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## **Review of Federal Agency Policies on Scientific Integrity**

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# Executive Summary

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## Background

The March 2009 Presidential Memorandum on Scientific Integrity emphasizes the importance of science in guiding government decisions and the need to ensure public trust in the science that informs those decisions. The memorandum assigns the Director of the Office of Science and Technology Policy (OSTP) responsibility for recommending a plan for achieving “the highest level of integrity in all aspects of the executive branch’s involvement with scientific and technological processes.”

On December 17, 2010, the Director of OSTP issued a Memorandum on Scientific Integrity that provides guidance for agencies to develop scientific integrity policies, including prohibitions on political interference with scientific processes and enhanced transparency. The OSTP Memorandum provides agencies with flexibility to create policies appropriate to their missions and scope of scientific work. Specifically, the OSTP Memorandum instructs agencies to develop scientific integrity policies that:

- Establish a foundation for scientific integrity;
- Develop public communication policies that promote openness and transparency;
- Use a transparent process to select individuals with scientific and technological expertise to serve on Federal Advisory Committees and afford them autonomy in their findings and reports; and
- Promote professional development of agency scientists and engineers.

In response to the OSTP Memorandum, 24 Federal agencies produced and published policies for protecting and supporting scientific integrity in Federal research. These include both agencies that conduct or support scientific research and agencies that issue regulations or engage in decision-making based upon scientific findings. The agency policies codified existing agency requirements and established new procedures and practices to implement the OSTP guidance on scientific integrity. Many agencies with policies pre-dating the OSTP Memorandum produced compilation documents of their relevant policies addressing scientific integrity. These policies reflect the different practices, expectations, and experiences of Federal agencies and the scientific communities with which they work.

OSTP tasked the IDA Science and Technology Policy Institute (STPI) to review the 24 Federal agency scientific integrity policies, to identify potential good practices for

meeting or exceeding the principles identified in the OSTP Memorandum, and to suggest ways of strengthening the policies to reflect current interests and developments. OSTP also asked STPI to identify government-wide policy developments relating to scientific integrity that have been promulgated in partial response to the OSTP Memorandum.

## **Methodology**

STPI reviewed the 24 agency policies OSTP identified and conducted semi-structured interviews with scientific integrity officials of select agencies, whose policies reflected diverse approaches in their implementation of scientific integrity policies. Some of the agencies include research misconduct within their definition of scientific integrity, while others do not combine these concepts for purposes of either definition or procedure. Some of the agencies primarily use scientific findings to support regulatory or policy decisions, while others focus on the conduct of science.

Information from these interviews informed topics for discussion at a half-day, OSTP-hosted interagency workshop on scientific integrity, held on August 30, 2016. The workshop brought 39 participants from 21 agencies together to discuss current and emerging issues in scientific integrity. The purpose of the workshop was to brief agencies on STPI's analysis of the variations in approach among the 24 agency policies, to discuss scientific integrity issues identified from STPI's review of the policies as informed by interviews, and to identify recommended next steps to strengthen agency scientific integrity practices.

## **Findings**

Most of the scientific integrity policies STPI reviewed address all four components of the OSTP Memorandum. A few do not explicitly address them all, and some include elements beyond those delineated in the OSTP Memorandum. For example, many policies provide a context on why scientific integrity is important to the agency's mission. Several policies reference related policies on scientific codes of conduct, conflict of interest, or data quality.

The OSTP Memorandum gives agencies flexibility to implement their scientific integrity policies in accordance with their culture and mission, so STPI anticipated variation among the policies examined, and noted significant variations in four areas.

First, the policies take different approaches to defining scientific integrity. The Presidential Memorandum and the OSTP Memorandum both set forth principles of scientific integrity, but neither includes a specific definition of the term and neither requires agencies to define it. Some agency policies include a definition of scientific integrity, while others reference the principles contained in both memoranda without explicitly defining the term. Some agencies have adopted definitions of "breach," "violation," or "loss" of

scientific integrity in addition to, or in lieu of, a definition of “scientific integrity” per se. A second difference in agency policies is inclusion of research misconduct into scientific integrity policies. One agency developed a definition of scientific integrity that incorporates the definition of research misconduct found in the Federal-wide policy for research misconduct. Several others adopted variations of this basic definition of scientific integrity. The incorporation of terms from the definition of research misconduct highlights the relationship some agencies perceive between scientific integrity and research misconduct. Agencies generally took a broader view of scientific integrity, including conflicts of interest, research misconduct, data quality, human subject protection, animal welfare, or data access and sharing policies. These activities contribute to the integrity of the scientific process, but many are beyond the scope and focus of the OSTP Memorandum.

At the workshop, participants discussed the various agency approaches to defining “scientific integrity.” Some agencies expressed the view that a uniform definition of scientific integrity based upon a baseline would be valuable and convey the importance of scientific integrity. Participants noted that reaching consensus on a uniform definition of scientific integrity or breach of scientific integrity would be difficult. Others expressed the view that agencies should continue to have flexibility to tailor the definition to their agency culture, mission, and organizational structure.

Third, agencies differ with respect to the scope of persons and activities covered under their scientific integrity policies. The Presidential and OSTP Memoranda focus on scientific integrity within the Federal Government. Their primary purpose is to ensure that Federal decisions are based on sound and rigorous science and to avoid political interference with Federal scientific findings and analysis. Most agency scientific integrity policies are directed toward the Federal workforce (Federal political appointees and civil servants) and their intramural research activities. Some agencies also include contractors or grantees who conduct or supervise scientific work that serves as the basis for policy decisions or regulations, or who communicate agency scientific findings to the public. Some of the agencies that define scientific integrity broadly (e.g., to include research misconduct and other activities that affect the quality and reliability of federally funded research) are contemplating or have taken steps to include extramural research within the scope of their policies.

Fourth, agencies vary with respect to which entity within the organization has primary responsibility for implementing the scientific integrity policy. Some agencies have placed scientific integrity in the same organizational structure that handles research integrity. Even agencies that include research misconduct within their definition of scientific integrity frequently assign responsibility for scientific integrity and research misconduct to distinct offices within the agency.

The workshop also highlighted some examples of potential good practices for scientific integrity policies and their implementation. Given the variation in culture,

organizational structure and mission of each agency, a good practice for some agencies may not be a good practice for all agencies, and discussion during the workshop reflected this diversity in approach. STPI organized potential good practices into themes derived from the components of the OSTP Memorandum. Selected examples for each categorization follow:

- Promoting a Culture of Integrity:
  - Provide an agency-specific context for why scientific integrity is important to an agency's mission and activities.
  - Train scientists and nonscientists on importance of scientific integrity.
  - Provide a process for resolving differences in scientific opinions.
  - Issue periodic bulletins or newsletters to remind personnel of importance of scientific integrity.
- Avoidance of Political Interference:
  - Develop a written statement of policy and adopt supporting policies to prohibit political interference with scientific findings.
  - Establish clearance processes for agency products that delineate political appointees' role and include review timelines.
  - Establish a statement of right of scientific review: scientists and researchers have the right to review, amend, or comment on final versions of any document or publication that significantly relies upon their work.
  - Appoint senior-level civil servants with adequate perceived and actual authority to serve as scientific officers or on review panels for the agency to address allegations involving high-level political officials.
  - Call upon other agencies to conduct investigations into alleged breaches of scientific integrity involving extremely high-level political officials.
  - Adopt a comprehensive approach to avoiding political interference.
- Public Communication:
  - Allow agency employees the right to express personal opinions to the public provided they clarify that their statements do not represent the official position of the agency.
  - Develop a policy on use of social media to communicate with the public.
  - Provide agency guidance on how to communicate scientific results to the public.

- Establish intra-agency clearance procedures to clarify political appointees’ role in communication of scientific findings and establish review timelines.
- Professional Development:
  - Encourage scientists to participate and engage with the broader scientific and scholarly community while complying with conflict of interest and other pertinent legal requirements.
  - Provide scientists the opportunity for professional development, including continuing education and attendance at professional conferences to maintain current expertise in their field.
  - Be flexible in approaches to enable scientists to participate in outside activities.
  - Issue policy guidance to facilitate participation in outside professional activities.

Officials interviewed from several agencies identified emerging issues in scientific integrity for deeper discussion at the workshop. These included conflict of interest and the relationship between scientific integrity as described in the OSTP Memorandum and other agency policies.

Conflict-of-interest challenges relate to the ability of scientists to serve on nonprofit boards, despite a change in the Office of Government Ethics (OGE) rule in 2013. A 1996 ruling from the Department of Justice (DOJ) on 18 U.S.C. Section 208 prohibited Federal employees from serving in their official capacities as an officer, director, or trustee of a nonprofit board unless provided by a waiver from his or her agency. The 2013 OGE ruling created a new exemption, finding that the financial interest of a nonprofit organization does not impute to a Federal employee that serves as an officer or director, and that a waiver was no longer necessary. Undue restrictions on scientists engaging with the broader scientific community may nevertheless hinder efforts to recruit high-quality scientists. Participants encouraged agency ethics officials to use a flexible approach to enable scientists to participate in outside activities. Workshop participants suggested issuance of agency guidance to encourage participation on nonprofit boards.

