

Union Calendar No. 475

110TH CONGRESS
2^D SESSION

H. R. 4174

[Report No. 110-749]

To establish an interagency committee to develop an ocean acidification research and monitoring plan and to establish an ocean acidification program within the National Oceanic and Atmospheric Administration.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 14, 2007

Mr. ALLEN (for himself, Mr. INSLEE, Mr. GILCHREST, Mr. BAIRD, Mr. EHLERS, Ms. BORDALLO, Mr. HOLT, Mr. OLVER, Mr. DELAHUNT, Mr. KLEIN of Florida, Mr. RUPPERSBERGER, and Mrs. CHRISTENSEN) introduced the following bill; which was referred to the Committee on Science and Technology

JULY 9, 2008

Additional sponsors: Mrs. CAPPS, Ms. LORETTA SANCHEZ of California, Mr. HINCHEY, Mr. GRIJALVA, Mr. FARR, and Ms. EDDIE BERNICE JOHNSON of Texas

JULY 9, 2008

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italics]

[For text of introduced bill, see copy of bill as introduced on November 14, 2007]

A BILL

To establish an interagency committee to develop an ocean acidification research and monitoring plan and to estab-

lish an ocean acidification program within the National Oceanic and Atmospheric Administration.

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; TABLE OF CONTENTS.**

4 (a) *SHORT TITLE.*—*This Act may be cited as the*
5 *“Federal Ocean Acidification Research And Monitoring Act*
6 *of 2008” or the “FOARAM Act”.*

7 (b) *TABLE OF CONTENTS.*—*The table of contents for*
8 *this Act is as follows:*

- Sec. 1. Short title; table of contents.*
- Sec. 2. Findings and purposes.*
- Sec. 3. Definitions.*
- Sec. 4. Interagency subcommittee.*
- Sec. 5. Strategic research plan.*
- Sec. 6. NOAA ocean acidification activities.*
- Sec. 7. NSF ocean acidification activities.*
- Sec. 8. NASA ocean acidification activities.*
- Sec. 9. Authorization of appropriations.*

9 **SEC. 2. FINDINGS AND PURPOSES.**

10 (a) *FINDINGS.*—*The Congress finds the following:*

11 (1) *The oceans help regulate atmospheric chem-*
12 *istry by acting as the largest sink for carbon dioxide.*

13 (2) *The rapid increase in atmospheric carbon di-*
14 *oxide is overwhelming the natural ability of the*
15 *oceans to absorb this gas.*

16 (3) *The influx of carbon dioxide into the atmos-*
17 *phere and the subsequent absorption by the oceans is*
18 *changing surface ocean carbon chemistry and low-*
19 *ering the pH. These changes in ocean chemistry are*

1 *detrimental to organisms including corals, which sup-*
2 *port one of the richest habitats on Earth, marine*
3 *shellfish, and many other organisms that form the*
4 *base of the food chain for many fish and marine*
5 *mammals.*

6 *(4) The rich biodiversity of marine organisms is*
7 *an important contribution to the national economy*
8 *and the change in ocean chemistry threatens tourism,*
9 *our fisheries, and marine environmental quality, and*
10 *could result in significant social and economic costs.*

11 *(5) Existing Federal programs support research*
12 *in related ocean chemistry, but gaps in funding, co-*
13 *ordination, and outreach have impeded national*
14 *progress in addressing ocean acidification.*

15 *(6) National investment in a coordinated pro-*
16 *gram of research and monitoring would improve the*
17 *understanding of ocean acidification effects on whole*
18 *ecosystems, advance our knowledge of the socio-*
19 *economic impacts of increased ocean acidification,*
20 *and strengthen the ability of marine resource man-*
21 *agers to assess and prepare for the harmful impacts*
22 *of ocean acidification on our marine resources.*

23 *(b) PURPOSES.—The purposes of this Act are to pro-*
24 *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 acidification*
5 *on marine organisms and ecosystems; and*

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

8 (2) *assessment and consideration of regional and*
9 *national ecosystem and socioeconomic impacts of in-*
10 *creased ocean acidification; and*

11 (3) *research on adaptation strategies and tech-*
12 *niques for effectively conserving marine ecosystems as*
13 *they cope with increased ocean acidification.*

