"POLICY WRAPPERS" FOR S&T FINDINGS

By Duane Blackburn



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Communicating science with integrity entails effective and transparent communication of scientific information to decision-makers, the media, and the American people.¹

The National Science and Technology Council (NSTC), Scientific Integrity Task Force

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Developing effective and beneficial policies on science and technology (S&T) matters first requires an accurate understanding of the underlying scientific topic and the issues associated with its application. Scientists, however, have not traditionally viewed policymakers as one of their audiences, and thus have not typically described their findings in a way that would ensure that nontechnical audiences properly understand the basics and potential ramifications of their work.

Others often step into this void, attempting to explain scientific findings to policy communities even if they do not have the wisdom or desire to do so accurately. This can lead to policies being enacted based on false evidence, which can have negative ramifications for both the nation and the future direction of scientific inquiry.

This is a long-term, community-wide failure, the negative impacts of which have significantly increased over the past few years due to the rise in mis- and disinformation from influencer organizations, news entities, and everyday citizens on social media. The new practice called for by the NSTC adds a responsibility for federally funded scientists to explain their findings to nonexpert communities, including policymakers, in nonscientific and easily understandable terms.

Analyzing the Problem

The discovery and community-wide acceptance of new scientific information is a complicated process that is dissimilar to how policymakers and everyday citizens receive and analyze materials. Properly assessing and understanding scientific information is time-consuming and difficult, even for scientists. Each new result must be scrutinized and picked apart by the community before it can be trusted, with issues routinely presenting themselves even in peer-reviewed publications (such as an inability to replicate others' findings or references making claims that aren't supported by the original documents).

To aid this process, scientists predominantly write to inform (and, yes, to impress) other scientists in their field of study. They sometimes use verbiage specific to their community, even though some terms may have different (or multiple) meanings externally. Doing so is an important aspect of advancing science, but also creates issues for the policy community and general public as they seek to understand and leverage new discoveries in their work.

For example, A 2021 National Academy of Sciences (NAS) review panel of the Information Technology Laboratory at the National Institute of Standards and Technology (NIST/ITL) selected this issue as an area for recommended attention for the agency.² In discussing the effectiveness of its Information Access Division's (IAD's) outputs, the NAS panel remarked that "IAD has identified 'researchers who are developing technology' as its primary stakeholder, and their research and dissemination of findings are clearly driven by and support this group.... The range of outputs provided, such as published papers, data sets, technical briefings, tools, and guidelines, vary to meet the needs of individual technology areas so that IAD is positively impacting their advancements to support government and nongovernment needs." However, the NAS panel also remarked that "IAD identified Congress and policymakers as its secondary stakeholder and recipients, users, and consumers of technology as its third. For the most part, IAD's outputs are not driven by, nor are they effective

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There should be widespread training for agency scientists so they can communicate scientific findings effectively to nonscientists in their agencies and to lay audiences, with the idea of helping ensure that policies and actions are based on an accurate understanding of the science.⁵

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for, these stakeholders. ... Indeed, these entities are usually required to analyze IAD's technical outputs themselves and determine their relevance and meaning, often resulting in misinterpretations, because these very technical outputs are not understandable by a variety of non-expert audiences." The NAS panel felt that NIST/ITL, like virtually every other R&D organization, had not adequately prioritized nonscientific audiences and failed to provide tailored insights so that they can be rapidly and accurately understood.

Scientific literature also typically has an air of finality and absolute correctness, as scientists attempt to convince their peers in advance of the pending community-wide scrutinization of their work. This can lead to nonscientists prematurely believing in an individual work's stated findings; also, it is notoriously difficult for anyone to accurately envision the future ramifications of a new discovery within realworld applications. When these assumptions prove inaccurate, it leads to poorly formed policies and public mistrust.

