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EXAMINING NOAA'S CLIMATE SERVICE PROPOSAL

HEARING

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

WEDNESDAY, JUNE 22, 2011

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EXAMINING NOAA'S CLIMATE SERVICE PROPOSAL

WEDNESDAY, JUNE 22, 2011

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC.

The Committee met, pursuant to other business, at 10:10 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Ralph Hall [Chairman of the Committee] presiding.

RALPH M. HALL, TEXAS
CHAIRMAN

EDDIE BERNICE JOHNSON, TEXAS
RANKING MEMBER

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Examining NOAA's Climate Service Proposal

Wednesday, June 22, 2011
10:00 a.m. to 12:00 p.m.
2318 Rayburn House Office Building

Witnesses

Dr. Jane Lubchenco, Administrator, National Oceanic and Atmospheric Administration

Mr. Robert Winokur, Deputy Oceanographer, Department of the Navy

HEARING CHARTER

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
Examining NOAA's Climate Service Proposal

WEDNESDAY, JUNE 22, 2011
10:00 A.M.—12:00 P.M.
2318 RAYBURN HOUSE OFFICE BUILDING

Purpose

On Wednesday, June 22, 2011, at 10:00 a.m. the House Committee on Science, Space, and Technology will hold a hearing to review the Administration's FY 12 budget request proposal to reorganize NOAA to create a climate service.

Witnesses

- Dr. Jane Lubchenco, Administrator, National Oceanic and Atmospheric Administration
- Mr. Robert Winokur, Deputy Oceanographer, Department of the Navy

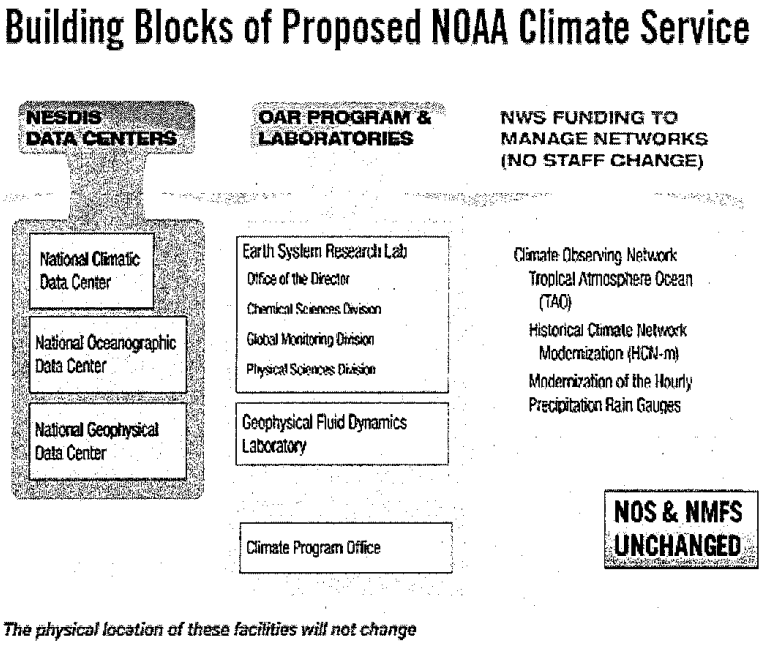
Background

The Administration's FY 12 budget request included a proposal for the creation of a Climate Service at the National Oceanic and Atmospheric Administration (NOAA). The stated goal of this new line office is to bring together NOAA's existing climate capabilities under a single entity to more efficiently and effectively respond to demands for climate services. According to NOAA, the Climate Service "will provide a single, reliable and authoritative source for climate data, information, and decision-support services to help individuals, businesses, communities and governments make smart choices in anticipation of a climate changed future."

The proposal would constitute the largest reorganization of NOAA since its establishment in 1970. NOAA proposes to spend $346 million on the new Climate Service in FY 12. It intends for this effort to be budget neutral, paid for through the transfer of transfer assets and resources from existing line offices (Figure 1). The assets that would move include:

- Three data centers from the National Environmental Satellite, Data and Information Service (NESDIS)
- Two science labs, including the Earth System Research Lab and the Geophysical Fluid Dynamics Lab, and the Climate Program Office from the Office of Oceanic and Atmospheric Research (OAR)
- The Climate Prediction Center and management oversight for the Climate Observing Network from the National Weather Service (NWS)

Figure 1. Building Blocks of Proposed NOAA Climate Service.



The National Ocean Service (NOS), National Marine Fisheries Service (NMFS), and Program Planning and Integration (PPI) would be untouched in this reorganization.

The new line office would be subdivided into three offices: the Office of Climate Research; the Office of Observation, Monitoring and Prediction; and the Office of Service Development and Delivery. The management structure that would oversee these three offices would consist of an Assistant Administrator for Climate Services, a Deputy Assistant Administrator for Climate Services, and a Climate Senior Scientist. These new positions would not require Senate confirmation, which is consistent with the structure of other NOAA line offices.

Table 1 shows the NOAA FY12 budget request and the impact the creation of the Climate Service has on the three line offices its assets come from. Most notably, OAR is reduced by 53 percent—by far the largest reduction from any line office—due to the loss of approximately $203 million in research funding to the Climate Service.

Table 1: NOAA FY 2012 Budget Request for Climate Service Reorganization (dollars in millions)

Account	FY08 Actual	FY10 Enacted	FY11 Request	FY12 Request	Climate Reorg	FY12 Request versus FY10 Enacted	
						$	%
National Ocean Service*	536.0	578.7	550.6	558.6	0.0	(20.1)	(3.5)
Oceanic and Atmospheric Research	398.0	449.1	464.9	212.0	(225.9)	(237.1)	(52.8)
National Weather Service	911.0	999.8	1003.2	988.0	(15.0)	(11.8)	(1.2)
National Environmental Satellite Data Information Service/NESS	955.0	1398.5	2209.0	2015.4	(111.0)	616.9	44.1
Climate Service	0.0	0.0	0.0	346.2	346.2	346.2	--
National Marine Fisheries Service**	829.0	1008.2	992.4	997.5	0.0	(10.7)	(1.1)
Program Support	446.0	485.9	515.1	524.8		38.9	8.0
Transfers/Rescissions		(24.8)	(50.3)	(144.8)			
Totals:	**4075.0**	**4748.4**	**5554.5**	**5497.7**		**749.3**	**15.8**

* Jurisdiction of the NOS line office is shared with the Resources Committee.
** NMFS is solely in the jurisdiction of the Resources Committee.

Climate Service Proposal Timeline

NOAA first announced its intent to create a climate service on February 8, 2010. This announcement was accompanied by the creation of six new NOAA Regional Climate Services Director positions at laboratories across the country. Additionally, Administrator Lubchenco appointed senior officials Tom Karl and Chet Koblinsky as Climate Service Transition Director and Deputy Director, respectively. In a December 2010 interview regarding NOAA's Climate Service activities, Karl said "We've moved in . . . we're waiting for the marriage certificate, but we're acting like we have a Climate Service." This statement, as well as the absence of a formal Climate Service budget submission to Congress, raised questions regarding NOAA's intended path for creation of the new office.

Earlier in 2010, the Consolidated Appropriations Act, 2010 (P.L. 111–117) included language directing NOAA to contract with the National Academy of Public Administration (NAPA) to study the formation of a climate service at NOAA.

The conferees direct NOAA to enter into a contract with the National Academy of Public Administration (NAPA) within 60 days after the enactment of this Act for a study and analysis of organizational options for a National Climate Service within NOAA, emphasizing maximum effectiveness and efficiency. The study should consider how to provide information at the global, regional, and State levels over varying timescales; support interaction among the government and various users, stakeholders, researchers, and information providers of climate information in both the private and public sectors; develop and distribute products and information that will support decision making to better prepare the Nation for climate variability and climate change; coordinate and align existing programs and resources internal and external to NOAA to reduce duplications and leverage existing climate-related resources; and provide estimates on projected funding levels. The study shall be completed no later than 120 days after the contract is awarded.

As such, NOAA delayed its formal proposal until the NAPA study was complete. The scope of the study was defined by four study questions:

- (1) Are NOAA's organizational design criteria appropriate?
- (2) Is NOAA's proposal to align core climate programs and resources into a Climate Science and Service Line Office the recommended approach?
- (3) Are NOAA's current resources sufficient to establish a Climate Science and Service Line Office that can meet current and future demands?
- (4) What additional business practices should NOAA consider to enhance climate services beyond NOAA's proposed organizational changes?

Limited to the scope of the study questions, the NAPA did not consider the potential impacts of a new Climate Service line office on non-climate-focused activities or the functionality of other line offices, such as NOAA's research enterprise housed in OAR. Although NAPA endorsed NOAA's proposal for the creation of a Climate Service within the scope of the questions listed above, its report emphasized that it "is skeptical that current funding levels (even as augmented at levels consistent

with the President's FY2011 budget request) will adequately sustain public and private sector expectations for climate services and research in the years ahead."[1]

On September 22, 2010, NOAA released a draft Climate Service vision and strategic framework for public comment. On January 24, 2011, NOAA released a new version of the Climate Service vision and strategic framework reflecting input from the public comment period. Finally, on February 14, 2011, the President's 2012 budget was released, containing the formal proposal to establish a Climate Service in NOAA.

Table 2 shows the operating plan proposed by NOAA for FY 2011.

Table 2: NOAA FY 2011 Spend Plan (dollars in millions)

FY 2011 Operating Plan	FY 2010 Enacted (Conference)	Adjusted FY 2011 President's Budget	FY 2011 Full-Year CR Spend Plan	FY 2012 President's Budget
National Ocean Service	578.7	549.1	547.6	559.6
Oceanic and Atmospheric Research	449.1	463.9	427.0	212.0
National Environmental Satellite, Information and Data Service	1,398.5	2,208.3	1,442.1	2,015.4
National Weather Service	999.8	997.9	968.5	988.0
Climate Service	--	--	--	346.2
National Marine Fisheries Service	1,008.2	989.1	965.5	1,001.1
Program Support	486.0	513.7	490.2	524.8
Totals:	4,725.2	5,580.0	4,642.0	5,544.1

Signed into law on April 15, 2011, The Department of Defense and Full-Year Continuing Appropriations Act, 2011 (P.L. 112–10) prohibits the use of funding to implement, establish or create a NOAA Climate Service.

Section 1348. None of the funds made available by this division may be used to implement, establish, or create a NOAA Climate Service as described in the "Draft NOAA Climate Service Strategic Vision and Framework" published at 75 Federal Register 57739 (September 22, 2010) and updated on December 20, 2010: Provided, That this limitation shall expire on September 30, 2011.

[1] National Academy of Public Administration. *Building Strong for Tomorrow: NOAA Climate Service*. September 13, 2010.

Chairman HALL. The Committee on Science, Space, and Technology will come to order.

Good morning. Welcome to today's hearing entitled "Examining NOAA's Climate Service Proposal." In front of you, your packets contain the written testimony, biographies and Truth in Testimony disclosures for today's witnesses. At this time I recognize myself for five minutes for an opening statement.

I want to welcome everyone here for this hearing on Examining NOAA's Climate Change Proposal, and I would first like to note my irritation about witness testimony. This Committee has always been very accommodating and appreciative of the busy schedules of our witnesses, each of us, the Republican and Democratic side have always had that appreciation. That is why we try to give them as much notice as possible. The Committee invited NOAA more than 3 weeks ago, and it is truly appalling that this testimony was 26 hours late and over 27 pages.

This lack of consideration of the Committee Members' time is not an encouraging sign that there is a willingness on the part of this witness or of this Administration to work with this Committee on important issues. I am disappointed that we have already started on the wrong foot. Dr. Lubchenco came to my office on November 15, 2010. I asked her several questions and she said she would seek this Committee's approval before implementing her proposal.

The purpose of this hearing is to consider the proposal put forth in the President's fiscal year 2012 budget request issued in February to totally reorganize NOAA and create a new line office called the Climate Service.

Though NOAA announced its intent to create this line office in early 2010, this is the first time Congress has had the opportunity to fully examine the implications of transitioning $226 million of fundamental research into an operations-focused climate office.

Over the past 18 months, I have communicated several concerns about this endeavor to Administrator Lubchenco. My hesitation can be divided into two categories, the first being the process by which this new climate change proposal has come into being. After our budget hearing on March 10th, this Committee sent a series of questions for the record, some of which asked about the Climate Service proposal and would have provided the Committee further information to make today's hearing more productive. It has been three months since we sent those questions, and we still have not heard back from NOAA. It is very difficult for the Committee to conduct proper oversight of agencies if they are delinquent, or at best, evasive, in responding to Members' inquiries. Given that the Administration and the Administrator have claimed that this topic is a high priority for her, I find it curious that these responses are taking this long to formulate.

The other part of this proposal that I find troubling is the actual substance of NOAA's design for a Climate Service. The foremost concern I have had is regarding the amount of resources NOAA is planning on moving from the Office of Oceanic and Atmospheric Research. More than half the resources of NOAA's research enterprise would be moved into a climate service. This proposal appears to contradict the notion that fundamental research must not be driven by operational demands.

In 2004, a research review team produced a report for NOAA's Science Advisory Board that proposed consolidating research across NOAA into a more focused and integrated line office in order to enhance cooperation and collaboration to promote research investment in innovation. However, instead of consolidating research activities, NOAA's proposal seeks to break up its research enterprise and move more than half of it into an operational service.

The issue before us today is about the major reorganization of an agency and the impact that such reorganization will have on the functioning of the agency. I recognize that certain climate services can provide value. For example, the drought forecasts issued by the National Integrated Drought Information System are very useful to farmers, water planners, and other state and local officials. I have no objection to these types of products, but I hope and expect they will continue to provide value as part of NOAA's existing agency structure.

My objection and our objection to this proposal has been the concern that the focus to create a climate service will severely harm vital research at NOAA by transferring resources away from fundamental science to mission-oriented research and service-driven products. This hearing is only the first step in the Committee's examination of NOAA's proposed Climate Service.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF CHAIRMAN RALPH M. HALL

I want to welcome everyone here today for this hearing on examining NOAA's Climate Service proposal.

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Though NOAA announced its intent to create this line office in early 2010, this is the first time Congress has had the opportunity to fully examine the implications of transitioning several hundred million dollars of fundamental research into an operations-focused climate office. Over the past 18 months, I have communicated several concerns about this endeavor to the Administrator Lubchenco. My hesitation can be divided into two categories. The first being the process by which this new Climate Service proposal has come into being.

After our budget hearing on March 10th, this Committee sent a series of questions for the record, some of which asked about the Climate Service proposal and would have provided the Committee further information to make today's hearing productive. It has been three months since we sent those questions, and we still have not heard back from NOAA. It is very difficult for the Committee to conduct proper oversight of agencies if they are delinquent— or at best evasive—in responding to Member inquiries. Given that the Administrator has claimed that this topic is a high priority for her, I find it curious that these responses are taking this long to formulate.

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I now recognize Ranking Member Johnson for five minutes for an opening statement.

Chairman HALL. I now recognize Ranking Member Ms. Johnson for five minutes for an opening statement, and I yield back my time.

Ms. JOHNSON. Thank you very much, Mr. Chairman. I appreciate you holding this hearing today to discuss the climate science and services of NOAA and their efforts to create a Climate Service line office within the agency. We will also discuss the range of services and products NOAA already provides for the countless numbers of users, including the U.S. Navy, who is with us today.

This Committee has heard as much as, if not more than, any other Committee on the subject of climate change. The scientific evidence is strong and, in my opinion, incontrovertible. Unfortunately, despite years of hearings and support for climate science through both Republican and Democratic Administrations and Majorities, it is clear that the Congress has taken a step backwards and allowed fear, doubt, and ignorance to undo the progress we were beginning to make on climate science. Instead of denying the existence of climate change, today we should be asking ourselves what we can do to help America adapt to the impacts of a changing climate.

These impacts will extend far beyond mere inconvenience. For anyone that is more concerned about financial costs of taking action to prevent and adapt to climate change, I ask you to consider the economic impacts such as prolonged droughts and heat waves, increased flooding, more intense storms, species extinction and invasive species, sea level rise, melting polar icecaps, and mass migration, just to name a few.

From the tornadoes in the South, drought and fires in the West, and flooding in the Midwest, regardless of their relation to climate change, we have seen in recent months how even isolated instances of these phenomena can devastate economies. That said, why should we not want to give people the tools and information needed to anticipate what is to come?

Many sectors of our society—farmers, natural resource managers, coastal resource managers, State and local government officials, the transportation sector, and water, utility and energy com-

panies, just to name a few—all benefit from NOAA's ability to predict the intensity and duration of climate events. On the national, regional, and local scale, these services and products will make it easier for decision makers and managers to prepare and develop plans to respond to the various weather and climate events.

As the demand for more climate information has grown, so has the need for our scientists to better understand and explain the various climate cycles and patterns. This is not a new need. In fact, in the 107th Congress, this Committee passed legislation authored by Mr. Hall to expand climate services by authorizing the National Integrated Drought Information Service, or NIDIS. It was a commonsense measure, unburdened by today's political rhetoric on climate change.

I hope that this hearing is not going to be another discussion about whether NOAA, in some underhanded way, has already established a Climate Service office without the consultation and approval of Congress. Dr. Lubchenco has stated several times, both verbally in this Committee and in letters, that NOAA has not established nor implemented a Climate Service line office. To rehash that discussion again today would be a waste of our time and taxpayers' dollars when we should be working to determine how NOAA can best serve the public's need for these services. It really is time to move forward.

This Committee has been discussing the creation of a Climate Service for the last few years now, and weighing the pros and cons of the different options for structuring the program. And there has been no shortage of input. In addition to the relevant agencies, many stakeholders have testified before this Committee and written letters, and numerous articles have been published about the growing need for, and the key elements of, an organized Climate Service. We must ensure that the services are aligned in a way that there is robust interagency coordination, and that the Federal Government is positioned to support the different regions and the State, local and tribal governments in their efforts. We must also make sure we continue to strengthen NOAA's climate science capabilities while also delivering timely and needed services. I expect that we will hear a commitment and a plan from NOAA for how to ensure that both the research and the services are maintained, and that other crucial missions of the agency are not compromised.

We may not yet agree on the mechanics, scope or scale of a program, but I believe we can all see the benefit of providing the individuals, communities, governments, and businesses in our districts with the type of reliable long-term climate information and services that will reduce our vulnerability to weather and climate events. I would hate to look back and regard these years we have spent discussing this as a lost opportunity to do something good for the next generation.

Thank you, Mr. Hall, and before I yield back, I would like to ask unanimous consent to submit a few letters of support for this Climate Service. I have letters here. One is a bipartisan one from two former Under Secretaries of NOAA that preceded our current Administration, Vice Admiral Lautenbacher from the Bush Administration and James Baker from the Clinton Administration. I also have letters from the Southern Regional Climate Center, the

Desert Research Institute and the Midwestern Regional Climate Center. These groups and others are urging us to support the reorganization of NOAA's proposal for the creation of Climate Service.

Thank you, and I yield back, Mr. Hall.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF RANKING MEMBER EDDIE BERNICE JOHNSON

Thank you, Chairman Hall. I appreciate you holding this hearing today to discuss the climate science and services of NOAA and their efforts to create a Climate Service line office within the agency. We will also discuss the range of services and products NOAA already provides for countless numbers of users, including the U.S. Navy, who is with us today.

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Many sectors of our society—farmers; natural resource managers; coastal resource managers; State and local government officials; the transportation sector; and water, utility, and energy companies, just to name a few—all benefit from NOAA's ability to predict the intensity and duration of climatic events. On the national, regional, and local scale, these services and products will make it easier for decision makers and managers to prepare and develop plans to respond to the various weather and climate events.

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Thank you, Chairman Hall.

Chairman HALL. Thank you, Ms. Johnson.

Without objection, they will be admitted.

[The information can be found in Appendix 2.]

Chairman HALL. The gentlelady from Texas yields back.

If there are Members who wish to submit additional opening statements, your statements will be added to the record at this point.

At this time I would like to introduce our witness panel. I would like to introduce our first of two witnesses, Dr. Jane Lubchenco. Prior to her service as Administrator at NOAA, Dr. Lubchenco served as the president of the American Society for the Advancement of Science, a professor at Harvard and Oregon State University, and she was also on the Board of Directors for the National Science Foundation. Dr. Lubchenco was sworn in on March 20, 2009, and this is the fourth time she has appeared before this Committee, and I thank you for being here. I recognize you for five minutes. I will not hold you to five minutes, just do your best to stay around it.

STATEMENT OF JANE LUBCHENCO, ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Dr. LUBCHENCO. Thank you very much, Chairman Hall, Members of the Committee. It is a pleasure to be here today, and I greatly appreciate the opportunity to talk to you about the proposed reorganization that was included in the President's fiscal year 2012 budget. This proposal would strengthen science across the agency, increase organizational effectiveness and create a new line office to allow NOAA to better meet the growing demand for information and services to help Americans plan for drought, prepare for floods, and support U.S. national security priorities around the globe.

The proposed realignment would enable NOAA to continue to advance our high-quality science and more readily transition scientific findings into usable services for American farmers, emergency managers, health care providers, weather-dependent businesses, Department of Defense, and more.

Before proceeding, I would like to again assure you that NOAA has not established a Climate Service. We fully understand that Congressional approval is needed, and I would like to apologize for the fact that my testimony was delayed in getting to the Committee, and I reiterate my regret for the manner in which the conversation between Congress, the Department and NOAA began.

In February of 2010, we announced our intention to establish a Climate Service. That announcement did not go well, and I apologize that we got off on the wrong foot. That announcement was in-

tended to mark the beginning of a dialogue with Congress. Mr. Hall, it is my sincerest hope that the time and effort that we have committed to sharing information with the Committee and responding to your requests over the last year have begun to restore the good will that long characterized the relationship between NOAA and the Science Committee, and it is my sincere hope that we can continue to work together going forward to build a stronger science and service enterprise at NOAA.

Few environmental factors affect our economy, ecosystems, and livelihoods more than weather and climate. Severe weather and climate extremes pose risks to human health, safety and property. Everyone understands the influence of weather on everyday life. Will it be hot or cold? Do I need an umbrella? Just as weather affects our daily decisions, so too does long-term weather or climate. Can farmers in northeastern Minnesota grow higher-value crops such as soybeans on their farms? How far from the Mississippi River or the Gulf Coast should houses be built? Will there be enough water to support the anticipated growth in Atlanta suburbs 20 years from now? NOAA's information about climate conditions is essential to smart planning and to create better prepared and more resilient businesses and communities.

The public is demanding more data and increasingly complex products at scales that are relevant to their decisions, and NOAA is working in concert with our partners to address these needs. A prime example of this, NOAA and the Western Governors Association are working toward a memorandum of understanding to improve the development, coordination, and dissemination of climate information to support the priorities and resource management decisions of western states. This MOU will build on NOAA's longstanding collaboration with the Western Governors Association on drought services and it explicitly recognizes the need for engagement among federal agencies and non-federal partners on this issue.

NOAA's climate services are also supporting the growth of a new category of economic, scientific and technologic innovation, entrepreneurs and businesses that specialize in the provision of tailored climate services and products that support specific users. This emerging private sector climate service industry takes information and products generated by the public sectors, adds value and markets them to businesses, states and the public. A roughly $1 billion private sector weather industry has grown up around NOAA's weather services and it is expected that a similar industry will emerge around NOAA's climate services.

NOAA is acutely aware that we do not stand alone on climate. We are key partners in the provision of climate data and services with other agencies, and we recognize that to meet America's growing need for timely, relevant, and authoritative information will require the concerted effort of the entire public and private climate enterprise.

The idea of creating a Climate Service at NOAA is not new. The concept first surfaced in the 1970s and took hold in the Bush Administration when Vice Admiral Lautenbacher recognized NOAA could not support the Nation's rising demand for NOAA's climate services within our existing organizational structure where in our

core climate science information and service activities are distributed across multiple line offices, thus inhibiting our ability to efficiently target and deploy our resources and efforts.

To resolve these inefficiencies and to meet the needs of the public, Administrator Lautenbacher announced his intent to establish a Climate Service organization in NOAA in 2008. Under my tenure at NOAA, we built upon the work he began and formally proposed an internal agency reorganization to consolidate the management of climate-related programs. This proposal would consolidate management, capture material efficiencies, and provide enhanced traceability and transparency across our climate activities, thus providing an efficient and effective research to service enterprise at NOAA. Throughout this process, NOAA has worked with the brightest minds on institutional planning and administration to design and implement a proposed reorganization. These principles and options were informed by recommendations from NOAA's Science Advisory Board, the Science Advisory Board's Climate Working Group, and a broad array of other interests including the National Academy of Public Administration panel that was formed at the request of Congress. After careful review, and as detailed in my written testimony, it was determined that the option that strengthens and maintains our Office of Oceanic and Atmospheric Research while establishing a separate Climate Service line office was the best solution. It minimizes disruption to Weather Service operations. It strengthens science across the agency and best aligns climate science with service delivery. Throughout, NOAA's SAB and our Climate Working Group actively considered the Nation's need for climate services and NOAA's climate capabilities and shortcomings.

Mr. Hall, we both care deeply about NOAA and about the science that occurs in NOAA. Science is the foundation of all that we do, and a cornerstone of this proposal is to strengthen OAR and NOAA science more broadly to support our mission and our services. In addition, this proposal would not diminish our investment in research and it would not move resources away from non-climate programs in OAR or other NOAA offices or programs. Similarly, none of NOAA's climate or other research capabilities is diminished by the proposed reorganization, and we don't propose any fundamental changes to the balance of internal versus external funding.

The proposal would open the door for OAR to turn its attention to incubating solutions to tomorrow's long-term science challenges, to integrating agency-wide science portfolio and driving NOAA science and technology innovation. OAR's ability to conduct long-term world-class research observation and modeling exemplified most recently in our contribution to the Deepwater Horizon response makes this line office instrumental to achieving our long-term vision. OAR would be positioned to lead crucial research and integrate collective capabilities across NOAA.

I am grateful that you, Mr. Hall, and the Committee Members have such a passion for our scientific enterprise. We share that with you, and we are committed to working closely with you to strengthen science at NOAA. I believe that our proposal embraces the highest standards of scientific excellence and integrity, and last week we released NOAA's draft scientific integrity policy for public

comment. Its purpose is to ensure a continued culture of scientific excellence and integrity at NOAA, and it explicitly prohibits science managers from suppressing or censoring scientific findings.

In summary, then, our proposal would allow NOAA to better enable Americans to make informed investment choices, build private sector jobs, grow a climate service-oriented sector of the economy, and create resilient communities while refocusing and strengthening NOAA's capacity for high-quality transformational research across the agency. I know that strengthening NOAA's science is an issue on which the Committee shares our strong commitment and we are grateful for your support. We look forward to working with the Committee to continue to advance NOAA's mission-focused science enterprise as we move forward. I believe that this is the right solution for NOAA and it is a good thing for American taxpayers, businesses, and for Congress. It does not grow government. It is not regulatory in nature nor does it cost American taxpayers any additional money. This is a proposal to do the job that Congress and the American public have asked NOAA to do but to do it better. Thank you very much.

[The prepared statement of Ms. Lubchenco follows:]

PREPARED STATEMENT OF DR. JANE LUBCHENCO, ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Chairman Hall, Ranking Member Johnson, and Members ofthe Committee, before I begin my testimony, I would like to thank you for the leadership, interest, and support that you have shown the National Oceanic and Atmospheric Administration (NOAA), one of the Nation's premier Earth science and service agencies. I am honored to be here as the Under Secretary of Commerce for Oceans and Atmosphere at NOAA to discuss the proposed reorganization that was included in the President's Fiscal Year (FY) 2012 budget. This proposal would strengthen science across the agency, increase organizational efficiencies, and create a new Climate Service Line Office at KOAA—to allow us to better meet the growing demand for climate information and services on climatic conditions and long-term forecasts that are vital to America's businesses and communities. I would like to emphasize upfront that this reorganization is a proposal, and NOAA has not created a new Line Office.

Summary

NOAA's short-term weather forecasts of conditions on an hourly basis to about two weeks out are a key component of our mission to protect American lives and property. Likewise, NOAA's long-range weather and seasonal forecasts, also known as climate forecasts, inform advance planning decisions, from weeks to months ahead of time, that allow for a rapid response to the onset of events such as severe storms, droughts, and floods.

Although many people think very long term when they hear the word "climate," climate simply picks up where weather leaves off. "Climate services" refer to forecasts of conditions any time in the future beyond two weeks. For more than a century, NOAA has provided information about the weather, by way of short-term forecasts of less than two weeks, and about the climate through long-range forecasts from two weeks to seasons or years out. For example, NOAA's climate forecasts, including seasonal precipitation and drought outlooks, are helping firefighters in Texas prepare for and respond to this record wildfire season. These data and products are not just critical to Americans when it comes to saving lives and property; NOAA's information is being used by businesses, industry, and governments to make smart investments in the economy and infrastructure. For example, just one of NOAA's information tools is helping the U.S. home building industry save an estimated $300 million per year in construction costs alone, by using NOAA's temperature trend information to design cost-effective building foundations.

Americans also depend on NOAA's climate information to reduce their risk to natural hazards (such as drought and flooding) and to take advantage of opportunities to use scarce resources more efficiently (such as reducing irrigation schedules during

periods of above-normal precipitation). And they are now demanding more data and increasingly complex products in a timely manner that, in turn, requires advanced scientific study. Appendix A ofthis testimony provides examples of the impressive growth in demand for NOAA's climate service, as well as additional examples of the types of services and data requests NOAA receives.