14 **SEC. 3. DEFINITIONS.**

15 *In this Act:*

16 (1) *OCEAN ACIDIFICATION.—The term “ocean*
17 *acidification” means the decrease in pH of the*
18 *Earth’s oceans and changes in ocean chemistry caused*
19 *by chemical inputs from the atmosphere, including*
20 *carbon dioxide.*

21 (2) *SECRETARY.—The term “Secretary” means*
22 *the Secretary of Commerce, acting through the Ad-*
23 *ministrator of the National Oceanic and Atmospheric*
24 *Administration.*

1 (3) *SUBCOMMITTEE.*—*The term “Subcommittee”*
2 *means the Joint Subcommittee on Ocean Science and*
3 *Technology of the National Science and Technology*
4 *Council.*

5 **SEC. 4. INTERAGENCY SUBCOMMITTEE.**

6 (a) *DESIGNATION.*—*The Joint Subcommittee on Ocean*
7 *Science and Technology of the National Science and Tech-*
8 *nology Council shall coordinate Federal activities on ocean*
9 *acidification.*

10 (b) *DUTIES.*—*The Subcommittee shall—*

11 (1) *develop the strategic research and monitoring*
12 *plan to guide Federal research on ocean acidification*
13 *required under section 5 of this Act and oversee the*
14 *implementation of the plan;*

15 (2) *oversee the development of—*

16 (A) *an assessment of the potential impacts*
17 *of ocean acidification on marine organisms and*
18 *marine ecosystems; and*

19 (B) *adaptation and mitigation strategies to*
20 *conserve marine organisms and ecosystems ex-*
21 *posed to ocean acidification;*

22 (3) *facilitate communication and outreach op-*
23 *portunities with nongovernmental organizations and*
24 *members of the stakeholder community with interests*
25 *in marine resources;*

1 (4) *coordinate the United States Federal research*
2 *and monitoring program with research and moni-*
3 *toring programs and scientists from other nations;*
4 *and*

5 (5) *establish or designate an Ocean Acidification*
6 *Information Exchange to make information on ocean*
7 *acidification developed through or utilized by the*
8 *interagency ocean acidification program accessible*
9 *through electronic means, including information*
10 *which would be useful to policymakers, researchers,*
11 *and other stakeholders in mitigating or adapting to*
12 *the impacts of ocean acidification.*

13 *(c) REPORTS TO CONGRESS.—*

14 (1) *INITIAL REPORT.—Not later than 1 year*
15 *after the date of enactment of this Act, the Sub-*
16 *committee shall transmit a report to the Committee*
17 *on Commerce, Science, and Transportation of the*
18 *Senate and the Committee on Science and Technology*
19 *of the House of Representatives that—*

20 (A) *includes a summary of federally funded*
21 *ocean acidification research and monitoring ac-*
22 *tivities, including the budget for each of these ac-*
23 *tivities; and*

24 (B) *describes the progress in developing the*
25 *plan required under section 5 of this Act.*

1 (2) *BIENNIAL REPORT.*—Not later than 2 years
2 after the delivery of the initial report under para-
3 graph (1) and every 2 years thereafter, the Sub-
4 committee shall transmit a report to the Committee
5 on Commerce, Science, and Transportation of the
6 Senate and the Committee on Science and Technology
7 of the House of Representatives that includes—

8 (A) a summary of federally funded ocean
9 acidification research and monitoring activities,
10 including the budget for each of these activities;
11 and

12 (B) an analysis of the progress made to-
13 ward achieving the goals and priorities for the
14 interagency research plan developed by the Sub-
15 committee under section 5.

16 (3) *STRATEGIC RESEARCH PLAN.*—Not later than
17 2 years after the date of enactment of this Act, the
18 Subcommittee shall transmit the strategic research
19 plan developed under section 5 to the Committee on
20 Commerce, Science, and Transportation of the Senate
21 and the Committee on Science and Technology of the
22 House of Representatives. A revised plan shall be sub-
23 mitted at least once every 5 years thereafter.

