House Science Committee: one last 'rational' climate science hearing?

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Dr. Patrick J. Michaels, Dr. Benjamin D. Santer, Dr. Richard B. Alley, and Dr. Richard A. Feely

On November 17, a subcommittee of the House Science and Technology Committee held a "Rational Discussion of Climate Change," with testimony from climate scientists including Ralph Cicerone, Gerald Meehl, Heidi Cullen, Richard Lindzen, Ben Santer, Richard Alley, Richard Feely, Patrick Michaels, and Judith Curry.

Scientists and students of communication between scientists and elected officials could learn from studying this hearing.

The hearing was the last for the outgoing leadership of the Subcommittee on Energy and Environment: the chairman is retiring, and ranking member Bob Inglis (R-SC), one of the few Republicans to take the warnings of climate scientists seriously, was defeated by a Tea Party-backed challenger in the Republican primary.

Written testimony submitted for the nearly four-hour hearing is posted on the Committee's website. There seems to be a technical problem at this point with the Committee's archived webcast, but the hearing was covered by C-Span and will be archived here for some period of time.

The Democratic majority called:

Dr. Ralph Cicerone, atmospheric chemist and President of the National Academy of Sciences;
Dr. Heidi Cullen, climate scientist and CEO of Climate Central;
Dr. Gerald A. Meehl, senior scientist at the National Center for Atmospheric Research;
Dr. Benjamin D. Santer, atmospheric scientist at Lawrence Livermore National Laboratory;
Dr. Richard B. Alley, professor of geosciences at Penn State University;
Dr. Richard A. Feely, senior scientist at the NOAA Pacific Marine Environmental Laboratory;
Rear Admiral David W. Titley, U.S. Navy oceanographer and chair of the Navy Task Force on Climate Change;
James Lopez, a top adviser at the Department of Housing and Urban Development; and
William Geer, director of the Center for Western Lands.

The Republican minority selected one witness for each of three panels:

Dr. Richard Lindzen, professor of atmospheric sciences at MIT;
Dr. Patrick Michaels of the Cato Institute; and
Dr. Judith Curry, professor of atmospheric sciences at the Georgia Institute of Technology.

At the hearing we saw a wide range of communication styles among the witnesses, some more effective than others in conveying points clearly, incisively, and expressively, and with a drive to make their communication connect with the listener. Many scientists could learn something from watching Richard Alley, Ben Santer, and Heidi Cullen in particular, as well as Pat Michaels.

The first panel (from the beginning of the C-Span webcast up to 1:25:00) addressed the basic science of climate change, with Dr. Cicerone (starting at 00:19:00) outlining the physics of the greenhouse effect and Earth's energy balance. His written testimony is an introduction to the mainstream science on past climate change, human-caused increases in greenhouse gases and other pollutants, and the observed and likely impacts of climate change.

Dr. Cullen of Climate Central (starting at 00:39:25) demonstrated her ability to communicate science to nonscientists in both her written and oral testimony and answers to questions at the hearing.

On the first panel, Dr. Lindzen (oral testimony starting at 00:26:16 and later during Q&A) questioned the sensitivity of the climate —namely, the "feedback" effects set in motion—to increases in CO_2 in the atmosphere, and contended that an increase in CO_2 will lead to very little warming.

"The higher sensitivity of existing models is made consistent with observed warming by invoking unknown additional negative forcings from aerosols and solar variability as arbitrary adjustments," Lindzen said.

Rep. Inglis picked up this thread in the question and answer, asking each panelist to comment on Lindzen's statement. Dr. Cicerone said that while Lindzen contends that a doubling of CO_2 isolated from other factors would cause a 1^{o} C warming, it's the additional forcing from water vapor that produces a greater warming.

As the "debate" for the savvier skeptics shifts towards questioning the magnitude of projected climate changes, communication should focus on explaining the importance of feedback effects.

Climatologist Gavin Schmidt wrote as part of an interesting ScienceInsider liveblog of the hearing:

> On sensitivity: First, amplifying feedbacks do not just exist in models, but are clearly seen in observations. Independent observational constraints on the total response to a climate forcing indicates strongly that net feedbacks are positive i.e. that the sensitivity to a doubling of CO_2 is greater than 2 degrees, and probably less than 4.5 degrees C…Lindzen is being very selective about what he calls 'observations.' A fuller assessment of the observations of water vapour, clouds, [and] ice cover indicates strongly that the mechanisms of positive feedback exist and are functioning in the real world.

