

COASTAL AND OCEAN ACIDIFICATION STRESSORS AND  
THREATS RESEARCH ACT OF 2019

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MAY 28, 2019.—Committed to the Committee of the Whole House on the State of  
the Union and ordered to be printed

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Ms. EDDIE BERNICE JOHNSON of Texas, from the Committee on  
Science, Space, and Technology, submitted the following

R E P O R T

[To accompany H.R. 1237]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. Science, Space, and Technology) to amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification, to establish and maintain a data archive system for Ocean Acidification data and Coastal Acidification data, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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## I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

### SECTION 1. SHORT TITLE.

This Act may be cited as the “Coastal and Ocean Acidification Stressors and Threats Research Act of 2019” or the “COAST Research Act of 2019”.

### SEC. 2. PURPOSES.

(a) IN GENERAL.—Section 12402(a) of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3701(a)) is amended—

(1) in paragraph (1)—

(A) in the matter preceding subparagraph (A), by striking “development and coordination” and inserting “coordination and implementation”;

(B) in subparagraph (A), by striking “acidification on marine organisms” and inserting “acidification and coastal acidification on marine organisms”; and

(C) in subparagraph (B), by striking “establish” and all that follows through the semicolon and inserting “maintain and advise an interagency research, monitoring, and public outreach program on ocean acidification and coastal acidification.”;

(2) in paragraph (2), by striking “establishment” and inserting “maintenance”;

(3) in paragraph (3), by inserting “and coastal acidification” after “ocean acidification”; and

(4) in paragraph (4), by inserting “and coastal acidification that take into account other environmental and anthropogenic stressors” after “ocean acidification”.

(b) TECHNICAL AND CONFORMING AMENDMENT.—Section 12402 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3701(a)) is amended by striking “(a) purposes.”.

### SEC. 3. DEFINITIONS.

Section 12403 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3702) is amended—

(1) in paragraph (1), by striking “of the Earth’s oceans” and all that follows before the period at the end and inserting “and changes in the water chemistry of the Earth’s oceans, coastal estuaries, and waterways caused by carbon dioxide from the atmosphere and the breakdown of organic matter”;

(2) in paragraph (3), by striking “Joint Subcommittee on Ocean Science and Technology of the National Science and Technology Council” and inserting “National Science and Technology Council Subcommittee on Ocean Science and Technology”;

(3) by redesignating paragraphs (1), (2), and (3) as paragraphs (2), (3), and (4), respectively;

(4) by inserting before paragraph (2), as so redesignated, the following new paragraph:

“(1) COASTAL ACIDIFICATION.—The term ‘coastal acidification’ means the combined decrease in pH and changes in the water chemistry of coastal oceans, estuaries, and other bodies of water from chemical inputs (including carbon dioxide from the atmosphere), freshwater inputs, and excess nutrient run-off from land and coastal atmospheric pollution that result in processes that release carbon dioxide, acidic nitrogen, and sulfur compounds as byproducts which end up in coastal waters.”; and

(5) by adding at the end the following new paragraph:

“(5) STATE.—The term ‘State’ means each State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, the Virgin Islands of the United States, and any other territory or possession of the United States.”.

### SEC. 4. INTERAGENCY WORKING GROUP.

Section 12404 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3703) is amended—

(1) in the heading, by striking “**SUBCOMMITTEE**” and inserting “**WORKING GROUP**”;

(2) in subsection (a)—

- (A) in paragraph (1), by striking “Joint Subcommittee on Ocean Science and Technology of the National Science and Technology Council shall co-ordinate Federal activities on ocean acidification and” and insert “Subcommittee shall”;
- (B) in paragraph (2), by striking “Wildlife Service,” and inserting “Wildlife Service, the Bureau of Ocean Energy Management, the Environmental Protection Agency, the Department of Agriculture, the Department of State, the Department of Energy, the Department of the Navy, the National Park Service, the Bureau of Indian Affairs, the National Institute of Standards and Technology, the Smithsonian Institution,”; and
- (C) in paragraph (3), in the heading, by striking “**CHAIRMAN**” and inserting “**CHAIR**”;

(3) in subsection (b)—

- (A) in paragraph (1), by inserting “, including the efforts of the National Oceanic and Atmospheric Administration to facilitate such implementation” after “of the plan”;
- (B) in paragraph (2)—
  - (i) in subparagraph (A), by inserting “and coastal acidification” after “ocean acidification”; and
  - (ii) in subparagraph (B), by inserting “and coastal acidification” after “ocean acidification”;
- (C) in paragraph (4), by striking “; and” and inserting a semicolon;
- (D) in paragraph (5)—
  - (i) by striking “developed” and inserting “and coastal acidification developed”; and
  - (ii) by striking the period at the end and inserting “and coastal acidification; and”;
- (E) by adding at the end the following new paragraph:

