitor associated recommendations, such as those related to records management, and monitor post-move activity including completion of an after-action review and the closeout of previous leases.

Also during this period, OIG contractors conducted audits of four NSF awardees that had expended more than \$751 million of NSF funds during the respective audit periods. The audits assessed the reasonableness, allowability, and allocability of costs across all NSF awards at the institutions.

The four audits of all institutions' awards identified, in total, more than \$860,000 of questioned costs. We made recommendations to NSF to recover the questioned amounts from the University of Southern California (\$639,479), Raytheon BBN Technologies (\$96,106), Georgia Tech Research Corporation (\$68,837), and the University of Arizona (\$56,904). We also made recommendations for the awardees to strengthen controls over the areas that led to the questioned costs. The auditors' findings included questioned travel costs, expenses claimed near the end of the award period, questioned subaward charges, and unapproved pre-award costs.

We also continued our efforts focused on the ethical conduct of research during this period. In addition to our ongoing investigations of research misconduct, we released the results of our review of awardees' compliance with training in the responsible conduct of research required by the *America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act of 2007*¹ (America COMPETES Act). The America COMPETES Act requires that each institution submitting a proposal to NSF certify that it has a plan to provide appropriate training and oversight in the ethical conduct of research to all undergraduates, graduate students, and postdoctoral researchers who will be supported by NSF to conduct research. In our review² of a sample of institutional Responsible Conduct of Research (RCR) training plans, issued in July 2017, we answered key compliance questions related to NSF's policy. Among other things, we found that while most of the institutions we sampled complied with NSF's RCR requirements, almost one quarter of the institutions did not initially do so. We also presented observations as to how institutions are responding to this requirement for NSF's consideration, including promising practices or techniques used by some of the institutions we studied that are worthy of being shared with the broader community. We hope that NSF will use this information to strengthen implementation of this important requirement. In response to our report, the NSF Director issued a notice to all institutions reminding the community that institutions must certify to having an RCR plan in place when submitting proposals.

Finally, this year we also highlight not only our work at NSF, but also our work in the Federal audit and investigative communities. As part of our mission to prevent fraud, waste, and abuse, we conduct outreach to build partnerships within the agency and with other Federal agencies, NSF awardees, and the research community. Our efforts in these areas serve to increase knowledge and efficiencies across the various communities, identify cross-cutting issues, and help improve oversight across the Federal government. Our office's early commitment to and involvement with the launch of Oversight.gov, the Federal Inspector General community's new accessible and searchable website, is an example of one such activity, which should dramatically improve the public's access to the OIG community's audit, evaluation, and investigative work.

Our work reflects our sustained commitment to helping NSF be an effective steward of taxpayer dollars and benefits from the support of NSF management and staff from across the Foundation. We look forward to our continued partnership with NSF, the NSB, and Congress to fulfill this goal.

Allison C. Arnes

¹ Pub. L. No. 110-69

² *OIG Review of Institutions' Implementation of NSF's Responsible Conduct of Research Requirements*, OIG Tracking No. PR12030006, July 25, 2017, https://www.nsf.gov/oig/pdf/RCR_MIR_Final_7-25-17.pdf

AUDITS AND REVIEWS

The Office of Audits is responsible for auditing grants, contracts, and cooperative agreements funded by the Foundation. We review agency operations and ensure that financial, administrative, and programmatic aspects of agency operations are conducted economically and efficiently. By providing independent and objective assessments of NSF's program and financial performance, we are committed to improving NSF's business policies and practices to better support NSF in promoting science, mathematics, and engineering research and education.

MANAGEMENT OF MAJOR MULTI-USER RESEARCH FACILITIES

This reporting period, we continued to review NSF's management of its major multi-user research facilities (major facility).³ These major facilities are state-of-the-art infrastructure for research and education and include telescopes, ships, distributed networks, and observatories. We found NSF has improved its oversight of such facilities — and closed recommendations from seven reports related to the management of major facilities⁴ — but that it did not fully comply with all of its new policy and implementing guidance. We also initiated an audit on the Association of Universities for Research in Astronomy's (AURA) indirect cost structure, but did not complete it due to AURA's reorganization, which will result in significant changes to its indirect cost structure.

NSF NEEDS STRONGER CONTROLS OVER BATTELLE MEMORIAL INSTITUTE AWARD FOR THE NATIONAL ECOLOGICAL OBSERVATORY NETWORK

NSF developed five new policy and implementing guidance documents from 2014 to 2016 to address OIG and National Academy of Public Administration recommendations to strengthen controls over its major facility construction projects. We reviewed the Battelle Memorial Institute (BMI) award for managing the National Ecological Observatory Network (NEON) to assess NSF's progress toward putting its new policies into practice.⁵

We found NSF strengthened some controls over the BMI award, such as reviewing the reasonableness of certain proposed costs and retaining a portion of contingency. In addition, NSF reviewed BMI's proposed use of management fee⁶ and incorporated

³ The term "major multi-user research facility," or "major facility," is synonymous with the term "large facility," used previously in our reports. The new terminology better aligns with the *American Innovation and Competitiveness Act* (Pub. L. No. 114-329), signed into law on January 6, 2017.

⁴ OIG Report No. 12-6-001, September 28, 2012; OIG Report No. 16-1-019, August 10, 2016; OIG Report No. 16-1-020, June 16, 2016; OIG Report No. 16-6-003, January 29, 2016; OIG Report No. 16-6-004, January 29, 2016; OIG Report No. 16-6-008, June 16, 2016; OIG Report No. 17-3-004, May 12, 2017

⁵ OIG Report No. 17-3-004, May 12, 2017

⁶ According to NSF Standard Operating Guidance 2015-1, *Negotiation, Award and Payment of Management Fee*, management fee means an amount of money paid to a recipient in excess of a cooperative agreement's or cooperative support agreement's allowable costs.

management fee terms and conditions into the BMI awards, including requiring BMI to report on the use of all management fee expended.

However, NSF did not fully comply with new policy and implementing guidance to strengthen controls. Specifically, NSF awarded funding to BMI before completing the cost proposal review document for the operations award and was still determining the total estimated cost of NEON in the fall of 2016. Without a cost proposal review document prior to the start of the operations award, NSF may provide funding to BMI for costs that are not necessary, reasonable, or allowable. Also, NEON is the first major facility project for which NSF has held management reserve. NSF did not have policies in place to prevent the use of its management reserve⁷ for costs that do not benefit the award. In addition, although prohibited by policy and/or implementing guidance, management fee was based on a percentage of total estimated project cost, was not finalized before work started, and was allowed to be used for charitable contributions.

We made recommendations that NSF strengthen controls over the BMI project and develop procedures to ensure that controls are in place prior to awarding future major facility awards. NSF agreed with all recommendations except for disallowing BMI's use of management fee for charitable contributions.

MANAGEMENT FEE RECOMMENDATIONS CLOSED DURING THIS SEMIANNUAL PERIOD

During this reporting period, we closed 13 recommendations related to management fee from 4 reports issued from 2016 to 2017. For example, in 2016 we issued reports with management fee-related recommendations concerning two NSF awardees, AURA and NEON. We closed the AURA recommendations, including our recommendations that AURA update its management fee policy and report its use of management fee to NSF. We closed management fee recommendations directed towards NEON because leadership of the project transitioned from NEON, Inc. to BMI, which should abate the risk identified in the NEON report.

In our 2016 report on NSF's negotiation, award, and management of management fees awarded to AURA and NEON, we recommended⁸ that NSF revise its management fee policy to require awardees to submit financial information to NSF so it could determine the need for a management fee. NSF disagreed with our recommendation and accepted the risk of not implementing it. Additionally, NSF responded that offering a management fee allows NSF to attract the most qualified organizations to run the Foundation's major facilities. Given this disagreement and the lack of clear government-wide rules with respect to management fees, we closed this recommendation and note our differences here.

⁷ The management reserve, \$3.2 million, is held by NSF to manage risks NSF identified, such as environmental compliance and potential liabilities, as opposed to funds for risks that are held and managed by BMI.

⁸ *National Science Foundation's (NSF) Negotiation, Award, and Management of Management Fees Awarded to AURA and NEON*, OIG Report No. 16-6-008, June 16, 2016

We also closed our recommendation regarding use of management fee for charitable contributions. During our inspection of BMI, we determined NSF allowed the organization to use its management fee to donate to charities. NSF identified in its standard operating guidance a list of items, such as alcohol and lobbying, for which awardees are not allowed to use management fee; at the time, charitable contributions were listed as a prohibited use. We recommended that NSF follow its policy and not allow management fee for charitable contributions. NSF responded that allowing BMI to use its management fee for charitable contributions is consistent with BMI's mission. In July 2017, NSF removed charitable contributions from its list of prohibited uses of management fee. As there are no government-wide rules prohibiting the use of management fee for charitable contributions and NSF has changed its internal policy, we closed our recommendation.

