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112TH CONGRESS
1ST SESSION

# H. R. 2258

To establish the National Hurricane Research Initiative to improve hurricane preparedness, and for other purposes.

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IN THE HOUSE OF REPRESENTATIVES

JUNE 21, 2011

Mr. HASTINGS of Florida (for himself, Ms. BORDALLO, Ms. WASSERMAN SCHULTZ, Ms. BROWN of Florida, Mr. FALEOMAVAEGA, Mr. PIERLUISI, and Mr. DEUTCH) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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# A BILL

To establish the National Hurricane Research Initiative to improve hurricane preparedness, 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 ''National Hurricane Research Initiative Act of 2011''.

**SEC. 2. DEFINITIONS.**

In this Act:

(1) DIRECTOR.—The term ''Director'' means the Director of the National Science Foundation.

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

(3) STATE.—The term ''State'' means any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, and any other territory or possession over which the United States has jurisdiction.

**SEC. 3. NATIONAL HURRICANE RESEARCH INITIATIVE.**

(a) REQUIREMENT TO ESTABLISH.—The Under Secretary and the Director shall establish an initiative known as the National Hurricane Research Initiative for the purposes described in subsection (b).

(b) PURPOSES.—The purposes of the National Hurricane Research Initiative shall be to set research objectives based upon the findings of the January 12, 2007, National Science Board report entitled ''Hurricane Warning: The Critical Need for National Hurricane Research Initiative''—

(1) to make recommendations to the National Science Board and the National Oceanic and Atmospheric Administration Science Advisory Board on such research;

(2) to assemble the science and engineering expertise of State or local government agencies or departments and nongovernmental entities (including universities and colleges and other research and academic institutions), through a multi-entity effort focused on—

(A) improving hurricane and other severe tropical storm forecasting capabilities, including formation, track, and intensity change;

(B) durable and resilient infrastructure; and

(C) mitigating impacts on coastal populations, the coastal built environment, and the natural coastal environment, including but not limited to, coral reefs, wetlands, and other natural systems that mitigate hurricane wind and storm surge impacts; and

(3) to make grants to eligible entities to carry out research in the following areas:

(A) PREDICTING HURRICANE INTENSITY CHANGE.—Research to improve understanding of—

(i) rapid change in storm size, motion, structure, and intensity;

(ii) storm internal dynamics; and

(iii) the interactions of the storm and its environmental conditions, including the atmosphere, ocean, and land surface.

(B) UNDERSTANDING OCEAN-ATMOSPHERE INTERACTIONS.—Observations, theory and modeling, to improve understanding of air-sea interaction in high wind speeds.

(C) PREDICTING STORM SURGE, RAINFALL, INLAND FLOODING, AND STRONG WINDS PRODUCED BY HURRICANES AND TROPICAL STORMS DURING AND AFTER LANDFALL.—Research to understand, model, and predict rainfall, flooding, high winds, the potential occurrence of tornadoes, and storm surge, including probabilistic modeling and mapping of risk.

(D) IMPROVED OBSERVATIONS OF HURRICANES AND TROPICAL STORMS.—Research to improve measurements of hurricanes and tropical storms through mobile radar platforms, Global Positioning Systems technology, unmanned vehicles, ground-based and wireless sensors, oceanic remote sensing technologies, and air-deployed ocean profilers and floats to improve our understanding of the complex na-

ture of storms and their interaction with the ocean and land.

(E) ASSESSING VULNERABLE INFRASTRUCTURE.—Research to develop a national engineering assessment of coastal infrastructure, including infrastructure related to levees, seawalls, drainage systems, bridges, water and sewage systems, power, and communications, to determine the level of vulnerability of such infrastructure to damage from hurricanes and to determine strategies to reduce such vulnerabilities.

(F) INTERACTION OF HURRICANES WITH ENGINEERED STRUCTURES.—Research to improve understanding of the impacts of hurricanes and tropical storms on buildings, structures, and housing combined with modeling essential for guiding the creation of improved building designs and construction codes in locations particularly vulnerable to hurricanes.

(G) RELATIONSHIP BETWEEN HURRICANES, CLIMATE, AND NATURAL ECOSYSTEMS.—Research to improve the understanding of complex relationships between hurricanes and climate, including research to deter-

mine the most effective methods to use observational information and numerical model simulations to examine the impacts on ecosystems over long and short periods of time, including but not limited to impacts on coral reefs, wetlands, and other natural systems that mitigate hurricane wind and storm surge impacts.

(H) TECHNOLOGIES FOR DISASTER RESPONSE AND RECOVERY.—Research to improve emergency communication networks for government agencies and non-government entities and to improve communications between such networks during disaster response and recovery, including cyber-security during disaster situations and the ability to improve damage assessments during storms.

(I) EVACUATION PLANNING.—Research to improve the manner in which hurricane-related information is provided to, and utilized by, the public and government officials, including research to assist officials of State or local government in determining the circumstances in which evacuations are required and in carrying out such evacuations.