Participants also discussed the interface between scientific integrity as described in the OSTP Memorandum and other agency policies. Several principles addressed in the OSTP Memorandum were already addressed by pre-existing agency policies, such as those on conflict of interest, research misconduct, or codes of scientific conduct. In addition, some Federal policies issued since the OSTP Memorandum promote public access to government scientific information. These new policies complement the goal of promoting transparency in government and enhancing public trust in the science underlying Federal decisions. Yet the overlap between scientific integrity and related policies poses a

challenge for agencies handling allegations of breach of scientific integrity. When an allegation of a breach of scientific integrity is filed, agencies often need to conduct an initial assessment to determine whether the allegation falls within the scope of scientific integrity policy or whether it should be addressed under a related agency policy. Different entities within the agency will have primary responsibility for investigating or addressing the issue, depending upon how it is characterized.

Agencies noted that the OSTP Memorandum focuses on scientific integrity processes within one agency and does not directly address scientific integrity matters involving multiple agencies. How best to coordinate scientific integrity matters involving multiple agencies may warrant further discussion.

### **Possible Future Steps**

Workshop participants identified four follow-up items for collective action:

- Sharing both tools and resources, including training materials, to implement agency scientific integrity policies
- Having periodic future interagency meetings to share good practices, challenges, and solutions in implementing the Presidential and OSTP Memoranda
- Continued emphasis on the importance of scientific integrity into the future
- Further collective consideration regarding what constitutes scientific integrity. Some agencies use the term “scientific integrity” to capture the full range of activities that affect the integrity of scientific research and scholarly activities, including conflicts of interest, research misconduct, data quality, protection of human subjects, animal welfare, or data sharing policies. These activities contribute to the integrity of the scientific process, but many are beyond the scope and focus of the OSTP Memorandum.

Given the different use of terminology among agencies, further interagency discussions could help clarify the relationship between the objectives of the OSTP Memorandum and these broader concepts of scientific integrity. In the future, examining this broader concept of activities that affect the integrity of science could be worthwhile to determine whether additional policy development/guidance is needed across agencies. Such a discussion should take into account related Federal policies adopted before and after the OSTP Memorandum, including policies to enhance public access to government scientific data.

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# 1. Introduction

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## A. Background

Upholding principles of scientific integrity in scientific processes encourages public trust in government decision-making. Assuring the public of the credibility of scientific results relevant to policy decisions requires rigorous and transparent scientific processes that are free from political influence and characterized by transparent and open communication of scientific findings and conclusions. Implementing processes that ensure accuracy, veracity, and objectivity of scientific findings and conclusions among Federal departments and agencies (collectively “agencies”) can support scientific integrity.

A Presidential Memorandum on Scientific Integrity issued in March 2009 emphasizes the importance of science in guiding government decisions and ensuring public trust in the science informing those decisions.<sup>1</sup> It delineates the following six principles:

1. Agency selection and retention of candidates for science and technology positions in the executive branch should be based on the candidate’s knowledge, credentials, experience and integrity;
2. When scientific or technological information is considered in policy decisions, the information should be subject to well-established scientific processes, including peer review where appropriate, and each agency should appropriately and accurately reflect that information in complying with and applying relevant statutory standards;
3. Political officials should not suppress or alter scientific findings or conclusions;
4. Except for information properly restricted from disclosure [by] statute, regulation, Executive Order, or Presidential Memorandum, each agency should make available to the public the scientific or technological findings or conclusions considered or relied on in policy decisions;
5. Each agency should have appropriate rules and procedures to ensure the integrity of the scientific process within the agency; including appropriate whistleblower protection;

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<sup>1</sup> White House, Office of the Press Secretary, “Scientific Integrity,” March 9, 2009, <https://www.whitehouse.gov/the-press-office/memorandum-heads-executive-departments-and-agencies-3-9-09>.

6. Each agency should have in place procedures to identify and address instances in which the scientific process or the integrity of scientific and technological information may have been compromised.

The Presidential Memorandum assigns the Director of OSTP responsibility for ensuring the highest level of integrity in all aspects of the executive branch's involvement with scientific and technological processes and for issuing recommendations to guarantee scientific integrity throughout the executive branch.

An Office of Science and Technology Policy (OSTP) Memorandum on Scientific Integrity issued on December 17, 2010, provides further guidance for agency scientific integrity policies while providing flexibility for agencies to craft policies appropriate to their mission and scope of scientific work.<sup>2</sup>

Specifically, the OSTP Memorandum identifies the basic foundations of scientific integrity in government:

1. Ensure a culture of scientific integrity by shielding scientific data and analysis from inappropriate political influence; encouraging honest investigation, open discussion, and a commitment to evidence; and preventing political officials from suppressing or altering scientific or technological findings;
2. Strengthen the actual and perceived credibility of government research by ensuring that hiring of scientists is based primarily upon their scientific and technological knowledge, that data and research supporting agency policy are independently peer reviewed, where feasible and appropriate, that clear standards exist to govern conflicts of interest, and that appropriate whistleblower protections are adopted;
3. Facilitate the free flow of scientific and technological information, consistent with privacy and classification standards, by promoting open communication among scientists and between scientists and the public, and expanding access to scientific and technological data and information; and
4. Establish principles for conveying scientific and technical information to the public, by fostering accurate presentation of information by communicating underlying assumptions and uncertainties and describing probabilities associated with scientific projections.

It further directs agencies to develop public communication policies that promote and maximize, to the extent practicable, openness and transparency with the media and public by enabling scientists to communicate with the media about their work and refraining from

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<sup>2</sup> OSTP, "Memorandum on Scientific Integrity," December 17, 2010, <https://www.whitehouse.gov/sites/default/files/microsites/ostp/scientific-integrity-memo-12172010.pdf>.

pressuring scientists to alter their findings. The OSTP Memorandum also instructs agencies to develop policies for Federal Advisory Committees (FACs) tasked to provide independent scientific advice by using a transparent process to select individuals with scientific and technological expertise and by affording FACs autonomy in their findings and reports. It promotes professional development of government scientists and engineers by encouraging them to publish in peer-reviewed, professional or scholarly journals, present findings at professional meetings, become editors or editorial board members of professional and scholarly societies, participate fully in professional or scholarly societies (including as officers) and receive honors and awards for their research and discoveries.

In response to the OSTP Memorandum, 24 Federal agencies have produced and published policies or compilations of previous policy documents for protecting and supporting scientific integrity in Federal research.<sup>3</sup> These documents codified existing requirements and established new procedures and practices to meet the OSTP guidance. They reflect different practices, expectations, and experiences of Federal agencies and the scientific communities with which they work.

OSTP tasked STPI to review and analyze the 24 Federal agencies' scientific integrity policies, identify potential good practices for meeting or exceeding the principles identified in the OSTP memo, and suggest ways of strengthening agency scientific integrity policies to reflect current interests and developments. OSTP also asked STPI to identify government-wide policy developments relating to scientific integrity that have been promulgated in partial response to the OSTP memorandum (e.g., Office of Government Ethics rule changes that allow Federal scientists to serve on nonprofit boards in their official capacity).

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<sup>3</sup> These agency policies are posted on the White House website at <https://www.whitehouse.gov/administration/eop/ostp/library/scientificintegrity/>. The 24 agencies include components of the Executive Branch. For example, the Department of Health and Human Services (DHHS) has a general scientific integrity policy for all of DHHS and the National Institutes of Health (NIH), the Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC) each have their own scientific integrity policies. Other departments and agencies that have published scientific integrity policies include: United States Department of Agriculture (USDA), Department of Commerce (DOC), National Institute of Standards and Technology (NIST), National Oceanic and Atmospheric Administration (NOAA), Marine Mammal Commission (MMC), Department of Education (DoEd), Department of Energy (DOE), Department of Homeland Security (DHS), Department of Justice (DOJ), Department of Labor (DOL), Department of State (DOS), Department of the Interior (DOI), Department of Transportation (DOT), Department of Veterans Affairs (VA), Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), Office of the Director of National Intelligence (ODNI), U.S. Agency for International Development (USAID), and Department of Defense (DOD).

## **B. Methodology**

A STPI team began by reviewing the 24 agency scientific integrity policies, compared and contrasted agency approaches for addressing the OSTP Memorandum, and documented the range of approaches taken. STPI also identified government-wide policy developments relating to scientific integrity that have been promulgated in partial response to the OSTP Memorandum and evaluated their adoption by agencies.

STPI then conducted semi-structured interviews with representatives of seven agencies to discuss the agencies' approaches to scientific integrity, experiences in implementing their scientific integrity policies, and emerging scientific integrity concerns.<sup>4</sup> STPI selected these agencies because they reflected diverse approaches in their implementation of scientific integrity policies. Some included research misconduct within their definition of scientific integrity, while others did not combine these concepts for purposes of either definition or procedure. Some of the agencies primarily use scientific findings to support regulatory, policy or operational decisions, while others focus on the conduct or support of scientific research. These agencies also provided STPI with additional relevant agency documents such as annual reports and brochures describing the agency's scientific integrity activities and manuals and procedures delineating the agency process for handling scientific integrity allegations. The interviews deepened STPI's understanding of policies, highlighted potential good practices, and identified emerging issues and challenges in scientific integrity.