“(6) ensure that each of the Federal agencies represented on the interagency working group—

- “(A) participates in the Ocean Acidification Information Exchange established under paragraph (5); and
- “(B) delivers data and information to support the data archive system established under section 12406(d);”

(4) in subsection (c), in paragraph (2)—

- (A) by inserting “, and to the Office of Management and Budget,” after “House of Representatives”; and
- (B) in subparagraph (B), by striking “the interagency research” and inserting “interagency strategic research”;

(5) by redesignating subsection (c) as subsection (d); and

(6) by inserting after subsection (b) the following:

“(c) ADVISORY BOARD.—

“(1) ESTABLISHMENT.—The Chair of the Subcommittee shall establish an Ocean Acidification Advisory Board.

“(2) DUTIES.—The Advisory Board shall—

- “(A) not later than 180 days before the Subcommittee submits the most recent report under subsection (d)(2)—
  - “(i) review such report;
  - “(ii) submit an analysis of such report to the Subcommittee for consideration in the final report submitted under subsection (d)(2); and
  - “(iii) concurrently with the Subcommittee’s final submission of the report under subsection (d)(2), the Advisory Board shall submit a copy of the analysis provided to the Subcommittee to the Committee on Commerce, Science, and Transportation of the Senate, the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Natural Resources of the House of Representatives;
- “(B) not later than 180 days before the Subcommittee submits the most recent strategic research plan under subsection (d)(3) to Congress—
  - “(i) review such plan;
  - “(ii) submit an analysis of such plan and the implementation thereof to the Subcommittee for consideration in the final strategic research plan submitted under subsection (d)(3); and
  - “(iii) concurrently with the Subcommittee’s final submission of the strategic research plan under subsection (d)(3), the Advisory Board shall submit a copy of the analysis provided to the Subcommittee to the Committee on Commerce, Science, and Transportation of the Senate,

the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Natural Resources of the House of Representatives;

“(C) provide ongoing advice to the Subcommittee and the interagency working group on matters related to Federal activities on ocean acidification and coastal acidification;

“(D) advise the Subcommittee and the interagency working group on—

“(i) efforts to coordinate research and monitoring activities related to ocean acidification and coastal acidification; and

“(ii) the best practices for the standards developed for data archiving under section 12406(e);

“(E) publish in the Federal Register a charter;

“(F) provide the Library of Congress with—

“(i) the charter described in subparagraph (E);

“(ii) any schedules and minutes for meetings of the Advisory Board;

“(iii) any documents that are approved by the Advisory Board; and

“(iv) any reports and analysis prepared by the Advisory Board; and

“(G) establish a publicly accessible web page on the website of the National Oceanic and Atmospheric Administration, that contains the information described in clauses (i) through (iv) of subparagraph (F).

“(3) MEMBERSHIP.—The Advisory Board shall consist of 24 members as follows:

“(A) 2 representatives of the shellfish and crab industry.

“(B) 1 representative of the finfish industry.

“(C) 1 representative of seafood processors.

“(D) 3 representatives from academia, including both natural and social sciences.

“(E) 1 representative of recreational fishing.

“(F) 1 representative of relevant nongovernmental organizations.

“(G) 6 representatives from relevant State, local, and Tribal governments.

“(H) 1 representative from the Alaska Ocean Acidification Network.

“(I) 1 representative from the California Current Acidification Network.

“(J) 1 representative from the Northeast Coastal Acidification Network.

“(K) 1 representative from the Southeast Coastal Acidification Network.

“(L) 1 representative from the Gulf of Mexico Coastal Acidification Network.

“(M) 1 representative from the Mid-Atlantic Coastal Acidification Network.

“(N) 1 representative from the Pacific Islands Ocean Observing System or similar entity representing the island territories and possessions of the United States in the Pacific Ocean, and the State of Hawaii.

“(O) 1 representative from the Caribbean Regional Association for Coastal Ocean Observing or a similar entity representing Puerto Rico and the U.S. Virgin Islands.

“(P) 1 representative from the National Oceanic and Atmospheric Administration shall serve as an ex-officio member of the Advisory Board without a vote.

“(4) APPOINTMENT OF MEMBERS.—The Chair of the Subcommittee shall—

“(A) appoint members to the Advisory Board (taking into account the geographical interests of each individual to be appointed as a member of the Advisory Board to ensure that an appropriate balance of geographical interests are represented by the members of the Advisory Board) who—

“(i) represent the interest group for which each seat is designated;

“(ii) demonstrate expertise on ocean acidification or coastal acidification and its scientific, economic, industry, cultural, and community impacts; and

“(iii) have a record of distinguished service with respect to ocean acidification or coastal acidification, and such impacts;

“(B) give consideration to nominations and recommendations from the members of the interagency working group and the public for such appointments; and

“(C) ensure that an appropriate balance of scientific, industry, and geographical interests are represented by the members of the Advisory Board.

