A BILL

To improve hurricane preparedness by establishing the National Hurricane Research Initiative, and for other purposes.

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

3 SECTION 1. SHORT TITLE.

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

5
SEC. 2. DEFINITIONS.

In this Act:

(1) ELIGIBLE ENTITIES.—The term "eligible entities" means Federal, State, regional, and local government agencies and departments, tribal governments, universities, research institutes, for-profit entities, and nongovernmental organizations.

(2) INDIAN TRIBE.—The term "Indian tribe" has the meaning given the term in section 102 of the Federally Recognized Indian Tribe List Act of 1994 (25 U.S.C. 479a).

(3) INITIATIVE.—The term "Initiative" means the National Hurricane Research Initiative established under section 3(a)(1).

(4) STATE.—The term "State" means any State of the United States, the District of Columbia, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, Puerto Rico, and the Virgin Islands.

(5) TRIBAL GOVERNMENT.—The term "tribal government" means the governing body of an Indian tribe.

(6) UNDER SECRETARY.—The term "Under Secretary" means the Under Secretary for Oceans and Atmosphere.
SEC. 3. NATIONAL HURRICANE RESEARCH INITIATIVE.

(a) Establishment.—

(1) In general.—The Under Secretary shall establish an initiative to be known as the "National Hurricane Research Initiative" for the purposes described in paragraph (2). The Initiative shall consist of—

(A) the activities carried out under this section; and

(B) the research carried out under section 4.

(2) Purposes.—The purposes described in this paragraph are as follows:

(A) To conduct research, incorporating to the maximum extent practicable the needs of eligible entities, to enable the following:

(i) Improvement of the understanding and prediction of hurricanes and other tropical storms, including—

(I) storm tracking and prediction;

(II) forecasting of storm formation, intensity, and wind and rain patterns, both within the tropics and as the storms move poleward;
(III) storm surge modeling, inland flood modeling, and coastal erosion;

(IV) the interaction with and impacts of storms with the natural and built environment; and

(V) the impacts to and response of society to destructive storms, including the socioeconomic impacts requiring emergency management, response, and recovery;

(ii) Development of infrastructure that is resilient to the forces associated with hurricanes and other tropical storms.

(iii) Mitigation of the impacts of hurricanes on coastal populations, the coastal built environment, and natural resources, including—

(I) coral reefs;

(II) mangroves;

(III) wetlands; and

(IV) other natural systems that can reduce hurricane wind and flood forces.
(iv) Improvement of communication with the public about hurricane forecasts and risks associated with hurricanes to reduce the harmful impacts of hurricanes and improve the response of society to destructive storms.

(B) To provide training for the next generation of hurricane researchers and forecasters.

(b) Implementation Plan.—

(1) In general.—Not later than 1 year after the date of the enactment of this Act, the Under Secretary shall, in coordination with the Director of the National Science Foundation, develop a detailed, 5-year implementation plan for the Initiative that—

(A) incorporates the priorities for Federal science and technology investments set forth in the June 2005 publication, “Grand Challenges for Disaster Reduction,” and in related 2008 implementation plans for hurricane and coastal inundation hazards of the Subcommittee on Disaster Reduction of the Committee on Environment and Natural Resources of the National Science and Technology Council.
(B) to the extent practicable and as appropriate, establishes strategic goals, benchmarks, milestones, and a set of systematic criteria and performance metrics by which the overall effectiveness of the Initiative may be evaluated on a periodic basis, including evaluation of mechanisms for the effective transition of research to operations and the application of research results for reducing hurricane losses and related public benefits; and

(C) identifies opportunities to leverage the results of the research carried out under section 4 with other Federal and non-Federal hurricane research, coordination, and loss-reduction initiatives, such as—

(i) the National Windstorm Impact Reduction Program established by section 204(a) of the National Windstorm Impact Reduction Act of 2004 (15 U.S.C. 15703);

(ii) the National Flood Insurance Program established under chapter 4 of the National Flood Insurance Act of 1968 (42 U.S.C. 4011 et seq.);
(iii) the initiatives of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.);

(iv) wind hazard mitigation initiatives carried out by a State;

(v) the Science Advisory Board, Social Science Working Group, and Hurricane Forecast Improvement Project of the National Oceanic and Atmospheric Administration; and

(vi) the Working Group for Tropical Cyclone Research of the Office of the Federal Coordinator for Meteorological Services and Supporting Research.

