

**QUESTIONS SUBMITTED FOR THE RECORD TO  
DR. JANE LUBCHENCO  
UNDER SECRETARY OF COMMERCE FOR OCEANS AND ATMOSPHERE  
AND NOAA ADMINISTRATOR  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE**

**FOLLOWING THE DECEMBER 2, 2009, HEARING ON  
“THE ADMINISTRATION’S VIEW ON THE STATE OF CLIMATE SCIENCE”**

**BEFORE THE  
SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING  
U.S. HOUSE OF REPRESENTATIVES**

**1. Given that EPA’s Endangerment Finding is largely based on the IPCC’s finding and those findings were based on data that is now subject to questions of scientific integrity, do you believe that EPA should have delayed its Endangerment Finding? Should EPA regulate while significant questions of scientific integrity are outstanding?**

**Answer:** There is no reason to doubt the thorough, heavily scrutinized, peer reviewed science and research that led scientists from around the world to agree that the “warming of the climate system is unequivocal” (IPCC, 2007).

**2. On March 19 of this year, Ben Santer wrote that, “If the RMS is going to require authors to make ALL data available - raw data PLUS results from all intermediate calculations - I will not submit any further papers to RMS journals.”**

**2a. Do you believe that raw data supporting journal articles should be available? Isn’t the availability of data an important element of transparency?**

**Answer:** NOAA has a full and open data policy and is committed to scientific integrity. NOAA believes strongly in the peer review process to help ensure the highest data and research quality. I believe other scientific organizations share this principle, as well as the principle that other researchers are able to reproduce the results.

**2b. Would you support legislation that required journals publishing federally-funded research to make their raw data available to the public?**

**Answer:** I believe the goal of increasing access to data produced with federal support can be achieved without new legislation. In fact, several agencies have already taken the initiative to put data-sharing policies into practice. For example, the National Institutes of Health requires any applicants for grants over \$500,000 to include data-sharing proposals in their applications; the National Science Foundation explicitly states it expects investigators to share data with other scientists; and NOAA has stated its commitment to making all raw physical climate data available in as timely a manner as possible.

In January 2009, the National Science and Technology Council released the report “Harnessing the Power of Digital Data for Science and Society.” An explicit goal in this report is to maximize digital scientific data access and utility. Two recommendations in this report are key to realizing this goal. First, the report recommends that all federal agencies develop and publish policies for data preservation and access. Second, proposals and projects that will generate scientific data should include a data-management plan that describes provisions for protection, access, and preservation.

Most leading journals (e.g., *Science*) that publish earth and climate science articles have policies that already strongly mandate data access and sharing. All data necessary to understand, assess, and extend the conclusions of a manuscript submitted to *Science* must be available to any reader of *Science*. After publication, all reasonable requests for materials must be fulfilled. *Science* also supports the efforts of databases that aggregate published data for the use of the scientific community. For example, climate data, published in *Science*, should be archived in the NOAA climate repository or other accessible public databases.

**3. Do the newly released e-mails raise any concerns for you? Specifically, do they raise concerns about the integrity of the scientific process?**

**Answer:** No, these emails do nothing to undermine the very strong consensus and the independent scientific analyses of thousands of scientists around the world that tell us the Earth is warming, and that this warming is largely a result of human activities. Excerpts from private email exchanges taken out of context do not offer a reason to doubt the immense body of thorough, heavily scrutinized, peer reviewed science and research that led scientists from around the world to agree that the “warming of the climate system is unequivocal” (IPCC, 2007). State-of-the-art research incorporates a variety of data sets, evidence and analysis, and cross references many pieces of information to ensure its conclusions are unbiased and dependable.

It is largely because of the rigorous and diverse scientific process that we can be so confident in the conclusions found in published research including the Intergovernmental Panel on Climate Change (IPCC) reports and the other peer reviewed science on which we base our understanding of the climate system. The peer review process is a critical and thorough process. It includes multiple rounds of comments and reviews from a wide range of experts, including scientists who were not involved in the study being reviewed, to ensure the accuracy and dependability of the research and its conclusions. The scientific process, which itself is carefully documented and open to scrutiny, is designed specifically to be open and inclusive to prevent results being driven by any one person or agenda.

**4. Notwithstanding your skepticism and dismissal of the contents of the released e-mails, they have raised a great deal of concern and questions by scientists, policymakers and American taxpayers. Before proceeding with any climate change legislation in Congress that establishes a cap-and-tax system - which is widely acknowledged to have a drastic economic impact on the lives of Americans - would you support an independent and exhaustive investigation into the e-mails? Who do you recommend conduct this investigation and why?**

**Answer:** A number of independent and reputable groups of scientists and journalists have already studied the e-mails and have concluded that while some human frailties are on display in the e-mails, none are of a magnitude or pervasiveness that calls into question the methods or the conclusions of the IPCC and the climate-science community more broadly. In addition, formal investigations of the implications of the e-mails and what if any corrective actions are indicated are already underway at the University of East Anglia, Pennsylvania State University, and the IPCC – the main institutions with which the writers of the most criticized and questioned e-mails are associated. Please also refer to my answer to question number 3.

