

111TH CONGRESS
1ST SESSION

H. R. 14

To provide for ocean acidification research and monitoring, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 6, 2009

Mr. BAIRD (for himself, Mr. INSLEE, and Mr. EHLERS) introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To provide for ocean acidification research and monitoring,
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 “Federal Ocean Acidifi-
5 cation Research And Monitoring Act of 2009” or the
6 “FOARAM Act”.

7 **SEC. 2. PURPOSES.**

8 (a) PURPOSES.—The purposes of this Act are to pro-
9 vide for—

1 (1) development and coordination of a com-
2 prehensive interagency plan to—

3 (A) monitor and conduct research on the
4 processes and consequences of ocean acidifica-
5 tion on marine organisms and ecosystems; and

6 (B) establish an interagency research and
7 monitoring program on ocean acidification;

8 (2) establishment of an ocean acidification pro-
9 gram within the National Oceanic and Atmospheric
10 Administration;

11 (3) assessment and consideration of regional
12 and national ecosystem and socioeconomic impacts
13 of increased ocean acidification; and

14 (4) research on adaptation strategies and tech-
15 niques for effectively conserving marine ecosystems
16 as they cope with increased ocean acidification.

17 **SEC. 3. DEFINITIONS.**

18 In this Act:

19 (1) OCEAN ACIDIFICATION.—The term “ocean
20 acidification” means the decrease in pH of the
21 Earth’s oceans and changes in ocean chemistry
22 caused by chemical inputs from the atmosphere, in-
23 cluding carbon dioxide.

24 (2) SECRETARY.—The term “Secretary” means
25 the Secretary of Commerce, acting through the Ad-

1 administrator of the National Oceanic and Atmos-
2 pheric Administration.

3 (3) SUBCOMMITTEE.—The term “Sub-
4 committee” means the Joint Subcommittee on
5 Ocean Science and Technology of the National
6 Science and Technology Council.

7 **SEC. 4. INTERAGENCY SUBCOMMITTEE.**

8 (a) DESIGNATION.—The Joint Subcommittee on
9 Ocean Science and Technology of the National Science
10 and Technology Council shall coordinate Federal activities
11 on ocean acidification.

12 (b) DUTIES.—The Subcommittee shall—

13 (1) develop the strategic research and moni-
14 toring plan to guide Federal research on ocean acidi-
15 fication required under section 5 and oversee the im-
16 plementation of the plan;

17 (2) oversee the development of—

18 (A) an assessment of the potential impacts
19 of ocean acidification on marine organisms and
20 marine ecosystems; and

21 (B) adaptation and mitigation strategies to
22 conserve marine organisms and ecosystems ex-
23 posed to ocean acidification;

24 (3) facilitate communication and outreach op-
25 portunities with nongovernmental organizations and

1 members of the stakeholder community with inter-
2 ests in marine resources;

3 (4) coordinate the United States Federal re-
4 search and monitoring program with research and
5 monitoring programs and scientists from other na-
6 tions; and

7 (5) establish or designate an Ocean Acidifica-
8 tion Information Exchange to make information on
9 ocean acidification developed through or utilized by
10 the interagency ocean acidification program acces-
11 sible through electronic means, including informa-
12 tion which would be useful to policymakers, re-
13 searchers, and other stakeholders in mitigating or
14 adapting to the impacts of ocean acidification.

15 (c) REPORTS TO CONGRESS.—

16 (1) INITIAL REPORT.—Not later than 1 year
17 after the date of enactment of this Act, the Sub-
18 committee shall transmit a report to the Committee
19 on Commerce, Science, and Transportation of the
20 Senate and the Committee on Science and Tech-
21 nology and the Committee on Natural Resources of
22 the House of Representatives that—

23 (A) includes a summary of federally fund-
24 ed ocean acidification research and monitoring

1 activities, including the budget for each of these
2 activities; and

3 (B) describes the progress in developing
4 the strategic research plan required under sec-
5 tion 5.

6 (2) BIENNIAL REPORT.—Not later than 2 years
7 after the delivery of the initial report under para-
8 graph (1) and every 2 years thereafter, the Sub-
9 committee shall transmit a report to the Committee
10 on Commerce, Science, and Transportation of the
11 Senate and the Committee on Science and Tech-
12 nology and the Committee on Natural Resources of
13 the House of Representatives that includes—

14 (A) a summary of federally funded ocean
15 acidification research and monitoring activities,
16 including the budget for each of these activities;
17 and

18 (B) an analysis of the progress made to-
19 ward achieving the goals and priorities for the
20 strategic research plan developed by the Sub-
21 committee under section 5.

