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(Original Signature of Member)

114TH CONGRESS
1ST SESSION

H. R. _____

To improve the National Oceanic and Atmospheric Administration's weather research through a focused program of investment on affordable and attainable advances in observational, computing, and modeling capabilities to support substantial improvement in weather forecasting and prediction of high impact weather events, to expand commercial opportunities for the provision of weather data, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To improve the National Oceanic and Atmospheric Administration's weather research through a focused program of investment on affordable and attainable advances in observational, computing, and modeling capabilities to support substantial improvement in weather forecasting and prediction of high impact weather events, to expand commercial opportunities for the provision of weather data, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Weather Research and Forecast Innovation Act of 2015''.

SEC. 2. PUBLIC SAFETY PRIORITY.

In accordance with NOAA's critical mission to provide science, service, and stewardship, the Under Secretary shall prioritize weather-related activities across all weather programs, including the provision of improved weather data, forecasts, and warnings for the protection of life and property and the enhancement of the national economy.

SEC. 3. WEATHER RESEARCH AND FORECASTING INNOVATION.

(a) PROGRAM.—The Assistant Administrator for OAR shall conduct a program to develop improved understanding of and forecast capabilities for atmospheric events and their impacts, placing priority on developing more accurate, timely, and effective warnings and forecasts of high impact weather events that endanger life and property.

(b) PROGRAM ELEMENTS.—The program described in subsection (a) shall focus on the following activities:

(1) Improving the fundamental understanding of weather consistent with section 2, including the boundary layer and other atmospheric processes affecting high impact weather events.

(2) Improving the understanding of how the public receives, interprets, and responds to warnings and forecasts of high impact weather events that endanger life and property.

(3) Research and development, and transfer of knowledge, technologies, and applications to the NWS and other appropriate agencies and entities, including the American weather industry and academic partners, related to—

(A) advanced radar, radar networking technologies, and other ground-based technologies, including those emphasizing rapid, fine-scale sensing of the boundary layer and lower troposphere, and the use of innovative, dual-polarization, phased array technologies;

(B) aerial weather observing systems;

(C) high performance computing and information technology and wireless communication networks;

(D) advanced numerical weather prediction systems and forecasting tools and techniques that improve the forecasting of timing, track, intensity, and severity of high impact weather, including through—

(i) the development of more effective mesoscale models;

(ii) more effective use of existing, and the development of new, regional and national cloud-resolving models;

(iii) enhanced global weather models; and

(iv) integrated assessment models;

(E) quantitative assessment tools for measuring the impact and value of data and observing systems, including OSSEs (as described in section 8), OSEs, and AOAs;

(F) atmospheric chemistry and interactions essential to accurately characterizing atmospheric composition and predicting meteorological processes, including cloud microphysical, precipitation, and atmospheric electrification processes, to more effectively understand their role in severe weather; and

(G) additional sources of weather data and information, including commercial observing systems.

(4) A technology transfer initiative, carried out jointly and in coordination with the Assistant Administrator for NWS, and in cooperation with the

American weather industry and academic partners, to ensure continuous development and transition of the latest scientific and technological advances into NWS operations and to establish a process to sunset outdated and expensive operational methods and tools to enable cost-effective transfer of new methods and tools into operations.

(c) EXTRAMURAL RESEARCH.—

(1) IN GENERAL.—In carrying out the program under this section, the Assistant Administrator for OAR shall collaborate with and support the non-Federal weather research community, which includes institutions of higher education, private entities, and nongovernmental organizations, by making funds available through competitive grants, contracts, and cooperative agreements.

(2) SENSE OF CONGRESS.—It is the sense of Congress that not less than 30 percent of the funds for weather research and development at OAR and NWS should be made available for the purpose described in paragraph (1).

(d) REPORT.—The Under Secretary shall transmit to Congress annually, concurrently with NOAA's budget request, a description of current and planned activities under this section.