Working with OSTP, STPI then developed an agenda for a half-day interagency workshop on August 30, 2016, to bring Federal scientific integrity officials together to discuss current and emerging issues in scientific integrity. The purpose of the workshop was to brief agencies on STPI's analysis of the variations in approach among the 24 agency policies, to identify and discuss scientific integrity issues identified from the review of the policies and structured interviews, and to determine potential next steps to further strengthen agency scientific integrity practices. Thirty-nine participants from 21 agencies attended the workshop. STPI provided an overview of the variation among agency scientific integrity policies and the potential good practices and emerging issues identified during the review of agency policies and interviews. OSTP and STPI facilitated breakout sessions on potential good practices and emerging issues. The discussions and input from the workshop have been incorporated into this report.

## **C. Organization of the Report**

This report provides an overview of how the agencies have implemented the OSTP Memorandum. It then highlights notable differences among the policies. Drawing upon the interviews and August 30, 2016 workshop, the report describes some agencies' practices

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<sup>4</sup> Representatives of DOI, EPA, USDA, NASA, FDA, NOAA, and NIH were interviewed.

that might be considered “good” or “best” practices. Emerging issues identified during the interviews and discussed in greater depth at the workshop are then summarized. Finally, the report provides a summary of future steps that agencies might undertake as a collective effort to strengthen agency scientific integrity policies or implementation of their policies.



## 2. Attributes of Federal Agency Scientific Policies

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### A. Implementation of the OSTP Memorandum

To date, 24 Federal departments and agencies have issued scientific integrity policies to implement the OSTP Memorandum on Scientific Integrity.<sup>5</sup> The policies are varied and reflect different agency missions and authorities. Some agencies rely upon scientific findings for rulemaking, regulatory or policy decision-making, while others use or disseminate scientific information in support of the conduct of research. Agencies such as the U.S. Department of Agriculture have research components that generate scientific information through both intramural and extramural research activities, and also have regulatory components that use scientific information to inform regulatory decisions and policy-making. Some research funding agencies do not conduct intramural research, while others, such as the U.S. Geological Survey, spend the majority of their funding on intramural research.

STPI reviewed the 24 policies to determine if the scientific integrity policies incorporated and implemented the principles delineated in the OSTP Memorandum. The OSTP Memorandum establishes four main components: Ensuring a Culture of Scientific Integrity; Public Communication; Federal Advisory Committees; and Professional Development. In addition, each of these components contain various subcomponents. Tables 1 through 4 provide tallies of the numbers of agencies reviewed that have implemented attributes of these four components in their scientific integrity policies, and in other related documents such as a manual, handbook, brochure, website, or in related agency policy documents, such as media communication, Federal Advisory Committee, research misconduct, or conflict-of-interest policies.

Most agency policies address all of the principles outlined for each of the four components delineated in the OSTP Memorandum. A small number of agency policies do not explicitly respond to each component of the memo. For example, five agency policies do not include information regarding conflict of interest in their scientific integrity policy, and four agency policies do not include information describing whether or how their scientists and engineers may join editorial review boards or serve as journal editors, although this information is often addressed in separate agency policies (e.g., ethics

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<sup>5</sup> Scientific integrity policies can be found at White House website, <https://www.whitehouse.gov/administration/eop/ostp/library/scientificintegrity/>.

policies). Topics missing from scientific integrity policies vary from one agency to another, reflecting each agency’s mission and role in terms of funding science, conducting science, or using science in decision-making, and other existing policy documents.

**Table 1. Attributes of Culture of Scientific Integrity Addressed in Agency Policies Reviewed**

<b>Attribute</b>	<b>Number of Policies Addressing Attribute</b>
Ensure culture of scientific integrity	24
Political officials should not suppress or alter scientific or technical findings	21
Adopt whistleblower protection to identify and address instances in which scientific integrity may be compromised	24
Strengthen actual or perceived credibility of government research	20
Ensure selection of candidates for science positions based primarily on scientific and technological knowledge and credentials	23
Independent peer review of data and research supporting agency policy decisions	23
Set clear standards governing conflict of interest	19
Establish principles for free flow of scientific and technical communication consistent with privacy and classification standards; enable scientists and engineers to communicate with other scientists, engineers and public about S&T matters	23
Convey S&T information in an accurate, transparent and informative manner to the public, including explanations of underlying assumptions, probabilities and uncertainties	23
Promote access to S&T information by making it available on-line in open formats	23

**Table 2. Attributes of Public Communication Addressed in Agency Policies Reviewed**

<b>Attribute</b>	<b>Number of Policies Addressing Attribute</b>
Agencies should be open and transparent with media	24
Agencies should allow scientist and engineers to communicate with media, in coordination with their supervisor and public affairs office	23
Agencies should offer articulate and knowledgeable spokespersons who can speak in objective, nonpartisan fashion about science and technology in response to media requests	20
Public affairs officials cannot pressure agency scientist to alter scientific findings	23
Agencies should have a dispute process for decisions to allow/disallow scientists from engaging in interviews or other public activities	21

**Table 3. Attributes of Federal Advisory Boards Addressed in Agency Policies Reviewed**

Attribute	Number of Policies Addressing Attribute
Recruitment process should be transparent	20
Professional biographical information for appointed committee members will be available on the FAC's website	19
Advisory board members should be selected based upon qualifications and expertise	23
Advisory boards should have a balanced membership	21
Conflicts of interest should be made publicly available unless prohibited by law	19
FACA reports should not be subject to review by agency	21

**Table 4. Attributes of Professional Development Addressed in Agency Policies Reviewed**

Attribute of Memo	Number of Policies Addressing Attribute
Agencies should promote professional development of its S&T employees	23
Agencies should encourage publication of their scientific research in scholarly journals	22
Agencies should allow government scientists to become editors of journals	20
Agencies should allow government scientists and engineers to fully participate in professional and scholarly societies, committees and task forces and remove barriers for serving as officers or on governing boards of such societies	23
Allow government scientists to receive honors and awards for their research and discoveries	21

## **B. Implementation of Other Attributes**

Many agency policies include elements beyond those delineated in the OSTP Memorandum. STPI identified eight elements that might serve to make an agency's policy more comprehensive: (1) providing a context for how and why scientific integrity is important to the agency's mission; (2) describing which persons and activities are covered under the policy; (3) defining key terms used in the policy; (4) designating entities responsible for agency oversight of scientific integrity; (5) designating entities responsible for handling allegations of breach of scientific integrity and procedures; (6) referencing other related policies such as scientific codes of conducts, research misconduct, conflict of interest, or data quality; (7) citing legal authorities for the policy; and (8) outlining an approach for resolving differences in scientific opinions. The tally of the number of agency policies STPI reviewed that address these additional attributes are listed in Table 5.

**Table 5. Other Attributes Addressed in Agency Policies Reviewed**

<b>Attribute of Memo</b>	<b>Number of Policies Addressing Attribute</b>
Provides agency context for policy	22
Scope: who and what activities are covered by the policy	20
Provides definitions of key terms	14
Designates personnel, offices, and/or committees responsible for providing leadership on scientific integrity	18
Outlines responsibilities of various agency components	12
Designates a responsible party for addressing allegations	16
Refers to other policies relevant to Scientific Integrity	20
Cites legal authorities for memorandum	18
Outlines an approach for resolution of differing scientific opinion	3

### 3. Notable Differences among Agency Policies

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STPI identified notable differences among policies in the following four areas: definition of scientific integrity; organizational responsibility; individuals and activities covered; and relationship between scientific integrity and research misconduct. These topics were discussed at the workshop.

#### A. Definition of Scientific Integrity

Agency policies vary in their approach to defining scientific integrity. The Presidential and OSTP Memoranda do not define the term “scientific integrity,” nor do they require agencies to define the term. The majority of agency policies do not define the term, either; instead, they reference the principles in the Presidential Memorandum.

Six agencies define the term scientific integrity in their policies. The Department of the Interior (DOI) developed a definition of scientific integrity that incorporates the definition of research misconduct found in the Federal-wide policy for research misconduct (referred to as “DOI core definition”).<sup>6</sup> DOI defines scientific integrity as:<sup>7</sup>

The condition that occurs when persons covered by this chapter adhere to accepted standards, professional values, and practices of the relevant scientific community, including the DOI Code of Scientific and Scholarly Conduct and Departmental standards for the performance of scientific activities for DOI employees and covered outside parties. *Adherence to these standards ensures objectivity, clarity, and reproducibility, and utility of scientific and scholarly activities and assessments and helps prevent bias, fabrication, falsification, plagiarism, outside interference, censorship and inadequate procedural and information security.* [italics added for emphasis].

