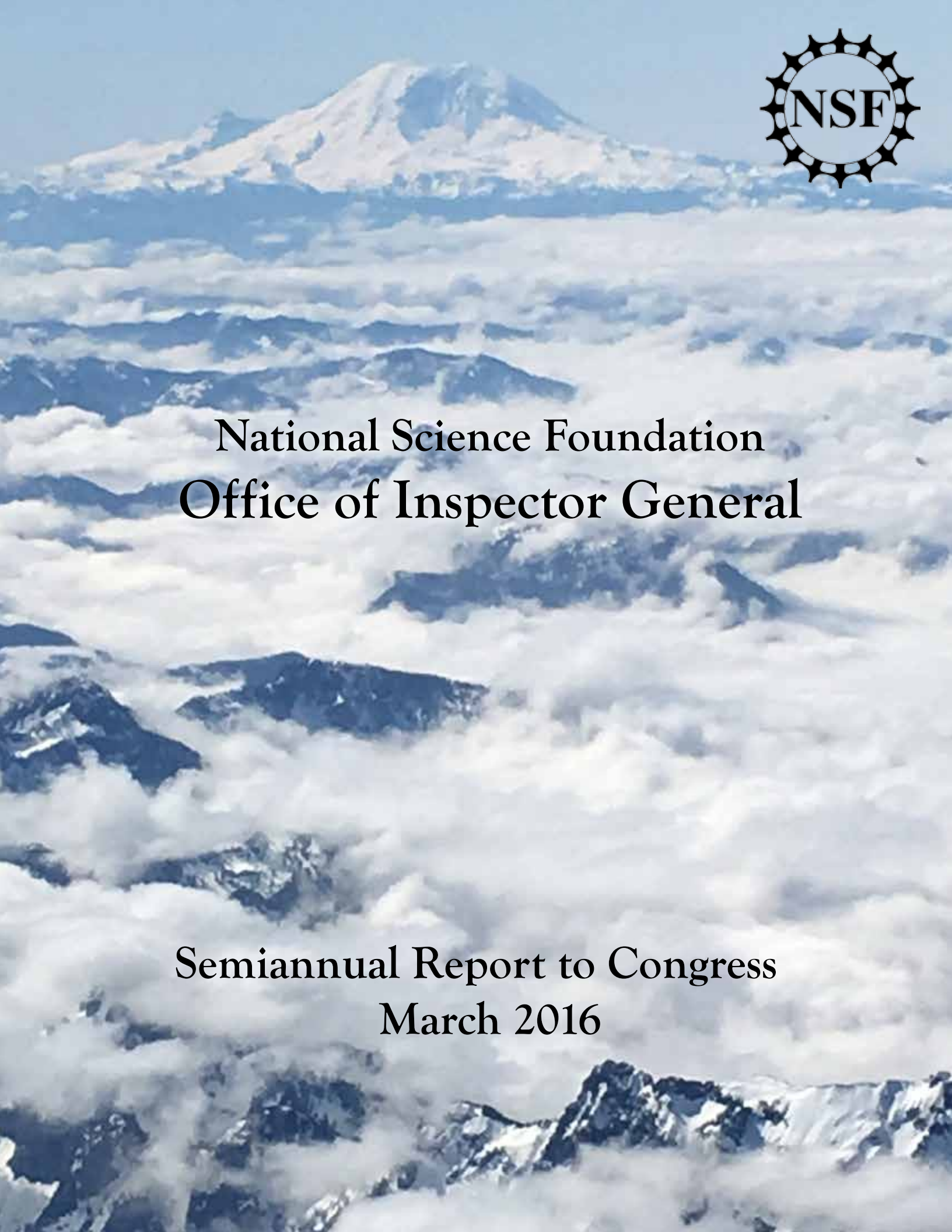

National Science Foundation
Office of Inspector General

Semiannual Report to Congress
March 2016

About the National Science Foundation...

The National Science Foundation (NSF) is charged with supporting and strengthening all research disciplines, and providing leadership across the broad and expanding frontiers of science and engineering knowledge. It is governed by the National Science Board which sets agency policies and provides oversight of its activities.

NSF invests approximately $7 billion per year in a portfolio of more than 50,000 research and education projects in science and engineering, and is responsible for the establishment of an information base for science and engineering appropriate for development of national and international policy. Over time other responsibilities have been added including fostering and supporting the development and use of computers and other scientific methods and technologies; providing Antarctic research, facilities and logistic support; and addressing issues of equal opportunity in science and engineering.

And the Office of Inspector General...

NSF's Office of Inspector General promotes economy, efficiency, and effectiveness in administering the Foundation's programs; detects and prevents fraud, waste, and abuse within the 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 agency.

Front cover photograph taken by Cynthia M. Davis from a airplane window while flying from Spokane to Seattle, Washington. Mt. Rainier is the white cap in the background, and the dark rocks below the clouds are the Cascade Mountain range.

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FROM THE INSPECTOR GENERAL

This Semiannual Report to Congress highlights the activities of the National Science Foundation (NSF) Office of Inspector General for the six month period ending March 31, 2016. During this reporting period, 32 audit reports and reviews were issued, four of which questioned $4 million. Our investigative staff closed 57 administrative and criminal/civil investigations, had seven research misconduct cases result in findings by NSF, and recovered $6.9 million for the government.

During this reporting period, my office's examination of NSF's oversight and management of the $344 million Daniel K. Inouye Solar Telescope project and the $473 million Large Synoptic Solar Telescope project identified cost and schedule risks that could lead to cost overruns and potentially to de-scoping that could limit the scientific benefits of these projects. These findings added to our extensive body of work spanning more than five years related to NSF's use and management of cooperative agreements for its high-dollar, high-risk research facilities.

I also testified in February at the request of the House Science, Space, and Technology Committee about the OIG's views on the report by the National Academy of Public Administration (NAPA) on NSF's use of cooperative agreements to support large scale investment in research. I commend the NSF Director and the Chair of the National Science Board's Audit and Oversight Committee for commissioning this report, which identified practices at other federal agencies that NSF could emulate. The report set forth practical recommendations, which if implemented, will significantly improve NSF's ability to ensure accountability over these high-dollar, high-risk projects. I wholeheartedly support the NAPA report recommendations, which reinforced many of OIG's recommendations, and, in some instances, endorsed more stringent measures.

At the very start of its report, the NAPA panel articulated the fundamental challenge that NSF is currently grappling with:

> It is clear that, in the past, NSF has prioritized the innovative scientific aspects of large facility construction projects; the agency now needs to apply equal emphasis on increased internal management of the business practices critical to enhanced oversight and project success. In doing so, the Panel believes that NSF and NSB will enhance the agency's ability to fulfill its mission of supporting groundbreaking science.

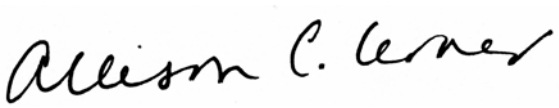
OIG concurs with this conclusion. NSF's swift and decisive implementation of the NAPA report's recommendations will have a significant, positive impact on the Foundation's ability to manage and oversee these high-risk, high-dollar projects.

With respect to other audit work during the past six months, our follow-up audit of the costs of NSF's use of personnel under the Intergovernmental Personnel Act (IPA) found that both the number of executive level IPAs and the costs associated with their tenure at NSF had increased since our 2013 audit of costs of assignees under the Intergovernmental Personnel Act. NSF paid $2.4 million more for salary, fringe benefits, lost consulting, and per diem for such personnel in 2015 than in 2012.

Our investigative work continues to reap significant financial recoveries, which totaled nearly $7 million in the past six months alone, and to aggressively pursue individuals and entities that seek to fraudulently obtain funds intended to advance scientific research. In this period, a research foundation returned over $330,000 to resolve allegations of misuse of funds in two NSF awards. In another case, a company owner paid $250,000 to resolve False Claim Act violations related to funding that the company received from NSF and NASA through the Small Business Innovation Research program.

Pursuing allegations of research misconduct (plagiarism, data fabrication, and data falsification) by NSF-funded researchers continues to be a focus of our investigative work, and in the past six months, NSF's actions in response to our research misconduct cases ranged from letters of reprimand to a proposed three-year debarment.

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



REPORT HIGHLIGHTS

Our examination of NSF's oversight and management of the $344 million Daniel K. Inouye Solar Telescope project and the $473 million Large Synoptic Solar Telescope project identified cost and schedule risks that could lead to cost overruns and de-scoping that could limit the scientific benefits of these projects. Among other things, we found that NSF lacked assurance that proposed costs for these projects were reasonable; that the Earned Value Management (EVM) system for the projects had not been certified; and that the accuracy of data reported in the EVM system had not been validated.

Our follow up review to assess NSF's progress toward reducing the costs of staff under the Intergovernmental Personnel (IPA) Act found that both the number and the cost of executive level IPAs had increased since 2012. NSF had 29 percent more executive level IPAs in 2015 than in 2012, costing nearly $2.4 million more. In 2015, NSF paid nearly $8.9 million for salary, fringe benefits, lost consulting, and per diem for 27 executive level IPAs in 2015. In 2012, NSF paid $6.5 million for the same expenses for 21 executive level IPAs.

Our investigations of fraud in the Small Business Innovation Research (SBIR) program continue to yield significant results including cases in which a PI was ordered to pay $100,000 in restitution for making false statements; a PI was indicted for wire fraud after creating shell companies to receive SBIR funding; and a company owner agreed to a civil settlement of $250,000.

The Foundation took administrative action to address our research misconduct recommendations including debarring a professor who submitting multiple proposals that contained plagiarism, debarring a PI who plagiarized material from a colleague's declined proposal into her own NSF proposal, and debarring a post-doctoral scholar who falsified NSF funded research data in a manuscript submitted to a journal.

