
WILL SCIENCE ENDURE WITHOUT INTEGRITY?

by Ed Styskel
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I am a scientist, college-trained and employed as a wildlife biologist for 40+ years. I'm accredited as a Certified Wildlife Biologist® by The Wildlife Society, meaning that my education and experience qualify me to represent my profession as an ethical practitioner in applying the principles of ecology to conserve and manage wildlife and habitats.

My career path—first with the USDA Forest Service, then as a private consultant—began with great excitement and nearly as much anxiety, and culminated after countless opportunities and memorable experiences. I now have a much better understanding of the true values of science and dedication by scientists than at the start of my professional career. These factors are my reasons for researching and sharing this essay about the ways that scientists and their work have been ignored, silenced, corrupted, or intimidated by some politicians and commercial interests.

Officials of federal, state, county, and city government regularly make policy decisions about issues that affect everyone's health, safety, and environment. Common sense dictates that good decisions require the best information available. Although science is rarely the only consideration in a decision, government's reliance on credible science is essential to ensure the public trust and democracy upon which our country was founded.

WHAT IS SCIENCE INTEGRITY?

Scientific integrity refers to processes through which independent science fully and transparently informs policy decisions, free from inappropriate political, ideological, financial, or other undue influence. Scientific integrity is guided by these principles: (1) independent science, (2) transparent decision-making, (3) scientific free speech, and (4) statutory compliance.

To achieve true independence, the scientific method must be performed by scientific experts free from political or financial pressure. Independence usually involves peer review, disclosure of potential conflicts of interest, public availability of research findings and methodology, freedom to publish research, and deterrents against scientific misconduct.

For transparency, the public must have access to the science, the government scientists involved, and records documenting how it was used by decision-makers.

To protect free-speech, scientists should be able to express their personal views on science and policy without the fear of retribution as long as they clarify they are not speaking for the government.

For legal compliance, decision-makers must not mislead when laws dictate that science is the determining factor in a decision. Laws that allow science to be balanced with other determining factors might even allow value judgments.

Misconduct by scientific researchers—plagiarism or data falsification, for example—is a rare violation of scientific integrity and, when discovered, is shamed by scientist peers. However,

science misconduct by government decision-makers seems to be a serious and recurring issue, with the offender usually suffering little or no legal consequence.

Many professional career organizations and government agencies have written policies regarding ethics and integrity. Most agencies developed theirs during the Presidential administration of 2009–2016. Those documents prescribe that employees be held to a high standard for the work they do. It is unfortunate that politicians, government political appointees, and commercial interests don't abide by those same standards.

HOW HAS SCIENCE BEEN MISUSED?

Many researchers and nonprofit organizations have reported on incidents of science abuse primarily at the national level. The following groups even maintain an online tally of integrity violations:

- [Harvard Law School, Environmental & Energy Law Program](#)
- [Columbia Law School, Sabin Center for Climate Change](#)
- [Brookings Institution](#)
- [Union of Concerned Scientists](#)
- [Sunlight Foundation](#)

At the time, the Presidential administration of 2000–2008 was widely regarded as the [most antagonistic](#) toward science and science policy in modern history. In 2017, that title has passed to another administration (and accommodating Senate majority) that reused successful strategies and new ones to officially reverse or cripple federal science and safety regulations. The scale and impact of these anti-science actions is astonishing, mostly hidden from the general population, and unsustainable for a vibrant democracy and civilized society to survive over time.

There are numerous techniques that Presidential administrations have tried in the last 40 years. These abuses of science and scientists usually take place in secret because of the public's inattention or purposeful distraction, the shield of lawful or self-proclaimed executive privilege and emergency powers, Executive Orders that by-pass Congress, and technically-unqualified political appointees with an agenda that favors the few.