(2) REVIEW.—Not later than 1 year after the date of the enactment of this Act, the Under Secretary shall make the implementation plan required by paragraph (1) available for review by the following:

(A) The Director of the National Science Foundation;

(B) The Secretary of Homeland Security;

(C) The Director of the National Institute for Standards and Technology.
(D) The Commanding General of the U.S. Army Corps of Engineers.

(E) The Commander of the Naval Meteorology and Oceanography Command.

(F) The Associate Administrator for Science Mission Directorate of the National Aeronautics and Space Administration.

(G) The Director of the U.S. Geological Survey.

(H) The Director of the Office of Science and Technology Policy.

(I) The Director of the National Economic Council.

(3) REVISIONS.—The Under Secretary shall revise the implementation plan required by paragraph (1) not less frequently than once every 5 years.

(e) RESEARCH—

(1) ESTABLISHMENT OF RESEARCH OBJECTIVES.—The Under Secretary shall, in consultation with the Director of the National Science Foundation, establish objectives for research carried out pursuant to section 4 that are—

(A) consistent with the purposes described in subsection (a)(2); and
(B) based on the findings of the expert assessments and strategies published in the following:

(i) The June 2005 publication entitled, “Grand Challenges for Disaster Reduction”, and the related 2008 implementation plans for hurricane and coastal inundation hazards of the Subcommittee on Disaster Reduction of the Committee on Environment and Natural Resources of the National Science and Technology Council.


(iv) Reports from the Hurricane Intensity Working Group of the National Science Advisory Board of the National Oceanic and Atmospheric Administration.
(2) AREAS OF CONCENTRATION.—The objectives required by paragraph (1) shall provide for 3 areas of concentration as follows:

(A) Fundamental hurricane research, which may include research to support continued development and maintenance of community weather research and forecast models, including advanced methods of observing storm structure and assimilating observations into the models, in which the agency or institution hosting the models ensures broad access and use of the model by the civilian research community.

(B) Technology assessment and development.

(C) Research on integration, transition, and application of research results.

(d) NATIONAL WORKSHOPS AND CONFERENCES.—The Under Secretary may, in coordination with the Director of the National Science Foundation, carry out a series of national workshops and conferences that assemble a broad collection of scientific disciplines—

(1) to address hurricane-related research questions; and
(2) to encourage researchers to work collaboratively to carry out the purposes described in subsection (a)(2).

(e) Public Internet Web Site.—The Under Secretary shall facilitate the establishment of a public Internet Web site for the Initiative—

(1) to foster collaboration and interactive dialogues among the Under Secretary, the Director of the National Science Foundation, and the public;

(2) to enhance public access to Initiative documents and products, including—

(A) reports and publications of the Initiative;

(B) the most recent 5-year implementation plan developed under subsection (b); and

(C) each annual cross-cut budget and report submitted to Congress under subsection (f); and

(3) that includes a publicly accessible clearinghouse of Federal research and development centers engaged in research and development efforts that are complementary to the Initiative.

(f) Annual Cross-Cut Budget and Report.—

(1) Requirement for Annual Cross-Cut Budget and Report.—Beginning with the first fis-
eral year beginning after the date the Under Secretary completes the implementation plan required by subsection (b); the Director of the Office of Science and Technology Policy shall, in conjunction with the Under Secretary, the Director of the National Science Foundation, and the Director of the Office of Management and Budget, submit to Congress each year, together with documents submitted to Congress in support of the budget of the President for the fiscal year beginning in such year (as submitted pursuant to section 1105 of title 31, United States Code)—

(A) a coordinated annual report for the Initiative for the last fiscal year ending before the date on which the report is submitted; and

(B) a cross-cut budget for the Initiative for the first fiscal year beginning after the date on which the report is submitted.

(2) Contents.—The report required by paragraph (1)(A) shall—

(A) document the grants and contracts awarded to eligible entities under section 4;

(B) for each eligible entity that receives a grant or contract under section 4, identify what
major activities were undertaken with such
funds, grants, and contracts; and

(C) for each research activity or group of
activities in an area of concentration described
in subsection (c)(2), as appropriate, identify
any accomplishments, which may include full or
partial achievement of any strategic goals,
benchmarks, milestones, or systematic criteria
and performance metrics established for the im-
plementation plan under subsection (b)(1)(B).