NOAA cannot meet the Nation's increased demand for this information with our current organizational structure. Our core climate science, information, and service activities are distributed across multiple line offices and therein inhibit our ability to efficiently target and deploy our resources and efforts. To address these administrative inefficiencies, the Department of Commerce and NOAA proposed an internal agency reorganization to consolidate the management of our climate-related programs, laboratories, and centers in a new NOAA Climate Service. Appendix B outlines the extensive criteria used to evaluate the various options for organizational structure of a climate service within NOAA, and reviews the analysis of the various options not selected. This effort was initiated under George W. Bush's Administration, and it has been highly vetted by a diverse array of organizational experts, scientists, NOAA's own Science Advisory Board (SAB), and, at the request of Congress, the National Academy of Public Administration (NAPA).

The Climate Service Line Office at NOAA would be a single point of contact in NOAA to provide credible, useful, and timely information products. It would work with the broader climate service enterprise, including other Federal, State, and local government agencies, the academic community, and the private sector to provide businesses, communities, and resource managers with services and information for decision making. The proposed Climate Service Line Office at NOAA would improve NOAA's organization, such that the agency can be a more accessible, transparent, and collaborative partner to achieve the agency's climate goals and to ensure that all Americans' needs for climate information are met. In doing so, NOAA's reorganization would also support economic innovation and entrepreneurship. This includes supporting development of the private sector climate services industry emerging around NOAA's climate information, in much the same way that the roughly $1 billion plus private sector weather industry has grown up around NOAA's weather data and services. Please see Appendix C for a description of the many benefits the proposed Climate Service Line Office at NOAA would provide.

A cornerstone of this reorganization is strengthening the Office of Oceanic and Atmospheric Research (OAR) and NOAA science more broadly to advance our scientific understanding and develop new technology to support NOAA's mission and services. NOAA's proposal embraces the highest standards of scientific excellence and integrity. In doing so, our proposed reorganization would preserve, strengthen, and integrate the existing solid foundation of science across the agency, advance innovative and transformational research and development, and incubate solutions to NOAA's next grand science challenges. I know this is an issue on which the Committee shares our strong commitment, and we are grateful for your support. We look forward to working with the Committee to continue to advance NOAA's mission-focused science enterprise as we move forward.

The proposed reorganization is good government. It comes at no additional cost to the American taxpayer, and would sustain NOAA's scientific research capabilities and focus them on these new challenges. In short, Americans are demanding more and better products to help them prepare for severe weather events and other hazards, and NOAA is proposing to more efficiently use the resources we receive to advance our science and improve our delivery of services to the public.

Climate, Weather, and Service Products

The Nation has relied on climate information and services for decades, in the same way we have relied on weather information (like severe weather forecasts and warnings) and other weather services. Throughout history, as well as today, people around the country and the world use climate information to minimize risks and maximize opportunities across a diversity of sectors. Weather information is short term, provided in hourly to roughly two-week forecasts. Many think of climate as far into the future, but in fact, climate picks up where weather leaves off at about the two-week mark. Climate services, like weather services but on a longer time scale, generally from two weeks out to seasons and beyond, are rooted in historical records of temperature, precipitation, storms, sea level, ice coverage, and related oceanic and atmospheric processes. Climate services are easily accessible and provide timely scientific data and information about the climate that help people make informed decisions in their lives, businesses, and communities. For decades, NOAA has been at the forefront of advancing climate science and delivering climate information products. Specific examples of NOAA's climate products include:

- Seasonal Atlantic and Pacific basin hurricane outlooks,
- Seasonal Outlooks (three-month) for precipitation and temperature,
- Seasonal to weekly drought outlooks,
- Monthly U.S. and global climate summaries,
- Annual State of the Climate reports,
- Annual Arctic Report Card updates,
- Sea Level Rise predictions,
- Climate projections and scenarios about future climate conditions.

As NOAA's climate science and services continue to mature, we should be better able to keep people out of harm's way, and enable them to plan for their communities' future and make smart business investments.

The Overarching Goals of the Reorganization Proposal

In the President's FY 2012 budget to Congress, the Secretary of Commerce proposed a budget-neutral reorganization of NOAA to improve its ability to provide Americans with information and services that will help them prepare for natural hazards and to make informed decisions.

The proposal outlines two major objectives essential to achieving this goal: (1) improve NOAA's ability to efficiently and effectively respond to the Nation's increasing demands for climate information, consistent with the Department of Commerce's (DOC) authority under the National Climate Program Act (15 U.S.C. §2901, *et seq.*); and (2) strategically renew and strengthen the agenda of the Office of Oceanic and Atmospheric Research's (OAR), NOAA's core research organization, making it a forward-looking charge to—incubate solutions to long-term science challenges, integrate an agency-wide science portfolio, and drive science and technology innovation. The reorganization would allow NOAA to better execute its mission, legislative mandates, and funding in a more effective, and transparent manner, It would consolidate NOAA's existing, widely dispersed climate capabilities under a single Line Office management structure to better organize NOAA to respond to the Nation's rapidly increasing demand for climate information and services.

This strategic aligmnent of climate assets will allow NOAA to improve its ability to provide the reliable and authoritative climate data, information, and decision-support services that Americans seek through a centralized, coherent, unified structure that will better facilitate coordination with other federal, state, local, and tribal partners. NOAA recognizes that no one federal agency, nor the Federal Government alone, can meet the Nation's need for climate science and services. This proposal would improve NOAA's organization such that the agency can be a more accessible, transparent, and collaborative partner. NOAA will continue to rely on governmental, academic, and private sector partnerships to ensure that all Americans' needs for climate information are met.

We are not requesting an increase in funds to implement this proposed organizational change. Equally important, the proposal does not move resources away from non-climate programs in OAR, or other NOAA offices or programs, to fund the Climate Service Line Office at NOAA. We are simply proposing to use existing climate-related funds and assets more effectively. In the same way, none of NOAA's climate or other research capabilities is diminished by the proposed reorganization. In fact, the proposal would free OAR to renew its focus on other innovative long-term research priorities across the agency, much as it has focused on and matured climate science over the past four decades, bringing it to the point that it is now ready to be more closely aligned with services, Furthermore, we do not propose any fundamental change to the balance of internal versus extramural funding, pending Congressional appropriation, Much like you would tune up your car's engine to obtain better performance, we are proposing to "tune up" our agency so we can better meet our Congressional mandates to provide Americans with climate information for smart decision making.

Scope and Demand for NOAA's Climate Services

Few environmental factors affect our economy, ecosystems, and livelihoods more than weather and climate. Severe weather and climatic extremes pose risks to human health, safety and property. Apart from the extremes, everyone understands the influence of weather on everyday life. Will it be hot or cold, windy or calm? Do I need an umbrella? Just as weather affects our daily decisions, so too does climate. Can farmers in northeastern Minnesota grow soybeans on their farms? How far from the Mississippi River or the Gulf Coast should houses be built? Will there be

enough water to support the anticipated growth in Atlanta's suburbs 20 years from now? Information about climate conditions is essential to smart planning, and to create better prepared and more resilient businesses and communities. NOAA's climate capabilities have matured significantly and grown in sophistication over the past 40 years. Today, more Americans than ever before depend upon this essential information to make decisions. The public is now demanding more data and increasingly complex products at scales that are relevant to them. Detailed accounts of the volume and scope of requests for NOAA's climate service products are provided in Appendix A.

Creating Opportunities for the Private Sector

NOAA's climate services are supporting the growth of a new category of economic, scientific and technology innovation: entrepreneurs and businesses that specialize in the provision of tailored climate services and products that support specific users. This emerging private sector climate service industry utilizes information and products generated by the public sector, adds value, and markets them to businesses and the public in much the same way as the existing private sector weather services industry. For example, private sector service providers use NOAA's long-term temperature and precipitation records to develop tailored products to help the energy sector plan for electricity demand and water availability. An explicit goal of the proposed Climate Service Line Office at NOAA is sustained engagement with the private sector to ensure that all of NOAA's climate data and products are easily accessible and supporting the development of this emerging market with tremendous growth potential. A roughly billion dollar private sector weather industry has grown up around NOAA's weather services, and it is expected that a similar private sector climate industry will emerge in coordination with NOAA's climate services.

History of NOAA's Climate Services and Existing Congressional Authorization

One of NOAA's longest and proudest legacies is that of being a leader in the field of climate science and service delivery. NOAA maintains the official U.S. and global climate data record, produces operational seasonal forecasts that include drought and flood outlooks, maintains the longest continuous data record of carbon dioxide measurements, and operates more than 50 percent of global ocean observation platforms, as well as other environmental sensors that span the globe. We have Nobel Prize-winning scientists who collaborate with peers from around the world to advance our knowledge of the planet's ever-changing climate system using data from observations and models.

In 1978, Congress had the foresight to see that climate information was important to the Nation, and officially passed the National Climate Program Act, which stated, "It is the purpose of the Congress in this Act to establish a national climate program that will assist the Nation and the world to understand and respond to natural and man-induced climate processes and their implications." This legislation also recognized NOAA's role, within the Department of Commerce, as the leading provider of climate information and services. With this charge from Congress, NOAA has been actively working to help society understand, plan for, and respond to climate variability and change. NOAA is committed to providing a suite of relevant climate science and services to help governments, businesses, and communities to manage their risks and take advantage of new opportunities. NOAA's climate capabilities are focused in core areas:

- Climate Observations and Monitoring to describe and understand the state of the climate system through integrated observations, monitoring, data stewardship;
- Climate Research and Modeling to understand and predict climate variability and change in time frames ranging from weeks to a century; and
- Climate Information Services to improve society's ability to plan and respond to climate variability and climate change.

Congress and this Committee have long recognized NOAA's leadership and capacities in the development and delivery of climate science and services, The Global Climate Change Research Act, the National Climate Program Act, the National Weather Service Organic Act, and the National Integrated Drought Information System Act (NIDIS) not only underpin the strong federal interagency climate science enterprise that has advanced the U.S.' and world's understanding of the Earth system, but also provide NOAA its foundational authorities to advance climate science and develop and deliver the climate services that serve the Nation. Over time, as our

understanding of the climate system has improved, NOAA has worked with and alongside its partners to transition NOAA data into climate services that support a broad range of decision makers. NOAA's NIDIS program is an excellent example of how our environmental information services can be critical to local decision makers, farmers, ranchers, energy producers, resource managers, and emergency responders. NIDIS demonstrates how our understanding of the climate system has advanced to the point where we can begin to develop regional climate services, and it holds repeated endorsements for the value of its services from a broad range of groups, including the Western Governors Association.

In its most recent recognition of NOAA's important role in climate science and services, Congress called for an expert panel ofthe National Academy of Public Administration (NAPA) to conduct a study of organizational options for the development of a Climate Service in NOAA.[1] The Panel of private and public sector business and administrative experts concluded that NOAA's assessment of user demand is accurate, but the business processes that NOAA has employed to meet this demand, including matrix management, were beneficial but largely inadequate. Next, they reviewed a broad range of organizational options specific to optimizing NOAA's ability to develop and deliver climate services. Ultimately, NAPA concluded that a Climate Service Line Office at NOAA would be needed for the agency to adequately respond to the increasing demand for climate information, and provided some valuable recommendations for its design and implementation.

Challenges of NOAA's Current Organization

Today, climate science and service capacities are distributed across five Line Offices at NOAA, resulting in bureaucratic inefficiencies, no clear access point to NOAA's climate information for users, and missed opportunities for synergies between scientific advances and fast-evolving services. Historically, this was less of a problem, as service development and delivery was less in demand, However, growing demand for advanced climate services has highlighted the limitations of NOAA's current organizational structure. Scientific, industry, government and public concerns about natural hazards such as floods and drought are fueling the tremendous growth in the demand for climate-related information from NOAA. All sectors of society are faced with the need to better understand and anticipate the impacts of climate variability and change in order to make more informed decisions and be competitive at home and abroad.

Existing Structure Is Unable to Keep Pace With Demand

Through our existing network of laboratories. data centers. programs, and operational assets distributed throughout the agency, NOAA responds to millions of annual requests for climate information. However, under our current distributed organizational structure for climate science and services, the rapidly increasing user demand is outpacing NOAA's capacity to effectively deliver requested products and information and exceeding NOAA's ability to meet or be responsive to future needs.

NOAA stakeholders who want access to our information have expressed frustration that they do not know who to go to as we have too many points of entry for climate information. For example, although the Climate Prediction Center produces the seasonal forecasts, information on historical climate is kept at the National Climatic Data Centers. It is reasonable for a stakeholder to include seasonal predictions and trends in a single request to NOAA, but they currently need to go through two different Line Offices to get this information. As another example, coastal managers looking for information on sea level rise will need to work with the National Oceanographic Data Center in the National Environmental Satellite, Data and Information Service (NESDIS) to find the data, the Climate Program Office in OAR and the regional climate services director in the National Climatic Data Center for information on grants and partners, and our labs in OAR, including the Geophysical Fluid Dynamics Laboratory and the Earth System Research Laboratory, for the models that help us understand future sea level trends. The single point of entry that the Climate Service Line Office at NOAA will provide is obviously needed.

Numerous external studies by NOAA's Science Advisory Board (SAB),the National Academies, NAPA, and others have reiterated the Nation's demand for easy-to-find, reliable, and understandable information and products ahout climate variability and change. A centralized Climate Service Line Office at NOAA will increase the agen-

[1] U.S. Congress, House, Conference Committee Report to Accompany Consolidated Appropriations Act, 2010, 111th Congress, 1st Session, 2009, Report 111–366.

cy's ability to anticipate, understand and provide the information Americans need to meet the challenge of being competitive and resilient in the climate of the future by incorporating relevant climate knowledge in their decision making today.

A New Organizational Structure Is Needed

Reorganizing NOAA's existing climate capabilities under a single Line Office will create a more integrated and efficient organization to better respond to these critical needs at the national and local level, and allow the agency to make key contributions in the development and delivery of climate science and services. Creating one office will establish a stronger position for NOAA to conduct its climate research, monitoring and assessment work in a coordinated fashion. It will also create a visible and easy-to-find single point of entry for people to access NOAA's science and service assets; enable improved information sharing and more productive partnerships with federal agencies, local governments, private industry and other users and stakeholders; and further increase transparency.

Since NOAA was established in 1970, its broad array of climate science and services has developed independently within each Line Office to meet each of their specific user needs and Congressional mandates. NOAA's existing framework for climate activities was established before the potential of climate services was fully recognized, and it is not optimized for efficient or coordinated climate service delivery. The oversight and management of this network of labs, centers and programs remains a decentralized.and loosely organized enterprise. NAPA specifically addressed the issue of current cross-line coordination efforts in their report. For the past eight years, NOAA has used a matrix management system to integrate climate activities across the agency. The NAPA review stated:

The introduction of matrix management and the creation ofthe Climate Goal Team were thoughtful and significant investments to respond to demand by improving performance across NOAA's distributed network of climate activities. Matrix management has helped improve alignment across a range of activities and organizational stovepipes.

NOAA has maximized the use of matrix management, but the rising demand for climate services requires NOAA to take additional action. NAPA concluded:

A major challenge of [NOAA's] Climate Goal Team has ultimately been its lack of consolidated management control of personnel and budgets . . . This has limited NOAA's ability to meet strategic climate objectives, and the agency has cited it as an important reason for why it proposed creation of a Climate Service.

NOAA has delivered science and services for decades, responds to thousands of direct requests per week, and serves data to tens of thousands of users per month via the Internet; however, the reality is that NOAA must improve our information and service delivery in order to meet the rapidly increasing public demand in this area. We have every reason to expect that demand will continue to increase in the future as people, business, and communities begin to more fully utilize environmental information, including climate forecasts, in their daily decision making.

Organizational structures have many virtues, and the major virtue NOAA will achieve here is accountability. During listening sessions and engagement activities across the Nation, across sectors, and across stakeholder groups, climate services is repeatedly raised as the number one area where people would like more from NOAA. However, despite this overwhelming demand and business case for our work, there is currently no position within NOAA that is accountable for the performance of our climate portfolio, resulting in ad hoc coordination and integration among dedicated NOAA employees who are willing and eager to step outside their traditional management boundaries to advance NOAA's climate science and services. As any business will tell you, however, this model has its limitations. Strong, focused leadership that is committed to executing a unified vision is central to any successful business. This is one of the key conclusions of the NAPA Panel, which was comprised not of climate scientists, but of business leaders and administrative experts who recognized this as NOAA's key challenge in growing our service delivery abilities.

How NOAA Arrived at the Reorganization Proposal

The idea of creating a Climate Service Line Office at NOAA is not new. The concept first surfaced in the early 1970s, not long after NOAA was established, and later gained prominence and traction in NOAA during the George W. Bush Administration. The Bush Administration turned the Nation's attention towards the need

for a Climate Service entity within the Federal Government, and supported rooting its foundation within NOAA. Dr. John Marburger, President Bush's Chief Science Advisor, also supported the establishnlent of a Climate Service and wrote in a letter to the Honorable Senator Inouye that, "given its distinctive observational assets, assessment and prediction capacity, and service delivery capabilities, the functions of a National Climate Service clearly require a leadership role for NOAA." Ultimately it was Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), the previous Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator under President George W. Bush, who first announced the agency's intent to create a Climate Service organization in NOAA.

Vice Admiral Lautenbacher made great advancements in promoting cross-Line Office integration within NOAA by implementing a matrix management system. Upon initiating matrix management, the Vice Admiral wrote in a NOAA memorandum that one of his first and highest priorities under that system was climate. Throughout the course of the previous Administration, the Vice Admiral oversaw a level of coordination on climate that has had an enduring benefit within NOAA and strengthened NOAA's climate science and services enterprise. However, over time the Bush Administration leadership recognized that matrix management alone was insufficient to ensure NOAA was positioned to support the Nation's climate service needs. Thus, in 2008, Administrator Lautenbacher announced his intent to establish a Climate Service Line Office in NOAA.

In addition, from 2008 to 2009, the NOAA SAB and its Climate Working Group (CWG) undertook an effort to compare and contrast specific options for the development of a National Climate Service—a broad enterprise of agencies, including NOAA, and organizations comprised of users, researchers and information providers. This effort resulted in the June 5, 2009, SAB report entitled *Options for Developing a National Climate Service*. The SAB's report concluded that each option had significant strengths and weaknesses and that no option was viewed as an ideal option for a National Climate Service. The report did not make specific recommendations as to how NOAA should reorganize its own internal climate capabilities. Among its findings, however, the SAB clearly stated, "The current NOAA organization is not well-suited to the development of a unified climate services function. Greater connectivity between weather and climate functions and between research, operations and users is required." Later, NAPA endorsed both this and the previous Administration's conclusions and decision to establish a climate service organization in NOAA. As noted above, NAPA agreed that the previous Administration made significant progress towards integrating NOAA's climate assets through matrix management. Ultimately, however, NAPA supported the assessment of both the previous and current administrations: matrix management alone is not sufficient to strategically align NOAA's assets towards our climate service objectives.

Upon arriving at NOAA, I had the opportunity to continue to build on the large body of information and analysis that had been done on the issue of a climate service organization in NOAA. Ever since the previous Administration's decision to establish a Climate Service organization, NOAA and external groups have been engaged in efforts to further develop the specific design and implementation considerations for a Climate Service. NOAA has both been working internally to further scope out the concept, as weIl as externally to gather input from its partners, including federal, state and local agencies, Congress, business and industry, the academic community, and non-governmental organizations. NOAA has held dozens of roundtables with our partners and constituents to discuss their needs for climate services. In addition, at Congress' request, NOAA commissioned NAPA to conduct the aforementioned study of organizational options for delivering climate services, which included its own extensive stakeholder and partner engagement process. Only after serious considerations and deliberations, a specific proposal was developed that outlined the NOAA programs that should be included in the Climate Service Line Office at NOAA.

Options Considered

There has been significant analysis and discussion both internal to NOAA and among external groups about the best organizational structure for a climate service in NOAA. The breadth of expertise and interests represented and the time that was afforded for these discussions was tremendously beneficial to the formulation of NOAA's proposed reorganization. DOC and NOAA have taken such discussions and the ideas they have generated very seriously. In response, NOAA has worked with some of the brightest minds on institutional planning and administration, service delivery, stakeholder involvement, and climate science to develop, evaluate and inte-

grate the many ideas that have arisen from these discussions into the proposed reorganization contained in the President's FY 2012 Budget Request.

Under Vice Admiral Lautenbacher's leadership, NOAA worked with private sector management experts for two years to study NOAA's structure for climate activities. In addition, NOAA's internal management developed numerous strategy documents that have been the foundation of the work that has followed under my tenure. Prior to developing a suite of options to consider, NOAA set out several design principles for all reorganization options that would be considered. These principles, and the subsequent options evaluated were informed by the recommendations received from our SAB and a variety of other internal and external sources of input and advice. The specific principles NOAA set out to guide its development of options included the following:

- Although various programs and activities would be consolidated, renamed, and managed collectively, any reorganization could not initiate or create new programs or activities not provided for in NOAA's existing authorizations and appropriations;
- All realigned activities in the current year would continue to be funded at Congressionally directed levels;
- The reorganization would not increase or decrease the NOAA Full-Time Equivalent (FTE) or billet allocation, or require any relocation of employees;
- The reorganization would not require any physical relocation of programs or labs, or require any new facilities to accommodate this reorganization;
- Result in a zero sum realignment of funds within the current NOAA budget; and
- Not increase the size of NOAA overhead.

Adhering to these principles, NOAA subsequently developed and analyzed four potential organizational structures to reorganize existing NOAA climate assets against a set of design criteria. All options considered were budget neutral, none grew the size of headquarters, and all had no impact on funding for NOAA's science portfolio. These options included: (a) consolidating major climate science and service assets in the National Weather Service, (b) consolidating major climate science and service assets in a new Climate Service Line Office and eliminating OAR by moving its research into relevant Line Offices, (c) consolidating major climate science and service assets in OAR, and (d) maintaining OAR and consolidating major climate science and service assets in a new Climate Service Line Office. More information on the design criteria and analysis of options that were not selected can be found in Appendix B.

NOAA's Proposal

After careful review against the design criteria outlined in Appendix B, and consideration of all input received, including from the SAB, NAPA, and a breadth of internal and external experts, NOAA determined that the option that strengthens and maintains OAR while establishing a separate Climate Service Line Office was paramount. The proposal is equally focused on and committed to strengthening and integrating NOAA's science enterprise and advancing the vision of OAR. The establishment of a separate Climate Service Line Office and maintenance of OAR, as a research-focused Line Office had numerous benefits as compared to the other options. OAR will continue to serve as NOAA's centralized research Line Office, serving all of NOAA by supporting and producing preeminent research and technology innovation that advances NOAA's mission. Because high-quality climate science is at the core of climate services, housing both climate science and services under one organizational structure will allow NOAA to better transition climate research findings into usable information and services that help businesses and communities make more informed economic decisions and safeguard lives and property. Since climate services are rapidly evolving, it is beneficial that the climate science and service development go hand in hand in order to develop products and services that can evolve and be initiated rapidly when needed in response to scientific information as it emerges. The continuous advancements in climate science demand a close proximity to the service, not only so that those advancements can constantly improve products (science push), but also so that the users can be asking new questions of the science (user pull). More information on the efficiencies that would be gained through this proposal, and the benefits that would be produced can be found in Appendix C.

Under NOAA's proposal, the building blocks of the proposed Climate Service Line Office would be drawn from three existing NOAA Line Offices:

- From OAR: The Geophysical Fluid Dynamics Laboratory, the Climate Program Office, and from the Earth System Research Laboratory—the Chemical Sciences Division, the Global Monitoring Division, the Physical Sciences Division;
- From NESDIS: The three data centers—the National Climatic Data Center (NCDC),the National Oceanographic Data Center and the National Geophysical Data Center; and
- From NWS: The Climate Prediction Center, and management responsibilities for climate observing networks including the Tropical Atmosphere Ocean (TAO) array and the modernization of the Historical Climate Network (HCN–m).

There will not be any programmatic changes to the National Ocean Service, the National Marine Fisheries Service, or the Office of Marine and Aviation Operations. It is important to point out that NOAA is aware that we must do more than simply reorganize our assets. For example, the nation is looking to NOAA for linkages between weather and climate, coasts and climate, and living marine resources and climate. This will require close working relationships between the new climate office and our other Line Offices, and although the Climate Service Line Office would take a leadership role, meeting these challenges effectively is a NOAA-wide endeavor.

The proposed Climate Service Line Office structure reflects NOAA's response to the needs of numerous demands for climate services, so that the agency can: (1) promote integration of NOAA's climate science and service assets; (2) heighten the accessibility and visibility of NOAA's climate services for our partners and users; and (3) allow NOAA to more efficiently address user and partner needs compared to our current distributed structure. To make this new organization successful, it will encompass a core set of longstanding NOAA capabilities with proven success, including climate observations, research, modeling, predictions and projections, assessments, and service delivery infrastructure. NOAA envisions the proposed Climate Service Line Office providing a single point of entry for people to access NOAA's information assets, and enabling improved information sharing and more productive partnerships with a broader enterprise that includes: federal agencies, local governments, private industry, other users, and stakeholders. To help realize this broader enterprise, NOAA is co-chairing (along with U.S. Geological Survey and the Office of Science and Technology Policy) a Roundtable on Climate Information and Services under the auspices of the National Science and Technology Council.

NOAA's proposed reorganization also maintains the highest standards of scientific integrity for all NOAA science and seeks to strengthen and integrate science across the agency. Through the reorganization NOAA is seizing the opportunity to refocus OAR's efforts to incubate solutions to tomorrow's long-term science challenges, to integrate an agency-wide science portfolio, and to drive NOAA science and technology innovation. For example, OAR provides: the next-generation weather prediction and forecast tools, including the Multi-function Phased Array Radar (MP AR) that provides a data refresh every 43 seconds versus traditional radar refresh rates of every three minutes; new research platforms such as the dedicated Okeanos Explorer that help us better understand what is happening under the ocean; and an Earth System Prediction Capability that is a NOAA-wide planning effort to identify future needs for environmental predictions. Realigning OAR and strengthening science across the agency is a core component of the proposed reorganization.

To further ensure that NOAA's commitment to continuing to develop leading-edge climate science is strengthened, a climate senior scientist position is included in the reorganization proposal. This position would ensure sound business practices wherein climate science informs, but does not prescribe, decision making, and decision making informs climate science but does not prescribe research priorities. Additionally, this position will be key to ensuring the highest standards of data quality are employed for climate science and services.

In contrast to the NWS model, where science and service (or operations) are housed in separate Line Offices, NOAA does not envision a service delivery component for the Climate Service Line Office that is remotely near the scale of the NWS with its 122 local forecast offices and other regional infrastructure. In fact, the research and science component of the proposed Climate Service Line Office is expected to continue to be much larger than its services component, where NOAA intends to employ approaches leveraging outside assets. Within NOAA, we will continue leveraging the service delivery infrastructure of the NWS and other partners like the Regional Integrated Sciences and Assessments (RISAs), Regional Climate Centers. State climatologists, Sea Grant extension, Coastal Services Centers, National Marine Sanctuaries, and other parts of NOAA. Given the growing demands for climate information from business, we are working with private sector companies that are providing climate information today or are interested in developing this line of business. The latter approach is much akin to the relationship between

the National Weather Service and the vibrant private weather community that exists today.

Specific Endorsements of a Climate Service Line Office

The unanimous conclusion of internal and external scientists and decision makers was that establishing a single management structure for the agency's core climate capabilities is required if the agency is to rise to meet the Nation's growing need for increasingly sophisticated information. One of the key sources of input from among NOAA's external advisers that led NOAA to this option were the recommendations of the NAPA expert panel that concluded, "The Panel strongly supports the creation of a NOAA Climate Service to be established as a Line Office in NOAA."

More recently, the SAB CWG winter 2011 report further reinforced NOAA's proposal for a dedicated Climate Service Line Office, stating:

The lack of action in several areas highlighted in the previous reviews speaks loudly to the need for a new line organization for climate services. These responses clearly illustrated the considerable inertia that exists within the present system and the difficulty in moving from a matrix-managed program to a line organization. Let there be no mistake: there is a tremendous amount of world-class climate research being performed within the agency. Yet, transitioning such high-quality research into a service-oriented and operational setting is quite another matter. There are some fairly major systemic challenges that need to be confronted going from a loose federation of somewhat independent NOAA organizations to a functioning climate service. Short of a Climate Service line organization with budgetary authority, the CWG believes it will prove very difficult to effect change if NOAA's approach to climate services continues in a matrix structure or manner. [2]

NOAA's reorganization proposal closely aligns with NAPA's final recommendations, such as the inclusion of the NWS's Climate Prediction Center, and recognizes the importance of having a temporary leadership position for change management in the new organization. It is clear that to meet the Nation's growing need for increasingly sophisticated information about our changing climate and potential impacts to various sectors, internal and external experts and decision makers have agreed—NOAA must establish a single management structure to more efficiently utilize and synergize the agency's core capabilities.

Strengthening NOAA Science and Renewing OAR

At its core, NOAA is a science agency and science underpins all that NOAA does. NOAA is committed to using the best possible science to inform our delivery of services, formulation of policies, and execution of management responsibilities. We are developing policies and practices that will promote scientific excellence inside and outside the agency, and enable scientists within NOAA to thrive as they make the discoveries and pursue the research necessary to inform our services and our stewardship responsibilities. NOAA has been working to develop a scientific integrity policy that would ensure a continued culture of transparency, integrity, and ethical behavior in NOAA. Additionally, NOAA is working to support recruitment and retention of scientists through development of a more robust science career track and expansion of senior science positions. NOAA's proposed reorganization adheres to this commitment to scientific excellence and embraces the highest standards of scientific integrity. We appreciate and share in the Committee's strong interest in ensuring that NOAA's science enterprise continues to advance our understanding of the Earth system such that we can provide Americans with the best possible information to aid their decision making.