SEC. 4. TORNADO WARNING IMPROVEMENT AND EXTENSION PROGRAM.

(a) IN GENERAL.—The Under Secretary, in collaboration with the American weather industry and academic partners, shall establish a tornado warning improvement and extension program.

(b) GOAL.—The goal of such program shall be to reduce the loss of life and economic losses from tornadoes through the development and extension of accurate, effective, and timely tornado forecasts, predictions, and warnings, including the prediction of tornadoes beyond one hour in advance.

(c) PROGRAM PLAN.—Not later than 6 months after the date of enactment of this Act, the Assistant Administrator for OAR, in coordination with the Assistant Administrator for NWS, shall develop a program plan that details the specific research, development, and technology transfer activities, as well as corresponding resources and timelines, necessary to achieve the program goal.

(d) BUDGET FOR PLAN.—Following completion of the plan, the Assistant Administrator for OAR, in coordination with the Assistant Administrator for NWS, shall transmit annually to Congress a proposed budget corresponding to the activities identified in the plan.

SEC. 5. HURRICANE WARNING IMPROVEMENT PROGRAM.

(a) IN GENERAL.—The Under Secretary, in collaboration with the American weather industry and academic partners, shall maintain a hurricane warning improvement program, and continue to provide support for the Hurricane Forecast Improvement Project (HFIP).

(b) GOAL.—The goal of such program shall be to develop and extend accurate hurricane forecasts and warnings in order to reduce loss of life, injury, and damage to the economy.

(c) PROGRAM PLAN.—Not later than 6 months after the date of enactment of this Act, the Assistant Administrator for OAR, in coordination with the Assistant Administrator for NWS, shall develop a program plan that details the specific research, development, and technology transfer activities, as well as corresponding resources and timelines, necessary to achieve the program goal.

(d) BUDGET FOR PLAN.—Following completion of the plan, the Assistant Administrator for OAR, in coordination with the Assistant Administrator for NWS, shall transmit annually to Congress a proposed budget corresponding to the activities identified in the plan.

SEC. 6. WEATHER RESEARCH AND DEVELOPMENT PLANNING.

Not later than 6 months after the date of enactment of this Act, and annually thereafter, the Assistant Admin-

istrator for OAR, in coordination with the Assistant Administrators for NWS and NESDIS, shall issue a research and development and research to operations plan to restore and maintain United States leadership in numerical weather prediction and forecasting that—

(1) describes the forecasting skill and technology goals, objectives, and progress of NOAA in carrying out the program conducted under section 3;

(2) identifies and prioritizes specific research and development activities, and performance metrics, weighted to meet the operational weather mission of NWS to achieve a weather-ready Nation;

(3) describes how the program will collaborate with stakeholders, including the American weather industry and academic partners; and

(4) identifies, through consultation with the National Science Foundation, American weather industry, and academic partners, research necessary to enhance the integration of social science knowledge into weather forecast and warning processes, including to improve the communication of threat information necessary to enable improved severe weather planning and decisionmaking on the part of individuals and communities.

SEC. 7. OBSERVING SYSTEM PLANNING.

The Under Secretary shall—

(1) develop and maintain a prioritized list of observation data requirements necessary to ensure weather forecasting capabilities to protect life and property to the maximum extent practicable;

(2) undertake, using OSSEs, OSEs, AOAs, and other appropriate assessment tools, ongoing systematic evaluations of the combination of observing systems, data, and information needed to meet the requirements listed under paragraph (1), assessing various options to maximize observational capabilities and their cost-effectiveness;

(3) identify current and potential future data gaps in observing capabilities related to the requirements listed under paragraph (1); and

(4) determine a range of options to address gaps identified under paragraph (3).

SEC. 8. OBSERVING SYSTEM SIMULATION EXPERIMENTS.