“(5) TERM OF MEMBERSHIP.—Each member of the Advisory Board—

“(A) shall be appointed for a 5-year term; and

“(B) may be appointed to more than one term.

“(6) CHAIR.—The Chair of the Subcommittee shall appoint one member of the Advisory Board to serve as the Chair of the Advisory Board.

“(7) MEETINGS.—Not less than once each calendar year, the Advisory Board shall meet at such times and places as may be designated by the Chair of the Advisory Board, in consultation with the Chair of the Subcommittee and the Chair of the interagency working group.

“(8) BRIEFING.—The Chair of the Advisory Board shall brief the Subcommittee and the interagency working group on the progress of the Advisory Board as necessary.

“(9) FEDERAL ADVISORY COMMITTEE ACT.—Section 14 of the Federal Advisory Committee Act shall not apply to the Advisory Board.”.

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

Section 12405 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3704) is amended—

(1) in subsection (a)—

(A) by striking “acidification” each place it appears and inserting “acidification and coastal acidification”;

(B) in the first sentence—

(i) by inserting “, and not later than every 5 years thereafter” after “the date of enactment of this Act”;

(ii) by inserting “address the socioeconomic impacts of ocean acidification and coastal acidification and to” after “mitigation strategies to”; and

(iii) by striking “marine ecosystems” each place it appears and inserting “ecosystems”; and

(C) in the second sentence, by inserting “and recommendations made by the Advisory Board in the review of the plan required under section 12404(c)(2)(B)(i)” after “subsection (d)”;

(2) in subsection (b)—

(A) in paragraph (1), by inserting “and social sciences” after “among the ocean sciences”;

(B) in paragraph (2)—

(i) in subparagraph (A), by striking “impacts” and inserting “impacts, including trends of changes in ocean chemistry”;

(ii) in subparagraph (B)—

(I) by striking “improve the ability to assess the” and inserting “assess the short-term and long-term”; and

(II) by striking “; and” at the end and inserting a semicolon;

(iii) by amending subparagraph (C) to read as follows:

“(C) provide information for the—

“(i) development of adaptation and mitigation strategies to address the socioeconomic impacts of ocean acidification and coastal acidification;

“(ii) conservation of marine organisms and ecosystems; and

“(iii) assessment of the effectiveness of such adaptation and mitigation strategies; and”;

(iv) by adding at the end the following new subparagraph:

“(D) improve research on—

“(i) ocean acidification and coastal acidification;

“(ii) the interactions between and effects of multiple combined stressors including changes in water chemistry, changes in sediment delivery, hypoxia, and harmful algal blooms, on ocean acidification and coastal acidification; and

“(iii) the effect of environmental stressors on marine resources and ecosystems;”;

(C) in paragraph (3)—

(i) in subparagraph (F), by striking “database development” and inserting “data management”;

(ii) in subparagraph (H) by striking “and” at the end; and

(iii) by adding at the end the following new subparagraphs:

“(J) assessment of adaptation and mitigation strategies; and

“(K) education and outreach activities;”;

(D) in paragraph (4), by striking “set forth” and inserting “ensure an appropriate balance of contribution in establishing”;

(E) in paragraph (5), by striking “reports” and inserting “the best available peer-reviewed scientific reports”;

(F) in paragraph (6)—

(i) by inserting “and coastal acidification” after “ocean acidification”;