1 **SEC. 5. STRATEGIC RESEARCH PLAN.**

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

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

17 (1) establish, for the 10-year period beginning in
18 the year the plan is submitted, the goals and prior-
19 ities for Federal research and monitoring which
20 will—

21 (A) advance understanding of ocean acidifi-
22 cation and its physical, chemical, and biological
23 impacts on marine organisms and marine eco-
24 systems;

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

- 1 (C) provide information for the development
2 of adaptation and mitigation strategies to con-
3 serve marine organisms and marine ecosystems;
- 4 (2) describe specific activities, including—
- 5 (A) efforts to determine user needs;
- 6 (B) research activities;
- 7 (C) monitoring activities;
- 8 (D) technology and methods development;
- 9 (E) data collection;
- 10 (F) database development;
- 11 (G) modeling activities;
- 12 (H) assessment of ocean acidification im-
13 pacts; and
- 14 (I) participation in international research
15 efforts;
- 16 (3) identify relevant programs and activities of
17 the Federal agencies that contribute to the interagency
18 program directly and indirectly and set forth the role
19 of each Federal agency in implementing the plan;
- 20 (4) consider and utilize, as appropriate, reports
21 and studies conducted by Federal agencies, the Na-
22 tional Research Council, or other entities;
- 23 (5) make recommendations for the coordination
24 of the ocean acidification research and monitoring ac-

1 *tivities of the United States with such activities of*
2 *other nations and international organizations;*

3 *(6) outline budget requirements for Federal ocean*
4 *acidification research and monitoring and assessment*
5 *activities to be conducted by each agency under the*
6 *plan;*

7 *(7) identify the monitoring systems and sam-*
8 *pling programs currently employed in collecting data*
9 *relevant to ocean acidification and prioritize addi-*
10 *tional monitoring systems that may be needed to en-*
11 *sure adequate data collection and monitoring of ocean*
12 *acidification and its impacts; and*

13 *(8) describe specific activities designed to facili-*
14 *tate outreach and data and information exchange*
15 *with stakeholder communities.*

16 *(c) PROGRAM ELEMENTS.—The plan shall include at*
17 *a minimum the following program elements:*

18 *(1) Monitoring of ocean chemistry and biological*
19 *impacts associated with ocean acidification at selected*
20 *coastal and open-ocean monitoring stations, including*
21 *satellite-based monitoring to characterize—*

22 *(A) marine ecosystems;*

23 *(B) changes in marine productivity; and*

24 *(C) changes in surface ocean chemistry.*

1 (2) *Research to understand the species specific*
2 *physiological response of marine organisms to ocean*
3 *acidification, impacts on marine food webs of ocean*
4 *acidification, and to develop environmental and eco-*
5 *logical indices that track marine ecosystem responses*
6 *to ocean acidification.*

7 (3) *Modeling to predict changes in the ocean car-*
8 *bon cycle as a function of carbon dioxide and atmos-*
9 *phere-induced changes in temperature, ocean circula-*
10 *tion, biogeochemistry, ecosystem and terrestrial input,*
11 *and modeling to determine impacts on marine eco-*
12 *systems and individual marine organisms.*

13 (4) *Technology development and standardization*
14 *of carbonate chemistry measurements on moorings*
15 *and autonomous floats.*

16 (5) *Assessment of socioeconomic impacts of ocean*
17 *acidification and development of adaptation and*
18 *mitigation strategies to conserve marine organisms*
19 *and marine ecosystems.*

20 (d) *NATIONAL ACADEMY OF SCIENCES EVALUATION.—*
21 *The Secretary shall enter into an agreement with the Na-*
22 *tional Academy of Sciences to review the plan.*

23 (e) *PUBLIC PARTICIPATION.—In developing the plan,*
24 *the Subcommittee shall consult with representatives of aca-*
25 *demic, State, industry and environmental groups. Not later*

1 *than 90 days before the plan, or any revision thereof, is*
2 *submitted to the Congress, the plan shall be published in*
3 *the Federal Register for a public comment period of not*
4 *less than 60 days.*

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

6 *The Secretary shall conduct research and monitoring*
7 *activities on ocean acidification within the National Oce-*
8 *anic and Atmospheric Administration consistent with the*
9 *strategic research plan developed by the Subcommittee*
10 *under section 5 that—*

11 *(1) includes—*

12 *(A) interdisciplinary research among the*
13 *ocean and atmospheric sciences, and coordinated*
14 *research and activities to improve understanding*
15 *of ocean acidification;*

