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# Climate Change, Part II: The Public Health Effects

I appreciate the opportunity to provide a perspective to the Subcommittee on the issue of climate change and public health given my 40 year professional career studying the health effects of air pollution and as National Program Director of the Air, Climate & Energy Research Program in EPA/ORD. Although retired, I continue to teach and advise students, produce research publications through collaborations, and provide public commentary via environmental advocacy organizations. I earned two MS degrees in environmental science (Rutgers University, 1973) and public health (Harvard University, 1973), and acquired my Sc.D. (Harvard University School of Public Health, 1977) studying the respiratory health effects of air pollution. Prior to joining EPA in 1984, I co-led the building of an inhalation research and cardiopulmonary laboratory at Brookhaven National Laboratory (DOE: 1977-1984). After joining EPA as an air pollution lung researcher, I was appointed Chief of the Pulmonary Toxicology Branch in 1986 to lead a team of health scientists on the study of the full systemic impacts of air pollution and associated risk factors using animal models of humans with pre-existent lung or other health impairments.

In 2003, I was appointed the National Director of Air Research for ORD, and then in 2012, I was appointed the National Program Director of Air, Climate & Energy (ACE) Research Program, a position that I held (through reappointment in 2016) until my January, 2018 retirement. This position had oversight, science direction, and leadership for the entire national air quality research program of EPA ORD (including health, ecology, measurement and air pollution control technologies, air quality chemistry and modeling, as well as climate and related energy modeling activities).

With the transition to the Trump Administration, I delayed my retirement one year to allow for my Program's adjustment to the new political EPA leadership. My goal in that changeover period was to continue an effort to transition research from traditional technical air quality sciences to research that supported preparedness for what I believed was a growing national air health issue – wildland fire. As wildland fires have grown in magnitude and impact over the last

several years, I felt this new focus on wildland fires was timely and appropriate due to their multidimensional impacts on air quality and environmental public health. The reciprocal relationship of wildland fire and climate made the issue especially poignant. At the same time, I also felt this national issue-based approach would be less contentious as the Agency shifts its attention away from traditional anthropogenic pollution sources. Moreover, properly designed, this wildland fire approach would provide widely applicable fundamental knowledge across an array of broadly applicable science questions, while targeting an inarguable national public health issue. I feel that I largely succeeded in that redirection of the ACE program, but during that transition year, it was clear the winds of a new "political" science could be felt throughout my organization.

**Purpose of this Testimony**

I was asked to provide some thoughts on the "health of EPA" from my vantage point during 2017 noting also how climate science within the Agency had fared in the transition and since that time. To address these queries, my comments will focus on three points: (1) The loss of mission focus; (2) the strategy of neglect regarding the importance of climate and air pollution on public health; and (3) my view on moving public sentiment out of the current climate quagmire.

**The EPA Mission**

My 34-year tenure with EPA encompassed six Presidential Administrations and nine congressionally confirmed EPA Administrators. The Assistant Administrators for ORD numbered considerably more, most in protracted "acting" roles pending congressional action on confirmations. Not surprisingly, each Presidency came with its environmental agenda, some more structured and/or progressive than others. Often the environmental attention of a given administration was dictated by events. Some of these included air episodes (ozone and wildfire smoke alerts, VW emission violations) and water contaminations (MTBE in CA groundwater, Gold King Mine spill in CO, lead in Flint, MI), pesticide and chemical issues (Alar on apples, chlorpyrifos in farm communities, Zika control), oil spills (Exon Valdez in AK, Deep Water Horizon in the Gulf of Mexico) and notably, the events of 911 and its aftermath.

Regardless of conservative or liberal perspectives of leadership, my experience with senior EPA leaders with whom I've interacted has always been in the spirt of the Agency mission – the protection of public and environmental health whether in crises or in our core agenda. Indeed, throughout my career as an Agency employee working with colleagues at all levels, that mission, regardless of political priorities and approaches, has always been motivated to the public good. But all that changed with this Administration.

Post inauguration, one could sense a paradigm shift. Historically, a transition team would meet immediately post inauguration with senior career officials for briefings on program status and operations. Instead, the political EPA transition team was truant for days without contact and was largely disinterested in associated briefing documents. The transition members also adopted the pejorative moniker of "landing team" (a la Normandy invasion?), but soon relented after widespread dissent by career staff. Likewise, when Administrator Scott Pruitt was formally

introduced to senior Washington staff in February, 2017, he spoke only of protecting small business, natural resources, and economic growth with not a single mention of the words "public health" or the concept of climate during his 15-minute speech. No questions were allowed.