Five other agencies—the U.S. Department of Agriculture (USDA), United States Agency for International Development (USAID), the National Oceanic and Atmospheric Administration (NOAA), Department of Justice (DOJ), and Department of Education (DoEd)—have adopted variations of this DOI core definition of scientific integrity.

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<sup>6</sup> Office of Research Integrity (ORI), “Federal Research Misconduct Policy,” 65 Federal Register No. 235, December 6, 2000, 76260–76264.

<sup>7</sup> DOI, “Chapter 3: Integrity of Scientific and Scholarly Activities,” in *Department of the Interior Departmental Manual*, 305 DM 3, December 16, 2014, <http://elips.doi.gov/ELIPS/DocView.aspx?id=4056>.

Although the Environmental Protection Agency (EPA) scientific integrity policy does not contain a definition, the website of its Office of the Science Advisor provides a definition of “scientific integrity” that is derived from the DOI core definition.<sup>8</sup> Table 6 contains examples of agency definitions of the term “scientific integrity.”

**Table 6. Example Definitions of Scientific Integrity in Agency Policies**

Agency	Definition
DOI	“The condition that occurs when persons covered by this chapter adhere to accepted standards, professional values, and practices of the relevant scientific community, including the DOI Code of Scientific and Scholarly Conduct and Departmental standards for the performance of scientific activities for DOI employees and covered outside parties. Adherence to these standards ensures objectivity, clarity, and reproducibility, and utility of scientific and scholarly activities and assessments and helps prevent bias, fabrication, falsification, plagiarism, outside interference, censorship and inadequate procedural and information security.”
DOL	“[T]he principles of scientific integrity outlined in the President’s and Director of OSTP’s Memoranda.”
EPA	<p>“Scientific Integrity results from adherence to professional values and practices, when conducting and applying the results of science and scholarship. It ensures:</p> <ul style="list-style-type: none"> <li>• Objectivity</li> <li>• Clarity</li> <li>• Reproducibility</li> <li>• Utility”</li> </ul> <p>“Scientific Integrity is important because it provides insulation from:</p> <ul style="list-style-type: none"> <li>• Bias</li> <li>• Fabrication</li> <li>• Falsification</li> <li>• Plagiarism</li> <li>• Outside interference</li> <li>• Censorship</li> <li>• Inadequate procedural and information security”</li> </ul>
USDA	“The condition resulting from adherence to professional values and practices when conducting and applying the results of science that ensures objectivity, clarity, and reproducibility, and that provides insulation from bias, fabrication, falsification, plagiarism, interference, censorship, and inadequate procedural and information security.”

\* The Department of Labor Scientific Integrity Statement of Policy, <https://www.dol.gov/asp/ideascale/>.

<sup>8</sup> EPA, “Basic Information about Scientific Integrity,” <https://www.epa.gov/osa/basic-information-about-scientific-integrity>.

The DOI core definition of scientific integrity incorporates elements of the definition of research misconduct. The Federal Research Misconduct Policy (December 6, 2000), which predates the OSTP Scientific Integrity Memorandum, sets forth a uniform definition of research misconduct.<sup>9</sup> In this uniform definition, research misconduct is defined as “fabrication, fabrication or plagiarism in proposing, performing or reviewing research; or in reporting research results. Research misconduct does not include honest error or differences of opinion.” The incorporation of terms from the definition of research misconduct highlights the relationship some agencies perceive between scientific integrity and research integrity.

NIH does not define scientific integrity but has a broad concept of scientific integrity: “Scientific integrity in this context, refers to maintaining the quality and objectivity of the research activities that the National Institutes of Health (NIH) funds and conducts, such that they are sound and worthy of the public’s confidence. NIH’s commitment to sound, objective science also strengthens the public’s trust in policy decisions informed by scientific data. In fostering scientific integrity, NIH aims to ensure that (1) scientific findings are objective, credible and readily available to the public and (2) the development of policies based on science is conducted with appropriate transparency.”<sup>10</sup>

Other agencies, including the Department of Homeland Security (DHS), Department of State (DOS), DOI, and USDA, have adopted definitions of “breach,” “loss,” or “compromise” of scientific integrity in addition to, or in lieu of, a definition of “scientific integrity” (Table 7). DHS defines “breach of scientific integrity” and its policy states that scientific integrity is characterized by principles and guidance for preserving and promoting scientific ethics and transparency. DOS defines “compromise of scientific integrity” shown in Table 7. DOI defines loss of scientific integrity,<sup>11</sup> and USDA’s revised scientific integrity policy defines “compromise of scientific integrity.”<sup>12</sup>

The variety of definitions led to discussion at the workshop on whether a uniform definition of scientific integrity is attainable or desirable. Some agencies indicated that a uniform definition based upon a common denominator would be valuable and highlight the importance of scientific integrity across the Federal government. Participants noted, however, that it might be difficult to reach a consensus on a uniform definition of scientific

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<sup>9</sup> ORI, “Federal Research Misconduct Policy,” 65 Federal Register No. 235, December 6, 2000, 76260–76264.

<sup>10</sup> NIH, “NIH Policies and Procedures for Promoting Scientific Integrity,” Office of the Director, November 2012, <https://ombudsman.nih.gov/ScientificIntegritynov2012.pdf>.

<sup>11</sup> DOI, “Chapter 3: Integrity of Scientific and Scholarly Activities,” in *Department of the Interior Departmental Manual*, 305 DM 3, December 16, 2014, <http://elips.doi.gov/ELIPS/DocView.aspx?id=4056>.

<sup>12</sup> USDA, “Scientific Integrity,” Departmental Regulation, DR 1074-001, .November 18, 2016. <https://www.ocio.usda.gov/document/departmental-regulation-1074-001>.

integrity or breach of scientific integrity. Others expressed the view that agencies should continue to have flexibility to tailor their definition to their agency culture, mission, and organizational structure.

**Table 7. Sample Descriptions of Loss, Breach, or Compromise of Scientific Integrity**

Agency	Definition
DHS	“Any inappropriate political influence of DHS scientists, engineers, researchers, or contractors to alter or suppress their scientific or technological data, findings or conclusions.”
DOI	Loss of scientific integrity “Occurs when there is a significant departure from the accepted standards and professional values and practices of the scientific community, including (for DOI employees and covered outside parties) the DOI Code of Scientific and Scholarly Conduct and Departmental standards for the performance of scientific or scholarly activities. Improperly using scientific information (including fabrication, falsification or plagiarism of science) for decision making, policy formulation, or preparation of materials for public information activities, can constitute a loss of integrity. Loss of scientific integrity negatively affects the quality or reliability of scientific information.”
DOL	DOL has a definition of “scientific dishonesty” which includes “hindering scientific integrity” or “suppressing data collection, scientific studies, or publication of results by scientists or their supervisors for the purpose of manipulating outcomes.”
DOS	<p>“Compromises of scientific integrity include but are not limited to:</p> <ul style="list-style-type: none"> <li>• using scientific studies or data to inform the decision-making process that are not representative of the current state of scientific knowledge and research (for example because they lack peer review, utilize poor methodology, or contain flawed analyses);</li> <li>• misrepresenting the underlying assumptions, uncertainties, or probabilities of scientific findings or attempting to suppress or alter scientific or technical findings during any step of the decision-making processor</li> <li>• altering or misrepresenting scientific or technological findings in public communications.”</li> </ul>

## **B. Persons and Activities Covered by Scientific Integrity Policies**

Agencies also differ with respect to the scope of persons and activities covered under their scientific integrity policies. The Presidential and OSTP Memoranda focus on scientific integrity within the Federal Government. Their primary purpose is to ensure that Federal decision-making, including policy and regulatory decisions, is based upon sound and rigorous science and the avoidance of political interference with Federal scientific findings and analysis. All of the agencies include Federal employees, including career staff and political appointees, within the scope of their policies. Agencies that conduct intramural research have applied their scientific integrity policies to such research.

Some agencies also include contractors or grantees who conduct or supervise scientific work that serves as the basis for policy decisions or regulations, or who communicate agency scientific findings to the public. For example:

- NOAA’s policy applies to employees, political or career, who are engaged in or supervise scientific activities, publicly communicate information resulting from scientific activities or use scientific information to make policy or regulatory decisions. Contractors who engage in these same activities also covered.
- DoEd’s policy applies to employees and contractors when engaged in supervising, managing or influencing scientific activities, communication information about DoEd scientific activities, or using scientific information to make Department policy, management or regulatory decisions.
- DOJ states that its policy applies to employees, contractors, grantees, and detailees working for or on behalf of DOJ and their supervisors when they are conducting, analyzing or reviewing scientific and technology data, analysis or evidence or using such results for an investigation, prosecution, regulation or policy development.

In addition, some agencies have taken steps to include extramural research within the scope of their policies even if the grantee’s scientific findings will not serve as a basis for agency decision-making. Some agencies express an “expectation” that contractors and grantees will adhere to the scientific integrity principles in the OSTP Memorandum. This provides strong encouragement but may not rise to the level of a legally enforceable provision in the event of a breach of scientific integrity. In order to enforce compliance, some agencies have developed language to include in their grants or contracts to require compliance with the agency’s scientific integrity policy. For example, NOAA has recently added language in its financial assistance awards applying the scientific integrity policy to researchers.

