



UNITED STATES DEPARTMENT OF COMMERCE
The Inspector General
Washington, D.C. 20230

February 18, 2011

The Honorable James M. Inhofe
United States Senate
Washington, DC 20515

Dear Senator Inhofe,

This responds to your letter of May 26, 2010, in which you requested that we examine issues related to the internet posting of email exchanges taken from the Climatic Research Unit (CRU) of the University of East Anglia in the United Kingdom in a reported computer hacking incident on or about November 17, 2009. These emails constituted exchanges between researchers at the CRU and many of the world's leading climate scientists, including employees of the National Oceanic and Atmospheric Administration (NOAA). Within days of the release of these emails, questions were raised publicly that the emails allegedly showed that climate change-related data had been manipulated or deleted to support the theory that global warming is caused by human activity.

You further inquired about the basis for a statement made by Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator, at a hearing before the House Select Committee on Energy Independence and Global Warming (House Select Committee) on December 2, 2009. During this hearing, entitled "The Administration's View on the State of Climate Science," Dr. Lubchenco testified:

"The [CRU] emails really do nothing to undermine the very strong scientific consensus and the independent scientific analyses of thousands of scientists around the world that tell us that the earth is warming and that the warming is largely a result of human activities."

Pursuant to your request, we conducted an inquiry to determine the following:

1. Whether NOAA carried out an internal review of the CRU emails posted on the internet.
2. The basis for Dr. Lubchenco's above testimony statement before the House Select Committee on December 2, 2009.
3. Whether NOAA has conducted a review of its global temperature data comprising the Global Historical Climatology Network-Monthly dataset (GHCN-M, described in the enclosure), which is maintained by NOAA's National Climatic Data Center (NCDC).



4. Whether any CRU emails indicated that NOAA:

- (a) inappropriately manipulated data comprising the GHCN-M temperature dataset;
- (b) failed to adhere to appropriate peer review procedures; or
- (c) did not comply with federal laws pertaining to information/data sharing, namely the Federal Information Quality Act (IQA), the Freedom of Information Act (FOIA), and the Shelby Amendment, which applies provisions of FOIA to recipients of federal funding (e.g., contractors and grantees).

In the course of our inquiry, we examined all of the 1,073 CRU emails that were posted on the internet (spanning 13 years, from 1996 to 2009), primarily focusing on the 289 emails that involved NOAA. We also interviewed Dr. Lubchenco, who was sworn in as Under Secretary and NOAA Administrator on March 20, 2009; the Director of NOAA's NCDC and Transitional Director for NOAA's Climate Service; the Co-Chair of the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (AR4) Working Group 1, who is a NOAA senior scientist; and other relevant NOAA and Departmental officials. Our inquiry did not assess the validity and reliability of NOAA's or any other entity's climate science work. Our results, including recommendations, are summarized below and detailed in the enclosure.

Summary of Results

1. NOAA's internal review of CRU emails. Shortly following the internet release of the CRU emails and ensuing public attention, NOAA conducted a management-level review of the emails, in conjunction with staff of the Department of Commerce's Office of General Counsel. According to Dr. Lubchenco, the purpose of the email review was to determine whether NOAA employees were involved with the controversy and, if so, whether they did anything that was illegal or improper with respect to their scientific work on behalf of NOAA. Dr. Lubchenco told us she personally read some of the emails and was relieved because they indicated that NOAA scientists had not done anything inappropriate involving their scientific work. The officials who conducted this review, which was undocumented, told us that the emails raised no concerns.

In our own review of all 1,073 CRU emails, we found eight emails which, in our judgment, warranted further examination to clarify any possible issues involving the scientific integrity of particular NOAA scientists or NOAA's data. As a result, we conducted interviews with the relevant NOAA scientists regarding these eight emails, and have summarized their responses and explanations in the enclosure.

In addition to the foregoing, we also found two other emails that raised questions, one regarding a 2002 contract NOAA awarded to the CRU, and the second involving actions on the part of two NOAA scientists in 2007. This latter email concerned the creation and forwarding of a photographic image titled, "marooned," which depicted Senator Inhofe and five other persons—several as characters from the television program *Gilligan's Island*—as stranded on a melting ice cap at the North Pole or floating nearby in the ocean. As detailed in the enclosure, we recommend that NOAA examine the CRU contract issues implicated by the one email and provide the results to us. With respect to the latter email, as a result of our bringing this matter to their attention, NOAA management recently took action to address the scientists' conduct.

2. Dr. Lubchenco's December 2, 2009, testimony statement. In preparation for the United Nations Climate Change Conference in mid-December 2009, the House Select Committee held a hearing on December 2, 2009, to discuss the Administration's view on the state of climate science. Both Dr. John Holdren, Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy, and Dr. Lubchenco testified at the hearing. Dr. Lubchenco, a marine ecologist and environmental scientist, told us that her statement from the hearing was based on, and reflects, her general confidence in the "fundamental science" behind the human-induced global warming theory, which she characterized as "robust." Specifically, Dr. Lubchenco told us that the CRU emails do nothing to undermine the conclusions drawn by climate scientists with regard to global warming because the emails involved just one of the many centers across the globe that analyzes climate information. According to Dr. Lubchenco, even if one were to discount the CRU's scientific assertions, other groups that analyze climate information have reached the same conclusion, and, as such, the fundamental science remains very strong.

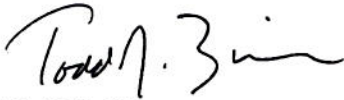
3. Review of the temperature data contained in the GHCN-M dataset. We determined that NOAA has not conducted a specific, targeted review of the monthly temperature data contained in the GHCN-M dataset as a result of the CRU controversy. Even though Dr. Lubchenco expressed confidence in the scientific research that forms the basis for the GHCN-M dataset, she and her staff discussed retroactively ensuring that the data meets certain standards, but she did not recall the feasibility or disposition of such an effort. However, according to NOAA, the algorithms¹, which NCDC utilizes to adjust monthly temperature time series data in the GHCN-M dataset, are extensively evaluated in peer-reviewed scientific literature. NOAA scientists with whom we spoke assert that the data itself is regularly subjected to rigorous quality control processes, which, according to NCDC's Director, effectively serve as "ongoing review[s of the data] that occurs...every month."

4. The integrity of NOAA's science and its adherence to peer review procedures and federal standards, as reflected in the CRU emails. In our review of the CRU emails, we did not find any evidence that NOAA inappropriately manipulated data comprising the GHCN-M dataset or failed to adhere to appropriate peer review procedures. In addition, we found no evidence to suggest that NOAA was non-compliant with the IQA or the Shelby Amendment. However, the CRU emails referenced a specific IPCC-related FOIA request received and responded to by NOAA in June 2007 that led to our further examination of how those FOIA requests were handled. We determined that, at the time, NOAA did not conduct a proper search for responsive documents as required under FOIA, and, as a result, did not have a sufficient basis to inform the requesters that it had no responsive documents. Given that federal agencies are legally obligated to publicly disclose records under the terms of FOIA, we recommend that NOAA conduct a proper search for responsive records as required by the FOIA, and reassess its response to the four FOIA requests in question, as appropriate. Additionally, based on the issues we identified in NOAA's handling of these particular FOIA requests, NOAA should consider whether these issues warrant an overall assessment of the sufficiency of its FOIA process.