**5. On June 24, 2003, Mick Kelly wrote in an email: “NOAA want to give us more money for the El Nino work with IGCN. How much do we have left from the last budget? I reckon most has been spent but we need to show some left to cover the costs of the trip Roger didn't make and also the fees/equipment/computer money we haven't spent otherwise NOAA will be suspicious. Politically this money may have to go through Simon's institute but there overhead rate is high so maybe not!” In light of this admission of fraud, would you support an investigation into the scandal surrounding the leaked emails?**

**Answer:** I am not familiar with the source of this email, but I have asked my team to look into it and report back.

**6. In your testimony, you state that President Obama “has made it clear that our choices [regarding climate change] will be informed by scientific knowledge...” If the data behind the science is deemed to be tainted or manipulated, would you and/or President Obama change your position to reflect that?**

**Answer:** We strongly believe that decision making should be informed by the best available scientific knowledge. The climate science available to date is using the methods or the conclusions of the broad scientific community, including the IPCC and the U.S. Global Change Research Program. As the science continues to evolve – and is reviewed and debated using the widely accepted scientific (peer review) process – decisions will, too, evolve to reflect any new information.

**7. In your written testimony, you mention your meetings with leaders of international organizations during your trip to Geneva in early September for the World Climate Conference-3. You wrote: “There was strong agreement that services must be informed by relevant and credible science and must engage the users at all steps in the process.”**

**7a. Did you interact with anyone from the University of East Anglia (UEA) at the conference?**

**Answer:** To the best of my knowledge, I do not recall interacting with anyone from the University of East Anglia at the conference.

**7b. Do you consider the UEA scientists’ methods relative to climate change to be in line with your definition of “credible science”?**

**Answer:** The University of East Anglia (UEA) is a respected research institution with standards and oversight that maintain, internationally, a strong reputation. I am not aware of any specific evidence that demonstrates the illegitimacy of any research papers published by UEA scientists. Datasets and analyses from other institutions show similar rates of warming to the rates shown in UEA data. The conclusions of the IPCC reports are based on many data sets including UEA's Climatic Research Unit, NOAA and the National Aeronautics and Space Administration (NASA).

**8. You mention in your written testimony about temperatures in the United States. Last year, NASA published a top ten list of the hottest years on record. The top year was 1934. And of the top ten, six were before World War II. What is your opinion on this?**

**Answer:** NOAA data for the contiguous United States (the region referenced in the NASA study) indicate that 1934 ranks among the top 5 warmest years on record, with 1998 the warmest followed by 2006, 1934, 1999, and 1921. Three of the ten warmest years of the record occurred before World War II and 2009 was the 13<sup>th</sup> consecutive year with the contiguous U.S. temperature above the 20<sup>th</sup> Century average. Differences in how NOAA and NASA process and analyze U.S. temperature data are responsible for the differences in a given year's calculated average temperature and resulting ranks. Both datasets agree that: (1) the temperature trend in the United States is positive, about one degree Fahrenheit during the 20<sup>th</sup> Century; (2) the 1930s were warm, but not as warm as the 1990s or 2000s; and (3) the 2000-09 decade was the warmest observed in the U.S. record.

**9. Recent research, including papers published this year in peer-reviewed journals, indicate that there is no correlation between atmospheric CO<sub>2</sub> concentration and ocean pH levels, and that recent acidification is within natural variations of pH, synchronous with the Interdecadal Pacific Oscillation. Have you read these 2009 papers authored by Dr. Wei and Dr. Liu in the *Geochimica et Cosmochimica Acta*? If so, what is your scientific opinion of these papers?**

**Answer:** I am advised by NOAA scientists that the paper by Wei and Liu (2009), and references therein, explains that pH in coastal waters of the Great Barrier Reef of Australia is more variable than the open-ocean as these areas are exposed to changes in river runoff and inter-annual climate variability. The long-term trends of ocean acidification in the open-ocean are more easily observable because local impacts from land sources (e.g., floods) are less apparent in the middle of the oceans. However, the long-term data at this site show a clear trend towards decreasing pH since the 1940s. As the authors state in their summary, this trend "indicates that the trend towards ocean acidification over the past 60 years in this region is mostly the result of rapidly increasing of levels of atmospheric CO<sub>2</sub> contributed by human activities." The decreasing pH trends are indeed consistent with other decreasing pH trends in open-ocean and coastal regions, although the magnitude of the trends vary from place to place depending on local conditions (see Feely *et al.*, *Oceanography*, 22(4), 36-47. 2009 for a summary of the global trends and projections for the future).