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SENATE
S. No. 1586

RECEIVED BY: 

Introduced by Senator Miriam Defensor Santiago

EXPLANATORY NOTE

The Constitution, Article 2, Section 16 provides that:

SEC. 16. The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.

As an archipelago, our country is surrounded by oceans. A great part of our economy is derived from ocean related industries. It is one of our paramount concerns to maintain the ecological balance of our oceans.

Ocean acidification is one of the growing concerns of scientists around the world. This phenomenon is defined as the decrease in pH of the Earth's oceans and changes in ocean chemistry caused by chemical inputs from the atmosphere, including carbon dioxide. One of the effects identified is the imbalance in calcium carbonate, leaving calcifying organisms vulnerable to dissolution. Such organisms include coccolithophores, corals, foraminifera, echinoderms, crustaceans and mollusks.

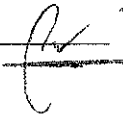
This bill seeks to establish research and monitoring initiative that would ensure that we would have sufficient information to act on the increasing danger of ocean acidification.¹


MIRIAM DEFENSOR SANTIAGO

¹ This bill was originally filed in the Fourteenth Congress, Second Regular Session

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1 AN ACT
2 TO PROVIDE FOR OCEAN ACIDIFICATION RESEARCH AND MONITORING
3

4 *Be it enacted by the Senate and the House of Representatives of the Philippines in*
5 *Congress assembled:*

6 SECTION 1. *Short Title.* – This Act shall be known as the “Ocean Acidification Research
7 and Monitoring Act.”

8 SECTION 2. *Purposes.* – The purposes of this Act are to provide for—

9 A. development and coordination of a comprehensive interagency plan to—

10 1. monitor and conduct research on the processes and consequences of ocean
11 acidification on marine organisms and ecosystems; and

12 2. establish an interagency research and monitoring program on ocean
13 acidification;

14 B. establishment of an ocean acidification program within the Philippine Atmospheric,
15 Geophysical and Astronomical Services Administration (PAGASA);

16 C. assessment and consideration of regional and national ecosystem and socioeconomic
17 impacts of increased ocean acidification; and

18 D. research on adaptation strategies and techniques for effectively conserving marine
19 ecosystems as they cope with increased ocean acidification.

20 SECTION 3. *Definitions.* – The purposes of this Act the term –

1 A. OCEAN ACIDIFICATION - means the decrease in pH of the Earth's oceans and
2 changes in ocean chemistry caused by chemical inputs from the atmosphere,
3 including carbon dioxide;

4 B. SECRETARY - means the Secretary of Science and Technology acting through
5 PAGASA; and

6 C. SUBCOMMITTEE - means the Joint Subcommittee on Ocean Science and
7 Technology of the Philippine Council for Aquatic and Marine Research and
8 Development (PCAMRD).

9 SECTION 4. *Interagency Subcommittee.* – The Joint Subcommittee on Ocean Science
10 and Technology of the PCAMRD shall coordinate national activities on ocean acidification.

11 SECTION 5. *Duties.* – The Subcommittee shall--

12 A. develop the strategic research and monitoring plan to guide national research on
13 ocean acidification required under this Act and oversee the implementation of the
14 plan;

15 B. oversee the development of—

16 1. an assessment of the potential impacts of ocean acidification on marine
17 organisms and marine ecosystems; and

18 2. adaptation and mitigation strategies to conserve marine organisms and
19 ecosystems exposed to ocean acidification;

20 C. facilitate communication and outreach opportunities with nongovernmental
21 organizations and members of the stakeholder community with interests in marine
22 resources;

23 D. coordinate the national research and monitoring program with research and
24 monitoring programs and scientists from other nations; and

25 E. establish or designate an Ocean Acidification Information Exchange to make
26 information on ocean acidification developed through or utilized by the interagency
27 ocean acidification program accessible through electronic means, including

1 information which would be useful to policymakers, researchers, and other
2 stakeholders in mitigating or adapting to the impacts of ocean acidification.

3 SECTION 6. *Report to Congress.* –

4 A. Not later than one (1) year after the effectivity of this Act, the Subcommittee shall
5 transmit a report to the appropriate committees in the Senate and the House of
6 Representatives that—

- 7 1. includes a summary of government funded ocean acidification research and
8 monitoring activities, including the budget for each of these activities; and
- 9 2. describes the progress in developing the strategic research plan required under
10 this Act.

11 B. Not later than two (2) years after the delivery of the initial report under paragraph (1)
12 and every 2 years thereafter, the Subcommittee shall transmit a report to the
13 appropriate committees in the Senate and the House of Representatives that—

- 14 1. a summary of government funded ocean acidification research and monitoring
15 activities, including the budget for each of these activities; and
- 16 2. an analysis of the progress made toward achieving the goals and priorities for
17 the strategic research plan developed by the Subcommittee under this Act.

18 C. Not later than two (2) years after the effectivity of this Act, the Subcommittee shall
19 transmit the strategic research plan developed under this Act to the appropriate
20 committees in the Senate and the House of Representatives. A revised plan shall be
21 submitted at least once every five (5) years thereafter.

22 SECTION 7. *Strategic Research Plan.* - Not later than two (2) years after the effectivity
23 of this Act, the Subcommittee shall develop a strategic plan for national research and monitoring
24 on ocean acidification that will provide for an assessment of the impacts of ocean acidification
25 on marine organisms and marine ecosystems and the development of adaptation and mitigation

1 strategies to conserve marine organisms and marine ecosystems. In developing the plan, the
2 Subcommittee shall consider and use information, reports, and studies of ocean acidification that
3 have identified research and monitoring needed to better understand ocean acidification and its
4 potential impacts, and recommendations made by the National Research Council of the
5 Philippines (NRCP) in the review of the plan required under subsection (d).