CLOSURE OF THE AUDIT OF AURA'S INDIRECT COST RATE STRUCTURE

OIG staff initiated an audit to determine if AURA's indirect cost structure resulted in an equitable distribution of indirect expenses, complied with applicable Federal regulations, and was appropriate for the organization. During the audit, we learned that AURA is undergoing a reorganization that will result in a significant change to its indirect cost structure.

As of April 2017, AURA had a complicated indirect cost structure comprised of 28 individual rates. According to AURA officials, it designed this structure with the goal of allocating indirect costs in the most accurate way possible. However, the reorganization should also simplify the indirect cost structure and result in a reduction in the number of rates.

We closed the audit due to the material impact that the reorganization will have on the indirect cost structure. Any recommendations related to an indirect cost structure that will be substantially different in the immediate future may not be applicable. Additionally, we did not evaluate the indirect cost structure proposed under the new organizational model because it is still in the planning stages and may change.

However, we did test AURA's application of its indirect cost rates for fiscal years 2015, 2016, and 2017 to ensure the rates were applied properly. AURA accurately applied the correct rates with one exception. In FY 2015, AURA applied a final indirect rate that was still under review by NSF rather than the previously approved provisional rate.

We will continue to monitor the progress of the reorganization to assess and identify any risk areas that may be considered for a future audit.

BUSINESS OPERATIONS MANAGEMENT AND CONTROL ENVIRONMENT

Selecting and funding great science is the agency's primary mission. Effective execution of its financial and administrative operations is critical to NSF's success, as are strong

systems and controls over such functions. Therefore, this reporting period, we continued to look at the “business” side of NSF and its control environment, including its controls to identify and mitigate conflicts of interest for its temporary staff, records management, and preparation for its relocation to its new headquarters building.

NSF COULD STRENGTHEN ITS CONTROLS TO IDENTIFY AND MITIGATE IPA CONFLICTS OF INTEREST

NSF draws scientists, engineers, and educators from academia, industry, or other eligible organizations on rotational assignment to supplement its workforce, many of whom NSF appoints under the *Intergovernmental Personnel Act*⁹ (IPA). Given the significant involvement IPAs have in NSF’s award and oversight processes, we conducted an audit¹⁰ to assess the effectiveness of NSF’s controls for identifying and mitigating conflicts of interest for IPAs agency wide.

We found NSF has implemented certain internal controls to identify and mitigate IPA conflicts of interest. However, some controls could be strengthened, and additional controls may improve NSF’s ability to identify or mitigate IPA conflicts of interest. Specifically, NSF’s information system does not restrict conflicted parties from accessing proposal and award information, and rules on submitting proposals while at NSF are not clear or consistently enforced. In addition, NSF did not always ensure a substitute negotiator was named when negotiating awards with former IPAs or fully track completion of exit briefings for departing IPAs. NSF had also not completed some of the corrective actions it agreed to take in response to a 2015 Management Implication Report from our Office of Investigations, including developing tools to enforce compliance with the timeframes associated with ethics and financial disclosure requirements and making further system enhancements to limit the creation of multiple principal investigator (PI) identification numbers, which could allow the circumvention of certain controls. These actions, if taken, would strengthen controls over IPA conflicts of interest.

We recommended that NSF take corrective actions to strengthen controls over IPA conflicts of interests, including reassessing controls to ensure staff do not have access to awards and proposals for which they are conflicted, ensuring that staff obtain exit interviews, and clarifying and enforcing its rules on the submission of preliminary proposals by current employees and IPAs. NSF agreed with most of our recommendations and proposed corrective actions. NSF also stated that it had completed some actions responsive to the 2015 Management Implication Report, including making system enhancements to address the issue of duplicative PI identification numbers and issuing an Ethics Memo.

⁹ Pub. L. No. 91-648

¹⁰ OIG Report No. 17-2-008, June 8, 2017

NSF COULD STRENGTHEN KEY CONTROLS OVER ELECTRONIC RECORDS MANAGEMENT

We conducted an audit¹¹ to determine whether NSF is compliant with applicable standards for preserving electronic messages as Federal records and if NSF has responded to congressional requests for information. This audit responded to a request from Ranking Member McCaskill and Senator Carper of the U.S. Senate Committee on Homeland Security and Government Affairs.

We determined that NSF has some controls in place for managing certain electronic records but cannot ensure it is complying with Federal requirements and guidance for electronic records management. NSF has developed a policy¹² to permanently preserve select senior officials' email and chat records, but at the time of our audit the U.S. National Archives and Records Administration (NARA) had not yet approved this policy. NSF has issued policies related to the appropriate use of information technology (IT) and social media, but is still exploring solutions to capture work-related text messages, social media posts, and records created on non-government accounts. We also found that NSF addressed the U.S. Government Accountability Office's (GAO) May 2015 records management recommendations.¹³

In addition, NSF has not finalized its guidance related to the use of smartphone applications that support encryption or the automatic deletion of messages for work-related communications, although it informed us that it has been working to complete that guidance since NARA issued its memo on this topic in March 2017. NSF has the capability to monitor the download of smartphone applications on NSF-owned mobile devices, yet it does not actively monitor downloads; instead it provides policies on expected behavior. This weakness allowed some NSF employees to download smartphone applications that support encryption or automatic deletion of messages without consulting the appropriate officials as required.

Finally, we determined that NSF has internal controls for responding to and tracking congressional requests for information. For the period of July 1, 2016, to June 13, 2017, we found no evidence that suggested NSF or NSB officials were asked to delay or withhold responses to congressional requests for information, or that NSF and NSB officials directed or advised NSF or congressional staff that NSF will only provide information to a committee chair.

We made five recommendations to strengthen NSF's compliance with electronic records management. As a result, NSF has agreed to take several actions, including updating its records management training course and requiring all NSF personnel who create, receive, access, or use Federal records to complete initial records management training within 60 days of employment and annual refresher training at least once each fiscal year. NSF has also agreed to implement controls to prevent prohibited

¹¹ OIG Report No. 17-2-009, July 6, 2017

¹² In August 2013, NARA provided agencies with a new records management approach, known as "Capstone," for managing their Federal record emails electronically.

¹³ GAO-15-339, *Additional Actions Are Needed to Meet Requirements of the Managing Government Records Directive*, May 14, 2015

applications from being downloaded onto NSF-issued mobile devices without authorization and to implement quarterly monitoring of applications installed on such devices by March 2018.

NSF NEEDS TO IMPROVE PLANNING FOR RECORDS MANAGEMENT IN LIGHT OF RELOCATION TO ITS NEW HEADQUARTERS

We conducted an inspection¹⁴ to determine if NSF implemented 1) procedures to decrease the amount of paper records moved to its new Alexandria, Virginia, headquarters location; 2) controls in its records management and digitization efforts; and 3) internal controls to ensure the safekeeping of records by departing employees. We also determined if NSF adequately addressed the concerns raised in GAO's May 2015 report on managing government records.

We found that NSF implemented some records management actions to reduce the amount of paper records moved to the new headquarters. NSF hired a new records management official in November 2015, and it has appropriate controls to ensure the safeguarding of information provided to the two contractors for records management and digitization services. In addition, NSF took corrective action to address recommendations in GAO's 2015 report.

Although NSF has made progress to decrease paper records, more work is needed. Because of NSF's delays in providing the contractor documents and the re-scoping of the contract, NSF risks not completing its scanning/digitization project efficiently. Also, because only approximately 36 percent of NSF employees had taken records management training as of August 2017, there is a risk that staff may have inadvertently discarded official records before the relocation. At the time of our fieldwork, NSF's separation clearance form did not address records management; however, in June 2017, NSF revised this form, reducing the risk that departing employees may dispose of official records.

NSF generally agreed with our recommendations and informed us that it plans to continue to update records schedules, inventory and scan paper files, update records management training, and require mandatory annual training for all staff. In response to our recommendation to complete a quality control test on the contractor's scanned files, NSF officials stated that the agency completed a quality control test on the contractor's scanned files in April 2016. However, this testing was limited to one NSF office; therefore, NSF should continue quality control testing to include more files from directorates.

¹⁴ *NSF's Relocation to its New Headquarters Location — Records Management*, OIG Report No. 17-3-003, Sept. 28, 2017

NSF UPDATED ITS INTEGRATED PROJECT SCHEDULE PRIOR TO THE NSF MOVE TO ALEXANDRIA

During this reporting period, we closed recommendations relating to NSF's relocation to Alexandria. Our previous audit¹⁵ identified that NSF had established a baseline relocation schedule as of May 2016 to manage and monitor activities that NSF and several contractors had to complete before the relocation. However, NSF did not include all key information in its May 2016 relocation baseline schedule, and status information in the schedule was not always current because NSF received only monthly updates from the construction contractor instead of weekly or bi-weekly as recommended by GAO.

In response to our recommendations, NSF updated its integrated project schedule in May 2017, but NSF did not update the schedule to include resources needed to complete the activities included in the schedule and did not ask for more frequent schedule updates from the building contractor. Regardless, in early October 2017, NSF completed its move to Alexandria.