Strengthen Science Within OAR and Across the Agency

In addition to establishing the Climate Service Line Office, the reorganization proposal is equally focused on and committed to strengthening and integrating NOAA's science enterprise and advancing the vision of OAR. The proposed reorganization does not diminish or eliminate any of NOAA's research or science activities, including OAR. OAR will continue to serve as NOAA's centralized research Line Office, serving all of NOAA by supporting and producing preeminent research and technology innovation that advances NOAA's mission. OAR will innovate (make new discoveries and find new technology applications), incubate (conduct long-term research

[2] NOAA Science Advisory Board Climate Working Group. 2011 Winter Report.

and develop technology to make new discoveries that are useful to NOAA's operations), and integrate (strengthen research and technology across NOAA and with partners).

Throughout the process of developing the proposal, NOAA carefully reviewed the role and structure of OAR, and it is our firm view that OAR is uniquely important in providing a dedicated science and research enterprise within NOAA and should be maintained as NOAA's core capacity to provide long-term atmospheric and oceanic research, science integration, and technology innovation. The experience of Deepwater Horizon highlighted the value of NOAA science to support decision making and the delivery of trusted and accurate information. During the crisis, OAR was able to take advantage of a deployed research asset that was already being used for research purposes—the P–3 aircraft—to estimate oil leak rates from the air. That flexibility and ingenuity are what enables a strong research enterprise that is responsive to real-time and long-term future needs. NOAA will look to OAR to play an expanded role as the integrator of science and technology across NOAA and provide research that supports NOAA's Next Generation Strategic Plan, and OAR will continue to foster and grow collaborations with both the interal and external scientific community. While the Climate Service Line Office will strengthen climate science and deliver climate services, OAR will continue to grow as an incubator of long-term and innovative research and integrate science across all of NOAA.

Renewing OAR's research agenda is part and parcel with the proposal to create a Climate Service Line Office. Our motivation is that just as OAR has served to incubate and advance climate science over the last four decades to a state where it can more readily inform climate services, the proposed reorganization will renew OAR's focus as an innovator and incubator of new grand challenges in oceanic and atmospheric science, technologies, and applications. In the proposed reorganization, OAR's portfolio would rise to meet science challenges including:

- Coordinating and managing emerging and transformational research portfolios including ocean acidification; innovative development of improved meteorological, oceanic and atmospheric observing technologies; modeling and forecasting to expand the use of renewable energy sources; unmanned air and underwater observing systems; high-performance computing; and weather "warn-on-forecast" programs to increase lead time and accuracy for hazardous weather.
- Emphasizing areas that are important challenges and opportunities for NOAA, such as fostering integrated ecosystem science beyond its current scope to include new tools for sustainable community planning, novel ways to observe the world around us, new ways to conduct fishery assessments, and innovative aquaculture and feed technologies.
- Moving NOAA toward a fully integrated approach to environmental modeling that spans the full domain of physical, chemical, and biological systems.

That said, strengthening science and fostering a culture of innovation across the agency remains a critical priority for NOAA. OAR performs a critical set of functions for NOAA's research enterprise as NOAA's central research Line Office, serving all of NOAA by supporting and producing long-term and transformational research and technology innovation that advances NOAA's mission. In its report, NAPA echoed this important role and the need to sustain OAR as a Line Office, as we work to stand up a Climate Service Line Office that necessarily includes climate science and service, "all parts of NOAA benefit from OAR's work to incubate fundamentally new approaches to mission-centered science, a capability best sustained by maintaining a nimble, freestanding OAR Line Office."

Under the proposed reorganization, OAR would, in cooperation with other Line Offices, including a Climate Service Line Office when approved, guide the analysis and direction of NOAA's agency-wide research portfolio. This responsibility includes: identifying NOAA's science challenges and gaps; recommending novel research portfolio management approaches; integrating science across NOAA's Line Offices to gain a comprehensive understanding of the Earth system. To this end, the OAR Assistant Administrator would serve as vice chair of the NOAA Research Council. Further, as leader of the central research Line Office, OAR's Assistant Administrator will be designated as the Senior Advisor to the NOAA Chief Scientist and responsible for providing him or her with science program analysis and policy support.

NOAA's Scientific Integrity Policy

I am excited to share today progress on what I consider the cornerstone for strengthening NOAA's scientific foundation. Last week we published NOAA's draft scientific integrity policy for public comment. Transparency is a key principle in this

policy, and in keeping with this principle, we are seeking comments from the public for 60 days. This policy reflects the commitment I made when I first came to NOAA to strengthen science, ensure it is not misused or undermined, and base decisions on good science. By being honest and open about our science, we build understanding and trust. This policy is about fostering an environment where science is encouraged, nurtured, respected, rewarded, and protected. It applies to all NOAA employees, political and career, and addresses applicable policy for grantees and contractors. The policy establishes principles for scientific integrity and codes of conduct for scientists and science managers, including explicitly prohibiting science managers from suppressing or censoring scientific findings. As part of institutionalizing this policy, we are developing a scientific integrity common Web site with additional resources, training opportunities, and FAQ for our staff. Our process has been deliberative and inclusive, and we look forward to feedback from the public on the draft policy we have developed. Over the next several months we will work to revise the policy in response to comments, and work with our staff and the Department to finalize and implement a policy that will ensure a continuing culture of scientific excellence at NOAA, and promote a culture of transparency, integrity, and ethical behavior. We look forward to having a Chief Scientist in place to help us compete and implement this policy expeditiously.

Increasing Budget Transparency

As part of the development of the proposed reorganization, NOAA considered the overall goal for increasing budget transparency across the agency. The proposed reorganization constitutes a consolidation and technical transfer of climate programs into a new Line Office that can better link climate science with decision support and other services being requested by the public. It does not eliminate or otherwise diminish any of NOAA's science mission, and NOAA's overall funding for cutting edge-research—whether climate or other critically important areas like oceans and weather—is not proposed to be reduced.

The structure of the proposed Climate Service Line Office and OAR budgets provides considerable transparency into the funding levels for the underlying programs, there better enabling Congress and the public to ensure that climate or other NOAA science is not diminished. The funding associated with the labs and programs that are proposed to be transferred from OAR to the Climate Service Line Office will be maintained and in some instances, such as ocean acidification and weather radar research, the FY 2012 Budget proposes targeted new investments in OAR for cutting-edge science.

Conclusion

We have not yet created a Climate Service Line Office, but believe doing so would be the best thing for NOAA and the Nation in order to provide the services American businesses and communities need to compete and respond to changing environmental and economic landscapes. The proposal to bring climate science and services together under one Line Office is fundamentally sound and provides a tremendous opportunity to integrate science and service delivery without detracting from a commitment to pursue, fund, and sustain basic research and science across the agency. NOAA's proposal has been highly vetted within the agency by our scientists, managers, and SAB, across the Federal Government, and from numerous external groups and individuals representing the brightest minds and thought leaders on climate science, service and organizational development. The proposal reflects the same basic organizational structure recommended by NAPA, and was submitted to Congress for approval as part of NOAA's FY 2012 Budget Request.

The proposed Climate Service Line Office would provide NOAA with the most efficient and effective structure to engage the American public and deliver timely and trusted information to a diversity of sectors and communities to make informed decisions to prepare for and become more resilient to environmental hazards. Climate information users recognize that climate variability and change bring not only new challenges to managing business, industry and the environment, but also new opportunities for innovation, adaptation and commerce. They want trusted and timely information so they can make informed decisions that minimize their own exposure to climate impacts while maximizing their future opportunities.

NOAA's deep regard for our responsibilities as sound stewards of taxpayer dollars is reflected in this reorganization proposal where we outlined our strategy to deliver sound products to our users while maximizing organizational efficiency, creating jobs and stimulating economic growth, These are chief priorities for NOAA and the entire Federal Government. In addition, the Climate Service Line Office will create

a place where new markets for private sector service providers can grow. These businesses can take information and products generated by the government and convey them to the public, using a model similar to those that provide weather products.

This proposal is a good thing for the American taxpayer, for Congress, and for NOAA. I believe it is the right solution for NOAA to better meet the Nation's current and future climate service demand. In summary, the proposed reorganization will allow NOAA to better enable Americans to make informed investment choices, build private sector jobs, grow a climate service-oriented sector of the economy, and create resilient communities while refocusing and strengthening NOAA's capacity for high-quality, transformational research across the agency. This proposal does not grow government, it is not regulatory in nature, nor does it cost the American taxpayer any additional money, This is a proposal to do the job that Congress and the American public have asked us to do—only better.

Appendix A: Scope and Demand for NOAA's Climate Services

The increasing demand for NOAA's climate data and service products is real and it is happening now. The following statistics demonstrate the tremendous increase in public user demand from requests through a number of NOAA's user interfaces, such as our data centers and climate Web portal.

- From FY 2009 to 2010, NOAA saw an *11 percent increase* in direct requests for climate-related data and information services (including individual requests via phone calls, emails, and other direct correspondence)—from 26,000 to 29,000 individual requests.
- NOAA's data centers provided *86% more climate related data products* in FY 2010 compared to FY 2009—from 806 terabytes to 1,500 terabytes (or 1.5 petabytes). To put this in context, a Kindle or other electronic book download averages about 800,000 bytes. In 2010, NOAA served up a total of at least 1.9 billion Kindle books worth of climate data, roughly 867 *million* more Kindle book equivalents than in 2009.
- In 2010, NOAA's National Climatic Data Center's (NCDC) Comprehensive Large Array Data Stewardship System site served over five times as much climate related data as in calendar year 2009—from 43 terabytes to 253 terabytes.
- From FY 2009 to FY 2010, NOAA had a *57% increase in climate-related data and information Web site hits*—from 906 million to 1.4 billion hits in addition to hits to the NOAA Climate Portal that launched in February 2010 and currently hosts over 27,000 visitors every month.

Within this increasing demand are requests from a breadth of economic and industrial sectors, including government, private sector, and non-government users. Demand starts at the most basic and familiar—your local TV weather forecaster relating the daily temperature and precipitation to an "average" for the day, to the strategic—forecasting climate conditions around the world to inform national security priorities. Below are specific examples of the types of services and data requests that have been received by NOAA.

- Farmers require seasonal temperature, precipitation, and frost-freeze data to determine what types of crops will grow well and when they should be planted.
- The U.S. Department of Agriculture uses NOAA's climate information to develop regional, national and global crop outlooks that provide the agricultural industry information about short- and long-term conditions that may impact crop production. NOAA's data are used to develop Plant Hardiness Zones which you can see on the tags of virtually all plants and trees you buy to ensure they will thrive in the climate conditions in which you live. As these zones change, NOAA's climate data provide the basis to ensure accurate depiction of the Plant Hardiness Zones.
- Local communities and emergency management offices use NOAA's sea level and storm frequency information to help them prepare for and become more resilient to short-term storm events, such as hurricanes and longer-term phenomena, such as sea level rise.
- Municipalities accessed NOAA's U.S. Snowfall Climatology information, which includes historical information about the severity of extreme snowfall events and return period probability, to develop annual snowfall removal budgets resulting in cost savings.
- Home builders follow guidelines that use NOAA data to determine the type of foundation and the optimal thermal characteristics of buildings for insulation

purposes. This information is said to save roughly $330M in annual building construction costs and annual energy cost savings of 586,000 megawatt hours (the annual energy savings equivalent to almost nine million gallons of gasoline) from using just one of NOAA's climate tools.[3]

- Ice thickness and freezing rain data are used for engineering design consideration in the construction of certain structures that are subject to outdoor weather.
- NOAA's maximum precipitation predictions have been used to develop new standards for dam design that are now used to improve dam safety and reliability.
- NOAA's climate forecasts, from seasonal precipitation and drought outlooks to weekly on-the-ground assessments of the U.S. Drought Monitor, are helping firefighters in Texas to prepare for and respond to a record wildfire season.
- NOAA works closely with the U.S. Army Corps of Engineers and water resource managers to provide longer-term drought and flooding outlooks and river forecasts, which are critical to effectively manage water levels in rivers important for transportation, such as the Mississippi, Missouri, and Ohio rivers.
- Insurance companies use NOAA data (e.g., the "normal" temperature, precipitation, mean height above sea level, and storm frequency) to calculate insurance premiums.
- Public health departments use NOAA data to inform air quality and UV forecasts.
- Coastal managers use NOAA's sea level data in efforts to restore wetlands for fish, shellfish, and bird habitat.
- Salmon fishery managers use information about temperature, precipitation, and snowpack to plan for and manage fish hatchery operations and in-stream habitat restoration efforts.
- Counties use NOAA information, such as trends in precipitation, to make long-term investments in storm-water management and storage capacity.
- Public service and utility conunissions around the country download NOAA's Climate Normals, which include spatial and temporal averages of climatological variables (e.g., temperature and precipitation) that describe base climatic conditions. Utilities subsequently use this information in formal processes to determine the rates that utilities charge.

APPENDIX B: Review Criteria and Options Not Selected for NOAA's Proposal

NOAA evaluated its four organizational options against the following design criteria:

Strengthen science in the agency.

- Strengthen and enhance the visibility, quality and relevance of science that supports NOAA's Mission and long-term strategy.
- Integrate climate science within the Climate Service Line Office and across NOAA to address cross-disciplinary areas such as climate and coastal, and climate and ecosystems.

Minimize disruptions and promote efficiency.

- Promote efficient implementation and operation.
- Minimize organizational complexity.
- Utilize existing programs to the greatest extent possible.

Establish climate leadership.

- Create a single line of accountability and responsibility for performance.
- Create a senior advocate for climate policy, strategy and budget within NOAA.

Enhance program coordination.

- Develop effective mechanisms that leverage program execution from across the agency and with our partners.

Promote user engagement on climate.

[3] *Economic Value for the Nation*, NOAA Satellites and information, September 2001.

- Create clear points of access for users.
- Facilitate and improve stakeholder engagement.
- Integrate user input into service development.

The following options were reviewed by NOAA but not selected:

Option A. Consolidate Major Climate Science and Service Assets in NWS.

- Relevant climate activities from across the agency would be removed from their current Line Office and consolidated in the NWS Line Office.
- The NWS Line Office would be renamed the National Weather and Climate Service Line Office.
- Climate science, services, and data stewardship would be added to NWS.

Analysis: The dedicated people of NOAA's NWS excel at the 24-hours-a-day, seven-days-a-week, on-time and on-demand operational aspects of delivering weather services that the Nation relies on to protect life and property. NOAA must ensure that the business practices and management structures that have made the NWS successful are not compromised. Preserving the business structure that is needed for weather service delivery, which entails providing products in a short time frame (from minutes to days), could inhibit the development and growth of climate service delivery, which occurs on a longer time scale. In addition to the well-recognized concerns of "research versus operations," our decision not to risk compromising the critical operations of the NWS was rooted in the fundamental nature of weather service operations, versus climate service operations. Weather and climate services are related, but they have fundamental differences. Climate services are relevant to longer time scale decisions, such as where and how to build critical infrastructure, or whether water conservation measures need to be taken now to mitigate the upcoming drought season. Although climate assets would be consolidated, the management of a National Weather Service and Climate Service Line Office would have to focus on an overly broad array of national priorities, ranging from immediate needs, such as this year's flooding in the Midwest and the outbreak of tornadoes, to working with other agencies to chart the course of the Nation's long-term climate science strategy. In addition, the option was not characterized as having a highly positive impact on strengthening climate science. Finally, in evaluating the impact of this option on promoting user engagement, NOAA found that while this structure would allow the leveraging of the NWS' connections to the user community that adding the full scope of an emerging and evolving climate engagement effort may detract from critical weather engagement functions.

Option B. Eliminate OAR and Consolidate Major Climate Science and Service Assets in a New Climate Service Line Office.

- OAR is eliminated and a Climate Service Line Office is created.
- OAR labs, programs, and activities relevant to climate would be housed in the Climate Service Line Office.
- OAR programs and activities not relevant to climate would be moved from OAR into other relevant Line Offices, aligning science with operations across the agency.
- The only Line Office dedicated to innovative, long-term research would be eliminated.

Analysis: The value of having a central research function that supports long-term research and innovation, and integrates science for all of NOAA's key mission areas is critical for NOAA's success. Aligning all of our research assets with their operational counterparts would likely result in positive outcomes in some instances (e.g., further aligning ecosystem research that supports fisheries management within the National Marine Fisheries Service) but not in others (e.g., moving weather research to within NWS). This option would also be contrary to the criteria for strengthening science within the agency. It would narrow the vision and scope of NOAA's research (e.g., ecosystem research would have more difficulty expanding beyond fisheries if all of it were located in the National Marine Fisheries Service). Having an entity within NOAA that is looking over the horizon and at NOAA's next-generation science needs is critical. This option also created significant organizational disruption to all other Line Offices that would be acquiring new assets.

Option C. Consolidate Major Climate Science and Service Assets in OAR.

- Centers, programs, and other climate-relevant activities would be moved from their current Line Offices into OAR.

- OAR would be renamed the NOAA Climate Service and Earth Systems Science.
- Services and data stewardship would be added to NOAA's centralized research capacity.

Analysis: Including all of NOAA's climate capabilities in the same Line Office as NOAA's non-climate research was viewed as creating a single entity within NOAA with too broad and diverse a mission. This option was anticipated to: (1) compromise the ability of OAR to focus on next-generation science for all of NOAA by putting a service delivery function into their mission, and (2) prevent climate services from being fully developed due to competing mission requirements. Such a Line Office would have multiple competing interests under a single management structure, which only continues NOAA's current organizational challenges associated with its climate portfolio. These competing organizational demands were also viewed to detract from NOAA's ability to have a Line Office dedicated to strengthening NOAA science across the agency, and similarly create too diverse an office mission to focus on climate program coordination and user engagement.

APPENDIX C: The Proposed Structure Will Increase Efficiency and Produce Benefits

The proposed Climate Service Line Office would consolidate management of a number of NOAA's climate science, research and observation centers along with NOAA's data and service delivery infrastructure. This arrangement would provide an efficient and effective climate research to service enterprise under a central management authority to further the goal of having a single, authoritative source of climate information. I strongly believe that this proposed reorganization is the right solution.

Organizational Efficiencies

By consolidating NOAA's climate activities in one Line Office, we will be able to realize organizational efficiencies that will translate into a more effective response to the Nation's increasing demands for climate information, including a single point of access to NOAA's climate data and tools and supporting the growth of the emerging private sector climate services industry. These organizational efficiencies include:

Reduce Multiple Administrative Requirements and Better Transition Science into Usable Services

In proposing to house NOAA's existing climate research capacities in the proposed Climate Service Line Office, a structure strongly endorsed by NAPA, NOAA will both be able to continue to advance its high-quality climate science and more readily transition scientific findings into usable services. The proximity of science and service capabilities will provide more streamlined and efficient interaction between these components and allow climate science and service development to go hand in hand to develop products and services that can evolve in response to scientific information as it emerges. The consolidation of management for both science and service under one organization will reduce multiple planning, coordination, evaluation, and reporting burdens that are currently required as a result of the distribution of climate capabilities in multiple Line Offices. By reducing these inefficiencies, greater effectiveness can be achieved in executing NOAA's funding for science and service development and delivery.

Capture Material Efficiencies

Some activities not entirely dedicated to climate are included in the proposed Climate Service Line Office in order to realize significant material efficiencies. For example, both the National Oceanographic Data Center and the National Geophysical Data Center are proposed to reside in the Climate Service Line Office as complements to the National Climate Data Center. NOAA has been working to consolidate our data center functions across the agency by putting NCDC, NODC, and NGDC in the same Line Office. Although the scope of their work supports a variety of mission areas, the common foundational infrastructure on which data centers are built is uniform and should be kept together. NOAA will continue to consolidate these functions to grow material efficiencies by moving all three data centers into the Climate Service Line Office.

Improved Science and Service

The proposed Climate Service Line Office will provide a reliable and authoritative source for climate data, information, and decision-support services to help individuals, businesses, communities and governments make informed choices to help prepare for and anticipate the effects of a changing climate. It will make our information more visible, accessible and useful to our many partners and users, allow us to more efficiently and effectively steer and coordinate our existing world-class science and information products, and improve our capacity to leverage the other assets—both within NOAA and externally—through a unified set of priorities and a single management structure. The proposed Climate Service Line Office will:

- Develop a sustained capacity to provide regional and sectoral climate vulnerability and risk assessments to meet NOAA's requirements under the U.S. Global Change Research Act;
- Clearly establish a regional focus coordinating and providing climate services—deliver locally relevant climate information that will help existing businesses and local communities maximize opportunities and minimize their exposure to risks in a changing environment to safeguard lives, property, and ecomonic investments;
- Better align climate observing and modeling assets with strategic needs;
- Improve integration and coordination of climate communications and outreach efforts throughout the agency;
- Create a visible and easy-to-find, one-stop trusted source for information from the public, the private sector, and other government agencies to access NOAA's climate science and service assets; and
- Enable improved information sharing and more productive partnerships with federal agencies, local governments, private industry, and other users and stakeholders.
- Establish an improved budget structure that provides considerable transparency into the funding levels for the underlying climate programs, thereby allowing Congress and the public to ensure climate science is not diminished.

Strong Internal and External Partnerships

No one agency or community can provide all of the climate services that the Nation needs, and the Climate Service Line Office requires an organizational framework that fosters sustained dialogue with diverse scientific and service communities. These communities include DOC; other parts of NOAA; federal, tribal, state, and local agencies; academic partners; private industry, non-governmental organizations, and the international community. The Climate Service Line Office will work with each sector, ensuring that emerging scientific findings are transformed into high-quality products responsive to user needs.

Science and Service Synergies Through a National Climate Service Enterprise [4]

In general, climate science and services are still in their infancy compared to, for example, weather science and services. The Climate Service Line Office will evolve iteratively, incorporating vigorous research investigations and discovery, and considering new processes, user requirements, and feedback. Weather services are driven by the necessarily fast information transmission and the sheer quantity of forecasts, watches, and warnings. Integrating emerging science into these demanding mission-critical operations requires a deliberate approach. Because climate services will often have a longer time horizon, new and emerging science can be more readily used in climate services.

An effective Climate Service Line Office will adopt an approach of "co-production of knowledge" with decision makers. [5] The intent of "co-production" is climate science that informs, but does not prescribe, decision making. Similarly, decision making should inform climate science, but not prescribe research priorities. The Climate Service Line Office must balance this "user pull and science push." Rapidly growing demand for climate services will challenge the Climate Service Line Office

[4] The "National Climate Service Enterprise" is used as shorthand in reference to the emerging interagency and private-sector investment in climate services.

[5] Ostrom, E., 1999: Crossing the Great Divide: Coproduction, synergy, and development. In: *Polycentric governance and development: Readings from the workshop in political theory and policy analysis* [McGinnis, M.D. (ed.)]. University of Michigan Press, Ann Arbor, MI, 346–374.

to expand its products and research information to address user needs, It is also important to recognize that science can anticipate the emergence of new risks.

Expanded Engagement Through Assessment Services

Climate Science Assessments comprehensively summarize the knowledge gathered from many studies and disciplines into authoritative overviews of climate variability, change, and impacts. Science assessments characterize uncertainties based on documented information and identify gaps in understanding to help prioritize future research and service development. Because the assessment process exemplifies the synergy between science and service, the Climate Service Line Office will use assessments to inform policy advisors, community planners, and decision makers, as well as its own research agenda. The Climate Service Line Office will only participate in Climate Science Assessments that have standards in place which meet or exceed those of Information Quality Act. The Climate Service Line Office wi11 focus on two types of Climate Science Assessments: (l) national and international assessments, and (2) problem-focused assessments. A third type of assessment—stakeholder needs assessments—will help ensure that the climate science and services are brought to bear on relevant issues. Together, these three types of assessments serve as powerful tools to guide the design of high-quality regional service products, and will frame dialogues among climate scientists and service providers and regional users.

Enhanced Traceability, Credibility, and Transparency

Through strength in research, tbe Climate Service Line Office will aim to grow the body of scientific knowledge about climate variability and change, including the determination and quantification of uncertainties and confidence intervals. Because the Climate Service Line Office will use and tailor new science to address applications and user needs, the Climate Service Line Office will ensure its data, information, and services meet the highest standards of scientific excellence. This mandates careful quality assurance, including:

- Rigorous and internationally recognized procedures for calibration and validation of observation and monitoring systems;
- Transparent peer-review procedures for articles, documents, and assessment reports;
- Quantification and accurate communication of uncertainty in model outputs;
- Accessible metadata documenting the quality of data products and services.

Creating a Culture for Success in the Climate Service Line Office

To create a new culture of shared learning that values the co-production of knowledge, advances scientific understanding of climate, and delivers relevant, usable services, the Climate Service Line Office will need to adopt business practices that:

- Promote ongoing and sustained engagement with policy advisors, community planners, and decision makers;
- Provide for the rapid infusion of research findings into products and services;
- Nurture the growth of science and service within a single organization as complementary rather than competing actuvities;
- Balance what users want and what is justifiable scientifically;
- Recognize science and research as valuable services in their own rights;
- Value communication and education as both a contribution to services and to research;
- Link research to decision making as an alternative to the more traditional research-to-operations paradigm;
- Incorporate a fast-track review process for information products to meet the time-dependent information needs of decision makers;
- Leverage innovative tools to enhance communication and collaboration with stakeholders.

Chairman HALL. Thank you, Dr. Lubchenco. I certainly accept your apology and hope you will have that same attitude toward answering the requests that we have sent to you. We appreciate you doing that.

Our second witness is Mr. Robert Winokur, Deputy and Technical Director, Office of the Oceanographer of the Navy, Chief of Naval Operations. He has been in this position since December 2003 and previously occupied the position from 1985 to 1993. From 1993 to 1999, Mr. Winokur served as the Assistant Administrator for Satellite and Information Services at NOAA. Thank you, sir, for appearing before the committee today. I ask you to stay as close to the five minutes as you can. Thank you.

STATEMENT OF ROBERT WINOKUR,
DEPUTY OCEANOGRAPHER, U.S. DEPARTMENT OF THE NAVY

Mr. WINOKUR. Thank you, Chairman Hall, Members of the Committee, Dr. Lubchenco. Thank you for the opportunity to discuss with you the Navy's interest in climatological data and information. As introduced, I am the Deputy Oceanographer of the Navy. The Oceanographer is also the Director of Navy's Task Force Climate Change. Today I am speaking about the Navy's needs for actionable climate information, how we have used climatology in the past, and how we would use projections in the future.

The Navy has used climatological information for over 150 years based initially on the groundbreaking work of Commander Matthew Fountaine Maury in the mid-19th century. The Navy Hydrographic Office continued Maury's work, providing climatological data until 1951 when the National Climatic Data Center in Asheville, North Carolina, became the authoritative source for federal climatological data.

Since operations at sea are very susceptible to environmental conditions, a better sense of what might be experienced allows mission planners to make critical decisions that help ensure safety and efficiency. Climatological data provides essential information for planning exercises, near-shore flight operations, ammunition transfers during pre- and post-deployment, and search and rescue operations. Likewise, climatological models of the upper atmosphere coupled with our forecast models allow us to route long-distance flights to maximize fuel efficiency. For our short facilities, climatology allows us to more efficiently plan for heating and cooling costs.

Increasing evidence, however, suggests that historical records will be inadequate for describing conditions of the future. While we know the climate is changing, we also know that specific details are uncertain. What we do know is that changes are magnified in the Arctic, which could impact naval missions later this decade. Broader trends in global climate indicators point to even more changes in mission requirements in the next few years. In fact, both the National Maritime Strategy, a cooperative strategy for the 21st century sea power, and the Quadrennial Defense Review highlight climate change as a significant factor to be considered when anticipating naval requirements of the 21st century.

Part of the military mission is to anticipate threats and changes to national security. Climate change and its interaction with and impacts on demographics, technology, globalization and resource allocation and management will be some of the drivers of security in this century. It is in this spirit that the Navy has identified its

needs for improving understanding of a changing global environment.

The Navy's role and responsibility regarding climate services would be as a customer using the information for technical, operational, and strategic planning and execution, and to provide feedback to those organizations that provide the services so that they may continue to improve them. The Navy believes that an organizational focus for providing reliable and authoritative climate data information and related products would be beneficial from a perspective of a climate services user. The Navy desires access to readily available, reliable, and consistent data and information in an easily available and preferably consolidated location to move us away from the current disparate method of locating and obtaining climate information such as standard climatology, Arctic sea ice, historical trends and future trends or current observations.

It is outside the Navy's purview to comment on the specifics of how best to provide climate data and services and how the collection of dissemination of climate services should be carried out. However, the Navy does acknowledge initiatives that result in increased effectiveness and efficiency and appreciates the potential benefits of a consolidated organizational construct.

The Navy recognizes the need to better understand the processes that are affecting the Earth's climate, predict how the climate will change in the future, and anticipate the security risks that may arise. The Navy is focused on readiness and adaptation while reducing the risk to vulnerable facilities and training our forces to be prepared for any future missions operating environments that much of the Navy has not regularly seen.

The Navy is focused on understanding the many uncertainties and challenges that climate change may have in the future on our facilities and operations. Climate change may add additional stresses to vulnerable and unstable regions. In addition of significance, our coastal infrastructure will be affected by changes in sea level by the impact of severe storm events. Credible and authoritative climatological data and predictions are necessary for us to conduct studies and assessments which are essential to inform Navy needs and future investments.

In this regard, the Navy has developed and is implementing two roadmaps, one for the Arctic region specifically and one focused on global climate change. These roadmaps outline the navy's approach to observing, predicting, and adapting to climate change with a list of actions for the next few years so as to better understand the potential impacts of and actions related to a changing climate on naval operations and investments.

Thank you, Mr. Chairman. I look forward to answering any questions that you or the Committee may have.

