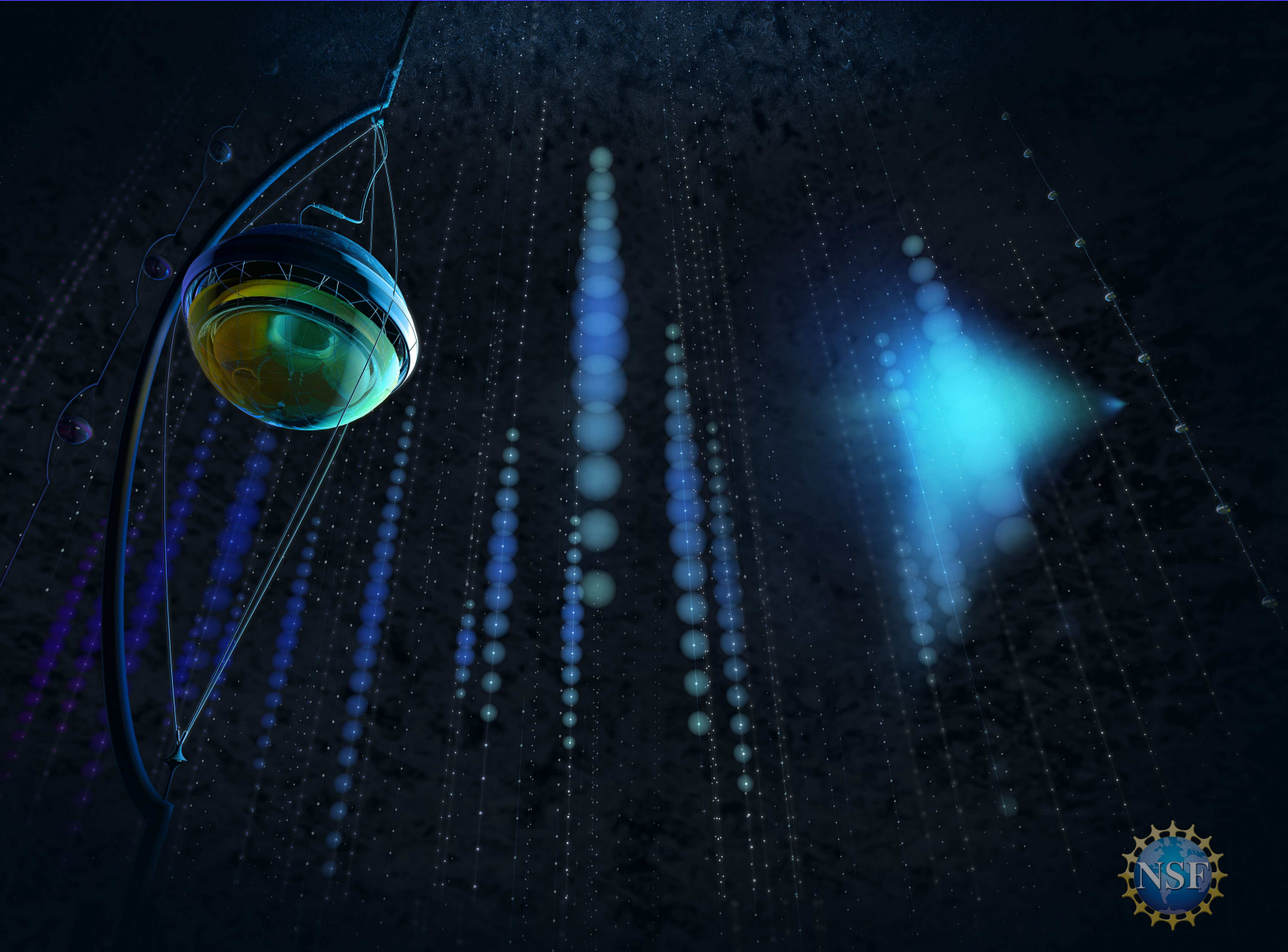


April 1, 2018 – September 30, 2018

Semiannual Report to Congress



National Science Foundation
Office of Inspector General
NSF-OIG-SAR-59

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 leadership has two major components: a director who oversees NSF staff and management responsible for program creation and administration, merit review, planning, budget and day-to-day operations; and a 24-member National Science Board to establish the overall policies of the Foundation.

With a budget of approximately \$7.7 billion (FY 2018), NSF is the funding source for approximately 25 percent of all federally supported basic research conducted by America’s colleges and universities. In FY 2018, NSF supported nearly 386,000 scientists, engineers, educators, and students at universities, laboratories, and field sites throughout the United States and the world.

About the NSF Office of Inspector General

The NSF 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 National Science Board and Congress, the Office is organizationally independent from the Foundation.

Credit:

Front cover and interior footer image: Nicolle R. Fuller/NSF/IceCube — a neutrino interacting with the clear Antarctic ice produces secondary particles.

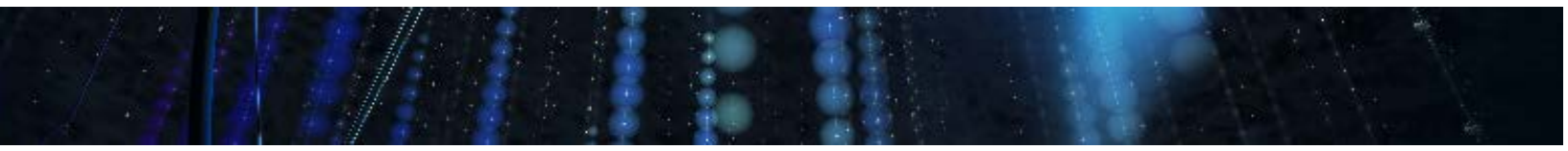


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From the Inspector General

This year marks the 40th anniversary of the Inspector General Act and the 29th anniversary of the creation of our office. Since 1989, we have been part of a community that has grown to 73 statutory Inspectors General who collectively oversee the operations of nearly every aspect of the Federal government. This report, which summarizes the work and accomplishments of our office during the second half of fiscal year 2018, is our 59th semiannual report.