¹ An algorithm is a step-by-step procedure for solving a problem or accomplishing some end, especially via computer (Source: *Merriam-Webster Online*. <http://www.merriam-webster.com/dictionary/algorithm>). NOAA applies algorithms to data in order to adjust for various non-climatic factors (e.g., instrument changes).

If I can answer any questions or be of further assistance, please feel free to contact me or my Deputy, Scott D. Dahl, at 202-482-4661.

Sincerely,

A handwritten signature in black ink, appearing to read "Todd J. Zinser". The signature is fluid and cursive, with the first name "Todd" being more prominent.

Todd J. Zinser

Enclosure

cc: Dr. Jane Lubchenco, Under Secretary of Commerce
for Oceans and Atmosphere and NOAA Administrator

Enclosure

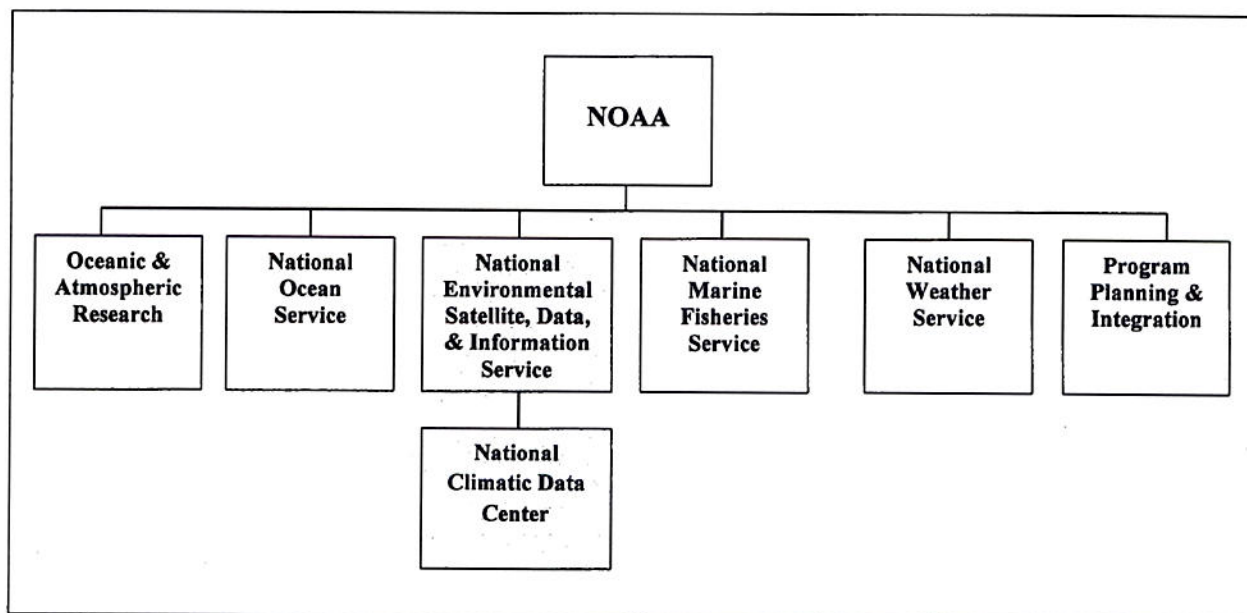
Detailed Results of Inquiry Responding to May 26, 2010, Request from Senator Inhofe

Background

National Climatic Data Center

The National Climatic Data Center (NCDC), headquartered in Asheville, North Carolina, is part of the National Oceanic and Atmospheric Administration's (NOAA) National Environmental Satellite, Data and Information Service (see Figure 1). NCDC houses the world's largest climate archive and, as such, provides historical perspectives on climate that are vital to studies on global climate change, the greenhouse effect, and other environmental issues. NCDC also works with international institutions such as the International Council of Scientific Unions, the World Data Centers, and the World Meteorological Organization, to develop standards by which data can be exchanged and made accessible.¹

Figure 1. NOAA Organizational Chart Related to GHCN-M



Source: OIG Adaption of NOAA Figure.

According to NCDC, it has more than 150 years of data on hand, with 224 gigabytes of new information added each day—equivalent to 72 million pages a day. NCDC uses this data to develop both national and global datasets, including the Global Historical Climatology Network (GHCN-Monthly, or GHCN-M). The GHCN-M is a dataset of surface temperature, precipitation, and barometric pressure records. When first released in 1992, the database

¹ Information obtained from NCDC's website: <http://www.ncdc.noaa.gov/oa/about/about.html>.

provided mean temperature data for approximately 6,000 stations worldwide to support a variety of climate-related activities. A second version was released in 1997 following extensive efforts to increase the number of stations and length of the data record. At that time, data from more than 30 sources worldwide (including nations) made it possible to expand the network to 7,280 stations and substantially improve coverage in previously data-sparse areas of the world.² The period of record varies from station to station, with several thousand stations extending back to 1950 and several hundred stations being updated monthly via CLIMAT³ reports.⁴

The GHCN-M is used operationally by the NCDC to monitor long-term trends in temperature and precipitation. The network has also been employed in several international climate assessments, including the United Nations Intergovernmental Panel on Climate Change (IPCC). According to NCDC's Director, the data contained in the GHCN-M is freely available to the general public.

In addition to the GHCN-M, there are two other major global land surface temperature datasets. These are published by (1) the Goddard Institute of Space Studies, which is part of the National Aeronautic and Space Administration in the United States, and (2) the Climatic Research Unit (CRU), which is part of the University of East Anglia in the United Kingdom. These three groups reportedly work independently and use different methods to process data to calculate the global average temperature.

Internet release of CRU emails

On or about November 17, 2009, 1,073 email exchanges were taken from the CRU in a reported hacking incident; soon after, the CRU emails were posted to the internet. These CRU emails constituted exchanges between researchers at the CRU and many of the world's leading climate scientists, including some at NOAA. Within days of the internet release of these emails, questions were raised publicly that the emails allegedly showed that climate-change related data had been manipulated or deleted to support the "anthropogenic" global warming theory (which asserts that the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century is a result of human activity.) For instance, critics pointed to a well-publicized CRU email dated November 16, 1999, in which Phil Jones, Director of the CRU, used the words "trick" and "hide the decline" while discussing temperature reconstructions. Critics alleged that these references indicated a deliberate attempt on his part to inappropriately alter climate data and influence the IPCC's findings and conclusions.

In addition, given that key global environmental policy makers, including those in the United States, base their decisions largely on the IPCC's work, critics expressed concerns over the

² Version 3 of the GHCN-M dataset is currently in Beta testing. (See OIG response to Question number three on page 9 for more details.)

³ CLIMAT is a code for reporting monthly climatological data assembled at land-based meteorological surface observation sites to data centers. The reports are generally sent and exchanged via the World Meteorological Organization's Global Telecommunication System.

⁴ Information obtained from NCDC's website at: <http://www.ncdc.noaa.gov/ghcnm/v2.php>

representations of “scientific consensus” contained in IPCC reports. Specifically, critics said the CRU emails reflected a lack of such consensus, or, at the very least, raised doubt as to the objectivity of the scientists who have contributed to IPCC reports as lead or contributing authors and expert reviewers.