The second panel (from 1:25:00 up to about 2:43:00 on the C-Span webcast) took on other indicators of anthropogenic climate change – climate "fingerprint" studies for attribution of anthropogenic climate change, ice melt, and ocean acidification. Dr. Alley (starting at 1:38:40) gave a clear and effective presentation on ice sheet behavior, noting that the uncertainties that do exist are "mostly on the bad side," and that a discussion truly encompassing "both sides" of the debate must also include the possibility of catastrophic warming.

The second panel was enlivened by a high point of the hearing – a sort of verbal boxing match between Ben Santer and Pat Michaels that the chairman allowed to go on for about four rounds of exchanges (from 1:56:30 to 2:12:00). Michaels, in his customary style, put up a custom-made, non-peer-reviewed data graph that purported to show that the IPCC concluded incorrectly that most of the observed global warming during the past 50 years is due to human activity. Santer came right back at him, telling the members that Michaels' analysis was just plain "wrong" – and taking it apart point by point. Michaels is no slouch in the debating department and returned fire. Back and forth they went, Michaels the contrarian and Santer jumping on every Michaels statement to carry an argument more widely accepted by the leading climate scientists. Finally the chairman decided to move on. (Santer's written testimony; Michaels's written testimony.)

It's not clear what the members get out of such an exchange. Some members have a tendency when listening to scientists giving opposing views at congresssional hearings to say something like "good, let's hear the evidence, let's examine both sides of the debate, and decide for ourselves." As if a congressional hearing were an appropriate venue to study scientific issues, and as if the members (or any other non-specialists) were qualified to draw conclusions about climate science. Mostly, such an occasion is not about science so much as it is about confirming one's preconceptions. Some might be confirmed in the view that Michaels is an outlier and provocateur, others that there is a big debate in the science community that precludes meaningful policymaking. But watching Santer have an opportunity to go after Michaels "on the record" was quite a

moment to see live (from our vantage point in a back corner of the standing-room-only audience at the hearing).

None of the scientific witnesses used physical demonstrations beyond Power Point presentations, but Rep. Inglis (at about 2:12:00) brought in what he called a "7th grade" science demonstration of his own, recalled from school days, to illustrate the impacts of acidification: a jar of vinegar containing an egg, with its calcium carbonate shell eaten away. Rep. Inglis used his demonstration to suggest the impacts of ocean acidification on marine life at the bottom of the food chain that Dr. Feely warned about in his testimony.

Richard Feely's testimony on ocean acidification, its relationship to carbon emissions, and its implications for marine life and the marine food chain, introduced an aspect of climate science and the threat of climatic disruption that Congress and the public are only beginning to become familiar with. His written testimony and his exchange with Mr. Inglis (2:13:00 to 2:17:45) were a significant and sobering contribution to the hearing record. Hopefully the next Congress won't deny or avoid talking about this problem.

Finally, witnesses on the third panel (2:45:00 to 3:46:00) discussed strategies for building resilience to the impacts of climate change. Admiral Titley (written testimony) gave an overview of the Navy's efforts to incorporate climate change concerns into its strategic planning, highlighting the planning underway for what are expected to be extended ice-free periods in the Arctic unprecedented in modern history. Mr. Lopez mentioned his participation in the Interagency Climate Change Adaptation Task Force and called for an increased focus on building resilience in our built infrastructure and managed ecosystems to the impacts we are already committed to.

Dr. Curry raised a number of issues in her written and oral testimony (starting at 3:03:52 and later in Q&A, e.g., from 3:37:00 in response to a question about the blogosphere), near the end of a long hearing with only the chairman still in attendance. Because she has courted some controversy in the climate science community and is working to develop a distinctive viewpoint on the

science-policy connection, scientists and bloggers might find it worthwhile to review her testimony.

None of the minority witnesses at the hearing questioned the existence of anthropogenic climate change. However, each questioned the mainstream projections of the magnitude of change, arguing that the magnitude of change is likely to be much smaller (Michaels, Lindzen), and/or that the projections are more uncertain than is generally acknowledged (Curry).

In addition to providing an opportunity to see how various scientists communicate with policymakers, and whether they demonstrate effective communication skills in addition to scientific expertise, the theater of a congressional hearing (and these events can probably best be seen as a form of theater) also offers a chance to take the measure of how members of Congress talk to scientists and how they posture and position themselves.