OVERSIGHT OF NSF AWARDEES

To fulfill its mission, NSF selects and administers productive investments in research and the Nation's science infrastructure. Grants administration is integral to the Foundation's mission, and, accordingly, what processes and operations we review. This reporting period, OIG contractors conducted audits of NSF awardees that had expended more than \$751 million of NSF funds and identified more than \$860,000 of questioned costs. We also evaluated a pilot program to reduce administrative tasks involving the amount and type of documentation required to support salary and wage charges to Federal awards. In addition, in our desk reviews of 43 audit reports, covering more than \$658 million in NSF direct expenditures, we found that 30 (70 percent) fully met Federal reporting requirements — an improvement since the last reporting period.

AUDITS OF NSF AWARDEES

OIG contractors conducted audits of four NSF awardees that had expended more than \$751 million of NSF funds during the respective audit periods. The audits assessed the reasonableness, allowability, and allocability of costs across all NSF awards at the institutions.

The four audits of all institutions' awards identified, in total, more than \$860,000 of questioned costs. We recommended that NSF recover the questioned amounts from the University of Southern California (\$639,479), Raytheon BBN Technologies (\$96,106), Georgia Tech Research Corporation (\$68,837), and the University of Arizona (\$56,904). We also recommended that the awardees strengthen controls over the areas that led to the questioned costs. The auditors' findings included questioned travel costs, expenses

¹⁵ *Review of NSF's Oversight of its Relocation: Part 3 Baseline Schedule*, OIG Report No. 17-3-002, December 21, 2016

claimed near the end of the award period, questioned subaward charges, and unapproved pre-award costs.

In addition, NSF resolved four grantee audits this period. It sustained the following amounts questioned in the respective audit reports: \$78,728 for the University of California Berkeley (OIG Audit No. 15-1-012); \$134,514 for the University of Wisconsin Madison (OIG Audit No. 15-1-014); \$70,040 for Stanford University (OIG Audit No. 15-1-020); and \$11,214 for Pennsylvania State University (OIG Audit No. 17-1-001).

EVALUATION OF FEDERAL DEMONSTRATION PARTNERSHIP'S PILOT PAYROLL CERTIFICATION PROGRAM FOR COMPLIANCE WITH 2 CFR 200

The Federal Demonstration Partnership established a pilot payroll certification program in 2011. The goal of the pilot was to reduce administrative tasks involving the amount and type of documentation required to support salary and wage charges to Federal awards. Instead of activity-based certifications for each individual at the end of each semester, the pilot program used cost-based certifications for each Federal award on an annual basis. The pilot program was created to comply with the requirements of Office of Management and Budget (OMB) Circular A-21, *Cost Principles for Institutions of Higher Education*.

We previously reported¹⁶ that the pilot payroll certification programs implemented by George Mason University and Michigan Technological University, while generally adhering to OMB Circular A-21 requirements, did not always comply with their documentation policies for payroll transactions for both the current reporting system and the pilot program, and that PIs did not have visibility over payroll charges to other awards. As a result, PIs would not be aware if collectively they were certifying and charging more than 100 percent of an employee's salary to multiple awards. Visibility of full allocations of employees' time could be an important control to help ensure that overcharges and inaccurate charges do not occur.

In response to a request from OMB, we evaluated the pilot programs for compliance with Title 2 U.S. Code of Federal Regulations (CFR) Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* ("Uniform Guidance"). Although the Uniform Guidance was not in effect at the time that we conducted our audits, we reviewed the audit reports and compared the results to its requirements. We found that the recommendations we made in our audit reports are still applicable for programs under the Uniform Guidance. Specifically, designing and implementing proper internal controls throughout the reporting period, as well as making full allocations of employee charges available to each PI with payroll costs charged for the employee, would be useful in assuring payroll charges to Federal awards are accurate.

¹⁶ September 2015 Semiannual Report, pages 10–12

QUALITY OF SINGLE AUDITS SHOWS IMPROVEMENT FROM PRIOR PERIOD

OMB Circular A-133, *Audits of States, Local Governments and Non-Profit Organizations*, and the Uniform Guidance provide audit requirements for state and local governments, colleges and universities, and non-profit organizations receiving Federal awards. Under the guidance, covered entities that expend \$750,000 or more a year in Federal awards must obtain an annual organization-wide audit that includes opinions on the entity's financial statements and compliance with Federal award requirements. Non-federal auditors, such as public accounting firms and state auditors, conduct these single audits. We review the resulting audit reports to ensure that the reports comply with the requirements of OMB Circular A-133, the Uniform Guidance, and Government Auditing Standards.

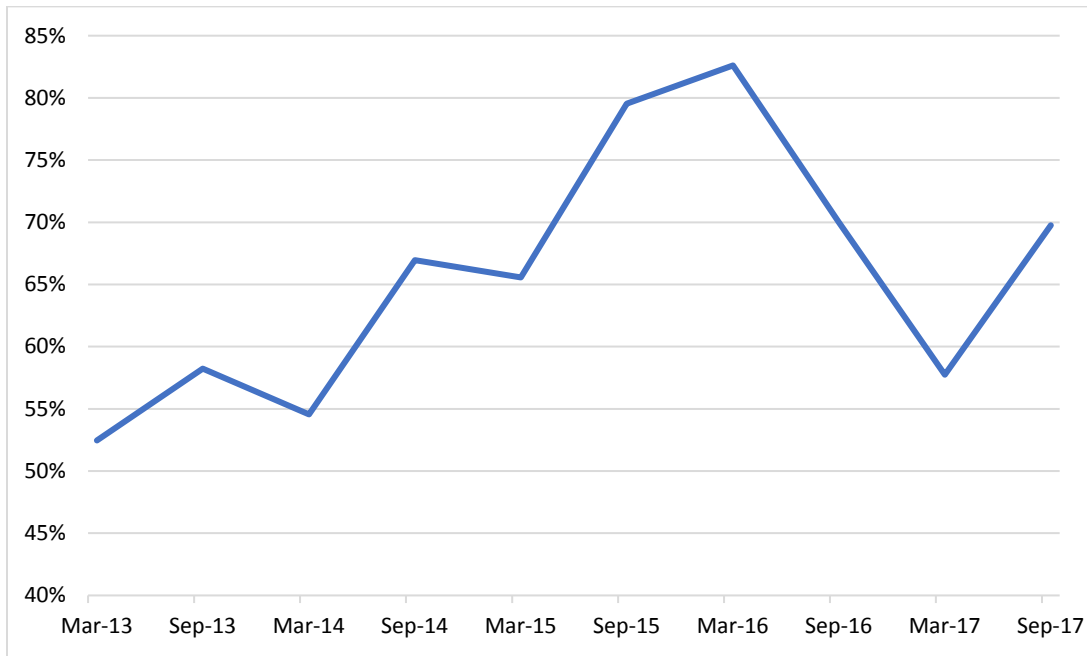
The audit findings in Single Audit Reports are useful to NSF in planning advanced monitoring site visits and other post-award monitoring efforts. Because of the importance of Single Audit Reports to this oversight process, we conduct desk reviews on all reports for which NSF is the cognizant or oversight agency for audit, and provide guidance to awardees and auditors to improve audit quality in future reports. In addition, we return to the awardees reports that are deemed inadequate so the awardees can work with the audit firms to take corrective action.

During the period, we conducted desk reviews of 43 audit reports,¹⁷ covering more than \$658 million in NSF direct expenditures, and found that 30 (70 percent) fully met Federal reporting requirements. The quality issues identified in 13 reports included 6 reports that were not submitted to the Federal Audit Clearinghouse in a timely manner; 4 reports in which the Schedule of Expenditures of Federal Awards did not include required information to allow for identification of awards received from or passed-through to other non-federal entities and/or did not adequately describe the significant accounting policies used to prepare the schedule; and 4 reports that were submitted to the Federal Audit Clearinghouse with an inaccurate Data Collection Form (Form SF-SAC). In addition, two reports included incomplete presentations of the audit findings as well as incomplete Corrective Action Plans to address the audit recommendations, one report failed to accurately identify the major program, and one report failed to include all of the required report elements.

As noted in Figure 1, the percentage of reports that fully met Federal reporting requirements showed marked improvement over the past several periods, rising from 58 percent in the most recent period to 70 percent in the current period. On average, 66 percent of reports fully met Federal reporting requirements over the past 5 years.

¹⁷ The audits were conducted by 30 different independent public accounting firms.

FIGURE 1. PERCENTAGE OF SINGLE AUDITS WITHOUT TIMELINESS OR QUALITY DEFICIENCIES



Source: NSF OIG Semiannual Reports

For those errors that potentially impacted the reliability of the audit reports, we contacted the auditors and awardees, as appropriate, for explanations of each of the potential errors. The auditors and awardees provided adequate explanations and/or additional information to demonstrate compliance with Federal reporting requirements. After we completed our review of the reports, we issued a letter to each auditor and awardee informing them of the results of our review and the specific issues they should work on to improve the quality and reliability of future reports.

INVESTIGATIONS

The Office of Investigations is dedicated to promoting effectiveness and efficiency in NSF programs and operations. We investigate wrongdoing involving organizations or individuals that receive awards from, conduct business with, or work for NSF. We assess the seriousness of misconduct and recommend proportionate action. When possible, we work in partnership with agencies and awardees to resolve issues.