Cost and Schedule Risks to the Daniel K. Inouye Solar Telescope Project

The Daniel K. Inouye Solar Telescope (DKIST) project was first approved by the National Science Board in 2009 at a cost of $298 million. In August 2013, the project cost was re-baselined to $344 million and the award expiration date was extended from December 2017 to July 2019. Our examination of NSF's oversight of DKIST revealed issues that pose cost and schedule risks, including lack of an independent cost estimate and limited information to support project expenditures.

It is essential for cost information for proposed budgets for large facility projects to be accurate, current, and adequately supported to ensure that costs to government are reasonable and allowable. With the DKIST project, neither the original cost proposal nor the re-baselined cost proposal could be audited, and an independent cost estimate has not been obtained. As a result, NSF lacks assurance that DKIST proposed costs are reasonable.

Instead of conducting an independent cost estimate, the NSF Grants Officer completed a reasonableness review in May 2014, after the award had been updated with the estimated $344 million of total project cost as a result of the re-baselined budget. A reasonableness review is one of the eight types of independent cost reviews described in the GAO Cost Estimating and Assessment Guide. It is noteworthy, however, that the most rigorous independent review is an independent cost estimate.

Unlike an independent cost estimate, a reasonableness review addresses only a project's high-value, high-risk elements and can simply pass through estimated values for the other costs. The reasonableness review sampled $55 million, or 16 percent of total project costs, and made 31 recommendations related to documentation to support certain materials costs and support in the cost book with respect to escalation costs, among other things. As of January 2016, 29 of the 31 recommendations from the reasonableness review remained open.

We also found that NSF lacks a specific plan to address the potential impact of low-probability, high-impact delays stemming from pending court decisions on permitting, which have increased the cost of the project in the past. As early as the preliminary design phase and before construction had started, NSF was aware of the risk of permitting delays for this project. In November 2006, NSF received the project's preliminary design review report which recommended that NSF develop a risk response plan to address a permitting delay. As part of this review, we requested a copy of the plan, but NSF was unable to provide it to us.

Developing, implementing, and maintaining important project documents is a basic element of sound project management, and it is troubling that NSF was unable to produce a critical document. Given that NSF knew about the likelihood of permitting delays, it makes sense for the agency to have developed a plan to mitigate costs.

We also found that improved information about the indirect cost rate structure and award expenditures was needed to strengthen oversight of DKIST. Indirect costs represent expenses that are not readily identified with a particular function, but are necessary for the general operation of an organization. Examples of indirect costs include salary and related expenses of accounting personnel and others, rent, and utilities, among other things. NSF's Cost Analysis and Audit Resolution Branch had expressed concern about the complex indirect rate structure, which could increase the risk of unreasonable and unallowable costs being charged.

In addition, we found that monthly reports NSF receives to enable it to see how funds are spent contain only a "budget report" summarizing monthly expenditures rather than detailed expenditure information. Absent such detailed information, NSF cannot tell if unallowable expenditures are made and cost overruns are occurring.

Further, while NSF receives monthly reports with earned value management (EVM) information for DKIST, it has not certified the EVM system or validated the data submitted by DKIST. If data is not validated, there is an increased risk that the information is inaccurate and will not correctly assess the project's progress. The poor quality of the information in EVM reports for the NEON project was one of the reasons why the potential cost overrun for that project was undetected for so long and demonstrates the importance of a robust EVM process.

NSF was aware of the risk of permitting delays as early as the preliminary design phase and before construction started. The DKIST project manager had identified the need for 13 months of schedule contingency; however, only seven months of the 13 months has been funded. At roughly 65 percent complete, DKIST has used six of the seven months of the schedule budget contingency and still faces potential delays.

Funding the additional six months of contingency at the time of re-baseline would have cost an estimated $5.5 million. Because NSF did not fund this amount, if it ultimately needs to use this additional schedule contingency, it will have to fund that use, which increases the risk of a budget overrun.

We recommended that NSF take immediate action to improve oversight of DKIST such as obtaining an independent cost estimate of any new re-baselined proposal and developing a plan to mitigate risks of any future delays. NSF responded to our Alert Memo on March 30, 2016.

In its response, NSF stated that it agreed with our recommendations either in whole or in part. Among other things, it agreed to develop a plan to identify potential impacts and mitigate risk of potential permitting delays; to validate AURA EVM data; to conduct a review of DKIST budget and schedule contingency; and to amend the cooperative support agreement as needed. NSF also stated that the reasonableness review it conducted was adequate to assess the costs for the DKIST re-baselined proposal.

Cost and Schedule Risks to the Large Synoptic Solar Telescope Project

The Large Synoptic Solar Telescope (LSST), which is being constructed in Chile under a cooperative agreement with the Association of Universities for Research in Astronomy, Inc. (AURA), was awarded in August 2014 with National Science Board-capped total funding of $473 million. Our December 2015 alert memo identified potential cost and schedule risks to the project, which could lead to cost overruns and de-scoping that could limit the project's scientific benefits.

We reviewed documents created by NSF's Cost Analysis and Audit Resolution Branch (CAAR), which identified several areas of concern including the complexity of the project's indirect cost rate. CAAR stated that AURA's indirect cost rate structure was very complicated, which could make errors more likely and lead to overcharges to the government. Also CAAR requested more robust documentation from AURA to support certain charges such as meals and facility usage rates.

In light of the foregoing, CAAR officials stated that an incurred cost audit of the LSST project each year, or at least every other year, would be beneficial to ensure that awardees, including AURA, are not overcharging NSF for indirect costs. In 2015, the grants officer recommended LSST receive an incurred cost audit. NSF has indicated that it is pursuing an incurred cost audit this year.

There is a heightened risk to the project because LSST is being constructed in Chile. NSF's review of a sample of Chilean expenditures found that supporting documentation was provided solely in Spanish, which made oversight of the expenses more difficult. To ensure that expenditures are allowable and warranted, it is essential to have clear support.

While NSF receives Earned Value Management (EVM) reports for LSST, which it uses to measure project schedule and costs, NSF does not verify the data LSST provides in its EVM reports. We found that the poor quality of information in EVM reports for NEON was one of the reasons why the potential cost overrun for that project was undetected for so long and demonstrates the importance of having a robust EVM process.

Compounding this concern, we learned that NSF did not require AURA to certify the EVM system for LSST. Certification of an EVM system is important to ensure that an awardee maintains an acceptable system, which includes data to support interim progress measures, among other things. Relying on "trust" that an awardee is providing sound data is not a substitute for an independent assessment of data being used to evaluate the project's progress.

Our examination of the thresholds other federal agencies use when determining whether an awardee's EVM system should be certified found that, for example, the Department of Health and Human Services requires such certification for projects over $10 million and National Aeronautical and Space Administration for projects over $50 million. The $473 million LSST project far exceeds the threshold other federal agencies use. NSF has indicated that it will validate the EVM data for LSST as part of its 2016 annual review process and that it has started to evaluate the benefits of EVM certification and is investigating establishing thresholds for EVM certification.

Finally, CAAR's financial viability assessment of AURA disclosed concerns with key indicators used to assess financial viability , which were troubling as AURA currently holds 16 active NSF grants/and or cooperative agreements representing total funding of nearly $1.35 billion. At the time of our review, NSF informed us that it is reviewing additional documentation AURA provided about its financial status. NSF recently shared results of an independent assessment of AURA's financial viability.

Although the LSST project is in the early stages of construction, it is not too late for NSF to enhance oversight of the project to ensure that potential cost overruns, schedule delays, and other problems are avoided in the future. It is not too late for NSF to ensure that problems similar to those that occurred with NEON do not recur with LSST. In response to our Alert Memo, NSF indicated that it is developing a tool to facilitate incurred cost reporting for large facility constructions projects, beginning to evaluate the costs and benefits of EVM certification, and taking steps to ensure that invoices provided in Spanish are translated accurately.

Cost and Number of IPAs at NSF Have Increased Since 2013 Audit

NSF uses the Intergovernmental Personnel Act (IPA) as its primary way to bring top scientists, engineers, and educators from universities to NSF as temporary staff to advance the agency's mission of supporting scientific and engineering research.

We conducted a follow up review during this reporting period to assess NSF's progress toward reducing IPA costs since our 2013 audit, which identified the cost of IPAs as of August 2012 and found that NSF's additional cost of using IPAs instead of career employees was approximately $6.7 million. Our follow up, which focused on xecutive level IPAs[1], found that both the number and the cost of such IPAs increased since 2012.

We found that NSF had 29 percent more executive level IPAs in 2015 than it had in 2012, costing nearly $2.4 million more. In 2015, NSF paid nearly $8.9 million for salary, fringe benefits, lost consulting, and per diem for 27 executive level IPAs, while it paid $6.5 million for these same expenses for 21 executive level IPAs in 2012.

We noted that the number of institutions cost sharing for executive IPAs and the dollar amount provided by cost sharing had increased, which is a step in the right direction toward reducing IPA costs. Nevertheless, our previous audit suggested additional opportunities to reduce IPA cost, including expanded use of telework and reviewing fringe benefit rates that exceed a certain amount, which NSF has not implemented. Because IPA costs are paid from program funds, it is essential for NSF to examine the cost associated with its reliance on IPAs to ensure that federal funds entrusted to NSF are being spent effectively and efficiently.

We reiterated the recommendation from our 2013 audit (which remains open) that the NSF take appropriate action to evaluate ways the cost of using IPAs can be reduced. NSF agreed that it should continue to fully respond to our previous recommendation and affirmed that it continues to explore alternatives to reduce IPA costs.

