Political Interference with Government Climate Change Science

Testimony of

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1. Rationale of Presentation

I provide this testimony because I believe that my experiences illustrate flaws that have developed in the functioning of our democracy. And I will use part of my presentation to compare the benefits of early actions to defuse the building climate crisis with the dangers of continued business-as-usual fossil fuel emissions.

I claim no expertise in legal matters or politics. My approach is to try to imagine how our forefathers would have viewed our present situation and how they may have dealt with the climate change issue. A well-informed educated public was and is a premise of our democracy; it is easy for me to imagine Benjamin Franklin presenting an objective discussion of climate change that would be thoughtfully received. Another fundamental tenet of our democracy, separation of powers within our government, with checks and balances, is brought into focus by the climate crisis.

2. My Experience

A. White House Approval and Editing of Congressional Testimony

During the past 25 years I have noticed an increase in the degree of political interference with scientific testimony to Congress. My first testimony was to a United States House of Representatives hearing organized by Representative Al Gore in early 1982. I do not recall whether White House approval of that testimony was required, but in any case there were no objections to the content of that testimony[1].

I testified to the United States Senate about climate change at least three times in the period 1984-1988. These testimonies required approval by the White House Office of Management and Budget (OMB). I did not have direct contact with people in OMB, rather NASA Headquarters (usually the NASA Office of Legislative Affairs) was an intermediary between the scientist (me) and OMB. In one case I strongly objected to changes that OMB made to my testimony, because I felt that the changes substantially altered the conclusions of our research and served to reduce concern about possible human-made climate change.

In this case the NASA intermediary in the Office of Legislative Affairs volunteered the information that I had the right to testify as a private citizen and present my testimony with the wording that I preferred. I took advantage of that right, testifying as a private citizen, and never felt any repercussions for doing so.

In 1989, after climate change had become of greater public and political concern, the constraints on communication via congressional testimony became stricter, at least in my experience. When I submitted written testimony to NASA Headquarters in 1989 for presentation to a Senate Committee chaired by Senator Gore, my secretary was instructed by NASA Headquarters to send the original typescript to NASA Headquarters so that they could insert several changes that were required by the White House OMB. When I was informed of this I was angered, intercepted the typescript, and insisted that any changes had to be made in my office. Several acceptable rewordings were negotiated (NASA Headquarters being the

[1] In that testimony I summarized three papers published with colleagues in 1981, the principal paper being one in Science (Reference 1) in which we showed that, when Southern Hemisphere data were included, the Earth had warmed by about 0.4°C (0.7°F) over the previous century. The second paper showed that non-CO_2 gases caused a climate forcing almost as large as that of CO_2. The third paper showed that sea level had increased about 12 cm in the preceding 100 years and suggested for the first time, I believe, that thermal expansion of ocean water accounted for a significant fraction of sea level rise.

intermediary between OMB and me), but three changes[2] that OMB required were unacceptable to me. Unlike the case earlier in the 1980s, I was told by NASA Headquarters that I needed to accept the changes or not testify. I agreed to accept the changes, but I then sent a fax to Senator Gore requesting that he ask me during the hearing about those specific statements, because I wanted to make clear that they were the opinion of the White House OMB, not my opinion. (This exchange was briefly shown in the documentary "An Inconvenient Truth".)

Review and editing of scientific testimony by the White House OMB seems to now be an accepted practice. The explanation I was given for why budgetary people should be allowed to review and edit scientific testimony was that NASA plans need to be consistent with the Administration's budget. Discussion with NASA personnel in Legislative Affairs and in Science program offices suggests that people at NASA Headquarters believe that NASA must "play ball" with OMB if it wishes to be treated well in its annual funding. It seems to me that this raises constitutional questions, because it is my understanding that the Constitution provides the power of the purse strings to Congress, not the Executive Branch of our government. I return to this issue in Section 4 below, after discussing in Section 3 the practical impacts of this political interference in climate science.