and

- (ii) by striking “of the United States” and inserting “within the United States”;
- (G) in paragraph (7), by striking “outline budget requirements” and inserting “estimate costs associated for full implementation of each element of the plan by fiscal year”;
- (H) in paragraph (8)—
  - (i) by inserting “and coastal acidification” after “ocean acidification” each place it appears;
  - (ii) by striking “its” and inserting “their”; and
  - (iii) by striking “; and” at the end and inserting a semicolon;
- (I) in paragraph (9), by striking the period at the end and inserting “; and”;
- (J) by adding at the end the following new paragraph:
  - “(10) describe monitoring needs necessary to support potentially affected industry members, coastal stakeholders, fishery management councils and commissions, non-Federal resource managers, and scientific experts on decision-making and adaptation related to ocean acidification and coastal acidification.”;
- (3) in subsection (c)—
  - (A) in paragraph (1)(C), by striking “surface”;
  - (B) in paragraph (2), by inserting “and coastal acidification” after “ocean acidification” each place it appears;
  - (C) in paragraph (3)—
    - (i) by striking “input, and” and inserting “inputs.”;
    - (ii) by inserting “, marine food webs,” after “marine ecosystems”; and
    - (iii) by inserting “, and modeling that supports fisheries management” after “marine organisms”;
  - (D) in paragraph (5), by inserting “and coastal acidification” after “ocean acidification”; and
  - (E) by adding at the end the following new paragraph:
    - “(6) Research to understand related and cumulative stressors and other biogeochemical processes occurring in conjunction with ocean acidification and coastal acidification.”;
  - (4) by striking subsection (e) and inserting the following:
    - “(e) ADVISORY BOARD EVALUATION.—Not later than 180 days before a plan is submitted to Congress, the Subcommittee shall provide the Advisory Board established under section 12404(c) a copy of the plan for purposes of review under paragraph (2)(B)(i) of such section.
  - “(f) PUBLICATION AND PUBLIC COMMENT.—Not later than 90 days before the strategic research plan, or any revision thereof, is submitted to Congress, the Subcommittee shall publish the plan in the Federal Register and provide an opportunity for submission of public comments for a period of not less than 60 days.”.

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

Section 12406 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3705) is amended—

- (1) in subsection (a)—
  - (A) in the matter preceding paragraph (1), by inserting “coordination,” after “research, monitoring,”;
  - (B) in paragraph (1)—
    - (i) in subparagraph (B)—
      - (I) by inserting “including the Integrated Ocean Observing System and the ocean observing assets of other Federal and State agencies,” after “ocean observing assets.”;
      - (II) by inserting “and agency and department missions, prioritizing the location of monitoring instruments, assets, and projects to maximize the efficiency of resources and to optimize understanding of socioeconomic impacts and ecosystem health” after “research program”;
    - (ii) in subparagraph (C)—
      - (I) by striking “adaptation” and inserting “adaptation and mitigation”; and
      - (II) by inserting “and supporting socioeconomically vulnerable communities and industries” after “marine ecosystems”;
      - (iii) in subparagraph (E), by striking “its impacts” and inserting “their respective impacts”;
      - (iv) in subparagraph (F), by striking “monitoring and impacts research” and inserting “research, monitoring, and adaptation and mitigation strategies”; and
      - (v) by adding at the end the following new subparagraph:

- “(G) research to improve understanding of the effect of—
  - “(i) other environmental stressors on ocean acidification and coastal acidification;
  - “(ii) multiple environmental stressors on living marine resources and coastal ecosystems; and
  - “(iii) adaptation and mitigation strategies to address the socio-economic impacts of ocean acidification and coastal acidification.”;
- (C) in paragraph (2), by striking “critical research projects that explore” and inserting “critical research and education projects that explore and communicate”; and
- (D) in paragraphs (1) and (2), by striking “acidification” each place it appears and inserting “acidification and coastal acidification”; and
- (2) by adding at the end the following new subsections:
  - “(c) RELATIONSHIP TO INTERAGENCY WORKING GROUP.—The National Oceanic and Atmospheric Administration shall serve as the lead Federal agency responsible for coordinating the Federal response to ocean acidification and coastal acidification, by—
    - “(1) leading the interagency working group in implementing the strategic research plan under section 12405;
    - “(2) coordinating monitoring and research efforts among Federal agencies in cooperation with State, local, and Tribal government and international partners;
    - “(3) maintaining an Ocean Acidification Information Exchange described under section 12404(b)(5) to allow for information to be electronically accessible, including information—
      - “(A) on ocean acidification developed through or used by the ocean acidification program described under section 12406(a); or
      - “(B) that would be useful to State governments, local governments, Tribal governments, resource managers, policymakers, researchers, and other stakeholders in mitigating or adapting to the impacts of ocean acidification and coastal acidification; and
    - “(4) establishing and maintaining the data archive system under subsection (d).
  - “(d) DATA ARCHIVE SYSTEM.—
    - “(1) MANAGEMENT.—The Secretary, in coordination with members of the interagency working group, shall provide for the long-term stewardship of, and access to, data relating to ocean acidification and coastal acidification by establishing and maintaining a data archive system that the National Center for Environmental Information uses to process, store, archive, provide access to, and incorporate to the extent possible, such data collected—
      - “(A) through relevant federally-funded research; and
      - “(B) by a Federal agency, State agency, local agency, Tribe, academic scientist, citizen scientist, or industry organization.
    - “(2) EXISTING GLOBAL OR NATIONAL DATA ASSETS.—In establishing and maintaining the data archive system under paragraph (1), the Secretary shall ensure that existing global or national data assets (including the data assets maintained by the National Centers for Environmental Information, the Integrated Ocean Observing System, and other existing data systems within Federal agencies) are incorporated to the greatest extent possible.
  - “(e) STANDARDS, PROTOCOLS, AND PROCEDURES.—With respect to the data described in subsection (d), the Secretary, in coordination with members of the interagency working group, shall establish and revise as necessary the standards, protocols, or procedures for—
    - “(1) processing, storing, archiving, and providing access to such data;
    - “(2) the interoperability and intercalibration of such data;
    - “(3) the collection of any metadata underlying such data; and
    - “(4) sharing such data with State, local, and Tribal government programs, potentially affected industry members, coastal stakeholders, fishery management councils and commissions, non-Federal resource managers, and academia.
  - “(f) DISSEMINATION OF OCEAN ACIDIFICATION DATA AND COASTAL ACIDIFICATION DATA.—The Secretary, in coordination with members of the interagency working group, shall disseminate the data described under subsection (d) to the greatest extent practicable by sharing such data on full and open access exchanges, including the Ocean Acidification Information Exchange described in section 12404(b)(5).
  - “(g) REQUIREMENT.—Recipients of grants from the National Oceanic and Atmospheric Administration under this subtitle that collect data described under subsection (d) shall—
    - “(1) collect such data in accordance with the standards, protocols, or procedures established pursuant to subsection (e); and