USDA’s revised scientific integrity policy states that in addition to its USDA employees, its contractors, cooperators, partners, permittees, lessees, grantees, and volunteers who supervise, manage, or report on scientific activities, publicly communicate information resulting from scientific activities, or use scientific information to engage in policy- or decision-making on behalf of USDA are “expected” to uphold the principles. They may also be required to comply if provided in agreements, contracts, statements of work, or memorandum of understandings.

DOI’s *Scientific Integrity Procedures Handbook*, 305 DM 3, dated December 16, 2014, provides that “DOI must ensure scientific and scholarly activity and information being completed by contractors, cooperators, partners, permittees, lessees, and grants meet scientific integrity requirements and that the science provided to the Department is of high quality and is trustworthy.” Program managers and contracting officials should include, when appropriate, the following language in leases and financial assistant agreements,

such as mapping, modeling efforts, scientific studies, environmental assessments, and wildlife surveys:<sup>13</sup>

Scientific integrity is vital to the Department of Interior (DOI) activities under which scientific research, data, summaries, syntheses, interpretations, presentations, and /or publications are developed and used. Failure to uphold the highest degree of scientific integrity will result not only in potentially flawed scientific results, interpretations, and applications but will damage DOI's reputation and ability to uphold the public's trust. All work performed must comply with the DOI scientific Integrity Policy posted to <http://www.doi.gov>, or its equivalent as provided by their organization of State law.

All of the agencies interviewed have indicated that they would defer to the grantee institution or contractor to investigate and address alleged breaches of scientific integrity associated with extramural research. DOI's policy contains mechanisms to address complaints against external parties, although the majority of USGS funding is for intramural research. EPA noted that some of its peer-review panels are led by contractors rather than EPA employees. For this reason, EPA took steps to extend its conflict-of-interest policies to contractors overseeing peer-review panels.

Agencies that extend the scope of their scientific integrity policies to extramural research have a view of scientific integrity that is broader in concept than contemplated in the OSTP Memorandum. The OSTP Memorandum focuses on professional development of the Federal workforce, independence and scientific expertise of Federal Advisory Committees, avoidance of political interference with scientific findings of agency scientists, and science used to support Federal policy decisions—these aspects of the OSTP Memorandum are not germane to extramural research that does not inform the Federal agency decision-making process or communicate agency generated scientific research results to the public.

Agencies that extend scientific integrity policies to extramural research use the term “scientific integrity” to capture the full range of activities that potentially impact the rigor, quality and reliability of federally funded research and the ethics in performing such research. This holistic approach to achieving scientific integrity offers some benefits. This approach focuses on the positive goal of achieving scientific integrity rather than focusing on misconduct. It also recognizes that multiple factors impact the integrity of science. Many of these activities, however, are outside the scope of the OSTP Memorandum and covered by other Federal or agency policies.

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<sup>13</sup> DOI, “Chapter IV – Requirements Related to Contractors and Financial Assistance,” in *Scientific Integrity Procedures Handbook*, 305 DM 3, December 16, 2014. <http://elips.doi.gov/ELIPS/DocView.aspx?id=4058>.

Given the different use of terminology among agencies, further interagency discussions might be useful to distinguish the meaning of scientific integrity for purposes of the OSTP Memorandum and these broader objectives. A term other than scientific integrity could be considered to describe these cluster of related activities that contribute to reliable and sound scientific data, analysis or findings. Alternatively, scientific integrity could be interpreted more broadly and different terminology could be developed to describe the activities that are the focus of the OSTP Memorandum.

### **C. Organizational Responsibility for Scientific Integrity**

Agencies vary with respect to which entity within the organization has primary responsibility for implementing the scientific integrity policy. Some agencies assign overall responsibility for scientific integrity to the highest nonpolitical official in the agency. Some departments have appointed scientific integrity officers in each departmental agency, often with a departmental scientific integrity officer (DSIO) with department-wide responsibility for managing the scientific integrity process. Some DSIOs are located in the agency front office while others are located within the Office of the Chief Scientist. Table eight includes a summary of agency organizational components responsible for scientific integrity leadership.

The assignment of responsibility to a particular entity within an agency can set the tone for the overall scientific integrity culture at the agency. The individual and entity responsible for oversight of the policy needs to be perceived as having sufficient authority to handle allegations of breach of scientific integrity involving high-level political officials. For this reason, many of the agencies assign responsibility to the highest-level nonpolitical official at the agency.

Some agencies have placed scientific integrity in the same organizational structure that handles research misconduct issues. Nonetheless, even agencies that include research integrity in their definition of scientific integrity frequently assign responsibility for these topics to distinct offices within the agency. These differences can affect agency procedures for addressing allegations of breach of scientific integrity. Some policies identify the agency point of contact for scientific integrity, delineate how to report a scientific integrity allegation, and describe the procedures should an allegation of breach of scientific integrity occur. Several agencies have also issued manuals or similar documents that provide detailed descriptions of the process for handling allegations.

Some agencies have established panels or committees to investigate and report on allegations of breaches of loss of scientific integrity associated with intramural research. At DOI, these panels review the accepted practices of the relevant community, determine if the evidence gathered indicates a significant departure from accepted practices or assist in further fact finding. EPA has a Standing Scientific Integrity Committee composed of Deputy Scientific Integrity Officials to oversee policy and provide an annual report. EPA

has indicated that this mechanism has proven very effective in attaining agency-wide support for a culture of scientific integrity. At EPA and NOAA, these panels also assist in preparation of the agency annual report.

FDA and NIST also use panels to ensure a culture of scientific integrity by strengthening the scientific expertise of their workforce and the credibility of agency scientific products. FDA has established panels to address internal scientific disputes and credentials and qualifications of prospective and current FDA scientists. NIST has established panels to ensure the rigor and quality of NIST scientific data, publications, software, and video products and accurately convey uncertainties associated with measurement results.

**Table 8. Organizational Components within Agencies Responsible for Scientific Integrity Oversight and Handling Allegations of Breaches of Scientific Integrity**

<b>Agency</b>	<b>Scientific Integrity Leadership</b>	<b>Organizational Entity Handling Allegations</b>	<b>Panel or Committee</b>
CDC	Associate Director for Science	Office of Science Quality, Office of the Associate Director for Science	An ad hoc inquiry committee is convened by the Research Integrity officer (RIO). If the findings of this committee warrant an investigation, the RIO convenes an investigation committee whose report is submitted to the Office of Research Integrity (ORI)
DHS	Chief Scientist serves as the Scientific Integrity Officer (SIO)	Chief Scientist, SIO	Scientific Integrity Committee is an ad hoc committee convened by SIO to conduct fact finding in response to reported breach of scientific integrity
DOD	Assistant Secretary of Defense for Research and Engineering		
DOI	Deputy Secretary of Interior has overall responsibility for scientific integrity; and Departmental Scientific Officer (DSIO) (who is the USGS Deputy Director)	Allegations sent to DOI Office of Executive Secretariat and Regulatory Affairs; complaint tracked and sent to appropriate Bureau Scientific Integrity Officer (BSIO)	A Scientific Integrity Review Panel is established as needed to examine issues related to scientific integrity. The panel prepares and submits reports to the BSIO/DSIO. The Office of Science Quality and Integrity may also play a role in processing a complaint.
DOEd	Institute of Education Sciences (IES) Deputy Director for Administration and Policy	Office of the Inspector General	
DOL	Office of Assistant Secretary for Policy (OASP)	Department Scientific Integrity Officer within OASP	

Agency	Scientific Integrity Leadership	Organizational Entity Handling Allegations	Panel or Committee
DOT	Director, Office of Research, Development and Technology in the Office of the Assistant Secretary for Research and Technology is the Department's Scientific Integrity Officer (DSIO)		
EPA	Scientific Integrity Official, Office of the Science Advisor	Scientific Integrity Official, Office of the Science Advisor	Standing Scientific Integrity Committee composed of Deputy Scientific Integrity Officials to oversee policy and provide annual report.
FDA	Office of Scientific Integrity, Office of Chief Scientist	Internal scientific disputes are addressed by FDA components and appeal process to Office of the Commissioner	Agency Dispute Process Review Board chaired by Chief Scientist handles internal scientific disputes elevated to Office of the Commissioner. FDA Scientist Review Committee reviews scientific credentials and qualifications of prospective and current FDA employees.
NASA	Chief Scientist		
NIH	Principal Deputy Director		
NIST	Associate Director for Laboratory Programs	Office of Chief Counsel	Editorial Review Board for review of scholarly manuscripts and documentation associated with datasets, software and videos intended for publication.*
NOAA	Deputy Undersecretary for Operations	NOAA Scientific Officer	NOAA Scientific Integrity Committee investigates allegations of scientific and research misconduct and prepares an investigative report and draft annual report.**
NSF	Office of the Director	Referred to appropriate office and tracked	

Agency	Scientific Integrity Leadership	Organizational Entity Handling Allegations	Panel or Committee
ODNI	Assistant Director of National Intelligence for Acquisition, Technology, and Facilities	Assistant Director of National Intelligence for Acquisition, Technology, and Facilities; Could escalate to Office of Inspector General	
DOS		Report allegations of compromise of scientific integrity up chain of command, use civil service or foreign service grievance systems, use dissent channel, or report to Office of Inspector General	
USAID	Bureau of Policy, Planning and Learning and Global Development Laboratory		
USDA	Chief Scientist (a position designated as being held by the Undersecretary for Research, Education and Economics); The Departmental Scientific Integrity Officer (DSIO) assists the Chief Scientist.	Office of Chief Scientist	DSIO may convene a Department-level panel to review, and make recommendations regarding, alleged scientific integrity concerns.*** The USDA Science Council, chaired by the Chief Scientist, is consulted and provides direction on scientific integrity policy.