1 Executive level IPAs hold positions at NSF equivalent to the Senior Executive Service (SES), such as Assistant Directors and Division Directors who lead NSF's science directorates and divisions.

NSF Needs to Strengthen Information Technology Controls

The Federal Information Security Management Act (FISMA) requires the Office of Inspector General (OIG) to conduct an independent evaluation to assess the effectiveness of NSF's information security program and practices and to determine compliance with FISMA requirements. NSF depends on computerized information systems to process, maintain, and report essential information. Reliability of computerized data and systems is essential and protecting information systems continues to be a challenge for NSF.

NSF's FY 2015 FISMA report included fourteen new findings, twelve for NSF and two for the U.S. Antarctic Program (USAP). Of the twelve new NSF findings, eight related to iTRAK, NSF's recently-implemented core financial system. Three of the new findings (one each for the NSF, iTRAK, and USAP systems) related to account management and background investigations, which could lead to unauthorized access to systems and data across the agency and expose NSF to the risk of inadvertent or deliberate compromise of the confidentiality, integrity, and availability of its systems and data.

Other new findings for NSF included weaknesses in system security plans, which could increase the risk that unauthorized changes could occur undetected; and weaknesses in the Plan of Actions and Milestones Process, which could increase the risk that vulnerabilities are not appropriately remediated. The new findings for the USAP systems included weaknesses in assessment and authorization documentation, which could increase the risk that appropriate security controls will not be consistently applied.

In addition, of the nineteen FY 2014 FISMA report findings, NSF completed corrective actions, and the OIG closed eleven findings in FY 2015. The FY 2015 report repeated or reissued eight findings from prior years. The prior year findings, from as early as FY 2006, included the need for USAP to develop and implement a disaster

recovery plan, and the need to remove the IT accounts of separated employees and contractors in a timely manner. NSF stated that it will develop an action plan to address findings from the FY 2015 FISMA report. Auditors will assess the status of all 22 findings during the FY 2016 FISMA evaluation.

Recommendations included development of a disaster recovery plan for Antarctic operations, ensuring that system accounts for terminated users are deactivated in a timely manner, ensuring that security controls over iTRAK are strengthened, and addressing weaknesses in IT security awareness and training. NSF stated that it will develop an action plan to address the recommendations.

Also, FY 2015 was the first year of reporting under the Federal Information Security Modernization Act of 2014 (FISMA 2014). As part of the FISMA 2014, OIGs used a new maturity model to assess agencies' information systems and continuous process monitoring (ISCM) programs. The model is designed to assess the people, processes, and technology domains, and to provide an overall assessment of the program. We found that although NSF has developed comprehensive ISCM policies, procedures, and strategies, they are not consistently implemented organization-wide.

Risks of Increased Reliance on Cloud Computing Should be Addressed

Cloud computing offers the potential for substantial cost savings through more efficient delivery of computing resources, flexible payments that increase or decrease based on needed resources, and less need to buy, build, and maintain hardware or data centers necessary for maintaining in-house information systems. However, using a cloud system also presents risks, such as loss of control over the data, as well as security and access issues that need to be properly managed.

Like many other federal agencies, NSF is increasingly using cloud computing technologies in place of in-house information systems. As a result, it must balance the potential cost savings benefit of cloud computing services with the risks of ceding control over agency data and systems to a commercial entity in the cloud environment. We evaluated NSF's efforts to adopt cloud-computing technologies and reviewed three contracts NSF executed with cloud service providers to assess compliance with applicable standards.

We found that NSF did not have an accurate and complete inventory of its cloud services and providers because it did not have a process to centrally capture and manage this information. As a result, the agency does not know the extent to which its data resides outside its own information system boundary, which subjects this data to risks such as interception of data in transit and unsecure data storage.

We also found that NSF did not have sufficiently detailed specifications in any of the three cloud contracts in our sample for some issues affecting data access and security, which could place NSF's data at risk. Finally, we found that NSF did not meet FedRAMP requirements for all three of the cloud contracts reviewed. Two of the cloud contracts did not contain provisions requiring the cloud service provider to meet and maintain FedRAMP compliance, as required by OMB and FedRAMP. The third contract did not comply with FedRAMP when it became operational in October 2014, as required by OMB for all cloud services implemented after June 2014. The purpose of FedRAMP requirements is to ensure that cloud-based services have an adequate information security program that addresses the specific characteristics of cloud computing and provides the level of security necessary to protect government information.

NSF agreed with our recommendations to strengthen its governance of cloud computing services, and to better address business and security risks by improving its inventory management of cloud services, including more detailed specifications in its cloud contracts, and requiring FedRAMP compliance for all of its cloud services. NSF developed a plan to address the recommendations and is in the process of implementing corrective actions.

Lack of Critical Cost Information Hinders Ability to Audit Two NSF Awardees

Incurred cost submissions, which include certified schedules of direct costs by award (identified by cost element) and applied indirect expenses, provide information that is critical for NSF to properly discharge its administrative and fiduciary responsibilities as a steward of federal funds. They are also essential tools for the conduct of an incurred cost audit. In some cases, the absence of properly prepared incurred cost submissions has added months and even years to the time required for audits being conducted on behalf of the OIG. For this reason, we have repeatedly recommended that NSF require annual incurred cost submissions for cooperative agreements totaling over $50 million.

The continued relevance of our incurred cost submission recommendations was underscored by two November 2015 reviews conducted by the Defense Contract Audit Agency (DCAA).[2] In those cases, DCAA auditors performed adequacy reviews of two large facility awardees' incurred cost submissions to determine if they included all of the information necessary to facilitate timely completion of an audit. In both cases the auditors found the submissions were inadequate, identifying a number of problems requiring corrective action before an audit could be initiated. Critical cost information that was not contained in the incurred cost submissions included incomplete sub-recipient documentation, a summary of all indirect cost rates, schedule of claimed overhead expenses, and a detailed listing of fringe expenses.

It is significant that two major, high-dollar NSF awardees' incurred cost submissions are missing important information needed to facilitate an audit. In addition, absent incurred cost submissions or their equivalent, NSF cannot adequately monitor awardees' expenditure of government funds during the post-award stage, compounding the risk that unallowable costs could be charged to awards and go undetected. We recommended that NSF require the Associated Universities, Inc. (AUI) and the National Ecological Observatory Network (NEON) to provide the missing information and schedules needed to have adequate incurred cost submissions.

More than $2 Million in Questioned Costs at NSF Awardee

An audit of approximately $296 million in costs claimed on NSF awards by the University of Washington during a three-year period ending March 31, 2013 questioned more than $2 million because the university did not always comply with applicable Federal and NSF award requirements.

The questioned costs included more than $1.8 million in salaries charged to NSF awards which exceeded NSF's two-month salary limit for senior project personnel. Of the 64 instances where excess salary was identified, five of those instances were related to senior personnel who exceeded the limit by at least 4 months, incurring $382,991 in questionable costs. The university relied on an NSF's 2010 frequently asked questions (FAQ) document, which stated that an awardee, under normal rebudgeting authority, could approve an increase in salary after an award had been made. However, the FAQ document is non-authoritative and contradicts the NSF requirement per the award administration guide which was in effect during the audit period.

In addition to costs questioned for salaries exceeding NSF's two-month limit, auditors questioned nearly $123,000 for equipment, materials, and supplies costs that did not appear to benefit the NSF award or did not appear necessary in light of the limited amount of time remaining on the award when the equipment was purchased. Other questioned costs included unsupported purchase card transactions, purchases made before the effective date of the award and without NSF's approval, unallowable spending for meals, and travel that occurred after the award expired.

2 Inadequate Incurred Cost Submissions for Fiscal Years 2010 and 2011, National Ecological Observatory Network, Inc., (NEON), Report No. 16-6-003, January 29, 2016; Inadequate Incurred Cost Submissions for Fiscal Years 2011-2013, Associated Universities, Inc. (AUI), Report No. 16-6-004, January 29, 2016.

Auditors recommended that NSF work with the University of Washington to resolve the questioned costs. The university generally agreed with the recommendations pertaining to questioned costs with the exception of the recommendation related to senior personnel salary. NSF is in the process of resolving the recommendations.

Incurred Cost Audits of Four NSF Contracts Question More Than $2 Million

At NSF's request, we contracted with DCAA to participate in incurred cost audits covering four NSF contracts.[3] Auditors questioned a total of more than $2 million of indirect costs, consultant costs, and unsupported subcontract costs, among other things. Recommendations included that NSF resolve the questioned contract costs.

Financial Statement Audit Reports

Establishing and maintaining sound financial management is a top priority for the federal government because agencies need accurate and timely information to make decisions about budget, policy, and operations. The Chief Financial Officer's Act of 1990 requires agencies to prepare annual financial statements which must be audited by an independent entity.

FY 2015 Financial Statement Audit Repeats a Significant Deficiency in Monitoring of Cooperative Agreements for Large Construction Projects

Under a contract with the OIG, CliftonLarsonAllen (CLA) conducted an audit of NSF's FY 2015 financial statements. CLA issued an unmodified opinion on the financial statements; however, the auditors reported a significant deficiency in NSF's internal controls over the monitoring of cooperative agreements for large construction projects, which has been cited as a significant deficiency each year beginning in FY 2011.

Auditors noted that NSF had made significant progress to correct weaknesses in prior financial statement audits pertaining to future awards of cooperative agreements for large construction projects. However, auditors stated that progress has continued to be slow in addressing issues concerning older, still active cooperative agreements. Accordingly, the following control weaknesses identified in the FY 2014 audit that have been repeated in the FY 2015 financial statement audit included:

- Awardees could draw down contingency funds without advance approval by NSF;
- Awardees' accounting systems and estimating practices were not sufficient to adequately track specific project costs; and
- In four of the five cooperative agreements reviewed, NSF could not provide award documentation or proposal documentation identifying the total approved contingency budget.