Our work continues to reflect our commitment to helping NSF be an effective steward of taxpayer dollars. For example, during this reporting period our investigations led to the recovery of nearly \$4 million, including funds returned to NSF, restitution, fees, and funds put to better use. Additionally, audits of incurred costs at six universities resulted in questioned costs totaling more than \$908,000.

Equally important, our oversight work promotes effectiveness, efficiency, and integrity in NSF programs and grants. For example, this period, we reported on NSF's oversight of subrecipient monitoring and issued an alert memorandum regarding the Woods Hole Oceanographic Institution's major overhaul stabilization account. We also initiated 15 investigations of alleged research misconduct, defined as plagiarism, fabrication, and falsification.

We appreciate the support of NSF management and staff from across the Foundation and look forward to our continued partnership with NSF, the National Science Board, and Congress to fulfill our mission. We also look forward to continuing our work with the Council of the Inspectors General on Integrity and Efficiency on important issues that cut across our government in the years to come.

Alison Lerner

Audits and Reviews

The Office of Audits is responsible for auditing grants, contracts, and cooperative agreements funded by the Foundation. We also review NSF programs and operations to ensure that financial, administrative, and programmatic aspects of NSF operations are conducted economically and efficiently. By providing independent and objective assessments of NSF's program and financial performance, we help NSF improve its business policies and practices to better support its mission.

Performance Audits

AUDIT OF NSF'S OVERSIGHT OF SUBRECIPIENT MONITORING

As required by the *American Innovation and Competitiveness Act* (Pub. L. No. 114-329), we conducted an audit to determine if NSF's processes for monitoring awardees were sufficient to ensure that pass-through entities (PTEs) monitored subrecipients properly. In most cases, NSF's processes for monitoring grantees were sufficient to ensure that PTEs monitored subrecipients properly. NSF has procedures to help ensure PTEs oversee their subrecipients' compliance under the Uniform Guidance,¹ comply with financial requirements, and maintain award objectives. However, improvements are needed to ensure that recipients of large and complex awards complete subrecipient risk assessments and consistently identify subawards. PTEs of major facilities did not always provide subrecipient budgets and budget justifications when required. NSF was not always able to identify subrecipients on major facility budget proposals because the systems and documents PTEs used to request approval for subawards did not always distinguish requests for contract funding from requests for subaward funding.

Ensuring PTEs complete subrecipient risk assessments and properly identify subawards is critical to help PTEs implement the appropriate level of subrecipient oversight. NSF acknowledged these concerns and is taking steps to strengthen its oversight of PTEs. We recommended NSF continue efforts to update NSF's policies and procedures to ensure they align with the Uniform Guidance; ensure NSF's guidance includes a specific mechanism to verify that PTEs of large and complex awards completed subrecipient risk assessments; and take action to ensure that PTEs clearly identify entities that will receive a subaward. NSF agreed with our recommendations.

Audits of NSF Awardees

SIX AUDITS RESULT IN ABOUT \$908,000 OF QUESTIONED COSTS

OIG contractors completed audits of six NSF awardees that expended more than \$586 million of NSF funds during the respective audit periods. The audits assessed the allowability, allocability, and reasonableness of costs charged to NSF and resulted in about \$908,000 of questioned costs. The auditors recommended that NSF recover the

¹ 2 C.F.R. Pt. 200 *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*

questioned amounts from the University of Montana (\$367,779); Massachusetts Institute of Technology (\$331,114); National Academy of Sciences (\$90,902); University of New Mexico (\$48,842); North Carolina State University (\$49,192); and Tufts University (\$20,461). The auditors also recommended that the awardees strengthen controls over the areas that led to the questioned costs. The findings included questioned equipment, travel, meals, salary, and participant support costs; purchases after the end date of the award; and inappropriately allocated indirect costs.

ONGOING AUDIT OF WOODS HOLE OCEANOGRAPHIC INSTITUTION

We issued a memorandum to alert NSF management of concerns we found during an ongoing audit of research ship expenditures claimed by Woods Hole Oceanographic Institution (Woods Hole). Specifically, we found Woods Hole could not account for more than \$750,000 of NSF funds and associated interest income that should have been available for future ship repair costs. Woods Hole used a single bank account for all Federal and non-Federal payments, leading to loss of accountability for the ship repair reserves. Additionally, Woods Hole's accounting system did not provide for matching of drawdowns of NSF funds to specific expenditures as required by Federal regulations. We were concerned that these issues might compromise Woods Hole's ability to properly oversee the additional \$220 million in funding it will receive from NSF for the management and operations of the Ocean Observatories Initiative.

NSF responded to the concerns raised in our memo. Regarding the accountability for ship repair reserve funds, NSF issued new award conditions that require ship operators like Woods Hole to maintain repair reserves in separate bank accounts. NSF confirmed that Woods Hole established such an account, with an opening balance of more than \$5.9 million, based on Woods Hole's calculation of reserves it should have available. Regarding our concern about matching drawdowns to expenditures, NSF stated that by design Federal funding of ship operations awards is based on application of negotiated daily ship usage rates and not on direct reimbursement for day-to-day expenditures. NSF verified that Woods Hole's requests for NSF funds reconciled with the appropriate daily ship usage rates.

Audit Resolution

Five previous audits of awardees were resolved this period. NSF sustained the following amounts of questioned cost in the respective audit reports: \$218,349 for the University of Michigan;² \$95,882 for Scripps Institution of Oceanography;³ \$187,089 for the University of California-San Diego;⁴ \$74,756 for Raytheon BBN Technologies;⁵ and \$72,784 for Texas A&M Engineering Experiment Station.⁶

² OIG 16-1-023, September 29, 2016

³ OIG 17-1-005, March 23, 2017

⁴ OIG 17-1-006, March 29, 2017

⁵ OIG 17-1-007, September 14, 2017

⁶ OIG 18-1-002, March 28, 2018

In addition, recommendations for one OIG report were closed this period. There were no monetary findings. In the report, *NSF's Oversight of the Large Synoptic Survey Telescope Construction Project*,⁷ we recommended that NSF strengthen its oversight of construction of the telescope project. In response, NSF verified the project's Earned Value Management System; hired a contractor to conduct a cost incurred audit of the Large Synoptic Survey Telescope Construction Project; amended NSF's cooperative agreement to require Federal award documents be in English; and is working with the awardee, the Association of Universities for Research in Astronomy, Inc., (AURA) to address unfunded liability issues. We urge NSF to continue conversations with AURA until all unfunded liabilities are resolved.