PROGRAM INTEGRITY INVESTIGATIONS

As part of our mission, we investigate allegations concerning misuse of NSF funds, false statements in documents submitted to NSF, and employee misconduct. When we identify a violation of a criminal or civil statute, we refer the matter to the U.S. Department of Justice (DOJ) for criminal prosecution or civil action. When appropriate, we also refer matters to NSF for administrative action, such as award termination and government-wide suspension/debarment.

SBIR COMPANY FOUNDER AND UNIVERSITY PROFESSOR ARRESTED ON CONSPIRACY CHARGE

A university professor who is also the founder of two Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) companies was arrested on a charge that he conspired with others to defraud the Federal Government. The founder was charged by criminal complaint, which alleged the founder and his co-conspirators attempted to defraud NSF by submitting proposals for work previously completed overseas. The founder also submitted false statements and claims to NSF concerning time and effort reporting, the expenditure of award funds, and compliance with award terms and conditions. Shortly before the end of this period, we recommended that NSF suspend the founder and his companies government wide; the agency's decision is pending. This joint investigation is ongoing.

SBIR COMPANY OWNER INDICTED ON WIRE FRAUD AND AGGRAVATED IDENTITY THEFT CHARGES

As a result of a joint investigation, the owner of an SBIR company was indicted on charges of wire fraud and aggravated identity theft for, among other things, submitting proposals that contained endorsements of people without their permission, budgeting funds for subcontractors without their knowledge, and not providing the subcontractors with the budgeted funds. After the indictment, based on our recommendation, NSF suspended the company and its owner government wide, pending the completion of legal proceedings.

NSF FELLOWSHIP RECIPIENT SENTENCED TO 27 MONTHS IN PRISON

As a result of a joint investigation, an NSF Graduate Research Fellowship recipient pled guilty and was sentenced for theft of Federal Government funds related to false

statements on an NSF grant application, wire fraud related to using multiple social security numbers to fraudulently obtain Federal student aid, and passport fraud. The subject pled guilty to three counts, and was sentenced to 27 months of imprisonment followed by 3 years of supervised release. The court also ordered restitution of more than \$500,000, nearly \$140,000 of which will be paid to NSF.

CIVIL COMPLAINT FILED AGAINST SBIR COMPANY AND OWNER FOR FAILING TO MAINTAIN RECORDS

We determined an SBIR company did not maintain award records, as required by NSF policy and the SBIR program. As a result, a civil complaint was filed against the company and its owner alleging, among other things, that the company and owner knowingly failed to maintain records of how the company expended grant funds and falsely certified to NSF that it would maintain such records.

UNIVERSITY IDENTIFIES ACCOUNTING ERRORS AND RETURNS MORE THAN \$2.2 MILLION TO NSF

A university self-reported that it erroneously charged more than \$2.2 million on various NSF awards due to an issue with its accounting procedures. The university determined that salaries for some administrative staff who did not work on NSF awards had inadvertently been charged directly to the awards. Because the university could not readily identify which salary costs were properly related to NSF awards, it decided to return all claimed administrative salary costs from 2005 to 2015. We reviewed the submitted report and concurred with its findings. The university took corrective action and returned more than \$2.2 million to NSF.

NSF WITHHELD FINAL PAYMENTS TO SBIR/STTR COMPANY

In response to our recommendation, NSF withheld the final payments for an STTR Phase I award and an SBIR Phase II award to a company. The company had provided a sample timesheet and its timekeeping policy to NSF during the required Phase II financial capability review. However, the company kept no time and effort records for its PI, who served in that role on both awards. Our investigation is ongoing.

FORMER CEO OF SBIR COMPANY REACHES NEARLY \$30,000 SETTLEMENT AGREEMENT

Our investigation of the former Chief Executive Officer (CEO) of an SBIR awardee company found that the former CEO had taken company funds for his personal use. DOJ declined to pursue the case. The awardee company recouped the stolen funds through its insurance company, so there was no monetary loss to NSF. The former CEO subsequently reached a settlement agreement with the awardee company's insurance company to repay nearly \$30,000 over 5 years.

RECIPIENT OF NSF FUNDS SENTENCED IN FRAUD SCHEME; UNIVERSITY RETURNED NEARLY \$3,000

A man portraying himself as a high school student fraudulently received a stipend from a university through an NSF award to promote math and science in middle schools. Another Federal law enforcement agency determined that he was an adult who committed fraud by receiving financial support to which he was not entitled. He was convicted of these offenses, and the university refunded NSF the amount of the stipend.

SBIR COMPANY AND PRINCIPALS SUSPENDED GOVERNMENT WIDE

Based on our recommendation, NSF suspended an SBIR company, its President, Senior Scientist, and PI government wide. Our investigation found that the company submitted false statements and claims related to the PI's primary employment, violated the SBIR percentage of work requirement, and failed to expend NSF funds in accordance with the approved budget. The joint investigation of the company and its principals is ongoing.

NSF SUSPENDS AWARD TO STTR COMPANY

Based on our recommendation, NSF suspended an award to an STTR company. We based our recommendation in part on evidence that the company misrepresented the employment status of the former PI, in violation of the SBIR/STTR program requirements. Our investigation of the company is ongoing.

NSF EMPLOYEE COUNSELED FOR VIOLATING ETHICAL CONDUCT STANDARDS

We investigated allegations that an NSF employee violated Federal ethics statutes by steering a procurement to an individual with whom she had a financial business relationship. We determined that the employee assisted in selecting the contractor, and, despite routinely seeking conflict of interest guidance from the NSF Office of General Counsel (OGC) on other matters, did not consult with OGC during the procurement of the contractor. We referred the matter to DOJ, which declined to prosecute. We reported the possible violation of the Standards of Ethical Conduct for Employees of the Executive Branch to the employee's supervisor, who formally counseled the employee.

ACTIONS RESULTING FROM PREVIOUSLY REPORTED PROGRAM INTEGRITY INVESTIGATIONS

We previously reported¹⁸ that a former graduate student pled guilty to one count of wire fraud for falsifying portions of a fellowship application, including fabricating a letter of support and forging an associated signature. A Federal court subsequently sentenced the former graduate student to 3 years of probation including 50 hours of community service, and ordered the graduate student to pay nearly \$40,000 in restitution. In this reporting period, based on our recommendation, NSF debarred the former graduate student for 5 years.

¹⁸ September 2016 Semiannual Report, p. 17; March 2017 Semiannual Report, p. 10

As previously reported,¹⁹ a community college returned more than \$490,000 for improperly charged and unsupported costs on two NSF awards. We identified additional unsupported charges totaling more than \$30,000, which the college agreed to return to NSF.

We previously reported²⁰ an employee of another Federal agency improperly applied for and received an NSF award. The employee used his university position as an adjunct professor in violation of his agency's guidance to use only his official government position when seeking Federal awards. By doing so, the employee violated a Federal ethics statute and ignored specific written guidance from agency ethics officials. The university agreed to return nearly \$20,000 and in response to our recommendation, NSF prevented the university from drawing down the remaining award funds, resulting in nearly \$7,000 in funds put to better use. Although DOJ declined to pursue the case, the employee's Federal agency issued him a letter of reprimand for his actions involving the NSF award and will provide additional counselling.

As a result of a joint investigation, a PI and company employee were sentenced to prison and ordered to pay restitution for making false statements to the SBIR program.²¹ In this reporting period, NSF debarred the PI and company for 5 years.

We previously reported the government-wide suspension, termination of awards, civil settlement, and debarment recommendation related to a small business and its principals.²² During this period, NSF reached agreements with the small business and its principals whereby the entities agreed to government-wide voluntary exclusions for 4 years, less time already spent under government-wide suspension.

RESEARCH MISCONDUCT INVESTIGATIONS

Research misconduct damages the scientific enterprise, is a potential misuse of public funds, and undermines the trust of citizens in government-funded research. It is imperative to the integrity of research funded with taxpayer dollars that NSF-funded researchers carry out their projects with the highest ethical standards. For these reasons, pursuing allegations of research misconduct — plagiarism, data fabrication, and data falsification — by NSF-funded researchers continues to be a focus of our investigative work.

NSF takes research misconduct seriously, as do NSF's awardee institutions. During this reporting period, institutions took actions against individuals found to have committed research misconduct, ranging from issuing letters of reprimand to expelling a student from the university. In every case, we recommended that NSF make a finding of

¹⁹ March 2017 Semiannual Report, p. 10

²⁰ March 2017 Semiannual Report, p. 9

²¹ March 2013 Semiannual Report, p. 23; September 2013 Semiannual Report, p. 16; September 2014 Semiannual Report, p. 23; September 2015 Semiannual Report, p. 23; March 2016 Semiannual Report, p. 20; September 2016 Semiannual Report, p. 18

²² September 2015 Semiannual Report, p. 26; March 2016 Semiannual Report, p. 22; September 2016 Semiannual Report, p. 17

research misconduct, issue a letter of reprimand, and require the subject to complete a Responsible Conduct of Research (RCR) training program. We also recommended additional significant actions as summarized below; unless specified, NSF's decisions are pending.