3 Three contracts were with Booz Allen Hamilton and one contract was with CH2MHill Constructors, Inc.

In FY 2015, NSF made significant progress in designing procedures to rectify certain specific other weaknesses noted in prior year Audit Report pertaining to future awards of CAs. However, some of those procedures were implemented late in the fiscal year, and they were unable to validate the effectiveness of such procedures.

Additionally, as confirmed by both tests and additional CA audits completed by the OIG and DCAA (on behalf of the OIG) in FY 2015, progress has continued to be slow in addressing the issues concerning older, still active, CAs with contingency funding.

The auditors found that the causes of the significant deficiency continued to exist through September 30, 2015, because NSF's corrective actions were not adequate; not fully implemented; or will be implemented only for new cooperative agreements. Further, the ongoing weaknesses identified continue to indicate that there are significant risks related to contingency funds in all cooperative agreements, and that NSF's controls over monitoring these cooperative agreements in general need improvement.

The audit also reported that NSF did not comply with the Improper Payments Elimination and Recovery Act reporting requirements, as detailed in the following.

NSF Did Not Comply with Improper Payments Elimination and Recovery Act Reporting Requirements in FY 2014

The Improper Payments Elimination and Recovery Act requires that the OIG test the agency's compliance with improper payment reporting requirements. Auditors found that NSF did not comply with two of the six IPERA reporting requirements in the FY 2014 Annual Financial Report. As a result, auditors could not determine whether NSF complied with the remaining four requirements.

With respect to the requirement to conduct a program-specific risk assessment, auditors found that NSF's risk assessment did not utilize a complete, accurate, and systematic method for determining the agency's risk for significant improper payment and did not evaluate all the required risk factors.

In FY 2015, NSF updated its 2014 IPERA risk assessment report and indicated that it completed certain follow-up activities. NSF has agreed to complete a qualitative IPERA risk assessment for FY 2015 to determine its susceptibility to significant improper payments in FY 2016.

FY 2015 Management Letter

The auditors also issued a Management Letter in conjunction with the financial statement audit report. The purpose of this document is to communicate findings that are not included in the audit report but are important to ensuring a sound overall internal control structure and require management's attention.

Among other things, the FY 2015 Management Letter stated that NSF needs to focus its grant monitoring efforts on establishing a baseline monitoring process for expired awards with substantial drawdowns after the grant has expired and using its annual risk-based award portfolio management approach to identify the award types and institutions for transaction payment testing.

National Science Board Could Improve its Compliance with Government in the Sunshine Act

The Government in the Sunshine Act aims to improve transparency for the public during the government's deliberation process of important matters. The Act applies to the National Science Board (NSB) and requires that the Board's meetings be open to the public, with the exception of meetings that qualify for ten narrow exemptions. In addition, the Act requires OIG to audit the Board's compliance with the Sunshine Act at least every three years.

We audited a sample of 85 of the 190 NSB meetings that took place from August 1, 2012, through July 31, 2015. We found that NSB's use of Exemption 9(B) increased from 25 percent between August 2011 and July 2012 to 85 percent between August 2014 and July 2015. We found that the NSB may have inappropriately used Exemption 9(B) to close agenda items in 9 of 44 closed meetings in our sample. This increase raised concerns about whether the NSB was using the exemption to close meetings that did not meet the exemption's criteria and should have been open to the public.

Exemption 9(B) rests on a determination that premature disclosure of information would be "likely to significantly frustrate implementation of a proposed agency action." Both the legislative history of the Act and court rulings emphasize that the exemption should not be used as a basis to protect deliberations because this would defeat the very purpose of the Sunshine Act.

NSB staff stated that the use of exemption 9(B) increased because of the number of meetings at which NSB needed to discuss risks to the Foundation had increased. The Board Office further explained that, upon review, four of the 9(B) agenda topics that we questioned could have been discussed in open session.

We also found that a broad range of topics was discussed in meetings closed under 9(B), but these topics were not fully described in the public agendas. Rather, some of the 9(B) topics were generically characterized as "Discussions on risks to NSF." Topics that the NSB closed which appeared inconsistent with Exemption 9(B) included discussions of congressional criticism of the merit review process, the propriety of certain research awards, the method of agency funding as well as NSF's response options to a document request from the Committee on Science, Space, and Technology of the U.S. House of Representatives.

With a few exceptions, we found NSB complied with the Act's procedural requirements for the meetings in our sample. The NSB Office generally agreed with our recommendations and has started implementing many of them including identifying certain topics separately on the agenda to promote fuller public understanding of the likely discussion and improving the timeliness of public notices for agenda items added on short notice. NSB asserted that its use of Exemption 9 (B) was appropriate.

Single Audits

Single Audits Identify Material Weaknesses and Significant Deficiencies at Three-Quarters of Awardees with Findings

OMB Circular A-133 provides audit requirements for state and local governments, colleges and universities, and non-profit organizations receiving federal awards. Under this Circular, covered entities that expend $500,000 or more a year in federal awards must obtain an annual organization-wide audit that includes 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. The OIG reviews the resulting audit reports for findings and questioned costs related to NSF awards, and to ensure that the reports comply with the requirements of OMB Circular A-133.

The 79 audit reports reviewed and referred[4] to NSF's Cost Analysis and Audit Resolution (CAAR) Branch this period covered NSF expenditures of approximately $741 million as reported in the annual Single Audits during audit years 2012 through 2015, and resulted in 34 findings at 25 NSF awardees. The auditors issued qualified opinions on the financial statements of one awardee and on compliance with federal grant requirements at four awardees, and identified a total of more than $212,000 in questioned costs (including approximately $144,000 in unsupported costs). At 19 of the 25 awardees (76 percent) with findings, auditors reported 26 material weaknesses and/or significant deficiencies in internal control over compliance, calling into question the awardees' ability to provide effective stewardship over federal funds. Awardees' lack of internal controls and noncompliance with federal requirements included: untimely and/or incorrect reporting of time and effort; untimely or inaccurate submission of financial reports; failure to ensure that property purchased with federal funds was adequately tracked and safeguarded; failure to ensure that the procurement process included verification that vendors had not been suspended or debarred; and inadequate monitoring of subrecipients.

Desk Reviews Find Improvements in the Audit Quality and Timeliness of Single Audits

The audit findings in A-133 reports are useful to NSF in planning site visits and other post-award monitoring efforts. Because of the importance of A-133 reports to this oversight process, the OIG conducts desk reviews on all reports for which NSF is the cognizant or oversight agency for audit, and provides guidance to awardees and auditors for the improvement of audit quality in future reports. In addition, OIG returns to the awardees reports that are deemed inadequate so that the awardees can work with the audit firms to take corrective action.

During the period, we conducted desk reviews of 46 audit reports[5] for which NSF was identified as the cognizant or oversight agency for audit, and found that 38 (83 percent) fully met federal reporting requirements. Eight reports contained audit quality and timeliness issues. The quality issues we identified

4 This number is lower than in previous periods due to security-related technical difficulties at the Federal Audit Clearinghouse, which prevented us from obtaining any reports between October 1st and December 7th.

5 The audits were conducted by 37 independent public accounting firms.

included three reports in which the Schedule of Expenditures of Federal Awards did not provide sufficient information to allow for identification of awards received from non-federal "pass-through" entities or did not adequately describe the significant accounting policies used to prepare the schedule.

In addition, six reports each had one of the following quality deficiencies: submitted after the deadline established in OMB Circular A-133; submitted to the Federal Audit Clearinghouse with an inaccurate Data Collection Form (Form SF-SAC); included an incomplete presentation of the audit finding; contained an incomplete Corrective Action Plan to address the audit recommendations; contained an incorrect calculation of the Type A/B threshold (the first step to determining which programs should be audited each year); and failed to accurately identify all of the awards in the major program.

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. In most cases, the auditors and awardees either provided adequate explanations and/or additional information to demonstrate compliance with federal reporting requirements. After completion of all 46 reviews, we issued a letter to each auditor and awardee informing them of the results of our review and the specific issues on which to work during future audits to improve the quality and reliability of the report.

Audit Resolution

NSF has Addressed Recommendations to Reduce the Cost of the USAP Medical Screening Process

In response to our September 2013 audit, which identified opportunities for NSF to reduce the cost of the United States Antarctic Program's medical screening process, to help decrease the number of applicants who do not complete the screening process, the Antarctic Support Contractor is giving candidates clearer information so they can better understand the significant commitment required for deployment to Antarctica. The contractor also informed NSF that it will continue to identify ways to improve the medical screening process.

Audits of the Federal Demonstration Labor Effort Pilots at George Mason and Michigan Technological Universities Result in Revised Policies to Strengthen Internal Controls over Labor Charges to NSF Awards

In response to our audit recommendations to strengthen internal controls to ensure labor charges to NSF are adequately supported, among other things, George Mason and Michigan Technological Universitites revised several policies and took steps to strengthen information technology controls to protect payroll information.

NSF Assesses its Administrative Cost Recovery Rate

In response to our recommendation to develop an approach to assess its administrative cost recovery rate that reflects the level of effort required of the agency, NSF revised the inputs used to calculate its rate after gathering information from other agencies about how they calculated their rates.

NSF Shuts Down its High-Speed Network

In response to our recommendations to enhance controls over its high-speed network, NSF no longer uses the high-speed network and de-commissioned it in October 2015.