(a) IN GENERAL.—In support of the requirements of section 7, the Assistant Administrator for OAR shall undertake OSSEs to quantitatively assess the relative value and benefits of observing capabilities and systems. Technical and scientific OSSE evaluations—

(1) may include assessments of the impact of observing capabilities on—

(A) global weather prediction;

(B) hurricane track and intensity forecasting;

(C) tornado warning lead times and accuracy;

(D) prediction of mid-latitude severe local storm outbreaks; and

(E) prediction of storms that have the potential to cause extreme precipitation and flooding lasting from 6 hours to 1 week; and

(2) shall be conducted in cooperation with other appropriate entities within NOAA, other Federal agencies, the American weather industry, and academic partners to ensure the technical and scientific merit of OSSE results.

(b) REQUIREMENTS.—OSSEs shall quantitatively—

(1) determine the potential impact of proposed space-based, suborbital, and in situ observing systems on analyses and forecasts, including potential impacts on extreme weather events across all parts of the Nation;

(2) evaluate and compare observing system design options; and

(3) assess the relative capabilities and costs of various observing systems and combinations of ob-

serving systems in providing data necessary to protect life and property.

(c) IMPLEMENTATION.—OSSEs—

(1) shall be conducted prior to the acquisition of major Government-owned or Government-leased operational observing systems, including polar-orbiting and geostationary satellite systems, with a lifecycle cost of more than $500,000,000; and

(2) shall be conducted prior to the purchase of any major new commercially provided data with a lifecycle cost of more than $500,000,000.

(d) PRIORITY OSSEs.—

(1) GLOBAL NAVIGATION SATELLITE SYSTEM RADIO OCCULTATION.—Not later than December 31, 2015, the Assistant Administrator for OAR shall complete an OSSE to assess the value of data from Global Navigation Satellite System Radio Occultation.

(2) GEOSTATIONARY HYPERSPECTRAL SOUNDER GLOBAL CONSTELLATION.—Not later than December 31, 2016, the Assistant Administrator for OAR shall complete an OSSE to assess the value of data from a geostationary hyperspectral sounder global constellation.

(e) RESULTS.—Upon completion of all OSSEs, results shall be publicly released and accompanied by an assessment of related private and public sector weather data sourcing options, including their availability, affordability, and cost effectiveness. Such assessments shall be developed in accordance with section 50503 of title 51, United States Code.

SEC. 9. COMPUTING RESOURCES PRIORITIZATION REPORT.

Not later than 12 months after the date of enactment of this Act, and annually thereafter, the NOAA Chief Information Officer, in coordination with the Assistant Administrator for OAR and the Assistant Administrator for NWS, shall produce and make publicly available a report that explains how NOAA intends to—

(1) continually support upgrades to pursue the fastest and most powerful and cost effective high performance computing technologies in support of its weather prediction mission;

(2) ensure a balance between the research to operations requirements to develop the next generation of regional and global models as well as highly reliable operational models;

(3) take advantage of advanced development concepts to, as appropriate, make next generation weather prediction models available in beta-test

mode to operational forecasters, the American weather industry, and partners in academic and government research; and

(4) use existing computing resources to improve advanced research and operational weather prediction.

SEC. 10. COMMERCIAL WEATHER DATA.

(a) AMENDMENT.—Section 60161 of title 51, United States Code, is amended by adding at the end the following: ''This prohibition shall not extend to—

''(1) the purchase of weather data through contracts with commercial providers; or

''(2) the placement of weather satellite instruments on cohosted government or private payloads.''.

(b) STRATEGY.—

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Secretary of Commerce, in consultation with the Under Secretary, shall transmit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a strategy to enable the procurement of quality commercial weather data. The strategy shall assess the range of commercial opportunities, including public-private

partnerships, for obtaining both surface-based and space-based weather observations. The strategy shall include the expected cost effectiveness of these opportunities as well as provide a plan for procuring data, including an expected implementation timeline, from these nongovernmental sources, as appropriate.