B. Communication Constraints by NASA Office of Public Affairs

The Office of Public Affairs in science agencies such as NASA exists for the purpose of helping communicate scientific results to the public. During my career I have noticed an increasing politicization of Public Affairs at the Headquarters level, with a notable effect on communication from scientists to the public. I refer not to the professionals in the Public Affairs offices at the NASA science centers, but to Public Affairs at NASA Headquarters, which is in charge overall and is generally headed by a political appointee. Interference with communication of science to the public has been greater during the current Administration than at any time in my career. As I was quoted on the 2006 calendar of the Freedom Forum "In my more than three decades in government, I have never seen anything approaching the degree to which information flow from scientists to the public has been screened and controlled as it has now."

The effect of the filtering of climate change science during the current Administration has been to make the reality of climate change less certain than the facts indicate and to reduce concern about the relation of climate change to human-made greenhouse gas emissions. For example, one of my staff members submitted a story based on his paper that found the ocean was less effective at removing human-made CO_2 than had previously been estimated. Public Affairs decided that this story should not be provided to the media. Another staff member had to attend

[2] The three changes were: (1) addition of a caveat after my discussion of expected climate changes due to increasing greenhouse gases that "these changes should be viewed as estimates from evolving climate models and not as reliable predictions"; this change negated much of the testimony, in which I argued, on heuristic grounds with support from models, that global warming would lead to increases in the extremes of the hydrologic cycle, i.e., more intense heat waves and droughts but also heavier rainfalls and floods; (2) addition of a suggestion that the increases of greenhouse gases could be partly or largely due to natural processes; again this was misleading because we were aware that the greenhouse gas increases are primarily of human origin; (3) addition of a statement that "any policy options which should reduce atmospheric CO_2 growth rates should make good economic and environmental sense, independent of concerns about an increasing greenhouse effect; although the meaning of this statement was unclear, it seemed to say that the greenhouse effect (global warming) should not have any effect on policies. Although some other scientists agreed with the White House OMB edits to my testimony (Reference 2), it was supposed to be my testimony.

a 'practice' press conference, in which he was asked whether anything could be done to stem accelerating loss of sea ice. When he suggested "we could reduce emissions of greenhouse gases" he was told sternly "that's unacceptable!", with the explanation that scientists are not allowed to say anything that relates to policy

An important example of political interference with the public's right to know has occurred with press releases relating to global warming science that have gone from NASA Headquarters to the White House for review, approval or disapproval, and editing. That this practice is inappropriate, if not illegal, is indicated by the response from NASA Public Affairs when I made note of this practice in a public talk (Reference 3). The NASA Assistant Administrator for Public Affairs traveled from Headquarters to Goddard Space Flight Center to deliver an oral "dressing down" of the professional writer at Goddard Public Affairs who had informed me about this practice. The writer was admonished to "mind his own business". This dressing down was delivered in front of the writer's boss. Such reprimands and instructions are delivered orally. If NASA Headquarters Public Affairs is queried by media about such abuses, they respond "that's hearsay!", a legal term that seems to frighten the media. My suggestion for getting at the truth is to question the relevant participants under oath, including the then NASA Associate Administrator for Earth Sciences, who surely is aware of who in the White House was receiving and reviewing press releases that related to climate change.

Communication constraints by NASA Headquarters Public Affairs came to light in December 2005, after some of the instructions by Headquarters Public Affairs were written down in memos and e-mails. This occurred shortly after my "Keeling" talk (Reference 4) at the American Geophysical Union meeting in San Francisco and the release within a week thereafter of our (GISS, Goddard Institute for Space Studies) analysis of global temperature, which showed record global temperature in 2005. NASA Headquarters Public Affairs was furious about the media attention, their anger being sparked by a call from the White House objecting to the publicity on global warming. The consternation, expressed during several three-way telecons between Headquarters-GSFC/Greenbelt-GISS/New York, was described by a participant as a "shit-storm". The upshot was a new explicit set of constraints on me, including requirement that any media interviews be approved beforehand and that Headquarters have the "right of first refusal" on all interviews, that I provide my calendar of all planned talks and meetings, and that I obtain prior approval for every posting on the GISS web site.

