

112TH CONGRESS
1ST SESSION

H. R. 2258

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

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

A BILL

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

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “National Hurricane
5 Research Initiative Act of 2011”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

8 (1) DIRECTOR.—The term “Director” means
9 the Director of the National Science Foundation.

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

4 (3) STATE.—The term “State” means any
5 State of the United States, the District of Columbia,
6 the Commonwealth of Puerto Rico, Guam, American
7 Samoa, the United States Virgin Islands, the North-
8 ern Mariana Islands, and any other territory or pos-
9 session over which the United States has jurisdic-
10 tion.

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

12 (a) REQUIREMENT TO ESTABLISH.—The Under Sec-
13 retary and the Director shall establish an initiative known
14 as the National Hurricane Research Initiative for the pur-
15 poses described in subsection (b).

16 (b) PURPOSES.—The purposes of the National Hurri-
17 cane Research Initiative shall be to set research objectives
18 based upon the findings of the January 12, 2007, National
19 Science Board report entitled “Hurricane Warning: The
20 Critical Need for National Hurricane Research Initia-
21 tive”—

22 (1) to make recommendations to the National
23 Science Board and the National Oceanic and Atmos-
24 pheric Administration Science Advisory Board on
25 such research;

1 (2) to assemble the science and engineering ex-
2 pertise of State or local government agencies or de-
3 partments and nongovernmental entities (including
4 universities and colleges and other research and aca-
5 demic institutions), through a multi-entity effort fo-
6 cused on—

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

10 (B) durable and resilient infrastructure;

11 and

12 (C) mitigating impacts on coastal popu-
13 lations, the coastal built environment, and the
14 natural coastal environment, including but not
15 limited to, coral reefs, wetlands, and other nat-
16 ural systems that mitigate hurricane wind and
17 storm surge impacts; and

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

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

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

25 (ii) storm internal dynamics; and

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

4 (B) UNDERSTANDING OCEAN-ATMOSPHERE
5 INTERACTIONS.—Observations, theory and mod-
6 eling, to improve understanding of air-sea inter-
7 action in high wind speeds.

8 (C) PREDICTING STORM SURGE, RAINFALL,
9 INLAND FLOODING, AND STRONG WINDS PRO-
10 DUCED BY HURRICANES AND TROPICAL STORMS
11 DURING AND AFTER LANDFALL.—Research to
12 understand, model, and predict rainfall, flood-
13 ing, high winds, the potential occurrence of tor-
14 nadoes, and storm surge, including probabilistic
15 modeling and mapping of risk.

16 (D) IMPROVED OBSERVATIONS OF HURRI-
17 CANES AND TROPICAL STORMS.—Research to
18 improve measurements of hurricanes and trop-
19 ical storms through mobile radar platforms,
20 Global Positioning Systems technology, un-
21 manned vehicles, ground-based and wireless
22 sensors, oceanic remote sensing technologies,
23 and air-deployed ocean profilers and floats to
24 improve our understanding of the complex na-

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

3 (E) ASSESSING VULNERABLE INFRASTRUC-
4 TURE.—Research to develop a national engi-
5 neering assessment of coastal infrastructure, in-
6 cluding infrastructure related to levees, sea-
7 walls, drainage systems, bridges, water and
8 sewage systems, power, and communications, to
9 determine the level of vulnerability of such in-
10 frastructure to damage from hurricanes and to
11 determine strategies to reduce such vulnerabili-
12 ties.

13 (F) INTERACTION OF HURRICANES WITH
14 ENGINEERED STRUCTURES.—Research to im-
15 prove understanding of the impacts of hurri-
16 canes and tropical storms on buildings, struc-
17 tures, and housing combined with modeling es-
18 sential for guiding the creation of improved
19 building designs and construction codes in loca-
20 tions particularly vulnerable to hurricanes.

21 (G) RELATIONSHIP BETWEEN HURRI-
22 CANES, CLIMATE, AND NATURAL ECO-
23 SYSTEMS.—Research to improve the under-
24 standing of complex relationships between hur-
25 ricanes and climate, including research to deter-

1 mine the most effective methods to use observa-
2 tional information and numerical model simula-
3 tions to examine the impacts on ecosystems
4 over long and short periods of time, including
5 but not limited to impacts on coral reefs, wet-
6 lands, and other natural systems that mitigate
7 hurricane wind and storm surge impacts.

8 (H) TECHNOLOGIES FOR DISASTER RE-
9 SPONSE AND RECOVERY.—Research to improve
10 emergency communication networks for govern-
11 ment agencies and non-government entities and
12 to improve communications between such net-
13 works during disaster response and recovery,
14 including cyber-security during disaster situa-
15 tions and the ability to improve damage assess-
16 ments during storms.