NSF Takes Steps to Address Recommendations from FY 2012 Audit of Compliance with Improper Payments Elimination and Reduction Act

NSF informed us that it has taken steps to address the recommendations in our FY 2012 audit of its compliance with the Improper Payments Elimination and Reduction Act (IPERA). The audit recommended that NSF strengthen controls over reporting of improper payments. We are currently in the process of reviewing NSF's compliance with IPERA's reporting requirements in FY 2015, and the adequacy of NSF's controls.

NSF Develops New Procedure for Overseeing Conflicts of Interest at Grantee Institutions

In response to our recommendations, NSF developed a procedure to oversee unmanageable conflicts at awardee institutions, and revised its guidance to require that awardee institutions notify NSF if they are allowing research to proceed without imposing conditions or restrictions where a conflict exists.

NSF Acts to Ensure that Principal Investigators Submit Required Reports on Time

In response to our recommendations, NSF implemented corrective actions to ensure that Principal Investigators (PI) submit their required annual and final project reports on time, and also made changes in its FastLane system so that PIs who had past due reports could not receive another NSF award under a different identification number.

In the past, the Office of Inspector General had an interagency agreement with the Defense Contract Audit Agency (DCAA) to provide audits of NSF's largest, most complex awards, including contracts pertaining to NSF's polar programs, and cooperative agreements for the construction of its large facilities. However, with very limited exceptions, the FY 2016 National Defense Authorization Act now prohibits DCAA from conducting audits for non-Defense agencies. The Act also prevented DCAA from completing many audits it was conducting for non-Defense agencies as of November 25, 2015. Therefore, OIG will need to contract with independent auditing firms to obtain audits that would have been conducted previously by DCAA, and will be competing with other OIGs and federal agencies to obtain these audits. As a result, it may take longer for our office to obtain audits of NSF's largest and most complex awards.

Civil and Criminal Investigations

Georgia Small Business and CEO Sentenced for Fraud Convictions Regarding SBIR Awards

The CEO of a small business in Georgia was previously convicted of wire fraud and false claims pertaining to NSF and NASA Small Business Innovation Research (SBIR) awards.[6] In this reporting period, the Court sentenced the CEO to four months in prison, followed by one year of supervised release, and a $900 special assessment. In addition, the Court ordered the small business to pay a $3,600 special assessment and a $5,000 fine, and sentenced it to five years' probation. The Court also ordered forfeiture of over $81,000 that was previously seized from the small business.

Texas PI and Company Employee Sentenced to Prison for Making False Statements to SBIR Program

A Texas small business, a PI, and a company employee had previously pled guilty to making false statements.[7] The PI was sentenced during this reporting period to five months in prison and ordered to pay $100,000 in restitution. The employee was sentenced to three months in prison and ordered to pay $135,000 in restitution, and the small business was ordered to pay a $15,000 fine. We recommended that NSF debar the PI and the small business for five years, and NSF's decision is pending.

Three Alleged Co-Conspirators Arrested in Multi-State Operation

Three individuals were arrested in a multi-state, multi-agency operation after our investigation found that they had fraudulently obtained SBIR funds from NSF and other agencies. As part of their scheme, the individuals submitted grant proposals, correspondence, and reports that misrepresented the identity of their employees, and created multiple shell companies to falsify outside investments. They also bolstered their proposals with falsified letters of support.

The individuals' companies received approximately 30 grants totaling over $8 million from NSF, the Department of Energy, the Department of Transportation, and the Department of Agriculture. Grant funds were initially deposited into bank accounts controlled by the individuals and were then distributed for their personal use. The investigation is ongoing.

Company Enters Guilty Plea and Company Owner Reaches Deferred Prosecution Agreement

A small business and its owner had been proposed for debarment and their awards terminated;[8] during this reporting period the company pled guilty to wire fraud and the owner entered into a deferred prosecution agreement.

6 September 2015 Semiannual Report, pp.21-22.
7 March 2013 Semiannual Report, p.23; September 2013 Semiannual Report, p.16; September 2014 Semiannual Report, p.23; September 2015 Semiannual Report, p.23.
8 September 2015 Semiannual Report, p.25; March 2014 Semiannual Report, p.20.

An information filed by the Department of Justice alleged that the company owner misrepresented his current and pending support in SBIR proposals to NSF and falsely certified that he was primarily employed by his company in proposals submitted to NASA and the Air Force. The company and owner agreed to forfeit $180,000, and the Court imposed a fine of $175,000 at sentencing. The company was also sentenced to 3 years of probation.

SBIR Company Owner Agrees to Civil Settlement of $250,000

We previously reported the indictment and pretrial diversion agreements of a California company owner and PI.[9] Following the criminal resolution, we referred the company owner and PI to the civil division of the U.S. Attorney's Office to seek restitution and damages for violations of the civil False Claims Act. During this semiannual period, the company owner paid $250,000 to resolve allegations related to funding that the company received from NSF and NASA through the SBIR program. In addition to the payment, the company and its owner agreed not to apply for NSF funding for five years.

PI Indicted on Four Counts of Wire Fraud

As part of our ongoing investigation, a PI in Illinois was indicted on four counts of wire fraud after he created a shell company to obtain approximately $200,000 in supplemental SBIR funding from NSF and NASA. The PI submitted grant proposals, correspondence, and reports that misrepresented the identity of an individual allegedly working for the shell company and the existence of an outside investment from that company. The PI provided falsified letters and a screenshot showing the apparent transfer of funds in order to make the fabricated third-party investment appear legitimate.

Employee of NSF Awardee Alleges Retaliation for Whistleblowing

The Pilot Program for Enhancement of Employee Whistleblower Protection[10] provides whistleblower protections to employees of grantees who reasonably believe that they are being retaliated against for reporting allegations of misuse of federal funds received by their non-federal employers, for contracts and grants awarded on or after July 1, 2013. Under the Pilot Program, we investigate such allegations and submit a report to NSF management, the complainant, and the grantee. NSF then determines whether there is sufficient basis to conclude that the awardee subjected the complainant to a prohibited reprisal.

We investigated an allegation that an NSF awardee eliminated an employee's position in retaliation for the employee reporting misuse of NSF award funds to the awardee's CEO and to our office. The employee also alleged sexual harassment and a hostile workplace.

The employee anonymously faxed his allegations to our office, and shortly after that the awardee reorganized itself and eliminated the employee's position. We submitted a report of investigation to NSF management, and NSF did not find a sufficient basis to conclude that the employee had been subjected to a prohibited reprisal.

9 March 2015 Semiannual Report, p.21; March 2013 Semiannual Report, p.23.
10 41 U.S.C. § 4712.

NSF Terminates Awards Totaling over $1.9 Million and University Returns more than $250,000

We previously reported the government-wide suspension of a Connecticut small business and its principals.[11] During this period, we recommended that NSF terminate an award to the company, as well as five awards to a university where the company principals were employed. NSF terminated all six awards, resulting in over $1.9 million put to better use. In addition, the university returned over $250,000 of award funds, which the company principals used to buy equipment from their own company after falsely stating that they had no financial interest in the company. Our investigation is ongoing.

NSF Terminates Over $600,000 of Awards to Affiliated SBIR Companies

Our ongoing investigation into several companies found that they represented in proposals and reports that their facilities and equipment were in separate locations in South Dakota and North Dakota, when the companies were actually sharing a facility and employees in California. Following our recommendation, NSF terminated the two active awards to the companies, resulting in over $625,000 put to better use.

NSF Withholds Final SBIR Award Payment of $75,000 and Seeks Recovery of Additional Erroneous Payments

Our investigation found that a Texas company applied for and received Phase I and Phase II funding from the SBIR program when it was not an eligible small business due to its ownership structure. We recommended that NSF permanently withhold the final Phase II payment and seek recovery of all other funds erroneously paid to the company as a result of the company's Phase I eligibility misrepresentations. NSF withheld the final $75,000 payment, and is seeking repayment of all other award funds disbursed to the company, totaling approximately $700,000.

Community College Returns Over $327,000 for Improper Charges

We determined that a PI at an Alabama community college improperly charged costs to an NSF grant that were related to another federal grant, and also submitted numerous charges that lacked supporting documentation. The college acknowledged the improper and unsupported costs and returned over $327,000 to NSF. In addition, as a result of our investigation, the college removed the PI and the college president from their positions.

Research Foundation Returns over $330,000 Improperly Paid to Faculty and Ineligible Students

A New York research foundation, which accepts awards for other entities as part of a college system, returned over $330,000 to resolve allegations of misuse of funds in two NSF awards. The awards provided scholarships and research experiences to undergraduates. However, the PI, college, and foundation failed to ensure that the students were legal resident aliens/U.S. citizens and academically eligible for the awards. The PI also failed to adhere to other selection criteria outlined in the proposals and the solicitations, such

11 September 2015 Semiannual Report, p.26.

as the requirement that the recipient be a science, technology, engineering or mathematics (STEM) major. The PI also caused NSF funds to be paid to other faculty without regard to the actual amount of time the faculty worked on the awards.

We referred information about this case to our Office of Audit for further review into systemic deficiencies, because this is the third investigation in five years involving the foundation to result in returned funds as a result of faulty eligibility determinations. With this payment, the foundation has returned nearly $650,000 in the last five years, primarily relating to improper payments to ineligible students.

University Returns over $115,000 for Erroneous Charges

Our investigation at a California university determined that the university made numerous inappropriate cost transfers to its NSF awards, in addition to charges that did not comply with the university's policies and procedures, including improper time and effort certifications, and improper justification, authorization, and timing of cost transfers. Following our recommendation, NSF disallowed the charges and required repayment of more than $115,000 to NSF.

NSF Debars Individuals and Companies in Response to OIG Recommendations

PI Debarred Following Criminal Conviction

NSF debarred a PI for five years following his conviction for wire fraud, mail fraud, falsification of records, and theft.[12] The PI's company was also issued a notice of proposed debarment; NSF's final action is pending.