These orders were delivered orally, as usual, as was a threat of "dire consequences" if I did not comply. However, a new young political appointee at Public Affairs, apparently was not well-schooled in the rules and left a paper trail, including a description of a specific instance in which Public Affairs barred me from speaking to NPR, offering the Associate Administrator in my stead. These indiscretions were perhaps the primary reason for his departure from NASA, rather than the fact that his resume failed to show that he was one course short of the university degree that he claimed. However, he was not acting on his own or affecting communication with the public in a way contrary to the wishes of his bosses. The paper trail that he left showed that the problem starts at the top, the decision to bar me from speaking with NPR being made "on the ninth floor" of Headquarters.

It became clear that the new constraints on my communications were gong to be a real impediment when I was forced to take down from our web site our routine posting of updated global temperature analysis. At that time I decided to write down the constraints that I had been placed under and to inform the media. An article appeared in the New York Times by Andy

Revkin, who had the courage to go with a story that had a limited paper trail. To NASA's credit, the Administrator promptly issued an unequivocal statement in support of scientific openness.

However, in no way has the impact of deception of the public about climate change been undone by NASA's forthright decision in favor of scientific openness. There remains a vast gap between what is understood about global warming, by the relevant scientific community, and what is known about global warming by those who need to know, the public and policy-makers. This gap should be of concern to the Committee on Oversight and Government Reform, because it relates in part to ways in which the functioning of our government is departing from the intentions of our forefathers. Of special relevance is the usurpation of congressional prerogatives by the executive branch, especially via increased control of the purse strings.

C. Executive Control of Purse Strings

The American Revolution launched the radical proposition that the commonest of man should have a vote of equal weight to that of the richest, most powerful citizen. Our forefathers devised a remarkable Constitution, with checks and balances, to guard against the return of despotic governance and subversion of the democratic principle for the sake of the powerful few with special interests. They were well aware of the difficulties that would be faced, however, placing their hopes in the presumption of an educated informed citizenry, an honestly informed public.

I have sometimes wondered how our forefathers would view our situation today. On the positive side, as a scientist, I like to imagine how Benjamin Franklin would view the capabilities we have built for scientific investigation. Franklin speculated that an atmospheric "dry fog" produced by a large volcano had reduced the sun's heating of the Earth so as to cause unusually cold weather in the early 1780s, as he noted that the enfeebled solar rays when collected in the focus of a "burning glass" could "scarce kindle brown paper". As brilliant as Franklin's insights may have been, they were only speculation as he lacked the tools for quantitative investigation. No doubt Franklin would marvel at the capabilities provided by earth-encircling satellites and super-computers that he could scarce have imagined.

Yet Franklin, Jefferson and the other revolutionaries must be distraught by recent tendencies in America, specifically increasing power of special interests in our government, concerted efforts to deceive the public, and arbitrary actions of government executives that arise from increasing concentration of authority in a unitary executive, in defiance of the aims of our Constitution's framers. These tendencies have dramatic impact on the global warming story.

Last year, about one month after the media hubbub about NASA Public Affairs' censoring of science, the mission of the National Aeronautics and Space Administration (NASA) was altered surreptitiously by executive action and the budget for Earth Science Research and Analysis was slashed retroactively to the beginning of the fiscal year, thus subverting constitutional division of power. Many people are aware that something bad happened to the NASA Earth Science budget last year, yet the severity of the cuts and their long-term implications are not universally recognized. In part this is because of a stealth budgeting maneuver, which I suspect most members of Congress are not aware of.

When annual budgets for the coming fiscal year are announced, the differences in growth from the previous year, for agencies and their divisions, are typically a few percent. An agency with +3 percent growth may crow happily, in comparison to agencies receiving +1 percent. Small differences are important because every agency has fixed costs (civil service salaries,

buildings, other infrastructure), so new programs or initiatives are strongly dependent upon any budget growth and how that growth compares with inflation.

When the administration announced its fiscal 2007 budget, NASA science was listed as having typical changes of 1 percent or so. However, Earth Science Research and Analysis actually had a staggering reduction of about 20 percent from the 2006 budget that Congress had passed. How could that be accomplished? Simple enough: reduce the 2006 research budget retroactively by 20 percent! One-third of the way into fiscal year 2006, NASA Earth Science was told to go figure out how to live with a 20-percent loss of the current year's funds.