[The prepared statement of Mr. Winokur follows:]

PREPARED STATEMENT OF ROBERT WINOKUR,
DEPUTY OCEANOGRAPHER, U.S. DEPARTMENT OF THE NAVY

I. Introduction

Mr. Chairman, Members of the Committee and distinguished colleagues, I want to thank you for the opportunity to discuss with you today the Navy's interests for climatological data and information. My name is Robert Winokur and I am the Dep-

uty Oceanographer of the Navy. The Oceanographer also holds the titles Director of Navy's Task Force Climate Change and Naval Deputy to the National Oceanic and Atmospheric Administration (NOAA). Today I am speaking about the Navy's needs for actionable climate information, how we have used climatology in the past, and how we would use projections in the future.

II. Background

Strategic planners have long used climatological records to provide guidance on weather and sea conditions at a particular place and time of year. Climatological records are based on long-term trends identified in recorded meteorological and oceanographic observations, providing a range of potential and probable conditions that could be encountered.

Since operations at sea are very susceptible to environmental conditions, a better sense of what might be experienced allows mission planners to make critical decisions that help ensure greater safety and efficiency. With proper knowledge, they can avoid planning exercises at times and in locations where high winds and seas, extreme temperatures, fog and haze, and frequent storms may make conditions unsafe for specific types of operations. Knowledge of probable wind conditions can help identify optimal windows of opportunity for near-shore flight operations. Climatology is an important component of conducting at-sea search and rescue operations and determining the best location to conduct ammunition transfers for surface ships beginning or completing extended deployments. By understanding probable sea conditions, we can route ships to minimize fuel usage. Likewise, climatological models of the upper atmosphere allow us to route long-distance flights to maximize fuel efficiency. For our shore facilities, climatology allows us to more efficiently plan for heating and cooling costs.

The Navy has used climatological information for over 150 years, based initially on the groundbreaking work of Commander Matthew Fountaine Maury in the mid-19th century. The Naval Hydrographic Office continued Maury's work, providing the Navy with climatological data until 1951, when the National Climatic Data Center in Asheville, North Carolina, became the authoritative source for federal climatological data.

Increasing evidence, however, suggests that historical records will be inadequate for describing conditions of the future. While we know the climate is changing, we also know the specific details are uncertain. What we do know is that changes are magnified in the Arctic, and that will impact naval missions later this decade. The broader trends in global climate indicators point to even more changes in mission requirements in the next few decades. In fact, both *A Cooperative Strategy for 21st Century Sea Power*, the National Maritime Strategy, and the *Quadrennial Defense Review* (QDR) highlight climate change as a significant factor to be considered when anticipating naval requirements of the 21st century.

The 2010 Quadrennial Defense Review (QDR) identifies climate change as an issue that will play a significant role in shaping the future security environment, and directs the Department of Defense to take specific actions to reduce the risks associated with climate change, while also identifying climate change and energy security as "inextricably linked." In addition, climate change is addressed in the 2010 National Security Strategy, which states that the issue is a key challenge requiring broad global cooperation.

The QDR discusses how climate change will affect the Department of Defense (DoD) in two broad ways: first, by shaping the operating environment, roles, and missions that we undertake; and second, describing the need for DoD to adjust to the impacts of climate change on our facilities and military capabilities by constructing a strategic approach that considers the influence of climate change.

Taking into account Federal and DoD guidance, the Navy recognizes the need to adapt to climate change and is closely examining the impacts that climate change will have on its military missions and infrastructure and the information needs required to understand these impacts. In May 2009, the Chief of Naval Operations, Admiral Roughead, created a task force to provide scientifically grounded assessments and recommendations for future naval operations. Task Force Climate Change includes representatives from various naval staff and program offices and the operational fleet, with the close collaboration of the U.S. Coast Guard and NOAA.

Within the two last years the Navy promulgated two roadmaps concentrated on the Arctic and global climate change. The roadmaps guide Navy's strategy, future investment, action, and public discussion on the Arctic and global climate change. The Navy Arctic Strategic Objectives, released in May 2010, specify the objectives

required to ensure the Arctic remains a region where U.S. national and maritime interests are safeguarded and the homeland is protected.

Through Task Force Climate Change, the Navy is assessing the timing and magnitude of climate change impacts on mission requirements, force structure, and infrastructure. To ensure readiness throughout the 21st century, the Navy has a need for actionable and operationally relevant climate information that improves its understanding of environmental change in order to both inform future investments and broaden cooperative partnerships, while adapting to fundamental changes.

III. Current Needs

The Arctic is one example of a critical area where the Navy has a need for accurate climate services. As stated by the Navy's Arctic Strategic Objectives, increasingly rapid environmental changes in the Arctic will make it more challenging to promote the end goal of a "safe, stable, and secure Arctic region." September 2007 was a record low in sea ice extent and the declining trend has continued—September 2010 was the third lowest sea ice extent on record, and the overall trend has shown an 11.2 percent decline per decade in seasonal ice coverage since satellites were first used to measure the Arctic ice in 1979. Perhaps more significantly, estimates from the University of Washington's Applied Physics Laboratory show that the volume of sea ice (as indicated by ice thickness) continues to decrease dramatically. September ice volume was at a record low in 2010—78 percent below its 1979 maximum and 70 percent below the mean for the 1979–2009 period. Regardless of changes to sea ice, the Arctic will remain ice-covered in the winter through this century and remains a very difficult operating environment.

The changing Arctic has national security implications for the Navy. The QDR identifies the Arctic as the region where the influence of climate change is most evident in shaping the operating environment and directs DoD to work with the Coast Guard and Department of Homeland Security to address gaps in Arctic communications, domain regional awareness, search and rescue, and environmental observation and forecasting capabilities. The Navy's Maritime Strategy identifies that new shipping routes have the possibility to reshape the global transportation system. For example, the Bering Strait has the potential to increase in strategic significance over the next few decades as the ice melts, the shipping season lengthens, and companies begin to ship goods over the Pole rather than through the Panama Canal.

While the Arctic is a bellwether for global climate change, there are other impacts of global climate change that may impact peace-keeping, humanitarian assistance, and disaster relief missions. Availability of freshwater will change with the redistribution of precipitation patterns and saltwater intrusion resulting from sea level rise. Alterations in freshwater systems will present challenges for flood management, drought preparedness, agriculture, and water supply. Understanding how and when precipitation patterns will shift, or the frequency of future floods and droughts, will help the Navy anticipate future threats to security, enabling it to establish mechanisms ahead of time to prevent future conflict that could be caused or exacerbated by environmental changes. The 2011 National Research Council Report requested by the Chief of Naval Operations, *National Security Implications of Climate Change for U.S. Naval Forces*, recognizes these potential mission impacts and recommends Navy action to address them in six priority areas, including preparing for an increase in humanitarian assistance and disaster relief and Arctic operations, addressing emerging technical requirements, and supporting research and development.

The National Research Council report also finds that "U.S. Navy, Coastal Guard, and Marine Corps coastal installations around the globe will become increasingly susceptible to projected climate change." The Navy's operational readiness hinges on continued access to land, air, and sea training and test spaces. Coastal infrastructure is particularly vulnerable because it will be affected by changes in global and regional sea level coupled with a potential increase in storm surge and/or severe storm events, and regional water resource or infrastructure challenges. Bases such as Guam and Diego Garcia provide a strategic advantage to the Navy in terms of location and logistics support. In order to limit the negative effects of climate change on sea level rise, the Navy requires access to climatological information on rates of global sea level rise and local coastal processes that will allow adaptation efforts and planning of new coastal facilities to be initiated at the right time and cost, especially for installations identified as high risk.

Currently the Navy is conducting a Capabilities Based Assessment (CBA) for the Arctic to identify capabilities required for future operations in the region and possible capability gaps, shortfalls, and redundancies. Assessments such as these will inform Navy strategy, policy, and plans to guide future investments. Furthermore,

the Office of Naval Research is making investments in its FY 12 budget to improve the Navy's capability to persistently monitor and accurately predict critical Arctic environmental changes and increase understanding of climate variability.

The Navy is actively leveraging interagency, international, and academic partnerships to ensure it has access to the best science and information and to avoid duplication of efforts. These partnerships have the added benefit of conserving resources in this fiscally constrained environment. We are participating, in coordination with appropriate DoD offices, in interagency efforts being conducted to improve coordination of climate services, including the National Science and Technology Council's Roundtable on Climate Information and Services, co-chaired by the Office of Science and Technology Policy, the National Oceanic and Atmospheric Administration, and the U.S. Geological Survey; the National Ocean Policy's strategic action plans, particularly the plan that focuses on the Arctic Ocean; and the U.S. Global Change Research Program's National Climate Assessment, which in part are coordinating agency climate science needs and adaptation efforts across the Federal Government.

Finally, the Navy is jointly planning an effort with the Air Force, the National Oceanic and Atmospheric Administration, and other agencies to advance U.S. environmental prediction capability to mitigate the impact of the severe weather and answer operational requirements facing our nation. This capability will combine the forecasting skills of the Navy's and the National Weather Service's global numerical weather, ocean, and ice models to provide a better Earth Systems Prediction Capability in the next 10 years.

IV. Conclusion

Part of the military mission is to anticipate threats and changes to national security. Climate change, and its interaction with and impacts on demographics, technology, globalization, and resource allocation and management, will be one of the drivers of security in this century. It is in this spirit that the Navy has identified its needs for improved understanding of a changing global environment.

The Navy's role and responsibility regarding climate services would be as a customer; using the information for tactical, operational, and strategic planning and execution; and to provide feedback to those organizations that provide the services so that they might continue to improve them. It is outside the Navy's purview to comment on what agency should provide climate services to the Federal Government, how they should carry out the collection and dissemination of climate services, and what level of funding is necessary to carry out this effort.

The Navy recognizes the need to better understand the processes that are affecting the Earth's climate, predict how the climate will change in the future, and anticipate the security risks that may arise. The Navy is focused on readiness and adaptation, while reducing the risk to vulnerable facilities, training our forces to be prepared for any future missions operating in environments that much of the Navy has not regularly seen.

Thank you Mr. Chairman. I look forward to answering any questions the Committee may have.

Chairman HALL. I thank you, sir, and I thank you both for your testimony.

I don't have to remind the Members here that we are relegated to five minutes, and I will try to set the pattern by being within five minutes. At this time I recognize myself for questions for five minutes.

Dr. Lubchenco, in testimony before the appropriators earlier this year, you argued that the entire Climate Service proposal by the Administration was really just an optical change that wouldn't impact daily operations. Specifically you said, and I quote: "This is a matter of appearances. The reality is no change to the dollars that are going to the science or to the dollars that are going out the door. We are not funding less science. We are not funding different science. We are not changing anything other than the fact that the climate scientists that were in oceanic and atmospheric research are now in the Climate Service. Other science remains there and will continue to thrive." Is this really just a matter of appearances, that you won't change the science, you won't change the money you

fund or how you fund it? Why is it such a big deal to have such a hard time to answer the questions we sent to you and to be 26 days late in answering questions for this Committee? Do you have a good answer for that?

Dr. LUBCHENCO. Mr. Chairman, we have had multiple exchanges of letters and meetings and calls. I have instructed my staff to be as responsive and transparent with the Committee as possible. I know that in response to your requests, we have delivered two sets of documents totaling over 6,000 pages. There is an extensive record within NOAA, and we have been working very, very diligently and hard to provide you and your colleagues and your staff with all of the information that you are requesting.

Chairman HALL. I thank you for that. You can solve that by answering the questions we have sent you. I hope you are going to do that.

Mr. Winokur, the title of this hearing is "Examining NOAA's Climate Proposal," yet you conclude your written testimony by saying—and you are here at the request of the minority, right?

Mr. WINOKUR. That is correct, Mr. Chairman.

Chairman HALL. All right. You said, "It is outside the Navy's purview to comment on what agencies should provide climate services to the Federal Government, how they should carry out the collection and dissemination of climate services and what level of funding is necessary to carry out this effort." Just so we are clear, your testimony is that the Navy has no position on NOAA's proposed Climate Service. Is that right?

Mr. WINOKUR. Correct, Mr. Chairman. Our position is that is an internal decision for NOAA to decide how best to organize. From the Navy, we require credible and authoritative data in a timely fashion so it would facilitate our requests if there was a coordinated and focused approach to answering Navy needs for data.

Chairman HALL. As you sit there today, then, and I thank you for your service to the Navy and to the country, would it be fair to say that it sounds as though the Navy doesn't actually need a Climate Service? Is that what you are telling us?

Mr. WINOKUR. No, I think what I am saying, Mr. Chairman, is that the Navy needs climate data, and if Climate Service is in fact the best way to provide it to us, then certainly we leave that to NOAA on how best to organize, but we do need a focused approach. The current situation of obtaining data from disparate sources makes it a little more complicated for the Navy to get what it needs, so we would certainly support efficiencies within any agency, and if this is the best way for NOAA to provide it, we would support it, but we are not taking an official position on how NOAA should best organize.

Chairman HALL. I appreciate that, and I think my time is about up.

The gentleman from Oregon, Mr. Wu, is recognized for five minutes. Ms. Johnson had a vote in another committee. She will return shortly. Mr. Wu, I recognize you for five minutes.

Mr. WU. Thank you very much, Mr. Chairman.

Chairman HALL. I stayed within four minutes and 59 seconds.

Mr. WU. I have restarted my clock. Before I start my five minutes, Mr. Chairman, we have one additional letter of support from

23 climate- and weather-related private sector entities, and Mr. Chairman, I would like to add this letter to the previous letters that Ms. Johnson submitted for the record, and I do note that the majority staff has received a copy of this letter.

Chairman HALL. Without objection, so ordered.

[The information can be found in Appendix 2.]

Mr. WU. Thank you very much.

Chairman HALL. You can continue now. You have four minutes and 49 seconds left.

Mr. WU. Very good.

I want to start by noting that NOAA does not have an organic act. This Congress has failed to pass one, even though NOAA was created in 1970 and it has existed for either 40 or 41 years. It was created by then-President Nixon, not by Executive Order but I believe by an Executive Reorganization Proposal. And the failure to pass an organic act, I think, leaves it to the executive branch and NOAA not to reorganize without input from Congress but to substantially take initiative in its reorganization while consulting Congress when appropriate, and this Committee and Congress have made strenuous efforts to pass an organic act but we have failed to do so. This Committee has passed an organic act through this Committee several times. It had made it through other Committees and not made it through the full House of Representatives, and I want to just lay that down. It, I think, explains some of NOAA's actions in reorganizing itself because it has to take additional actions in doing so in the absence of an organic act.

Administrator Lubchenco, I would like to return for a moment. You did address this in your testimony, but I would like to return for a moment to the difference between climate and weather because it is so important. Maybe Members of the Committee understand part of that. Maybe the staff understands that fully. But perhaps members of the general public do not fully understand the difference between climate and weather and the functions of the Weather Service and any future Climate Service, and I want to give you further opportunity to explain the difference.

Dr. LUBCHENCO. Thank you very much, Congressman, and thank for your support of NOAA and recognition of the importance of having an organic act but also the importance of our continuing to reorganize to be better and better and to deliver what Congress and the American people expect.

To your question, weather happens over hours to days. Our weather models that provide some of the best weather forecasts in the world provide each and every American with information about weather but also warnings, and this is in the time frame that is generally less than two weeks. Anything longer than that is what we define as climate. Climate is future weather more than two weeks out and so this focuses on weeks to months to years and beyond, and much of the climate services of which we are speaking and that we currently provide under existing authorizations but want to do a more effective job of providing has to do with information about pending droughts, pending floods, pending severe storm conditions, things that more than two weeks out. We utilize observations and modeling and understanding of past weather and climate information to anticipate what is likely down the road. And

so, for example, when last fall NOAA warned the communities in the upper Midwest that the spring was likely to be a very significant flooding year, that is an example of a climate service. That kind of information is extraordinarily useful for planning purposes—how many sandbags do we need to buy, what kind of information do we need to provide to our communities, how can we begin to think about and be prepared. The same is true for firefighters battling fires in Texas. Having information beginning last winter that this was going to be a very, very dry and warm spring enabled planning to begin. That kind of climate service information we currently provide but we don't do so in a way that is as effective or as efficient as we believe it could be, hence the proposal for this reorganization.

Mr. WU. Thank you very much, Administrator Lubchenco, for that very interesting example of the difference between tornadoes tomorrow and floods next year. Thank you.

Chairman HALL. The gentleman yields back. The gentleman from California, Mr. Rohrabacher, is recognized for five minutes.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman, and I would like to ask Dr. Lubchenco, do you believe that you are obligated to—that your actions are obligated to be within the parameters that are set by law by the Congress?

Dr. LUBCHENCO. Yes, sir.

Mr. ROHRABACHER. And what is your interpretation of the last Department of Defense continuing appropriations act of 2012 when a reading of it from our side suggests that you are prohibited from using funds to implement, establish or create a NOAA Climate Service? Is that your interpretation as well?

Dr. LUBCHENCO. Yes, Congressman. We were instructed very explicitly not to implement or create a Climate Service, and we have not done so.

Mr. ROHRABACHER. Okay. Now, you have a director that—well, what is the title for Mr. Tom Karl's position in your operation?

Dr. LUBCHENCO. Mr. Karl is the Director of the National Climatic Data Center. He also serves as the Transitional Director for the NOAA Climate Service, the proposed NOAA Climate Service.

Mr. ROHRABACHER. Is Climate Service Transition Director part of his title?

Dr. LUBCHENCO. Yes, it is.

Mr. ROHRABACHER. All right. Thus, you think that when Congress says you are—no funding shall be used to implement Climate Service, that you are within the guidelines from Congress in establishing a Climate Service transitional director. Isn't that implementing a Climate Service for NOAA on its face?

Dr. LUBCHENCO. No, Congressman, it is not. I believe that it is being smart and——

Mr. ROHRABACHER. Smart is not necessarily considered law.

Dr. LUBCHENCO. I understand. I will change my wording. I believe that prior to implementing any potential change, whether that change comes about or not, requires good planning and good execution if the proposal is approved, and in this case, we set—the kind of proposal that is before Congress now is a very substantial one and moves—does a reorganization that requires extensive amount of planning and begun under Vice Admiral Lautenbacher,

we began to think about what would a new line office look like, how should it be structured, and Mr. Karl was——

Mr. ROHRABACHER. But once you go beyond that and you actually hire someone, for example, have you not also hired six new NOAA regional Climate Service director positions in this last year? So not only do you have one man seated just in case you are able to follow through with this in another law, you have also put on six new regional directors as well.

Dr. LUBCHENCO. Congressman, the six regional Climate Service climate directors, Climate Service directors, were hired using existing funds and are part of our ongoing commitment to provide climate services for which we have explicit authorization from Congress and to enable regional managers, regional planners, regional businesses to have the kind of long-term weather and climate information that they need. That is part of our existing authority.

Mr. ROHRABACHER. When you say existing funds, then you say the appropriations bill that we just—the continuing resolution which prohibits the use of funding, that your use of existing funds is not restricted by that prohibition by Congress?

Dr. LUBCHENCO. Congressman, those regional directors were hired prior to the continuing resolution and they are consistent with what we normally do to provide climate services under existing authorizations.

Mr. ROHRABACHER. So a continuing use of funds for people to provide salary for people who legislation has suggested you are prohibited from using funds to implement a Climate Service but continuing use of funds is not restricted in your analysis by this law?

Dr. LUBCHENCO. Congressman, those regional directors are not part of our proposed reorganization.

Mr. ROHRABACHER. But they are part of your budget.

Dr. LUBCHENCO. Of course they are part of our budget. Everybody on the payroll is part of our budget but they are not part of this proposed reorganization, which we have not implemented——

Mr. ROHRABACHER. Well, it doesn't say here as part of your reorganization. It says prohibits use of your funds that Congress provides you. It doesn't say you are prohibited unless it has something to do with your reorganization.

Ms. LUBCHENCO. I believe that the language prohibits us from implementing or creating a Climate Service, and we have not done that.

Mr. ROHRABACHER. It would appear to me, one last note, Mr. Chairman, is a quote from this new Transitional Director, Tom Karl, when asked about whether or not they were establishing the Climate Service, he said, "We have moved in. We are waiting for the marriage certificate but we are acting like we have a Climate Service." So I am not going to ask you anything about living in climate sin without the marriage certificate, but it seems to me that something is going on here that you do not have authority to do with your budget, and I think we need to further look at this very closely, Mr. Chairman. Thank you very much.

Chairman HALL. The gentleman yields back his time.

The chair recognizes the gentleman from California, Mr. McNerney, for five minutes.

Mr. WU. Mr. Chairman, I would like to yield my position to Mr. Miller because I need to step away for some votes, and I also want to note for the gentleman from California that the six hires and Mr. Karl, that they were put in place before Mr. Hall's amendment and before the appropriations bill was passed last year. Thank you, Mr. Chairman.

Chairman HALL. I recognized Mr. McNerney, and if Mr. McNerney wants to yield his time to Mr. Miller, certainly he would be welcome to do that.

Mr. WU. I apologize.

Mr. MCNERNEY. Thank you, Mr. Chairman.

Dr. Lubchenco, one of the objections that I seem to be hearing from the majority party is a lack of cooperation or planning with the agency between the agency and the Committee here. Would you consider your agency as being cooperative or uncooperative, and if you consider it cooperative, could you give some specific examples of meetings or actions that took place in an effort to cooperate in terms of developing the plan?

Dr. LUBCHENCO. Thank you, Congressman. I believe we have been very responsive, very cooperative. I fully admit and have apologized for the fact that I think we got off on the wrong foot when we did the initial announcement, and I think that was a serious mistake. We have consistently been in dialogue with the Committee. Our staff has been communicating quite frequently. I have briefed this Committee about our proposed reorganization. I have met with the Chairman a number of times, and in fact, this dialogue began with this very Committee quite a while ago as we were considering this proposal. So we have had, I believe, very extensive interactions and communications.

This Committee and Congress, for example, requested when we first proposed this reorganization in February of 2010, Congress directed us to engage the National Academy of Public Administration to review our plans and to provide this Committee and Congress with an evaluation of the proposal that we had. So that is a specific example of some of the interaction and dialogue that we have had following the original proposal. That study was very extensive, very exhaustive. They delivered a report last September which has strongly endorsed the proposal that we have provided. It also made a very strong case for the need for a Climate Service to provide much more effective and efficient delivery, one point easily identified and that committee report has been very helpful in informing and modifying our proposal as we move forward.

Mr. MCNERNEY. Thank you.

Mr. Winokur, in your experience, how would you revamp NOAA's effect—never mind. How can the proposed Climate Service benefit the Navy and our national security?

Mr. WINOKUR. From a Navy perspective, we would like frankly a simple and easy entry point into the organization so that, for example, if we were dealing with disparate parts of NOAA, it facilitates our interaction with NOAA if we can go through a single organizational component or in the context of data, if you will allow me to put it this way, through a single data portal. So rather than for the Navy to go to one part or NOAA or another part of NOAA or frankly to another part of the Federal Government, it would fa-

cilitate our needs for data if we could ease the entry point and work through a single coherent organization. Overall, as I said in my testimony, we do need credible, authoritative information in a timely manner so that we can use that for future planning.

Mr. MCNERNEY. And do you think this has an impact on national security?

Mr. WINOKUR. I think it would facilitate our ability to obtain data that we need for national security.

Mr. MCNERNEY. Thank you.

Dr. LUBCHENCO. Congressman, would you consider letting me add one quick thing to that?

Mr. MCNERNEY. Yes.

Dr. LUBCHENCO. I believe that another way that the reorganization will help not only the Navy but Department of Defense and others in addition to what Mr. Winokur has said is that housing science and services together in a single line office allows faster transfer of new knowledge into delivery of services. So above and beyond the one point easily identified source, the services that are available are delivered more rapidly and are more current.

Mr. MCNERNEY. Would that allow collaboration among non-agency scientists on the issues that were being considered and discussed and presented?

Dr. LUBCHENCO. Absolutely. We currently collaborate extensively not only with other agencies but with academia, with the private sector, and that collaboration is only enhanced when you can identify one place to go instead of five or six across the agency.

Mr. MCNERNEY. Thank you.

Mr. Chairman, I have expired my time.

Chairman HALL. I thank the gentleman and recognize the gentleman from Georgia, Dr. Broun, for five minutes.

Mr. BROUN. Thank you, Mr. Chairman.

Dr. Lubchenco, NOAA's National Weather Service already has the Climate Prediction Center, which has the stated goal of being "the world's best, most trusted climate service center using partnerships to develop cutting-edge climate products." Its stated mission is to "deliver climate prediction, monitoring and assessment products for time scales from weeks to years to the Nation and the global community for the protection of life and property and the enhancement of the economy." On its Web site, CPC states that its "products are operational predictions of climate variability, real-time monitoring of climate and the required databases and assessments of origins of major climate anomalies. The products cover time scales from weeks to seasons, extending into the future as far as technically feasible and cover the land, ocean and atmosphere, extending into the stratosphere."

The proposed NOAA Climate Service would gut research in modeling from the Office of Atmospheric Research, OAR, and data centers from NCDS. It basically politicizes the issue and minimizes the other core missions of the agency, all in an attempt to increase coordination. On top of that, its stated goal is to "bridge the gap between climate science and decision making." That sounds a lot like a propaganda office to me.

Since the National Weather Service, a trusted source of impartial information, already has an office executing this task and the Of-

fice of Atmospheric Research is conducting climate research, what is the goal of the National Climate Service other than policy advocacy?

Dr. LUBCHENCO. Congressman, the Climate Prediction Center and the Weather Service, the great science that we have in the Office of Atmospheric Research, other units like the National Climatic Data Center that are in the satellite division are all existing strong pieces that we have that provide either climate science or climate services. The challenge is that they are located in disparate parts of NOAA. They do not have a—we have to connect them through our matrix management structure, and others from the outside don't necessarily know where to go to get easy information. Our proposal——

Mr. BROUN. Well, pardon me, because I have just a limited amount of time. The Navy has complained that they don't have one source to contact you. It seems the CPC does all the goals that you are expecting NOAA's new Climate Service that I think you are already instituting against the law actually, but why not just support and reinforce the work of CPC or data centers which already have trusted reputations rather than standing up a politically charged office? This seems to be an unneeded distraction that has nothing to do with science or providing the public with better information. If it is better to gut climate research out of OAR and put it in a separate line office, why aren't you suggesting that for other line offices and why do we need OAR if we are just going to align research with each line office? Do you also suggest that we eliminate OAR?

Dr. LUBCHENCO. Congressman, the Climate Prediction Center is only one part of our climate sciences and services, and it alone cannot do all that we need to have done. We are having increasing requests for information about climate, long-term weather and climate, and we believe that providing this information to the diversity of users is best done by having a single identifiable place that is much greater than what just the Climate Prediction Center does. This is a proposal to be responsive to our existing mandates from Congress as well as more responsive to the American people in providing the information that they need and that we believe will be very, very helpful.

Mr. BROUN. Well, I think the CPC is already doing what you are suggesting. I think you are breaking the law, frankly, because you are standing up a service that Congress has told you not to do along with the questions that Mr. Rohrabacher gave you. I think you are standing this up against Congress's direct instructions to you in the law. CPC could do exactly what you are doing. The Navy could contact CPC if you just do your job and let the Climate Prediction Service do what it could do. This just seems like a politically motivated advocacy office that this Administration is trying to stand up. Even though these people were already hired prior to that bill being passed, it doesn't mean that we need to continue funding them.

Mr. Chairman, I yield back.

Mr. HARRIS. [Presiding] Thank you very much.

The gentlelady from Florida, Ms. Wilson, is recognized for five minutes. Not here? Ms. Sewell is recognized for five minutes.

Ms. SEWELL. Thank you so much, Mr. Chairman.

Madam Administrator, I know that those were pretty harsh allegations that were just made against NOAA, and I was wondering if you would like to respond to the last question.

Dr. LUBCHENCO. Thank you, Congresswoman. We believe that we are doing exactly what Congress instructed us to do. We have existing authorization dating back to 1978 through three different pieces of legislation that Congress has passed that require us to provide climate science and climate services. That is exactly what we have been doing and are continuing to do. We have not and will not implement or create the proposed Climate Service until we have permission from Congress to do so.

Ms. SEWELL. Well, I know that one of the things that we are all concerned about is that the goal if we are to create a Climate Service, a proposed Climate Service to NOAA, is that we want to make sure that your basic mission is not impeded in any way.

I hail from Alabama, and we have had some pretty harsh tornadoes that have affected my district and my State, and I just want to know what assurances you can give us that your forecasts, your climate forecast operations and your environmental satellite program will not be in any way negatively impacted by any proposed Climate Service.

Dr. LUBCHENCO. Thank you, Congresswoman. When we first set out to consider possible different options for reorganization, we had a number of criteria in mind. One of them was to not in any way, shape, or form undermine the very good work of any of the other important parts of NOAA. We also wanted to have a reorganization that was budget-neutral, did not cost any additional resources and that would provide the most effective and efficient climate services to the American people. The very careful, thoughtful way that we have gone about thinking about reorganization, the extensive consultation we have done with our Science Advisory Board, with the National Academy of Public Administration and others has resulted in the proposal that is before Congress, and we believe that the proposal will not only provide—satisfy the growing and increasing demand for climate services, long-term weather information, climate services but also strengthen science within NOAA. That is one of my highest priorities and we believe that this renewal of the Office of Atmospheric and Oceanic Research is—this is a great opportunity to renew research focus in OAR and to do so in a way that incubates long-term research and integrates science across NOAA. So we believe this is a win-win for the American public and is completely consistent with what we have been directed to do by Congress.

Ms. SEWELL. Thank you. How do you feel that NOAA's weather and climate forecasts are helping people like the folks in my district prepare for these catastrophic events, weather events that we have been experiencing? Can you just give me—address NOAA's efforts to help prepare communities like mine?