Reviews of Single Audits

QUALITY OF SINGLE AUDITS INCREASES SIGNIFICANTLY FROM PRIOR PERIOD

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance)⁸ provides 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 reporting packages to ensure that they comply with the requirements of the Uniform Guidance and applicable Government and non-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 reporting packages for which NSF is the cognizant or oversight agency for audit. A desk review consists of reviewing the audit reporting package, but not the underlying auditors' audit documentation, to determine whether the reporting package meets Uniform Guidance, Generally Accepted Government Auditing Standards (GAGAS), and auditing standards issued by the American Institute of Certified Public Accountants (AICPA). We provide the results of our reviews to awardees and auditors along with guidance to improve audit quality in future reporting packages. In addition, we return to the awardees reporting packages that are deemed inadequate, so the awardees can work with the audit firms to take corrective action.

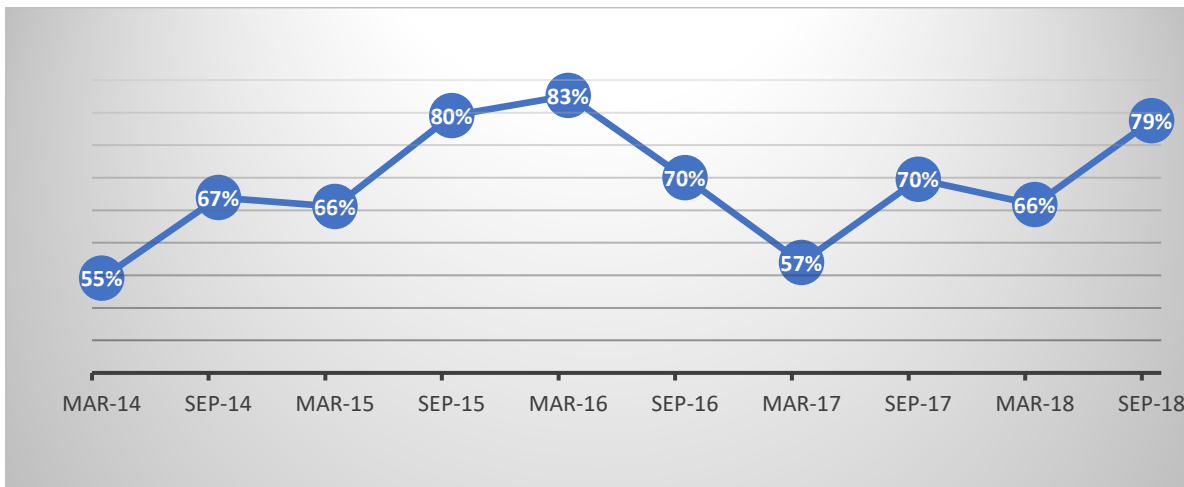
During the period, we conducted desk reviews of 47 audit reporting packages,⁹ in total covering more than \$549 million in NSF direct expenditures. As shown in Figure 1, we found that 37 (79 percent) fully met Federal reporting requirements. This represents a significant increase in quality from the last semiannual period (ending March 31, 2018), when 66 percent of reports fully met Federal reporting requirements, and nears the 5-year high of 83 percent reported for the semiannual period ending March 31, 2016.

⁷ OIG 16-3-001, December 10, 2015

⁸ 2 C.F.R. Pt. 200

⁹ The audits were conducted by 35 different independent public accounting firms.

FIGURE 1. PERCENTAGE OF SINGLE AUDITS THAT MET FEDERAL REPORTING REQUIREMENTS



Source: NSF OIG Semiannual Reports

Regarding the 10 reports (21 percent) this period that did not fully meet Federal reporting requirements, we found that:

- 4 reports were not submitted to the Federal Audit Clearinghouse in a timely manner;
- 4 reporting packages contained the Schedules of Expenditures of Federal Awards that 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;
- 6 reporting packages were submitted to the Federal Audit Clearinghouse with an inaccurate Data Collection Form (Form SF-SAC);
- 2 reporting packages included incomplete Corrective Action Plans to address the audit recommendations; and
- 2 audit reports did not contain all the required report language.

For 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 on which they should work to improve the quality and reliability of future reports. We also provided copies of the letters to each awardee's other Federal funding agencies for their use in monitoring and oversight.

OIG Quality Control Reviews Find Acceptable and Partially-Acceptable Single Audits

Quality Control Reviews (QCR) consist of on-site reviews of auditor documentation in support of Single Audits. QCRs are an important tool for determining whether Single Audits meet government auditing and reporting requirements, and for helping to improve future audit quality. Firms can receive a QCR rating of Pass, Pass with Deficiencies, or Fail. During this period, we issued two reports on our QCRs of three Single Audits for NSF awardees.

REVIEW OF CALIFORNIA INSTITUTE OF TECHNOLOGY

We rated the Single Audit conducted on California Institute of Technology (Caltech) for the year ended September 30, 2016, as Pass. An audit with a QCR rating of Pass is an audit in which the audit documentation contains no quality deficiencies or only minor quality deficiencies that do not require corrective action for the audit under review or future audits. We found nothing to indicate that the firm's planning, performance, and documentation of audit work were inappropriate or unreliable.

REVIEWS OF THE RESEARCH FOUNDATION FOR THE CITY UNIVERSITY OF NEW YORK

We rated the Single Audits conducted on the Research Foundation for the City University of New York (RFCUNY) for the 2 years ended June 30, 2015, and June 30, 2016, as Pass with Deficiencies. An audit with a QCR rating of Pass with Deficiencies is an audit in which the audit documentation contains quality deficiencies that should be corrected in future audits but does not call into question the reliability of the audit under review.