17 (I) EVACUATION PLANNING.—Research to
18 improve the manner in which hurricane-related
19 information is provided to, and utilized by, the
20 public and government officials, including re-
21 search to assist officials of State or local gov-
22 ernment in determining the circumstances in
23 which evacuations are required and in carrying
24 out such evacuations.

1 (J) COMPUTATIONAL CAPABILITY.—Re-
2 search to improve understanding of the efficient
3 utility of multiple models requiring sharing and
4 inter-operability of databases, computing envi-
5 ronments, networks, visualization tools, and
6 analytic systems beyond what is currently avail-
7 able for transitioning hurricane research assets
8 into operational practice and to provide access
9 to robust computational facilities beyond the fa-
10 cilities normally accessible by the civilian re-
11 search community for the hurricane research
12 enterprise, including data acquisition and mod-
13 eling capability during hurricane events.

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

22 (1) The National Aeronautics and Space Ad-
23 ministration.

24 (2) The National Institute of Standards and
25 Technology.

1 (3) The Department of Homeland Security, in-
2 cluding the Federal Emergency Management Agen-
3 cy.

4 (4) The Department of Energy.

5 (5) The Defense Advanced Research Project
6 Agency.

7 (6) The Environmental Protection Agency.

8 (7) The United States Geological Survey.

9 (8) The Army Corps of Engineers.

10 (d) COORDINATION.—The White House Office of
11 Science and Technology Policy, through the National
12 Science and Technology Council, shall coordinate the ac-
13 tivities carried out by the United States related to the Na-
14 tional Hurricane Research Initiative as a formal program
15 with a well defined organizational structure and execution
16 plan.

17 (e) GRANTS.—

18 (1) AUTHORITY.—The Under Secretary and the
19 Director may award grants to appropriate State and
20 local governmental agencies or departments, re-
21 search universities or nongovernmental entities to
22 carry out the purposes described in subsection (b).

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

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

3 (f) RESEARCH SEMINARS AND FORUMS.—The Under
4 Secretary and the Director shall carry out a series of na-
5 tional seminars and forums that assemble a broad collec-
6 tion of scientific disciplines to direct researchers to work
7 collaboratively to carry out the purposes described in sub-
8 section (b).

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

18 (h) AUTHORIZATION OF APPROPRIATIONS.—There is
19 authorized to be appropriated \$150,000,000 for each of
20 the fiscal years 2012 through 2016 to carry out this sec-
21 tion.

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

23 (a) REQUIREMENT TO ESTABLISH.—The Under Sec-
24 retary and the Director shall establish a National Infra-
25 structure Database for the purposes of—

1 (1) cataloging and characterizing the physical,
2 social, and natural infrastructure in order to provide
3 a baseline for developing standards, measuring modi-
4 fication, and determining loss;

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

9 (3) providing data to researchers to improve
10 their ability to measure hurricane impacts, separate
11 such impacts from other effects, both natural and
12 anthropogenic, make effective recommendations for
13 improved building codes and urban planning prac-
14 tices, and develop effective procedures for respond-
15 ing to infrastructure disruption.

16 (b) DATABASE REQUIREMENTS.—The National In-
17 frastructure Database shall be a virtual, cyber environ-
18 ment that uses existing capabilities and facilities, and es-
19 tablishes new capabilities and facilities, as appropriate, to
20 provide an interoperable environment and the necessary
21 metadata and other resources needed by users of that
22 Database.

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

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

2 (a) REQUIREMENT TO ESTABLISH.—The Under Sec-
3 retary and the Director shall develop a National Hurri-
4 cane Research Model to conduct integrative research and
5 to facilitate the transfer of research knowledge to oper-
6 ational applications, including linking relevant theoretical,
7 physical, and computational models from atmospheric,
8 oceanic, economic, sociological, engineered infrastructure,
9 and ecologic fields, conducting experimental research to
10 understand the extensive complexities of hurricanes, train-
11 ing of the next-generation hurricane researchers and fore-
12 casters, and obtaining measurable results in a comprehen-
13 sive framework suitable for testing end-to-end integrative
14 systems.

15 (b) SYSTEM REQUIREMENTS.—The National Hurri-
16 cane Research Model shall be a physically distributed and
17 highly coordinated working environment in which research
18 from the National Hurricane Research Initiative can be
19 experimentally substantiated using suitable quantitative
20 metrics, and where a culture of interaction and collabora-
21 tion can further be promoted, including in the areas of—

- 22 (1) facilities and cyber infrastructure;
23 (2) software integration; and
24 (3) fixed mobile data collection platforms and
25 data provisioning systems.

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

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

5 There is authorized to be appropriated
6 \$1,070,000,000 for fiscal year 2012 to carry out the Joint
7 Polar Satellite System program.

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