Dr. LUBCHENCO. Congresswoman, I had the opportunity to visit Tuscaloosa in your district just a few days after the disastrous tornado that was there, and I saw firsthand how horrid much of the damage was and how many people's lives were disrupted, and despite the fact that there were a large number of people that were

killed by that tornado, I think it is quite likely there would have been many, many more had we not had the multiple days worth of warnings from the National Weather Service that enabled people to get out of harm's way, to be prepared, that alerted the emergency responders that this is serious, the fact that we issued warnings five days in advance, thanks to the information from our polar orbiting weather satellites, and then two-day warnings, one-day warnings, day-of warnings. That is a prime example of what our Weather Service does so exceptionally well, and we consistently try to get better and better at those kinds of short-term weather alerts and warnings. By the same token, information that is months out that says floods are likely, droughts are likely, wildfires are likely will also enhance communities' ability to be prepared.

It also creates a new opportunity for the private sector. We have seen the emergence of a billion-dollar private sector weather enterprise. The Weather Channel, Accu-Weather are some familiar examples. We fully anticipate that as we achieve the ability to do these longer-term weather forecasts and climate forecasts, we will have a comparable demand from the private sector for information where they can take publicly provided information, add value and grow a whole new industry around climate services. So we see multiple potential benefits in this.

Ms. SEWELL. Thank you very much.

Mr. HARRIS. Thank you very much.

Now, Mrs. Adams from Florida is recognized for five minutes.

Mrs. ADAMS. Thank you.

Dr. Lubchenco, you and I have had our differences on the fishing issue and everything else, and I was just listening to the discussion about restoring good will with this Committee. Do you consider 26 days late timeliness in response?

Dr. LUBCHENCO. Congresswoman, I am not sure what you are speaking of with respect to——

Mrs. ADAMS. As the chairman said, he was waiting 26 days it took to get the answers——

Dr. LUBCHENCO. We have been providing information to the Committee on a rolling basis.

Mrs. ADAMS. But apparently there are some answers to questions that have been asked that they are still waiting for?

Dr. LUBCHENCO. There are still questions outstanding in part because the scope—well, I am sorry, 26 hours. I know what you are speaking of now. The chairman in his opening remarks said that my testimony to the Committee for this hearing was 26 hours late, and that is true, and it is highly unfortunate. It is something for which I apologize, and it is what it is. I can't ignore that that was——

Mrs. ADAMS. And we are still waiting for some answers to some questions that the Committee has asked, correct?

Dr. LUBCHENCO. So the Committee has——

Mrs. ADAMS. Just yes or no. I have a short period of time.

Dr. LUBCHENCO. There are additional questions to be answered.

Mrs. ADAMS. You mentioned in your opening statement the climate science office was needed to offer services like those used during the Deepwater Horizon oil spill. Was NOAA unable to offer the services that were needed to assist in this incident?

Dr. LUBCHENCO. NOAA provided a wealth of information in direct support in response——

Mrs. ADAMS. Was that a yes or no?

Dr. LUBCHENCO. [continuing]. And if we had the Climate Service——

Mrs. ADAMS. Ms. Lubchenco, I have a short amount of time. Yes or no.

Dr. LUBCHENCO. [continuing]. We could have done even more.

Mrs. ADAMS. So was it a yes? Were you able to provide?

Dr. LUBCHENCO. We provided a lot. We could have done better had we had this.

Mrs. ADAMS. So that is your reasoning and rationale for the need for this new service?

Dr. LUBCHENCO. Among many others.

Mrs. ADAMS. You know, I am looking at research, a 2004 research review team report to the NOAA Science Advisory Board on research organization and management within the agency included the following recommendation. There should be a single authority for OAR laboratory programs to join institutes to help establish partnerships with other agencies and universities and that the wholesale dissolution of OAR and distribution of its resources and talent to the other lines would splinter rather than more tightly connect the science and research enterprise. In developing your Climate Service proposal, did you consider these expert suggestions to consolidate NOAA research programs and warnings against the splintering of OAR resources and talent? If not, why, and if so, why were the recommendations dismissed?

Dr. LUBCHENCO. Congresswoman, that report in 2004 did in fact advise our thinking. A later report in 2011 and others from the same Science Advisory Board endorsed the proposal that we have brought before Congress today. Their thinking evolved as did ours.

Mrs. ADAMS. In your written testimony, you have laid out the reasons for the reorganization of 53 percent of your agency's assets into a single line office. What I found most interesting was the language you used to describe this change. You used the term "climate variability" eight times to describe the research activities of the new office line. Is this change meant to reorient NOAA towards having the majority of its budget for climate change research without actually saying that?

Dr. LUBCHENCO. I am not sure what you are asking, Congresswoman.

Mrs. ADAMS. Is this change meant to reorient NOAA towards having the majority of its budget for climate change research without actually saying that?

Dr. LUBCHENCO. Congresswoman, anything longer than two weeks out is in the category that we call climate variability and climate change. The climate system has natural fluctuations that is climate variability.

Mrs. ADAMS. Is the movement of so much of your research assets into this new office being done for the purpose of creating an office which advocates a specific model or climate change rather than producing data to inform researchers?

Dr. LUBCHENCO. There is no advocacy in what we are proposing or intending. We are providing information to enable others to make informed decisions.

Mrs. ADAMS. And is your agency so bureaucratic that you need to move 53 percent of your assets into one place just to have a single source of data?

Dr. LUBCHENCO. Having—it is good government to reorganize periodically and to become more efficient and effective, which is exactly what we are doing.

Mrs. ADAMS. Mr. Winokur, I have about 10 seconds. I just want to confirm, does the Navy have a single entry point for data from NOAA now? Is your testimony that you don't have a single entry data point to NOAA?

Mr. WINOKUR. That is correct, Congresswoman. We go to different parts of NOAA depending on the type of information that we require.

Mrs. ADAMS. Do you receive that information that you are asking in a timely manner?

Mr. WINOKUR. Ultimately, we receive it, yes, but we go——

Mrs. ADAMS. Is it in a timely manner?

Mr. WINOKUR. Generally, yes.

Mrs. ADAMS. Thank you.

Mr. HARRIS. Thank you very much.

It is my pleasure to recognize Ms. Johnson, the Ranking Member, for five minutes.

Ms. JOHNSON. Thank you very much, Mr. Chair, and let me say, Dr. Lubchenco, I am limited to five minutes, your responses are not, so I am going to ask three questions up front.

This spring, the United States has experienced an unprecedented number of extreme weather and climate events including drought, floods, fires, and tornadoes, and it does not seem these storms are stopping. In fact, we are seeing extreme events in places we have never seen them before. Instead of stopping NOAA's efforts to find a better way of providing this country with information, we should be ensuring that NOAA is providing these services in the most efficient way possible. What impact would this proposed Climate Service have on the creation of jobs, stability of food prices, and the growth of the economy? And how will the proposed Climate Service help better prepare us for such climate extremes in the future? And then the third question is, you mentioned that NOAA already has the authority to conduct climate science and deliver climate services. In fact, NOAA already does both. But if this proposed reorganization is not approved by Congress, what would be the impact of this decision on the public and the American businesses?

Dr. LUBCHENCO. Thank you, Ranking Member. I think that the extreme events to which you allude really underscore the importance of having an effective and efficient ability to provide long-term weather and climate information to people. Currently, firefighters around the country use NOAA's climate forecasts from seasonal precipitation and drought outlooks to weekly on-the-ground drought monitoring information assessments to help them prepare for wildfires. Farmers require seasonal temperature, precipitation, and frost freeze data to determine what kind of crops to grow. The U.S. homebuilding industry estimates it saved over $300 million

per year in construction costs by using the information that NOAA provides. Local community and emergency management offices use our sea-level data, for example, and storm frequency information to help them prepare, insurance companies, public health departments, power utilities and others. These are all examples of current users of our climate data and information, and we believe that this reorganization will enable us to provide this information in a more timely manner and more effective.

I have mentioned that we believe there is a huge potential to grow a new private sector enterprise around climate services. That is most definitely a jobs issue. As you appreciate that the current private weather enterprise totals a billion dollars, I think there is huge potential.

And finally, you posed the very important question of what would happen if we did not receive permission from Congress to implement this reorganization. Currently, our climate service and science is distributed across five different line offices. If it is limited to the current organization, we would continue to have bureaucratic inefficiencies, no clear access point, missed opportunities for synergies between scientific advances and fast-evolving services, and we would not be in a position to help catalyze this emerging private sector enterprise. So it would be business as usual, which is not in the best interest of the American public, I believe.

Ms. JOHNSON. Thank you very much. I am within my five minutes. As a matter of fact, I am going to yield back a few seconds.

Mr. HARRIS. I thank you very much. I recognize myself for five minutes. Thank you, Dr. Lubchenco, for appearing before the Committee again, and Mr. Winokur.

Dr. Lubchenco, does NOAA right now have a prediction for sea-level change in the next 50 or 100 years?

Dr. LUBCHENCO. Yes, Congressman, it does.

Mr. HARRIS. And what is it?

Dr. LUBCHENCO. Well, it varies by region.

Mr. HARRIS. Let us do my district, the 1st Congressional district of Maryland, Chesapeake Bay.

Dr. LUBCHENCO. I don't have those numbers at my fingertips, Congressman, but I would be happy to get them to you.

Mr. HARRIS. So you have possession. Good. Well, I hope it kind of agrees with what is published on the NOAA Climate Service's Web site. I take it that the NOAA Climate Service's Web site is what you referred to as the NOAA climate portal in your testimony?

Dr. LUBCHENCO. The NOAA climate portal, yes.

Mr. HARRIS. Okay. And you do have an increased number of hits. Now, I share the concern of my fellow physician from Georgia here, Dr. Broun, that, you know, our hesitation is that the Climate Services could become a little propaganda source instead of a science source. And I am going to ask for it to be entered into the record. In the Climate Watch magazine on the NOAA Climate Service, now, I didn't know you published a magazine because normally when you think of science, you don't think of magazines, but I guess NOAA is a little different in that thinking, and it republishes an article I believe from *Chesapeake Quarterly*. Now, *Chesapeake*

Quarterly, as far as I know, is not a peer-reviewed scientific publication, is it?

Dr. LUBCHENCO. I am not familiar with it, Congressman.

Mr. HARRIS. Okay. Well, if you could get that information to me, I am pretty sure it is not. If you go through the article published it says on March 10, 2011, this year, it is called "Before the Next Flood" and it deals with sea-level change or water rising in the Chesapeake Bay area, and it does it in a fairly sensational way. Because, for instance, it shows a picture of a four-foot sea-level rise and then on top of that a six-foot rise from a storm like Isabel. Now, does that imply that NOAA believes there is going to be a four-foot sea-level rise in the Chesapeake Bay?

Dr. LUBCHENCO. I do not know what our estimates are, Congressman.

Mr. HARRIS. Well, why would you put something on your Web site that has a picture of a four-foot sea-level rise with no designation of the time? I mean, this doesn't say, you know, potential within 100 years. It actually quotes IPCC as the source for the sea-level rise, not a NOAA study, and it says a three-foot rise over 100 years with no range. I believe the IPCC report had a range, didn't it, of projected sea-level rise?

Dr. LUBCHENCO. That is correct, Congressman.

Mr. HARRIS. Is that the way normally you would present something scientifically? Like you would suggest, you would footnote it and you would perhaps put other data in? I mean, is this science? Is what NOAA has on its Climates Service's Web site science? That is what I would like to know.

Dr. LUBCHENCO. Congressman, I am not familiar with that article. I would be happy to look at it and comment on it. Typically, we would present a range of information, and I am guessing that having concrete visuals enables people to translate a particular rate of change into something that is actually——

Mr. HARRIS. Doctor, that is exactly right, but there is no rate. It just says four foot. It doesn't say four-foot rise projected by the IPCC to be at the 95th percentile chance of probability in the year 2020 or 2120. It just has a picture of a four-foot rise.

Now, Dr. Lubchenco, you are also aware that on the eastern shore of Maryland, that there are two factors. One is that the eastern shore is sinking.

Dr. LUBCHENCO. Correct.

Mr. HARRIS. And that the sea level may be rising and probably is rising. I read this article, and it doesn't talk about—I mean, it, you know, just occasionally mentions it but it talks about sea level but it doesn't talk about the land sinking around it and how different that might be and the implications might be different. And then it talks about the fact that they can't get a local zoning code change since Hurricane Isabel 10 years ago when the sea-level rise was six feet. Now, how does this part of NOAA's scientific contribution to our understanding of climate change when you are talking about getting a local zoning change in response to a hurricane? I don't get it. There is a disconnect. Is this where we are going to concentrate what ultimately will be billions of dollars of our money is to publish an online magazine?

Now, as part of the justification for your center, you actually say that you had a 57 percent increase in climate-related data and information Web site hits. I assume that includes hits on this magazine article. You don't really want us to set up a new service at NOAA to publish a magazine article taken from another magazine where you are merely republishing it from *Chesapeake Quarterly* which I will profer, and I am sure your staff will determine, is not a scientific peer-reviewed journal. Do you really want us to do that? You are asking Congress when we have got to borrow 41 cents out of every dollar including a significant amount of that from the Chinese to set up a Climate Service for you to publish this?

Dr. LUBCHENCO. Congressman, I haven't seen that article so I can't really comment.

Mr. HARRIS. Well, I am going to ask you to comment on it in the questions that will be coming from the Committee after this because this is absolutely atrocious. This exactly exemplifies what the gentleman from Georgia was talking about.

With that, the gentleman from Maryland, Mr. Sarbanes, is recognized for five minutes.

Mr. SARBANES. Thank you, Mr. Chairman. Thank you very much, Administrator Lubchenco.

Just to follow up on that for a second, would you like to take a moment and speak briefly, because I have a bunch of questions, but speak to the resource that NOAA represents and the fact that you are having increasing use of the Web site for scientific data from the audiences that you serve and why that is a benefit to those audiences?

Dr. LUBCHENCO. Thanks, Congressman. We do—we are receiving increased, just overwhelming number of increases for information in general but data in particular, and we have quantified that. Between 2009 and 2010, we saw an 11 percent increase in direct requests for data and information, and our data centers provided 86 percent more climate-related data in 2010 than 2009, and these requests are coming primarily from a wide variety of users from firefighters, from farmers, from electricity providers, from home insurers, from other agencies, the Department of Health, USDA, the Army Corps of Engineers, and coastal managers. They are all looking for the kind of data that we have on temperature, on precipitation, on water resources, on sea-level rise, and because we are getting more and more increases in these requests, we believe we have a responsibility to be responsive, which has in large part prompted our asking ourselves how can we be more efficient, how can we do more with less, how can we be stewards of taxpayer dollars in a way that is responsive to these increasing requests.

Mr. SARBANES. I appreciate that. Let me just make a few comments.

First of all, I want to thank NOAA. I think it is a terrific organization.

Dr. LUBCHENCO. Thank you.

Mr. SARBANES. I think that the research you are doing frankly serves as a foundation for so many important policy decisions that we need to make here and that the country needs to make going forward. So it is a critical function that NOAA serves, and it does so in a very, very professional way. All of the people that I have

had the opportunity to deal with at NOAA reflect, I think, a cultured professionalism and dedication to science and facts and data and evidence that really makes the reputation of that agency I think a premier one, in particular with respect to the work that you do in the Chesapeake Bay, providing critical information for us so that we can make these tough decisions going forward.

You said it a number of times but I want to reiterate that all you are trying to do with this proposal that you have made is to do your job better. We have people parading around the halls of the Capitol every day talking about how government has to operate more efficiently, has to find ways to save, to reduce duplication, to spend the taxpayers' money wisely. Here is an agency, NOAA, that is hearing that and taking it to heart and trying to implement many ideas that can achieve that, and proposing other ideas such as this one with the Climate Service that represents efficiency. I thought you answered very well the questions regarding having a transition director with respect to Climate Service. If you had come up here and proposed to have a new Climate Service, the next question would be, well, what is that going to look like, and if you hadn't had somebody in charge of looking into and planning, you wouldn't be able to answer those questions. Any responsible proposal is going to have to do a certain amount of research to come forward and say this is what this would look like, and the efficiencies that you are proposing I think make a lot of sense, so I congratulate the agency on that. I also appreciate your very thoughtful responses to the questions and I apologize that in some instances you were cut off while you were trying to respond.

And so I want to thank you for your testimony. I find it very compelling, the need for this. It started way before you, so others on both sides of the aisle have recognized the importance of doing this, and I hope that we can move forward and create this opportunity.

And I want to thank you, Mr. Winokur, as well for your testimony. You said at one point that you recognize the benefits of a consolidated organizational construct. I regard that as an endorsement, even though you are not offering up an official position of the Navy, an endorsement of the proposal that has been set forth by Dr. Lubchenco and NOAA.

So I hope we can move forward with this, and I thank you all for your testimony and I yield back.

Mr. HARRIS. Thank you very much, Mr. Sarbanes.

I recognize Mr. Quayle for five minutes.

Mr. QUAYLE. Thank you, Mr. Chairman.

Dr. Lubchenco, you have emphasized that the Climate Service is needed to more closely align climate science information with delivery of services to the public and that your proposed structure will make communication of this information more productive and more effective. Do you see any tradeoffs or potential downsides to this proposal or is it just win-win?

Dr. LUBCHENCO. Congressman, we spent a lot of time thinking long and hard about this and did extensive consulting with others to better understand what the tradeoffs might be, and we believe that the proposal that is before Congress enables us to be more efficient with the dollars that we have, to respond to the increasing

demands for information about long-term weather and climate, to support a growing private sector enterprise and essentially be good stewards of taxpayer dollars. We believe that we can increase the strength of science within NOAA with this proposal. It does not in any way diminish the caliber or the quantity of science that is being done. It will afford us an opportunity to better directly connect the science and services within a climate single unit, and at the same time strengthen science elsewhere in the organization by enabling the Office of Atmospheric and Oceanic Research to be an incubator of long-term science and integrate science across the agency. So we think this is a win-win.

Mr. QUAYLE. I am just curious, what about non-climate research that you are proposing to transfer into the Climate Service? Isn't there really a risk that basic research to understand the atmosphere or applied research to improve weather prediction will be impacted negatively if subsumed into an organization whose mission is solely focused on climate?

Dr. LUBCHENCO. Congressman, that is a legitimate concern, and I think we have a number of examples within NOAA where we have superb, outstanding science that coexists with a service-providing entity. We do that in our fisheries line office, for example. We do it in ocean service line office. And by analogy, we believe that we can have really strong science and have the science connected to services within this proposed Climate Service line office.

Mr. QUAYLE. Okay. Now, you are proposing to move the research physical science division in Boulder to the Climate Service. Is that correct?

Dr. LUBCHENCO. We are not proposing to move any people or any labs to any new physical entity. We are putting them under a new management structure if this is approved.

Mr. QUAYLE. Okay. And so is that the same for the OAR's chemical science division?

Dr. LUBCHENCO. That is correct.

Mr. QUAYLE. So I have understood that about 98 percent of the current physical science division's work is weather research and water science. Is that right?

Dr. LUBCHENCO. I don't know the exact number. That is approximately correct.

Mr. QUAYLE. And about one-third of the chemical science division involves air quality, weather, water, coasts, estuaries and oceans research in science. So when you are saying you are not proposing to move resources away from non-climate activities, I don't understand how that really squares with that.

Dr. LUBCHENCO. The design principles that we utilized when we started to have this conversation included wanting to have the most efficient and effective delivery of climate service information, to protect the integrity of science and to not disrupt and break apart any existing laboratories. The laboratories, the programs that we are proposing to move into the climate science, I mean the Climate Service line office do include pieces that do both climate and other kind of science and it is important that they stay together, and that is the proposal. There is a lot of need for integration across all of NOAA because physical sciences or chemical sciences that might relate to climate also would relate to weather. That is

just the nature of that science, and so in moving them, this will not diminish—it won't change what they do. It won't undermine their ability to do that well. It will enhance the connection of climate science to climate services.

Mr. QUAYLE. Okay. Thank you very much. I yield back.

Mr. HARRIS. Thank you very much.

I recognize the Ranking Member of the Energy and Environment Subcommittee, Mr. Miller, for five minutes.

Mr. MILLER. Thank you, Mr. Chairman.

Dr. Lubchenco, I apologize if I slip up and call you Admiral. I am used to calling the——

Dr. LUBCHENCO. I would take that as a compliment, sir.

Mr. MILLER. [continuing]. Head of NOAA Admiral. You have been accused of breaking the law in giving an existing employee a new title that included the word "climate" and adding new employees, six new employees that had "climate" in their titles. When did you add those positions or change that title?

Dr. LUBCHENCO. Congressman, those were done before the Continuing Resolution.

Mr. MILLER. Six months ago, nine months ago? I mean, last year?

Dr. LUBCHENCO. Last year.

Mr. MILLER. Okay. And then you said before the Continuing Resolution, the Hall amendment that supposedly says that those two employment actions ran afoul of was how long ago?

Dr. LUBCHENCO. A number of months ago.

Mr. MILLER. But well after you renamed those positions and added employees?

Dr. LUBCHENCO. That is correct.

Mr. MILLER. Did you have authority—did you think you had authority to add those positions with "climate" in their title and change an existing employee's title to add "climate" when you did that?

Dr. LUBCHENCO. We absolutely did, Congressman. We have three Acts passed by Congress that direct us to do climate-related science and delivery of services. The National Climate Act of 1978, the Global Change Research Act, and the National Integrated Drought Information System Act are existing authorizations under which we operate, under which we have people who do climate service provision and do climate science, and we are operating under those authorities.

Mr. MILLER. Okay. Obviously climate and weather aren't exactly the same but they are not unrelated, either. A forecast of the ocean levels in 50 years is climate, and whether it is going to rain tomorrow and what the temperature is going to be tomorrow is weather, but where is the demarcation? You said earlier about two weeks. Is that correct?

Dr. LUBCHENCO. That is correct. Our weather models allow us to make reasonable forecasts out to about 10 days, and so—and then the climate—so we define weather as anything less than two weeks, roughly.

Mr. MILLER. Okay, and climate——

Dr. LUBCHENCO. And climate is longer than that.

Mr. MILLER. Okay. You said earlier that there was an increasing demand in the private sector for climate services. I think Mr. Sarbanes' questions got at that some but could you tell us what kind of requests you are getting and what kind of products or services do you think NOAA can provide with your climate forecasting abilities that to the private sector would be useful, would find useful?

Dr. LUBCHENCO. Congressman, let me answer with an example. I met about a year ago with the Western Governors Association, who were having—the focus of their meeting was on water and drought, which is a major issue in the West, and they have been very pleased with our National Drought Information Services that we created in response to a request from them. That is an example of a climate service that we currently provide, and that like a number of other services I believe are increasingly important to a wide variety of managers and users of data.

Now, the private sector is already marshaling, preparing to respond to the increasing demand, and many of the Governors were telling me of the private companies that they have contracted with to give them better information about the likelihood of water in different parts of their State, water resources, what is the likelihood of drought. Those companies take the information that we currently provide and tailor it to a specific place or user. We believe that we can be even more helpful to them by this reorganization that enables them to more easily find the information they need and to create additional services in response to their demand, much like what we do with the Weather Service. We would provide basic core information and then the private sector can take that, add value, tailor it, repackage it, put whatever bells and whistles they want on it.

Mr. MILLER. You gave a statistic that the homebuilders had given for how much they thought your services had saved them. How much—what was that statistic again?

Dr. LUBCHENCO. The U.S. homebuilding industry tells us that they believe they have saved over $300 million per year in construction costs alone by using just one of NOAA's climate tools that relates to freezing and frost depths. So in building homes in a way that is specific to a place instead of more than is needed, they can save a huge amount of money.

Mr. MILLER. And that is just residential construction, not all construction?

Dr. LUBCHENCO. That is correct.

Mr. MILLER. Mr. Chairman, my time has expired.

Mr. HARRIS. Thank you very much.

I recognize the gentleman from Illinois, Mr. Hultgren, for five minutes.

Mr. HULTGREN. Thank you, Mr. Chairman.

Thank you both for being here. Sorry, I have a couple different committees going on at once, so sorry to be coming in a little bit late, but good to be here and appreciate you being here as well.

A couple questions. NOAA's Next Generation Strategic plan that was issued back in December of 2010 stated that one of the main objectives for achieving a long-term goal for climate adaptation and mitigation is improved scientific understanding of the changing climate system and its impacts. Specifically, it states international,

national, state and local efforts to limit greenhouse gases require reliable information to support emissions verifications as do efforts to track climate changes and mitigate impacts. The statement raises several red flags, I think, since it seems to be stating that NOAA will be conducting research to support the implementation of greenhouse gas emission reduction policies. H.R. 1 made the position of the House of Representatives very clear on greenhouse gas reduction policies. Therefore, it really must be concluded that this objective is a political one and not science-based.

Furthermore, the United States is not a party to the Kyoto Protocol, the only international agreement aimed at reducing greenhouse gas emissions. For many people, the stated goal is the heart of the concern about NOAA's proposal that this service will be driven by a political agenda and not scientific research needs. Question—sorry for the long preface here, but what guarantees can you give to this Committee that the Climate Service will not be used to promote such policies that have not been passed by Congress nor signed into law by the President?

Dr. LUBCHENCO. Congressman, thanks for that question. Our proposed reorganization has nothing to do with cap and trade. It is not regulatory. It is not advocacy. Our mission is to provide scientific information and to translate that information into usable data, usable products like weather outlooks, like hurricane forecasts, like drought outlooks, to take that information and provide it to the American public, to the private sector, to state and local managers so that they in turn can use that information to make the best decisions. We don't advocate, we provide information.

Mr. HULTGREN. How do we make sure that that continues, that it doesn't shift? It sounds like from the statements that we have heard that there is some shift going more toward the political side and less towards science-based and what guarantees are in place to make sure that that—as you state, the intention is to be all science-based, no political agenda. What guarantees are there? What precautionary steps are being taken to make sure that that actually occurs?

Dr. LUBCHENCO. Congressman, one of the benefits of the proposed reorganization is that it has greater transparency in terms of how taxpayer dollars are spent. You can look at our budgets and see exactly where the money goes, and I believe that that is one of the kinds of checks and balances that is appropriate. I reiterate that we are providing information so that others can make decisions.

Mr. HULTGREN. Switching gears a little bit here, Dr. Lubchenco. You have repeatedly emphasized that the Climate Service proposal would strengthen science within NOAA and that the proposed focus on climate services will not detract from the quality or focus of science that NOAA conducts. With that in mind, help me understand the process through which Climate Service budget and planning is developed. What line office within NOAA has led this effort? And then just wondering too, is the Office of Atmospheric Research, which is responsible for delivering the science foundation that NOAA depends on, are they involved in this, delivering this? If you can just help me understand the structure.

Dr. LUBCHENCO. Sure, Congressman. We currently have science in multiple line offices within NOAA, and this proposal to do a reorganization and create a new Climate Service line office benefited from extensive input from all parts of NOAA as well as extensive consultation outside. It was an idea that was initially proposed in the late 1990s and that my predecessor, Admiral Lautenbacher, and the Bush Administration said this is an idea we should pursue, a line office for climate services. When I came on board, I thought that was exactly what we needed, and we have proceeded in a very deliberate and consultative fashion to work through the different options and give the proposal to Congress that we are bringing.

Mr. HULTGREN. What line office within NOAA has led the effort?

Dr. LUBCHENCO. No single line office. It has been an all-NOAA effort. The OAR that is our lead for science has been an active participant, so too have the other line offices—the Weather Service, fisheries, ocean services, our satellite division. Each of those has participated very actively in this proposal.

Mr. HULTGREN. Thank you. I see my time is up. I yield back.

Mr. HARRIS. Thank you very much.

The gentlelady from Ohio, Ms. Fudge, is recognized for five minutes.

Ms. FUDGE. Thank you very much, Mr. Chairman, and thank both of you for being here.

I am going to ask you a question that absolutely has no politics to it at all, because flooding affects Republicans and Democrats. I am aware that NOAA provides long-term seasonal outlooks that help communities and businesses prepare for flooding. This is an activity that is especially relevant to Ohio. Could you please describe for me the types of long-term forecasts that NOAA provides that help Ohioans prepare for flooding and other Midwestern areas that have experienced this spring? Everybody's house floods in our area. I don't care what side of the aisle they are on.

Dr. LUBCHENCO. Thank you, Congresswoman. One of the services that we currently provide is our outlooks about droughts and floods, various things having to do with water, and as early as last fall, NOAA alerted the states in the upper Midwest and mid-Midwest that in fact conditions were likely to have very significant flooding this spring, and then in I believe late, I think it was December, but I can check on that, we issued—actually, I think I might have this here. No, I don't want to look for it. We issued a warning saying essentially that because of the amount of snow pack that was present and because of the conditions that were developing having to do with La Nina, with other atmospheric changes, that it was highly likely we would get very, very significant flooding in the Mississippi River drainage basin and then later we added the Missouri River as well, and that is exactly what we have seen this year, and these outlooks that said, I think it was from Montana to Wisconsin and from the Canadian border down to St. Louis, originally that was the outlook said we will have very significant flooding this year, get ready, and that is exactly what has transpired. I believe that that outlook and those warnings have been very useful in helping communities be prepared, for helping state managers marshal their resources, and we have indeed seen extraordinary flooding this year in both the Mississippi as well as

the Missouri River, and it has caused an inordinate amount of damage, but the damage would likely have been much worse had we not had these kinds of outlooks.

Ms. FUDGE. Thank you very much. Do you consider this a climate service?

Dr. LUBCHENCO. Yes, Congresswoman.

Ms. FUDGE. I just wanted to be clear because——

Dr. LUBCHENCO. Yes. Thank you for that clarification.