The firm met Uniform Guidance, OMB Circular A-133,¹⁰ GAGAS, and AICPA requirements related to auditor independence, firm-wide system of quality control, continuing professional education, and reporting. In addition, the firm adequately planned, performed, and documented the audit of RFCUNY's financial statements for FY 2016. However, the firm did not fully support its conclusions and opinions related to Federal program requirements in 2015 or 2016. Specifically, the firm did not adequately evaluate the Schedule of Expenditures of Federal Awards. Further, the firm did not adequately evaluate internal controls over several compliance requirements. Finally, the firm did not adequately document the work performed during the audits. As a result, the audit documentation was not sufficient to allow for an experienced auditor with no ties to the audit to understand the work performed and reach the same conclusions as the audit team. We made several recommendations to the firm that would strengthen the quality of its Single Audits. The firm agreed with the recommendations and has implemented firm-wide corrective actions.

¹⁰ OMB Circular A-133, *Audits of States, Local Governments, and Non-Profit Organizations*, was in effect for the FY 2015 audit. It was superseded by Uniform Guidance for the 2016 audit.

Investigations

The Office of Investigations is dedicated to promoting efficiency and effectiveness 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. We work in partnership with agencies and awardees to resolve issues when possible.

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 our investigations to the 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 or debarment.

HUSBAND AND WIFE INDICTED FOR WIRE FRAUD SCHEME

A husband and wife were indicted on one count each of wire fraud for a scheme to defraud NSF of more than \$1 million in Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funds to their company. The indictment alleged the husband and wife used part of the funds for personal expenses, including to pay off the mortgage on their family home, and for the enrichment of themselves or their minor children, who they represented as employees of the company. Based on our recommendation, NSF imposed a Government-wide suspension on the husband and wife, their SBIR/STTR company, and three other associated companies/entities. The investigation is ongoing, and trial is scheduled for March 2019.

SBIR COMPANY SETTLES FOR MORE THAN \$2.5 MILLION

As a result of a multi-agency investigation, an SBIR company entered into a civil settlement with DOJ. As part of the settlement, the company agreed to pay more than \$2.5 million to settle allegations that the company used significantly less qualified employees to perform work it had budgeted for highly qualified individuals, used ineligible third-party contracts to obtain supplemental funding, and included false expenditure information in its project reports. NSF's portion of the settlement was more than \$600,000.

COMPANY AGREES TO PAY ALMOST \$2 MILLION TO SETTLE ALLEGATIONS OF INELIGIBILITY

The joint investigation of a company that received more than \$4.5 million through the SBIR program found that the company's affiliation with a second company violated the

program's eligibility requirements. The two companies were owned by members of the same family, shared management and ownership, operated out of the same facility, and shared administrative resources and employees. Together, the two companies had more than 500 employees, making the companies ineligible to participate in the SBIR program. However, the company certified in its proposals and other submissions that it and its affiliates had fewer than 500 employees and that it was eligible to participate in the program. The company and its principals entered into a civil settlement with DOJ and agreed to pay almost \$2 million to resolve the allegations. NSF's portion of the settlement was almost \$120,000.

UNIVERSITY AGREES TO PAY MORE THAN \$1.7 MILLION TO RESOLVE FALSE CLAIMS ACT ALLEGATIONS

A university agreed to settle allegations that it failed to maintain a time and effort system capable of ensuring that salary costs were charged correctly and appropriately to various grants. This multi-agency investigation determined the university submitted numerous false certifications attesting to its compliance with the terms and conditions of Federal grants, which included specific requirements for documenting time and effort. The university provided documentation that did not reconcile with the amounts reported to several Federal agencies, or with amounts recorded elsewhere in its own internal records. The settlement with DOJ required the university to pay more than \$1.7 million, of which more than \$800,000 was returned to NSF.

UNIVERSITY RESEARCH FOUNDATION SETTLES ALLEGATIONS FOR MORE THAN \$700,000

A university research foundation entered into a civil settlement with DOJ and agreed to pay more than \$700,000 to resolve allegations of misuse of funds in awards from several Federal agencies. The matter originated as a *qui tam* legal proceeding against the research foundation alleging: improper supplemental salary payments to researchers; violation of salary caps; violations of NSF's 2-month summer salary rule; improper charging of administrative salaries; inadequate time and effort compliance; internal cost-sharing noncompliance; and other miscellaneous issues. The investigating agencies requested records pertaining to awards and principal investigators (PI) mentioned in the complaint. As part of the investigation, we identified significant instances of cost shifting of salary and tuition expenditures, improper travel expenditures, and improper supplemental salary payments to researchers on four NSF awards. As a result of the agreement, more than \$440,000 was returned to NSF.

SBIR COMPANY AGREES TO PAY ALMOST \$200,000 TO RESOLVE FALSE CLAIMS ACT ALLEGATIONS

An SBIR company agreed to settle allegations that it failed to disclose and obtain approval for subcontractors the company claimed as working on NSF and U.S. Army SBIR awards. It was also alleged that the company failed to maintain records demonstrating costs were incurred and allocable to the awards. The settlement with DOJ required the company to pay almost \$200,000 to the Government, of which almost \$20,000 was returned to NSF.

SMALL BUSINESS PAYS MORE THAN \$120,000 TO RESOLVE FALSE CLAIMS ACT ALLEGATIONS

A company agreed to settle allegations that it submitted false certifications and statements regarding the primary employment of a PI on an NSF SBIR award. Prior to and during the award, the company certified that the PI was primarily employed at the company. Our investigation determined that at the time of the award, the PI had not received authorization to work in the United States and was thus ineligible to be employed by the company until more than 2 months into the 6-month award. The settlement with DOJ required the company to pay more than \$120,000.

SBIR COMPANY VIOLATED PRIMARY EMPLOYMENT REQUIREMENT

We investigated an allegation that an SBIR company violated the program's primary employment requirements. We determined the company's PI was not employed with the company for the first few weeks of its NSF SBIR award, and when he did start working for the company, he did not meet the SBIR primary employment requirements until the final month of the award. We recommended that NSF permanently withhold the final payment on the award and that it debar the company and the PI for 1 year. NSF's decisions are pending.