- **Rollback Environmental and Safety Regulations** • Since 2017, the President has acted to [change at least 81 regulations](#) of concern. Here are examples. • The administration's new interpretation of the [National Environmental Policy Act](#) limits powers and scope, ignores cumulative impacts on climate change, and would probably lessen public input into decisions. • The Department of the Interior (DoI) proposes two definitions of "habitat" within the [Endangered Species Act](#), each of which would be too narrow in scope and scale for present or future conditions. • An Environmental Protection Agency (EPA) rule change for the [Clean Water Act](#) would remove protections from more than half of wetlands and one-fifth of streams in the nation. • The DoI

A commitment to the ethical use of science should not be a partisan issue, since the long-term welfare and survival of human society depends on laws and regulations that prevent exposure to unnecessary dangers.

proposes re-interpreting the [Migratory Bird Treaty Act](#) to end prosecution for incidental take (harm) of migratory birds unless the take was intentional. • In effect for the next five years, the EPA proposes to maintain (instead of tighten) the current National Ambient Air Quality Standards for Particulate Matter and Ozone in the [Clean Air Act](#), change membership in the Air Science Advisory Committee, and accelerate the approval process.

- [Nominate Agency Heads Openly-Hostile to the Agency Mission](#)
- [Leave Key Science Positions Vacant](#)
- [Temporarily Appoint Department/Agency Leaders to Avoid Congressional Approval](#)
- [Use Emergencies and Executive Power To Accomplish Political Goals](#)
- [Weaken Environmental Enforcement & Monitoring](#)
- [Disregard Legally-Mandated Science](#)
- [Disband, Hamper, or Compromise Science Advisory Committees](#)
- [Allow Conflicts of Interest in the Decision Process](#)
- [Exploit the Slow Pace for Litigation to Achieve Short-term Political Gain](#)
- [Reduce Transparency](#)
- [Create a Chilling Environment of Intimidation, Censure, or Coercion of Scientists and Whistle-Blowers](#)
- [Disinformation](#)
- [Falsify Data or Fabricate Results](#)
- [Selectively Edit or Create False Uncertainty in Scientific Documents](#)
- [Tamper With Scientific Procedures](#)
- [Hide, Suppress, or Delay Release of Scientific Findings](#)
- [Politicize Grants and Funding](#)
- [Shortcut Record-Keeping](#)
- [Dissatisfaction or Involuntary Relocation of Agency Career Personnel](#)
- [Imply Statements as “Fact” But Without Evidence](#)

WHAT DO CAREER FEDERAL SCIENTISTS SAY ABOUT THEIR WORK ENVIRONMENT?

Scientists working for the federal government conduct, synthesize, and communicate scientific information that informs, guides, and directs policy action on issues of public health, safety, and the environment. Government decisions have greater societal benefits from the involvement of federal scientists, scientific advisory committees, academic scholars, interdepartmental consultations, and input from the wider public.

Prior research shows that maintaining scientific integrity depends on (1) a clear comprehensive science integrity policy, (2) competent and trustworthy agency leaders, and (3) an environment where employees feel effective and valued.

In 2018, 63,000 federal scientists from 16 federal agencies were invited to answer a [survey](#) that assessed their perception of scientific integrity. Responses from more than 3,700 fully completed surveys across five agencies show that Federal scientists perceive losses of scientific integrity within the President’s administration.

The loss was greater at the DoI and EPA, where scientists ranked technically-incompetent and untrustworthy leadership as the top barriers to science-based decision-making. Political interference in scientific work and adverse work environments were also higher

at the EPA and Fish and Wildlife Service (FWS) in 2018 than in prior years.

Conversely, scientists at the Center for Disease Control (CDC), Federal Drug Administration (FDA), and National Oceanic and Atmospheric Administration associated their leaders positively for science integrity. Political interference in scientific work at the CDC and FDA was not higher in 2018

than earlier years.

Prior to 2011, most government science agencies did not have scientific integrity policies in place. The survey found that even after policies were introduced, they alone do not predict government scientist’s perception of agency effectiveness or adherence.

WHAT’S THE HARM, ISN’T THIS JUST POLITICS?

It is unthinkable that people might not be concerned by the magnitude and harm of government actions that misuse scientific evidence. Perhaps those who are not alarmed believe “such things won’t affect me”, or “I cannot change destiny”, or “I don’t have time or interest to pay attention”. The reality is that Planet Earth is one gigantic ecosystem and the United States is a very influential component, so what happens in this nation will affect its citizens and places elsewhere.

