

111TH CONGRESS
1ST SESSION

H. R. 327

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

IN THE HOUSE OF REPRESENTATIVES

JANUARY 8, 2009

Mr. HASTINGS of Florida (for himself, Ms. ROS-LEHTINEN, Ms. WASSERMAN SCHULTZ, Mr. MARIO DIAZ-BALART of Florida, Mr. MEEK of Florida, Mr. BROWN of South Carolina, Mr. BISHOP of Georgia, Mr. MACK, Mr. LINCOLN DIAZ-BALART of Florida, Ms. BORDALLO, Ms. CASTOR of Florida, Mr. WEXLER, Mr. MCINTYRE, Mr. MOORE of Kansas, Mr. BILIRAKIS, Mr. WEINER, Mr. MELANCON, and Mr. BUCHANAN) introduced the following bill; which was referred to the Committee on Science 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 2009”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

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

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

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

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

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

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

24 (1) to make recommendations to the National
25 Science Board and the National Oceanic and Atmos-

1 pheric Administration Science Advisory Board on
2 such research;

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

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

12 (B) durable and resilient infrastructure;
13 and

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

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

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

- 1 (i) rapid change in storm size, motion,
2 structure, and intensity;
3 (ii) storm internal dynamics; and
4 (iii) the interactions of the storm and
5 its environmental conditions, including the
6 atmosphere, ocean, and land surface.

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

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

19 (D) IMPROVED OBSERVATIONS OF HURRI-
20 CANES AND TROPICAL STORMS.—Research to
21 improve measurements of hurricanes and trop-
22 ical storms through mobile radar platforms,
23 Global Positioning Systems technology, un-
24 manned vehicles, ground-based and wireless
25 sensors, oceanic remote sensing technologies,

1 and air-deployed ocean profilers and floats to
2 improve our understanding of the complex na-
3 ture of storms and their interaction with the
4 ocean and land.

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

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

23 (G) RELATIONSHIP BETWEEN HURRI-
24 CANES, CLIMATE, AND NATURAL ECO-
25 SYSTEMS.—Research to improve the under-

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

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

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

1 which evacuations are required and in carrying
2 out such evacuations.

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

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

24 (1) The National Aeronautics and Space Ad-
25 ministration.

1 (2) The National Institute of Standards and
2 Technology.

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

6 (4) The Department of Energy.

7 (5) The Defense Advanced Research Project
8 Agency.

9 (6) The Environmental Protection Agency.

10 (7) The United States Geological Survey.

11 (8) The Army Corps of Engineers.

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

19 (e) GRANTS.—

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

1 (2) BEST PRACTICES.—The Under Secretary
2 and the Director shall develop and make available to
3 the public a description of best practices to be used
4 to carry out a project with a grant awarded under
5 this subsection.

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

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

21 (h) AUTHORIZATION OF APPROPRIATIONS.—There is
22 authorized to be appropriated \$150,000,000 for each of
23 the fiscal years 2009 through 2013 to carry out this sec-
24 tion.

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

2 (a) **REQUIREMENT TO ESTABLISH.**—The Under Sec-
3 retary and the Director shall establish a National Infra-
4 structure Database for the purposes of—

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

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

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

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

1 (c) AUTHORIZATION OF APPROPRIATIONS.—There is
2 authorized to be appropriated \$10,000,000 for each of the
3 fiscal years 2009 through 2013 to carry out this section.

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

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

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

25 (1) facilities and cyber infrastructure;

1 (2) software integration; and

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

4 (c) AUTHORIZATION OF APPROPRIATIONS.—There is
5 authorized to be appropriated \$75,000,000 for each of the
6 fiscal years 2009 through 2013 to carry out this section.

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