(2) REQUIREMENTS.—The strategy shall include—

(A) an analysis of financial or other benefits to, and risks associated with, acquiring commercial weather data or services, including through multiyear acquisition approaches;

(B) an identification of methods to address planning, programming, budgeting, and execution challenges to such approaches, including—

(i) how standards will be set to ensure that data is reliable and effective;

(ii) how data may be acquired through commercial experimental or innovative techniques and then evaluated for integration into operational use;

(iii) how to guarantee public access to all forecast-critical data to ensure that the American weather industry and the public

continue to have access to information critical to their work; and

(iv) in accordance with section 50503 of title 51, United States Code, methods to address potential termination liability or cancellation costs associated with weather data or service contracts; and

(C) an identification of any changes needed in the requirements development and approval processes of the Department of Commerce to facilitate effective and efficient implementation of such strategy.

(3) AUTHORITY FOR AGREEMENTS.—The Assistant Administrator for NESDIS may enter into multiyear agreements necessary to carry out the strategy developed under this subsection.

(c) PILOT PROGRAM.—

(1) CRITERIA.—Not later than December 31, 2015, NOAA shall publish criteria detailing its requirements for obtaining and utilizing space-based commercial weather data.

(2) PILOT CONTRACT.—

(A) CONTRACT.—Not later than October 1, 2016, NOAA shall, through an open competition, enter into at least one pilot contract with

a private sector entity to provide to NOAA commercial weather data in a manner that meets the criteria published under paragraph (1).

(B) ASSESSMENT OF DATA VIABILITY.—Not later than October 1, 2019, NOAA shall transmit to Congress the results of a determination of the extent to which data provided under the contract entered into under subparagraph (A) meet the criteria published under paragraph (1).

(3) OBTAINING FUTURE DATA.—NOAA shall, to the extent feasible, obtain commercial weather data from private sector providers.

(4) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated out of funds made available for procurement, acquisition, and construction at NESDIS $40,000,000 for carrying out this subsection.

SEC. 11. ENVIRONMENTAL INFORMATION SERVICES WORKING GROUP.

(a) ESTABLISHMENT.—The NOAA Science Advisory Board shall continue to maintain a standing working group named the Environmental Information Services

Working Group (in this section referred to as the ''Working Group'') to—

(1) provide advice for prioritizing weather research initiatives at NOAA to produce real improvement in weather forecasting;

(2) provide advice on existing or emerging technologies or techniques that can be found in private industry or the research community that could be incorporated into forecasting at NWS to improve forecasting skill;

(3) identify opportunities to improve communications between weather forecasters, emergency management personnel, and the public; and to improve communications and partnerships among NOAA and the private and academic sectors; and

(4) address such other matters as the Science Advisory Board or the Working Group believes would improve the accuracy, timeliness, or cost effectiveness of weather forecasting.

(b) COMPOSITION.—

(1) IN GENERAL.—The Working Group shall be composed of leading experts and innovators from all relevant fields of science and engineering including atmospheric chemistry, atmospheric physics, meteor-

ology, hydrology, social science, risk communications, electrical engineering, and computer sciences.

(2) NUMBER.—The Working Group shall be composed of no fewer than 15 members. Nominees for the Working Group may be forwarded by the Working Group for approval by the Science Advisory Board. Members of the Working Group may choose a chair (or co-chairs) from among their number with approval by the Science Advisory Board.

(c) ANNUAL REPORT.—The Working Group shall transmit annually to the Science Advisory Board for submission to the Under Secretary a report on progress made by NOAA in adopting the Working Group's recommendations. The Science Advisory Board shall transmit this report to the Under Secretary. Within 30 days of receipt of such report, the Under Secretary shall transmit it to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

SEC. 12. INTERAGENCY WEATHER RESEARCH AND INNOVATION COORDINATION.