22 (3) STRATEGIC RESEARCH PLAN.—Not later
23 than 2 years after the date of enactment of this Act,
24 the Subcommittee shall transmit the strategic re-
25 search plan developed under section 5 to the Com-

1 mittee on Commerce, Science, and Transportation of
2 the Senate and the Committee on Science and Tech-
3 nology and the Committee on Natural Resources of
4 the House of Representatives. A revised plan shall
5 be submitted at least once every 5 years thereafter.

6 **SEC. 5. STRATEGIC RESEARCH PLAN.**

7 (a) IN GENERAL.—Not later than 2 years after the
8 date of enactment of this Act, the Subcommittee shall de-
9 velop a strategic plan for Federal research and monitoring
10 on ocean acidification that will provide for an assessment
11 of the impacts of ocean acidification on marine organisms
12 and marine ecosystems and the development of adaptation
13 and mitigation strategies to conserve marine organisms
14 and marine ecosystems. In developing the plan, the Sub-
15 committee shall consider and use information, reports, and
16 studies of ocean acidification that have identified research
17 and monitoring needed to better understand ocean acidifi-
18 cation and its potential impacts, and recommendations
19 made by the National Academy of Sciences in the review
20 of the plan required under subsection (d).

21 (b) CONTENTS OF THE PLAN.—The plan shall—

22 (1) establish, for the 10-year period beginning
23 in the year the plan is submitted, the goals and pri-
24 orities for Federal research and monitoring which
25 will—

1 (A) advance understanding of ocean acidi-
2 fication and its physical, chemical, and biologi-
3 cal impacts on marine organisms and marine
4 ecosystems;

5 (B) improve the ability to assess the socio-
6 economic impacts of ocean acidification; and

7 (C) provide information for the develop-
8 ment of adaptation and mitigation strategies to
9 conserve marine organisms and marine eco-
10 systems;

11 (2) describe specific activities, including—

12 (A) efforts to determine user needs;

13 (B) research activities;

14 (C) monitoring activities;

15 (D) technology and methods development;

16 (E) data collection;

17 (F) database development;

18 (G) modeling activities;

19 (H) assessment of ocean acidification im-
20 pacts; and

21 (I) participation in international research
22 efforts;

23 (3) identify relevant programs and activities of
24 the Federal agencies that contribute to the inter-
25 agency program directly and indirectly and set forth

1 the role of each Federal agency in implementing the
2 plan;

3 (4) consider and utilize, as appropriate, reports
4 and studies conducted by Federal agencies, the Na-
5 tional Research Council, or other entities;

6 (5) make recommendations for the coordination
7 of the ocean acidification research and monitoring
8 activities of the United States with such activities of
9 other nations and international organizations;

10 (6) outline budget requirements for Federal
11 ocean acidification research and monitoring and as-
12 sessment activities to be conducted by each agency
13 under the plan;

14 (7) identify the monitoring systems and sam-
15 pling programs currently employed in collecting data
16 relevant to ocean acidification and prioritize addi-
17 tional monitoring systems that may be needed to en-
18 sure adequate data collection and monitoring of
19 ocean acidification and its impacts; and

20 (8) describe specific activities designed to facili-
21 tate outreach and data and information exchange
22 with stakeholder communities.

23 (c) PROGRAM ELEMENTS.—The plan shall include at
24 a minimum the following program elements:

1 (1) Monitoring of ocean chemistry and biological
2 impacts associated with ocean acidification at selected
3 coastal and open-ocean monitoring stations,
4 including satellite-based monitoring to characterize—
5

6 (A) marine ecosystems;

7 (B) changes in marine productivity; and

8 (C) changes in surface ocean chemistry.

9 (2) Research to understand the species specific
10 physiological response of marine organisms to ocean
11 acidification, impacts on marine food webs of ocean
12 acidification, and to develop environmental and ecological
13 indices that track marine ecosystem responses to ocean
14 acidification.

15 (3) Modeling to predict changes in the ocean
16 carbon cycle as a function of carbon dioxide and atmosphere-induced
17 changes in temperature, ocean circulation, biogeochemistry,
18 ecosystem and terrestrial input, and modeling to determine
19 impacts on marine ecosystems and individual marine organisms.
20

21 (4) Technology development and standardization
22 of carbonate chemistry measurements on moorings and
23 autonomous floats.

24 (5) Assessment of socioeconomic impacts of
25 ocean acidification and development of adaptation

1 and mitigation strategies to conserve marine orga-
2 nisms and marine ecosystems.

3 (d) NATIONAL ACADEMY OF SCIENCES EVALUA-
4 TION.—The Secretary shall enter into an agreement with
5 the National Academy of Sciences to review the plan.

6 (e) PUBLIC PARTICIPATION.—In developing the plan,
7 the Subcommittee shall consult with representatives of
8 academic, State, industry and environmental groups. Not
9 later than 90 days before the plan, or any revision thereof,
10 is submitted to the Congress, the plan shall be published
11 in the Federal Register for a public comment period of
12 not less than 60 days.