UNIVERSITY RETURNS MISCHARGED FUNDS TO NSF

We investigated allegations that a PI was mischarging grant funds on an NSF award. In response to our request for records, the university conducted its own internal investigation. It identified and returned to NSF almost \$150,000 after concluding that participant support expenses and program income had not been managed correctly in its financial system. The university's actions resolved the issues identified in the allegation.

SBIR COMPANY FOUNDER MADE FALSE REPRESENTATIONS TO RECEIVE SBIR AWARDS

We investigated allegations that an SBIR company founder made multiple false representations to obtain an SBIR award. We determined the misrepresentations included the identity of the PI for the award, the author and submitter of the proposal, and the person at the company that was corresponding with NSF. After the award was made, the company founder made additional false representations about a replacement PI. We referred this matter to DOJ, and it was declined for prosecution. Based on our recommendation, NSF had previously suspended the award. During this period, we recommended that NSF permanently withhold the final payment of approximately \$220,000 on the award and that it debar the company and the company founder for 3 years. NSF's decisions are pending.

PI PROHIBITED FROM SERVING AS A REVIEWER, AWARDS SUSPENDED

We determined that a PI who received NSF awards through both a university and an SBIR company submitted false information in proposals and reports. We recommended that

NSF suspend the PI's awards pending the outcome of our investigation; NSF concurred with our recommendation. In addition, we determined that the PI had received duplicate travel reimbursements from NSF and various university awards for attending review panels. The PI also shared panel proposals with others at his home institution in violation of confidentiality policies. NSF agreed with our recommendation to prohibit the PI from serving as an NSF reviewer for 3 years. Our investigation is ongoing.

NSF WITHHOLDS FINAL PAYMENT TO SBIR COMPANY

NSF agreed with our recommendation to withhold a final payment to an SBIR company, which resulted in \$25,000 in funds put to better use. We based our recommendation in part on evidence that the company misrepresented the employment status of its PI and its use of award funds. Our investigation of the company is ongoing.

NSF SUSPENDS AWARD TO SBIR COMPANY

NSF agreed with our recommendation to suspend an award to an SBIR company. We based our recommendation on the identification of financial irregularities indicating funds may have been misused. Our investigation is ongoing.

UNIVERSITY RETURNS NSF FUNDS AND AGREES TO TERMINATE AWARD

Our investigation revealed that a PI took two extended overseas absences during an NSF award, without providing the required advanced notice to NSF. NSF agreed with our recommendation to suspend the award to the university. We also learned that the PI was on unpaid leave from the university but held concurrent employment overseas, the latter of which was not disclosed to NSF. After the award suspension, the university voluntarily agreed to terminate the award, which resulted in the recovery of more than \$200,000 in unspent funds. The university also returned more than \$50,000 in costs incurred from the date of the PI's first extended overseas absence. In addition, the university informed us that the PI is no longer employed at the university. Our investigation is ongoing.

NSF SUSPENDS AWARD TO UNIVERSITY

NSF agreed with our recommendation to suspend a Faculty Early Career Development Program (CAREER) award to a university. We based our recommendation on evidence that the PI left a tenure-track position at the university to take a full-time position at a foreign institution. Our investigation is ongoing.

Actions Resulting from Previously Reported Program Integrity Investigations

COMPANY OWNER AND THREE COMPANIES ENTER GUILTY PLEAS

We previously reported¹¹ the termination of awards made to several companies that claimed their facilities and equipment were in separate, distinct locations in the Midwest,

¹¹ March 2016 Semiannual Report, p. 21

when the companies were sharing a facility and common employees on the West Coast. During this period, the owner of one of the companies pled guilty to wire fraud and three of the companies pled guilty to conspiracy to commit wire fraud. The entities in total paid more than \$1 million in restitution prior to entering their pleas. NSF's portion of the restitution was more than \$800,000. Sentencing is scheduled in December 2018.

SBIR COMPANY PI PLEADS GUILTY TO CONVERSION

We previously reported¹² the indictment of a PI who created a shell company to obtain approximately \$200,000 in supplemental SBIR funding from NSF and NASA. During this period, the PI pled guilty to one count of conversion of Federal funds to personal use. The PI's sentencing is scheduled in November 2018.

COMPANY AGREES TO PAY ALMOST \$250,000 TO SETTLE FALSE CLAIMS ACT LITIGATION

We previously reported¹³ that a civil complaint was filed against an SBIR 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. The company and its owner entered into a civil settlement with DOJ and agreed to pay almost \$250,000 to resolve the allegations.

SBIR COMPANY AND OWNER RECOMMENDED FOR DEBARMENT

We previously reported¹⁴ the criminal plea and sentencing of a company owner who submitted proposals containing endorsements of people without their permission and budgeted funds for subcontractors without their knowledge and without providing them any form of payment. During this period, we recommended that NSF debar the company owner and company for at least 10 years. NSF's decision is pending.

PI RECOMMENDED FOR DEBARMENT

We previously reported¹⁵ the guilty plea of a company belonging to a PI co-conspirator who submitted SBIR grant proposals. During this period, we recommended NSF debar the PI for 3 years. NSF's decision is pending.

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. Pursuing allegations of research misconduct — plagiarism, data fabrication, and data falsification — by NSF-funded researchers continues to be a focus of our investigative work.

¹² March 2016 Semiannual Report, p. 21

¹³ September 2017 Semiannual Report, p. 14

¹⁴ March 2018 Semiannual Report, p. 10

¹⁵ March 2018 Semiannual Report, p. 10

NSF takes research misconduct seriously, as do NSF's awardee institutions. During this reporting period, institutions took actions against individuals who committed research misconduct, including issuing letters of reprimand, suspending without pay, and dismissing a Ph.D. student. For each case described in this section, we recommended that NSF take significant actions against the individuals. Unless otherwise specified, NSF's decisions are pending.

ASSISTANT PROFESSOR WHO PREVIOUSLY COMMITTED RESEARCH MISCONDUCT FALSIFIED DATA

An NSF funded PI falsified data contained in an NSF proposal. The university investigation committee concluded the PI intentionally and recklessly falsified data in one figure and recklessly fabricated data in a second figure. The university made a research misconduct finding against the PI but did not impose any sanctions because the PI resigned and departed the United States.