NSF Debars Michigan Business Owner, His Wife, and Three Businesses

NSF debarred a business owner and his wife for three years following his guilty plea to mail fraud and misuse of the NSF logo and her guilty plea to concealment of a felony.[13] NSF also debarred their three businesses for three years.

Debarment of Former Research Institute Employee

NSF debarred a former research institute employee for five years following her embezzlement conviction.[14]

12 September 2015 Semiannual Report, p.25; September 2014 Semiannual Report, p.21.
13 September 2014 Semiannual Report, p.22.
14 September 2014 Semiannual Report, p.20.

Debarment of Former NSF Employee

NSF debarred a former NSF employee for five years following her guilty plea to three counts of felony embezzlement.[15]

NSF Debars PI and Company for Misuse of Purchase Card

NSF debarred a PI and her company for one year as a result of the PI's misuse of a university purchase card. The PI used the card to cover gambling expenses and to buy her own company's textbook and charged these expenses to two NSF awards. The PI repaid the funds to the university; the university reimbursed the NSF awards and replaced the PI on the two awards.

ADMINISTRATIVE INVESTIGATIONS

Fabricated IRB Approval Leads to $1.66 Million Available for Better Use

We previously reported that a PI at a Pennsylvania university fabricated a document showing his project's required IRB approval, and submitted the fabricated document to NSF as part of his research proposal, which was subsequently awarded.[16] The university returned about $44,000 that had been expended and voluntarily relinquished the award, making an additional $1.6 million available for better use. Our investigation is ongoing.

Graduate Student Submits Published Articles as Proposals for Funding

A graduate student at a New York university submitted a proposal to NSF to receive funding for research he had already completed and published in an academic journal, using his advisor's data. The proposal was a verbatim copy of the article, except the student changed past-tense verbs to future tense and replaced numerical values with 'x'. A large amount of the text in both was also plagiarized. His advisor stated that the student had not had permission to use the data. The student told his advisor that there were no other instances in which he published using the data.

We found that the student had submitted ten more proposals to NSF seeking funds to perform work that had already been completed and submitted to, or published in, academic journals, some of which used the advisor's data. The student's advisor and other faculty resigned from his doctoral committee, prompting a university investigation. The student left the university before the investigation was finished.

None of the NSF proposals was awarded. We referred the matter for criminal prosecution and it was declined in lieu of administrative action. We recommended that NSF debar the student for five years, and NSF's decision is pending.

15 March 2015 Semiannual Report, p.21.
16 March 2015 Semiannual Report, p.25.

University Repays $260,000 for Professor's Mischarges to NSF and DOE Awards

Our investigation revealed that a professor at a Florida university was paying her husband (who had no science background) for "helpful suggestions" on her publications resulting from research funded by two NSF awards as well as two Department of Energy (DOE) awards. She claimed that her NSF program officers gave her permission to hire her husband for this purpose, which was not true. We also found that she significantly mischarged student and postdoc salaries on NSF awards. She defended these actions by stating that all her research fit under one "umbrella."

We presented evidence to the university, which agreed with our findings and returned over $165,000 for mischarged funds related to student salary. The university also repaid over $40,000 to NSF and $50,000 to DOE for award funds used for the professor's husband's salary. In addition, the university issued a reprimand, made the professor ineligible for promotions or salary increases for three years, required her to complete training on federal effort reporting, and will heavily monitor all aspects of her reporting related to sponsored projects for three years. The professor resigned her position as department chair.

University's Lack of Candor Results in Nearly $300,000 Put to Better Use

In response to our recommendation, NSF terminated a Texas university's award, which resulted in $300,000 of funds put to better use. Previously, NSF had suspended the award because the university failed to notify NSF of the PI's absence for nine of the first twelve months of the award and his resignation from the university.[17] Immediately prior to the leave of absence, the university determined that the PI had misused funds from an earlier NSF award, violated university conflict of interests policies, and failed to obtain the requisite approval for outside employment.

Although the PI gave seven months' notice before he resigned, the university did not inform NSF of the pending resignation until nine months later. The university failed to provide oversight of the PI's graduate students during the PI's absence. One month before the PI's final day, the university requested that a co-PI be added to the award, but did not inform NSF that the PI was going to resign. The NSF program officer indicated that had he known of the PI's pending absence, he would not have approved the addition of a co-PI.

Bitcoin Miner Agrees to Voluntary Exclusion

Previously, we reported on a researcher who engaged in unauthorized mining of bitcoins on two NSF-funded supercomputers.[18] After proposing a 5-year debarment, NSF negotiated a voluntary exclusion agreement with the researcher resulting in a reduction of the exclusion period to 18 months, and requiring 100 hours of community service.

17 March 2015 Semiannual Report, p.24.
18 March 2014 Semiannual Report, pp.29-30; September 2014 Semiannual Report, p.18.

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 letters of reprimand to termination of employment. NSF's actions in research misconduct cases ranged from letters of reprimand to a proposed three-year debarment.

In every case discussed below, we recommended that NSF make a finding of 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.

Student Fabricated Data in Order to Perform More Interesting Research

After being confronted by her advisor, a doctoral student at a Massachusetts university admitted that she fabricated data in an NSF-funded research project that was published in a journal article. The student said she fabricated the data in order to move on to research that was more scientifically interesting to her. The university immediately dismissed her, informed the journal, and retracted the published article. The university's investigation determined that the student intentionally and knowingly fabricated a figure in the published article, which it deemed a significant departure from accepted practices.

We concurred with the university's conclusion, and recommended that NSF debar the student for three years, and require certifications and assurances for six years.

Plagiarism Leads to Funds Put to Better Use

A PI from a Puerto Rico university plagiarized material in a funded NSF proposal, which was suspended and subsequently terminated, resulting in over $150,000 of funds put to better use. As described previously,[19] the PI included plagiarized material in a funded NSF proposal and an unfunded proposal.

The PI's university concluded that she committed research misconduct. The PI asserted during the investigation that student assistants prepared portions of the proposal; however, she had no evidence regarding student involvement. The university reprimanded the PI and required that her writing be monitored for three years, that she successfully complete a university course regarding proper citations practices within one year, and that she complete a refresher workshop the following year.

19 March 2015 Semiannual Report, pp.31-32.

Our investigation concluded the PI committed research misconduct by knowingly plagiarizing material in two proposals, constituting a significant departure from accepted practices. We also identified plagiarism in the PI's dissertation. We recommended that NSF require the PI submit certifications and assurances for three years and certify compliance with university-imposed requirements.

PI Plagiarized Portions of His Proposed Research Work

A PI from a New York university copied a portion of another scholar's research goals into a declined NSF proposal and copied a substantial portion of the methodology into a second declined NSF proposal. The university's investigation concluded that, although the PI's act was a significant departure from accepted practices, the PI did not commit research misconduct because he acted with careless intent. The university required the PI to take or teach a responsible conduct of research course, and to use proper citation practices in his writings.

Our review of the university's report found that the university incorrectly interpreted the reckless standard of intent, determining erroneously that recklessness requires a conscious or purposeful element. Our investigation concluded that the PI acted recklessly and thus committed research misconduct. We recommended that NSF require the PI to submit certifications and assurances for two years, and certify compliance with university-imposed requirements.

PI Asserts Numerous Reasons to Explain Plagiarism Allegation

A PI at a Michigan university submitted an NSF proposal containing three pages of apparently copied text in the proposal's five-page literature review. The PI asserted that he had used the American Psychological Association (APA) citation style, that common language use was coincidence, and that he used the author's words to avoid misinterpretation. We determined the PI's citation practices did not meet APA standards, found his other responses contradictory, and referred the investigation to his institution.

The PI asserted that: 1) NSF policies are nuanced and in conflict with his own literal interpretation; 2) NSF's requirements for quotation use conflict with other disciplines' standards; 3) his field is eclectic and not addressed by NSF policy; and 4) the research proposal is not really research. The university refuted all of these assertions and concluded that the PI committed plagiarism, at least recklessly, which was a significant departure from accepted practices. The university required the PI to participate in a supervisory meeting to discuss the seriousness of his actions, identify steps to prevent future occurrences; take training about plagiarism prevention; and submit all grant proposals to a university official for review for two years.

Our investigation determined that the PI knew his actions constituted plagiarism, knew NSF proposals required attention to citation, and was not unfamiliar with the grant writing process. Consequently, we determined he acted knowingly. We recommended that NSF require the PI submit certifications and assurances for two years, and certify compliance with university-imposed requirements.

Assistant Professor Recklessly Plagiarizes in NSF Proposal

An assistant professor in Alabama submitted an NSF proposal in which most of the first page, as well as a few other paragraphs, were apparently copied from other sources. She stated she copied and pasted text from her source documents without any notation into the same computer document where she was also composing original text for the proposal—over months of composition, this practice led to her inability to distinguish copied from original text. The university determined that she recklessly plagiarized and terminated her employment. We agreed with the university's conclusions and recommended that NSF require certifications for one year.

Actions by NSF Management on Previously Reported Research Misconduct Investigations

NSF has taken administrative action to address our recommendations on seven research misconduct cases reported in previous Semiannual Reports. In each case, NSF made a finding of research misconduct, issued a letter of reprimand, and required RCR training. NSF also took additional significant actions in response to our recommendations, as summarized below.