6 SECTION 8. *Contents of the Strategic Research Plan.* – The strategic research plan shall

7 –

8 A. establish, for the 10-year period beginning in the year the plan is submitted, the goals
9 and priorities for national research and monitoring which will—

- 10 1. advance understanding of ocean acidification and its physical, chemical, and
11 biological impacts on marine organisms and marine ecosystems;
- 12 2. improve the ability to assess the socioeconomic impacts of ocean
13 acidification; and
- 14 3. provide information for the development of adaptation and mitigation
15 strategies to conserve marine organisms and marine ecosystems;

16 B. describe specific activities, including—

- 17 1. efforts to determine user needs;
- 18 2. research activities;
- 19 3. monitoring activities;
- 20 4. technology and methods development;
- 21 5. data collection;
- 22 6. database development;
- 23 7. modeling activities;
- 24 8. assessment of ocean acidification impacts; and
- 25 9. participation in international research efforts;

26 C. identify relevant programs and activities of the government agencies that contribute
27 to the interagency program directly and indirectly and set forth the role of each
28 government agency in implementing the plan;

- 1 D. consider and utilize, as appropriate, reports and studies conducted by other entities;
- 2 E. make recommendations for the coordination of the local ocean acidification research
3 and monitoring activities with such activities of other nations and international
4 organizations;
- 5 F. outline budget requirements for national ocean acidification research and monitoring
6 and assessment activities to be conducted by each agency under the plan;
- 7 G. identify the monitoring systems and sampling programs currently employed in
8 collecting data relevant to ocean acidification and prioritize additional monitoring
9 systems that may be needed to ensure adequate data collection and monitoring of
10 ocean acidification and its impacts; and
- 11 H. describe specific activities designed to facilitate outreach and data and information
12 exchange with stakeholder communities.

13 SECTION 9. *Program Elements.* – The plan shall include at a minimum the following
14 program elements:

- 15 A. Monitoring of ocean chemistry and biological impacts associated with ocean
16 acidification at selected coastal and open-ocean monitoring stations, including
17 satellite-based monitoring to characterize—
- 18 1. marine ecosystems;
 - 19 2. changes in marine productivity; and
 - 20 3. changes in surface ocean chemistry.
- 21 B. Research to understand the species specific physiological response of marine
22 organisms to ocean acidification, impacts on marine food webs of ocean acidification,
23 and to develop environmental and ecological indices that track marine ecosystem
24 responses to ocean acidification.
- 25 C. Modeling to predict changes in the ocean carbon cycle as a function of carbon dioxide
26 and atmosphere-induced changes in temperature, ocean circulation, biogeochemistry,
27 ecosystem and terrestrial input, and modeling to determine impacts on marine
28 ecosystems and individual marine organisms.

1 D. Technology development and standardization of carbonate chemistry measurements
2 on moorings and autonomous floats.

3 E. Assessment of socioeconomic impacts of ocean acidification and development of
4 adaptation and mitigation strategies to conserve marine organisms and marine
5 ecosystems.

6 SECTION 10. *NCRP Review.* – The Secretary shall enter into an agreement with the
7 NCRP to review the plan.

8 SECTION 11. *Public Participation.* – In developing the plan, the Subcommittee shall
9 consult with representatives of academic, local government, industry and environmental groups.
10 Not later than 90 days before the plan, or any revision thereof, is submitted to the Congress, the
11 plan shall be duly published for a public comment period of not less than 60 days.

12 SECTION 12. *PAGASA Ocean Acidification Activities.* – The Secretary shall conduct
13 research and monitoring activities and may establish a program on ocean acidification within
14 PAGASA consistent with the strategic research plan developed by the Subcommittee under this
15 Act that—

16 A. Includes –

- 17 1. interdisciplinary research among the ocean and atmospheric sciences, and
18 coordinated research and activities to improve understanding of ocean
19 acidification;
- 20 2. the establishment of a long-term monitoring program of ocean acidification
21 utilizing existing global and national ocean observing assets, and adding
22 instrumentation and sampling stations as appropriate to the aims of the
23 research program;
- 24 3. research to identify and develop adaptation strategies and techniques for
25 effectively conserving marine ecosystems as they cope with increased ocean
26 acidification;

1 4. as an integral part of the research programs described in this Act, educational
2 opportunities that encourage an interdisciplinary and international approach to
3 exploring the impacts of ocean acidification;

4 5. as an integral part of the research programs described in this Act, national
5 public outreach activities to improve the understanding of current scientific
6 knowledge of ocean acidification and its impacts on marine resources; and

7 6. coordination of ocean acidification monitoring and impacts research with
8 other appropriate international ocean science bodies;

9 B. provides grants for critical research projects that explore the effects of ocean
10 acidification on ecosystems and the socioeconomic impacts of increased ocean
11 acidification that are relevant to the goals and priorities of the strategic research plan;
12 and

13 C. incorporates a competitive merit-based process for awarding grants.

14 SECTION 13. *Appropriations.* –The amount necessary for the implementation of this Act
15 is hereby appropriated.

16 SECTION 14. *Separability Clause.* – If any provision or part hereof, is held invalid or
17 unconstitutional, the remainder of the law or the provision not otherwise affected shall remain
18 valid and subsisting.

19 SECTION 15. *Repealing Clause.* – Any law, presidential decree or issuance, executive
20 order, letter of instruction, administrative order, rule or regulation contrary to or is inconsistent
21 with the provision of this Act is hereby repealed, modified, or amended accordingly.

22 SECTION 16. *Effectivity Clause.* – This Act shall take effect fifteen (15) days after its
23 publication in at least two (2) newspapers of general circulation.

24 Approved,