We accepted the investigation committee's findings regarding the first figure. In a previous OIG case, NSF made a research misconduct finding against the PI regarding the second figure.¹⁶ Therefore, our report did not address the second figure. We concluded that the PI intentionally falsified data for the first figure in an awarded NSF proposal and failed to comply with the certification and assurance requirements imposed by NSF following the previous research misconduct finding. The PI also falsified data records related to the figure in a laboratory member's notebook.

We recommended that NSF make a finding of research misconduct and debar the PI for 5 years. We also recommended that the PI be required to complete training in the responsible conduct of research (RCR). We further recommended that for 10 years from the date of the research misconduct finding, NSF should: require the PI to submit certifications and assurances for documents submitted to NSF; submit a detailed data management plan for proposals, with annual certifications in the case of awards; and bar the PI from participating as an NSF peer reviewer, advisor, or consultant.

GRADUATE STUDENT FALSIFIED DATA IN TWO EXPERIMENTS

A graduate student whose research was supported by an NSF grant falsified data in two experiments, which misrepresented results of her research. Her advisor (and co-PI of the NSF grant) discovered the falsified data and reported it to the university. The university conducted an inquiry, during which the graduate student confessed to purposefully falsifying data in one experiment. The student subsequently left the university and ended all correspondence with the university.

The university concluded the student intentionally falsified and fabricated data in both experiments and committed research misconduct. It expelled her from the university and foreclosed her readmission. It also directed her advisor to retract a conference proceeding and a paper that relied upon her falsified data.

¹⁶ March 2014 Semiannual Report, p. 24

Based on the evidence, we recommended NSF make a finding of research misconduct for falsification and debar the graduate student for 2 years. We also recommended that NSF: require the graduate student to complete an RCR training program within 1 year of NSF's finding; bar the graduate student from participating as an NSF peer reviewer, advisor, or consultant for 5 years; and, for 5 years, require certifications and assurances and require the graduate student to submit a detailed data management plan and to provide annual certifications that this plan is being implemented.

FORMER NSF PROGRAM OFFICER COPIED PART OF DECLINED PROPOSAL INTO HIS OWN

A former NSF program officer (PO) submitted an NSF proposal with portions of text copied from a previously declined NSF proposal for which he had served as the cognizant PO. He denied that he had kept a copy of the declined proposal after leaving NSF but did not offer a plausible explanation for the identical text contained in his proposal. We concluded the preponderance of evidence indicated the former PO knowingly used text from the declined proposal in his own proposal. Further, in his role as PO, the PI abused his NSF position and obtained confidential material, which he later impermissibly used for his own proposal.

We recommended that NSF make a finding of research misconduct, issue a letter of reprimand, require responsible conduct of research training, and debar the former PO for 1 year. We also recommended his letter of reprimand include language addressing breach of PO confidentiality. Finally, we recommended NSF require certifications and assurances for 4 years and bar the PO from serving as an NSF peer reviewer, advisor, consultant, or *Intergovernmental Personnel Act* (IPA) rotator for 4 years.

PI FALSIFIED LETTERS OF SUPPORT AND PLAGIARIZED IN PROPOSALS

A PI plagiarized text in four NSF proposals and submitted falsified support letters from a collaborator with two of those proposals. During the university's investigation, the PI admitted to falsifying the collaborator's letter of support. He also admitted to modifying and reusing two additional letters of support from two other sources without permission. He submitted these falsified letters with two of the proposals. Based on the findings of their investigation, the university suspended the PI for 10 days without pay and required him to complete an online RCR course.

We concurred with the university that the PI included three falsified letters of support with two NSF proposals. As part of our investigation, we conducted an in-depth plagiarism review of the PI's recent NSF proposals and found the PI plagiarized text and one figure in four different proposals. We recommended that NSF make a finding of research misconduct and debar the PI for 1 year. We also recommended NSF bar the PI from participating as an NSF peer reviewer for 3 years and require the PI to submit certifications and assurances with each document submitted to NSF for 3 years.

PI ADMITS AN UNACKNOWLEDGED RESEARCHER WROTE PROPOSAL

We determined that two of a PI's proposals contained inappropriately copied material. The PI told us that the figure from the first proposal was not cited due to a software issue and that an unnamed postdoctoral researcher wrote the second proposal. During the university review, the PI named the postdoctoral researcher, and the review determined that the second proposal contained text that was constrained by its technical nature. It concluded there was insufficient substance to warrant an investigation.

Our investigation confirmed the postdoctoral researcher was not listed as an author of the second proposal. We concluded the PI knowingly committed plagiarism when he submitted the postdoctoral researcher's work as his own without appropriate credit. Based on our conclusions, we recommended that NSF make a finding of research misconduct. We also recommended that NSF require the PI to submit certifications for 1 year and bar the PI from serving as an NSF reviewer, advisor, or consultant for 1 year.

PI PLAGIARIZED INTO NSF PROPOSAL

A university investigation committee concluded the PI committed research misconduct when he plagiarized text into an NSF proposal. The university also concluded the PI and his graduate students engaged in a pattern of self-plagiarism in their published papers. Self-plagiarism is not research misconduct by NSF's definition; however, it can be a questionable research practice. The university delayed the PI's tenure application for 1 year, assigned a faculty mentor to the PI, required him to take a RCR course and, for 3 years, required the PI to submit all proposals and manuscripts to the Office of the Associate Provost for review before submission to an agency or journal.

Based on the evidence, we recommended that NSF make a finding of research misconduct. We also recommended that NSF: require the PI to complete an RCR training program within 1 year; bar the PI from participating as an NSF peer reviewer, advisor, or consultant for NSF for 1 year; and for 1 year, require the PI provide a certification and assurance for each document (proposal, report, *etc.*) to which the PI contributes for submission to NSF.

Actions by NSF Management on Previously Reported Research Misconduct Investigations

Based on our recommendations, NSF adjudicated five 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 Responsible Conduct of Research (RCR) training. NSF also took additional significant actions in response to our recommendations, as summarized below.