Ms. FUDGE. Because some people I think don't understand what a climate service is, so I thank you. And with the minute or so I have left, is there something that you would like to share with us that maybe you did not get an opportunity to answer? Certainly, I am no scientist so I have learned a great deal today about the difference between what my Republican colleagues believe is science and what is not science. So if you could just give me some closing comments, I would appreciate it very much.

Dr. LUBCHENCO. Congresswoman, I think I would start with the clarification you requested and simply emphasize that climate service is really shorthand for long-term weather and climate information, and that that information is vitally important to saving lives and property but also to stimulating businesses, to helping businesses plan and save money. Our intention in doing this reorganization is to provide what we are being asked increasingly to provide but to do so in a way that is consistent with our Congressional mandates and with the needs of the American people, and to do so in a way that is being a good steward of American taxpayer dollars, to do so as efficiently and effectively and as collaboratively as we can.

This proposal is good government, and I am immensely proud of what NOAA does each and every day, the 13,000 employees of NOAA, in providing the amazing weather forecasts, the climate services, drought outlooks, fire, hurricane outlooks, flooding, and wildfire. All of that kind of information we understand is important and we want to do an even better job of providing it.

Ms. FUDGE. Thank you very much.

Mr. Chairman, I yield back.

Mr. HARRIS. Thank you very much, and as the noon hour is approaching, I do want to thank both witnesses for taking your time and for sitting with us for the last two hours.

The Members of the Committee may have additional questions for any of you. I encourage any of the Members who have additional questions to please submit them and we will ask you to respond to them in writing. The record will remain open for two weeks for additional comments from Members.

I would like to get a commitment, though, Dr. Lubchenco, for you to try to get the questions back, both the leftover ones from the March 10th hearing as well as today's as soon as feasible because we do want to complete the record and we do need to move on into the appropriations process at some point, and I do want to thank NOAA for a job well done and the Department of the Navy for a job well done.

Thank you very much, and the witnesses are excused and the hearing is adjourned.

[Whereupon, at 12:00 p.m., the Committee was adjourned.]

Appendix 1

Answers to Post-Hearing Questions

ANSWERS TO POST-HEARING QUESTIONS

Responses by Dr. Jane Lubchenco,
Undersecretary of Commerce for Oceans and Atmosphere
and NOAA Administrator,
National Oceanic and Atmospheric Administration, U.S. Department of Commerce,
Washington, DC

Questions submitted by Chairman Ralph M. Hall

Q1. In the 2004 Research Review Team report to the NOAA Science Advisory Board, it was noted that "for all science-based operational agencies or companies reviewed, there were organizational and operational mechanisms that provided for funding stability for a research program with a longer-term focus. With the development of a NOAA research plan and data obtained during this research review, NOAA OAR can quickly implement changes necessary to manage a successful research program for NOAA." [page 28]

Q1a. Given the current fiscal environment, and the concerns laid out in the NAPA report about the long-term budgetary feasibility of creating a new Climate Service line office, why should NOAA risk research funding stability and sacrifice expediency in an effort to create a separate Climate Service line office?

A1a. In their report, the National Academy of Public Administration panel states:

The Panel is skeptical that current funding levels (even as augmented at levels consistent with the President's FY 2011 budget request) will adequately sustain public and private sector expectations for climate services and research in the years ahead. It would be impossible for this Panel to propose a precise budget for this new Climate Service based on the limited information available to us, and choices still to be made by NOAA. Nonetheless, by its design and because of growing needs, the NOAA Climate Service can reasonably be expected to take on a great deal more than its current workload in the years ahead. It will have to prioritize its new research and service deliverables with tenacious discipline.

NAPA then goes on to state, "This budget challenge, we wish to make clear, would be a poor reason to oppose creation of the new NOAA line office."

The proposal to create a Climate Service line Office is budget neutral and would maintain, strategically realign, and make targeted investments in the NOAA research enterprise, including but not limited to climate research. The proposed reorganization would not eliminate or reduce any of NOAA's research activities.

The demand for climate services is increasing and will outstrip current private and public capacity to respond. To better anticipate, develop, and deliver the science and services to address this growing need, it will be necessary for academic institutions, government agencies, the private sector, and others to work together in a coordinated and concerted manner, and to prioritize efforts.

NOAA's proposal to create a Climate Service Line Office would not only allow the agency to more efficiently and effectively participate in the broader enterprise; it would also provide more streamlined and reliable access to NOAA's authoritative climate data and information and therein allow partners to maximize their contributions to the enterprise. The proposed Climate Service Line Office structure reflects NOAA's response to the needs of numerous demands for climate services, so that the agency can: (1) promote integration of NOAA's climate science and service assets; (2) heighten the accessibility and visibility of NOAA's climate services for our partners and users; and (3) allow NOAA to more efficiently address user and partner needs compared to our current distributed structure.

In the same way, NOAA recognizes the need to prioritize climate service activities in light of the tremendous existing and anticipated demand. To this end, based on recommendations from NAPA and the NOAA Science Advisory Board Climate Working Group, NOAA undertook an internal and public process to draft the *Vision and Strategic Framework*. This document outlines and prioritizes both foundational science and information services that NOAA would continue to provide to partners and users to support their development of tailored products and services, as well as four key societal challenges—coasts, marine ecosystems, extreme events, and water—where NOAA would focus advancements across the spectrum of climate science and services.

1b. Furthermore, what reasoning exists, given these risks, for NOAA to move forward without having conducted an extensive assessment of the impact on the rest of

the activities,organizational structure, and synergy of NOAA's other line offices, including what would remain of OAR?

A1b. The idea of creating a Climate Service Line Office at NOAA is not new. The concept first surfaced in the early 1970s, not long after NOAA was established, and later gained prominence and traction in NOAA during the George W. Bush Administration. NOAA's reorganization proposal benefited from several years of extensive analysis by internal and external groups. As a result, the proposal carefully considered and minimized impacts to NOAA's organizational synergy, and in fact seizes on the opportunity to strategically renew and realign NOAA's research portfolio to strengthen science and innovation across the agency. This proposal would help prioritize and stabilize funding for NOAA's entire research portfolio.

Q2. As you noted in your testimony, last September the National Academy of Public Administration (NAPA) released a report making suggestions for the creation of a NOAA Climate Service. While it was strongly supportive of the creation of a Climate Service, it was skeptical that NOAA could reorganize internally in a budget neutral way without diverting resources from other NOAA functions.

Q2a. Please explain why you believe NAPA's conclusion with respect to budget neutral creation of a climate Service is wrong.

A2a. NAPA rightly identifies the dramatically increasing public expectation for climate science and services are greater than can be addressed at current levels of resources. This increasing public demand and the consequent need for greater effort, however, will continue independent of whether NOAA establishes a Climate Service Line Office. NOAA, NAPA, and a broad consensus of external partners and organizations believe strongly that for NOAA to most efficiently and effectively deploy its climate capabilities at any level of funding, the agency's climate-related capabilities are best consolidated under a singular management structure. In this way NAPA clearly states, "This budget challenge, we wish to make clear, would be a poor reason to oppose creation ofthe new NOAA line office."

Addressing the public's demand for climate information is a job that requires all hands on deck—no one agency or organization alone can meet the increasing need. NOAA fully recognizes that responding to the increasing demand for climate services poses a capacity challenge to the existing climate services enterprise, which includes academic institutions, government agencies, the private sector, and other organizations. In order to better anticipate, develop, and deliver the science and services to address this growing need, it would be necessary for the entire enterprise, not just NOAA, to work together in a coordinated and concerted manner.

To that end, NOAA's proposal to create a Climate Service Line Office would not only allow the agency to more efficiently and effectively participate and partner in the broader enterprise; it would also provide more streamlined and reliable access to NOAA's authoritative climate data and information and therein allow our partners in the enterprise to maximize their contributions and innovation potential.

2b. How will NOAA be able to provide the same services and still pay for a transition? Doesn't the manpower needed for this reorganization cost money?

A2b. One of NOAA's key design principles for evaluating reorganization options to create a Climate Service Line Office was that it must be budget neutral and not require any additional funds beyond our current appropriations to execute. The elements of this "budget-neutral" character of our proposal include the following:

- The proposal does not grow the size of our administrative functions or overhead.
- In order to minimize transition costs, no existing programs, labs, or centers would have to be relocated, and no employees would be required to move from their current locations.
- The proposal maintained material efficiencies, like keeping NOAA's data centers together, in order to keep those shared capabilities and infrastructure intact.

NOAA's proposal seeks to minimize unnecessary disruptions at every step of the proposed transition process, for example, by keeping our labs intact and only moving programs that are principally climate-focused. Equally, if not of greater importance are the potential cost savings to the American people and businesses that need to access NOAA's climate information. Currently,there is no single point of entry for the public to access NOAA's climate science and services. NOAA's proposal would create that front door, a feature our stakeholders are asking for, and in doing so significantly cut down on their transaction costs for accessing our information and doing business with NOAA. We believe that any short-term transition costs would

be far outweighed in the longer term by more efficient and effective operations as we develop and deliver climate services under a single management structure.

Q3. In your testimony, you state that the NAPA study concluded that NOAA's current organizational structure was inadequate to meet current demand. NAPA came to this conclusion from the narrow point of view of how to improve climate services at NOAA. However, NAPA's endorsementof your proposal did not consider the effect that the creation of the Climate Service would have on the rest of the line offices.

Q3a. Has NOAA conducted an internal analysis or contracted with an independent review team to assess the impact this reorganization will have on the rest of the Agency?

A3a. There has been significant analysis and discussion both internal to NOAA and among external groups about the best organizational structure for a climate service in NOAA. The breadth of expertise and interests represented and the time that was afforded for these discussions over several years was tremendously beneficial to the formulation of NOAA's proposed reorganization. The Department of Commerce and NOAA have taken such discussion and the ideas they have generated very seriously. In response, NOAA has worked with some of the brightest minds on institutional planning and administration, service delivery, stakeholder involvement, and climate science to develop, evaluate and integrate the many ideas that have arisen from these discussions into the proposed reorganization contained in the President's FY 2012 budget proposal.

NOAA's proposal to create a Climate Service took great care to consider and reflect recommendations from numerous prominent studies and external groups, including the NOAA Science Advisory Board (SAB) and more recently the National Academy of Public Administration (NAPA) study that was requested by the Commerce, Justice and Science Subcommittees of the House and Senate Appropriations Committees, to provide recommendations for how NOAA should be better organized to deliver reliable and timely information on climate to a variety of stakeholders. In addition to their recommendations about the organizational structure for climate service in NOAA, NAPA evaluated impacts to other parts of NOAA from potential reorganization options. For example, in evaluating the impacts of consolidating climate science and services in the National Weather Service, NAPA concluded, "that a forced marriage of weather and climate missions would serve neither well." Similarly, in evaluating impacts of consolidating all climate science and services under OAR, NAPA concluded that, "Compelling and thoroughly reasonable demands to strengthen climate research and services would, in this case, over time likely dilute and diminish OAR's unique abilities to support multiple NOAA line offices, including a NOAA Climate Service." NAPA further asserted that, "all parts of NOAA benefit from OAR's work to incubate fundamentally new approaches to mission-centered science, a capability best sustained by maintaining a nimble, freestanding OAR line office."

Prior to NAPA's more recent analysis, from 2008 to 2009 the NOAA SAB and its Climate Working Group (CWG) undertook an effort to compare and contrast specific options for the development of a National Climate Service—a broad enterprise of agencies, including NOAA, and organizations comprised of users, researchers and information providers. The CWG established four Tiger Teams and a Coordinating Committee to evaluate the pros and cons of each option. This effort resulted in the June 5, 2009, SAB report entitled *Options for Developing a National Climate Service*.

More recently, the SAB CWG winter 2011 report further reinforced NOAA's proposal for dedicated Climate Service Line Office, stating:

The lack of action in several areas highlighted in the previous reviews speaks loudly to the need for a new line organization for climate services. These responses clearly illustrated the considerable inertia that exists within the present system and the difficulty in moving from a matrix managed program to a line organization. Let there be no mistake: there is a tremendous amount of world-class climate research being performed within the agency. Yet, transitioning such high-quality research into a service-oriented and operational setting is quite another matter. There are some fairly major systemic challenges that need to be confronted going from a loose federation of somewhat independent NOAA organizations to a functioning climate service. Short of a Climate Service line organization with budgetary authority, the CWG believes it will prove very difficult to effect change if NOAA's approach to climate services continues in a matrix structure or manner. (SAB CWG Winter 2011 Report)

Finally, NOAA has conducted extensive internal analyses as it developed its reorganization proposal. NOAA has taken great care to consider the reorganization proposal's impacts and opportunities to the agency. The proposal was designed taking careful account of this analysis to not only minimize disruption and impacts across the agency, but also to ensure the continuation of agency-wide synergies and further seize on opportunities to make critical agency-wide advancements to strengthen our science portfolio.

At the broadest level of analysis, NOAA brought together its expert scientists and managers from each of its Line Offices across the agency to develop a vision, goals, and principles for a climate service. NOAA has provided the Committee with numerous examples of these analyses, which started as early as January 1974, in a document produced by the Federal Coordinator for Meteorological Services and Supporting Research entitled *Federal Plan for Natianal Climatic Services*. Others which have been provided include:

- *Draft Strategic Plan for a National Climate Service, (2008)*. Draft Strategic Plan by NOAA's Climate Service Development Team.
- Solomon, S, R. Dole, R. Feely, I. Held, W. Higgins, J. Payne, E. Shea, U. Varanasi, M. Westley (2009) *A Vision for Climate Services in NOAA*. Perspectives from a panel of NOAA research scientists.

At a more detailed level of analysis, scientists and managers from across the agency have diligently worked to develop and analyze options for a climate service in NOAA with appropriate consideration of impacts to the entire agency. First, prior to developing a suite of reorganization options to consider, NOAA set out several design principles for all reorganization options that would be considered. These principles, and the subsequent options evaluated, were informed by the recommendations received from our SAB and a variety of other internal and external sources of input and advice. The specific principles NOAA set out to guide its development of options included the following:

- Although various programs and activities would be consolidated, renamed, and managed collectively, any reorganization could not initiate or create new programs or activities not provided for in NOAA's existing authorizations and appropriations;
- All realigned activities in the current year would continue to be funded at Congressionally directed levels;
- The reorganization would not increase or decrease the NOAA Full-Time Equivalent (FTE) or billet allocation, or require any relocation of employees;
- The reorganization would not require any physical relocation of programs or labs, or require any new facilities to accommodate this reorganization;
- Result in a zero sum realignment of funds within the current NOAA budget; and
- Not increase the size of NOAA overhead.

Adhering to these principles, NOAA subsequently developed and analyzed four potential organizational structures to reorganize existing NOAA climate assets against a set of design criteria. All options considered were budget neutral, none grew the size of headquarters, and all had no impact on funding for NOAA's science portfolio. These options included: (a) consolidating major climate science and service assets in the National Weather Service, (b) consolidating major climate science and service assets in new Climate Service Line Office and eliminating OAR by moving its research into relevant Line Offices, (c) consolidating major climate science and service assets in OAR, and (d) maintaining OAR and consolidating major climate science and service assets in a new Climate Service Line Office.

NOAA evaluated its four organizational options against the design criteria listed below. Of the five criteria employed, three focused explicitly on broader agency impacts and opportunities (i.e., #1, #2, and #4 below).

Design Criteria

1. Strengthen science in the agency.

- Strengthen and enhance the visibility, quality, and relevance of science that supports NOAA's Mission and long-term strategy;
- Integrate climate science within the Climate Service Line Office and across NOAA to address cross-disciplinary areas such as climate and coastal, and climate and ecosystems.

2. Minimize disruptions and promote efficiency.

- Promote efficient implementation and operation;
- Minimize organizational complexity;
- Utilize existing programs to the greatest extent possible.

3. Establish climate leadership.

- Create a single line of accountability and responsibility for performance;
- Create a senior advocate for climate policy, strategy, and budget within NOAA.

4. Enhance program coordination.

- Develop effective mechanisms that leverage program execution from across the agency and with our partners.

5. Promote user engagement on climate.

- Create clear points of access for users;
- Facilitate and improve stakeholder engagement;
- Integrate user input into service development.

Q3b. NOAA has other complex projects, such as environmental satellite programs, that regularly go through independent reviews and assessments. Would you be willing to subject your proposal to such an independent and objective assessment?

A3b. From the beginning, NOAA developed its proposal in an open and transparent manner.The proposal to create a Climate Service Line Office in NOAA underwent several independent reviews and assessments. If Congress approves a Climate Service Line Office within NOAA, the agency would look to the CWG and other groups to provide independent and objective reviews of our progress and effectiveness in transitioning to and implementing the new office. Most notably, NOAA commissioned a National Academy of Public Administration (NAPA) study, as requested by the Commerce, Justice and Science Subcommittees of the House and Senate Appropriations Committees, to provide recommendations for how NOAA should be better organized to deliver reliable and timely information on climate to a variety of stakeholders. These and others are detailed above in part A of this question.

Previously, in 2008, NOAA contracted with Accenture, a global management consulting,technology services and outsourcing company, to study organizational options for improving the agency's climate service delivery. NOAA provided a copy of Accenture's report to the Committee on May 6, 2011.

In addition, NOAA's Science Advisory Board (SAB) Climate Working Group (CWG) conducts ongoing reviews of NOAA's climate activities. NOAA continues to support the CWG and other groups' independent and objective reviews of our climate programs. NOAA has provided the Science Committee with copies ofthe CWG's recent reports. Most recently, the SAB CWG winter 2011 report further reinforced NOAA's proposal for a dedicated Climate Service Line Office, stating:

The lack of action in several areas highlighted in the previous reviews speaks loudly to the need for a new line organization for climate services. These responses clearly illustrated the considerable inertia that exists within the present system and the difficulty in moving from a matrix managed program to a line organization. Let there be no mistake: there is a tremendous amount of world-class climate research being performed within the agency. Yet, transitioning such high quality research into a service-oriented and operational setting is quite another matter. There are some fairly major systemic challenges that need to be confronted going from a loose federation of somewhat independent NOAA organizations to a functioning climate service. Short of a Climate Service line organization with budgetary authority, the CWG believes it will prove very difficult to effect change if NOAA's approach to climate services continues in a matrix structure or manner. (SAB CWG Winter 2011 Report)

Q4. In January 2008, National Weather Service Director Jack Hayes issued a directive that stated: "Provision of climate services, in particular the monitoring of variations in climate and climate forecasting, is essential to mitigate the loss of life and property and to enhance the national economy. The NWS [National Weather Service] is the federal agency charged with delivering these services to the U.S., its territories, and, as appropriate, its interests abroad." As part of this charge, the National Weather Service maintains the Climate Prediction Center in Camp Springs, Maryland, supports "Climate Services Programs" at each NWS regional office, issues climate products on a daily basis from the more than 120 Weather Forecast Offices, and oversees these efforts from the Climate Services Division at the NWS Headquarters. NOAA's Science Advisory Board, in

making recommendations on the development of a National Climate Service in February 2009, suggested that including the Climate Service as part of the NWS would be the "option simplest to implement" from "every practical standpoint." The Report also supported "[g]reater connectivity between weather and climate functions."

Q4a. If the National Weather Service is currently handling much of the climate services portfolio now, why is a separate line office necessary? Will the 1,000 National Weather Service employees that currently perform Climate Service work as a fundamental function of their jobs be transferred to the new line office?

A4a. This question illustrates the reasons for NOAA's proposal to reorganize its existing assets to form a Climate Service Line Office. NOAA's climate science and services have developed organically and independently in multiple forms and functions throughout five of our six line offices. As a result, significant effort must be expended on coordination to meet our climate goals. For example, the climate products produced by NWS are funded, in part, by another line office in order to leverage the expertise at NWS. Similar examples are also found in NESDIS and OAR. By bringing together NOAA's dispersed climate assets under one umbrella of a line office, the agency would be more efficient and effective with taxpayer dollars.

NOAA's weather services are provided on a time scale of hours to 10 days out, whereas climate services are provided from two weeks out to months, seasons, years, decades and beyond. Currently, the National Weather Service's Climate Prediction Center, which has been identified to move into the proposed Climate Service Line Office, provides climate forecasts and predictions for precipitation, temperature, hurricanes, and extreme weather on the order of weeks to seasonal outlooks. Also, NWS currently supports a fraction of the climate services that are encompassed throughout NOAA. Other climate services components not in the NWS include research, observations, modeling, data collection and storage, and services. The Climate Prediction Center is a nexus between the weather and climate communities at NOAA and beyond. By proposing to move the Climate Prediction Center to the proposed Climate Service Line Office, a move endorsed by National Weather Service Employees Organization (NWSEO), NOAA would leverage this capacity to the betterment of both the weather and climate communities within NOAA.

To answer your second question, the only NWS staff that would be moved into the proposed Climate Service Line Office would be the Climate Prediction Center employees and contractors, which currently number approximately 50 FTEs and 25 contractors. Other staff in the NWS that work on climate activities, such as NWS staff in local weather forecast offices that serve as climate focal points for the public, would remain in the NWS and closely coordinate with the proposed Climate Service Line Office. This relationship would allow for leveraging of existing on-the-ground NOAA capabilities, serve as a nexus between NOAA's suite of weather and climate services, and provide the public with seamless access to weather and climate information.

Q5. The Weather Service is often cited as a model for the Climate Service. However, most of the research and science that informs and helps develop Weather Service products is housed separately within NOAA's research office. Presumably, this model of distinct research and weather service activities is working, or NOAA would be trying to change it.

Q5a. If so, then, why won't the same model work for the Climate Service?

Q5b. What is your reasoning for proposing that research associated with climate services be treated differently than research associated with weather services?

A5a–5b. The dedicated people of NOAA's NWS excel at the 24-hours-a-day, seven-days-a-week, on-time and on-demand operational aspects of delivering accurate weather services that the Nation relies on to protect life and property. In the Weather Service, where the beat of operations is on the order of minutes to hours to days, the strongest organizational structure is to separate long-term weather research from operations because of the long time frame of weather research investments (5 to 10 to 15 years) and the large operational infrastructure and subsequent resource requirements of the Weather Service's 122 forecast offices that require constant attention and funding streams.

In contrast to the NWS model, where science and service (or operations) are housed in separate line offices, NOAA would not envision a service delivery component for the proposed Climate Service Line Office at the scale of the NWS with its 122 local forecast offices and other regional infrastructure. The research and science component of the proposed Climate Service Line Office would continue to be much larger than its services component, where NOAA intends to employ an approach

that leverages assets outside the proposed Climate Service. Within NOAA, we would continue leveraging the service delivery infrastructure of the NWS and other partners like the Regional Integrated Sciences and Assessments (RISAs), Regional Climate Centers, State climatologists, Sea Grant extension, Coastal Services Centers, National Marine Sanctuaries, and other parts of NOAA. Given the growing demands for climate information from business, we are working with private sector companies that are providing climate information today or are interested in developing this line of business. This latter approach is much akin to the relationship between the National Weather Service and the vibrant private weather community that exists today.

Furthermore, climate services do not have the same beat of operations as weather services. Climate services are relevant to longer time scale decisions, such as where and how to build critical infrastructure, or whether water conservation measures need to be taken now to mitigate the upcoming drought season. Because climate services are rapidly evolving, it is beneficial for climate science and service development to go hand in hand in order to develop products and services that can evolve together and be initiated rapidly when needed in response to scientific information as it emerges. Services benefit from the close proximity to continuous advancements in climate science, not only because advancements can constantly improve products (science push), but also because users can be asking new questions of the science (user pull). Because high-quality climate science is at the core of climate services, housing both climate science and services under one organizational structure would allow NOAA to better transition climate research findings into usable information and services that help businesses and communities make more informed economic decisions and safeguard lives and property.

Q6. Recognizing that budget realities demand policymakers prioritize and make difficult choices, which is a higher priority for NOAA: enhancing short-term weather prediction to save lives and property from deadly storms such as tornadoes, or improving long-term predictions of climate to enhance planning and decision making by business and governments?

A6. NOAA provides science, stewardship, and service to the Nation. NOAA's weather forecasts, from minutes out to two weeks, are critical to protecting lives and property from extreme events. NOAA's forecasts of two weeks and beyond, also known as climate forecasts, are critical to making the advanced planning decisions from weeks to months ahead of time that allow for a prepared response to such events such as the ongoing drought in Texas. Additionally, NOAA's climate information also supports informed decision making for national security as well as economic growth and resiliency in both the short and long term.

NOAA's FY 2012 President's Budget request is the result of a rigorous review and prioritization ofthe agency's programs and activities necessary to meet NOAA's responsibilities to the Nation. Low-priority programs or activities have already been curtailed or eliminated, core functions and services are sustained, and targeted increases are requested for only the most critical programs, projects, or activities necessary to meet the growing demand for NOAA's services. Both NOAA's weather and climate missions to the Nation will continue to be a priority for the agency.

Q7. If you move activities such as the Geophysical Fluid Dynamics Lab in Princeton, whose scientists work collectively and individually on the multidisciplinary aspects of weather, environmental, as well as climate modeling, to an exclusive climate service, how do you prevent the scientists from "stovepiping" their efforts, ignoring or dropping their other diminished modeling pursuits, and losing the current synergy and collaboration?

A7. NOAA's research labs, including the Geophysical Fluid Dynamics Laboratory (GFDL), are at the forefront of our scientific understanding about the Earth System. Today, GFDL's research is primarily focused on diverse aspects of climate modeling, including modeling the interactions between climate and ecosystems and climate and oceans. Although the lab is principally focused on climate research and modeling, GFDL's interdisciplinary efforts and collaborations are translating their climate expertise to NOAA's other mission areas. For example, GFDL has been applying their work to help answer questions ranging from the linkages between climate and extreme weather, seasonal predictions and projections, and fisheries. These interdisciplinary collaborations are critical to NOAA's mission and would continue under the proposed Climate Service if approved.

In order to minimize disruption to NOAA's mission responsibilities and employees, maintain current synergies (such as those GFDL is engaged in), and leverage material efficiencies, the labs, centers and programs that have been identified to move to the Climate Service would be transferred as intact units. NOAA recognizes

that while the majority of the research conducted within the proposed Climate Service would be climate focused, there are other important research capabilities that are proposed to move and must be preserved. Similarly, not all of NOAA's climate research would occur within the proposed Climate Service. Partnerships across all these parts of the agency, as well as with a variety of external partners, would be a key to success on such issues. NOAA recognizes that cross-line integration and coordination on research issues would continue to be essential, as they are today.

The missions of existing OAR programs that are proposed for transfer to the Climate Service in the reorganization would not change. Existing research, modeling, monitoring, and observational programs, including their internal vs. extramural funding distributions, are also envisioned to continue under the proposed Climate Service, with sustenance of the scientific rigor. That said, while the core missions ofthese programs would not change, minor strategic redirections of funding would continue to occur each year as a result of careful program reviews in the context of NOAA's Next Generation Strategic Plan and NOAA leadership approval in order to ensure the agency's portfolio of programs most efficiently and effectively meets the Nation's evolving needs.

NOAA is also using the proposed reorganization as an opportunity to strategically realign its existing core research line office, the Office of Oceanic and Atmospheric Research (OAR), to strengthen the agency's overall science enterprise. To this end, OAR would have a key role in ensuring cross line office synergies are maintained and cultivated, promoting multi-disciplinary collaborations internal and external to NOAA. Further, as leader of the central research Line Office, the OAR assistant administrator would become the senior advisor to the NOAA Chief Scientist and would serve as vice-chair of the NOAA Research Council.

Q8. The Committee's understanding is that about 80% of the current Physical Science Division's work is weather research and water science, and that about one-third of the Chemical Science Division involves air quality, weather, water, coasts, estuaries, and oceans research and science. When you say you are not proposing to move resources away from non-climate activities, how does that square with the facts?

A8. The proposed transfer would not result in deviations from the core missions or activities of these programs. The proposed reorganization does not eliminate or reduce any of NOAA's research and weather activities (including National Weather Service's budget). In fact, NOAA's FY 2012 proposal maintains NOAA's research funding levels. As proposed, NOAA would transfer the Geophysical Fluid Dynamics Laboratory, the Climate Program Office, and three divisions of the Earth System Research Laboratory—Chemical Sciences Division, Physical Sciences Division, and Global Monitoring Division—to the proposed Climate Service.

The difference between weather and climate is our Earth's environmental changes (e.g., the atmospheric conditions) in a short time (days as weather) versus in long time (weeks, months, years and longer, as climate). NOAA's weather-related activities are captured in NOAA's National Weather Service, while the activities of the Physical and Chemical Science Divisions (from the questions) have more profound impact on the understanding and prediction of our Earth's climate system (including the atmosphere, water, ecosystem, etc).

The Physical Sciences Division (PSD) was created during the formation of the Earth System Research Laboratory in 2005 to address time scales from weather (less than two weeks) to those normally associated with climate variability (seasonal- to-interannual time scales). PSD maintains a significant focus on water resources (too much/too little), supporting NOAA programs such as the Hydrometeorological Testbed (HMT) and the National Integrated Drought Information System (NIDIS). While 80% of the current PSD work may be weather research and water science, it is closely integrated with short-term c1imate research and serves a broad range of applications. For example, PSD is preeminent in the science of air-sea interaction, which has led to improvements in both weather and climate models. Because PSD research cuts across time scales, it is quite effective in diagnosing the origins of extreme events such as droughts, floods, and heat waves so as to improve their prediction and to inform adaptation.

Approximately one-third of the Chemical Sciences Oivision (CSO) work involves air quality, weather, water, coasts, estuaries, and oceans research. However, the CSO work that could be termed "nonclimate" is very closely tied to understanding impacts of climate change and variability, and it also contributes to climate research as well. In addition, the tools used for air quality research are very closely aligned with climate research. The CSO work on weather is mostly related to boundary layer meteorology that is fundamental to assessing climate impacts, wind energy, and evaluation of emissions essential for climate studies.

