

**COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON ENVIRONMENT
SUBCOMMITTEE REPORT**

H.R. 2413 The Weather Forecasting Improvement Act of 2013

I. Purpose

The purpose of H.R. 2413, sponsored by Rep. Jim Bridenstine, is to prioritize and redirect NOAA resources to a focused program of investment on near-term, affordable and attainable advances in observational, computing, and obtainable 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.

II. Background and Need for Legislation

Weather impacts American lives, and extreme weather poses significant risks to important parts of the U.S. economy. NOAA has traced a rise in weather disasters costing the economy up to \$1 billion in damage per weather event, and a recent analysis found that substantial parts of the economy are sensitive to weather variability, representing more than three percent of Gross Domestic Product and nearly \$500 billion a year.¹

Recent severe weather events in the United States have underscored the need for timely, accurate, and reliable weather forecasts. Within NOAA, the National Weather Service (NWS), the Office of Oceanic and Atmospheric Research (OAR), and the National Environmental Satellite, Data, and Information Service (NESDIS) play important roles in developing and deploying U.S. weather forecasting capabilities.² NOAA is joined in this effort by an ever-evolving private sector weather enterprise. The National Academy of Sciences recently emphasized the importance of this partnership, noting that “[p]rivate sector and other organizations provide sensor data, weather forecasts, and end-user services to a broad set of customers.”³

Rapid technological advances in computing and other areas such as remote sensing and advanced radar hold great promise to improve severe weather prediction, but have yet to be fully exploited. This promise was detailed in NOAA’s most recent *20 Year Research Vision*⁴, which asserted that

¹ <http://journals.ametsoc.org/doi/pdf/10.1175/2011BAMS2928.1>

² For more information on these responsibilities, see: “To Observe and Protect: How NOAA Procures Data for Weather Forecasting,” March 28, 2012, <http://science.house.gov/hearing/subcommittee-energy-and-environment-hearing-how-noaa-procures-data-weather-forecasting>.

³ <http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/Weather-Services-Report-Brief.pdf>.

⁴ http://nrc.noaa.gov/sites/nrc/Documents/Reduced%20file%20size_20%20yr%20Research%20Vision.pdf

emphasis on weather research and technological development will result in significant benefits to public safety:

“Severe storm and event warnings will save more lives and property. The enhanced information delivery systems of the future will be well coordinated and able to quickly disseminate severe storm and event warnings. The warnings themselves will see dramatic improvements. For example, tornado warning lead times will be on the order of one hour, rather than minutes. Technology like phased array radar, significant improvements in our understanding of meso-scale weather processes, and the development of models that embody this understanding will enable this accomplishment. Improvements in storm surge forecasting and increased tsunami monitoring/warning capacity will also greatly minimize loss of life and property damage from these hazards.”^{5,6}

Citing ongoing concerns about potential data gaps for NOAA’s polar-orbiting and geostationary satellite programs, including a potential polar-orbiting gap of 17 to 53 months, the Government Accountability Office added NOAA’s satellite programs to its High Risk List in 2013. This potential gap in weather satellite coverage and management problems with NOAA’s satellites has been the subject of several Science, Space, and Technology Committee hearings over many years. The GAO emphasized the potential effects of a gap:

According to NOAA program officials, a satellite data gap would result in less accurate and timely weather forecasts and warnings of extreme events, such as hurricanes, storm surges, and floods. Such degradation in forecasts and warnings would place lives, property, and our nation’s critical infrastructures in danger. Given the criticality of satellite data to weather forecasts, the likelihood of significant gaps and the potential impact of such gaps on the health and safety of the U.S. population and economy, GAO has concluded that the potential gap in weather satellite data is a high-risk area and added it to the High Risk List in 2013.⁶

In addition, independent reviews of NOAA’s weather research portfolio have also recommended a stronger emphasis on moving research-to-operations within NOAA’s weather portfolio. In 2010, the National Academy of Public Administration stated that OAR “provides particularly important institutional glue to support innovation across NOAA.”⁷ In April 2013, NOAA’s Science Advisory Board stated that “unless...science is transitioned into operations...NOAA will fail in its mission. NOAA must make certain that the intended end use of the scientific information is understood from the start by its researchers working on scientific questions and, ensure that internal as well as external end-user needs are incorporated explicitly into the problem formulation.”⁸

III. Subcommittee Actions

The Environment Subcommittee held a hearing on May 23, 2013 entitled “Restoring U.S. Leadership in Weather Forecasting.” The purpose of the hearing was to examine ways to

⁵ http://nrc.noaa.gov/sites/nrc/Documents/Reduced%20file%20size_20%20yr%20Research%20Vision.pdf

⁶ <http://www.gao.gov/assets/660/652133.pdf>

⁷ http://www.napawash.org/wp-content/uploads/2010/09/NAPA-Final-Report_NOAA-Climate-Service-Study_September-20101.pdf

⁸ <http://www.sab.noaa.gov/Reports/2013/SAB%20R&D%20Portfolio%20Review%20Report%20to%20NOAA%20FINAL.pdf>

improve the National Oceanic and Atmospheric Administration (NOAA) weather forecasting, and to receive testimony on draft legislation to prioritize weather-related research.

The Committee received testimony from: Mr. Barry Myers, Chief Executive Officer of AccuWeather, Inc. and Mr. Jon Kirchner, President of GeoOptics, Inc.

Witnesses discussed the current weather forecasting systems in the US and highlighted opportunities to improve weather forecasting through new technologies.