- In the case of a PI who copied text into an NSF proposal from a junior scientist's white paper that he received while serving as a PO at another federal agency,¹⁷ NSF

¹⁷ March 2018 Semiannual Report, p. 12

made a finding of research misconduct, which the subject appealed. The agency's final adjudication is pending.

- In the case of a former graduate student who fabricated and falsified data and figures,¹⁸ NSF debarred the former graduate student for 1 year. NSF also required the former graduate student to submit certifications and assurances, and detailed data management plans with annual certifications of adherence, for any proposals or reports to NSF for 4 years. Finally, NSF prohibited the former graduate student from participating as an NSF peer reviewer, advisor, or consultant for 4 years.
- In the case of a PI who plagiarized nearly half of his NSF proposal's 15-page project description,¹⁹ NSF required the PI to submit certifications and assurances and barred him from participating as an NSF peer reviewer, advisor, or consultant for 3 years.
- In the case of a PI who admitted to plagiarizing material in an NSF proposal,²⁰ NSF required the PI to submit certifications and assurances and barred the PI from participating as an NSF peer reviewer, advisor, or consultant, for 3 years.
- In the case of a PI who plagiarized into an NSF proposal,²¹ NSF required the PI to certify compliance with his university's requirements, including notifying NSF of any retractions or corrections pursuant to the university's requirement, and submit contemporaneous certifications and assurances with any submissions to NSF. NSF also and barred the PI from serving as an NSF reviewer, advisor, or consultant for 2 years.

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.

UNIVERSITY RETURNS MORE THAN \$250,000 OF MISALLOCATED GRANT FUNDS

We previously reported²² that four of a PI's grants were terminated or allowed to expire by the institution, after our analysis of his grant spending pattern led NSF to reject the PI's request to transfer the grants to another institution. Our continued investigation into the grant expenditures indicated the PI was spending grants "consecutively," *i.e.*, using one award to support all current research activity under all grants until nearly depleted. The PI's actions resulted in salary and other expenses being charged to the incorrect NSF grants. The university acknowledged these misallocations and repaid more than \$250,000

¹⁸ March 2018 Semiannual Report, p. 12

¹⁹ March 2018 Semiannual Report, p. 13

²⁰ March 2018 Semiannual Report, p. 13

²¹ March 2018 Semiannual Report, pp. 13-14

²² March 2015 Semiannual Report, p. 24

of the mischarged grant funds. The university also implemented internal changes to its administrative systems to better assist research faculty and prevent similar future issues.

POSTDOCTORAL FELLOWSHIP RECIPIENT FAILS TO NOTIFY NSF OF OTHER FELLOWSHIP

A recipient of a highly competitive NSF Postdoctoral Fellowship failed to inform NSF that she was already supported by a Fellowship from her home institution as required. Before receiving the NSF Fellowship, the recipient signed an acknowledgement stating she reviewed the Administrative Guide for the NSF Fellowship program. The Guide clearly states that a recipient of an NSF Fellowship cannot receive more than one Fellowship and cannot be paid for other employment except for teaching a course as part of the recipient's professional training. We recommended that NSF suspend the Fellowship, which it did immediately. This investigation is ongoing.

UNIVERSITY REPAYS MORE THAN \$14,000

We previously reported an investigation involving two universities,²³ in which one university refunded misallocated NSF grant funds. Our investigation of the second university found it had also misallocated NSF award funds to activities unrelated to the award. The second university returned more than \$14,000 to NSF.

²³ March 2018 Semiannual Report, p. 16

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	\$0
B.	Recommendations that were issued during the reporting period	\$0
C.	Adjustments related to prior recommendations	\$0
Subtotal of A+B+C		\$0
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	\$0
F.	For which no management decision was made within 6 months of issuance	\$0

Table 2. Audit Reports Issued with Questioned Costs

		Number of Reports	Questioned Costs	Unsupported Costs
A.	For which no management decision has been made by the commencement of the reporting period	10	\$6,401,538	\$461,164
B.	That were issued during the reporting period	6	\$908,290	\$76,042
C.	Adjustment related to prior recommendations	0	\$0	N/A
Subtotal of A+B+C		16	\$7,309,828	\$537,206
D.	For which a management decision was made during the reporting period	5	\$3,281,716	N/A
	i. Dollar value of disallowed costs	N/A	\$648,860	N/A
	ii: Dollar value of costs not disallowed	N/A	\$2,632,856	N/A
E.	For which no management decision had been made by the end of the reporting period	11	\$4,028,112	\$141,117
F.	For which no management decision was made within 6 months of issuance	5	\$3,119,822	\$65,075

Table 3. Reports Issued (By OIG and independent public accounting firms)

Report Number/Date Issued	Title	Questioned Costs	Unsupported Costs	Better Use of Funds
18-1-003 May 18, 2018	<i>Performance Audit of Incurred Costs—North Carolina State University</i>	\$49,192	\$16,709	\$0
18-1-004 August 22, 2018	<i>Performance Audit of Incurred Costs—University of New Mexico</i>	\$48,842	\$0	\$0
18-1-005 September 6, 2018	<i>Performance Audit of Incurred Costs—National Academy of Sciences</i>	\$90,902	\$54,725	\$0
18-1-006 September 11, 2018	<i>Performance Audit of Incurred Costs—Massachusetts Institute of Technology</i>	\$331,114	\$4,254	\$0
18-1-007 September 27, 2018	<i>Performance Audit of Incurred Costs—University of Montana</i>	\$367,779	\$0	\$0
18-1-008 September 26, 2018	<i>Performance Audit of Incurred Costs—Tufts University</i>	\$20,461	\$354	\$0
18-2-005 June 21, 2018	<i>NSF's Oversight of Subrecipient Monitoring</i>	\$0	\$0	\$0
18-6-001 September 14, 2018	<i>Alert Memorandum Regarding Woods Hole Oceanographic Institution Major and Overhaul Stabilization Account</i>	\$0	\$0	\$0
18-8-001 May 14, 2018	<i>Quality Control Review of KPMG LLP's FYs 2015 and 2016 Single Audits of the Research Foundation of the City University of New York</i>	\$0	\$0	\$0
18-8-002 May 14, 2018	<i>Quality Control Review of Pricewaterhouse Coopers LLP's FY 2016 Single Audit of the California Institute of Technology</i>	\$0	\$0	\$0
N/A April 30, 2018	IPERA Compliance Letter to Congress	\$0	\$0	\$0
Total		\$908,290	\$76,042	\$0

