

SCIENTIFIC INSIGHT AND INTEGRITY

The American Chemical Society (ACS) strongly supports the use of comprehensive scientific and engineering input into the development and evaluation of policy options. ACS also encourages the use of scientific integrity policies that help federal, state, local, and tribal governments obtain and integrate scientific assessments into policy development and implementation.

Scientific integrity refers to the adherence to ethical and professional standards and the principles of honesty and objectivity throughout the entire scientific process. This includes conducting research, managing scientific activities, utilizing research findings, and communicating about scientific endeavors. It involves maintaining transparency, rigor, and accountability in all aspects of the scientific process, including data collection, analysis, and reporting. Upholding scientific integrity, which has always been a hallmark of great innovation and paramount for economic success, is essential for ensuring the credibility, reproducibility, and trustworthiness of scientific findings.

The growing use of Artificial Intelligence (AI) and large language models in scientific research, communication, and education has exciting potential. However, disclosure, transparency, and accountability regarding their use are crucial for upholding the integrity of research and the scholarly record. Specifically, the use of AI tools must be clearly described. AI has potential to both exacerbate and reduce social inequality; efforts must be made to enhance the greater good for all. As AI tools evolve and become more integrated in the sciences, ACS will continue to be vigilant on how this impacts the process of science and make specific recommendations accordingly.

Scientific integrity – including the independence of the scientific process and the rigorous application of science-based knowledge – must be upheld throughout all levels of government as noted in the Open, Public Electronic and Necessary (OPEN) Government Data Act. We recommend that scientists and engineers provide comprehensive, transparent, unbiased, reproducible, and understandable technical analyses. Policymakers should therefore consider relevant technical information in a transparent manner, minimizing bias.

As stated in the National Academies of Sciences, Engineering, and Medicine’s recent report, *Fostering Integrity in Research*

“...as science is called upon to inform decision making there is more risk of research being invoked in controversies, misrepresented, or shaped to advance a desired political outcome, contributing to poor decision making and loss of public trust.”

To clarify and strengthen the role of science and the integrity of its use in development of public policy, ACS recommends the following:

Use of Scientific Information and Evidence by Federal, State, Local, and Tribal Governments

- All branches of government must regularly review and improve their procedures for obtaining and utilizing unbiased scientific and technical input for policy development.

- Executive, legislative, and judicial branches of the federal government, as well as state, local, and tribal governments must make use of transparent science, technology, and policy analyses performed by qualified professionals including direct testimony from diverse technical experts on scientific issues.
- Legislative hearings about the science used to inform the crafting of laws and regulatory decisions should be encouraged, because this open dialog will provide the best basis to identify the nature and certainty of knowledge about technical issues.
- Government agencies should form advisory committees of credible experts with diverse backgrounds to guide decision making. Committees must reduce or eliminate conflict of interest (COI) concerns by clear disclosures of potential COIs such as employer, professional or political affiliations, prior policy positions, and funding sources.
- Government agencies must uphold clear conflict of interest policies. Potential conflicts of interest and bias among researchers and other experts involved in policy development and assessment should be handled transparently and fairly.
- Government agencies should clearly and transparently identify needed scientific information for policy decision making; gather it in a consistent, unbiased, and timely manner; and protect intellectual property, confidential information, and privacy rights.
- Program leaders should be responsible for weighing the advice of the committee, making decisions, and documenting rationales for decisions made.

Scientific Processes and Procedures

- Agencies that conduct or fund scientific research must establish and maintain scientific integrity policies that can ensure the objectivity, clarity, and reproducibility of the scientific information, and that provide protection against bias, fabrication, falsification, plagiarism, interference, and censorship. Agencies providing funding must make adherence to these policies a requirement for receiving funding.
- Scientific discourse must be encouraged; such discourse is purposely designed to question what is known and consider various scientific perspectives and interpretations, validated through the proper and unbiased application of the scientific method.
- Scientists and their institutions should not be burdened by repetitive requests for information and explanation such as excessive Freedom of Information requests.

Data Quality, Use, Review, and Preservation

- Government policy analysts must ensure that scientific input incorporates and references all relevant, reputable peer-reviewed sources, emphasizing the primary literature whenever possible.
- Quantitative scientific input with identified uncertainty and sensitivity analyses should be the norm. Conflicting results should be documented and, to the extent possible, quantitatively assessed, evaluated, and reconciled by experts.
- Cross-agency communication is encouraged and should be as transparent as possible.
- Government agencies should archive, protect, and provide sustained access to scientific data and scientific databases consistent with the Open, Public, Electronic, and Necessary (OPEN) Government Data Act. Preservation of data and transparency are critically important for scientific integrity.

Scientific Access and Advice

- Government employed or funded scientists and engineers should be empowered to pursue professional development, present their unclassified research at appropriate technical symposia, and publish in peer-reviewed journals without interference.
- Government researchers should be allowed to discuss their published, peer-reviewed research with the media and the public. When they comment publicly on policy options informed by their research and general technical knowledge, they should clearly state that they are offering their own opinions and not speaking for any government agency.
- When government agencies must prevent their employees, grantees, and/or advisors from commenting publicly on scientific results or policies, restrictions should be transparent and consistently enforced. Appeal processes should be easily available and timely.