The Earth Science budget was further tightened in 2007 and is almost a going-out-of-business budget. From the taxpayers' point of view it makes no sense. An 80 percent budget must be used mainly to support infrastructure (practically speaking, you cannot fire civil servants; buildings at large facilities such as Goddard Space Flight Center will not be bulldozed to the ground; and the grass at the centers must continue to be cut). But the budget cuts wipe off the books most planned new satellite missions (some may be kept on the books, but only with a date so far in the future that no money needs to be spent now), and support for contractors, young scientists, and students disappears, with dire implications for future capabilities.

Bizarrely, this is happening just when NASA data are yielding spectacular and startling results. Two small satellites that measure the Earth's gravitational field with remarkable precision found that the mass of Greenland is now decreasing by about 150 cubic kilometers of ice per year and West Antarctica by a similar amount. The area on the ice sheets with summer melting has increased markedly, major ice streams (portions of the ice sheet moving most rapidly toward the ocean and discharging icebergs) have increased doubled in flow speed, and the area in the Arctic Ocean with summer sea ice has decreased 20 percent in the last 25 years.

One way to avoid bad news: stop the measurements! Only hitch: the first line of the NASA mission is "to understand and protect our home planet." Maybe that can be changed to "...protect special interests' backside."

I should say that the mission statement *used* to read "to understand and protect our home planet." That part has been deleted—a shocking loss to me, as I had been using that phrase to justify speaking out about the dangers of global warming. The quoted mission statement had been constructed in 2001 and 2002 via an inclusive procedure involving representatives from the NASA Centers and e-mail interactions with NASA employees. In contrast, elimination of the "home planet" phrase occurred with no fanfare in a spending report delivered to Congress in February 2006, the same report that retroactively slashed the Earth Science research budget. In July 2006 I asked dozens of NASA employees and management people (including my boss) if they were aware of the change. Not one of them was. Several expressed concern that such management changes by fiat would have a bad effect on organization morale.

These budgetary goings-on in Washington were noted in editorials of *The Boston Globe*: "Earth to NASA: Help!" (June 15, 2006) and "Don't ask; don't ask" (June 22, 2006), both decrying the near-termination of Earth measurements. Of course, the *Globe* might be considered "liberal media". But it is conservatives and moderates who should be most upset, and I consider myself a moderate conservative. When I was in school we learned that Congress controlled the purse strings; it is in the Constitution. But it does not really seem to work that way, not if the Administration can jerk the science budget around the way they have. It seems more like David Baltimore's "Theory of the Unitary Executive" (the legal theory that the president can do pretty much whatever he wants) is being practiced. My impression is that conservatives and moderates would prefer that the government work as described in the Constitution, and that they prefer to

obtain their information on how the Earth is doing from real observations, not from convenient science fiction (see Reference 5).

3. Practical Impact of Political Interference with Climate Change Science

A. Communication of Climate Change Threat

There is little doubt that the Administration's downplaying of evidence about global warming has had some effect on public perception of the climate change issue. The impact is to confuse the public about the reality of global warming, and about whether that warming can be reliably attributed to human-made greenhouse gases.

However, I believe that the gap between scientific understanding of climate change and public knowledge about the status of that understanding probably is due more to the impact of special interests on public discourse, especially fossil fuel special interests, rather than political interference with climate change science.

I have no knowledge of whether special interests have had a role in political interference with climate change science. Nevertheless, it is my personal opinion that the most fundamental government reform that could be taken to address climate change and government accountability in general would be effective campaign finance reform.

B. Delay of Action: Potential Economic Benefits Become Costs

The effect of leaving the public confused about the reality of human-caused climate change is to delay actions needed to put the nation and the world on an energy pathway that would preserve creation, the planet that civilization developed on. If these actions are taken early, changes can be phased in gradually with great economic benefit to the nation.

Delay, on the other hand, means that changes will need to be made rapidly and thus inefficiently. Less appropriate technologies must be, in effect, "bull-dozed" before they are "worn out", and our industry will not be ready with more appropriate technology. Early action would provide our industry a long-term competitive advantage.

An example is provided by vehicle efficiency. The 30% improvement in automobile and light truck efficiencies proposed by California, if adopted nationally, would result in an annual reduction in oil import requirements of more than $100 billion dollars, with oil at $50 per barrel (Reference 6). This is opposed by United States automobile manufacturers and oil companies, who, in my opinion, seem more concerned with their short-term profits than with the best long-term interests of the nation, the planet, and future generations.