The self-aggrandizing Pruitt-saga is history, but the science denial and meritless deregulating agenda set forth by him continues under the Andrew Wheeler leadership. The Wheeler administration is craftily pushing the same agenda of dismantlement of EPA effectiveness and eroding the environmental public health gains achieved over nearly 50 years by quietly working the system from within. At its core is an ongoing effort to redefine long-affirmed science review practices by reshaping review committees with for-hire individuals of similar mind while pushing out unbiased consensus science. There is tacit solicitation of public or outside expert input for these review groups and revised policies that is ignored in the calculated march forward. Good examples of these policy items include the so-called "secret science" claims and the disingenuous "transparency rule" implementation. This administration seems to have neither an environmental public health mission nor any strategy that cares to look ahead at future environmental challenges that face the nation.

**Climate: A Strategy of Neglect**

My last year as the lead of the ACE Research Program in ORD was during the transition of the Pruitt Administration.[1] That year saw an erosion of spirit by many science staff working on Air-related projects due to the relentless public rhetoric by the Administrator. The message of the Pruitt agenda was a focus on (weakening) components of the Toxic Substance Control Act (TSCA), abating lead in select urban drinking water systems, and PFAS contamination of water resources. Pruitt's failure to mention air quality or climate did not go unnoticed throughout both the ACE program and ORD. These formerly major priorities were now left to appendices. Yet, as with the constrained budgets of the last decade, the ACE research portfolio was reasonably stable as we moved in 2017 into wildland fire and advanced air sensor technologies.

The Trump Administration proposed research budget (PrezBud) for 2019, however, slashed EPA, ORD, and air/climate funding. Fortunately, Congress maintained a largely stable budget for EPA research, but the Pruitt Administration froze all hiring to achieve FTE reductions and the goal of shrinking the Agency, a policy that has been maintained by the Wheeler Administration. At the same time, there were virtually no direct communications between the then Administrator's Office with career senior leadership, with ORD clearly left to the side. Unlike previous Administrators, Pruitt did not meet ORD senior staff for a year, until January, 2018, and then in a no-questions 20 minute visit. The deliberate effort to restrict information only heightened concerns on what secret agenda was being contemplated and how science was being shorted; consequently, the pallor of suspicion and paranoia percolated through the organization.

To that point, one specific case germane to ACE was the erroneous disparagement of a landmark 2017 publication in the *New England Journal of Medicine* on Particulate Matter health effects in the elderly. This disparagement was delivered to the news media by a communications representative from Pruitt's office without consulting any knowledgeable ORD air scientists and

Office of Air and Radiation policy leaders. The spokesperson called the study "bad science" challenging its design noting lack of control variables (there were actually more than 100) with absurd claims about the elderly being bad drivers and getting killed in traffic accidents, a well-documented untruth. [The reality is elderly people have greatly diminished roadway deaths because they don't drive much.] Paradoxically, this New England Journal of Medicine research endeavor had been supported with EPA funds. Neither internal objection to the Administrator's Office nor public retraction of this false statement was ever made. Clearly, the fear of contrarily speaking out against the new norm was apparent within the organization.

Meanwhile, work effort suffered both in level-of-effort and in the introduction of new science talent due to retirements, departures, and the leadership decisions to not hire post-docs and research fellows specifically in ORD. This neglect of science and its central role in Agency decision-making was increasingly evident to existing staff, review committees, and the science community who have long worked with Agency scientists on complex environmental issues. Staffing problems have continued across the Agency with, notably, about a 30% reduction in the climate expertise in ORD and policy offices. There is new talk of limited post-doc and hires in some science areas, but the image of EPA as a career goal and cutting-edge research opportunity is tarnished.

How did this policy of neglect further reflect play in in the EPA climate arena? *The US Global Change Research Program* (USGCRP) established by Congress in 1990 provided a clear mandate for EPA involvement in climate change research, with a requirement that a National Climate Assessment (NCA) be conducted every 2-4 years by climate leaders across academia and the government. EPA plays a significant role in advising this body of over 250 scientists in their development of a publically translatable document to inform policy. Surprisingly, the Administration did not attempt to constrain the EPA role or the NCA document, although there was an attempt to "bury" its public release in 2018 by delaying that release until "Black Friday", the day after Thanksgiving, long noted as a day when the public is least attentive to the news media.

Likewise, within the Agency, climate assessments and related research have not been directly interrupted, just slowed by staff reductions, funding priority changes, and a subliminal message of disregard. In some corners of the Agency, this attitude has bred a paranoia that has morphed into a level of self-censorship of some research publications, where line managers have occasionally recommended the removal of the word '*climate'* in titles and the substitution of metaphorical terms. Such veiled messages of these supervisors have confused junior staff scientists and fueled the sense of gloom. I, and other veteran leaders, personally spent and continue to spend considerable effort to encourage and mentor staff to push ahead, be it warily. Unfortunately, no messaging comes from senior Agency career leaders standing-up climate science as within our mandate. Not surprisingly, a "foxhole mentality" has evolved that persists today.