Q9. In your testimony, you state that you look forward to working with this Committee to continue to advance NOAA's mission-focused science enterprise. Do you see NOAA as an operational agency supported by science, or do you see NOAA as a science agency with operational and regulatory functions?

A9. NOAA has a three-part mission—science, service and stewardship. NOAA works to understand and predict changes in climate, weather, oceans, and coasts; to share that knowledge and information with others; and to conserve and manage coastal and marine ecosystems and resources. Science provides the foundation and future promise of the service and stewardship elements of NOAA's mission.

Q10. NOAA's Next Generation Strategic Plan issued in December 2010 outlined four primary goals for the future. The first long-term goal is climate adaptation and mitigation. Within that goal, the first objective is to improve scientific understanding of the changing climate and its impacts. "Research on the connections between weather and climate, for instance, is necessary to understand how a changing climate may affect precipitation patterns and severe weather events, including hurricanes. On decadal-to-centennial time scales, research is needed to understand feedback between atmospheric greenhouse gases and the rate of global-to-regional climate impacts, such as changes in sea level, heat waves, droughts, and air and water quality. Research is required to understand how changes in the global ocean circulation affect the climate system and their subsequent impacts on coastal regions, including sea level rise, ocean acidification, and living marine resources."

Q10a. These research needs describe areas of fundamental climate science. If, as the National Academy of Sciences said in a 2001 report, research supporting a climate service should be mission-oriented, where will NOAA conduct the basic research needed to answer these questions?

Q10b. Aren't the assets you are proposing to move out of the Oceanic and Atmospheric Research office the same ones that conduct this underlying research? If so, why would you move such assets into an organization that requires operationally directed research?

A10a–10b. Science at NOAA is the systematic study of the structure and behavior of the ocean, atmosphere, and related ecosystems; integration of research and analysis; observations and monitoring; and environmental modeling. NOAA science includes discoveries and ever-new understanding of the oceans and atmosphere, and the application of this understanding to such issues as the causes and consequences of climate change, the physical dynamics of high-impact weather events, the dynamics of complex ecosystems and biodiversity, and the ability to model and predict the future states of these systems. Science provides the foundation and future promise of the service and stewardship elements of NOAA's mission. All NOAA science relates to NOAA's mission, and is therefore mission-oriented.

The proposed Climate Service would include basic physical science research as well as adaptation and other applied climate research. As proposed in the PB FY 12, OAR would transfer the Geophysical Fluid Dynamics Laboratory, the Climate Program Office, and three divisions of the Earth System Research Laboratory—Chemical Sciences Division, Physical Sciences Division, and Global Monitoring Division—to the proposed Climate Service. The proposed transfer would not result in deviations from the core missions or activities of these programs.

Creating a single Line Office would establish a stronger position for NOAA to strategically guide its climate research, monitoring, and assessment work in a coordinated fashion. Climate services are rapidly evolving; therefore, it is beneficial that climate science and service development go hand in hand to develop products and services that can evolve together and be initiated rapidly when needed in response to scientific information as it emerges. Services benefit from the close proximity to continuous advancements in climate science, not because advancements can constantly improve products (science push), but also because users can be asking new questions of the science (user pull). Because high-quality climate science is at the core of climate services, housing both climate science and services under one organizational structure would allow NOAA to better transition climate research findings into usable information and services that help businesses and communities make more informed economic decisions and safeguard lives and property. It also would enable improved information sharing and more productive partnerships. with federal agencies, local governments, private industry, and other users and stakeholders.

As mentioned above, this reorganization proposal would maintain the highest standards of scientific integrity for all NOAA science. In doing so, the proposal

would preserve OAR as NOAA's core research and innovation hub, a key NAPA recommendation, and would seize on the opportunity to strengthen science across NOAA by strategically renewing OAR's forward-looking research agenda. In proposing to house much of OAR's climate research in the proposed Climate Service Line Office, NOAA would both be able to better transition its high-quality climate science into usable services and seize upon the opportunity to refocus OAR's efforts to incubate solutions to tomorrow's long-term science challenges, integrate an agency-wide science portfolio, and drive NOAA science and technology innovation.

Q11. Keeping in mind the accuracy problems encountered by the National Weather Service, what assurances can you provide regarding the accuracy of and uncertainties associated with projects issued by a NOAA Climate Service, which will presumably forecast climate and weather patterns weeks and months out in the future, and on regional scales?

A11. NOAA has instituted a major initiative to strengthen science across the agency. As laid out in the draft Vision and Strategic Framework document, through strength in research, the Climate Service would aim to grow the body of scientific knowledge about climate variability and change, including the determination and quantification of uncertainties and confidence intervals. The Climate Service would ensure its data, information, and services meet the highest standards of scientific excellence. This mandates careful quality assurance, including:

- Rigorous and internationally recognized procedures for calibration and validation of observation and monitoring systems;
- Transparent peer-review procedures for articles, documents, and assessment reports;
- Quantification and accurate communication of uncertainty in model outputs; and
- Accessible metadata documenting the quality of data products and services.

The Climate Service would identify—and make public—the teams responsible for the quality assurance of particular products, to ensure that its services are trustworthy, relevant, well described, and easily accessible.

The National Weather Service continually improves its forecasting accuracy and abilities through investments in new technology and a skilled workforce. This improvement is tracked with performance measures that show outcome-based results. For example:

- Since 1990, NHC's Official Annual Average track forecasts (based on track error) have improved by about 60%. Current five-day error is as large as the three-day error was just 10 years ago. In other words, today's five-day forecast is as good as 2000's three-day forecast. As Craig Fugate, Administrator of the Federal Emergency Management Agency, said recently, "if this year was just 10 years ago, they would have had to evacuate Florida's coast for Hurricane Irene" (evacuations were ordered for NC and northward).
- Tornado warning lead time has increased from less than five minutes in the early 90s to over 14 minutes today. Tornado warning accuracy has increased from 40 percent to 75 percent over the same time. Flash flood warning lead time increased from about 14 minutes to over 90 minutes over the past 20 years.

Climate outlooks, predictions and projections would be held to the same rigorous scientific standards and results monitored with performance measures.

Q12. A primary justification you have cited to argue for creation of the Climate Service is that NOAA has been "inundated" with requests for climate information from businesses as well as State and local governments.

Q12a. Approximately how many such requests have you received? With respect to forecasts, approximately what percentage of these requests are longer-term in nature, i.e,. beyond one year?

A12a. Americans who depend upon NOAA's climate information to make decisions for their family, business, and community balance sheets are now demanding more data, increasingly complex products, and advanced scientific study. A more efficient and effective organizational structure, such as the proposal that the President included in his FY 12 budget proposal to Congress, would better enable NOAA to meet these demands. At this time, with so many requests coming into the agency through multiple venues, NOAA can only track the aggregate number of requests and does not have the capacity to inventory individual requests.

However, the following aggregate statistics demonstrate the tremendous increase in demand from such sectors as business, insurance/reinsurance, finance, energy, transportation, water management, agriculture, national security, and resource management via incoming requests through a number of NOAA's user interfaces.

(1) Direct requests from users for climate-related data and information services: From fiscal year 2009 to 2010, NOAA saw an increase of 11 percent in direct requests (includes individual requests via phone calls, emails, and other direct correspondence) from 26,000 to 29,000 individual requests.

(2) Climate-related data provided from data centers: In FY 2010 NOAA provided 86% more climate-related data from data centers as compared with data provided in FY 2009—from 806 terabytes to 1,500 terabytes (or 1.5 petabytes). This stems both from an increased quantity of data available and a greater number of user requests. To put this in context, a Kindle or other electronic book download averages about 800,000 bytes. Using this as a comparison, NOAA provided a total of at least 1.9 billion Kindle books worth of climate data, roughly 867 million more Kindle book equivalents than in 2009.

(3) In calendar year 2010, NOAA's National Climatic Data Center (NCDC) Comprehensive Large Array data Stewardship System site served over five times as much climate-related data as in calendar year 2009—from 43 terabytes to 253 terabytes.

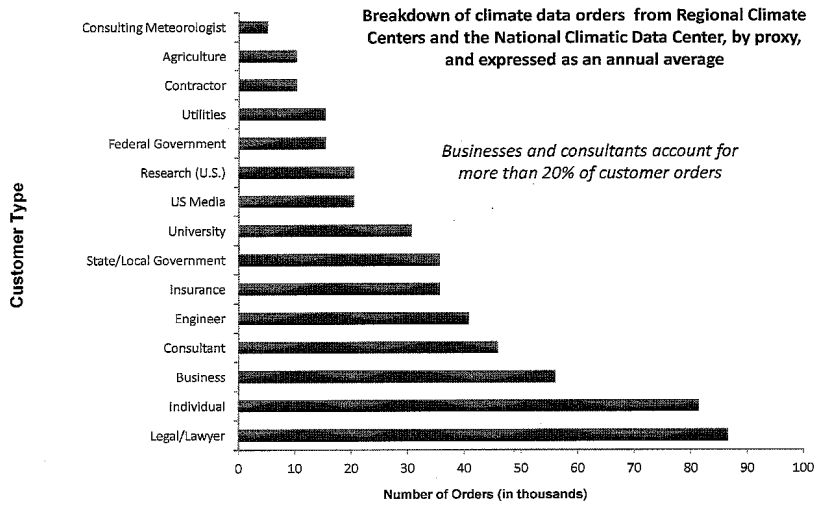
(4) From FY 2009 to FY 2010, Web hits for NOAA climate services experienced a 57% increase in climate-related data and information Web site hits—from 906 million to 1.4 billion hits. This does not include hits to our new Climate Portal that launched in February 2010 and currently hosts over 27,000 visitors every month. Because of the huge numbers involved, it would not be practical to provide documentation of each request. We can, however, provide statistics as to the origin of the requests related to the domain name of the user request. Our statistics indicate the following approximate distribution over the past two years.

- .com ---- 15%
- .edu ----- 9%
- .gov ---- 12%
- .mil ----- 1%
- .net ---- 24%
- .us ------ 7%
- Foreign - 13%
- Unresolved 19%

Such demands come in from multiple interfaces across multiple Line Offices within NOAA, and we do not track them in a comprehensive manner. Housing NOAA's climate activities in one line office could allow us to more effectively track and analyze the nature of these requests.

For example, while NOAA's National Climatic Data Center (NCDC) cannot currently maintain an inventory of specific requests, NCDC does maintain a program of user engagement and services in 12 key economic sectors including: agriculture, civil infrastructure, coastal hazards, energy, health, insurance, litigation, marine and coastal ecosystems, national security, tourism,transportation and water resources.

A recent analysis by staff of NCDC and the Cooperative Institute for Climate and Satellites (CICS) used statistics collected by one of NCDC's primary partners, the Regional Climate Centers (RCC) and an analysis of orders from NCDC's Climate Data Online service to get a snapshot of the sectoral breakdown of key customers for RCC services and, by proxy, NCDC, as shown in the following graph. This analysis indicated that businesses and consultants account for more than 20% of customer orders with a customer group breakdown.



Within this increasing demand are requests from a breadth of economic and industry sectors,including both governmental, private sector, and non-governmental stakeholders. Specific examples of these types of requests that were received include:

- An agricultural expert in Wilkes County, NC, requested daily high and low temperatures for the 2010 growing season from April 1, 2010, thru October 31, 2010, to calculate the growing degree days or temperature above 50° F in the Wilkes County area. He is researching growing degree days and length of growing season for a possible vineyard in the Yadkin Valley, American Vitacultural Area.
- Firefighters in Texas, New Mexico, and Arizona used seasonal, weekly and daily temperature forecasts to help prepare for and respond to this record wildfire season.
- Emergency managers along the Mississippi, Missouri, and Red River basins used seasonal snowpack, precipitation, and river forecasts to help prepare communities for the onset of flooding months before it began.
- Public Service/Utility Commissions around the country downloaded NOAA's Climate Normals, which include spatial and temporal averages of climatological variables (e.g.,temperature, precipitation, etc.) that describe base climatic conditions. Utilities subsequently use this information in formal processes to determine the rate that each utility is allowed to charge its customers.
- Municipalities around the country accessed NOAA's U.S. Snowfall Climatology information, which includes historical information about the severity of extreme snowfall events and return period probability. This information is used to develop annual municipal snowfall removal budgets and results in efficient planning and cost savings.

Q12b. Although you include an appendix in your testimony that claims to list these requests, it does not give us a full scope of the requests you claim NOAA has been getting. Will you compile a complete list of these requests and provide it to the Committee?

A12b. The appendix in Dr. Lubchenco's testimony before the House Science, Space, and Technology Committee provided a summary list that is representative of requests the agency receives for climate information. At this time, due to the limitations of our staff, budget and organizational structure, we are not able to quickly provide a complete and comprehensive list of all requests received across NOAA's broadly distributed access points for climate information and services. When NOAA

has this capacity, we would be pleased to share this information with the public and the Committee. The answer for 12a represents the best overall characterization of requests that our tracking systems are able to reasonably provide at this time.

Q13. How much money had NOAA already spent on transition activities prior to the April 15th Appropriations Act that prohibited the use of funds for such activities?

Q13a. Which line office did those funds come from?

Q13b. What functions did NOAA forgo in order to find the funding for these transition activities?

Q13c. Please provide the Committee with a dollar amount spent on transition activities in FY 11 up through April 15th, and specify exactly what the funding was used for.

A13a–13c. The 2011 Full-Year Continuing Resolution Appropriations Act (the Act), Sec. 1348, states "None of the funds made available by this division may be used to implement, establish, or create a NOAA Climate Service as described in the 'Draft NOAA Climate Service Strategic Vision and Framework' published at 75 Federal Register 57739 (September 22, 2010) and updated on December 20, 2010: Provided, That this limitation shall expire on September 30, 2011." NOAA has not used any funds to implement, establish, or create a NOAA Climate Service, as prohibited by the Act.

The Act does not apply retroactively; therefore, to the extent the Committee suggests that the Act prohibited the use of funds for activities undertaken prior to the date of enactment of the Act, we respectfully disagree.

Q14. In a December 2010 interview regarding the NOAA Climate Service (NCS) activities, Tom Karl, Director of NOAA's National Climatic Data Center and transitional director of NCS, said, "We're moved in . . . we're waiting for the marriage certificate, but we're acting like we have a Climate Service." This appears to contradict your testimony that NOAA is not currently implementing a Climate Service program. Can you explain the discrepancy?

A14. The quote above was an unfortunate misstatement and did not accurately characterize the realities of our planning efforts to submit a formal proposal to Congress. I want to assure you that NOAA has not implemented, established, or created a NOAA Climate Service as prohibited by the 2011 Full-Year Continuing Resolution Appropriations Act.

Q15. Public Law 112–10, the Department of Defense and Full-Year Continuing Appropriations Act, prohibits the use of funding to implement, establish or create a NOAA Climate Service. This limitation expires September 30 of this year.

Q15a. Knowing of this Committee's reluctance over your agency's advancement of an NCS without appropriate congressional oversight in advance, will you continue to abide by this restriction in the absence of Congress explicitly approving formulation of a Climate Service as part ofthe FY 12 budget process?

A15a. The 2011 Full-Year Continuing Resolution Appropriations Act (the Act), Sec. 1348, states "None of the funds made available by this division may be used to implement, establish, or create a NOAA Climate Service as described in the 'Draft NOAA Climate Service Strategic Vision and Framework' published at 75 Federal Register 57739 (September 22, 2010) and updated on December 20, 2010: Provided, That this limitation shall expire on September 30, 2011." NOAA has not used, and would not use, any FY 2011 funds to implement, establish, or create a NOAA Climate Service as prohibited by the Act.

NOAA has submitted its reorganization proposal to Congress as part of the President's Fiscal Year 2012 Budget Request.

Q15b. Are all NOAA line offices organizations, programs, projects and activities being conducted as currently authorized and appropriated by Congress?

A15b. We interpret your question as relating to NOAA's climate mission. NOAA carries out its climate mission consistent with existing authority, including the National Weather Service Organic Act, 15 USC §313, the National Climate Program Act, 15 USC §§ 2901–2908, and the Global Change Research Act, 15 USC §§ 2931–2961, among other relevant statutes.

Following the passage of the 2011 Full-Year Continuing Resolution Appropriations Act (the Act), section 1348, NOAA managers were promptly informed of the prohibition contained in the Act and reminded to continue to refrain from taking

any program, administrative, or personnel actions to implement, establish, or create a Climate Service Line Office.

Q15c. Do all NOAA line office organizations, programs, and operations exist today as constituted on January 1, 2010?

A15c. NOAA's current organizational structure is outlined in the following two Department of Commerce Department Organization Orders, which were provided to the Committee on May 6, 2011:

- January 7, 2011: Department of Commerce Department Organization Order: National Oceanic and Atmospheric Administration. 00025–5 (prescribes the organization, management structure, and assignment of functions down to the Staff Office level and to the first level beneath each Assistant Administrator).
- March 14, 2011: Department of Commerce Department Organization Order: Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration. 000 10–15 (prescribes the scope of authority and functions of the position of Under Secretary of Commerce for Oceans and Atmosphere and Administrator of NOAA).

NOAA's line office and program operations continue to be governed by and in compliance with the NOAA Business Operations Manual dated February 2011, which describes how NOAA works within the structure established by the DOOs.

If the Committee would like the versions of 000 25–5, 000 10–15 and the Business Operations Manual that were effective on January 1, 2010, we would be pleased to provide them.

Q15d. Has NOAA been planning, transitioning, and/or reorganizing for the future creation of a Climate Service? Has a Climate Service transition infrastructure been put in place?

A15d. In order to develop the Climate Service Line Office reorganization proposal outlined in the President's Fiscal Year 2012 Budget Request, NOAA's expert scientists and managers from across the agency were engaged in normal planning and budget formulation activities until the time that the proposal was delivered to Congress as part of the President's FY 2012 budget. Since that time NOAA has continued to engage in budget formulation as part of the normal agency budget process. NOAA has not used any funds to create, establish, or implement a Climate Service as described in the "Draft NOAA Climate Service Strategic Vision and Framework" published at 75 Federal Register 57739 (September 22, 2010) and updated on December 20, 2010, as prohibited by the 2011 Full-Year Continuing Resolution Appropriations Act, Sec. 1348.

Q15e. Has an interim NOAA Climate Service staff been formed with policy and operational control of climate science and service programs, projects, and activities throughout NOAA?

A15e. NOAA's organization and decision-making processes, including management functions and organizational and strategic structures for all of NOAA's programs, are outlined in the NOAA Business Operations Manual, dated February 2011, which was submitted to the Committee on May 6, 2011. NOAA's climate science and service programs continue to be governed by and in compliance with that NOAA Business Operations Manual.

Q15f. Is Tom Karl the NOAA Climate Service Transition Director?

A15f. Since 1998, Tom Karl's official position has been Director of the National Climatic Data Center. In addition, Tom Karl was assigned the additional title of NOAA Climate Service Transition Director in March 2010. His duties were set forth in a memo dated March 5, 2010, which was provided to the Committee on May 6, 2011. Those duties are consistent with, and not prohibited by, the 2011 Full-Year Continuing Resolution Appropriations Act, section 1348.

Q15g. Is there a Climate Service Executive Board in NOAA? If so, what is the purpose of the Board, and what responsibility and functions does it carry out?

A15g. There is no Climate Service Executive Board in NOAA. NOAA does maintain a Climate Strategic Planning Board that coordinates across NOAA line offices on budget planning and evaluation for NOAA's climate goal under NOAA's formal matrix management structure—the Strategy Execution and Evaluation process. In addition, over approximately the past 10 years, groups of NOAA lab and center directors, and other officials from across NOAA, have communicated, collaborated, and met in person in order to improve upon the development and delivery of NOAA's existing array of climate science and services products, as well as to develop the pro-

posal for a Climate Service Line Office. These groups have used various titles to refer to themselves, including "NCS Executive Team," "Transition Corporate Board," and "Executive Board." Management responsibility for NOAA activities is set forth in the DOOs and the Business Operations Manual described in Question 15c, above.

Q15h. Is NOAA in the process of creating or implementing a new line office?

A15h. NOAA submitted a proposal in the President's Fiscal Year 2012 Budget Request to create a Climate Service Line Office. NOAA has not created, established, or implemented a Climate Service Line Office, as prohibited by the 2011 Full-Year Continuing Resolution Appropriations Act, Sec. 1348.

Q15i. Is NOAA in compliance with the law in the current Continuing Resolution statutory language prohibiting implementation, including any and all planning, transitioning, and reorganizing,for a new Climate Service line office? If so, does NOAA disagree that Climate Service-related planning, transitioning, and reorganizing constitute implementation that is currently prohibited by law?

A15i. Section 1348 of the 2011 Full-Year Continuing Resolution Appropriations Act prohibits use of FY 2011 funds to "implement, establish, or create a NOAA Climate Service as described in the 'Draft NOAA Climate Service Strategic Vision and Framework' published at 75 Federal Register 57739 (September 22, 2010) and updated on December 20, 2010." NOAA is in compliance with this law.

Q16. Who currently plans, develops, formulates, and proposes NOAA's pre-decisional climate science and research budget and program priorities? Is it OAR? Or is that undertaken elsewhere?

A16. No single individual, entity, or position within NOAA has sole responsibility for NOAA's entire climate science and research budget and program priorities. NOAA has climate science and research interests distributed across the agency. Although most of our climate science and research assets are primarily located in OAR, NWS, and NESDIS, there are activities being carried out in NOS and NMFS (e.g., ocean acidification, and socioeconomic research) that require consideration and coordination in order for NOAA to develop an effective and comprehensive climate research portfolio. Priorities and funding for climate science and services are ultimately driven by NOAA's goal to maintain the highest quality climate science while being responsive to user needs, such as making scientific data and information about climate easily accessible in order to help people make informed decisions in their lives, businesses, and communities.

NOAA uses a strategy implementation process that builds off the Administration, Department, and Agency priorities. The process emphasizes results-based budgeting and evaluation. Planning, development and formulation of climate science and research priorities require a collaborative effort across line offices (OAR, NESDIS, and NWS) and staff offices that house climate-related programs, as well as with the Chief Financial Officer (CFO), Office of Program Planning and Integration (PPI), and NOAA Headquarters. By using fiscal guidance and consistent performance measures across each step of the process, improved communication is enabled among all participants. The proposed Climate Service line office, if approved by the Congress, would help to streamline the process and makes it more efficient.

Q17. Does each NOAA line office control budget policy development for activities funded within their respective office? If not, please detail and explain any instances in which budget policy for individua/line offices related to the FY 11, FY 12, and FY 13 budget years is led or controlled outside of that line office.

A17. Please refer to the previous answer—each NOAA line office, in collaboration with the NOAA CFO, PPI, NOAA Headquarters, and the Department of Commerce, works to develop and implement budget policy for activities funded within their respective line office. Please see NOAA's Business Operations Manual and NOAA's Next Generation Strategic Plan for further information.

Q18. Have you enlisted the NOAA General Counsel to help compile, review, and fully and legally comply with my explicit, targeted inquiry made on March 15 for transition plans, directives, and assignments, including emails, regarding the Climate Service? If so, who and when? If not, why not?

A18. As with other significant Congressional document requests, the NOAA General Counsel's office, along with other offices within the Department of Commerce and NOAA, are assisting with the ongoing response to the Committee's March 15 document request.

Q19. Since the announcement of the NOAA Climate Service proposal in February 2010, have off-site trips, travel, conferences, workshops and/or retreats been used to make transition and reorganization decisions and do Climate Service planning, development, strategy, vision, and implementation?

Q19a. How many out-of-town meetings have there been, and how many NOAA employees have traveled and attended these gatherings? How much has all this travel cost?

Q19b. Please submit a listing of all the trips, conferences, workshops, retreats and other sessions, their itineraries, who attended, and how much each cost NOAA.

A19a–19b. NOAA's broad suite of climate research, information and services staff and capabilities is distributed throughout the United States in numerous labs and centers. In order to ensure NOAA's climate vision, strategy, and priorities reflect the breadth of its expertise, it continues to be critically important for the agency's key climate scientists and managers to be brought together in person from time to time. Particularly, as NOAA developed its reorganization proposal and the draft Vision and Strategic Framework, it was more critical than ever that NOAA hear from scientists and managers across the agency to ensure that these developments benefit from their insights, expertise, and experience.

Since NOAA's announcement in February 2010 of the intent to create a Climate Service in NOAA, there have been a total of five meetings outside the Washington, DC, metro area focused on developing NOAA's reorganization proposal, which is contained in our fiscal year (FY) 2012 Budget Request currently before Congress for approval, and writing the draft Vision and Strategic Framework document.The majority ofthese meetings have been held in locations where NOAA has facilities (one in Boulder, CO, and two in Asheville, NC), and the others were held in a central location (Chicago, IL) relative to the NOAA scientists and managers who participated.

A total of approximately 81 NOAA employees have traveled to one or more these five meetings. The number of employees who traveled to each meeting is listed below.

- 65 travelers to Boulder, CO;
- 12 travelers to Asheville, NC;
- 13 travelers to Chicago, IL;
- 23 travelers to Chicago, IL;
- 23 travelers to Asheville, NC.

Total travel costs (e.g., airfare, lodging, per diem, ground transportation, and miscellaneous) for these meetings were approximately $117,517.61, for an on average cost of $864/person/trip.

Meetings listed below were attended by climate scientists, subject matter experts, lab and center directors, headquarters staff, and administrative staff, including representatives across all NOAA Line Offices.

- Boulder, CO. Travel cost: $ 61,979.60; no facilities cost.
- Asheville, NC. Travel cost: $ 12,433.93; no facilities cost.
- Chicago, IL. Travel cost: $ 17,542.00; facilities cost: $16,486.32 (for both Chicago meetings).
- Chicago, IL. Travel cost: $ 29,784.55; facilities cost included in item 3.
- Asheville, NC. Travel cost: $ 12,263.85; no facilities cost.

Q20. A recent study looking to cut waste and duplication in the Federal Government through reorganizations suggested moving NOAA out of the Department of Commerce, or perhaps splitting it up between the U.S. Department of the Interior and NASA.

Q20a. What impact would either of these actions have on plans for an NCS?

Q20b. From Congress' perspective, such actions appear to send a signal that the Administration may not believe in the need for an NCS—do you agree?

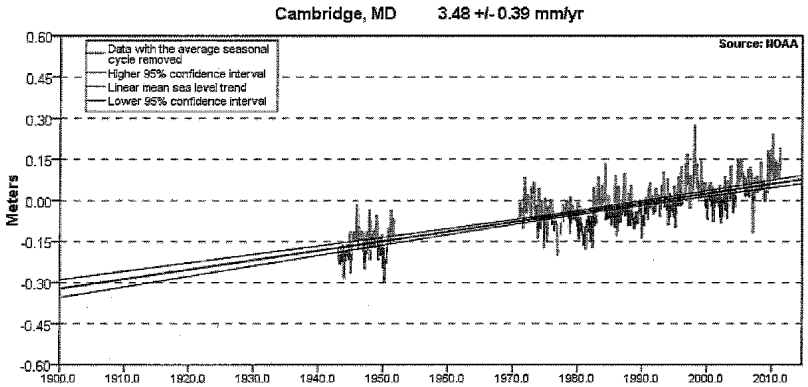
A20a–20b. NOAA is not clear to which study this question refers. At this time, the only official reorganization proposal endorsed by the Administration is included in the President's fiscal year 2012 budget that was submitted to the Congress in February, 2011—the proposal for the NOAA Climate Service Line Office. This good government proposal would allow NOAA to most efficiently and effectively provide cli-

mate information to fuel the American economy, create jobs, and support resilient communities.

Questions submitted by Representative Andy Harris

Q1. In the hearing you said that NOAA had predictions for sea-level change in the next 50 and 100 years for my district. Can you please provide these predictions and include the range of uncertainty associated with these predictions?

A1. NOAA's National Ocean Service (NOS) provides baseline assessments of sea level trends from historical and present-day water level observations at more than 128 long-term water level stations using a minimum span of 30 years of observations at each location. Those data are compiled into sea level trends, as in the example below for Cambridge, Maryland (trends for other locations are available at *http://www.tidesandcurrents.noaa.gov/sltrends*). These baselines are important because the local rates of sea level rise relative to the land are highly variable depending on the amount of vertical land motion along the coast. When assessing the potential amount of sea level rise for a given long-term water level station, the observed trends in relative mean sea level published by NOAA can be used as "baseline" information by extending the observed trend into the future. This makes no assumptions and uses no input about future changes in the rates of sea level rise due to climate change; the trends are based on what is actually observed today. For the mid-Chesapeake Bay on the eastern shore of Maryland, the relative sea level trend at the NOAA Cambridge tide station can be used as this observed baseline; the current relative mean sea level trend at Cambridge, MD, is approximately 3.48mm/yr ±0.39. Projecting this observed rate forward from 2010, the sea level would rise relative to the land at Cambridge by 174 mm ±19.5 (0.57 ft. ± 0.06) by 2060 and by 348 mm ± 34.8 (1.14 ft. ¶ 0.11) by 2110. These projected rates are based entirely on actual sea level trends observed over the last 30 years in Cambridge, Maryland, and they do not factor in projected global sea level rise estimates from the IPCC.



The plot shows the monthly mean sea level without the regular seasonal fluctuations due to coastal ocean temperatures, salinities, winds, atmospheric pressures, and ocean currents. The plotted values are relative to the most recent *Mean Sea level datum established by CO-OPS*. The long-term linear trend is also shown, including its 95% confidence interval. The mean sea level trend is 3.48 ± 0.39 mm/yr, based on monthly mean sea level data from 1943 to 2006. This equates to a change of 0.57 feet ± 0.06 over 50 years or 1.14 feet ± 0.11 over 100 years, but does not factor in projected effects of climate change on sea levels.