C. Moral and Legal Burdens

The most troubling impact of the political interference with climate change science is the potential burden that we leave for our children and grandchildren. The Administration continually points to China, which will soon pass the United States as the largest emitter of CO_2, as a reason for minimalist action by the United States on greenhouse gas emissions.

However, the science unambiguously shows that climate change is driven by cumulative emissions, not current emissions. Cumulative emissions of the United States are more than three times that of any other nation (Reference 7) and will continue to be the largest for decades. Furthermore, rather than negotiating on the terms of the international accord designed to reduce emissions in developed countries and slow the growth of emissions in developing nations, the United States walked away, thus preventing effective implementation.

One consequence is that, as indigenous people must abandon their land to rising seas or shifting climatic zones, they will be well aware of the principal source of the problem. Thus if we continue on this course, failing to effectively address climate change, we will leave a heavy moral burden, and perhaps a legal burden, for our children.

If the science and communication of the science were not interfered with, and if our children were allowed to express a preference, would they choose the current path of our government for energy and climate? I think not. Even with knowledge that fundamental changes will be needed to phase into a different energy course, I am confident they would want the United States to play a leadership role.

4. Issues and Questions Raised

A. Propriety of Filtering Congressional Testimony

What is the basis, what is the rationale, by which Congress allows the Administration to filter, edit and alter scientific testimony of government scientists delivered to Congress? Is this behavior a right that is granted to the Executive branch by the Constitution or authorized by other official instruments?

Presumably there is basis for this practice or it would not be tolerated. However, based on my experiences, discussed in part above, it seems to me that the practice is detrimental to the functioning of our democracy. The taxpayers foot the bill for most of the research by government and academic scientists. Thus the public should not be denied the full benefit of knowledge that derives from that research.

B. Politicization of Public Affairs Office

The problem stems from the fact that Public Affairs offices at the headquarters level of the science agencies are headed by political appointees. The inevitable result is a pressure for science to show the answers that the party in power prefers to see. This is true independent of which party is in power. Any such pressure contradicts the nature of scientific investigation, which relies on unprejudiced evaluation of all alternatives.

The best solution to this problem would be to have the Public Affairs offices professionally staffed, with no political appointees. If this is not possible, they should be renamed as Offices of Propaganda.

C. Executive Control of the Purse Strings

When I came to NASA 40 years ago as a 25 year old post-doc it seemed to me that the NASA approach was to focus on excellence in science and engineering. It was expected that Congress and the White House would provide funding based on merits. Perhaps I was naïve. But I did not get any sense that NASA was working for the White House. There has been a huge change between then and now.

The Executive branch seems to be exercising greater control in the functioning of our government, in ways that our forefathers probably did not imagine and almost certainly would not approve. This includes White House control of testimony to Congress, White House control of information that scientists provide to the public through Public Affairs, and most decidedly through control of the purse strings.

Control of the purse strings is the most powerful of the tools in the hands of the Executive branch. It has a tremendous effect on information that is provided to Congress and to

the public. You may think that a government scientist can easily exercise his right of free speech, to speak as a private citizen as I am today. But how many will do so, when the power of the purse strings is held by the Executive branch? You may think that there are plenty of government scientists who are confident of their ability to get a job elsewhere or would not mind being sent off to pasture. But it is not so simple as that. With the purse strings the Executive branch holds hostage your "children", your science programs, and your colleagues' livelihood. It is not easy to face your colleagues when they feel that you are damaging their support.

5. Summary Implications of Climate Change Science

A. Status of Science

Progress in climate science during the past several years has increased our understanding of how sensitive the Earth's climate is to forcings, such as human-made emission of gases into the atmosphere by burning fossil fuels. This understanding derives especially from the Earth's history, which shows how the Earth responded to changing forcings in the past (Reference 7).

The data show that the Earth's climate has considerable inertia, due especially to the massive oceans and ice sheets. Yet the climate can change dramatically on century time scales, and even on decadal and shorter time scales.