FORMER ASSISTANT PROFESSOR FABRICATES DATA, MISLEADS COLLEAGUES

A co-PI of an NSF grant provided fabricated interview data used in a conference presentation and a manuscript submitted for publication. The data he claimed to have collected were subsequently questioned by his colleagues when he altered quotations. He departed the university and shortly thereafter ceased cooperating with the investigative committee (IC). The IC learned there were multiple occasions in which the co-PI's data were questioned by his colleagues. Those colleagues withdrew publications in which those data appeared. The IC learned the co-PI presented his own graduate student with questionable data, which led to her retracting the paper in which that data appeared and not being able to use that data in her dissertation. The IC unanimously concluded there were multiple occurrences in which the co-PI falsified interview data purportedly resulting from student interviews. Accordingly, the university determined the co-PI committed research misconduct.

We concurred with the university and concluded the co-PI committed research misconduct by exhibiting a pattern of data falsification and lying to his collaborators to avoid taking responsibility for his actions. We recommended NSF debar the co-PI for 5 years; require the co-PI to provide certifications and assurances for 1 year following the debarment; and prohibit the co-PI from serving as a reviewer, advisor, or consultant for 1 year following the end of the debarment.

POSTDOCTORAL FELLOW FABRICATES AND FALSIFIES DATA

An NSF-supported postdoctoral fellow fabricated and falsified data in four publications and three unpublished manuscripts. After denying the allegations during the university's inquiry, the postdoctoral fellow admitted to data fabrication in his response to the inquiry report. Based on an investigation into additional alleged acts of research misconduct, the IC determined that the postdoctoral fellow intentionally engaged in multiple acts of data falsification. The university did not impose any disciplinary or corrective actions because he had already departed the university. Three out of the four publications were, however, retracted.

We concurred with the university's findings. The postdoctoral fellow's acts were intentional and constituted a significant departure from accepted practices of the research community. We recommended that NSF debar him for 5 years. We further recommended that for 5 years after the debarment period, NSF require certifications and assurances; require submission of a detailed data management plan with annual certifications of adherence for any new awards; and bar him from participating as a peer reviewer, advisor, or consultant for NSF.

GRADUATE STUDENT FALSIFIES DATA AND PLAGIARIZES IN MANUSCRIPT PUBLISHED WITHOUT CO-AUTHORS' KNOWLEDGE

A university determined that an NSF-supported graduate student committed data falsification, plagiarism, and other ethical violations in preparing and submitting a manuscript, which two journals published. Specifically, the graduate student submitted the manuscripts without his co-authors' knowledge or consent, copied unattributed text and figures from a dissertation, and reported results he had been told were inaccurate.

During the investigation, the graduate student denied responsibility, asserting that an unprofessional relationship with his advisor caused the events and that his advisor did not correctly train or supervise him. He also said he disagreed with concerns about the data. The university found, based on a preponderance of the evidence, that the graduate student committed multiple acts of plagiarism and data falsification with varying levels of intent ranging from reckless to intentional. It dismissed the graduate student and pursued retraction of the two publications. It also made recommendations to the graduate student's academic department to ensure all students received appropriate training.

We concurred with the university that the graduate student acted intentionally in plagiarizing figures and text from another researcher's dissertation and in falsifying data in the published manuscript, and that the actions represented a significant departure from accepted practices. We also determined the graduate student committed unethical acts in relation to the manuscript's submission and publication; made inaccurate statements during the misconduct process; and never took responsibility for his actions, which we deemed aggravating factors.

We recommended that NSF debar him for 3 years and require he submit certifications and assurances for 3 years following debarment.

GRADUATE STUDENT FALSIFIED DATA IN PUBLISHED PAPER

A graduate student falsified data in a published paper based on NSF-funded research. Researchers from another institution contacted the PI stating the published results were likely falsified. When the PI repeated the same experiments without the graduate student present, the results were radically different. The PI realized that the results reported in the paper were implausible and retracted the paper.

Although the university's IC did not make a finding of research misconduct, the university's deciding official, based on additional review, concluded that the graduate student committed research misconduct by manipulating the instrument used in obtaining the data, thereby falsifying the data. The university subsequently expelled the graduate student.

We concurred with the deciding official's conclusion that the graduate student had manipulated the instrument used to create the falsified data. We recommended that

NSF debar the graduate student for 3 years and require submission of certifications and assurances for 3 years after the debarment.

GRADUATE STUDENT FABRICATES DATA

A graduate student at a university, supported by an NSF Graduate Research Fellowship Program award, fabricated data included in an NSF proposal and in two submitted manuscripts, one of which was accepted for publication. The student admitted to the research misconduct and voluntarily withdrew from the graduate program prior to the university's investigation. The two manuscripts were withdrawn prior to publication. The university's IC determined that the student intentionally fabricated and falsified data, a significant departure from accepted practices of the research community. The university took disciplinary actions, which included recording the research misconduct finding in the student's transcript and sending notifications to the student's previous research mentors. In addition, the grades in the student's graduate research courses were changed to unsatisfactory, and those credits cannot be applied towards a degree.

We concluded that the student's acts of data fabrication were intentional, fit a pattern of research misconduct, and were a significant departure from accepted practices. We recommended that NSF debar him for 3 years. We further recommended that for 3 years after the debarment period, NSF require certifications and assurances; require submission of a detailed data management plan with annual certifications of adherence for any resulting awards; and bar him from participating as a peer reviewer, advisor, or consultant for NSF. NSF proposed a 1-year debarment concurrent with 4 years of the additional requirements and prohibitions as recommended above.

GRADUATE STUDENT FALSIFIES EXPERIMENTS

In NSF-supported research, a graduate student falsely portrayed numerous experimental procedures and falsified data. After attempts failed to replicate the student's data, her mentor retracted two papers. The university investigation concluded that the student falsified 14 figures in the 2 papers. However, the IC felt a lack of physical evidence precluded them from drawing any conclusions on whether the student had falsely portrayed the experiments.

We concurred with most of the university's conclusions; however, we found that the evidence indicated that the student falsely portrayed the experimental procedures. We recommended that NSF debar the graduate student for 5 years and require the graduate student to submit certifications and assurances for 3 years after the debarment.

PI PLAGIARIZED INTO NSF PROPOSAL

We received an allegation that the authors of an NSF proposal (PI and two co-PIs) included plagiarized text in the proposal. We conducted an inquiry and learned the PI was responsible for most of the copied text. We referred an investigation to the university, which concluded the PI plagiarized with a culpable intent, the plagiarism was

a significant departure from accepted practices, and the act constituted research misconduct.

The IC was limited in its recommendations because of inadequacies within the university's research misconduct policy. It recommended training and supervision as corrective actions. The adjudicator concurred with the committee recommendations and made a finding of research misconduct. The adjudicator decided that the university would: 1) within 6 months, require the Subject to complete training in research ethics, to include proper citation and referencing; 2) require for 1 year that the Subject run his documents through iThenticate and submit the reports to the Office of the Vice Chancellor for Research; and 3) require for 1 year that the Subject be prohibited from serving on advisory and peer review committees. The adjudicator also acted to address the shortcomings of the university's policies and ethical training. He directed several offices to develop a revised policy on misconduct in research, directed one of those offices to provide RCR training for all new faculty, and imposed a requirement that all students conducting research complete appropriate RCR training.

We concurred with the university that the PI committed research misconduct. We recommended that for 2 years NSF bar the PI from participating as a peer reviewer, advisor, or consultant for NSF, and require submission of certifications to NSF.

ASSISTANT PROFESSOR ARGUES CITATIONS ALONE ARE SUFFICIENT

An assistant professor plagiarized in three NSF proposals. She claimed that she had not understood the convention of using quotation marks to identify copied text, instead believing copied material required only careful and accurate citation. Her university's IC concluded that she had been ignorant of the use of quotation marks, but pointed out that some copied text had inaccurate citation or no citation at all. They nevertheless concluded no research misconduct occurred.

Our investigation determined that almost all the copied text had insufficient citation. We concluded the assistant professor committed research misconduct and recommended that NSF require the professor to submit certifications and assurances for 1 year and impose a 1-year ban on serving as a reviewer, advisor, or consultant.

DATA FABRICATION LEADS TO NEARLY \$300,000 PUT TO BETTER USE

A university investigation concluded that a former graduate student falsified 16 images in the student's Ph.D. thesis and in resulting publications. The university also concluded that two faculty members, one of them a laboratory director, exercised inadequate supervision over the student's work and publications, and that the laboratory director's laboratory management practices were deficient.

Based on the investigation, the university suspended the laboratory director for a semester, barred her from advising graduate students or applying for grants for 2 years, and imposed training requirements. It also reprimanded the collaborating faculty member and imposed training requirements on him as well.

The university concluded that it could not continue the work on an existing NSF award to the laboratory director due to her inability to advise graduate students, so it requested that her award be terminated. NSF terminated the award, which resulted in nearly \$300,000 of funds put to better use. Our investigation is ongoing.