One personal anecdote speaks to this point. Early PrezBud and prior congressional budget documents began to refer to the ACE program with the "C" removed from the acronym. The

Program was referred to in the printed budget as "A-E"; however, many of the document sections were so poorly conceived, prepared, and proof-read that often both ACE and A-E coexisted in the same narrative. Our ORD budget office immediately gravitated to A-E in our planning process. I fought the name change and never used the A-E acronym during my tenure; shortly after my departure, ORD budget officials codified the change to A-E, instead of ACE and so it persists today. I muse with former colleagues that the space defined by the hyphen is just saving the space for the future reinsertion of "C" when sanity returns to this country.

**Speaking of Climate Change**

Climate is clearly the environmental issue of this century. The Pentagon itself has noted climate change as a national security issue. Many federal agencies and departments, including NOAA, NASA, and DOE, conduct climate research and perform major global atmospheric modeling. These agencies are funded in the billions of dollars for this work compared to the minor ~$22M in EPA's research budget. The EPA is primarily a user of this information to develop impact assessments threaded with energy use scenarios and options to provide a sound foundation for policy decisions and strategies. In the several years up to this Administration, EPA published many documents summarizing climate and its health and environmental impacts, but unfortunately these impacts have gone forth into the public domain, unappreciated if not understated. The New York Times in 2017 noted survey data indicating that ~70% of the public believes climate will have significant impacts in the US but likewise ~70% felt that they themselves would not be significantly affected.[2] Fortunately, recent data suggests this sentiment is changing[3] due to increasing reports of catastrophic events. The multiplicity of impacts on indirect health impacts of climate change on public health is not always headline-worthy.

Public health is a balance of biological and social systems that have evolved with the climate in the 10,000 years of modern humans. Hence, as climate change is slowly understood in its full context, we can see stressors on individual people and communities reflected in public health outcomes. Climate change impacts directly and indirectly in outcomes that range from flooding, worsening air pollution, disease carrying pest distributions, access to food and water, proliferation and intensity of wildland fires, etc. Not surprisingly, therefore, climate is now linked to mental health status including depression and PTSD, the propensity for civil unrest and crime, population migration, and with extreme events (whether meteorological, wildfire, or civil conflicts). Disadvantaged communities are most often affected and experience magnified outcomes, with children being the most vulnerable. The waves of peril from climate change move in all directions and back upon themselves, echoing and magnifying through the biosphere.

Climate change must be taken seriously and better understood as much change lies ahead of us, even if we find some magic remedy to radically reduce greenhouse gases. I believe the biggest hurdle lies with public opinion and pressure on our elected officials. The present denial among a segment of the population is partially fueled by political rhetoric. Sadly, public outreach by government policy even in more supportive times, has, in my view, been built upon two passive

and futile terms - “adaptation and mitigation”. These terms do not reflect the “American spirit”. Our Homeland Security experience taught us that “preparedness” can be a motivating force, where the entirety of America takes charge to combat an enemy, which is in fact what climate change is. While any strategy to combat climate change encompasses elements of adaptation, resiliency, and mitigation, it does not speak to the American soul. We must use the power of language to bring further awareness to our climate situation and fuel the American spirit to meet the challenge of climate and its impacts on our future and that of our children. I believe that preparedness will draw upon American talents and ingenuity, and the political elements will follow.

In closing, I’m reminded of a personal story that I relate to my classes -- a metaphor for the climate predicament in which we are now involved. As a young teenager, I explored the White Mountains of NH with my nature science class. Together with friends we decided it would be fun to run down a slope for the thrill - not unlike today’s carbon-fueled lifestyle. As we ran, we elated at the speed we could achieve only to soon realize that our legs were no longer keeping up with our descent. The speed was beyond our ability to cope and soon we flew into a tumble down the hill ending in a heap. And so it is with climate change rapidly exceeding our ability to keep up. What end is in store after the tumble?

[1]Science under siege: behind the scenes at Trump’s troubled environment agency. By Jeff Tollefson. *Nature* July 12, 2018 https://www.nature.com/articles/d41586-018-05706-9

[2]New York Times, March 21, 2017. https://www.nytimes.com/interactive/2017/03/21/climate/how-americans-think-about-climate-change-in-six-maps.htmlimes

[3]New York Times, Jan 22, 2019. https://www.nytimes.com/2019/01/22/climate/americans-global-warming-poll.html