\* NIST Suborder 1801.01, Review of Scholarly and Technical Manuscripts Intended for Publication, 07/26/2016; NIST Suborder 1801.02, Review of Data Intended for Publication, 7/26/2016; NIST Suborder 1801.03, Review of Software Intended for Publication, 7/26/2016; and NIST Suborder 1801.04, Review of Scholarly and Technical Videos Intended for Publication, 7/26/2016.

\*\* NOAA Scientific Integrity Committee Terms of Reference dated June 2015.

\*\*\* USDA Departmental Manual 1074-001 – “Procedures for Responding to Allegations of Compromised Scientific Integrity.”

## **D. Relationship with Research Misconduct**

As previously noted, some agencies perceive a close relationship between scientific integrity and research misconduct. DOI and NOAA, for example, have merged scientific integrity and research misconduct into one policy. These agencies view research misconduct as a component of scientific integrity.

Agencies that incorporate research misconduct into their definition of scientific integrity define “scientific integrity” in broader terms than those described in the OSTP Memorandum. These agencies use the term scientific integrity to describe an ecosystem of policies and practices that contribute to the conduct of sound and objective science and the quality of scientific data and findings. As noted previously, NIH’s scientific integrity policy references its research misconduct, peer review and conflict-of-interest policies, viewing them as integral to achieving scientific integrity in the research conducted and funded by NIH. EPA observes that a variety of sources contribute to scientific integrity. These include scientific misconduct policies, public affairs, conflict resolution, laboratory accreditation, environmental statutes, data access, peer review and advisory committees, ethics, employment law, professional development, and quality assurance.

Criteria and procedures for findings of research misconduct may be able to be adopted for allegations of loss of scientific integrity. In addition to setting forth a uniform definition, the 2000 Federal Research Misconduct Policy addresses the evidence needed to support a finding of research misconduct:

- There must be significant departure from accepted practices of the relevant research community.
- The misconduct must be committed intentionally, knowingly, or recklessly.
- The allegation must be proven by a preponderance of evidence.

The Federal Research Misconduct Policy also describe stages in the handling of an allegation of research misconduct—inquiry and investigation, standards which have been adopted by agencies such as DOI that include research misconduct under scientific integrity. One difference noted between research misconduct and scientific integrity is that loss of scientific integrity may arise from an insufficiently rigorous scientific process and not any wrongdoing by a specific individual.

There are also agencies that view scientific integrity as distinct from research misconduct. Many agencies already had research misconduct procedures in place following the issuance of the 2000 Federal-wide policy and developed distinct scientific integrity policies to implement the OSTP Memorandum. For example, NSF views its scientific integrity policies and procedures as distinct from those for research misconduct. NSF’s scientific integrity policy applies solely to NSF staff activities and is focused on

public affairs officials' communication of science information to the public. Senior staff in the NSF Director's Office have overall responsibility for the scientific integrity policy. In contrast, NSF's research misconduct policy applies exclusively to extramural research. Under NSF's regulation, research misconduct investigations are handled by the Office of Inspector General and NSF's Deputy Director handles the adjudication of research misconduct cases.<sup>14</sup> An appeal may be filed with the NSF Director.<sup>15</sup>

It is not clear that there are specific advantages or disadvantages to incorporating the definition of research misconduct into the definition of scientific integrity or using similar procedural approaches. Flexibility may be needed to account for cross-agency differences in culture, mission and organizational structure. Agencies noted that they already have policies and procedures in place to address research misconduct and scientific integrity and that they should retain flexibility on how to approach research misconduct and scientific integrity.

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<sup>14</sup> NSF's research misconduct regulation, 45 CFR Part 689.

<sup>15</sup> Title 45 CFR Section 689.9.



## 4. Policy and Implementation: Toward Good Practices

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STPI synthesized the input from its review of agency policies and interviews with key staff to identify potential good practices for discussion at the workshop. A session on Policy and Implementation: Toward Good Practices provided an opportunity to discuss these and identify additional good practices. The session consisted of four breakout discussions:

- *Promoting a culture of scientific integrity*: Honesty and rigor to produce high-quality scientific information, convey importance of scientific integrity to agency, and internal agency training.
- *Avoidance of political interference*: Both internal and external to the agency and strengthening the actual and perceived credibility of government research.
- *Public communication*: Including communication of scientific and technical information to the media and the public and transparency of decision-making.
- *Professional development of government scientists and engineers*. Continued learning, attendance at professional conferences, authorship of peer-reviewed journal articles and participation on professional or scholarly societies.

Agencies noted that given the variation in culture, organizational structure, and mission of each agency, perspectives on various scientific integrity issues differed, and so a good practice for some agencies may not be a best practice for all agencies. With this caveat, the following were identified as potential good practices:

### A. Practices to Encourage a Culture of Scientific Integrity

- Train agency scientists and managers in both scientific and nonscientific components on scientific integrity, and customize the training to the intended audience. Training promotes a culture of scientific integrity and provides guidance on how to operationalize scientific integrity principles in daily work.
- Issue periodic newsletters or bulletins on scientific integrity developments to remind personnel throughout the agency of the importance of scientific integrity.
- Provide guidance on good authorship practices to prevent authorship disputes. Although authorship disputes may not be covered by scientific integrity policies, several agencies have issued guidance to ensure appropriate credit for authorship.

- Conduct independent peer review of scientific findings and conclusions that will serve as basis for agency decision-making as appropriate. Workshop attendees discussed the need for standard procedures for peer review within the agency, and ensuring robust peer review for contractor-produced scientific products.
- Encourage employees to express disagreement with scientific findings or interpretations. Several of the codes of scientific conduct encourage a professional discourse on differing scientific views. Two agencies delineate a process to resolve differences in scientific opinion.

## **B. Practices to Avoid Political Interference**

- Develop a written statement of policy and adopt supporting policies to prohibit political interference with scientific findings (e.g., one agency enacted regulations to prevent public affairs officials from politically interfering with agency scientist's communication with the media).
- Appoint senior-level civil servants with adequate perceived and actual authority to serve as agency scientific integrity officers and on review panels to address allegations involving high-level political officials. Some agencies have assigned responsibility for scientific integrity to their highest-level nonpolitical officials. USDA, DOI, and NOAA elevate allegations of breaches of scientific integrity by high-level political officials to a departmental scientific integrity officer.
- Call upon other agencies to conduct investigations into alleged breaches of scientific integrity involving high-level political officials, if needed.
- Establish a clearance process for agency scientific products that includes review timelines to ensure timely publication and release. EPA is an example of an agency that has established such a process.
- Establish a statement on the right of scientific review: scientists or researchers have the right to review, amend, or comment on the final version of any document or publication that significantly relies upon their work. Providing scientists and engineers with the right to scientific review provides another layer of checks to ensure sound science is being produced and disseminated within agencies.
- Provide clarity between science and policy decisions, such as demarcating where the scientific process ends and the policy process begins.
- Adopt a comprehensive approach to avoiding political interference. EPA has identified five key areas to prevent political interference with scientific findings: transparency, awareness, adjudication, implementation, and assessments.

### **C. Practices for Public Communication**

- Allow employees the right to express personal opinions to the public provided they clarify that they are not official agency positions. Some agencies such as EPA and NOAA provide employees with the right to express personal opinions to media, public, or on social media, provided that they make an explicit disclaimer that the opinion voiced is in the scientist's private capacity and does not represent official agency policy. Adopting such a practice is not straightforward: there are challenges associated with distinguishing a scientist's personal opinion from the agency's official position.
- Develop a policy on the use of social media to communicate with the public. The DOC, FDA, and the NSF have issued social media policies.<sup>16</sup> Of note is FDA's issuance outlining expectations for using social media on behalf of the agency. FDA employees are encouraged to use social media technologies to enhance communication, collaboration, and exchange of information with the public that may benefit public health. The policy recognizes the right of employees to express their personal views via social media, provided that they comply with applicable principles, guidelines, and standards of conduct; clarify that they are not speaking for the agency; and do not disclose nonpublic information.
- Provide agency guidance on how scientific results are communicated to the public. The DOC has provided additional guidance on the topic of public communications and addresses official and unofficial communications, communication with the media, and describes agency-specific roles and responsibilities with regards to public communication.
- Establish intra-agency clearance procedures to clarify political appointees' role in communication of scientific findings.