- In the case of a former graduate student who falsified data appearing in his submitted PhD dissertation and in multiple publications,[20] NSF debarred the individual for three years and imposed three years of subsequent certifications and assurances.
- Previously, we reported on a graduate student at a Rhode Island university who provided falsified data to his NSF-funded advisor who included it in a journal article that has been retracted.[21] NSF made a finding of research misconduct and imposed a three-year debarment.
- In the case of a professor at a Florida university who submitted multiple proposals containing plagiarism to NSF over a period of four years,[22] NSF imposed a one-year debarment and four years of certifications and assurances. NSF also took final action against a postdoctoral research associate involved in this case, imposing a one-year debarment and four years of certifications and assurances.
- In the case of a PI at a Pennsylvania university who plagiarized material from a colleague's declined proposal into her own NSF proposal,[23] NSF imposed a one-year debarment followed by three years of certifications and assurances. NSF also barred the PI from serving as a peer reviewer, consultant, or advisor for NSF for a year.
- In the case of a post-doctoral scholar at a Pennsylvania university who falsified NSF-funded research data in a manuscript submitted to a journal,[24] NSF imposed a one-year debarment and four years of certifications and assurances.
- In the case of a PI who claimed that the wrong version of his proposal was submitted to NSF, and that the use of quotation marks around directly copied text in his proposals was not required by the standards of his research community,[25] NSF imposed three years of certifications and assurances.

20 September 2014 Semiannual Report, p.26.
21 March 2015 Semiannual Report, p.27.
22 September 2014 Semiannual Report, pp.26-27.
23 March 2015 Semiannual Report, p.28.
24 March 2015 Semiannual Report, p.28.
25 March 2015 Semiannual Report, p.29.

- In the case of a Missouri PI who submitted annual and final project reports that misrepresented the publications supported from his grant,[26] NSF required certifications and assurances for three years.
- In the case of a professor at a Virginia university who submitted two NSF proposals containing plagiarism,[27] NSF imposed two years of certifications and assurances.
- In the case of a professor at a Georgia university who submitted two NSF proposals containing plagiarism,[28] NSF imposed two years of certifications and assurances.
- In the case of an associate professor at a Massachusetts university who plagiarized material into multiple NSF proposals,[29] NSF imposed one year of certifications and assurances.
- In the case of an Illinois professor who plagiarized materials into four NSF proposals,[30] NSF imposed two years of certifications and assurances.

26 March 2015 Semiannual Report, pp.28-29.
27 March 2015 Semiannual Report, p.29.
28 March 2015 Semiannual Report, p.30-31.
29 March 2015 Semiannual Report, p.31.
30 March 2015 Semiannual Report, p.30.

CONGRESSIONAL TESTIMONY

On February 4, 2016, the Inspector General testified before the House of Representatives Science, Space, and Technology Subcommittees on Oversight and Research and Technology at a hearing titled, "A Review of Recommendations for NSF Project Management Reform."

The hearing focused on the National Academy of Public Administration (NAPA) report titled, "National Science Foundation: Use of Cooperative Agreements to Support Large Scale Investment in Research." The report included practical recommendations that, if implemented by the agency, will significantly improve NSF's ability to ensure accountability over these high-risk, high-dollar projects.

Based on OIG's work, the Inspector General's testimony discussed six of NAPA's recommendation in detail and also covered three additional matters that were not the subject of a NAPA recommendation but are nonetheless critical to NSF's management and oversight of large facility projects.

The NAPA report noted that NSF has a group of in-house accountants and analysts in the Cost Analysis and Audit Resolution (CAAR) branch of the Division of Institution and Award Support who conduct pre-award cost analyses of proposals pending before the agency, including those for large facilities. OIG agrees that there is great value in the reviews CAAR conducts and supports NAPA's recommendation to promote transparency and require higher level review of exceptions to the recommendations from pre-award cost analysis conducted by CAAR.

In addition, OIG agreed with NAPA's recommendation that to strengthen accountability NSF should retain a portion of an awardee's contingency funds and distribute them with other incremental funds as needed. Our previous audit work has found that construction budgets for NSF's large facility projects included millions of dollars for contingencies which lacked adequate supporting documentation. The risk of misuse of these funds is heightened because of the control NSF allows recipients to exert over contingency funds, and the lack of clarity that exists over how amounts for contingencies are actually expended.

With respect to NAPA's recommendation for NSF to eliminate the practice of including management fees in cooperative agreements, NSF has indicated that it is evaluating its current policy and investigating alternatives to management fee, such as those mentioned in the panel's report. OIG indicated that if NSF decides to continue the use of management fee in cooperative agreements, it should consider and address the issues raised in the OIG's September 2015 alert memo. One area of particular concern is the fact that NSF's final policy omits any consideration of other sources of income available to an awardee in determining the amount of the fee award, thereby moving away from the principle that an awardee should only receive a fee based on its demonstrated need to maintain financial viability.

OIG also supported NAPA's determination, reflected in three recommendations,that NSF needs to take swift, decisive action to improve its internal project and financial management capability, as well as the project management capability of its awardees. OIG concurred with the findings and recommendations that flow from this conclusion and recognized that the actions required to implement these recommendations will require culture change within the agency and at its awardees.

The Inspector General also discussed three additional matters that are critical to NSF's management and oversight of large facility projects. The first concerned earned value management (EVM) systems. Two recent OIG reviews of NSF's largest, riskiest construction projects noted issues with EVM. In the September 2015 review of NSF's management of the potential $80 million cost overrun for the NEON project, the OIG found that the EVM reports provided by NEON did not give accurate figures for the cost to complete the project until NEON was prompted by NSF based on declining scheduled variance. As a result, based on NEON's EVM and monthly progress reports, NSF was unable to identify the magnitude of the potential budget overrun or the precise reason for the schedule variance.

In the OIG's December 2015 review of NSF's oversight of the LSST construction project, it found that while NSF receives EVM reports for LSST, which it uses to measure project schedule and costs, NSF does not verify the data LSST provides in its reports.

Two other matters, which are extremely important in the effort to ensure accountability over large facility projects, are incurred cost submissions and incurred cost audits for cooperative agreements over valued at $50 million and over. Incurred cost submissions, which include certified schedules of direct costs by award (identified by cost element) and applied indirect expenses, provide information that is critical for NSF to properly discharge its administrative and fiduciary responsibilities as a steward of federal funds. They are also essential tools for the conduct of an incurred cost audit.

Incurred cost audits of large facility recipients provide NSF and its stakeholders with the best evidence of how awardees are expending the federal funds entrusted to them. While not required by law or regulation, such audits are essential tools for ensuring accountability in high-risk, high-dollar projects. In their absence, unallowable costs charged to these awards may go undetected because NSF lacks sufficient visibility over incurred costs.

Through an extensive body of audit work in this area, the OIG has identified ways for NSF to strengthen the management and oversight of its costliest and riskiest large facility projects. The NAPA report reinforced many of our recommendations and, in some instances, endorsed more stringent measures. NSF's swift and decisive implementation of the report's recommendations will have a significant, positive impact on the Foundation's ability to manage and oversee these high-risk, high-dollar projects.

Audit Data

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		$11,714,680
B.	Recommendations that were issued during the reporting period		$0
C.	Adjustments related to prior recommendations		$0
Subtotal of A+B+C			$11,714,680
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		$11,714,680
For which no management decision was made within 6 months of issuance			$11,714,680

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	15	$8,967,726	$2,302,856
B.	That were issued during the reporting period	14	$4,227,280	$374,357
C.	Adjustment related to prior recommendations	0	$0	$0
Subtotal of A+B+C			$13,195,006	$2,677,213
D.	For which a management decision was made during the reporting period	8	$575,341	$177
	dollar value of disallowed costsdollar value of costs not disallowed	N/A N/A	$375,106 $200,235	N/A N/A
E.	For which no management decision had been made by the end of the reporting period	21	$12,619,665	$2,677,036
For which no management decision was made within 6 months of issuance		10	$8,776,381	$2,302,679

Status of Recommendations that Involve Internal NSF Management Operations

Open Recommendations (as of 10/01/2015)	
Recommendations Open at the Beginning of the Reporting Period	117
New Recommendations Made During Reporting Period	77
Total Recommendations to be Addressed	194
Management Resolution of Recommendations[31]	
Awaiting Resolution	66
Resolved Consistent With OIG Recommendations	111
Management Decision That No Action is Required	0
Final Action on OIG Recommendations[32]	
Final Action Completed	44
Recommendations Open at End of Period (03/31/2016)	**150**

Aging of Recommendations

Awaiting Management Resolution	
0 through 6 months	46
7 through 12 months	5
More than 12 months	15
Awaiting Final Action After Resolution	
0 through 6 months	31
7 through 12 months	6
More than 12 months	47

31 "Management Resolution" occurs when the OIG and NSF management agree on the corrective action plan that will be implemented in response to the audit recommendation.

32 "Final Action" occurs when management has completed all actions it agreed to in the corrective action plan.