PI PLAGIARIZED TEXT AND FIGURES IN AN NSF PROPOSAL

A PI on an NSF proposal plagiarized both text and figures into an NSF proposal without providing adequate attribution. The university conducted an investigation that concluded the PI knowingly committed plagiarism and exhibited a pattern of plagiarism. The university required that the PI complete an online RCR course, and required that all PI's external funding proposals be run through plagiarism detection software for 3 years with the results presented to university officials at least 7 calendar days prior to the submission deadline.

We concurred with the university's finding and recommended that NSF require the PI submit certifications and assurances for 1 year and be prohibited from participating as a peer reviewer, advisor, or consultant for NSF for 1 year.

ACTIONS BY NSF MANAGEMENT ON PREVIOUSLY REPORTED RESEARCH MISCONDUCT INVESTIGATIONS

NSF adjudicated on our recommendations from seven research misconduct cases reported in previous Semiannual Reports. Except where noted, each case resulted in NSF making a finding of research misconduct, issuing a letter of reprimand, and requiring RCR training. NSF also took additional significant actions in response to our recommendations, as summarized below.

- In the case of a university associate professor who falsified and fabricated research,²³ NSF initially made a finding of research misconduct and issued a notice of proposed debarment based on our report of investigation. However, the former associate professor appealed the finding and thereafter entered into a settlement with NSF in which he agreed to a voluntary government-wide exclusion. The voluntary exclusion included a prohibition on serving as a reviewer for NSF. The former associate professor also agreed to voluntarily exclude himself, and any companies in which he is a principal owner, from submitting proposals to NSF, and from being listed as senior personnel on any proposals submitted to NSF, until he has completed an RCR course and provided a certificate of course completion to NSF. As part of the settlement, NSF set aside the research misconduct finding.
- In the case of an assistant professor who submitted nine proposals containing both plagiarized text and previously published research,²⁴ NSF debarred the assistant professor government wide. A year later, the assistant professor appealed the

²³ September 2016 Semiannual Report, p. 21

²⁴ September 2016 Semiannual Report, p. 22

finding. NSF denied the appeal, upholding the 2-year debarment; the 4-year requirement for certifications and assurances; and 4-year ban on serving as a reviewer, advisor, or consultant for NSF.

- In the case of a graduate student who falsified data in a conference poster that was also included in an NSF award's Annual Report,²⁵ NSF required for 3 years submission of certifications and assurances and detailed data management plans with annual certifications of adherence. NSF also barred her from serving as an NSF reviewer, advisor, or consultant for 3 years.
- In the case of an assistant professor who submitted an NSF proposal containing copied material in its background/motivation and proposed research sections,²⁶ NSF required that he submit certifications and assurances for 2 years.
- In the case of a university assistant professor who falsified data in an NSF proposal,²⁷ NSF required submission of certifications and assurances for 1 year, as well as the submission of a detailed data management plan for any resulting awards, and barred the assistant professor from serving as an NSF reviewer, advisor, or consultant for 1 year. NSF also required a certification that the assistant professor complied with the university's imposed requirements, which included completion of training courses, oversight by a mentoring committee, and submission of a correction to the journal that published the manuscript with the mislabeled figure.
- In the case of a university faculty member who plagiarized almost an entire seven-page manuscript from two law review articles,²⁸ we recommended that NSF debar the faculty member for 1 year; require that she submit certifications and assurances for 3 years following the debarment period; and bar her from serving as an NSF peer reviewer, advisor, or consultant. We recommended actions because the manuscript's topic was discussed in the proposal, the manuscript itself cited NSF support, and the manuscript was mentioned in a progress report submitted to NSF. The agency determined that the employee's conduct fell outside the jurisdiction of NSF's research misconduct regulation and, therefore, took no action.
- In the case of an assistant professor who submitted an NSF proposal containing copied material in its plan of work section, describing nonstandard experimental procedures and values, and who acknowledged the existence of additional copying in the proposal, as well as copying in two other NSF proposals, NSF required the assistant professor to submit certifications and assurances for 2 years.

²⁵ March 2017 Semiannual Report, p. 12

²⁶ March 2017 Semiannual Report, p. 12

²⁷ September 2016 Semiannual Report, p. 23

²⁸ September 2016 Semiannual Report, p. 22

ADMINISTRATIVE INVESTIGATIONS

Our office investigates a wide variety of allegations that are not pursued as criminal or civil matters or do not meet the strict definition of research misconduct. These cases, which are resolved administratively, include (but are not limited to) misallocation of grant funds, violations of human and animal subject regulations, violations of peer review confidentiality, conflicts of interest, and employee misconduct.

VIRTUAL PANELIST LIVE-TWEETS ABOUT PANEL REVIEW

A panelist participating remotely in NSF's merit review process used her Twitter account to "live-tweet" her observations about the applications, the panel, and the panelists. Even after the program director asked her to stop, the panelist continued to tweet, posting a rationalization justifying her tweeting if NSF objected to her actions. After sending several requests asking the panelist to cease tweeting, to which the panelist was unresponsive, the program director removed the panelist from the panel.

We concluded the panelist's actions violated the confidentiality of NSF's review process. Accordingly, we recommended NSF send the panelist a letter of reprimand notifying her that NSF has made a finding that she violated NSF's rules for panelists; bar the panelist from participating as a peer reviewer, advisor, or consultant for NSF; and take other actions as appropriate to protect the integrity of its review process. NSF acted swiftly to prohibit the panelist from serving as a review, advisor, or consultant for 3 years.

DECLINED SUPPLEMENTS RESULT IN \$48,000 PUT TO BETTER USE

We investigated a PI who requested an institutional transfer of five NSF awards. The PI had used very little of the funds over several years, but reported significant achievements in progress reports and acknowledged support from the awards in publications. The PI had ample funds available but nevertheless requested supplements to three of the awards. We reported the low spending rate to the awards' program officers, who ultimately declined the PI's supplement requests, resulting in \$48,000 of funds put to better use. The investigation into the grant expenditures is ongoing.

OIG REVIEW OF INSTITUTIONS' IMPLEMENTATION OF RESPONSIBLE CONDUCT OF RESEARCH REQUIREMENT

In 2007, President Bush signed into law the *America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act of 2007*²⁹ (America COMPETES Act), which, among other things, directed NSF to introduce a requirement for awardees to provide adequate training for undergraduate students, graduate students, and postdoctoral researchers about RCR. NSF began implementing

²⁹ Pub. L. No. 110-69

the Act in 2010. In 2013, we began a review of how a sample of institutions had implemented their RCR training in response to NSF's requirement.

In July 2017, we issued a report³⁰ to NSF that includes the results of our review and answers key compliance questions related to NSF's policy, such as whether the institutions in our sample had a plan, had designated a person to oversee compliance, and could verify that the necessary people are being trained. We found that while most of the institutions we sampled complied with NSF's RCR requirements, almost one quarter of the institutions did not initially do so. In addition, the institutions we reviewed utilized a wide variety of training approaches and formats. As a result of our findings and observations, we identified opportunities for NSF to strengthen its RCR policy, such as providing written guidelines or templates for universities to follow.

In response to our report, the NSF Director issued a notice reminding the community that institutions must certify to having an RCR plan in place when submitting proposals. The notice emphasized the importance of training and that it is the responsibility of each institution to determine the content of the training.

³⁰ See footnote 2, *supra*.

OUTREACH EFFORTS

Preventing and detecting waste, fraud, and abuse in NSF's programs and operations is central to our mission. Our outreach efforts are essential to building partnerships within the agency and with other Federal agencies, NSF awardees, and research communities, and those relationships enhance our ability to accomplish our mission. They assist us in promoting education on fraud recognition and prevention, proper administration of Federal funds, the ethical conduct of research, and resolving integrity and efficiency matters effectively. We have also enhanced oversight and accountability through activities with the Council of the Inspectors General on Integrity and Efficiency (CIGIE) — focusing on projects to address integrity, economy, and effectiveness issues that transcend individual government agencies. Finally, our office has conducted an audit peer review in accordance with the Comptroller General's government auditing standards.

OIG Leadership and Staff Continue Community Involvement

Oversight.gov, which launched on October 1, 2017, is the Federal Inspector General community's new accessible and searchable repository of reports published for all 67 OIGs that publish public reports. As members of the initiative's steering committee, our office was one of a small group to upload audit, investigative, and semiannual reports to the test website. In addition, our auditors participated in the Federal Audit Executive Council DATA Act³¹ Working Group and its coordination meetings with GAO. The DATA Act was enacted to increase transparency of direct Federal agency expenditures and, among other things, expanded on the required Federal spending information that agencies report. It also requires a series of oversight reports by agencies' OIGs and GAO.