“(2) submit such data to the data archive system under subsection (d), in accordance with any rules promulgated by the Secretary.”.

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

Section 12407 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3706) is amended—

- (1) by striking “ocean acidification” each place it appears and inserting “ocean acidification and coastal acidification”;
- (2) in subsection (a)—
  - (A) in the matter preceding paragraph (1)—
    - (i) by striking “continue” and all that follows through “which shall”;
    - (ii) by striking “proposals for research” and inserting “proposals for the researching”;
    - (iii) by striking “its impacts” and inserting “their respective impacts”;
  - (B) in paragraph (1), by striking “marine ecosystems” and inserting “ecosystems”;
  - (C) in paragraph (2), by striking “; and” at the end and inserting a semicolon;
  - (D) in paragraph (3)—
    - (i) by striking “and its impacts” and inserting “and their respective impacts”;
    - (ii) by striking the period at the end and inserting “; and”;
  - (E) by adding at the end the following new paragraph:
    - (4) adaptation and mitigation strategies to address socioeconomic effects of ocean acidification and coastal acidification.”;
- (3) by adding at the end the following:

“(d) REQUIREMENT.—Recipients of grants from the National Science Foundation under this subtitle that collect data described under section 12406(d) shall—

- “(1) collect data in accordance with the standards, protocols, or procedures established pursuant to section 12406(e); and
- “(2) submit such data to the Director and the Secretary, in accordance with any rules promulgated by the Director or the Secretary.”.

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

Section 12408 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3707) is amended—

- (1) by striking “ocean acidification” each place it appears and inserting “ocean acidification and coastal acidification”;
- (2) in subsection (a), by striking “its impacts” and inserting “their respective impacts”;
- (3) by adding at the end the following new subsection:

“(d) REQUIREMENT.—Researchers from the National Aeronautics and Space Administration under this subtitle that collect data described under section 12406(d) shall—

- “(1) collect such data in accordance with the standards, protocols, or procedures established pursuant to section 12406(e); and
- “(2) submit such data to the Administrator and the Secretary, in accordance with any rules promulgated by the Administrator or the Secretary.”.

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

Section 12409 of the Federal Ocean Acidification Research and Monitoring Act of 2009 (33 U.S.C. 3708) is amended—

- (1) in subsection (a), by striking “subtitle—” and all that follows through paragraph (4) and inserting the following: “subtitle \$30,500,000 for each of the fiscal years 2020 through 2024.”;
- (2) in subsection (b), by striking “subtitle—” and all that follows through paragraph (4) and inserting the following: “subtitle \$20,000,000 for each of the fiscal years 2020 through 2024.”.

## II. PURPOSE OF THE BILL

The purpose of the bill is to reauthorize and update the Federal Ocean Acidification Research and Monitoring Act of 2009 by expanding the scope of federal ocean acidification and coastal acidification research, establishing an independent Ocean Acidification Advisory Board, establishing and maintaining a data archive system for ocean and coastal acidification data, and for other pur-

poses. The bill is cosponsored by Representatives Beyer, Blumenauer, Brownley, Cartwright, Case, Casten, Cox, Crist, DeFazio, Fitzpatrick, Gabbard, González-Colón, Hastings, Kilmer, Larsen, Lofgren, Lowenthal, Luria, Malinowski, Mast, McNerney, Moulton, Mucarsel-Powell, Pallone, Panetta, Pappas, Peters, Pingree, Posey, Rooney, Rouda, Ryan, Sires, Soto, Speier, Thompson, Tonko, Van Drew, Velázquez, Waltz, Wasserman Schultz, and Young.