As a result of the CRU email controversy, a number of domestic and international panels, including by the House of Commons of the United Kingdom, the University of East Anglia, and Pennsylvania State University, were separately convened to examine the contents of the emails to assess whether the scientists (1) “manipulated” or “manufactured” data; (2) did not comply with freedom of information requests; and/or (3) inappropriately kept articles which contradicted their beliefs out of journals or assessments. (See Appendix A for a listing of some of these reports and Appendix B for our detailed inquiry methodology).

Details of Issues Examined

1. Determine whether NOAA conducted an internal review of the CRU emails posted on the internet.

As part of our inquiry, we interviewed Dr. Lubchenco and individuals who participated in NOAA’s management-level review of the CRU emails, and conducted our own review of all 1,073 emails. According to Dr. Lubchenco, the purpose of the CRU email review was to determine whether NOAA personnel were involved with the controversy, and if so, “did they do anything that was illegal and for which there may be some liabilities” with respect to their scientific work on behalf of NOAA. Dr. Lubchenco told us she personally read some of the emails. She noted that she was “relieved because they were at odds with the way they were being publicly portrayed, and I thought that the ones I read [indicated] that NOAA scientists were exercising by and large good judgment and not doing things that were inappropriate” in their scientific work.

We found that NOAA carried out the management-level review in late November or early December 2009, shortly following the internet release of the CRU emails, in conjunction with staff of the Department of Commerce’s Office of General Counsel (OGC). The officials who conducted this review, which was undocumented, told us that the emails raised no concerns.

In our own review of all 1,073 CRU emails, we found eight emails which, in our judgment, warranted further examination to clarify any possible issues involving the scientific integrity of particular NOAA scientists or NOAA’s data. As a result, we conducted interviews with the relevant NOAA scientists regarding these eight emails, and have summarized their responses and explanations below:⁵

- **CRU email #1140039406.** This email, dated February 15, 2006, documented exchanges between several climate scientists, including the Deputy Director of CRU, related to their contributions to chapter six of the IPCC AR4. In one such exchange, the Deputy Director of CRU warned his colleagues not to “let [the Co-Chair of AR4 WG1] (or [a researcher at

⁵ The issues identified here are not exclusive to the eight CRU email control numbers referenced herein, in that some were also raised in other emails.

Pennsylvania State University)) push you (us) beyond where we know is right" in terms of stating in the AR4 "conclusions beyond what we can securely justify." The Deputy Director of CRU further noted in the email that he wished only to provide "a confirmation of the general conclusion of the TAR [Third Assessment Report]," without attributing this confirmation to data or analytical techniques that had come to light since the publication of the TAR.

The Co-Chair explained to us that she had only requested that these scientists cite the evidence that they contended "reinforced" the TAR's conclusion regarding the "exceptional warmth of the late 20th century, relative to the past 1000 years." She told us that her goal as Co-Chair was not to push a particular outcome, but to ensure that the scientists provided "more clarity as to what the reasoning was for [the] particular statement" they were making.

- **CRU email #1169653761.** This email, dated January 24, 2007, between various non-NOAA scientists discusses a request by the Co-Chair of AR4 WG1 to shift data values in a chart used in WG1's "Summary for Policymakers" (SPM). Specifically, in response to questions about the data points used in a particular chart, one of the email recipients stated as follows:

"[t]he averages of the values in Figure 3.6 over 1961-1990 turned out not to be exactly 0.000 owing to missing data in the reference period (a perennial problem [the Director of CRU] is well aware of). But [the Co-Chair] wanted the SPM curve to average exactly 0.000 in 1961-1990 so the values were shifted by somewhere between 0.02 and 0.03."

The Co-Chair explained to us that very often, climate-related data is presented in terms of anomalies of temperature—in other words, the difference from average temperatures for any given area over a period of time. "If there is any missing data, it will influence [this] difference." For instance, if one set of data is very complete, as in "all the points are there, all over the whole world, [but] in the other one, that's not the case..., there's going to be a slight offset...because they're not exactly the same coverage....So, putting a slight shift in the curve to account for that, and saying that's what you did is perfectly okay in scientific usage." She added that because the chart "was going into the [SPM], I wanted to make sure that we didn't have to spend a lot of time explaining what I've just explained to you to people who are not experts." With regard to shifting the values between 0.02 and 0.03, the Co-Chair said that she was not a recipient of this email and did not remember seeing anything on this topic and, therefore, did not know how large the shift actually was.

- **CRU email #1182255717.** This email, dated June 19, 2007, included several exchanges between climate scientists, related to questions raised by critics concerning the validity and reliability of the data contained in a 1990 article entitled "Urban Heat Islands in China," to which the NCDC Director had contributed.

The NCDC Director explained to us that he was responsible for contributing U.S. data to the piece; however, the Chinese meteorological data, which is the subject of the controversy, was collected by one of his colleagues, a non-NOAA scientist, and the NCDC Director had not personally analyzed it. The NCDC Director further told us that in general, while co-authors of an article "certainly read what the [collective] paper [is] saying..., [they do not do] analysis that the other people contributed." We also spoke with other scientists who indicated

that such independence in scientific research and writing is not uncommon; co-authored articles are often divided into sections, and each co-author is only responsible for his or her own contribution. In addition, the CRU emails indicate that the individuals who questioned the data contained in this article appeared to direct their complaints mainly to the scientist responsible for compiling and analyzing the Chinese meteorological data.

- **CRU email #1177890796.** In an email dated April 29, 2007, the Deputy Director of CRU and a lead author for chapter six of the IPCC AR4, sent an email to a researcher at Pennsylvania State University stating that "...I was particularly unhappy that I could not get the statement into the SPM [Summary for Policymakers] regarding the AR4 reinforcement of the results and conclusions of the TAR [Third Assessment Report]. I tried my best but we were basically railroaded by [the Co-Chair of AR4 WG1]."

The Co-Chair explained to us that the referenced lead author never raised this issue with her and, as such, she was not sure what he meant by his comment. However, the Co-Chair said that a general statement such as, "the AR4 reinforced the conclusions of the TAR" seemed very unclear to her. As it stands, the AR4 WG1 SPM reads "[s]ome recent studies indicate greater variability in Northern Hemisphere temperatures than suggested in the TAR, particularly finding that cooler periods existed in the 12th to 14th, 17th and 19th centuries."⁶ According to the Co-Chair, this "greater variability" in temperatures points to differences between the conclusions drawn in the TAR and the AR4. As such, she "didn't want to have confusing general statements [in the AR4] that [the AR4] reinforced, in some way [the conclusions of the TAR]. To me, it seemed much better to say what the similarities and differences [of the conclusions in the reports] were."

- **CRU email #1212073451.** In an email dated May 29, 2008, in which the Director of the CRU requested a researcher from Pennsylvania State University to ask an individual, who is now a NOAA scientist, to delete certain emails related to his participation in the IPCC AR4.

This scientist explained to us that he believes he deleted the referenced emails at that time. We determined that he did not become a NOAA employee until after the incident, in August 2008, and therefore did not violate any agency record retention policies. Further, this individual informed us that in December 2009, he received a letter from Senator Inhofe requesting that he retain all of his records, which he told us he has done.

We note that in response to an earlier OIG recommendation, on April 8, 2010, and again on February 7, 2011, Dr. Lubchenco sent an email to all NOAA employees reminding them of their records retention responsibilities. While we consider the Under Secretary's communications sufficient in implementing our recommendation, we note that the recommendation was not made in the context of FOIA and, as such, neither of the

⁶ IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.: Miller (eds.)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

communications referenced FOIA. Accordingly, NOAA may wish to specifically address FOIA in future refresher guidance concerning record retention.