Table 4. Reports Issued before April 1, 2018²⁴ with Unimplemented Recommendations as of September 30, 2018 (Summary Table)

Year	Number of Reports with Unimplemented Recommendations	Number of Unimplemented Recommendations	Dollar Value of Aggregate Potential Cost Savings²⁵
2006	1	2	N/A
2007	2	2	N/A
2012	1	1	N/A
2015	1	1	N/A
2016	3	46	\$2,221,458
2017	10	63	\$1,070,635
2018	3	33	\$401,833
Total	21	148	\$3,693,926

²⁴ NSF has commented on all reports within 60 days of receipt.

²⁵ Aggregate potential savings are “questioned costs” if the recommendations have not been resolved, and “sustained costs” if the recommendations have been resolved.

Table 5. Reports Issued before April 1, 2018, for Which No Management Decision Has Been Made by September 30, 2018, Including the Aggregate Potential Cost Savings of Those Recommendations (Detailed Table)²⁶

Report No.	Issued	Title	Summary	No. of Recs without Mgmt. Decision	Why Mgmt. Decision Has Not Been Made	Desired Time-table for Mgmt. Decision	Aggregate Potential Cost Savings
16-1-004	2/11/16	University of Washington	Incurring Cost Audit	14	Resolution further delayed due to number and complexity of individual transactions requiring review and verification.	3/31/19	\$2,003,109
17-1-003	3/20/17	Purdue University	Incurring Cost Audit	8	Questioned cost transactions and complex issues require additional documentation from the University and coordination within NSF.	3/31/19	\$91,281
17-1-009	9/29/17	University of Southern California	Incurring Cost Audit	15	Draft management decisions require additional review and revision.	10/5/18	\$639,479
17-1-010	9/28/17 ²⁷	University of Arizona	Incurring Cost Audit	11	Draft management decisions require additional review and revision.	12/31/18	\$56,904
18-1-001	10/19/17	University of Kansas Center for Research	Incurring Cost Audit	13	Draft management decisions require additional review and revision.	10/10/18	\$329,049
Total				61			\$3,119,822

²⁶ 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.

²⁷ Report was revised and reissued 10/3/17.

Investigations Data

April 1, 2018 – September 30, 2018

Table 6. Investigative Case Activities

Referrals ²⁸ to DOJ Criminal Prosecutors	4
Referrals to Criminal State/Local Authorities	1
Indictments/Criminal Information	2
Arrests	0
Criminal Convictions/Pleas	5
<hr/>	
Referrals to DOJ Civil Prosecutors	1
Referrals to Civil State/Local Authorities	0
Civil Settlements/Judgements/Compliance Plans	10
<hr/>	
Investigative Reports Issued to NSF Management for Action ²⁹	30
Research Misconduct Findings Issued by NSF	5
Government-wide Suspensions/Debarments/ Voluntary Exclusions	7
Administrative Actions taken by NSF ³⁰	31
<hr/>	
Total Investigative Recoveries ³¹	\$3,950,126 ³²
<hr/>	
Substantiated Whistleblower Retaliation	0
Substantiated Agency Interference	0

²⁸ We count referrals of individuals and entities separately.

²⁹ 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.

³⁰ This includes sanctions related to findings of Research Misconduct, suspension/termination of awards or employee misconduct.

³¹ This includes funds returned to NSF, restitution, fees, and funds put to better use.

³² This total includes previously unreported recoveries of slightly more than \$20,000.

Research Misconduct (RM) Statistics FY 2009 – FY 2018

Table 7. Allegations

FY	RM Allegations Received (Including allegations made against both funded and declined NSF proposals.)			
	Plagiarism	Fabrication	Falsification	Total ³³
2009	108	0	11	119
2010	90	4	10	104
2011	85	17	15	117
2012	94	9	8	111
2013	80	10	12	102
2014	38	7	5	50
2015	67	11	12	90
2016	35	10	11	56
2017	38	1	8	47
2018	38	4	3	45
Totals	673	73	95	841

Table 8. Investigations

FY	RM Allegations Investigated (Including case activity defined as "Inquiry" in the RM regulation.)			
	Plagiarism	Fabrication	Falsification	Total ³⁴
2009	83	0	10	93
2010	70	3	3	76
2011	58	15	8	81
2012	78	7	5	90
2013	76	8	11	95
2014	36	7	5	48
2015	67	11	12	90
2016	24	6	9	39
2017	27	1	6	34
2018	32	3	2	37
Totals	551	61	71	683

³³ We used three different methods of capturing allegation data from FY 2009–2018, thus trends cannot be identified across the entire reporting period. The periods were: 1) FY 2009 through FY 2012; 2) FY 2013, when we were granted Statutory Law Enforcement authority, through FY 2015; and 3) FY 2016, when we implemented a new investigative case management system, to date. We also conducted 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 conducted the last proactive assessment in 2013, but allegations resulting from it were still being identified in 2014.

³⁴ A small number of allegations involving RM result in criminal or civil investigations; we have not included those allegations in this report.

Note: Tables 7 and 8 only provide information about allegations that come to our office's attention and those we investigate. Thus, they may not reflect the total universe of research misconduct related to NSF proposals or awards. Some of the figures in the tables may differ from previous semiannual reports due to additional allegations being identified during an investigation.

Table 9. Investigative Outcomes³⁵

FY ³⁶	Total RM Findings				Included Debarment ³⁷
	Plagiarism	Fabrication/ Falsification	Multi ³⁸	Total	
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	10	2	0	12	6
2016	12	5	0	16	4
2017	5	8	0	13	5
2018	7	5	2	14	6
Totals	123	32	6	161	48

³⁵ 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.

³⁶ These data reflect RM findings by NSF in the fiscal year of the finding.

³⁷ 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.

³⁸ "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 them.

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