### III. BACKGROUND AND NEED FOR THE LEGISLATION

Ocean acidification is an invisible but growing threat to ocean and coastal economies and communities. Ocean acidification is the gradual decrease in oceanic pH due primarily to the absorption of excess atmospheric carbon dioxide by seawater. When carbon dioxide gas reacts with seawater, it lowers the pH, which raises the acidity. Since the Industrial Revolution, the oceans have absorbed approximately one-third of the carbon dioxide emissions from the atmosphere.<sup>1</sup> This has caused ocean surface pH to decrease by 0.1, corresponding to a nearly 30 percent increase in acidity.<sup>2</sup> Under a higher emissions scenario, global mean surface acidity is expected to increase by 100–150 percent by the end of the century.<sup>3</sup>

Acidification is occurring faster in some U.S. coastal regions as a result of upwelling of naturally low pH water (Pacific Northwest), changes in freshwater inputs (Gulf of Maine), and high nutrient inputs (for example, in agricultural watersheds).<sup>4</sup>

Ocean acidification impairs the growth of shelled marine organisms, such as oysters, mussels, clams, and corals, and has also been shown to negatively impact some fish species. Some scientific models predict that acidification will generally reduce fish catch and biomass. Overall, acidification is expected to alter marine ecosystems and food webs, which will have consequences for the millions of people who live in coastal communities across the United States and its territories.

Recognizing the growing threat of ocean acidification, Congress enacted the Federal Ocean Acidification and Monitoring (FOARAM) Act in 2009, to support research and monitoring efforts to better understand ocean acidification and its impacts. The bill established the Ocean Acidification Program at the National Oceanic and Atmospheric Administration (NOAA), and the Interagency Working Group on Ocean Acidification, which provides a coordinated response by federal agencies to understand, monitor, and address ocean acidification.

Since FOARAM was passed into law, our understanding of ocean acidification and its impacts has increased substantially. However, research gaps remain, including the effects of acidification on many marine organisms, and the socioeconomic impacts to coastal communities and industries. FOARAM expired in 2012. The COAST Research Act would reauthorize FOARAM and improve research on ocean and coastal acidification and direct federal agencies to assess adaptation and mitigation strategies.

<sup>1</sup> IPCC Assessment Report 5

<sup>2</sup> IPCC AR5

<sup>3</sup> National Climate Assessment 4; Volume I; Ch. 13

<sup>4</sup> NCA4; Volume I; Ch. 13

#### IV. COMMITTEE HEARINGS

For the purposes of section 103(i) of H. Res. 6 of the 116th Congress, the following hearings were used to develop the legislation:

On March 7, 2019, the Honorable Lizzie Fletcher presiding over the Environment Subcommittee of the Committee on Science, Space, and Technology held a hearing focused on climate change impacts on our nation's oceans and coasts, where ocean acidification was discussed as a major associated impact. There were four witnesses: (1) Dr. Sarah Cooley, Director of the Ocean Acidification Program at Ocean Conservancy. Dr. Cooley provided testimony on the science of ocean warming, acidification, and deoxygenation and resulting impacts to marine ecosystems and humans. (2) Dr. Radley Horton, Lamont Associate Research Professor at Columbia University Earth Institute's Lamont-Doherty Earth Observatory. Dr. Horton testified on sea level rise projections and impacts to coastal communities. (3) Dr. Thomas K. Frazer, Professor and Director of the School of Natural Resources and Environment at the University of Florida. Dr. Frazer testified on the impacts of climate change to fisheries and the need for increased federal investment in research to promote adaptation and mitigation to those changes. (4) Ms. Margaret A. Pilaro, Executive Director of the Pacific Coast Shellfish Growers Association. Ms. Pilaro provided testimony on the impacts of ocean acidification and deoxygenation to shellfish hatcheries and strategies for how their industry has started to adapt.

#### V. COMMITTEE CONSIDERATION AND VOTES

As summarized in Section IV of this report, the Subcommittee on Environment heard testimony in the 116th Congress relevant to the activities authorized in H.R. 1237 at a hearing held on February 27, 2019.

On February 14, 2019, Representative Suzanne Bonamici of the Committee on Science, Space, and Technology, for herself and Representatives Young, Pingree, and Posey, introduced H.R. 1237, *the COAST Research Act of 2019*, to amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification data, and for other purposes.

