



November 5, 2013

The Honorable Lamar S. Smith  
Chairman, Committee on Science, Space,  
and Technology  
Committee on Science, Space and Technology  
U.S. House of Representatives  
Washington, D.C. 20515

Dear Mr. Chairman:

This letter provides the Department of Commerce's (Commerce) views on H.R. 2413, the *Weather Forecasting Improvement Act of 2013*, as marked up by the Subcommittee on Environment (Subcommittee). Commerce and, in particular, Commerce's National Oceanic and Atmospheric Administration (NOAA), welcome the Subcommittee's interest in improving NOAA's weather forecasting capabilities. Although Commerce supports the intent of this bill to improve weather forecasting and prediction of high impact weather events, such as tornadoes and hurricanes, as explained below and in the enclosure, Commerce has serious concerns with the bill as passed by the Subcommittee on July 9, 2013.

Commerce is concerned that this bill would prioritize weather research at the expense of climate and oceans research, particularly because it authorizes appropriations out of amounts made available to NOAA's Office of Oceanic and Atmospheric Research (OAR) and directs NOAA to prioritize and redirect NOAA resources to weather research. Reducing resources for ocean and climate research would jeopardize core activities that are critical to improving weather forecasting because the patterns of the ocean and atmosphere are inextricably linked. NOAA's current weather forecast models rely on robust observations of the oceans and the atmosphere at all time scales, short to long term. Additionally, the understanding of weather phenomena gained through ocean and climate research, as well as weather research directly, is essential to the operation of these models and the development of new models and model improvements. For example, continuing long-term oceanic and atmospheric observations, delivering seasonal El Niño Southern Oscillation forecasts, and understanding and predicting key climate factors are fundamental to NOAA's ability to forecast the number and intensity of extreme weather events, such as droughts and floods, heat and cold waves, and hurricanes and tornadoes. Therefore, shifting funding from oceans and climate research is counterproductive to the Subcommittee's goal of improving weather forecasting capabilities.

Furthermore, although H.R. 2413 focuses on the important work OAR does with the National Weather Service (NWS) to transition its research projects to operational products, it does not recognize the importance of other, longer-term OAR projects for weather forecasting. The legislation would direct NOAA to prioritize its research and development on short-term projects to improve weather forecast models at the expense of long-term research activities that are necessary to maintain forecasting capabilities in the future. OAR's work on longer-term model development, radars, and research ensures that the next generation of products will be available

to keep NWS at the forefront of weather forecasting five to twenty years from now. Focusing research efforts solely on short-term forecasting will weaken NWS forecasting capabilities in the long term. This short-term focus is particularly evident in the bill's reallocation of computing resources to operational weather prediction under Section 9(4). Commerce also notes that recent upgrades to NOAA operational computers, which likely are unaccounted for in the bill, will pave the way for the transition of OAR research projects to the NWS for operational use.

Commerce supports this bill's intent to increase funding for observational, computing, and modeling capabilities to improve weather forecasting and prediction of high impact weather events, but not at the expense of critical oceans and atmospheric research or long-term research activities necessary for improving NOAA's weather forecasting capability. Commerce includes specific suggestions to address its concerns in the enclosed comments and strengthen the legislation.

We appreciate the opportunity to present these views on H.R. 2413. The Office of Management and Budget has advised that there is no objection to the transmittal of these views from the standpoint of the Administration's program. If you have any questions, please call me, or Margaret Cummisky, Assistant Secretary for Legislative and Intergovernmental Affairs, at 482-3663.

Sincerely,

A handwritten signature in dark ink, appearing to read "Justin S. Antonipillai", written over a horizontal line.