- **CRU email # 1226451442.** This email, dated November 11, 2008, referenced a FOIA request (#2009-00070) submitted to NOAA for records related to a 2008 article entitled "Consistency of Modeled and Observed Temperature Trends in the Tropical Troposphere" by various authors, including four NOAA scientists. The requester asked for "monthly time series output" of certain climate models used to calculate temperature trends contemplated in the article, as well as "any correspondence concerning these monthly time series" between specified authors of the article, including the four aforementioned NOAA scientists. Pursuant to our inquiry, we learned that NOAA responded to the requester that it had no responsive records. However, we found some CRU emails discussing the aforementioned article, which, as a result, may have been responsive to the FOIA request and thus required agency action.

We interviewed the four NOAA scientists specified in the FOIA request to determine why these documents were not provided to the requester. We learned that upon receipt of this FOIA request, the four NOAA scientists and one NOAA General Counsel attorney participated in a conference call to decide how to address the FOIA request. It was ultimately determined by the group that the request for "monthly time series output" was seeking only the numerical data output from the climate model simulations, which the NOAA scientists had never possessed, and not the analysis of temperature trends derived from this numerical data, which were the subject of the CRU emails related to the article. Also on this conference call, the NOAA scientists determined that because they had never possessed the specific numerical data, they therefore could not possess "correspondences concerning these monthly time series."

- **CRU email #1226959467.** In this email, dated November 17, 2008, the Director of CRU discussed with a NASA scientist the fact that the majority of the quality control procedures that NCDC performed on temperature data that comprised the GHCN-M were done after the raw data had been reported, rather than in real-time (at the same time the data was reported).

According to the NCDC Director, NCDC can do a better job of ensuring the quality of temperature data retrospectively than it can in real-time because, as time passes, there is more opportunity for late reports to come in. Such reports thus provide additional values upon which NCDC can rely in calculating temperature trends. However, the NCDC Director noted that GHCN-M version 3, which is currently scheduled to become fully operational at the end of FY 2011, will have considerably more real-time quality control processes.

- **CRU email #1254850534.** In this email, dated October 6, 2009, the Director of CRU responded to an email from a climate scientist at the University Corporation for Atmospheric Research (UCAR) in Colorado. Pursuant to his comparison of CRU's climate-related dataset to those of NCDC and NASA's Goddard Institute for Space Studies (GISS), the CRU Director noted that "NCDC must have some data gaps."

NCDC's Chief Scientist explained to us was not copied on this email and, therefore, told us that he could not speculate as to which "data gaps" the CRU Director was referring to in his email, he provided some insight into the rationale behind what some may consider gaps in

NCDC's GHCN-M dataset. For example, NCDC's Chief Scientist explained that GISS "interpolate[s] land data out over the frozen Arctic Ocean," or "fills in" information based on data gathered from stations on nearby land. Conversely, he told us NCDC treats this ocean area as "missing [data]" because NCDC "deal[s] with land data separately over land, and then ocean data over the ocean." Also, NCDC's Chief Scientist told us that it has been NCDC's long-standing policy to "not put data in [the] GHCN that we couldn't release [to the public]" for any given reason. For example, the Chief Scientist explained that if a country has prohibited the public release of data it owns because it wishes to sell the data, it will be excluded from the GHCN-M dataset; however, such data may make its way into other global climate datasets which do not have such restrictions.

In addition to the foregoing, we found two other emails that raised questions, one regarding a 2002 contract NOAA awarded to the CRU, and the second involving actions on the part of two NOAA scientists in 2007. This latter email concerned the creation and forwarding of a photographic image titled, "marooned," which depicted Senator Inhofe and five other persons—several as characters from the television program *Gilligan's Island*—as stranded on a melting ice cap at the North Pole or floating nearby in the ocean. These two emails are discussed as follows:

(a) Potential irregularities involving NOAA contract (CRU email #1056478635)

This email, dated June 24, 2003, captioned "NOAA Funding," was sent by a visiting fellow at CRU, a NOAA contractor, to another researcher (affiliated with a research institution in Vietnam) stating the following:

"NOAA want[s] to give us more money for the El Nino work with IGCN [Indochina Global Change Network]. 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 [name omitted] didn't make and also the fees/equipment/computer money we haven't spent otherwise NOAA will be suspicious."

The visiting fellow served as CRU's "principal investigator"⁷ for its contract with NOAA. This email raises questions about CRU's use of NOAA funds and, in our view, should have been identified and examined in the course of NOAA's CRU email review. We learned that this particular email was also highlighted by the House Select Committee in "Questions Submitted for the Record" following Dr. Lubchenco's above-referenced December 2, 2009, testimony. NOAA's written response to the committee, dated February 16, 2010, stated that NOAA would look into this issue and report back to the committee. However, we determined that NOAA had not followed up on this topic or provided a response to this question to the committee. The Under Secretary told us that had she seen this email, she would have wanted to know more about it and whether there was anything to be concerned about. She thought that the review team may not have paid attention to it given the volume of emails reviewed.

⁷ A principal investigator (PI) is the lead scientist for a particular research project. The PI has direct responsibility for completion of a funded project, directing the research and reporting directly to the funding agency.

According to the Deputy Director of NOAA's Climate Program Office, with whom we spoke in January 2011, she was recently tasked with identifying the amount and purpose of this contract. As a result, we learned that NOAA contracted with the CRU in 2002-2003 to conduct two training workshops on forecasting El Nino and La Nina in Indochina at a cost of \$29,240 and \$37,000, respectively. However, at the time of our interviews, NOAA had not established whether the terms of this contract were adhered to by CRU.

Auditing NOAA's contracting with CRU was not within the scope of our inquiry, but in light of these circumstances it is important for NOAA to be assured that CRU fully complied with the applicable U.S. contracting rules and requirements. Moreover, NOAA could not tell us the universe of climate-related contracts it has issued over the past ten years to parties and institutions such as CRU. Accordingly, we recommend that NOAA examine this contract—along with any other contracts, grants, or cooperative agreements awarded to CRU—to verify conformance with all terms and specifications, and to identify any irregularities, and provide us the results of its review.

(b) Inappropriate image created and forwarded by NOAA scientists to the Director of the CRU (CRU email #1171901402)

This email, dated February 19, 2007, captioned "Fwd: Marooned?" contained an inappropriate image which NCDC's Chief Scientist forwarded to the Director of the CRU.⁸ The image depicts superimposed photographs of several individuals involved in the debate over global warming as characters from the television program *Gilligan's Island*, stranded on a melting ice cap at the North Pole or floating nearby in the ocean. In the course of our inquiry, we learned that another NOAA scientist had created the image during official business hours, using government computer equipment.

Both the Chief Scientist and the creator of the image told us it was meant to bring some levity to the constant criticism that they and their fellow climate scientists were facing at the time from "climate skeptics." Notwithstanding their rationale, such an image could foster an adverse appearance about the scientists' objectivity, and at least one internet blog questioned the propriety of the image. While none of the senior NOAA officials we interviewed said they were aware of the referenced email and the attached picture before we interviewed them, Dr. Lubchenco told us that "it was in bad taste." According to NOAA, both scientists, who acknowledged that the image was inappropriate, have since been counseled by their respective supervisors.