(J) COMPUTATIONAL CAPABILITY.—Research to improve understanding of the efficient utility of multiple models requiring sharing and inter-operability of databases, computing environments, networks, visualization tools, and analytic systems beyond what is currently available for transitioning hurricane research assets into operational practice and to provide access to robust computational facilities beyond the facilities normally accessible by the civilian research community for the hurricane research enterprise, including data acquisition and modeling capability during hurricane events.

(c) COOPERATION WITH OTHER AGENCIES.—The Under Secretary and the Director shall cooperate with the head of each appropriate Federal agency or department, research institute, university, and disaster-response or nongovernmental organization to utilize the expertise and capabilities of such entity to carry out the purposes of the National Hurricane Research Initiative, including cooperation with the heads of the following entities:

(1) The National Aeronautics and Space Administration.

(2) The National Institute of Standards and Technology.

(3) The Department of Homeland Security, including the Federal Emergency Management Agency.

(4) The Department of Energy.

(5) The Defense Advanced Research Project Agency.

(6) The Environmental Protection Agency.

(7) The United States Geological Survey.

(8) The Army Corps of Engineers.

(d) COORDINATION.—The White House Office of Science and Technology Policy, through the National Science and Technology Council, shall coordinate the activities carried out by the United States related to the National Hurricane Research Initiative as a formal program with a well defined organizational structure and execution plan.

(e) GRANTS.—

(1) AUTHORITY.—The Under Secretary and the Director may award grants to appropriate State and local governmental agencies or departments, research universities or nongovernmental entities to carry out the purposes described in subsection (b).

(2) BEST PRACTICES.—The Under Secretary and the Director shall develop and make available to the public a description of best practices to be used

to carry out a project with a grant awarded under this subsection.

(f) RESEARCH SEMINARS AND FORUMS.—The Under Secretary and the Director shall carry out a series of national seminars and forums that assemble a broad collection of scientific disciplines to direct researchers to work collaboratively to carry out the purposes described in subsection (b).

(g) INITIAL RESEARCH TO DEVELOP IMPROVED HURRICANE INTENSITY FORECASTS AND IMPACT PROJECTIONS.—The Under Secretary and the Director shall within 120 days after the enactment of this Act issue a request for proposals to undertake the basic and applied research with an annual budget in the amounts as deemed appropriate by the Under Secretary and the Director to accomplish the desired research results during a 10-year term.

(h) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated $150,000,000 for each of the fiscal years 2012 through 2016 to carry out this section.

**SEC. 4. NATIONAL INFRASTRUCTURE DATABASE.**

(a) REQUIREMENT TO ESTABLISH.—The Under Secretary and the Director shall establish a National Infrastructure Database for the purposes of—

(1) cataloging and characterizing the physical, social, and natural infrastructure in order to provide a baseline for developing standards, measuring modification, and determining loss;

(2) providing information to Federal, State, and local government officials to improve information public policy related to hurricanes and tropical storms; and

(3) providing data to researchers to improve their ability to measure hurricane impacts, separate such impacts from other effects, both natural and anthropogenic, make effective recommendations for improved building codes and urban planning practices, and develop effective procedures for responding to infrastructure disruption.

(b) DATABASE REQUIREMENTS.—The National Infrastructure Database shall be a virtual, cyber environment that uses existing capabilities and facilities, and establishes new capabilities and facilities, as appropriate, to provide an interoperable environment and the necessary metadata and other resources needed by users of that Database.

(c) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated $10,000,000 for each of the fiscal years 2012 through 2016 to carry out this section.

**SEC. 5. NATIONAL HURRICANE RESEARCH MODEL.**

(a) REQUIREMENT TO ESTABLISH.—The Under Secretary and the Director shall develop a National Hurricane Research Model to conduct integrative research and to facilitate the transfer of research knowledge to operational applications, including linking relevant theoretical, physical, and computational models from atmospheric, oceanic, economic, sociological, engineered infrastructure, and ecologic fields, conducting experimental research to understand the extensive complexities of hurricanes, training of the next-generation hurricane researchers and forecasters, and obtaining measurable results in a comprehensive framework suitable for testing end-to-end integrative systems.

(b) SYSTEM REQUIREMENTS.—The National Hurricane Research Model shall be a physically distributed and highly coordinated working environment in which research from the National Hurricane Research Initiative can be experimentally substantiated using suitable quantitative metrics, and where a culture of interaction and collaboration can further be promoted, including in the areas of—

(1) facilities and cyber infrastructure;

(2) software integration; and

(3) fixed mobile data collection platforms and data provisioning systems.

(c) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated $75,000,000 for each of the fiscal years 2012 through 2016 to carry out this section.

**SEC. 6. JOINT POLAR SATELLITE SYSTEM.**

There is authorized to be appropriated $1,070,000,000 for fiscal year 2012 to carry out the Joint Polar Satellite System program.

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