### **D. Practices for Professional Development**

- Encourage scientists to participate and engage with the broader scientific and scholarly community while complying with conflict of interest and other legal requirements. This requires a balance between avoidance of conflict of interests and the need for employees to continue to have professional development

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<sup>16</sup> DOC, Office of the Chief Information Officer, "Policy on the Approval and Use of Social Media and Web 2.0 (SM/W2.0)," December 9, 2010, <http://www.osec.doc.gov/webresources/socialmedia/>; FDA, "FDA Social Media Policy," November 2015, <http://www.fda.gov/AboutFDA/AboutThisWebsite/WebsitePolicies/ucm472483.htm>; and NSF, "National Science Foundation (NSF) Social Media: Comment Policy, Disclaimer, Privacy, Copyright," accessed November 4, 2016, <https://www.nsf.gov/social/policies.jsp>.

opportunities. It is important not to unduly restrict participation of scientists from engaging with the broader scientific community because it will hinder agency efforts to recruit and maintain high-quality scientists.

- Provide scientists opportunities to continue education and attend professional conferences to maintain current expertise in their field. For example, FDA has established an Office of Scientific and Professional Development within the Office of Chief Scientist dedicated to professional development of scientists.
- Encourage professional development. For example, NOAA encourages its scientists to be leaders in the scientific community and states in its policy that its scientists are its greatest asset.
- Be flexible in agency approaches to enabling scientists to participate in outside activities. For example, scientists may be able to serve on a nonprofit board if they refrain from directly participating in budget discussions, lobbying efforts, or preparing proposals for funding from their agencies. If scientists are restricted from serving on a board in an official capacity, agencies should explore other options, such as allowing the scientists to serve as liaison to the board or participate in board meetings in a personal capacity.
- Issue policy guidance to facilitate participation in outside professional activities.

As an example, the DOC has issued updated “Guidelines for Authorizing Department of Commerce Employees to Serve as Officers or Board Members of Nonprofit Organizations on Behalf of the Government” on June 30, 2016. The policy encourages managers throughout the department to consider appointment of employees to serve with nonprofit organizations in appropriate circumstances and consistent with the guidelines.<sup>17</sup> Factors to consider include whether the nonprofit organization has a broad agenda and whether its policy positions are generally consistent with that of the agency, whether appointment to the nonprofit organization will create any concerns in view of the employee’s seniority and duties, whether sufficient resources are available to assign the employee to the organization, and whether the employee’s regular government duties will include participation in any agency decisions that have a direct financial effect on the organization. Policy guidance such as the DOC revision offers additional support for scientists considering positions in professional organizations, especially given the 2013 rule change by the OGE which removed the requirement of scientists to have conflict of interest waivers from the agency. Further information on conflict of interest with regards to appointments in professional societies is provided in Chapter 5.

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<sup>17</sup> DOC, “Guidelines for Authorizing Department of Commerce Employees to Serve as Officers or Board Members of Nonprofit Organizations on Behalf of the Government,” June 30, 2016, [https://ogc.commerce.gov/sites/ogc.commerce.gov/files/official\\_service\\_with\\_nonprofits-6-29-16.pdf](https://ogc.commerce.gov/sites/ogc.commerce.gov/files/official_service_with_nonprofits-6-29-16.pdf).

## 5. Current and Emerging Issues in Scientific Integrity

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Interviews with agency scientific integrity officials identified a number of emerging issues that formed the basis for four breakout sessions at the workshop:

1. **Relationship between scientific integrity, research misconduct, and other agency policies.** Some agencies have incorporated the definition of research misconduct into their definition of scientific integrity. Other agencies have adopted their procedures for handling allegations of research misconduct for handling allegations of breach of scientific integrity. (This relationship is discussed in Chapter 3.)
2. **Coverage of scientific integrity policies: intramural versus extramural research.** As noted above, some agencies expect contractors or grantees who influence agency scientific activities or communicate scientific information to the public to comply with their scientific integrity policies. These agencies are contemplating including compliance provisions in their contract or grant instruments. (This topic is addressed in Chapter 3.)
3. **Conflict of interest.** Despite a recent change in the Government of Ethics rule, some agencies still experience conflict-of-interest challenges with respect to employees serving on nonprofit boards.<sup>18</sup>
4. **Interface between scientific integrity and other agency policies.** When an allegation of a scientific integrity breach is filed, agencies need to determine if the allegation falls within the scope of scientific integrity or if it should be addressed under a related agency policy, such as data quality, research misconduct, disputes over authorship, protection of human subjects, conflict of interest, or fraud, waste, and abuse. Additional complexity arises when the

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<sup>18</sup> Workshop participants also discussed issues on whistleblower protections. The Presidential and OSTP Memoranda both note that agencies should adopt appropriate protection for whistleblowers. The workshop background paper noted that two recent Federal court decisions have interpreted the scope of the whistleblower statute. The U.S. Supreme Court held in *Department of Homeland Security v. MacLean*, 135 S. Ct. 913 (2015), that the word “law” in the Whistleblower Act’s “right-to-disclose” provision in 5 U.S.C. Section 2302(b)(8)(A) refers to a statute, not a rule or regulation. The U.S. Court of Appeals for the Federal Circuit held in *Rainey v. Merit Systems Protection Board*, No. 15-3234 (Fed. Cir. June 7, 2016), that the whistleblower protection right to disobey provision in 5 U.S.C. Section 2302(b)(9) is limited to refusal of any employee to carry out an action that violates a Federal statute. Agencies may want to evaluate whether these cases affect their scientific integrity policies.

subject of a personnel action alleges that the personnel action itself is a breach of scientific integrity.

Because the first two topics are addressed in Chapter 3, this chapter addresses the remaining two emerging issues: conflict of interest and the interface between scientific integrity and other agency policies. Workshop participants identified one additional issue for future consideration in efforts to advance scientific integrity—coordination of scientific integrity matters that involve more than one agency. This chapter also briefly explores that issue.

## **A. Conflict of Interest**

Title 18 U.S.C. Section 208(a) prohibits Federal employees from participating in an official capacity in a particular government matter in which they have a financial interest, if the matter would have a direct and predictable effect on the interest. The Department of Justice’s Office of Legal Counsel issued an opinion in 1996 finding that Section 208(a) prohibits Federal employees from serving in their official capacities as officer, director, or trustee of nonprofit boards unless they have a waiver from his/her agency.

The OSTP Memorandum specifically called for policies to “[a]llow full participation in professional or scholarly societies, committees, task forces and other specialized bodies of professional societies, *including removing barriers for serving as officers or on governing boards of such societies* [italics added for emphasis].

In response to the OSTP Memorandum, the Office of Government Ethics (OGE) issued a final rule on April 5, 2013, creating a new exemption, finding that the financial interest of a nonprofit organization does not impute to a Federal employee that serves as an officer or director. OGE concluded that such financial interests are too remote or inconsequential to affect the integrity of employees’ services.

An agency waiver is therefore no longer required for employees to serve on nonprofit boards. To avoid conflicts of interest, though, employees are still required to consult with ethics officials to serve in an official capacity on a governing board or as officers of an outside organization. Each agency has discretion to limit or condition an employee’s participation on a governing board or as an officer in his/her official capacity in a manner consistent with the needs and interests of the agency. There are limitations on Federal employee participation on a nonprofit board in an official capacity. For example, Federal employees cannot use their government positions to award funding to any nonprofit organizations on which they serve. Other limitations include lobbying, fundraising, regulatory, investigational, or representational activities.

Despite the OGE rule change in 2013, Federal employees in some agencies may still experience conflict-of-interest challenges to participation in outside activities. Ethics

officials may still be restrictive about allowing employees to serve on nonprofit boards. Representational issues continue to pose challenges.

As discussed in Chapter 4, workshop participants noted that it is important to encourage scientists to participate and engage with the broader scientific and scholarly community while complying with conflict of interest and other legal requirements. Agencies noted that it is important not to unduly restrict participation of scientists from engaging with the broader scientific community. Onerous restrictions can also hinder efforts to recruit high-quality scientists. To achieve the right balance, FDA has issued procedures and guidance to facilitate participation in outside professional activities. According to FDA, this has resulted in greater participation of FDA scientists in outside activities, without increasing concerns about conflicts of interest.

Several agencies have issued guidance to facilitate participation on nonprofit boards. For example, DOC issued updated “Guidelines for Authorizing Department of Commerce Employees to Serve as Officers or Board Members of Nonprofit Organizations on Behalf of the Government.” The policy encourages managers throughout the Department to consider the appointment of employees to serve with nonprofit organizations in appropriate circumstances in ways consistent with the guidelines.<sup>19</sup> Factors to consider include whether the nonprofit organization has a broad agenda and whether its policy positions are generally consistent with that of the agency, whether appointment to the nonprofit organization will create any concerns in view of the employee’s seniority and duties, whether sufficient resources are available to assign the employee to the organization, and whether the employee’s regular government duties will include participation in any agency decisions that have a direct financial effect on the organization.