NOAA climate models run by the Geophysical Fluid Dynamics Laboratory have contributed to assessments of projections of global sea level change. In 2007, the Intergovernmental Panel on Climate Change used such models and low, medium, and high emission scenarios to project a rise in the world's oceans from a range of approximately seven to 15 inches (0.58 to 1.25 feet) for scenario B1 (low emissions scenario) to a range of 10 to 23 inches (0.83 to 1.92 feet) for scenario A1F1 (high

emissions scenario) when comparing the period 2090–2099 to 1980–1999.[1] As for uncertainties, the global sea level change estimates only take into account the contributions of thermal expansion of the oceans and changes in land ice. They do not include some aspects of ice sheet dynamics (for example, the possibility of accelerated melting in Greenland or West Antarctica) because these were too poorly known at the time of the 2007 assessment to be included with any scientific confidence. The contributions to future sea level by ice sheet dynamics and ocean-ice interactions, as well as the regional distribution of sea level change due to changes in oceanic and atmospheric circulation, are topics of current active research in NOAA and in the broader scientific community.

Global climate models cannot, at this time, provide sea level projections to the scale of one Congressional district; however, efforts to increase the spatial resolution of global climate models are currently underway at NOAA's Geophysical Fluid Dynamics Laboratory, and downscaling these global predictions through coastal models with local fidelity is a current area of research at NOAA. In the meantime, NOAA is providing state and local communities with tools and expertise to begin identifying vulnerability to sea level change and other inundation threats and to visualize a variety of sea level scenarios.

With support from NOAA through the Coastal Zone Management Act, the State of Maryland is creating a foundation to map, plan, and adapt to sea level rise, Over the past 10 years, Maryland has collected high-resolution elevation data to inform models and predictions for flooding and inundation. In addition, NOAA's National Ocean Service recently completed a report (2010–01) titled "Technical Considerations for Use of Geospatial Data in Sea Level Change Mapping and Assessment," which provides technical guidance to agencies, practitioners, and coastal decision makers on how to understand, collect, and apply geospatial data for sea level change assessments and mapping products.

Another resource is the Climate Change Science Program (CCSP) Synthesis and Assessment Product 4.1, "Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region." This report assesses the effects of sea level rise on coastal environments and presents key challenges to be addressed. The assessment highlights global and local sea level rise projects, as well as a case study that describes how Maryland is dealing with this issue. This report was co-authored by EPA, NOAA, and USGS.

In addition to sea level rise, the Chesapeake Bay is subject to storm surges, as was experienced during Hurricane Isabel in September 18–19, 2003. Storm surges of 3–5 ft above normal tide levels were observed over the central portions of the Chesapeake Bay, 5–6 ft over the southern portion of the Bay in the vicinity of Hampton Roads, Virginia, and 6–8 ft above normal levels were observed in the upper reaches of the Chesapeake Bay near Annapolis and Baltimore, Maryland, and in most of the main stem rivers draining into the Chesapeake Bay. Even higher surges occurred at the heads of the rivers, with values of 8.5 ft above normal levels at the Richmond City locks along the James River in Virginia and nearly 8 ft along the Potomac River in Washington, DC. Water levels exceeded previous record levels established in the Chesapeake-Potomac Hurricane of 1933 in Washington, DC, Baltimore, and Annapolis (see *http://www.nhc.noaa.gov/2003isabel.shtml*).

Q2. The article on the NOAA Climate Portal we discussed at the hearing comes from Chesapeake Quarterly. Is Chesapeake Quarterly a peer-reviewed scientific publication?

A2. Although *Chesapeake Quarterly* is not a peer-reviewed publication, it is a high-quality, award-winning publication of Maryland Sea Grant, an entity that is administered by the University of Maryland Center for Environmental Science. *Chesapeake Quarterly* is published for a lay audience and includes articles that explore scientific, environmental, and cultural issues relevant to the Chesapeake Bay and its watershed. The articles are developed by experienced writers following an editorial process that provides quality control. The articles draw on peer-reviewed literature and on other sources of information such as interviews. Articles are reviewed editorially with source citations noted.

Q3. Does NOAA pay a subscription fee to publish articles on the NOAA Climate Portal from publications such as Chesapeake Quarterly?

Q3a. If so, how many publications does NOAA currently pay a subscription fee to?

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[1] *See* Table SPM.3 *in* Intergovernmental Panel on Climate Change (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 IntergovernmentalPanel on Climate Change, *http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf).*

Q3b. Please provide a list of all such publications NOAA pays a subscription fee to publish articles on the NOAA Climate Portal.

A3a–3b. NOAA does not pay a subscription fee to *Chesapeake Quarterly* to republish selected articles on the NOAA Climate Portal Prototype; nor does NOAA pay a subscription fee to any other source of articles published on the Portal.

Q4. Is the purpose of the NOAA Climate Portal to provide information to the public from all sources,including advocacy or "gray" literature?

Q4a. How will users of the Web site be able to distinguish between information from advocacy organizations and information from peer-reviewed scientific publications?

Q4b. How does NOAA's publication of nonpeer-reviewed data or advocacy information comply with its responsibilities under the Data Quality Act to ensure and maximize the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies?

A4a–4b. The NOAA Climate Portal is a prototype created for the purpose of evaluating an approach to providing a wide range of objective data and information that is based on primary climate science sources, including the peer-reviewed climate science literature, climate science data, and interviews with subject matter experts. The information presented, whether peer reviewed or nonpeer-reviewed, is of known quality or from sources acceptable to the relevant scientific and technical communities and is labeled so that readers can distinguish the source. NOAA will take steps to ensure that it more clearly distinguishes between the types of content appearing in the Portal's different sections, each of which has its own audience and focus.

The technically qualified managers and editors of the NOAA Climate Portal Prototype review products before publication and set publication priorities based upon one or more of the following: (i) significant new science results, upon publication in peer-reviewed journals; (ii) relevant case studies in which NOAA climate science and/or services (such as decision support tools) are used in decision-making contexts for societal benefit; (iii) information to address commonly asked questions and/or misconceptions about climate; and (iv) information to help explain and contextualize climate-related current events and their societal relevance.

NOAA is committed to scientific rigor and quality on the Portal. To date, the *Chesapeake Quarterly* article discussed in Question 2, above, is the only journal article from a non-NOAA source that has been published. NOAA will take steps to ensure that its rigorous pre-publication reviews of products posted on the Portal formally document the agency's compliance with the Data Quality Act.

Q5. Does the NOAA Climate Portal include the range of uncertainties related to the information it provides? If so, are these uncertainties communicated in a way that average users can understand them? If not, why not?

A5. Describing ranges of uncertainty is an important component of communicating climate science and our understanding of the impacts of climate variability and change. NOAA has a strong record of success in communicating uncertainties around its weather forecasts and warnings, and is committed to the same when communicating climate research to the public and translating climate science into usable information for decision makers. NOAA is committed to being a neutral broker of weather and climate science and services. In the NOAA Climate Portal Prototype, NOAA is continuing its work to better communicate uncertainty.

The Portal Prototype includes both peer-reviewed technical articles that present uncertainty, as well as discussions and presentations of the concepts of scientific uncertainty for lay audiences through such vehicles as articles in the *Climate Watch Magazine*. For example, scientific uncertainties are addressed in the authoritative, peer-reviewed literature and climate assessment reports, which are linked to in the Portal's "Understanding Climate" section. Separately, in a *Climate Watch Magazine* article, describing how scientists and planners accommodate the uncertainty of model projections of future climate was one of the main themes of a story NOAA published about the Boulder, Colorado's, water supply. As explained in that story, model projections of future precipitation vary widely—some predicting wetter futures, some predicting drier futures, and NOAA detailed how scientists studied the implications for the city's water supply in each of these possible outcomes; page three of the article is devoted to explaining the diverging projections and their significance for assessing Boulder's water supply (see *www.climatewatch.noaa.gov/article/2011/39522/3*).

NOAA also provides Portal Prototype users with references to authoritative reports and peer-reviewed literature for readers who want that level of complexity. Permanent links and references to peer-reviewed, authoritative sources are also provided in the Understanding Climate section of the Portal Prototype. As NOAA continues to develop the Climate Portal during this prototype phase, we are committed to continuing to improve the scientific rigor of the information presented, including information about uncertainty, through our own evaluation and valuable feedback from a diversity of external users.

Q6. If the intent of the NOAA Climate Portal is to be a "one-stop-shop" for climate information, why has no other agency posted information on your Web site?

A6. The intent of the Climate Portal Prototype is to be a "one-stop-shop" for NOAA's climate information. Based upon the success of prototype and user feedback—and if there is sufficient interest from other agencies with a commensurate level of contribution and support from them—the Portal's scope could be scaled up to serve as a one-stop for climate information and services for all of the Federal Government.

However, the NOAA Climate Portal has published data and information from other agencies. Specifically, we have published other agencies' data in the:

- Global Climate Dashboard;
- Understanding Climate section, which includes links to authoritative assessment reports published by the USGCRP, the IPCC, the National Academy of Sciences, and the World Meteorological Organization;
- Education section, which includes links to educational information produced by many agencies;and
- *ClimateWatch Magazine*, which features quite a few articles with images and information from other agencies.

NOAA is still in a prototype phase of development, as stamped on the Portal's banner, and as explained in the "About this site" page at *http://www.climate.gov/about.html*. NOAA made the NOAA Climate Portal Prototype available to allow the public to interact with it and provide the agency feedback as to whether it meets their needs for climate data and information. Questions and comments from the public are actively solicited on the "Frequently Asked Questions" page at *http://www.climate.gov/faq.html*. NOAA has been gathering lessons learned from this evaluation period to help the agency identify ways of refining and improving the prototype.

Questions submitted by Representative Paul C. Broun

Q1. What role do NOAA scientists play in the IPCC assessments and in IPCC policy deliberations, such as the IPCC 33rd Session held in Abu Dhabi, United Arab Emirates, May 10–13, 2011? Specifically,how many NOAA employees attended this session? How many NOAA employees attended the previous session?

A1. NOAA scientists have contributed to the IPCC assessments in various roles from coordinating lead authors, lead authors, contributing authors and review editors to overall reviewers. In the last assessment report, released in 2007, a NOAA scientist served as co-chair of a Working Group responsible for producing an entire volume of the report. NOAA scientists and NOAA-supported university partners also indirectly contribute data, model runs, and other research to the IPCC Assessments, as these are often cited in the reports.

NOAA has also participated in the intergovernmental aspects of the IPCC as part of the U.S. delegation to IPCC plenary meetings. NOAA sent one representative to the Abu Dhabi meeting and one to the session prior to that in Busan, Korea.

Q2. In last year's InterAcademy Council review of IPCC, the Council recommended that that IPCC "should develop and adopt a rigorous conflict of interest policy that applies to all individuals directly involved in preparation of IPCC reports, including senior IPCC leadership (IPCC Chair and Vice Chairs), authors with responsibilities for report content {i.d., WG Co-Chairs, coordinating lead authors (CLAs), and lead authors (LAs), Review Editors (Res), and technical staff di-

rectly involved in report preparation {e.g., staff of the TSUs and the IPCC Secretariat)."[2]

Q2a. Do you support that recommendation, and if not, why not?

A8. NOAA supports this recommendation, which the United States endorsed in its 32nd Plenary.

Q3. At the May IPCC Abu Dhabi meeting, the IPCC delayed adopting a conflict of interest policy as recommended by last year's InterAcademy Council review until at least early 2012.[3]

Q3a. Given that work on the IPCC's Fifth Assessment Report (ARS) is well underway, isn't it imperative for the IPCC to adopt a rigorous conflict of interest policy as soon as possible to help ensure the integrity of the ARS process?

Q3b. Do you agree, and if so, will you urge Dr. Holdren and Secretary of State Clinton to strongly support this position at the next IPCC meeting tentatively scheduled in January 2012?

A3a–3b. The United States supported the InterAcademy Council recommendation for a conflict of interest policy, and the State Department and White House Office of Science and Technology Policy were very actively involved in developing the new draft policy for the IPCC plenary. At the 33rd session of IPCC, the plenary approved a conflict of interest policy that is consistent with the lAC recommendation, and that draws heavily from the policy of the U.S. National Academy of Sciences (NAS).

We expect that the 34th IPCC plenary, currently scheduled for November 2011, will agree on the process by which the policy will be implemented. This will make the IPCC one of the few science assessment processes in the world to have a formal conflict of interest policy. Recognizing the need to identify and address any conflicts of interest as soon as possible, each of the Working Groups has applied interim conflict of interest procedures to authors and editors involved in the development ofthe Fifth Assessment Reports.

Questions submitted by Ranking Member Eddie Bernice Johnson

Q1. NOAA hired six Regional Climate Service Directors (RCSDs). How do these RCSDs fit into NOAA's existing activities and mission on climate science and services? When were they hired? And what would their role(s) be in the proposed reorganization?

A1. In February 2010, NOAA's National Climatic Data Center (NCDC) issued a vacancy announcement for six Regional Climate Services Director positions to enhance NOAA's capability to more effectively meet the fast-accelerating demand for climate-related information. Following a Nation-wide, competitive recruitment process, the appointment of the six Regional Climate Services Directors (RCSDs) was announced in September 2010. The six RCSDs are co-located with NOAA's six National Weather Service (NWS) regional headquarters offices. This co-location underscores significant weather-climate linkages and recognizes the role that existing NWS regional and local service infrastructure will play in the future of NOAA's weather and climate services. The directors are building upon a broad range of climate products and services in NCDC and across NOAA and leveraging the expertise of widely diverse partners to better assess, refine, and deliver climate science and information to address specific regional needs. In this context, the regional climate services directors are working with NOAA's many partners to identify new and emerging regional climate issues and help NOAA develop products and services to address those issues. Some specific examples include:

- On July 7, 2011, the Southern Regional Climate Services Director hosted a South-Central U.S. Drought Impacts Assessment Workshop in Austin, TX. Over 40 federal, state, local, and private sector organizations were represented at the event, which highlighted the current drought status, short- and long-term climate outlooks, a range of environmental and socioeconomic impacts observed thus far, and state-level planning and response activities. Outcomes from the workshop include an updated regional drought outlook and specific pilot project

[2] InterAcademy Council, "Climate change assessments, Review of the processes and procedures for the IPCC," October 2010, p.53 (*http://reviewipcc.interacademycouncil.net/report/Climate Change Assessments, Review of the Processes & Procedures of the IPCC.pdf*).

[3] IPCC 33rd Session, 10–13 May 2011, Abu Dhabi,*"Decisions Taken With Respect to the Review of IPCC Processes and Procedures Conflict of Interest Policy."*.

opportunities with the Texas Forest Service and Lower Colorado River Authority.

- On June 30, 2011, the Western Region Climate Services Director served as the moderator for a climate business sector roundtable during the Western Governors' Association (WGA) annual meeting in Coeur d'Alene, Idaho. The roundtable followed the signing of a Memorandum of Understanding between NOAA and WGA to improve the development and delivery of climate science and services to Western states. Private sector attendees—from BNSF Railways to IBM to PepsiCo—discussed two primary issues: (1) how weather and climate affect their business operations; and (2) which climate services would be most useful for NOAA to provide.
- On March 8th, 2011, the Central Region Climate Services Director held a workshop to begin developing and coordinating a Missouri Basin Climate Collaboration that involved 12 different federal agencies from across the basin. The meeting was held with agreement of 15 federal executives comprising the Missouri River Basin Interagency Roundtable (MRBIR). Participants included multiple NOAA offices; the High Plains Regional Climate Center; the Western Water Assessment RISA; the National Integrated Drought Information System (NIDIS); National Drought Mitigation Center (NDMC); the President of the American Association of State Climatologists (AASC); and representatives of universities, state, and local government agencies and tribal interests. Results from the meeting included improved communication to reduce redundancies and better collaboration on projects of mutual interest and national and regional priorities.
- On June 15th, 2011, Regional Climate Services Director for the Central Region and core partners met with the City of Chicago to explore how NOAA climate data and information could aid the ongoing development and implementation of their Climate Action Plan. Participants included the City of Chicago, Midwestern Regional Climate Center, Illinois State Climatologist, Sea Grant representatives from Illinois/Indiana, ICLEI, and the National Weather Service Chicago office. The City approached NOAA for assistance with this plan, the first of its kind for the Chicago metro area aimed at protecting the lives, environment, and property of the area.
- On September 21–22, 2011, NOAA's Central Region Climate Services Director will host several members of the Oglala Sioux Nation to discuss how NOAA climate data and information may be of use in planning the Thunder Valley community on the Pine Ridge reservation. The project is a product of a HUD/EPA grant to plan sustainable communities. The tribal members will meet with NOAA representatives, the High Plains Regional Climate Center, and representatives from other federal agencies.
- NOAA's Eastern Regional Climate Services Director, in partnership with the Regional Climate Center at Cornell University, convened a two-day workshop August 3–4, 2011, in Ithaca, NY, that focused on inland climate impacts and information needs. The workshop focused attention to the inland areas of the region, with discussions on climate impacts on agriculture, birds, water resource management, forestry, migratory fishes, and infrastructure. The meeting brought together over 50 representatives from all 16 states in the region as well as federal partners from the Geological Survey, the Fish and Wildlife Service, Federal Highways, Forest Service, Fisheries Service, and Weather Service, as well as many of our academic partners at Cornell.
- NOAA's Regional Climate Services Director forthe Eastern Region is a founding member of two interagency federal partnerships in the region that focus on climate adaptation and mitigation: the New England Federal Partners (originating first in 2002, and more formally organizing in 2006) as well as the newly formed NY/NJ Federal Partnership for climate, meeting for the first time on July 26, 2011. These federal partnerships bring together over 15 different federal agencies with quarterly face-to-face meetings founded on the principles of communication, coordination, and collaboration on major drivers in the natural sciences, specifically climate, coastal, and marine spatial planning, and tribal engagement topics. These federal partnerships,and others forming in subregions within the East, will serve as the primary collaborative for the national climate assessment and ongoing regional climate adaptation hubs for future work together.

The directors are collaborating with regional partners from other federal agencies, state, local, and tribal governments, universities, the private sector, and non-governmental organizations. In addition to establishing broad dialogue on regional climate issues, the regional climate services directors are working to strategically integrate

the work of various NOAA-funded partners already engaged in climate science and services at the regional level, including the Regional Integrated Sciences and Assessment (RISA) programs, Regional Climate Centers, state climatologists, and many partners across the private and government sector. Integrating the work of these components in a way that significantly leverages their distinct assets will yield increased value to users and support more efficient, cost-effective delivery. Under the proposed reorganization, the RCSDs would continue to serve as the representatives of NOAA's climate services, providing assistance in the development, delivery, and evaluation of NOAA products and services in regions and ensuring that regional climate information needs and priorities are conveyed back to the NOAA Climate Service leadership to support the evolution of climate science and services to meet the needs of decision makers.

Appendix 2

Additional Material for the Record

Additional Material for the Record

17 June 2011

The Honorable Ralph M. Hall
Chairman
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, DC 20515

The Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Hall and Ranking Member Johnson:

As former National Oceanic and Atmospheric Administration (NOAA) Administrators we urge you to support the fiscal year 2012 budget request from NOAA for a budget-neutral reorganization to establish a Climate Service Line Office and realign the Office of Oceanic and Atmospheric Research's focus to strengthen science across NOAA. Establishing a Climate Service would continue NOAA's forward-looking record of achievement and efficient and effective service to the nation.

NOAA's timely and accurate short-term weather and longer-term weather and climate information are critical to saving lives and property and ensuring the continued prosperity of our businesses and economy, as we have recently witnessed from this spring's outbreak of drought, floods and tornados around the nation. NOAA's three-month winter seasonal forecasts were able to predict reliably both the onset of drought in Texas and floods in North Dakota months ahead of onset, allowing individuals and local emergency responders time to plan and take action.

Individuals, businesses and governments have and will continue to rely heavily upon both weather and climate information from NOAA to inform major decisions relating to agriculture, health, transportation, water and natural resources, energy production and national security. The demand for timely and trusted climate information has dramatically increased in recent decades with advancements in our understanding of climate change and the potential risks and opportunities it presents to our society and economy. It is critical that NOAA be able to adapt to efficiently meet this demand for new information.

The concept of a Climate Service in NOAA is based on strong science and information delivery developed over the past three decades. Most recently the National Academy of Public Administration, conducted a study entitled "Building Strong for Tomorrow: Recommendations for the Organizational Design of the NOAA Climate Service," and concluded that they "strongly support the creation of a NOAA Climate Service to be established as a line office in NOAA."

Our collective experience tells us that consolidating NOAA's widely distributed climate capabilities into a single management structure will create a more efficient and responsive agency. A single entry point will make NOAA a more coordinated and efficient partner that can provide climate information and services that are calibrated to meet our nation's current and future needs. This is good government and good for those who depend on climate-related information to inform decisions in their lives, businesses, and communities.

Businesses, individuals and governments in communities across America are demanding authoritative, trusted and timely information from NOAA today to help them prepare and plan for a more sustainable future. The longer we wait, the greater the delay in establishing an organization that can serve the needs of the American people and help catalyze a private sector climate services industry much like that which has evolved with our weather enterprise. Clearly, establishing a Climate Service in NOAA is an idea whose time has come. We urge you to approve the fiscal year 2012 proposal to establish a Climate Service in NOAA.

Sincerely,

D. James Baker
NOAA Administrator, 1993 - 2001

Conrad C. Lautenbacher
NOAA Administrator, 2001 - 2008

cc:
The Honorable Daniel K. Inouye
The Honorable Thad Cochran
The Honorable Kay Bailey Hutchison
The Honorable John D. Rockefeller
The Honorable Harold Rogers
The Honorable Norm Dicks
The Honorable Chaka Fattah
The Honorable Frank R. Wolf
The Honorable Barbara A. Mikulski

June 21, 2011

The Honorable Ralph M. Hall
Chairman

The Honorable Bernice Johnson
Ranking Member

House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Hall and Representative Johnson:

Basic weather and climate information is of critical importance to American business – for local growth and global competitive advantage – we therefore respectfully request that you support NOAA's efforts to create a line office for Climate Service.

Potential changes in precipitation (including drought in the Southwest), river flooding and runoff, sea-level rise, severe storms, storm surges, and other factors directly influence operational and investment decisions in many economic sectors, including agriculture, manufacturing, retail, insurance, transportation and energy.

Long-range forecasts and other outlooks provide information about the likelihood and magnitude of these changes beyond the typical two-week weather forecast and are essential to identifying and reducing many types of short- and long-term financial risks borne by commercial interests. For example, managing risk related to storm surge in our U.S. coastal areas (which have an estimated insured value of $9 trillion) depends upon anticipating how sea-level rise and coastal storm patterns may change through time.

A growing awareness among U.S. businesses that customers, supply chains, infrastructure and operations may be adversely affected by changes in the climate is creating a demand for commercial climate services. The burgeoning U.S. climate service industry (currently estimated to exceed $4 billion in annual revenue) is, however, dependent on credible and accessible information about the physical climate system. By creating a line office within NOAA that is dedicated to providing basic climate-related information, these newly emerging commercial providers and their growing customer bases will benefit by having a single access point for vetted information collected or developed by a wide variety of NOAA programs.

We applaud the Committee's continued support of climate change R&D at NOAA and all of the other agencies that comprise the U.S. Global Change Research Program. A key next step in transforming the advances in our understanding of climate into the actionable information that decision-makers need is the creation of a single point of access for basic climate information. We therefore respectfully request that you support NOAA efforts to establish a line office for Climate Service.

Sincerely,

AccuWeather
Alliance for Earth Observations
American Geophysical Union
American Association of Port Authorities (AAPA)
American Weather and Climate Industry Association (AWICA)
Asheville Buncombe Sustainability Initiatives, Inc.
Atmospheric and Environmental Research (AER)
Biltmore Farms, LLC
The Campaign for Environmental Literacy
Centers for Environment and Climate Interactions (CECI)
Computer Sciences Corporation (CSC)
CMG, Inc.
The Elumenati
GeoEye Foundation
I.M. Systems Group
National Weather Service Employees Organization
The Planetary Society
Raytheon Intelligence and Information Systems
Reinsurance Association of America
UNC-Asheville's National Environmental Modeling and Analysis Center (NEMAC)
University Corporation for Atmospheric Research (UCAR)
WeatherBank, Inc.
ZedX, Inc.

Cc: The Honorable Frank R. Wolf
The Honorable Chaka Fattah

Southern Regional Climate Center

Powered by ACIS
NOAA Regional Climate Centers

June 21, 2011

The Honorable Eddie Bernice Johnson
Ranking Member, Committee on Science, Space and Technology
394 Ford House Office Building
Washington, DC 20515

Dear Ranking Member Johnson:

During your hearing examining NOAA's Climate Service proposal, I urge you to support NOAA's efforts to establish an integrated and comprehensive system of climate data and information, research, education, and outreach for the benefit of government, industry, economic development, and the citizens of the United States.

The Southern Regional Climate Center, primarily funded through Congressional support for more than 20 years, has worked closely with NOAA to provide climate services to a wide array of customers in private and public sectors. During this time we have observed an evolution of customer needs for climate data and information that has become increasingly sophisticated. Customers no longer rely on the provision of historical climate information, alone, to guide their decisions. Rather, they demand integrated climate information to support their decision-making processes that includes historical data products, short-term forecasts and longer-term climate outlooks. This information includes in-situ observations, remotely sensed data, and (increasingly) model output forecasts and projections. Their decisions rely on an understanding that unbiased climate information allows them to be better informed of increasing climate variability and change that affect their short-term and long-term planning processes; information that is best supplied by organizations committed to open data sharing and peer reviewed techniques to provide the best information currently available.

In order to supply this information the Regional Climate Centers rely on NOAA climate data, modeling, and education products that provide a consistent national information framework. We add a regional perspective tailored to climate and environmental issues, industries, and economic sector differences that occur at the regional level. Our long-term relationship with regional customers and collaborators has established trust in the information we distribute, provides regional feedback to NOAA, and helps improve national products at the regional level.

Coordination of resources and activities within a NOAA Climate Service will improve the quality of climate information to benefit the national economy, protect natural and built environments, and improve decisions influenced by climate variability and change. Your approval and support of a reorganization effort to establish a NOAA Climate Service will provide positive benefits for present and future generations.

Thank you for your consideration.

Sincerely,

Kevin Robbins

Dr. Kevin Robbins
Director, Southern Regional Climate Center
Chair, Geography and Anthropology

MRCC
Midwestern Regional Climate Center
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Email: mrcc@isws.illinois.edu

June 20, 2011

The Honorable Eddie Bernice Johnson
Ranking Member, Committee on Science, Space and Technology
394 Ford House Office Building
Washington, DC 20515

Dear Ranking Member Johnson,

I am writing to respectfully request your support of NOAA's Climate Service proposal.

The Midwestern Regional Climate Center has a 23-year history of delivery of climate services and information that provide practical solutions to specific climate problems, and allow us to develop climate information for the Midwest on climate-sensitive issues such as agriculture, climate change, energy, the environment, human health, risk management, transportation, and water resources. The demand for these services continues to increase. Our web site receives more than one million hits per month, and our service office receives telephone calls, email, and faxes from businesses and the general public requesting a variety of climate information used in every-day decisions.

A vital component to our being able to respond to the many requests for information has been our partnership with NOAA. The establishment of a Climate Service will strengthen that partnership between NOAA and all climate service partners, including the Regional Climate Centers and the State Climatologists, and will provide for a more coordinated and efficient delivery of climate services to the nation.

Again, I urge you to support NOAA's Climate Service proposal in your deliberations of the House Committee on Science, Space, and Technology on Wednesday, June 22.

Thank you for your consideration.

Respectfully,

Steven D. Hilberg
Director
217-333-8495
Fax: 217-244-0220
Email: hberg@illinois.edu

The Midwestern Regional Climate Center is a cooperative program of the Illinois State Water Survey and the National Climatic Data Center (National Oceanic and Atmospheric Administration, U.S. Department of Commerce)

The Illinois State Water Survey is a division of the Prairie Research Institute at the University of Illinois

Desert Research Institute

SCIENCE • ENVIRONMENT • SOLUTIONS

20 June 2011

The Honorable Ralph Hall
Chairman, Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Hall:

I am writing you in support of the proposed NOAA climate service. The Western Regional Climate Center, which is partially supported by NOAA, but also by other federal agencies and the private sector, serves the 11 western states including Alaska and Hawaii. We provide climate data and information to a large customer base representing sectors including water, agriculture, recreation/tourism, legal, engineering, manufacturing, insurance, utilities, transportation and education. We routinely receive very enthusiastic and supportive responses to this service from every one of these sectors. Nearly 80% of our customer contacts represent business interests. Our web site contains substantial amounts of climate data and information freely available for the public – we receive approximately 3.0 million user web hits per month. Clearly, the public interest in climate data and information is significant.

The weather data that NOAA collects and provides, along with numerous climate related products they generate, are critical for us to maintain our services to the user community. Initiation of a NOAA climate service is important for streamlining weather/climate data collection and archiving, reducing non-relevant redundancies, increasing interagency and partner coordination and collaboration, and increasing efficiencies to reduce tax-payer costs.

I ask that you allow NOAA to organize their proposed climate service. The quarter century of Congressionally supported Regional Climate Center experience with these sectors strongly affirms that this will benefit the Nation's economic interests and its global competitiveness. Weather and climate fluctuations have a pervasive and substantial impact on the daily lives of nearly every citizen and business. Society is demanding more climate information, and we want to be able to efficiently and effectively meet these needs. A NOAA climate service will very much help address the public demands.

Thank you for considering this matter.

Sincerely,

Dr. Timothy Brown
Director, Western Regional Climate Center
Tel: 775-674-7090; Email: tim.brown@dri.edu

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