At this hearing, on the Democratic side, Chairman Brian Baird (D-Washington) included this in his opening statement:

> In the context of climate change and ocean acidification, I also believe that because our nation is the biggest historical producer and second largest current producer of greenhouse gasses, we have a profound moral responsibility to be sure we get this right. Scripture teaches us to love thy neighbor as thyself. If our disproportionate impacts on the rest of the world are harming billions of other people and countless other species, we are not living up to that scriptural guidance….
>
> I believe the evidence of climate change and ocean acidification is compelling and troubling, but even without that conclusion, I am convinced that we must change our energy policies for reasons of economics, national security and environmental and human health.

Mr. Baird appeared to listen intently to the testimony, asked reasonable questions, showed respect for the scientist-witnesses, and stressed the importance of acting to reduce the risk of unchecked climate change. Unfortunately, he was the only Democratic member in attendance, and with his impending

retirement, this hearing, coming at the tail end of this Congress, amounted to something of a rump session, notwithstanding the extraordinary talent entrained to provide testimony.

One thing that has been evident for some time is that Congress seems to have considerable difficulty coming up a collective learning curve on climate science. With the new House of Representatives in January having an unusually large number of new members, many of them not particularly literate in science and 'skeptical' (or, more accurately in many cases, deniers) of climate science, the rock will have rolled back down the mountain and the climate-science Sisyphus will have to start pushing it upward once again.

The next ranking Democrat after Mr. Baird (a Ph.D former academic who taught scientific methodology and basic statistics and published in peer review journals) on the Subcommittee on Energy and Environment is Rep. Jerry Costello of Illinois – a coal-oriented non-scientist from a coal state.

On the Republican side, in addition to Mr. Inglis, who made a strong statement on behalf of environmental stewardship and future generations and separated himself from his colleagues who have adopted an anti-science poltiics (his opening statement starting at 11:43 is a highlight), the hearing was attended by Rep. Roscoe Bartlett of Maryland, Rep. Dana Rohrabacher of California, and very briefly, long enough only to deliver an opening statement, Ralph Hall of Texas.

Rep. Bartlett, the presumptive incoming chair of the subcommittee as the next ranking Republican after Mr. Inglis, appears to accept the science of climate change, but focused his questioning primarily on energy independence and peak oil. He asked (starting at about 1:00:00) panelists why major interest groups in the debate on climate policy couldn't at least agree on the benefits of achieving independence from foreign oil, regardless of how they view the climate science. Heidi Cullen replied that a variety of groups do share a position in support of developing alternative energy for transportation.

However, the climate problem cannot be reduced to a problem of dependence on foreign oil. The U.S. still has vast coal reserves, enough to electrify the transportation sector, and any serious discussion of the climate-energy nexus has to take that into account. Coal is the worst offender in CO_2 emissions, and our dependence on it for electric power generation must be addressed if we are to forestall the worst impacts of climate change.

The witnesses also encountered the notorious denier Dana Rohrabacher from Southern California – former speechwriter for Ronald Reagan, long-time member of the Science committee, and long-time aggressive denialist with a growing habit of using his allotted time at hearings to bait and mock climate science and scientists, sometimes to the exclusion of even asking them any questions. At this hearing, he performed with his first panel Q&A starting at 1:08:14, then later engaged in an interesting and spirited exchange with Richard Alley. This exchange (from 2:19:00 to 2:29:00), on whether human activity is responsible for significant warming and what can be learned from the advance and retreat of ice sheets and glaciers, is a case study of a politician with a predetermined conclusion and political agenda showing more interest in using a scientist as a foil than in learning from him. Alley took him on so effectively that Rohrabacher finally escaped by switching his attention to Pat Michaels and letting him have the last word.

Last but not least, Rep. Hall, at 87 the oldest member of the House and the current ranking minority member on the Committee, is a deeply conservative former-Democrat-turned-Republican. His opening statement (starting at 0:06:23) was a dismal exercise, with a drive-by hit on 'climategate' and various other denialist touchstones, and generally blowing a cloud of obstructionist smoke.

After 30 years in Congress, Mr. Hall may finally rise to the position of committee chairman, of the full Science and Technology Committee. It's hard to see intellectual alertness, scientific thoughtfulness, 21st century problem-solving capability, or climate policy faring well under the Science Committee in the next Congress.

Earlier CSW posts:

Rep. Inglis, Rick Piltz, and Bill McKibben on NPR All Things Considered

Ben Santer on communicating climate science

Adm. Titley briefing on national security implications of climate change

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