The evidence confirms a predominance of positive feedbacks that amplify climate response on short time scales, these feedbacks including increasing atmospheric water vapor and decreasing sea ice cover as the planet becomes warmer. However, the data also indicate the presence of feedbacks on decadal, century and longer time scales. These feedbacks include movement of forests and other vegetation poleward as the climate warms, increased net emission of greenhouse gases from the ocean and biosphere, and decrease in the area and brightness of ice sheets.

The predominance of positive feedbacks, along with the inertia of the oceans and ice sheets, has profound practical implications. It means that if we push the climate system hard enough it can obtain a momentum, it can pass tipping points, such that climate changes continue, out of our control. Unless we begin to slow down the human-made climate forcings, there is the danger that we will create a different planet, one far outside the range that has existed in the course of human history (References 7, 8, 9).

It is because of these climate feedbacks and the inertia of the ocean and ice sheets that the global warming problem differs fundamentally from the problem of conventional air pollution (Reference 12). By the time that the public can clearly see the existence of climate change, there is momentum in the system for a great deal of additional change. As a result we are probably already very near, if not beyond, the dangerous level of interference with atmospheric composition. I have discussed the possibility of drawing down atmospheric CO_2 by burning biofuels in power plants and capturing and sequestering the CO_2 (Reference 13). However, by far the most effective actions at this time would be to slow current emissions to the atmosphere, while better understanding and improved technologies are developed.

B. Impact of Political Interference on Quality of Decision Making

Political interference in transmittal of information about climate change science to the public has deleterious effects on the quality of decision making. Science cannot make decisions for the public. The public and policy makers must consider all factors in making decisions and

setting policy. But these other factors should not influence the science itself or the presentation of science to the public.

One consequence of political interference is that the public is not yet well-informed about the nature and scale of actions that will be needed to address climate change. This is important because it will take time for the public and their policy makers to thoughtfully consider these matters. As an example of the nature and scale of actions that I believe will be needed to address climate change, I list in the following section some specific recommendations that I discussed at a recent presentation in Washington (Reference 13).

C. Recommendations to Policy-Makers

1. Moratorium on new coal-fired power plants until the technology for CO_2 capture and sequestration is available. The reason for this is that about a quarter of CO_2 emissions will remain in the air "forever", i.e., more than 500 years. As a result, I expect that it will be realized within the next decade or so, that all power plants without sequestration must be "bull-dozed" before mid-century. Thus it makes sense to give high priority to energy efficiency and renewable energies in the near-term.

2. A gradually but surely increasing price on carbon emissions is needed to drive energy efficiency improvements and innovative technologies. The results will include high-tech high-pay jobs, technologies that will increase our exports and improve our balance of payments, improved energy independence and national security. It will require a strong leader to level with the public that a tax on carbon emissions is needed. If this is introduced along with technology investments, the public should be provided options that will reduce their carbon emissions and limit their taxes. The government should avoid trying to specify the technology "winners".

3. Energy efficiency standards are needed in addition to a price on carbon emissions. Architects and engineers agree that the technology exists now for new and renovated buildings to produce 50 percent less CO_2 than existing buildings, and emissions can be further reduced in the future. National adoption of the proposed California vehicle efficiency standards would make a huge reduction in our oil and energy needs, as discussed above. Barriers to efficiency, such as the fact that utilities make greater profits if they sell more energy, rather than if they encourage efficiency, need to be removed.

4. Congress should request the National Academy of Sciences to carry out a study on the stability of ice sheets, which is likely to be a driver in determining what level of global warming constitutes "dangerous" interference with the climate system (Reference 11). The United Nations Intergovernmental Panel on Climate Change already provides periodic reports of the science, at about 6-year intervals, but the problem is too urgent and important for the country to rely solely on such assessments. The National Academy of Sciences was established by Abraham Lincoln in part with just such "Service to the Nation" in mind.

5. Congress needs to address the following threats to American democracy: (1) the public's right to unfiltered information, including congressional testimony free of political interference, and Public Affairs (public information) offices that are staffed by professionals not by political appointees, (2) the absence of effective campaign finance reform.

As long as these threats to democracy are not addressed it will be difficult to deal with human-made climate change successfully. The Committee on Government Oversight and Reform seems an appropriate place to raise these issues.

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