At this time of national and world crises that involve climate, human health, and biological diversity, the rollback of environmental protections is especially irresponsible, short-sighted, and wasteful of human imagination, effort, time, and resources. Here are the facts.

Planet Earth’s [climate crisis](#) is closely linked to excessive [human consumption](#) from a wealthy lifestyle. The most affluent countries are mainly responsible for historical greenhouse gas emissions, and generally have the greatest per capita emissions. Economic and population growth are among the most important drivers of increases in CO2 emissions from fossil fuel combustion.

Climate warming, biological invasions, loss of biodiversity, fragmentation of habitats, and over-exploitation of natural resources are known to lead toward simpler ecological networks—also known as [food webs](#)—which don’t have the complexity, resilience, and persistence of nature’s communities. The change can be abrupt with little or no warning.

Changing patterns of climate temperature and precipitation, disruption of interspecies relationships, increasing pests and

Millions and millions of taxpayer dollars pay for scientific research each year, so the misuse of resulting information is a stick to the eye of every wage-earner.

Deregulation and other anti-science actions will eventually leave a crippled, depleted, dysfunctional ecosystem incapable of providing the environmental services all humanity depends on.

pathogens, habitat fragmentation, and over-harvesting can push [medicinal plants](#) to extinction. Some species may react to environmental stresses with declining biomass production or changes in chemical content that potentially affect quality or safety for medical uses. Most of the world's people derive benefit from the use of medicinal plants.

The biological spread of [invasive alien plants and animals](#) is a consequence of our increasingly connected world and booming human population. Alien species can nudge native species diversity and abundance toward extinction, and change their natural behavior and genetic composition. As a result, ecosystem functions and services toward human livelihood may be harmed.

Human societies will have to learn to live with more fire on the landscape because [wildfires](#) are influenced by climate change, human population growth, biodiversity and forest structure, and freshwater availability. The weight of scientific evidence suggests that recent catastrophic wildfires are not merely outliers, but rather indications of what the future holds in terms of human health, property damage, financial cost, and wildfire behavior.

Human impacts to [freshwater](#) lakes, rivers, streams, wetlands, and groundwater are robbing critical natural resources and services from current and future generations. Currently, about one-third of all global freshwater discharges pass through human agricultural,

industrial, or urban infrastructure, where it is vulnerable to degradation or consumption. Less than one-fifth of the world's pre-industrial freshwater wetlands remain.

[Birds](#) are excellent indicators of environmental health and ecosystem integrity. Since the 1970's, the North American continent has lost 3 billion birds because of habitat degradation or loss—nearly 30 percent of the total. Birds inhabiting native grasslands declined 53 percent, and those in western forests dropped 29 percent. Steep declines in North America parallel patterns of bird decline emerging globally.

Humans are causing [insect extinctions](#) by (1) driving habitat loss, degradation, and fragmentation, (2) use of polluting and harmful substances, (3) the spread of invasive species, (4) global climate change, (5) direct overexploitation, and (6) the extinction of other species upon which insects depend. It is likely that worldwide insect extinctions have numbered approximately 250,000–500,000 species since the industrial era. Insect losses harm pollination, decomposition, and the sources for new medicines.

The evidence presented by thousands of scientific researchers is their impassioned plea for our response. **We must demand that government leaders listen to, learn from, and urgently act with the benefit of credible facts and truth.**

THE ETHICS OF SCIENCE

- The end that science seeks is truth.
- There are rules that must be followed in seeking the truth which require trust in independence in observation and in thought.
- Freedom, respect, and tolerance are handmaidens to science.
- Scientists acquire knowledge by small steps, none of which is final and the mistakes of one generation of scientists are rungs in the ladder towards truth.
- The only purpose of seeking the truth is to accumulate knowledge which becomes the property of the world without respect to race, religion, nationality, political and sexual orientation, or cultural beliefs.
- Science is unifying because it seeks answers which society ultimately hold as important.

Post by William Stone, signatory of the Second Warning to Humanity