Our Investigations staff also provided support to numerous initiatives within the Federal Inspector General, law enforcement, and research communities. The Assistant Inspector General for Investigations chaired the Council of the Inspectors General on Integrity and Efficiency (CIGIE) Assistant Inspector General for Investigations Committee and co-chaired the SBIR Working Group. OIG's Special Agents and Investigative Attorneys provided grant fraud training to multiple agencies and assisted them in developing SBIR investigative programs, and the Special Agent in Charge planned and executed a leadership workshop for CIGIE Special Agents in Charge, at which more than 30 agencies were represented. Investigative staff also served as guest instructors at numerous training programs conducted by the CIGIE Inspector General Criminal Investigator Academy and Federal Law Enforcement Training Center (FLETC); served on curriculum development and review efforts for the FLETC Investigative Analyst curriculum and the FLETC Grant Fraud curriculum; and were active in the FLETC Law Enforcement Control Tactics Working Group. OIG's investigative scientists continued to engage with the research community, presenting at research integrity

³¹ *Digital Accountability and Transparency Act of 2014* (DATA Act), Pub. L. No. 113-101

meetings sponsored by other government agencies, universities, and professional organizations.

OIG Conducts Audit Peer Review of the OIG for the Board of Governors of the Federal Reserve System and the Consumer Financial Protection Bureau

Audit organizations that perform audits and attestation engagements in accordance with the Comptroller General's Government Auditing Standards (GAS) must have an external peer review performed every 3 years by independent reviewers. Peer reviews focus on quality control, which includes organizational structure and policies and procedures that help ensure compliance with GAS.

During this reporting period, we completed a peer review of the Office of Inspector General's Audit Office for the Board of Governors of the Federal Reserve System and the Consumer Financial Protection Bureau (Board/CFPB) for the year ending March 31, 2017. We determined that the OIG Board/CFPB's system of quality control was suitably designed to provide reasonable assurance that audits were performed and reported in accordance with GAS. Our independent assessment resulted in a *pass* rating. A copy of our peer review report is available on the OIG Board/CFPB's website.³²

³² <https://oig.federalreserve.gov/reports/peer-review-audit-operations.pdf>

MANAGEMENT CHALLENGES FOR NSF IN FY 2018

We published our assessment³³ of NSF's top management and performance challenges and the agency's progress in addressing those challenges as required by the *Reports Consolidation Act of 2000*.³⁴ We compiled this list based on our audit and investigative work; general knowledge of the agency's operations; and evaluative reports of others, including GAO and NSF's various advisory committees, contractors, and staff.

This year's list identifies six areas representing challenges NSF must continue to address to better accomplish its mission:

- Major Multi-User Research Facilities Management
- Business Operations Management
- Management of the *Intergovernmental Personnel Act* Program
- Management of the United States Antarctic Program
- Cybersecurity and Information Technology Management
- Encouraging the Ethical Conduct of Research

This year, we led with challenges faced in managing major facilities. This is not a new challenge, and NSF has improved its oversight over its major facilities over the past few years. NSF is now challenged to implement all of its new controls.

In the business operations challenge, we identified that ensuring that payments are proper at the time they are initiated continues to be a challenge for NSF because grant recipients are generally not required to provide supporting documentation in order to receive payments from the agency. Issues with accountability and transparency are further compounded due to the need for NSF to monitor awardees that "pass through" funds to subrecipients. NSF continues to be challenged to implement controls over the spending of grant funds that ensure transparency and accountability but do not unduly encumber awardees and Federal program officers.

While a core part of the Foundation's business operations, cybersecurity and IT management was highlighted as a standalone challenge area this year. The protection of its information systems against unauthorized access or modification is critical to NSF's ability to carry out its mission. NSF's FY 2016 *Agency Financial Report* contained the first instance of an IT-related significant deficiency in internal control over financial reporting. NSF has taken steps to address the deficiency and should continue to take steps to improve IT controls over financial reporting.

We also removed two challenges identified in previous periods from this year's list. In the past, we had a challenge focused on grants administration, which is integral to the Foundation's mission, and, accordingly, what processes and operations we review. However, due to its broad nature, instead of distinguishing grants administration as its

³³ *Management Challenges for the National Science Foundation in Fiscal Year 2018*, October 12, 2017

³⁴ Pub. L. No. 106-531

own challenge this year, we instead incorporated specific aspects of grant administration where we see issues in more narrowly focused challenge areas. In addition, as NSF completed its relocation to its headquarters in Alexandria, Virginia, in October 2017, we no longer consider NSF's move to a new building as a challenge area and removed it from the list. Although NSF has completed its move, we will continue to monitor associated challenges, such as with records management, which we included as a business operations management challenge.

Most of these challenges are longstanding, and we are encouraged by the actions NSF has taken to address them during this fiscal year. Effective responses to these challenges will help position NSF to ensure the integrity of NSF-funded projects, to spend research funds in the most effective and efficient manner, and to maintain the highest level of accountability over taxpayer dollars.

STATISTICAL DATA

AUDIT DATA

TABLE 1. AUDIT REPORTS ISSUED WITH RECOMMENDATIONS FOR BETTER USE OF FUNDS

		Dollar Value
A.	For which no management decision has been made by the commencement of the reporting period	\$12,029,696
B.	That were issued during the reporting period	\$0
C.	Adjustments related to prior recommendations	\$0
Subtotal of A+B+C		\$12,029,696
D.	For which a management decision was made during the reporting period	\$0
	i: Dollar value of management decisions that were consistent with OIG recommendations	\$0
	ii: Dollar value of recommendations that were not agreed to by management	\$0
E.	For which no management decision had been made by the end of the reporting period	\$12,029,696
F.	For which no management decision was made within 6 months of issuance	\$12,029,696

TABLE 2. AUDIT REPORTS ISSUED WITH QUESTIONED COSTS

		No. of Reports	Questioned Costs	Unsupported Costs
A.	For which no management decision has been made by the commencement of the reporting period	11	\$11,539,509	\$380,411
B.	That were issued during the reporting period	4	\$861,326	\$62,013
C.	Adjustment related to prior recommendations		\$0	\$0
Subtotal of A+B+C		15	\$12,400,835	\$442,424
D.	For which a management decision was made during the reporting period	4	\$4,006,011	\$4,000
	i: Dollar value of disallowed costs	N/A	\$294,496	N/A
	ii: Dollar value of costs not disallowed	N/A	\$3,711,515	N/A
E.	For which no management decision had been made by the end of the reporting period	11	\$8,394,824	\$438,424
F.	For which no management decision was made within 6 months of issuance	7	\$7,533,498	\$376,411

TABLE 3. LIST OF REPORTS: OIG AND IPA-PERFORMED³⁵ REVIEWS³⁶

Report Number	Subject	Questioned Costs	Unsupported Costs	Better Use of Funds
17-1-007	Raytheon BBN Technologies	\$96,106	\$23,861	\$0
17-1-008	Georgia Tech Research Corporation	\$68,837	\$0	\$0
17-1-009	University of Southern California	\$639,479	\$38,152	0
17-1-010	University of Arizona	\$56,904	\$0	\$0
17-2-008	Review of IPA Conflicts of Interest	\$0	\$0	\$0
17-2-009	NSF Controls over Electronic Records Management	\$0	\$0	\$0
17-3-003	NSF Relocation — Records Management	\$0	\$0	\$0
17-3-004	NSF Controls over Battelle Award for NEON	\$0	\$0	\$0
17-3-005	NSF's Compliance with IPERA in FY 16	\$0	\$0	\$0
17-6-001	Closure of the Audit of AURA's Indirect Cost Rate Structure	\$0	\$0	\$0
17-7-001	OIG Peer Review of the OIG Audit Organization for the Board of Governors of the Federal Reserve System and the Consumer Financial Protection Bureau	\$0	\$0	\$0
17-7-002	IQCR of 17-1-020 (UC Davis)	\$0	\$0	\$0
N/A	FDP's Pilot Payroll Certification Program — Compliance with 2 CFR 200	N/A	N/A	N/A
Total		\$861,326	\$62,013	\$0

TABLE 4. REPORTS ISSUED BEFORE 4/3/17 WITH UNIMPLEMENTED RECOMMENDATIONS AS OF 9/30/17 (SUMMARY TABLE)³⁷

Year	Number of Reports with Unimplemented Recommendations	Number of Unimplemented Recommendations	Dollar Value of Aggregate Potential Cost Savings ³⁸
2006	1	2	N/A
2007	2	2	N/A
2009	1	4	\$92,667
2012	1	1	N/A
2013	2	8	\$266,893
2014	2	3	\$11,714,680 ³⁹
2015	4	44	\$204,554
2016	4	47	\$4,713,347
2017	8	52	\$3,135,167 ⁴⁰
Total	25	163	\$20,127,308

³⁵ In Table 3, IPA refers to independent public accounting firm.

³⁶ The Office issued 13 reports this semiannual period.

³⁷ NSF has commented on all reports within 60 days of receipt.

³⁸ Aggregate potential savings are **Questioned Costs** if the recommendations have not been resolved, and **Sustained Costs** if the recommendations have been resolved.

³⁹ The \$11,714,680 (for Report No. 14-1-005) is Funds Put to Better Use (potential cost savings), not Questioned Costs (potential costs that could be returned to the government).