⁸ We considered it inappropriate to further distribute this image and thus did not publish it in our report. As of February 15, 2011, it remained publicly posted at <http://www.climate-gate.org/cru/documents> (February 19, 2007, 11:20 a.m., document #116746, "marooned.jpg").

2. Determine the basis for Dr. Lubchenco's testimony statement that "The [CRU] emails really do nothing to undermine the very strong scientific consensus and the independent scientific analyses of thousands of scientists around the world that tell us that the earth is warming and that the warming is largely a result of human activities."

In preparation for the United Nations Climate Change Conference in mid-December 2009 (commonly referred to as the "Copenhagen Summit"), the House Select Committee held a hearing on December 2, 2009, to discuss the Administration's view of the state of climate science. Dr. Lubchenco, a marine ecologist and environmental scientist, testified to the aforementioned statement in response to a question she received at the hearing. Dr. Lubchenco told us she could not be sure whether she had read any of the CRU emails or received a briefing from her staff on the results of NOAA's CRU email review prior to testifying before the House Select Committee. However, she informed us that her testimony statement was not grounded in the results of those efforts. Instead, she reported that her statement reflects her general confidence in the "fundamental science" behind the human-induced global warming theory, which she characterized as "robust."

Specifically, Dr. Lubchenco told us that the CRU emails do nothing to undermine the conclusions drawn by climate scientists with regard to global warming because the emails involved just one of the centers across the globe that analyze climate information. She further asserted to us that even if one were to discount the CRU's scientific assertions, the other centers which independently analyze climate-related information have reached the same conclusion, and, as such, the fundamental science remains very strong.

In addition to Dr. Lubchenco's statement related to the CRU email controversy, Dr. John Holdren, Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy, testified in his opening remarks at the December 2, 2009, hearing that:

"The emails are mainly about a controversy over a particular dataset and the ways a particular, small group of scientists have interpreted and displayed that dataset. It's important to understand that these kinds of controversies and even accusations of bias and improper manipulation are not all that uncommon in science...In this particular case, the data set in question and the way it was interpreted and presented by these particular scientists constitutes a very small part of the immense body of data and analysis on which our understanding of the issue of climate change rests."

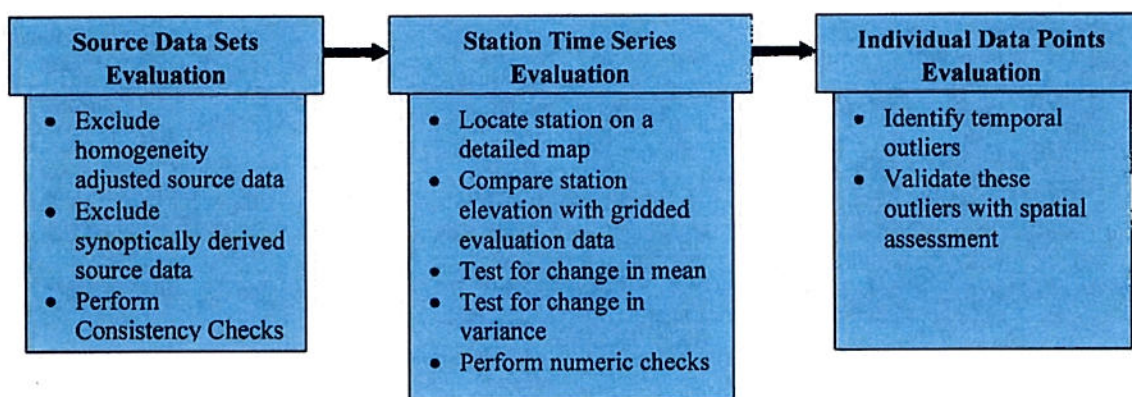
3. Determine whether NOAA has conducted a review of temperature data contained in the NCDC GHCN-M dataset (Dataset Index Identifier-9100). If not, determine why such a review of NCDC's GHCN-M temperature data has not been conducted in light of the correspondences released in November 2009 between researchers at the CRU and many of the world's leading climate scientists, including NOAA employees.

We found that NOAA has not conducted a specific, targeted review of the temperature data contained in the GCHN-M dataset as a result of the CRU controversy. Dr. Lubchenco told us that

she and her staff had “talked about... going back and making sure that all of the data we have...meets the standards that we expect them to meet,” but could not recall any specifics, as she does not typically become involved to that level of detail. Dr. Lubchenco expressed confidence in the scientific research that forms the basis for the GHCN-M dataset.

NOAA officials informed us that the algorithms NCDC utilizes to adjust monthly temperature time series data in the GHCN-M dataset, are, as discussed in the following section, evaluated in peer-reviewed scientific literature. Additionally, NOAA scientists with whom we spoke assert that both historical and near-real time GHCN-M data are regularly subjected to quality control processes, which, according to NCDC’s Director, effectively serve as “ongoing review[s] of the data] that occur...every month.” NOAA maintains that the data is processed in accordance with a quality assurance review checklist, with each step in the checklist geared toward identifying a specific data problem; data must pass each step in order to proceed to the next step. (See Figure 2 for a flowchart of NCDC’s quality control tests run on the data before it is incorporated into GHCN-M Version 2.)⁹ Once the reviews are completed, NCDC makes data adjustments from the applied algorithms, resulting in the GHCN-M Version 2 dataset.

Figure 2. Flow chart of NOAA quality control tests for data incorporated into GHCN-M Version 2



Source: OIG Adaptation of NOAA Figure.

In August 2010, NCDC posted a new test version (Beta Version 3) of the GHCN-M dataset on its website. Version 3 presently runs simultaneously with Version 2 so that NCDC, as well as the public, can get a sense about the differences between the new version and old version. According to NCDC’s Chief Scientist, initial comparisons of the data “found that the new system was better, more reliable.” NCDC attributes this improvement in part to new quality control processes and the use of advanced techniques to adjust for irregularities in the data. NCDC anticipates using GHCN-M Version 3 officially by the end of Fiscal Year 2011.

Separately, it should be noted that the United Kingdom’s Met Office (similar to NOAA) submitted a proposal to the World Meteorological Organization’s (WMO) Commission for

⁹ Peterson, Thomas C., Russell Vose, Richard Schmoyer, and Vyachevslav Razuvaev, 1997: *Global Historical Climatology Network Quality Control of Monthly Temperature Data*, *International Journal of Climatology*, 18: 1169-1179.

Climatology in February 2010 for the creation of a single, comprehensive repository of global climate data (including temperature records not currently freely available) through the collaboration with many partners in other countries. Accordingly, the proposal envisioned that the climate data in this “one-stop-shop” would be corrected and adjusted in a transparent way, so as to ensure that the resulting datasets are sound and traceable to help allay public concerns that the scientists may have manipulated the data. According to NCDC’s Chief Scientist, who is also the current President of the Commission for Climatology, the Commission’s members have endorsed the proposal and the effort is currently underway.

4. Determine whether any of the CRU emails indicated that NOAA:

(a) inappropriately manipulated data comprising the GHCN-M temperature dataset.