On April 9, 2019, the Subcommittee on Environment met to consider H.R. 1237 and three other ocean acidification bills. There were no amendments offered to H.R. 1237. Ms. Fletcher moved that the Subcommittee favorably report H.R. 1237 to the Full Committee. *The motion was agreed to by a voice vote.*

The Committee on Science, Space, and Technology met to consider H.R. 1237 on Wednesday, May 1, 2019 and considered the following amendments to the bill:

1. Ms. Bonamici offered an amendment in the nature of a substitute that makes technical changes to the COAST Research Act. The amendment was based on feedback from the NOAA Ocean Acidification Program and other stakeholders. The feedback was gathered after the introduction of the legislation. The amendment helps to define NOAA's role in researching the impacts of ocean acidification. *The amendment was agreed to by a voice vote.*

Ms. Johnson moved that the Committee favorably report the bill, H.R. 1237, as amended, to the House with the recommendation that the bill be approved. *The motion was agreed to by a voice vote.*

## VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL

H.R. 1237 amends the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, expands and improves federal research on Ocean Acidification and Coastal Acidification, and establishes and maintains a data archive system for Ocean Acidification data and Coastal Acidification data, among other purposes.

## VII. SECTION-BY-SECTION ANALYSIS (BY TITLE AND SECTION)

### *Section 1. Short title*

Coastal and Ocean Acidification Stressors and Threats Research Act of 2019 or COAST Research Act of 2019

### *Section 2. Purpose*

This section integrates the importance of research, monitoring, and adaptation strategies for both ocean acidification and coastal acidification, taking into account other environmental and anthropogenic stressors.

### *Section 3. Definitions*

This section provides definitions for the terms “coastal acidification,” “ocean acidification”, “Secretary”, “State”, and “Subcommittee”.

### *Section 4. Interagency Working Group*

This section expands the Interagency Working Group on Ocean Acidification to include current participating members, including: the Bureau of Ocean Energy Management, the Environmental Protection Agency, the Department of Agriculture, the Department of State, the Department of Energy, the Department of the Navy, the National Park Service, the Bureau of Indian Affairs, the National Institute of Standards and Technology, and the Smithsonian Institution.

This section also establishes an Advisory Board comprised of representatives of the shellfish and crab industry, finfish industry, seafood processors, recreational fishing, academia, nongovernmental organizations, state, local, and tribal governments, and regional coastal acidification networks. The Advisory Board is charged with providing ongoing advice to both the National Science and Technology Council’s Subcommittee on Ocean Science and Technology and the Interagency Working Group on Ocean Acidification on federal activities relating to ocean and coastal acidification.

### *Section 5. Strategic research plan*

This section would expand the strategic plan for federal research and monitoring on ocean acidification to include an assessment of the effects of coastal acidification, the effectiveness of adaptation and mitigation strategies, the effects of other environmental stressors, and the socioeconomic effects of both ocean acidification

and coastal acidification. The strategic research plan should also address monitoring needs necessary to support potentially affected industry members, coastal stakeholders, fishery management councils and commissions, non-federal resource managers, and scientific experts in decision-making and adaptation related to ocean and coastal acidification. This section also directs the Advisory Board to evaluate the strategic research plan before it is submitted to Congress and published in the Federal Register.

*Section 6. NOAA Ocean Acidification Activities*

This section would designate NOAA as the lead federal agency responsible for coordinating the federal response to ocean acidification and coastal acidification, including the implementation of the strategic research plan. The section also directs the NOAA Ocean Acidification Program to conduct research to improve understanding of ocean and coastal acidification and adaptation and mitigation strategies that could support socioeconomically vulnerable communities, establish a long-term monitoring program, and enhance public outreach to improve understanding of current scientific knowledge of ocean and coastal acidification. The section clarifies that NOAA will be responsible for maintaining the Ocean Acidification Information Exchange. NOAA is directed to establish a data archive system, coordinating with existing federal systems, to process, store, archive, and provide access to any data relating to ocean acidification and coastal acidification collected by federal funded research, and when feasible, collected by federal, state, and local agencies, tribes, academic scientists, citizen scientists, and industry organizations.

*Section 7. National Science Foundation ocean acidification activities*

This section directs the National Science Foundation to support competitive, merit-based, peer-reviewed proposals for research proposals for the researching and monitoring of ocean acidification and coastal acidification. Recipients of NSF grants are directed to submit collected data to the NOAA data archive system.

*Section 8. National Aeronautics and Space Administration activities*

This section directs NASA to use space-based monitoring assets to monitor ocean acidification and coastal acidification. Researchers at NASA are directed to submit collected data to the NOAA data archive system.

*Section 9. Authorization of appropriations*

This section authorizes \$30.5 million for NOAA for fiscal years 2020 through 2024. The section also authorizes \$20 million for the NSF for fiscal years 2020 through 2024.