The Environment Subcommittee also held a hearing on June 26, 2013 entitled “Restoring U.S. Leadership in Weather Forecasting Part 2,” with the purpose of continuing the discussion of improving NOAA’s weather forecasting.

The Committee received testimony from: The Honorable Kathryn Sullivan, Acting Administrator at the National Oceanic and Atmospheric Administration; Dr. Kelvin Droegemeier, Vice President for Research, Regents’ Professor for Meteorology, Weathernews Chair Emeritus, University of Oklahoma; Dr. William Gail, Chief Technology Officer, Global Weather Corporation, President-Elect, American Meteorological Society; and Dr. Shuyi Chen, Professor, Meteorology and Physical Oceanography, Rosentiel School of Marine and Atmospheric Sciences, University of Miami.

The Subcommittee on Environment met to consider H.R. 2413 on July 9, 2013.

The Subcommittee considered 8 amendments, 4 were withdrawn and 3 were approved.

An amendment offered by Ms. Bonamici to strike the public safety priority was withdrawn.

An amendment offered by Mr. Stewart to make clarifying bill changes was agreed to by voice vote.

An amendment offered by Mr. Grayson to add specific weather events within the weather research section was agreed to by voice vote.

An amendment offered by Ms. Bonamici to strike the “Observing System Simulation Experiments” section was withdrawn.

An amendment offered by Mr. Grayson to add a hurricane warning program section was agreed to by voice vote.

An amendment offered by Ms. Edwards to strike the “Computing Resources Prioritization” section was defeated by a recorded vote of 6 nays and 4 yeas.

An amendment offered by Ms. Bonamici to strike the authorization of appropriations was withdrawn.

An amendment offered by Ms. Bonamici to insert authorizations for NOAA's Office of Atmospheric Research was withdrawn.

The bill, as amended, was agreed to by voice vote, and was favorably reported to the full Committee by voice vote.

IV. Section by Section Analysis

H.R. 2413, the Weather Forecasting Improvement Act of 2013, as amended by the Subcommittee on Environment on July 9, 2013

Section 1. Short Title. This section establishes the short title as the "Weather Forecasting Improvement Act of 2013".

Section 2. Public Safety Priority. This section directs the Under Secretary of the National Oceanic and Atmospheric Administration (NOAA Administrator) to make weather forecasting to protect lives and property NOAA's top planning and management priority in relevant line offices.

Section 3. Weather Research and Forecasting Innovation. This section directs the Assistant Administrator of the Office of Oceanic and Atmospheric Research (OAR) to undertake a weather research program and directs the Assistant Administrator to place priority emphasis on developing more accurate and timely warnings and forecasts of high impact weather events that endanger life and property. Section 3 further defines the specific program elements to include advanced radar, aerial systems, computing/modeling, and Observing System Stimulation Experiments (OSSE) and codifies a longstanding joint OAR-National Weather Service (NWS) tech transfer program, moving its funding from NWS. Finally, Section 3 directs NOAA to support academic weather research through competitive grants and contracts.

Section 4. Tornado Warning Extension Program. This section establishes a Tornado Warning Extension Program focused on developing and extending accurate tornado forecasts and warnings beyond one hour in order to reduce loss of life, injury, and damage to the economy.

Section 5. Hurricane Warning Precision Program. This section establishes a hurricane warning precision program aimed at developing and extending accurate hurricane forecasts and warnings in order to reduce loss of life, injury, and damage to the economy.

Section 6. Weather Research and Development Planning. Section 5 directs NOAA to develop a prioritized weather research plan to guide activities authorized under the Act and restore U.S. leadership in weather modeling, prediction, and forecasting. The section requires the plan to identify, through consultation with the National Science Foundation, the research necessary to integrate social science knowledge into weather forecast and warning processes.

Section 7. Observing System Planning. Section 6 directs NOAA to maintain a list of observation data requirements and systematically evaluate the combination of systems necessary to meet such requirements. This section further directs NOAA to identify current and potential future data gaps in observing capabilities and develop a range of options to address any identified gaps.

Section 8. Observing System Simulation Experiments. This section directs NOAA to undertake Observing System Simulation Experiments (OSSEs) to quantitatively assess the relative value and benefits of observing capabilities and systems. This section identifies specific instances when OSSEs must be performed.

Section 9. Computing Resources Prioritization Report. Section 9 directs NOAA to issue a plan that: (1) assures that NOAA aggressively pursues the newest, fastest, and most cost effective high performance computing technologies in support of its weather prediction mission; (2) assures a balance between the research requirements; (3) takes advantage of advanced development concepts; and (4) identifies opportunities to reallocate existing advanced computing resources from lower priority uses to improve operational weather prediction.

Section 10. Commercial Weather Data. This section clarifies that restrictions in existing law prohibiting the sale of weather satellite systems to the private sector do not extend to the purchase of weather data through contracts with commercial providers or the placement of instruments on private payloads.

Section 11. Definitions. This section provides definitions for terms in the bill.

Section 12. Authorization of Appropriations. Section 11 authorizes, out of funds made available for OAR's operations, research, and facilities appropriations account, \$100 million for each of Fiscal Years 2014 through 2017 to carry out the weather research program established under section 3. It further specifies that out of the \$100 million provided in this section, \$80 million is authorized for weather laboratories and cooperative institutions and \$20 million is authorized for weather and air chemistry research programs. Finally, this section also authorizes \$20 million annually to carry out the joint technology transfer initiative described in section 3.