We found no evidence in the CRU emails that NOAA inappropriately manipulated data comprising the GHCN-M dataset. The CRU emails referenced certain “adjustments” to the raw data contained in the GHCN-M dataset. NOAA scientists told us that such adjustments are routinely made to remove artificial biases created by, for example, station moves, instrument changes, and urbanization issues, and thus did not constitute inappropriate manipulation of the data. As mentioned previously, the three global temperature datasets maintained by NOAA, NASA, and the CRU use different methodologies to process raw data.

While we did not verify the validity and reliability of the methodologies used to compile the raw or adjusted data contained in the GHCN-M, we did examine whether any information in the CRU emails indicated that NOAA failed to provide open access to its methodologies, thus making it impossible for interested persons to reproduce its results. We found no evidence to suggest such failure on NOAA’s part. According to NCDC’s Chief Scientist, NCDC retains all original data used to derive products such as homogenized or normalized datasets. Per NOAA, these original data are also maintained in such a form that any researcher can access and analyze them to reproduce published scientific results. According to NOAA, the methods used to derive such published scientific results are documented in peer-reviewed scientific journal articles. These methods are also made publicly available in as timely a manner as possible. In addition, NCDC’s Director informed us that NOAA-developed software required to reproduce such results are made available to the public upon request. We found nothing in the CRU emails or in the course of our inquiry which disputed these claims.

(b) failed to adhere to appropriate peer review procedures.

We found no evidence in the CRU emails to suggest that NOAA failed to adhere to its peer review procedures prior to its dissemination of information. NOAA has established policies and procedures related to internal and external peer reviews in accordance with the OMB Final Information Quality Bulletin for Peer Review, dated January 2005.¹⁰ NOAA’s policies require peer review of *influential scientific information*, or information that the agency determines will or does have a clear and substantial impact on important public policies or private sector

¹⁰ *Final Information Quality Bulletin for Peer Review*, 70 Fed. Reg. 2664 (OMB Jan. 14, 2005).

decisions.¹¹ It also includes information on how to select appropriate peer reviewers and opportunities to include public participation.

In July 2010, we issued a report¹² that, among other things, addressed NCDC's internal peer review process. At that time, we found that NCDC, in at least one instance, failed to account for an internal review it had performed on a scientific article, presumably because it was in the process of switching to an electronic software package designed for reviewing such articles. We recommended that NCDC periodically perform quality control checks of this system to verify that it was functioning correctly, so as to avoid another situation where NCDC could not adequately verify that a complete internal review had been performed. As part of our present inquiry, we received a demonstration of NCDC's internal review process and found that the aforementioned electronic software package is fully operational. We also found that the system contains mechanisms by which drafts of articles, as well as reviewer comments on such drafts, are saved at each stage of the internal review process, thus documenting reviewer questions and concerns as to the information contained therein.

(c) did not comply with federal laws pertaining to information/data sharing, namely the Federal Information Quality Act (IQA) the Freedom of Information Act (FOIA), and the Shelby Amendment.

(i) Federal Information Quality Act

We found no evidence in the CRU emails to suggest that NOAA violated its obligations under the IQA. The IQA constitutes a set of guidelines to OMB, requiring it to provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, utility, integrity and objectivity of information (including statistical information) disseminated by such federal agencies.¹³ To comply with these guidelines, OMB required federal agencies to implement information quality guidelines and, furthermore, to establish an administrative mechanism for persons to seek and obtain correction of information maintained and disseminated by these agencies.¹⁴ Therefore, in order to determine whether any information exchanged in the CRU emails raised concerns regarding NOAA's obligations under the IQA, we examined whether such information indicated that NOAA failed to adhere to its own IQ Guidelines, which NOAA implemented on October 1, 2002.¹⁵

¹¹ U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, *National Oceanic and Atmospheric Administration Information Quality Guidelines* (2002).

¹² Review of NOAA's Efforts to Modernize U.S. Historical Climatology Network: STL-19846 (July 29, 2010).

¹³ Consolidated Appropriations Act of 2001, Pub. L. No. 106-554, App. C, § 515, 114 Stat. 2763, 2763A-153 (2000).

¹⁴ *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies, Final Guidelines* (corrected), 67 Fed. Reg. 8452 (OMB Feb. 22, 2002).

¹⁵ U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, *National Oceanic and Atmospheric Administration Information Quality Guidelines* (2002). The mandates contained in NOAA's IQ Guidelines are twofold. First, NOAA line offices must conduct pre-dissemination reviews

We found no mention in the CRU emails that NOAA did not comply with its IQ Guidelines and thus the IQA, whether by failing to conduct a pre-dissemination review of particular information or by failing to make proper use of its administrative correction mechanism.

(ii) **Freedom of Information Act (FOIA)**

We found a reference¹⁶ in the CRU emails to a FOIA request submitted to NOAA in June 2007, related to the IPCC, which, upon further investigation, raised questions about NOAA's processing of the request. In examining NOAA's response to this FOIA request, we discovered three additional, nearly identical FOIA requests received and responded to by NOAA during the same time frame. As such, we reviewed NOAA's processing of all four FOIA requests.¹⁷

FOIA extends to any person a legally-enforceable right to require federal agencies to make full or partial disclosure of certain unreleased information. The Act defines agency records subject to disclosure, outlines mandatory disclosure procedures and grants nine specific exemptions to the statute.¹⁸ FOIA provides that, upon receiving a reasonably specific request for records that complies with published rules, an agency must "promptly" make such records available to the requester.¹⁹ Absent "unusual circumstances," the agency has 20 business days from the date on which it received the FOIA request to determine whether to withhold any records under a FOIA exemption and to notify the requester of its decision.²⁰ Generally, agencies must undertake a search that is reasonably calculated to uncover all relevant documents, where the term "search" means to "review, manually or by automated means, agency records for the purpose of locating those records which are responsive to a request."²¹

of information for three elements: utility, integrity and objectivity. Second, NOAA's IQ Guidelines set forth an administrative correction mechanism by which an *affected person*—one who uses, benefits from or is harmed by the information at issue—may file a request for correction of that information.

According to NOAA's guidelines, information possesses the requisite *utility* if it is useful, or helpful, beneficial and serviceable, as well as accessible and understandable, to its broad range of intended users. Information possesses the requisite *integrity* if it has been adequately safeguarded from unauthorized access, such as may result in improper use, modification or destruction of the information. Finally, information possesses the requisite *objectivity* if it is accurate, reliable and unbiased and is presented in a clear, complete and unbiased manner. The guidelines further state that because NOAA handles scientific information which reflects the inherent uncertainty of the scientific process, information is deemed accurate if it is within an acceptable degree of imprecision or error appropriate to the particular kind of information at issue and otherwise meets commonly accepted scientific, statistical or other standards.

¹⁶ CRU email #1182255717.

¹⁷ NOAA FOIA request numbers: 2007-00342, 2007-00354, 2007-00355 and 2007-00364.

¹⁸ 5 U.S.C. § 552.

¹⁹ 5 U.S.C. § 552(a)(3).

²⁰ 5 U.S.C. § 552(a) (6).

²¹ 5 U.S.C. § 552(a) (3).

With regard to the four FOIA requests mentioned above, the requesters sought NOAA records pertaining to review comments on the Second Order Draft and Final Draft of the IPCC AR4 Working Group 1. NOAA received and responded to these requests over a span of three weeks, informing each requester that “[a]fter reviewing our files, we have determined that we have no NOAA records responsive to your request. If records exist that are responsive to your request, they would be records of the IPCC and as such can be requested from the IPCC....” Contrary to NOAA’s assertions, we found that it did not conduct a sufficient search for records prior to responding to these FOIA requests.