OIG and CPA Performed Reviews

Report Number	Subject	Questioned Costs	Unsupported Costs	Better Use of Funds
16-1-001	CH2MHill Incurred Cost FY 08	$373,815	$0	$0
16-1-002	CH2MHill Group Home Office Allocation	$0	$0	$0
16-1-003	CH2MHill Ltd Audit FY 08	$0	$0	$0
16-1-004	University of Washington (ARRA)	$2,003,109	$12,868	$0
16-1-005	BAH Booz, Allen, Hamilton FY 08 Incurred Cost	$466,446	$217,935	$0
16-1-006	BAH #13 Disclosure Statement	$0	$0	$0
16-1-007	BAH #15 Revised Disclosure Statement	$0	$0	$0
16-1-008	BAH IT System General Internal Control	$0	$0	$0
16-1-009	BAH # 14 Revised Disclosure Statement	$0	$0	$0
16-1-010	BAH Actions to Correct Deficiencies Related to Compliance with DFARS Accounting System Administration	$0	$0	$0
16-1-011	BAH CAS 416 Noncompliance	$0	$0	$0
16-1-012	COL's Proposed Direct Amounts for FYs 10 & 11	$0	$0	
16-1-013	BAH FY 2009 Incurred Cost Audit Oversight	$1,171,673	$0	$0
16-1-014	NSF Negotiation Effort for RTSC by DCAA	$0	$0	$0
16-1-015	Supplemental DCAA Memo for Annual Direct Costs Claimed by RTSC	$0	$0	$0
16-1-016	Supplemental DCAA Memo on Crediting Station Proceeds for RTSC	$0	$0	$0
16-1-017	CH2MHill FYs 09 & 10 Incurred Cost		$0	$0
16-1-018	AUI Incurred Cost FYs 08-10		$0	$0
16-2-001	FY 2015 Financial Statement Audit		$0	$0
16-2-002	FY2015 Closing Package Financial Statement	$0	$0	$0
16-2-003	FY 2015 FISMA Metrics Package	$0	$0	$0
16-2-004	FY 2015 FISMA Independent Evaluation	$0	$0	$0
16-2-005	FY 2015 Financial Statement Management Letter	$0	$0	$0
16-2-006	FY 2015 IT Management Letter (FISMA)	$0	$0	$0
16-2-007	2015 Government in the Sunshine Act, Audit of NSB Compliance	$0	$0	$0
16-3-001	NSF's Oversight of the Large Synoptic Telescope (LSST) Construction Project	$0	$0	$0
16-3-003	Cloud Computing Inspection	$0	$0	$0
16-3-004	NSF's Oversight of the Daniel K. Inouye Solar Telescope (DKIST) Construction Project	$0	$0	$0
16-6-001	2015 Follow Up on Cost of IPA	$0	$0	$0
16-6-002	CH2MHill General Observations	$0	$0	$0
16-6-003	NEON Inadequate Incurred Cost Submissions	$0	$0	$0
16-6-004	AUI Inadequate Incurred Cost Submissions	$0	$0	$0
	Total:	**$4,015,043**	**$230,803**	**$0**

NSF-Cognizant Reports

Report Number	Subject	Questioned Costs	Unsupported Costs
16-4-001	12-14 WHOI Woods Hole Oceanographic Institution - MA	$0	$0
16-4-002	12-14 Boyce Thompson Institute for Plant Research - NY	$0	$0
16-4-003	12-14 WTEC World Technology Evaluation Center - PA	$0	$0
16-4-004	6-15 The New Mexico Consortium and Subsidiary - NM	$0	$0
16-4-005	12-14 The Franklin Institute - PA	$0	$0
16-4-006	6-15 Bigelow Laboratory for Ocean Sciences - ME	$0	$0
16-4-007	6-15 WGBH Educational Foundation & Subsidiaries - MA	$0	$0
16-4-008	7-15 MSRI Mathematical Sciences Research Institute - CA	$0	$0
16-4-009	6-15 University Enterprises Corporation at CSUSB - CA	$0	$0
16-4-010	6-15 Association of American Colleges & Universities - DC	$0	$0
16-4-011	6-15 National Alliance for Partnership in Equity Education Foundation - PA	$0	$0
16-4-012	6-15 CCAT Observatory - NY	$0	$0
16-4-013	12-14 American Meteorological Society - MA	$0	$0
16-4-014	12-14 AAPT American Association of Physics Teachers, Inc. - MD	$0	$0
16-4-015	12-14 Shodor Education Foundation, Inc. - NC	$0	$0
16-4-016	12-14 American Institute of Mathematics - CA	$0	$0
16-4-017	5-15 Oregon Museum of Science & Industry - OR	$0	$0
16-4-018	6-15 Carnegie Foundation for the Advancement of Teaching - CA	$0	$0
16-4-019	6-15 National Collegiate Inventors & Innovators Alliance DBA VentureWell - MA	$0	$0
16-4-020	6-15 Balboa Park Cultural Partnership - CA	$0	$0
16-4-021	12-14 Youth Radio - CA	$0	$0
16-4-022	12-14 Astrophysical Research Consortium - WA	$0	$0
16-4-023	12-14 Stroud Water Research Center - PA	$0	$0
16-4-024	6-15 The Science Museum of Minnesota - MN	$0	$0
16-4-025	6-15 IRIS Incorporated Research Institutions for Seismology - DC	$0	$0
16-4-026	9-15 ARCUS Arctic Research Consortium of the United States - AK	$0	$0
16-4-027	9-15 The Chattanooga-Hamilton County Public Education Fund - TN	$0	$0
16-4-028	6-15 Toyota Technological Institute at Chicago - IL	$25	$25
16-4-029	6-15 Museum of Science - MA	$0	$0
16-4-030	6-15 The Woods Hole Research Center - MA	$0	$0
16-4-031	6-15 New York Hall of Science - NY	$0	$0
16-4-032	6-15 Maine Mathematics and Science Alliance - ME	$0	$0
16-4-033	12-14 UNAVCO, Inc. - CO	$216	$216
16-4-034	12-14 Mozilla Foundation and Subsidiary - CA	$0	$0
16-4-035	6-15 Pacific Science Center - WA	$0	$0
16-4-036	8-15 Twin Cities Public Television, Inc. - MN	$0	$0

14-4-037	3-15 ASTC Association of Science-Technology Centers - DC	$0	$0
16-4-038	9-15 UCAR University Corporation for Atmospheric Research - CO	$0	$0
16-4-039	12-14 CUAHSI Consortium of Universities for the Advancement of Hydrologic Science, Inc. - MA	$0	$0
16-4-040	12-14 The 21st Century Partnership for STEM Education - PA	$0	$0
16-4-041	9-15 The Concord Consortium, Inc. - MA	$0	$0
16-4-042	6-15 California Academy of Sciences - CA	$0	$0
16-4-043	6-15 New York Public Radio - NY	$0	$0
16-4-044	6-15 Kennesaw State University Research & Service Foundation - GA	$0	$0
16-4-044	6-15 The Fred Rogers Company and Subsidiaries - PA	$0	$0
16-4-046	9-15 Astronomical Society of the Pacific - CA	$0	$0
	Total	**$241**	**$241**

Other Federal Reports

Report Number	Subject	Questioned Costs	Unsupported Costs
16-5-001	9-12 The Aerospace Corporation - CA	$118	$0
16-5-002	12-14 CRDF U.S. Civilian Research and Development Foundation - VA	$10,063	$0
16-5-009	9-14 Yukon River Inter-Tribal Watershed Council - AK	$137,687	$137,687
16-5-012	9-14 University of West Alabama - AL	$12,750	$0
16-5-016	12-14 Marine Biological Laboratory - MA	$28,851	$0
16-5-024	6-15 Northeast Wisconsin Technical College - WI	$5,745	$0
16-5-031	6-15 Tuskegee University - AL	$15,586	$5,626
16-5-032	6-15 The Corporation of Haverford College - PA	$1,196	$0
	Total:	**$211,996**	**$143,313**

Audit Reports With Outstanding Management Decisions

This section identifies audit reports involving questioned costs, and funds put to better use where management had not made a final decision on the corrective action necessary for report resolution with six months of the report's issue date. At the end of the reporting period there were 11 reports remaining that met this condition. The status of recommendations that involve internal NSF management is described on page 33.

Report Number	Subject	Questioned Costs	Unsupported Costs	Better Use of Funds
09-1-014	University of Michigan	$1,604,713	$1,418,889	$0
13-1-002	Jackson State University[33]	$943,475	$844,241	$0
13-1-004	ARRA Cornell University	$794,221	$19,703	
14-1-005	Audit of AURA Cost Book Evaluation for the Rebaselined ATST/DKIST Project	$0	$0	$11,714,680
15-1-012	University of California, Berkeley	$1,863,351	$4,000	$0
15-1-014	ARRA University of Wisconsin - Madison	$1,669,588	$0	$0
15-1-019	Indiana University	$830,008	$0	$0
15-1-020	Stanford University	$337,377	$0	$0
15-1-021	Florida State University	$568,130	$0	$0
15-1-022	Carnegie Mellon University	$149,672	$0	$0
15-5-094	9-14 J.F. Drake State Community and Technical College - AL[34]	$15,846	$15,846	$0
	Total:	**$8,776,381**	**$2,302,679**	**$11,714,680**

33 This report is on hold at the request of OIG.
34 This report is on hold at the request of OIG.

Investigative Activities

Referrals to Prosecutors	6
Criminal Convictions/Pleas	3
Arrests	3
Civil Settlements	1
Indictments/Information	1
Investigative Recoveries	$6,905,259.84
Referrals to NSF Management for Action	17
Research Misconduct Findings	7
Suspensions/Debarments/Exclusions	24[35]
Administrative Actions taken by NSF	46
Certifications and Assurances Received[36]	18

Case Statistics

	Preliminary	Investigations
Active at Beginning of Period	3	227
Opened	7	60
Closed	8	57
Active at End of Period	2	230

Freedom of Information Act and Privacy Act Requests

Our office responds to requests for information contained in our files under the Freedom of Information Act ("FOIA," 5 U.S.C. § 552) and the Privacy Act (5 U.S.C. § 552a). During this reporting period:

Requests Received	21
Requests Processed	19
Appeals Received	0
Appeals Upheld	0

Response times ranged between 1 day and 21 days, with the median around 17 days and the average around 13.7 days.

35 Late in the most recent reporting period, multiple government-wide suspensions and debarments became effective. We did not learn of these actions until this reporting period. This total reflects these previously unreported actions.

36 NSF accompanies some actions with a certification and/or assurance requirement. For example, for a specified period, the subject may be required to confidentially submit to OIG a personal certification and/or institutional assurance that any newly submitted NSF proposal does not contain anything that violates NSF regulations.