Justin S. Antonipillai  
Acting General Counsel

Enclosure

cc: The Honorable Eddie Bernice Johnson  
Ranking Member

The Honorable Chris Stewart  
Chairman, Subcommittee on Environment

The Honorable Suzanne Bonamici  
Ranking Member, Subcommittee on Environment

## **Technical Comments of the Department of Commerce on H.R. 2413, the “Weather Forecasting Improvement Act of 2013”**

### **Long Title**

The long title declares this legislation is a bill to prioritize and redirect resources of the National Oceanic and Atmospheric Administration (NOAA) to a program of investment on near-term advances in observational, computing, and modeling capabilities to deliver weather forecasting improvements. As explained in the transmittal letter, Commerce is concerned that this bill would prioritize weather research at the expense of climate and oceans research. Because the patterns of the ocean and atmosphere are inextricably linked, this direction would be counterproductive to the goal of improving weather forecasting. Furthermore, the focus on “near-term” advances would direct NOAA to prioritize its research and development on short-term projects to improve weather forecast models at the expense of long-term research activities that are necessary to maintain forecasting capabilities in the future. Therefore, Commerce recommends striking “prioritize and redirect NOAA resources to” and inserting “authorize” and recommend striking “on near-term, affordable, and attainable” and inserting “for.” With these amendments, the long title would read, “To authorize a focused program for advances in observational, computing, and modeling capabilities to deliver substantial improvement in weather forecasting and prediction of high impact weather events, such as tornadoes and hurricanes, and for other purposes.”

### **Section 2. Public Safety Priority**

Section 2 requires the Under Secretary to make weather-related activities the top priority in planning and management of programs within all relevant line offices. NOAA already places a high priority on its weather mission. As in the section above, Commerce is concerned that this language will prioritize weather research at the expense of climate and oceans research, which is counterproductive to improving weather forecasting. Therefore, Commerce recommends striking “the top” and replacing with “a high,” so that the language reads, “...the Under Secretary shall make such weather-related activities a high priority in the planning and management of programs within all relevant line offices.”

### **Section 4. Tornado Warning Lead Time Extension Program**

Section 4(d) requires the Under Secretary to transmit annually to Congress a proposed budget corresponding to the activities identified in the plan for the tornado warning extension program. The Department of Commerce, rather than the Under Secretary, transmits the budget to Congress. Accordingly, Commerce recommends amending “Under Secretary” to “Secretary of Commerce” in Section 4(d).

### **Section 5. Hurricane Warning Precision Program**

Section 5 proposes to create a Hurricane Warning Precision Program, the goal of which would be to “develop and extend accurate hurricane forecasts and warnings in order to reduce loss of life, injury, and damage to the economy.” Section 5 is duplicative of the Hurricane Forecast Improvement Project (HFIP) and its funded activities. Commerce recommends striking this

section or, alternatively, amending “Hurricane Warning Precision Program” to read “Hurricane Forecast Improvement Program,” where it occurs. In addition, because the existing HFIP is led by the National Weather Service (NWS), Commerce recommends amending subsection (a) to read: “In carrying out section 3, the *Under Secretary of Commerce for Oceans and Atmosphere* shall continue the Hurricane Forecast Improvement Project, in consultation with the Assistant Administrators for NWS, OAR and the National Environmental Satellite, Data, and Information Service (NESDIS).” Similar text alterations should be made in subsection (c) to indicate NWS will issue plans in coordination with OAR. This research is very close to an operational status, but many critical parts are performed by OAR. We recommend continued support of the HFIP, an example of successful collaboration among OAR, NWS, and NESDIS, as well as external partners.

Furthermore, as in Section 4(d), Section 5(d) requires the Under Secretary to transmit annually to Congress a proposed budget corresponding to the activities identified in the plan. For the same reasons discussed above, Commerce recommends amending “Under Secretary” to read “Secretary of Commerce” in Section 5(d).

## **Section 7. Observing System Planning**

Section 7(2) directs the Under Secretary of Commerce for Oceans and Atmosphere to undertake, using Observing System Experiments (OSEs), Observing System Simulation Experiments (OSSEs), and other assessment tools, ongoing systematic evaluations of the combined observing systems, data, and information necessary to meet the requirements of Section 7(1), which requires the Under Secretary to develop and maintain a prioritized list of observation data requirements to ensure weather forecasting capabilities to protect life and property. Commerce appreciates the Subcommittee’s recent amendment to Section 7(2), which allows NOAA the flexibility to use OSEs, OSSEs, and other assessment tools in carrying out these systemic evaluations, but recommends amending the language of Section 7(2) to “undertake, using quantitative and other assessment tools, ongoing systematic evaluations of the combination of observing systems, data, and information needed to meet the requirements developed under paragraph (1), examining various options to maximize observational capabilities and their cost effectiveness.” Furthermore, while Commerce appreciates the flexibility to use various assessment tools under Section 7(2), Commerce recommends limiting these assessments to future systems and not on programs that are already on-orbit or those so advanced in the acquisition cycle that Commerce would not reasonably be able to terminate them.