(a) ESTABLISHMENT.—The Director of the Office of Science and Technology Policy shall establish an Interagency Committee for Advancing Weather Services to improve coordination of relevant weather research and fore-

cast innovation activities across the Federal Government. The Interagency Committee shall—

(1) include participation by the National Aeronautics and Space Administration, the Federal Aviation Administration, NOAA and its constituent elements, the National Science Foundation, and such other agencies involved in weather forecasting research as the President determines are appropriate;

(2) identify and prioritize top forecast needs and coordinate those needs against budget requests and program initiatives across participating offices and agencies; and

(3) share information regarding operational needs and forecasting improvements across relevant agencies.

(b) CO-CHAIR.—The Federal Coordinator for Meteorology shall serve as a co-chair of this panel.

(c) FURTHER COORDINATION.—The Director shall take such other steps as are necessary to coordinate the activities of the Federal Government with those of the American weather industry, State governments, emergency managers, and academic researchers.

SEC. 13. OAR AND NWS EXCHANGE PROGRAM.

(a) IN GENERAL.—The Assistant Administrator for OAR and the Assistant Administrator for NWS may es-

tablish a program to detail OAR personnel to the NWS and NWS personnel to OAR.

(b) GOAL.—The goal of this program is to enhance forecasting innovation through regular, direct interaction between OAR's world-class scientists and NWS's operational staff.

(c) ELEMENTS.—The program shall allow up to 10 OAR staff and NWS staff to spend up to 1 year on detail. Candidates shall be jointly selected by the Assistant Administrator for OAR and the Assistant Administrator for NWS.

(d) REPORT.—The Under Secretary shall report annually to the Committee on Science, Space, and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate on participation in such program and shall highlight any innovations that come from this interaction.

SEC. 14. VISITING FELLOWS AT NWS.

(a) IN GENERAL.—The Assistant Administrator for NWS may establish a program to host postdoctoral fellows and academic researchers at any of the National Centers for Environmental Prediction.

(b) GOAL.—This program shall be designed to provide direct interaction between forecasters and talented academic and private sector researchers in an effort to

bring innovation to forecasting tools and techniques available to the NWS.

(c) SELECTION AND APPOINTMENT.—Such fellows shall be competitively selected and appointed for a term not to exceed 1 year.

SEC. 15. DEFINITIONS.

In this Act:

(1) AOA.—The term ''AOA'' means an Analysis of Alternatives.

(2) NESDIS.—The term ''NESDIS'' means the National Environmental Satellite, Data, and Information Service.

(3) NOAA.—The term ''NOAA'' means the National Oceanic and Atmospheric Administration.

(4) NWS.—The term ''NWS'' means the National Weather Service.

(5) OAR.—The term ''OAR'' means the Office of Oceanic and Atmospheric Research.

(6) OSE.—The term ''OSE'' means an Observing System Experiment.

(7) OSSE.—The term ''OSSE'' means an Observing System Simulation Experiment.

(8) UNDER SECRETARY.—The term ''Under Secretary'' means the Under Secretary of Commerce for Oceans and Atmosphere.

SEC. 16. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2015.—There are authorized to be appropriated for fiscal year 2015—

(1) $90,800,000 to OAR to carry out this Act, of which—

(A) $70,000,000 is authorized for weather laboratories and cooperative institutes; and

(B) $20,800,000 is authorized for weather and air chemistry research programs; and

(2) out of funds made available for research and development in NWS, an additional amount of $16,000,000 for OAR to carry out the joint technology transfer initiative described in section 3(b)(4).

(b) FISCAL YEARS 2016 AND 2017.—For each of fiscal years 2016 and 2017, there are authorized to be appropriated—

(1) $100,000,000 to OAR to carry out this Act, of which—

(A) $80,000,000 is authorized for weather laboratories and cooperative institutes; and

(B) $20,000,000 is authorized for weather and air chemistry research programs; and

(2) an additional amount of $20,000,000 for the joint technology transfer initiative described in section 3(b)(4).

(c) LIMITATION.—No additional funds are authorized to carry out this Act, and the amendments made by this Act.