SEC. 4. NATIONAL HURRICANE RESEARCH.

(a) NATIONAL SCIENCE FOUNDATION COMPETITIVE
GRANT RESEARCH PROGRAM.—

(1) IN GENERAL.—The Director of the National
Science Foundation shall, in coordination with the
Under Secretary, establish a program to award
grants to eligible entities to carry out research that
is consistent with the research objectives established
under section 3(c)(1).

(2) SELECTION.—The National Science Foun-
dation shall select grant recipients under this section
through its merit review process.

(b) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-
ISTRATION RESEARCH PROGRAM.—
(1) **In General.**—The Under Secretary shall, in coordination with the Director of the National Science Foundation, carry out a program of research that is consistent with the research objectives established under section 3(c)(1):

(2) **Research Activities.**—Research carried out under paragraph (1) may be carried out through—

(A) intramural research;

(B) awarding grants to eligible entities to carry out research;

(C) contracting with eligible entities to carry out research; or

(D) entering into cooperative agreements to carry out research.

(3) **Demonstration Projects Authorized.**—Research carried out under this subsection may include demonstration projects.

(e) **Collaboration.**—To the maximum extent practicable, each entity carrying out research under this section shall collaborate with existing Federal and federally funded research centers operating in related fields, for-profit organizations, and international, regional, State, local, and tribal governments—
(1) to gather and share experiential information; and

(2) to advance scientific and engineering knowledge, technology transfer, and technology commercialization in the course of conduct of hurricane-related research and its application to mitigating the impacts of hurricanes and other tropical storms on society.

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) ELIGIBLE ENTITIES.—The term “eligible entities” means Federal, State, regional, and local government agencies and departments, tribal governments, universities, research institutes, for-profit entities, and nongovernmental organizations.

(2) INDIAN TRIBE.—The term “Indian tribe” has the meaning given the term in section 102 of the Federally Recognized Indian Tribe List Act of 1994 (25 U.S.C. 479a).

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(4) STATE.—The term “State” means any State of the United States, the District of Columbia, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, Puerto Rico, and the Virgin Islands.

(5) TRIBAL GOVERNMENT.—The term “tribal government” means the governing body of an Indian tribe.

(6) UNDER SECRETARY.—The term “Under Secretary” means the Under Secretary for Oceans and Atmosphere.

SEC. 3. NATIONAL HURRICANE RESEARCH INITIATIVE.

(a) ESTABLISHMENT.—

(1) IN GENERAL.—The Under Secretary shall establish an initiative to be known as the “National Hurricane Research Initiative” for the purposes described in paragraph (2). The Initiative shall consist of—

(A) the activities carried out under this section; and

(B) the research carried out under section 4.

(2) PURPOSES.—The purposes described in this paragraph are as follows:
(A) To conduct research, incorporating to the maximum extent practicable the needs of eligible entities, to enable the following:

(i) Improvement of the understanding and prediction of hurricanes and other tropical storms, including—

(I) storm tracking and intensity predictive studies, including hurricane modeling programs at the mesoscale and convective scale conducted by eligible entities, to improve hurricane track accuracy and intensity prediction;

(II) forecasting of storm formation, intensity, and wind and rain patterns, both within the tropics and as the storms move poleward;

(III) storm surge modeling, inland flood modeling, and coastal erosion;

(IV) the interaction with and impacts of storms with the natural and built environment; and

(V) the impacts to and response of society to destructive storms, including the socioeconomic impacts requiring
emergency management, response, and recovery.

(ii) Development of infrastructure that is resilient to the forces associated with hurricanes and other tropical storms.

(iii) Mitigation of the impacts of hurricanes on coastal populations, the coastal built environment, and natural resources, including—

(I) coral reefs;

(II) mangroves;

(III) wetlands; and

(IV) other natural systems that can reduce hurricane wind and flood forces.

(iv) Improvement of communication with the public about hurricane forecasts and risks associated with hurricanes to reduce the harmful impacts of hurricanes and improve the response of society to destructive storms.