NSF also has guidance for its scientists regarding service as officers or board members of nonprofit organizations.<sup>20</sup> NSF sets forth the following conditions for NSF scientists who wish to serve as officers or board members as part of their official duties: (1) provide the Office of General Counsel with an email from their supervisors granting permission to serve; (2) refrain from representing the organization to the Federal Government; (3) do not receive compensation and adhere to restrictions on fundraising and receipt of gifts from outside sources; (4) refrain from lobbying; (5) do not share nonpublic information with the organization; (6) recuse themselves from organization matters involving NSF or other Federal agencies; (7) refrain from participating in any NSF proposal, award, contract, or other financial support to the organization and from being named in any proposal submitted by the organization for Federal funds; (8) use the

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<sup>19</sup> DOC, “Guidelines for Authorizing Department of Commerce Employees to Serve as Officers or Board Members of Nonprofit Organizations on Behalf of the Government.” [https://ogc.commerce.gov/sites/ogc.commerce.gov/files/official\\_service\\_with\\_nonprofits-6-29-16.pdf](https://ogc.commerce.gov/sites/ogc.commerce.gov/files/official_service_with_nonprofits-6-29-16.pdf).

<sup>20</sup> NSF, email dated September 13, 2016, from Assistant General Counsel, Ethics, to Anita Eisenstadt, IDA Science and Technology Policy Institute (STPI).

sponsored travel procedure if the organization offers to pay travel expenses; (9) report the position on their financial disclosure report; (10) seek guidance from conflict officials before handling matters in which fellow board members or officers are involved; and (11) limit participation in financial decisions of the organization. In addition, scientists are subject to post-employment restrictions on representing the organization back to the government on matters in which they personally and substantially participated in on behalf of the organization.

Scientific integrity officials encourage ethics officials to use a flexible approach to enable scientists to participate in outside activities. For example, a scientist may be able to serve on a nonprofit board if the scientist refrains from directly participating in budget discussions, lobbying efforts, or preparation of proposals for funding from his/her agency. If a scientist is restricted from serving on a board or as an officer in an official capacity, agencies can explore other options to enable the scientist to participate in the activity, such as serving as a liaison to the board or participating in the board meeting in a personal capacity. Including case studies on service on an outside board in agency conflict-of-interest and scientific integrity training can also provide scientists a better understanding of how to navigate the rules.

## **B. Interface between Scientific Integrity and Other Agency Policies**

This topic has two dimensions. The first is the interface between scientific integrity as described in the OSTP Memorandum and other agency policies that promote the integrity of scientific research. Several of the principles delineated in the Presidential and OSTP Memoranda had already been addressed in existing agency policies on topics such as conflict of interest, scientific codes of conduct, research misconduct, protection of human subjects, animal welfare, data quality, Federal Advisory Committee procedures, and fraud, waste or abuse. Accordingly, several of the agencies' scientific integrity policies reference or compile these related policies, provide links for additional information on these policies, and delineate which organizational entity is responsible for compliance with these policies. For example, several scientific integrity policies note that the Office of Inspector General is responsible for allegations of waste, fraud, and abuse. Agencies that already had scientific codes of conduct in place before the issuance of the OSTP Memorandum incorporated these codes into their scientific integrity policies and include a violation of the scientific code of conduct as a breach of scientific integrity.

Also noteworthy are Federal policies that have been issued since the OSTP Memorandum that promote public access to government-generated scientific information. These include the Office of Management and Budget's Memorandum "Open Data Policy – Managing Information as an Asset" (M-13-13), May 9, 2013; Executive Order, "Making Open and Machine Readable the New Default for Government Information," May 9, 2013; and OSTP Memorandum "Increasing Access to the Results of Federally Funded Scientific

Research,” February 22, 2013.<sup>21</sup> These policies complement the goals of the OSTP Memorandum to promote public access to scientific information, promote transparency in government, and enhance public trust in the science underlying Federal decision-making. Several agencies consider these policies to be part of a broader definition of scientific integrity.

The second dimension of the overlap between scientific integrity and related policies relates to the handling of allegations of breach of scientific integrity. When an allegation of scientific integrity is filed, agencies often need to conduct an initial assessment to determine whether the allegation falls within the scope of scientific integrity policy or whether it should be addressed under a related agency policy. Different entities within the agency may have primary responsibility for investigating or addressing the issue, depending upon how the issue is characterized. Further, different procedures or appeal rights may apply, depending upon the nature of the allegations.

Another complexity arises when the subject of a personnel action alleges that the personnel action itself is a breach of scientific integrity. Communication and coordination among relevant agency personnel, such as the agency’s Office of General Counsel, scientific integrity officers, the Office of Inspector General and the Office of Human Resources are needed when a personnel action is related to allegations of breach of scientific integrity. Some effort may be required to distinguish personnel issues from scientific integrity issues.

Ongoing communication between the different components of an agency involved in personnel and scientific integrity matters (e.g., Human Resources, Office of General Counsel, Scientific Integrity Officers, and Office of Inspector General) can help ensure consistency and coordination among the various agency components.

### **C. Coordination of Scientific Integrity Issues Involving Multiple Agencies**

The OSTP Memorandum focuses on scientific integrity processes within individual agencies and that it does not directly address scientific integrity matters involving multiple agencies. For example, the OSTP Memorandum does not provide a mechanism for addressing scientific integrity issues arising when there is a conflict between scientific findings made by one agency and the policy decisions at another agency that are based upon the same scientific findings. In such cases, a resolution process at an interagency level may be required. In addition, the OSTP Memorandum does not delineate a coordination

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<sup>21</sup> These policies can be found at <https://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf>; <https://www.whitehouse.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government-> and <https://www.whitehouse.gov/blog/2016/02/22/increasing-access-results-federally-funded-science>.

process for handling allegations of breach of integrity involving individuals at multiple agencies. Further interagency discussion on this topic may be warranted.

## 6. Potential Future Steps

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During the final session of the workshop, participants were asked to suggest future agency and collective steps that might be taken to enhance implementation of scientific integrity policies. Participants identified four areas for future action:

- **Sharing and pooling agency resources.** Agencies expressed a strong interest in sharing tools and pooling resources, especially with regard to training and measuring outcomes. EPA and USDA offered to share their training tools with other agencies. EPA also offered to inform agencies about work to measure success of its implementation of the scientific integrity policy, including development of a logic model and survey. EPA strives for four outcomes: public trust, increased transparency, scientific conclusions not influenced by political or policy implications, and whether its scientists are able to do their best work.
- **Periodic interagency meetings to share good practices, challenges, and solutions in implementing scientific integrity policies.** Agencies also expressed an interest in establishing a community of practice that could meet periodically and share good practices, challenges, and solutions in implementing scientific integrity policies. Some agencies noted that an existing interagency working group originally dedicated to research misconduct issues has expanded its scope to address scientific integrity and could serve as a forum for these discussions.
- **Continue to emphasize importance of scientific integrity.** Agencies highlighted the continued importance of scientific integrity. They recommended highlighting agencies' accomplishments to-date in meeting the objectives of the OSTP Memorandum and their continuing efforts to support scientific integrity.
- **Further discussion regarding what constitutes scientific integrity.** A topic worthy of further collective consideration is the variation in agencies' definition and use of the term "scientific integrity." Some agencies are currently using the term to capture the full range of activities that affect the integrity of scientific research and scholarly activities, including conflicts of interest, research misconduct, data quality, protection of human subjects, animal welfare, and data sharing. These activities contribute to the integrity of the scientific process, but many are beyond the scope and focus of the OSTP Memorandum. Given the different use of terminology among agencies, further interagency discussions would be useful to distinguish the relationship between the objectives of the

OSTP Memorandum and these broader concepts of scientific integrity. In the future, it might also be worth examining the broader concept of activities that affect the integrity of science to determine whether additional policy development or guidance is needed across agencies. Such a discussion should also take into account other policies that existed before the issuance of the 2010 OSTP Memorandum, as well as those that have been issued since.

## Abbreviations

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CDC	Centers for Disease Control and Prevention
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DOE	Department of Energy
DoEd	Department of Education
DOC	Department of Commerce
DOD	Department of Defense
DOJ	Department of Justice
DOI	Department of the Interior
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
DSIO	Departmental Scientific Integrity Officer
EPA	Environmental Protection Agency
FAC	Federal Advisory Committee
FACA	Federal Advisory Committee Act
FDA	Food and Drug Administration
MMC	Marine Mammal Commission
NASA	National Aeronautics and Space Administration
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NSF	National Science Foundation
NSTC	National Science and Technology Council
OCS	Office of the Chief Scientist
OGE	Office of Government Ethics
ODNI	Office of the Director of National Intelligence
ORI	Office of OSTP Office of Science and Technology Policy
S&E	science and engineering
S&T	science and technology
STPI	IDA Science and Technology Policy Institute
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VA	Department of Veterans Affairs



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