

**Republic of the Philippines
HOUSE OF REPRESENTATIVES
Quezon City**

**FIFTEENTH CONGRESS
First Regular Session**

House Bill No. **4604**

**Introduced by Representatives
DIOSDADO MACAPAGAL ARROYO and GLORIA MACAPAGAL ARROYO**

**AN ACT
TO PROVIDE FOR OCEAN ACIDIFICATION RESEARCH AND MONITORING**

EXPLANATORY NOTE

Article II, Section 16 of the Constitution provides that *"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 archipelagic country, 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.

We therefore enjoin our colleagues to work with us in ensuring the expeditious passage of this bill into law.


DIOSDADO MACAPAGAL ARROYO
Second District, Camarines Sur


GLORIA MACAPAGAL ARROYO
Second District, Pampanga

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

SECTION 1. *Short Title.* – This Act shall be known as the "Ocean
Acidification Research and Monitoring Act of 2011."

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

- A. development and coordination of a comprehensive interagency plan to:
1. monitor and conduct research on the processes and consequences of ocean acidification on marine organisms and ecosystems; and
 2. establish an interagency research and monitoring program on ocean acidification;
- B. establishment of an ocean acidification program within the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA);
- C. assessment and consideration of regional and national ecosystem and socio-economic impacts of increased ocean acidification; and

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

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

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

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

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

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

SECTION 5. *Duties.* –The Subcommittee shall:

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

B. oversee the development of:

1. an assessment of the potential impacts of ocean acidification on marine organisms and marine ecosystems; and
2. adaptation and mitigation strategies to conserve marine organisms and ecosystems exposed to ocean acidification;

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

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

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

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

SECTION 6. *Report to Congress.* -

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

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

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

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

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

SECTION 7. *Strategic Research Plan.* - Not later than two (2) years after the effectivity of this Act, the Subcommittee shall develop a strategic plan for national research and monitoring on ocean acidification that will provide for an assessment of the impacts of ocean acidification on marine organisms and marine ecosystems and the development of adaptation and mitigation strategies to conserve marine organisms and marine ecosystems. In developing the plan, the Subcommittee shall consider and use information, reports, and studies of ocean acidification that have identified research and monitoring needed to better understand ocean acidification and its potential impacts, and recommendations

made by the National Research Council of the Philippines (NRCP) in the review of the plan required under subsection (d).

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

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

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

B. describe specific activities, including:

1. efforts to determine user needs;
2. research activities;
3. monitoring activities;
4. technology and methods development;
5. data collection;
6. database development;
7. modeling activities;
8. assessment of ocean acidification impacts; and
9. participation in international research efforts;

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

D. consider and utilize, as appropriate, reports and studies conducted by other entities;

E. make recommendations for the coordination of the local ocean acidification research and monitoring activities with such activities of other nations and international organizations;

F. outline budget requirements for national ocean acidification research and monitoring and assessment activities to be conducted by each agency under the plan;

G. identify the monitoring systems and sampling programs currently employed in collecting data relevant to ocean acidification and prioritize additional monitoring systems that may be needed to ensure adequate data collection and monitoring of ocean acidification and its impacts; and

H. describe specific activities designed to facilitate outreach and data and information exchange with stakeholder communities.

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

A. Monitoring of ocean chemistry and biological impacts associated with ocean acidification at selected coastal and open-ocean monitoring stations, including satellite-based monitoring to characterize:

1. marine ecosystems;
2. changes in marine productivity; and
3. changes in surface ocean chemistry.

B. Research to understand the species specific physiological response of marine organisms to ocean acidification, impacts on marine food webs of ocean acidification, and to develop environmental and ecological indices that track marine ecosystem responses to ocean acidification.

C. Modeling to predict changes in the ocean carbon cycle as a function of carbon dioxide and atmosphere-induced changes in temperature, ocean circulation, biogeochemistry, ecosystem and terrestrial input and modeling to determine impacts on marine ecosystems and individual marine organisms.

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

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

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

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

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

A. Includes-

1. interdisciplinary research among the ocean and atmospheric sciences, and coordinated research and activities to improve understanding of ocean acidification;
2. the establishment of a long-term monitoring program of ocean acidification utilizing existing global and national ocean observing assets, and adding instrumentation and sampling stations as appropriate to the aims of the research program;
3. research to identify and develop adaptation strategies and techniques for effectively conserving marine ecosystems as they cope with increased ocean acidification;
4. as an integral part of the research programs described in this Act, educational opportunities that encourage an interdisciplinary and international approach to exploring the impacts of ocean acidification;
5. as an integral part of the research programs described in this Act, national public outreach activities to improve the understanding of current scientific knowledge of ocean acidification and its impacts on marine resources; and
6. coordination of ocean acidification monitoring and impacts research with other appropriate international ocean science bodies;

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

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

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

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

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

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

Approved,