The FOIA requests asked for “documents, memoranda, review comments, reports, internal and external correspondence or mail including email correspondence and attachments *to and from NOAA employees*” [emphasis added] regarding WG1’s review comments on the Second Order Draft and Final Draft of the IPCC AR4. However, the NOAA scientists with whom we spoke indicated that as a result of their participation in WG1 as authors and/or editors,²² they may have possessed responsive records, but were never apprised of the FOIA requests. As such, they did not search for and forward potentially responsive records for agency processing, as is required under FOIA.

The Co-Chair of the IPCC AR4 WG1, who was the only NOAA scientist informed of any of the aforementioned FOIA requests, told us that she did not conduct a “comprehensive search” for and forward potentially responsive documents for agency processing. This was based, in part, on her understanding that her IPCC-related work product was the property of the IPCC, due to the confidentiality provisions contained in many of the documents. In addition, she reportedly received verbal guidance from her supervisor and a NOAA OGC attorney that the IPCC-related documents she had created and/or obtained while on “detail” assignment to the IPCC did not constitute NOAA records.

FOIA includes provisions as to what constitutes an “agency record.” Under FOIA, an agency must exert sufficient control over the requested documents to render them “agency records” such as would be subject to disclosure. To qualify as agency records, documents must be created or obtained by the agency and under its control at the time the FOIA request is made.²³ The Co-Chair informed us that the IPCC process was governed by an implicit policy of confidentiality with respect to, for example, the pre-decisional correspondences of its members. We examined IPCC-related records in the possession of NOAA employees, some of which contained the directive “Do Not Cite or Quote,” and others of which had “Confidential. Do Not Cite or Quote.” However, none of the NOAA employees with whom we spoke who participated in the IPCC AR4 recalled explicit IPCC policies or procedures pertaining to the confidentiality of the material produced as part of the assessment process. Absent such an unambiguous directive, in our view, the IPCC did not demonstrate a clear intent to retain control over the records created or obtained by NOAA employees.²⁴

²² According to Dr. Lubchenco, NOAA scientists comprise 73 percent of the federal authors in the IPCC’s AR4 for Working Group 1, the basis of the physical understanding of climate.

²³ *DOJ v. Tax Analysts*, 492 U.S. 136, 144-45 (1989)

²⁴ Subsequent to the publication of AR4, the Thirty-Second Session of the IPCC released a *Review of IPCC Processes and Procedures* on October 11-14, 2010, for use with the Fifth Assessment Report. In it, the IPCC stated that it could not provide its participants any legal advice as to whether IPCC-related

Further, the Co-Chair told us that she had been detailed from NOAA to the IPCC from 2002 to 2007. As such, she said that upon her receipt of one of the four FOIA requests, she had consulted with her supervisor as well as a NOAA OGC attorney, to determine how she should respond to the request. The Co-Chair said that based on these exchanges, it was her understanding that any IPCC-related documents in her possession did not constitute "agency records" and, accordingly, she did not conduct a "comprehensive search" for responsive records. We spoke with her supervisor who said that he had also consulted with a NOAA OGC attorney on the matter and that he, too, understood that the Co-Chair's IPCC-related documents were not NOAA records.

We interviewed the two NOAA OGC attorneys whom the Co-Chair and her supervisor referenced during their interviews with us to determine what, if any, advice the attorneys provided to these individuals. Both attorneys specifically told us that they had not advised the Co-Chair or her supervisor on this matter at the time NOAA received the FOIA requests referenced herein. One attorney said that he never spoke to the Co-Chair about that issue, while the second attorney told us that he was consulted only after NOAA had already responded to the FOIA requesters that it had no responsive documents.

This second attorney maintained that the Co-Chair had called him within the past year or two, after NOAA responded to the 2007 FOIA requests, to confirm that the advice the Co-Chair said she received from him was still applicable. This attorney again maintained that he had not provided any such guidance. The attorney told us that at that point, he researched the matter and, based on his read of a precedent court case that he thought might be on point, *Judicial Watch, Inc. v. Dep't of Energy*, 412 F.3d 125 (D.C. Cir. 2005), he responded to the Co-Chair that the advice she said she had received earlier appeared reasonable. However, this attorney noted that he had been led to believe by the Co-Chair that she was officially detailed to the IPCC and, further, that a search for responsive documents had been conducted, but no such documents were found. This attorney also told us that even now, NOAA OGC does not have an official position as to whether IPCC-related records constitute NOAA records for the purposes of FOIA.

Based on our interviews of the two NOAA OGC attorneys, we followed-up with the Co-Chair and her supervisor, both of whom again told us that their handling of the aforementioned FOIA requests was based on advice they had received from these two specific attorneys. We requested from the Co-Chair and her supervisor documentation of any discussions with the NOAA OGC attorneys on this matter, which they were unable to provide. As such, we were unable to reconcile the divergent accounts.

We examined the precedent case referenced by one of the NOAA OGC attorneys, *Judicial Watch, Inc. v. Dep't of Energy*, and found that unlike in this case, the Co-Chair, as well as other NOAA employees who participated in the AR4, performed much of their IPCC-related work at NOAA offices and/or using NOAA equipment, received their pay from NOAA, and, in their own words, continued to work on other NOAA matters and remained subject to the supervision of other NOAA employees. In addition, all of the NOAA employees we questioned on this topic, with the exception of the Co-Chair, considered their IPCC-related work to be an official NOAA

documents in their possession constituted agency records such that they would be subject to release under individual member countries' FOIA laws.

activity. Furthermore, we found no evidence that any of the employees, including the Co-Chair, were formally “detailed” to the IPCC, via, for example, a memorandum of understanding or SF-52 Request for Detail.²⁵ As a result, in our view, any records created by these employees in the “legitimate conduct of [their] official duties,” including IPCC-related work, constitute NOAA agency records, and as such, should have been processed under FOIA to determine whether the records were releasable.

We note that in the course of our inquiry, we did not determine whether NOAA actually possessed responsive documents and/or whether it should have released any IPCC-related records created or obtained by its employees in response to the aforementioned four FOIA requests. However, it is clear that NOAA did not conduct a proper search in response to these requests, and it should not have excluded from the universe those IPCC documents that the Co-Chair may have possessed at the time of the requests. Only by going through the proper FOIA process—including conducting a search and turning over responsive documents to NOAA’s designated FOIA official—could NOAA have made a determination whether the records in question were in fact NOAA records and whether any exemptions may have been applicable under FOIA.

Given that federal agencies are legally obligated to publicly disclose records under FOIA, we recommend that NOAA carry out a proper search for the records sought in these FOIA requests and, as appropriate, reassess its response. Additionally, given the issues we identified in NOAA’s handling of these particular FOIA requests, NOAA should consider whether these issues warrant an overall assessment of the sufficiency of its FOIA process.