## **Section 8. Observing System Simulation Experiments**

Section 8(a) requires the NOAA Assistant Administrator of OAR to undertake OSSEs to quantitatively assess the relative value and benefits of observing systems in support of the requirements of Section 7, whereas Section 8(c) requires NOAA to conduct OSSEs prior to (1) the acquisition of major Government-owned or Government-leased operational observing systems, and (2) the purchase of major new commercially provided data. As a preliminary matter, Commerce is unclear as to whether the Subcommittee intends that Section 8(c) would limit the requirement that NOAA conduct OSSEs under Section 8(a) only when acquiring major Government-owned or -leased operational observing systems and major new commercially

provided data. As with assessments required under Section 7(2), requiring NOAA to conduct OSSEs (or any quantitative assessment tool) for its current observing systems or those already in an advanced stage of acquisition would be unnecessarily burdensome if there is no reasonable, cost-effective way to alter or abandon them. Therefore, Commerce recommends merging Section 8(c) into Section 8(a) to limit the requirement that NOAA conduct OSSEs only prior to the acquisitions laid out in Section 8(c).

Conversely, if the Subcommittee's intent in Section 8(a) is to require OSSEs on an ongoing basis for assessing the relative value of observing systems in support of the requirements of Section 7, then 8(a) is in conflict with Section 7(2), because Section 7(2) allows the flexibility to use OSEs, OSSEs, and other assessment tools to undertake the required evaluations, whereas Section 8(a) would require the use of OSSEs to accomplish the same purpose. Section 8 requires NOAA to undertake OSSEs to quantitatively assess the relative value and benefits of observing capabilities and systems. Commerce understands that the Subcommittee's intent is to ensure that NOAA uses quantitative analysis to determine the best suite of observing systems at the optimal cost. OSSEs, however, are not always the most effective tool for accomplishing that goal because they can be expensive and time-consuming. NOAA needs flexibility to determine the most appropriate quantitative analysis tools to assess observing systems. Therefore, similar to Commerce's suggested amendments to Section 7(2), Commerce recommends amending the language in Sections 8(a), (b), and (c) to replace "OSSEs" wherever it appears with "quantitative analysis and other assessment tools" to provide NOAA with this flexibility.

Furthermore, under Section 8(c), only "major" Government-owned or Government-leased operational observing system and commercially provided data would trigger the requirement to perform an OSSE. Because the term "major" is not defined or quantified in the bill, Commerce recommends clarifying the threshold for "major" with regard to these acquisitions.

Finally, Section 8(d) requires NOAA to conduct two specific "Priority OSSEs," one for Global Positioning System radio occultation (GPS-RO) and one for a geostationary hyperspectral sounder global constellation, by June 30, 2014. While NOAA is already planning to conduct these OSSEs, Commerce suggests that the timeline be extended to June 30, 2015, to give adequate time for these assessments to be completed.

## **Section 9. Computing Resources Prioritization Report**

Section 9 requires the NOAA Chief Information Officer (CIO) to issue a plan, updated annually, to support NOAA's advanced research and operational weather prediction models with high performance computing (HPC). The plan must balance research and operational model needs and reallocate existing advanced computing resources from lower priority uses to improve operational weather prediction. Commerce is concerned that Section 9 would direct funding away from OAR's oceans and climate research and into HPC for operational weather prediction at the expense of weather research and oceans and climate uses. Commerce cautions against a reallocation of resources that would result in such an outcome because it would have a serious negative impact on NOAA's ability to develop the next generation of ocean, climate, and ultimately, weather models. In addition to operational supercomputing, cutting-edge HPC for ocean and climate research is also essential to the development of next generation weather services and products. For example, seasonal to inter-annual "earth system" climate models are

essential to advancing long-term weather forecasts for extreme events such as drought and floods. Commerce recommends that the balance between research and operation requirements be driven by the needs of the user community, and therefore encourages the Committee to reconsider the balance between the weather operations and the oceans and climate research supercomputing currently reflected in this bill.