16 *(B) the establishment of a long-term moni-*
17 *toring program of ocean acidification utilizing*
18 *existing global and national ocean observing as-*
19 *sets, and adding instrumentation and sampling*
20 *stations as appropriate to the aims of the re-*
21 *search program;*

22 *(C) research to identify and develop adapta-*
23 *tion strategies and techniques for effectively con-*
24 *serving marine ecosystems as they cope with in-*
25 *creased ocean acidification;*

1 (D) as an integral part of the research pro-
2 grams described in this Act, educational oppor-
3 tunities that encourage an interdisciplinary and
4 international approach to exploring the impacts
5 of ocean acidification;

6 (E) as an integral part of the research pro-
7 grams described in this Act, national public out-
8 reach activities to improve the understanding of
9 current scientific knowledge of ocean acidifica-
10 tion and its impacts on marine resources; and

11 (F) coordination of ocean acidification
12 monitoring and impacts research with other ap-
13 propriate international ocean science bodies such
14 as the International Oceanographic Commission,
15 the International Council for the Exploration of
16 the Sea, the North Pacific Marine Science Orga-
17 nization, and others;

18 (2) provides grants for critical research projects
19 that explore the effects of ocean acidification on eco-
20 systems and the socioeconomic impacts of increased
21 ocean acidification that are relevant to the goals and
22 priorities of the strategic research plan; and

23 (3) incorporates a competitive merit-based proc-
24 ess for awarding grants that may be conducted jointly
25 with other participating agencies or under the Na-

1 *tional Oceanographic Partnership Program under*
2 *section 7901 of title 10, United States Code.*

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

4 *(a) RESEARCH ACTIVITIES.—The Director of the Na-*
5 *tional Science Foundation shall continue to carry out re-*
6 *search activities on ocean acidification which shall support*
7 *competitive, merit-based, peer-reviewed proposals for re-*
8 *search and monitoring of ocean acidification and its im-*
9 *pacts, including—*

10 *(1) impacts on marine organisms and marine*
11 *ecosystems;*

12 *(2) impacts on ocean, coastal, and estuarine bio-*
13 *geochemistry; and*

14 *(3) the development of methodologies and tech-*
15 *nologies to evaluate ocean acidification and its im-*
16 *pacts.*

17 *(b) CONSISTENCY.—The research activities shall be*
18 *consistent with the strategic research plan developed by the*
19 *Subcommittee under section 5.*

20 *(c) COORDINATION.—The Director shall encourage co-*
21 *ordination of the Foundation's ocean acidification activi-*
22 *ties with such activities of other nations and international*
23 *organizations.*

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

2 (a) *OCEAN ACIDIFICATION ACTIVITIES.*—*The Admin-*
3 *istrator of the National Aeronautics and Space Administra-*
4 *tion, in coordination with other relevant agencies, shall en-*
5 *sure that space-based monitoring assets are used in as pro-*
6 *ductive a manner as possible for monitoring of ocean acidi-*
7 *fication and its impacts.*

8 (b) *PROGRAM CONSISTENCY.*—*The Administrator shall*
9 *ensure that the Agency’s research and monitoring activities*
10 *on ocean acidification are carried out in a manner con-*
11 *sistent with the strategic research plan developed by the*
12 *Subcommittee under section 5.*

13 (c) *COORDINATION.*—*The Administrator shall encour-*
14 *age coordination of the Agency’s ocean acidification activi-*
15 *ties with such activities of other nations and international*
16 *organizations.*

17 **SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

18 (a) *NOAA.*—*There are authorized to be appropriated*
19 *to the National Oceanic and Atmospheric Administration*
20 *to carry out the purposes of this Act—*

21 (1) *\$8,000,000 for fiscal year 2009;*

22 (2) *\$12,000,000 for fiscal year 2010;*

23 (3) *\$15,000,000 for fiscal year 2011; and*

24 (4) *\$20,000,000 for fiscal year 2012.*

1 *(b) NSF.—There are authorized to be appropriated to*
2 *the National Science Foundation to carry out the purposes*
3 *of this Act—*

4 *(1) \$6,000,000 for fiscal year 2009;*

5 *(2) \$8,000,000 for fiscal year 2010;*

6 *(3) \$12,000,000 for fiscal year 2011; and*

7 *(4) \$15,000,000 for fiscal year 2012.*

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