In MITRE's own input to the NSTC's Scientific Integrity Task Force, we wrote, "Enhancing the public's trust in Federal science requires two thrusts: (1) ensuring the integrity of the science itself (including how it is communicated to other scientists and used in operations) and (2) ensuring the science is being explained properly to nonscientific audiences. The majority of the government's prior scientific integrity endeavors, and indeed this Request for Information from the task force, predominantly focuses on the first thrust. That is an understandable first step as it is foundational to the effort. But going forward, MITRE recommends significantly enhancing efforts on the second front as well, as this is the part that the public actually sees and drives their individual analyses."³ We are happy that the Task Force agreed and added a new principle in this regard.

A Proposed New (but Easy) Step to Help Overcome the Problem

The question now is, how can scientists best communicate their findings to their peers while also ensuring that nonexpert audiences also understand their findings? An easy, yet likely impactful, approach would be for scientists to develop a "policy wrapper" document adjacent to their technical publications to explain the scientific findings in a manner that is easy for policymakers (and those who seek to influence them) to understand and leverage—while keeping the core paper written for the scientific community. Each policy wrapper document would be no more than one to two pages in length and would be written predominantly by the originating technical authors, with assistance from someone with policy experience (to help ensure its usefulness to that community). Core sections within the policy wrapper document should include:

- What's the issue? Briefly discuss the scientific issue, but from the viewpoint and background of the targeted policymakers. Start the discussion from where *they* are.
- What did we do? Briefly discuss the setup and implementation of the scientific work. While this is a critical and often extensive aspect of the core technical paper, it shouldn't be for the policy wrapper. Policymakers need to know the basics, and how the concepts are aligned with fundamental scientific principles and should thus be trusted.
- What did we learn? Discuss the core findings in *nontechnical terms*. Be sure to include discussion of when the results are relevant and when they are not, as well as the authors' certainty in the findings. Context is critical for policy deliberations help the policymakers understand it properly.
- What does it mean? This would likely be the lengthiest aspect of the policy wrapper document. Authors must first put themselves in the policymaker's shoes by considering the deliberations they are having and then share in the document insights into the technical findings that should influence policymakers' thinking or

future actions. Be mindful to not oversell this analysis—in most every situation of actual policymaking, there are many considerations beyond just the science.⁴

 Link to the technical paper. Make it easy for those who have only the policy wrapper document to find the full technical paper for more in-depth study.

Scientists and organizations that utilize this policy wrapper concept will not only be able to provide insights to scientific audiences, but also help to ensure that their results are properly understood and leveraged by the policy community and public audiences. Understanding not only the science but also its policy applications is a critical aspect of ensuring scientific integrity and national advancement.

About the Author

Duane Blackburn leads science and technology policy for MITRE's Center for Data-Driven Policy, which brings objective, evidencebased, nonpartisan insights to government policymaking. Mr. Blackburn previously served for eight years (across two administrations) in the White House Office of Science and Technology Policy (OSTP).

For more information about this paper or the Center for Data-Driven Policy, contact <u>policy@mitre.org</u>.

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² An Assessment of Selected Divisions of the Information Technology Laboratory at the National Institute of Standards and Technology: Fiscal Year 2021. National Academies of Sciences, Engineering, and Medicine, <u>https://doi.org/10.17226/26354</u>.

³ Response of The MITRE Corporation to the OSTP RFI to Improve Federal Scientific Integrity Policies. 2021. MITRE, <u>https://www.mitre.org/</u> <u>publications/technical-papers/response-of-the-</u> <u>mitre-corporation-to-the-ostp-rfi-to-improve-</u> <u>federal-scientific-integrity-policies</u>

⁴ Ibid.

⁵ White House Office of Science & Technology Policy Releases Scientific Integrity Task Force Report. 2022. The White House, <u>https://www.whitehouse.gov/ostp/news-</u> <u>updates/2022/01/11/white-house-office-of-</u> <u>science-technology-policy-releases-scientific-</u> <u>integrity-task-force-report/</u>. Last accessed February 13, 2022.

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