⁴⁰ This total includes \$3,050 of Questioned Costs and \$315,016 of Funds Put to Better Use for Report No. 17-1-004.

TABLE 5. REPORTS ISSUED BEFORE 4/1/17, FOR WHICH NO MANAGEMENT DECISION HAS BEEN MADE BY 9/30/17, INCLUDING THE AGGREGATE POTENTIAL COST SAVINGS OF THOSE RECOMMENDATIONS (DETAILED TABLE)⁴¹

Report No.	Issue Date	Title	Summary	No. of Recs. without Mgmt. Decision	Why Mgmt. Decision Has Not Been Made	Desired Timetable for a Mgmt. Decision	Aggregate Potential Cost Savings
14-1-005	9/30/14	Independent Audit of Association of Universities of Research in Astronomy (AURA) Cost Book Evaluation for the Rebaselined ATST/DKIST Project	Audit of re-baselined proposal for ATST/DKIST telescope	1	NSF is evaluating the results of a recently completed AURA accounting system audit in order to decide whether an estimating system audit is needed.	11/30/17	\$11,714,680 ⁴²
14-3-002	9/30/14	Alert Memo: NSF's Management of Costs Proposed for the Large Synoptic Survey Telescope Construction Project	Assessed the reasonableness and integrity of proposed LSST costs	1	NSF is evaluating the results of a recently completed AURA accounting system audit in order to decide whether an estimating system audit is needed.	11/30/17	N/A
16-1-004	2/11/16	University of Washington	Incurred Cost Audit	14	Complex issues require additional NSF review before management decisions can be finalized.	1/31/18	\$2,003,109
16-1-023	9/26/16	University of Michigan	Incurred Cost Audit	24	Review and revision of draft management decisions led to additional delay.	12/31/17	\$2,710,238
16-3-001	12/10/15	NSF's Oversight of the Large Synoptic Survey Telescope Construction Project	Assessed potential cost and schedule risks to the project	1	Issue complexity – awardee's unfunded liabilities. NSF is continuing to work with OIG and the awardee on resolution.	3/31/18	N/A

⁴¹ This table shows only recommendations that are unimplemented because they are **unresolved**, either because NSF has not provided corrective action plans, or NSF and OIG have not agreed on the adequacy of the proposed corrective actions. Table 4 includes additional reports/recommendations because it includes the reports with unresolved recommendations shown in this table, plus reports with resolved recommendations that have not yet been implemented.

⁴² The \$11,714,680 represents Funds Put to Better Use (potential cost savings), not Questioned Costs (potential costs that could be returned to the government).

Report No.	Issue Date	Title	Summary	No. of Recs. without Mgmt. Decision	Why Mgmt. Decision Has Not Been Made	Desired Timetable for a Mgmt. Decision	Aggregate Potential Cost Savings
17-1-002	2/27/17	University of California Davis	Incurred Cost Audit	9	Resolution of questioned cost transactions for 58 different awards requires additional research and coordination.	3/31/18	\$2,330,503
17-1-003	3/20/17	Purdue University	Incurred Cost Audit	8	Questioned cost transactions and complex issues require additional documentation from the University and research by NSF.	2/28/18	\$91,281
17-1-004	3/23/17	Audit of R/V Oceanus Operations Award	Incurred Cost Audit	3	Highly complex issues related to ship rates require extensive research and coordination within NSF and other Federal agencies.	3/31/18	\$318,066 ⁴³
17-1-005	3/23/17	Scripps Institution of Oceanography, University of California San Diego	Incurred Cost Audit	8	Questioned cost transactions and complex issues require additional documentation from the University and coordination within NSF.	1/31/18	\$111,516
17-1-006	3/29/17	University of California, San Diego	Incurred Cost Audit	10	Questioned cost transactions and complex issues require additional documentation from the University and coordination within NSF.	2/28/18	\$283,801
Total: 10				79			\$19,563,194

⁴³ This includes \$3,050 of Questioned Costs and \$315,016 of Funds Put to Better Use.

INVESTIGATIONS DATA

April 1, 2017 – September 30, 2017

TABLE 6. INVESTIGATIVE ACTIVITIES

Referrals ⁴⁴ to DOJ Criminal Prosecutors	6
Referrals to Criminal State/Local Authorities	0
Indictments/Criminal Informations	2
Arrests	1
Criminal Convictions/Pleas	3
Referrals to DOJ Civil Prosecutors	2
Referrals to Civil State/Local Authorities	0
Civil Settlements/Judgements/Compliance Plans	1
Investigative Reports Issued to NSF Management for Action ⁴⁵	18
Research Misconduct Findings Issued by NSF	6
Government-wide Suspensions/Debarments/ Voluntary Exclusions	17
Administrative Actions taken by NSF ⁴⁶	25
Total Investigative Recoveries ⁴⁷	\$3,219,435.79
Substantiated Whistleblower Retaliation	0
Substantiated Agency Interference	0

TABLE 7. CASE STATISTICS

	Preliminaries	Investigations
Cases Active at Beginning of Period	2	218
Cases Opened this Period	7	38
Cases Closed this Period	6	67
Cases Active at End of Period	3	189

⁴⁴ We count referrals of individuals and entities separately.

⁴⁵ We count only Investigative Reports issued to NSF that include recommendations for administrative action (e.g. findings of Research Misconduct, imposition of Government-wide Suspension or Debarment, or suspension/terminations of awards). We count recommendations for each individual and entity separately.

⁴⁶ This includes sanctions related to findings of Research Misconduct, suspension/termination of awards, or employee misconduct.

⁴⁷ This includes funds returned to NSF, restitution, fees, and Funds Put to Better Use.

RESEARCH MISCONDUCT (RM) STATISTICS

FY 2007 – FY 2017

TABLE 8. ALLEGATIONS AND INVESTIGATIONS

FY	RM Allegations Received ⁴⁸				RM Investigations Opened ⁴⁹			
	P	Fab	Fal	Total ⁵⁰	P	Fab	Fal	Total ⁵¹
2007	82	7	6	95	59	5	0	64
2008	130	6	9	145	97	4	5	106
2009	107	0	11	118	82	0	10	92
2010	87	4	9	100	67	3	2	72
2011	84	17	15	116	57	15	8	80
2012	97	9	8	114	80	7	5	92
2013	84	10	11	105	80	8	10	98
2014	36	7	4	47	34	7	4	45
2015	64	9	9	82	64	9	9	82
2016	35	10	11	56	24	6	9	39
2017	38	1	8	47	27	1	6	34
Totals	844	80	101	1025	671	65	68	804

These tables only provide information about allegations that come to our office’s attention and cases we open. Accordingly, they do not reflect the total universe of research misconduct related to NSF proposals or awards, only a subset.

Note: some of the figures in the allegation and investigation tables differ from the previous Semiannual Report due to a data capture discrepancy that was identified and corrected.

⁴⁸ Key to allegations: P = Plagiarism; Fab = Fabrication; Fal = Falsification. Allegations were made against both funded and declined NSF proposals.

⁴⁹ We define an investigation as any case in which investigative activity occurred, including case activity defined as “Inquiry” in the RM regulation.

⁵⁰ Over the reporting period FY 2007–2017, we used three different methods of capturing allegation data. The periods were: FY 2007 through FY 2012; then FY 2013, when we were granted Statutory Law Enforcement authority, through FY 2015; and finally, FY 2016 onward, when we switched to a new Investigative case management system. For this reason, one cannot make a meaningful comparison or identify trends related to allegations across the entire reporting period. A further limitation on the ability to identify such trends arises from the fact that we ran several proactive assessments looking for plagiarism over the years encompassed in the tables, which inflated the number of plagiarism allegations we had in some years. We ran the last such proactive in 2013, but allegations resulting from it were still being identified in 2014.

⁵¹ There are a small number of allegation involving RM that result in Criminal or Civil investigations. We have not included those allegations in this report.

TABLE 9. INVESTIGATIVE OUTCOMES⁵²

FY ⁵³	Total RM Findings				Included Debarment ⁵⁴
	P	Fab/Fal	Multi ⁵⁵	Total	
2007	11	1	0	12	5
2008	9	2	1	12	5
2009	16	0	1	17	5
2010	9	1	1	11	2
2011	14	3	0	17	5
2012	18	0	0	18	2
2013	13	3	0	16	6
2014	19	5	2	26	7
2015	9	2	0	11	6
2016	11	5	0	16	4
2017	3	8	0	11	3
Totals	132	30	5	167	50

⁵² The outcomes reported in this table cannot be linked to the allegations and investigations by fiscal year, due to the varying amount of time it takes to investigate and adjudicate allegations of RM.

⁵³ These data reflect RM findings by NSF in the fiscal year of the finding.

⁵⁴ The debarment action taken by NSF typically lags NSF's RM finding (debarment is a multi-step process with a separate appeal), but in this display we link the debarment data to the date of the RM finding.

⁵⁵ "Multi" indicates that an allegation of plagiarism and either fabrication or falsification was substantiated in our investigation. NSF makes a single finding of RM, even if we refer multiple allegations to NSF.



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