(iii) Shelby Amendment

We found no evidence in the CRU emails to suggest that NOAA violated its obligations under the Shelby Amendment. The “Shelby Amendment” refers to a provision attached to the Omnibus Consolidated and Emergency Supplemental Appropriations Act for Fiscal Year 1999, which essentially authorizes federally-funded research data derived from institutions of higher education, hospitals and non-profit institutions to be accessed through the mechanisms set forth in FOIA.²⁶ As a result, OMB Circular A-110 was revised to state that when a FOIA request centers on federally-funded research data that is both published and has been used by the federal government to develop agency action that has the force and the effect of the law, the agency must request, and the recipient of federal funds must provide, the requested research data so that it can be made available to the public pursuant to the procedures established under FOIA.²⁷

²⁵ Although the court emphasized in *Judicial Watch* that the source of compensation for employees is not dispositive, these facts taken together strongly indicate that the NOAA employees working on IPCC matters remained NOAA employees and were not effectively transformed into IPCC employees.

²⁶ Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999, Pub. L. No. 105-277, 112 Stat. 2681, 2681-495 (1998).

²⁷ OMB Circular A-110, *Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations*, 64 Fed. Reg. 54,926 (OMB Oct. 8, 1999).

As addressed previously, the CRU emails contained references to two distinct FOIA requests submitted to NOAA, neither of which specifically asked NOAA for research data produced by an institution of higher education, hospital or non-profit institution operating under a monetary grant from NOAA. As a result, there is no evidence in the CRU emails to suggest that NOAA did not meet its obligations under the Shelby Amendment.

Recommendations

Based on the foregoing results of our inquiry, we recommend that NOAA take the following actions:

1. Carry out a proper search for responsive records to the four FOIA requests seeking NOAA records regarding review comments on the Second Order Draft and Final Draft of the IPCC AR4 WG1, and reassess the agency's response to these requests as appropriate. Additionally, given the issues we identified in NOAA's handling of these particular FOIA requests, NOAA should consider whether these issues warrant an overall assessment of the sufficiency of its FOIA process.
2. Review the contract with CRU referenced in CRU email No. 1056478635, along with any other contracts, grants, or cooperative agreements awarded to CRU—to verify conformance with all terms and specifications, and to identify any irregularities—and provide the results of its review to us.

Appendix A
List of Inquiries OIG Reviewed Related to CRU Emails

	Title	Date	Conducted by
1	United States Senate Report 'Consensus' Exposed: The CRU Controversy	February 2010	United States Senate Committee on Environment and Public Works, Minority Staff
2	RA-10 Inquiry Report: Concerning the Allegations of Research Misconduct Against Dr. Michael E. Mann	February 2010	Pennsylvania State University (University Administrators)
3	The disclosure of climate data from the Climatic Research Unit at the University of East Anglia	March 2010	United Kingdom House of Commons, Science and Technology Committee
4	Report of the International Panel set up by the University of East Anglia to examine the research of the Climatic Research Unit.	April 2010	University of East Anglia, Oxburgh Panel (United Kingdom)
5	RA-10 Final Investigation Report Involving Dr. Michael E. Mann	June 2010	Pennsylvania State University (Faculty Members)
6	The Independent Climate Change Emails Review	July 2010	University of East Anglia, Muir Russell Panel (United Kingdom)
7	EPA's Denial of the Petitions to Reconsider the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule (40 CFR Chapter 1)	August 2010	U.S. Environmental Protection Agency
8	Climate Change Assessments, Review of the Processes & Procedures of the IPCC	August 2010	InterAcademy Council*
* The InterAcademy Council is a multinational organization of science academies created to produce reports on scientific, technological, and health issues related to global challenges of our time, providing knowledge and advice to national governments and international organizations.			

Appendix B

Methodology

On or about November 17, 2009, 1,073 email exchanges were taken from the CRU in a reported hacking incident; soon after, they were posted to the internet. These CRU emails constituted exchanges between researchers at the CRU and many of the world's leading climate scientists, including some at NOAA. Within days of the internet release of these emails, questions were raised publicly that the emails allegedly showed that climate-change related data had been manipulated or deleted to support the "anthropogenic" global warming theory (which asserts that the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century is a result of human activity.) Senator Inhofe requested that we examine issues surrounding the CRU email controversy. Accordingly, we conducted an inquiry to determine:

1. Whether NOAA carried out an internal review of the CRU emails posted on the internet.
2. The basis for a testimony statement made by Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator, before the House Select Committee on Energy Independence and Global Warming (House Select Committee) on December 2, 2009, in a Hearing entitled "The Administration's View on the State of Climate Science," in which she stated the following:

"The [CRU] emails really do nothing to undermine the very strong scientific consensus and the independent scientific analyses of thousands of scientists around the world that tell us that the earth is warming and that the warming is largely a result of human activities."

3. Whether NOAA has conducted a review of its global temperature data comprising the Global Historical Climatology Network-Monthly (GHCN-M) dataset, which is maintained by NOAA's National Climatic Data Center's (NCDC).
4. Whether any of the CRU emails indicated that NOAA:
 - (a) inappropriately manipulated data comprising the GHCN temperature dataset;
 - (b) failed to adhere to appropriate peer review procedures; or
 - (c) did not comply with federal laws pertaining to information/data sharing, namely the Federal Information Quality Act (IQA), the Freedom of Information Act (FOIA), and the Shelby Amendment.

As a part of our inquiry, we examined all 1,073 emails,²⁹ spanning 13 years (1996 through 2009), that were posted on the Internet from a CRU server in November 2009. We then narrowed the focus of our inquiry to the 289 emails that we identified as relating to NOAA and/or its employees. The two NOAA scientists whose names most frequently appear in the emails³⁰ included the Director of the NCDC and Transitional Director of NOAA's Climate Service (103 emails); and a NOAA senior scientist who served as Co-Chair of Working Group 1 (WG1) for the United Nations Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) (108 emails).

We interviewed Dr. Jane Lubchenco, who was sworn in as Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator on March 20, 2009; the Transitional Director of NOAA's Climate Service, who is the former Director of NCDC; the Co-Chair of the IPCC AR4 Working Group 1, who is a NOAA senior scientist; and other key officials identified in the CRU emails, including scientists and managers from NCDC and NOAA's Office of Oceanic and Atmospheric Research (OAR). Specifically, we interviewed officials from OAR's (1) Earth System Research Laboratory, (2) Geophysical Fluid Dynamic Laboratory, and (3) Air Resource Laboratory. We also interviewed individuals associated with the CRU email review that NOAA conducted in conjunction with the Department of Commerce's Office of General Counsel (OGC), including NOAA's former Acting Deputy Chief of Staff (current Deputy Director of NOAA's Coastal Services Center) and an attorney from the Department of Commerce's OGC. Additionally, we interviewed two attorneys from NOAA's OGC who were familiar with FOIA issues referenced in this report.

Finally, we examined background information relating to the GHCN, including relevant peer reviewed literature and data quality assurance procedures; IPCC AR4 Policy and Procedures; relevant U.S. laws, regulations, and policies; and various reports issued relating to the CRU email controversy (see Appendix A for a listing of reports reviewed). Our inquiry did not include any assessment of the validity and reliability of NOAA's or any other entity's climate science research.

²⁹ While 1,073 emails were posted to the Internet, each of these 1,073 emails contained a number of additional emails embedded in text. Given that many of these embedded emails were repeats of previously embedded emails, we were unable to identify exactly how many emails we reviewed in total or to distinguish one embedded email from another in any meaningful way. As such, in this report, we refer to specific embedded emails only by referencing the control numbers of the emails which contained these embedded emails, of which there are 1,073.

³⁰ Includes the number of emails in which the individual was a sender/receiver, copied on, and/or mentioned in the text of an email.