(B) To provide training for the next generation of hurricane researchers and forecasters.

(b) IMPLEMENTATION PLAN.—
(1) IN GENERAL.—Not later than 540 days after the date of the enactment of this Act, the Under Secretary shall, in consultation with the Director of the National Science Foundation, develop a detailed, 5-year implementation plan for the Initiative that—

(A) incorporates the priorities for Federal science and technology investments set forth in the June 2005 publication, “Grand Challenges for Disaster Reduction”, and in related 2008 implementation plans for hurricane and coastal inundation hazards of the Subcommittee on Disaster Reduction of the Committee on Environment and Natural Resources of the National Science and Technology Council;

(B) to the extent practicable and as appropriate, establishes strategic goals, benchmarks, milestones, and a set of systematic criteria and performance metrics by which the overall effectiveness of the Initiative may be evaluated on a periodic basis, including evaluation of mechanisms for the effective transition of research to operations and the application of research results for reducing hurricane losses and related public benefits; and
(C) identifies opportunities to leverage the results of the research carried out under section 4 with other Federal and non-Federal hurricane research, coordination, and loss-reduction initiatives, such as—

(i) the National Windstorm Impact Reduction Program established by section 204(a) of the National Windstorm Impact Reduction Act of 2004 (15 U.S.C. 15703);

(ii) the National Flood Insurance Program established under chapter 1 of the National Flood Insurance Act of 1968 (42 U.S.C. 4011 et seq.);

(iii) the initiatives of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.);

(iv) wind hazard mitigation initiatives carried out by a State;

(v) the Science Advisory Board, Social Science Working Group, and Hurricane Forecast Improvement Project of the National Oceanic and Atmospheric Administration; and

(vi) the Working Group for Tropical Cyclone Research of the Office of the Federal
Coordinator for Meteorological Services and Supporting Research.

(2) REVIEW.—Not later than 540 days after the date of the enactment of this Act, the Under Secretary shall make the implementation plan required by paragraph (1) available for review by the following:

(A) The Director of the National Science Foundation.

(B) The Secretary of Homeland Security.

(C) The Director of the National Institute of Standards and Technology.

(D) The Commanding General of the U.S. Army Corps of Engineers.

(E) The Commander of the Naval Meteorology and Oceanography Command.

(F) The Associate Administrator for Science Mission Directorate of the National Aeronautics and Space Administration.

(G) The Director of the U.S. Geological Survey.

(H) The Director of the Office of Science and Technology Policy.

(I) The Director of the National Economic Council.
(3) **REVISIONS.**—The Under Secretary shall revise the implementation plan required by paragraph (1) not less frequently than once every 5 years.

(c) **RESEARCH.**—

(1) **ESTABLISHMENT OF RESEARCH OBJECTIVES.**—The Under Secretary shall, in consultation with the Director of the National Science Foundation, establish objectives for research carried out pursuant to section 4 that are—

(A) consistent with the purposes described in subsection (a)(2); and

(B) based on the findings of the expert assessments and strategies published in the following:

(i) The June 2005 publication entitled, “Grand Challenges for Disaster Reduction”, and the related 2008 implementation plans for hurricane and coastal inundation hazards of the Subcommittee on Disaster Reduction of the Committee on Environment and Natural Resources of the National Science and Technology Council.

(ii) The January 2007 report by the National Science Board entitled, “Hurri-
cane Warning: The Critical Need for a Na-
tional Hurricane Initiative”.

(iii) The February 2007 report by the
Office of the Federal Coordinator for Mete-
orological Services and Supporting Re-
search entitled, “Interagency Strategic Re-
search Plan for Tropical Cyclones: The Way
Ahead”.

(iv) Reports from the Hurricane Inten-
sity Working Group of the National Science
Advisory Board of the National Oceanic
and Atmospheric Administration.

(2) AREAS OF CONCENTRATION.—The objectives
required by paragraph (1) shall provide for 3 areas
of concentration as follows:

(A) Fundamental hurricane research, which
may include research to support continued devel-
opment and maintenance of community weather
research and forecast models, including advanced
methods of observing storm structure and assimili-
ating observations into the models, in which the
agency or institution hosting the models ensures
broad access and use of the model by the civilian
research community.
(B) Technology assessment and development.