Specifically, Commerce has concerns about Section 9(4), which directs the NOAA CIO to reallocate computing resources to operational weather prediction. Commerce is concerned that prioritizing operational needs over research needs will be counterproductive to the goal of achieving improvements in weather forecasting and would negate the requirement of balance between research and operational computational capacity outlined in Section 9(2). NOAA already has a robust computing allocation process in place that recognizes the importance of the broad spectrum of NOAA's responsibilities, including its operational weather mission. The NOAA High Performance Computing Board, whose membership includes all of the Line Office Deputy Assistant Administrators, oversees the High Performance Computing Allocation Committee. The Allocation Committee includes representatives from each of the HPC user communities within NOAA. Each fiscal year, these representatives develop an allocation plan based on the available computing capacity and the proposals received for that capacity. There are always far more requests than available computing capacity. In addition to requests from the traditional weather and climate user communities, the Allocation Committee evaluates requests from relatively new user communities in ecosystems, transportation, and coastal modeling. These communities have the potential to work in concert with the weather community to model impacts of severe weather on coastal communities and ecosystems. Accordingly, Commerce recommends striking Section 9(4).

Commerce also has concerns about the Subcommittee's intent in Section 9(3), which directs the NOAA CIO, in coordination with the Assistant Administrators of OAR and NWS, to "make its next generation weather prediction models available in beta-test mode to NOAA's operational forecasters, the American weather industry, and its partners in academic and government research..." Although some research projects currently make next generation models available in beta-test mode on a limited scale, broadening this practice may impose increased availability requirements on NOAA's research and development HPC. This would increase costs (higher availability HPC is more expensive to maintain) and potentially could limit the total available computing capacity for other important research needs. Commerce recommends striking this language or clarifying that this is not a requirement for every project.

As discussed above, Section 9(2) requires that the high performance plan "assures a balance between the research requirements to develop the next generation of regional and global models and its highly reliable operational models." The plan to restore U.S. leadership in weather forecasting and modeling outlined in Section 6 should assure this balance, and the NOAA CIO should develop a computing support plan under Section 9 that is consistent with this balance. Commerce recommends striking "assures a" or amending it to "is consistent with". While the distinction between "assures" and "is consistent with" may appear subtle, Commerce recommends this amendment to reinforce the concept of the mission requirements and priorities driving the implementation of computing plans.

Finally, while Commerce appreciates the Subcommittee's interest in upgrading NOAA's operational computing capabilities, such upgrades are already underway. Comments during the July 9<sup>th</sup> markup indicate that the Subcommittee members have not accounted for the recent major upgrade to NOAA's operational computers, which tripled NOAA's hardware operational capability. The *Disaster Relief Appropriations Act of 2013* also provides additional funds to improve operational and weather research computing in both FY 2014 and FY 2015. With these funds, NOAA's operational computing capability will increase tenfold by 2015. The FY 2014 President's Budget requests additional funds for NOAA to upgrade operational computing, which will provide a 27-fold increase in operational computing capability by 2015. That advancement will give NOAA unmatched operational computing capability and the ability to run the latest long-range forecast models with improved resolution. These upgrades will allow for the transition of research projects within OAR to NWS for operational use.

#### **Section 10. Commercial Weather Data**

Section 10(a) amends Section 60161 of title 51, U.S. Code, to clarify that the prohibition in this section of the U.S. Code on leasing, selling, or transferring weather data to the private sector or commercializing any portion of the weather satellite systems operated by Commerce does not extend to the purchase of weather data through contracts with commercial providers or the placement of weather satellite instruments on co-hosted government or private payloads. Although Commerce has no specific recommendation regarding this section, Commerce notes that NOAA already purchases data from commercial sources and engages in hosted payload agreements. NOAA continues to encourage private sector companies to pursue data technologies and continues to assess commercial entities' ability to provide this data in a cost-effective and reliable manner. Notwithstanding the clarification proposed in the amendment, NOAA must continue to ensure, however, that commercial systems can reliably provide the necessary data and at a cost equal to or lesser than NOAA's current systems.

#### **Section 12. Authorization of Appropriations**

Section 12 proposes to authorize appropriations to carry out this legislation out of funds made available for operations, research, and facilities in OAR. While Commerce understands the limitations of the current fiscal environment, this provision prioritizes weather-related activities at the expense of other critical mission research areas, which as we have outlined above, may be counterproductive to improving weather forecasting. Commerce recommends either striking this section or striking the language "Out of funds made available for operations, research, and facilities in OAR."

Furthermore, Commerce recommends amending the authorization language in Section 12 to include a statement that "these amounts are in addition to amounts otherwise authorized in other Acts." This language would provide NOAA with some flexibility in funding those activities under Section 3 that also fall under other NOAA program statutes and could help to avoid inadvertent violations of the Antideficiency Act.