13 **SEC. 6. NOAA OCEAN ACIDIFICATION ACTIVITIES.**

14 The Secretary shall conduct research and monitoring
15 activities and may establish a program on ocean acidifica-
16 tion within the National Oceanic and Atmospheric Admin-
17 istration consistent with the strategic research plan devel-
18 oped by the Subcommittee under section 5 that—

19 (1) includes—

20 (A) interdisciplinary research among the
21 ocean and atmospheric sciences, and coordi-
22 nated research and activities to improve under-
23 standing of ocean acidification;

24 (B) the establishment of a long-term moni-
25 toring program of ocean acidification utilizing

1 existing global and national ocean observing as-
2 sets, and adding instrumentation and sampling
3 stations as appropriate to the aims of the re-
4 search program;

5 (C) research to identify and develop adap-
6 tation strategies and techniques for effectively
7 conserving marine ecosystems as they cope with
8 increased ocean acidification;

9 (D) as an integral part of the research
10 programs described in this Act, educational op-
11 portunities that encourage an interdisciplinary
12 and international approach to exploring the im-
13 pacts of ocean acidification;

14 (E) as an integral part of the research pro-
15 grams described in this Act, national public
16 outreach activities to improve the under-
17 standing of current scientific knowledge of
18 ocean acidification and its impacts on marine
19 resources; and

20 (F) coordination of ocean acidification
21 monitoring and impacts research with other ap-
22 propriate international ocean science bodies
23 such as the International Oceanographic Com-
24 mission, the International Council for the Ex-

1 ploration of the Sea, the North Pacific Marine
2 Science Organization, and others;

3 (2) provides grants for critical research projects
4 that explore the effects of ocean acidification on eco-
5 systems and the socioeconomic impacts of increased
6 ocean acidification that are relevant to the goals and
7 priorities of the strategic research plan; and

8 (3) incorporates a competitive merit-based proc-
9 ess for awarding grants that may be conducted
10 jointly with other participating agencies or under the
11 National Oceanographic Partnership Program under
12 section 7901 of title 10, United States Code.

13 **SEC. 7. NSF OCEAN ACIDIFICATION ACTIVITIES.**

14 (a) RESEARCH ACTIVITIES.—The Director of the Na-
15 tional Science Foundation shall continue to carry out re-
16 search activities on ocean acidification which shall support
17 competitive, merit-based, peer-reviewed proposals for re-
18 search and monitoring of ocean acidification and its im-
19 pacts, including—

20 (1) impacts on marine organisms and marine
21 ecosystems;

22 (2) impacts on ocean, coastal, and estuarine
23 biogeochemistry; and

1 (3) the development of methodologies and tech-
2 nologies to evaluate ocean acidification and its im-
3 pacts.

4 (b) CONSISTENCY.—The research activities shall be
5 consistent with the strategic research plan developed by
6 the Subcommittee under section 5.

7 (c) COORDINATION.—The Director shall encourage
8 coordination of the Foundation’s ocean acidification activi-
9 ties with such activities of other nations and international
10 organizations.

11 **SEC. 8. NASA OCEAN ACIDIFICATION ACTIVITIES.**

12 (a) OCEAN ACIDIFICATION ACTIVITIES.—The Ad-
13 ministrators of the National Aeronautics and Space Admin-
14 istration, in coordination with other relevant agencies,
15 shall ensure that space-based monitoring assets are used
16 in as productive a manner as possible for monitoring of
17 ocean acidification and its impacts.

18 (b) PROGRAM CONSISTENCY.—The Administrator
19 shall ensure that the Agency’s research and monitoring
20 activities on ocean acidification are carried out in a man-
21 ner consistent with the strategic research plan developed
22 by the Subcommittee under section 5.

23 (c) COORDINATION.—The Administrator shall en-
24 courage coordination of the Agency’s ocean acidification

1 activities with such activities of other nations and inter-
2 national organizations.

3 **SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

4 (a) NOAA.—There are authorized to be appropriated
5 to the National Oceanic and Atmospheric Administration
6 to carry out the purposes of this Act—

7 (1) \$8,000,000 for fiscal year 2010;

8 (2) \$12,000,000 for fiscal year 2011;

9 (3) \$15,000,000 for fiscal year 2012; and

10 (4) \$20,000,000 for fiscal year 2013.

11 (b) NSF.—There are authorized to be appropriated
12 to the National Science Foundation to carry out the pur-
13 poses of this Act—

14 (1) \$6,000,000 for fiscal year 2010;

15 (2) \$8,000,000 for fiscal year 2011;

16 (3) \$12,000,000 for fiscal year 2012; and

17 (4) \$15,000,000 for fiscal year 2013.

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