(C) Research on integration, transition, and application of research results.

(d) NATIONAL WORKSHOPS AND CONFERENCES.—The Under Secretary may, in coordination with the Director of the National Science Foundation, carry out a series of national workshops and conferences that assemble a broad collection of scientific disciplines—

(1) to address hurricane-related research questions; and

(2) to encourage researchers to work collaboratively to carry out the purposes described in subsection (a)(2).

(e) PUBLIC INTERNET WEB SITE.—The Under Secretary shall facilitate the establishment of a public Internet Web site for the Initiative—

(1) to foster collaboration and interactive dialogues among the Under Secretary, the Director of the National Science Foundation, and the public;

(2) to enhance public access to Initiative documents and products, including—

(A) reports and publications of the Initiative;
(B) the most recent 5-year implementation plan developed under subsection (b); and

(C) each annual cross-cut budget and report submitted to Congress under subsection (f); and

(3) that includes a publicly accessible clearing-house of Federal research and development centers engaged in research and development efforts that are complementary to the Initiative.

(f) BIENNIAL CROSS-CUT BUDGET AND REPORT.—

(1) REQUIREMENT FOR BIENNIAL CROSS-CUT BUDGET AND REPORT.—Beginning with the first fiscal year beginning after the date the Under Secretary completes the implementation plan required by subsection (b), the Director of the Office of Science and Technology Policy shall, in conjunction with the Under Secretary, the Director of the National Science Foundation, and the Director of the Office of Management and Budget, submit to Congress once every 2 years, together with documents submitted to Congress in support of the budget of the President for the fiscal year beginning in such year (as submitted pursuant to section 1105 of title 31, United States Code)—

(A) a coordinated biennial report for the Initiative for the last 2 fiscal years ending before the date on which the report is submitted; and
(B) a cross-cut budget for the Initiative for the first fiscal year beginning after the date on which the report is submitted.

(2) CONTENTS.—The report required by paragraph (1)(A) shall—

(A) document the grants and contracts awarded to eligible entities under section 4;

(B) for each eligible entity that receives a grant or contract under section 4, identify what major activities were undertaken with such funds, grants, and contracts; and

(C) for each research activity or group of activities in an area of concentration described in subsection (c)(2), as appropriate, identify any accomplishments, which may include full or partial achievement of any strategic goals, benchmarks, milestones, or systematic criteria and performance metrics established for the implementation plan under subsection (b)(1)(B).

SEC. 4. NATIONAL HURRICANE RESEARCH.

(a) NATIONAL SCIENCE FOUNDATION COMPETITIVE GRANT RESEARCH PROGRAM.—

(1) IN GENERAL.—The Director of the National Science Foundation shall, in coordination with the Under Secretary, establish a program to award
grants to eligible entities to carry out research that is consistent with the research objectives established under section 3(c)(1).

(2) **SELECTION.**—The National Science Foundation shall select grant recipients under this section through its merit review process.

(b) **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION RESEARCH PROGRAM.**—

(1) **IN GENERAL.**—The Under Secretary shall, in coordination with the Director of the National Science Foundation, carry out a program of research that is consistent with the research objectives established under section 3(c)(1).

(2) **RESEARCH ACTIVITIES.**—Research carried out under paragraph (1) may be carried out through—

(A) intramural research;

(B) awarding grants to eligible entities to carry out research;

(C) contracting with eligible entities to carry out research; or

(D) entering into cooperative agreements to carry out research.
(3) DEMONSTRATION PROJECTS AUTHORIZED.—

Research carried out under this subsection may include demonstration projects.

(c) COLLABORATION.—To the maximum extent practicable, each entity carrying out research under this section shall collaborate with existing Federal and federally funded research centers operating in related fields, for-profit organizations, and international, regional, State, local, and tribal governments—

(1) to gather and share experiential information; and

(2) to advance scientific and engineering knowledge, technology transfer, and technology commercialization in the course of conduct of hurricane-related research and its application to mitigating the impacts of hurricanes and other tropical storms on society.
To improve hurricane preparedness by establishing the National Hurricane Research Initiative, and for other purposes.

November 14, 2012

Reported with an amendment