

110TH CONGRESS
1ST SESSION

H. R. 2407

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

IN THE HOUSE OF REPRESENTATIVES

MAY 21, 2007

Mr. HASTINGS of Florida (for himself, Ms. ROS-LEHTINEN, Ms. WASSERMAN SCHULTZ, Mr. THOMPSON of Mississippi, Mr. MELANCON, Mr. TAYLOR, Mr. JINDAL, Mr. MEEK of Florida, Mr. KLEIN of Florida, Mr. WEXLER, Ms. CORRINE BROWN of Florida, Mr. MAHONEY of Florida, Mr. MARIO DIAZ-BALART of Florida, Mr. LINCOLN DIAZ-BALART of Florida, Mr. MCINTYRE, Mr. ORTIZ, Mr. JEFFERSON, Mr. KELLER of Florida, Mr. MACK, 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 2007”.

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

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

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

17 (1) to make recommendations to the National
18 Science Board and the National Oceanic and Atmos-
19 pheric Administration Science Advisory Board on
20 such research;

21 (2) to assemble the science and engineering ex-
22 pertise of State or local government agencies or de-
23 partments and nongovernmental entities (including
24 universities and colleges and other research and aca-

1 demic institutions), through a multi-entity effort fo-
2 cused on—

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

6 (B) durable and resilient infrastructure;
7 and

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

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

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

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

21 (ii) storm internal dynamics; and

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

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

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

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

24 (E) ASSESSING VULNERABLE INFRASTRUC-
25 TURE.—Research to develop a national engi-

1 neering assessment of coastal infrastructure, in-
2 cluding infrastructure related to levees, sea-
3 walls, drainage systems, bridges, water and
4 sewage systems, power, and communications, to
5 determine the level of vulnerability of such in-
6 frastructure to damage from hurricanes and to
7 determine strategies to reduce such
8 vulnerabilities.

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

17 (G) RELATIONSHIP BETWEEN HURRI-
18 CANES, CLIMATE, AND NATURAL ECO-
19 SYSTEMS.—Research to improve the under-
20 standing of complex relationships between hur-
21 ricanes and climate, including research to deter-
22 mine the most effective methods to use observa-
23 tional information and numerical model simula-
24 tions to examine the impacts on ecosystems
25 over long and short periods of time, including

1 but not limited to impacts on coral reefs, wet-
2 lands, and other natural systems that mitigate
3 hurricane wind and storm surge impacts.

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

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

21 (J) COMPUTATIONAL CAPABILITY.—Re-
22 search to improve understanding of the efficient
23 utility of multiple models requiring sharing and
24 inter-operability of databases, computing envi-
25 ronments, networks, visualization tools, and

1 analytic systems beyond what is currently avail-
2 able for transitioning hurricane research assets
3 into operational practice and to provide access
4 to robust computational facilities beyond the fa-
5 cilities normally accessible by the civilian re-
6 search community for the hurricane research
7 enterprise, including data acquisition and mod-
8 eling capability during hurricane events.

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

17 (1) The National Aeronautics and Space Ad-
18 ministration.

19 (2) The National Institute of Standards and
20 Technology.

21 (3) The Department of Homeland Security, in-
22 cluding the Federal Emergency Management Agen-
23 cy.

24 (4) The Department of Energy.

1 (5) The Defense Advanced Research Project
2 Agency.

3 (6) The Environmental Protection Agency.

4 (7) The United States Geological Survey.

5 (8) The Army Corps of Engineers.

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

13 (e) GRANTS.—

14 (1) AUTHORITY.—The Undersecretary and the
15 Director may award grants to appropriate State and
16 local governmental agencies or departments, re-
17 search universities or nongovernmental entities to
18 carry out the purposes described in subsection (b).

19 (2) BEST PRACTICES.—The Under Secretary
20 and the Director shall develop and make available to
21 the public a description of best practices to be used
22 to carry out a project with a grant awarded under
23 this subsection.

24 (f) RESEARCH SEMINARS AND FORUMS.—The Under
25 Secretary and the Director shall carry out a series of na-

1 tional seminars and forums that assemble a broad collec-
2 tion of scientific disciplines to direct researchers to work
3 collaboratively to carry out the purposes described in sub-
4 section (b).

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

14 (h) AUTHORIZATION OF APPROPRIATIONS.—There is
15 authorized to be appropriated \$285,000,000 for each of
16 the fiscal years 2008 through 2018 to carry out this sec-
17 tion.

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

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

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

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

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

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

19 (c) **AUTHORIZATION OF APPROPRIATIONS.**—There is
20 authorized to be appropriated \$20,000,000 for each of the
21 fiscal years 2008 through 2018 to carry out this section.

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

23 (a) **REQUIREMENT TO ESTABLISH.**—The Under Sec-
24 retary and the Director shall develop a National Hurri-
25 cane Research Model to conduct integrative research and

1 to facilitate the transfer of research knowledge to oper-
2 ational applications, including linking relevant theoretical,
3 physical, and computational models from atmospheric,
4 oceanic, economic, sociological, engineered infrastructure,
5 and ecologic fields, conducting experimental research to
6 understand the extensive complexities of hurricanes, train-
7 ing of the next-generation hurricane researchers and fore-
8 casters, and obtaining measurable results in a comprehen-
9 sive framework suitable for testing end-to-end integrative
10 systems.

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

- 18 (1) facilities and cyber infrastructure;
19 (2) software integration; and
20 (3) fixed mobile data collection platforms and
21 data provisioning systems.

22 (c) AUTHORIZATION OF APPROPRIATIONS.—There is
23 authorized to be appropriated \$130,000,000 for each of

1 the fiscal years 2008 through 2018 to carry out this sec-
2 tion.

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