## VIII. COMMITTEE VIEWS

H.R. 1237, the COAST Research Act of 2019, reauthorizes and updates the Federal Ocean Acidification Research and Monitoring (FOARAM) Act of 2009, which expired in 2012. Since FOARAM was passed into law, the federal investment in ocean acidification research has significantly improved our understanding of how ocean chemistry is changing and how certain marine species are re-

sponding. According to the Fourth National Climate Assessment, ocean chemistry is currently changing at a rate that is faster than at least the past 66 million years, and ocean acidity levels are projected to increase an additional 100% to 150% by the end of the century. Yet the field of ocean acidification is still relatively nascent and the federal funding for ocean acidification research has remained roughly steady for the last decade, since the passage of FOARAM. The Committee believes it is important to enhance the federal investment in research and monitoring of ocean acidification to reflect the growing scientific needs and to support management, adaptation, and mitigation of impacted marine and coastal ecosystems and human communities. It is the Committee's view that the COAST Research Act of 2019 makes important improvements and updates to FOARAM. Among other necessary updates, H.R. 1237 expands the definition of ocean acidification to include estuaries and adds a formal definition of coastal acidification to recognize the specific mechanisms that alter coastal chemistry. The bill expands federal research and monitoring to improve our understanding of ocean and coastal acidification and improves our understanding how ocean acidification interacts with other environmental stressors such as harmful algal blooms.

Ocean acidification threatens the viability of certain coastal and ocean industries, such as commercial and recreational fisheries, tourism, and recreation. The Committee views ocean acidification as a multi-sectoral issue that requires engagement from a diversity of experts to advise on solutions. Based on stakeholder feedback, H.R. 1237 establishes an independent Ocean Acidification Advisory Board comprised of representatives of the shellfish and other fishing industries, academia, local, state, and tribal governments, U.S. territories and the regional acidification networks. The Committee believes that the regionally balanced Advisory Board will provide valuable advice to the interagency working group on federal ocean acidification response.

The COAST Research Act would designate NOAA as the lead federal agency responsible for implementing the federal ocean acidification response. This was based on a recommendation by a 2015 Government Accountability Office report that suggested an independent national ocean acidification program could help advance our understanding of ocean acidification. The Committee believes NOAA has already been leading the federal response to ocean acidification and that this designation reflects the fact that NOAA has the right expertise and tools to lead the federal response. H.R. 1237 also directs NOAA to maintain a data archive system to process, store, and archive all existing data from federally funded sources, including existing global and national data sets and research from state, local, tribal, academic, citizen science, and industry data sets. The bill also ensures the data are open source and available to the public. The Committee views the data archive as an important source of information to strengthen research and inform management, mitigation, and adaptation options for communities and industries that are most vulnerable to ocean and coastal acidification.

## IX. COST ESTIMATE

Pursuant to clause 3(c)(2) of rule XIII of the Rules of the House of Representatives, the Committee adopts as its own the estimate of new budget authority, entitlement authority, or tax expenditures or revenues contained in the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

## X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

U.S. CONGRESS,  
CONGRESSIONAL BUDGET OFFICE,  
*Washington, DC, May 24, 2019.*

Hon. EDDIE BERNICE JOHNSON,  
*Chairwoman, Committee on Science, Space, and Technology,  
House of Representatives, Washington, DC.*

DEAR MADAM CHAIRWOMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 1237, the COAST Research Act of 2019.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Robert Reese.

Sincerely,

KEITH HALL,  
*Director.*

Enclosure.

H.R. 1237, COAST Research Act of 2019			
As ordered reported by the House Committee on Science, Space, and Technology on May 1, 2019			
By Fiscal Year, Millions of Dollars	2019	2019-2024	2019-2029
Direct Spending (Outlays)	0	0	0
Revenues	0	0	0
Deficit Effect	0	0	0
Spending Subject to Appropriation (Outlays)	0	202	253
Pay-as-you-go procedures apply?	No	Mandate Effects	
Increases on-budget deficits in any of the four consecutive 10-year periods beginning in 2030?	No	Contains intergovernmental mandate?	No
		Contains private-sector mandate?	No

H.R. 1237 would amend the Federal Ocean Acidification Research and Monitoring Act of 2009 and would authorize the appropriation of about \$51 million annually over the 2020–2024 period for the National Oceanic and Atmospheric Administration (NOAA) and the National Science Foundation (NSF) to implement authorized activities related to ocean acidification.

Assuming appropriation of the authorized amounts, CBO estimates that implementing H.R. 1237 would cost \$202 million over the 2020–2024 period and \$51 million after 2024. In 2019, NOAA allocated \$12 million to ocean acidification related activities. The costs of the legislation, detailed in Table 1, would fall into budget functions 300 (natural resources and environment) and 250 (general science, space, and technology).

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER H.R. 1237  
By fiscal year, millions of dollars—

	2019	2020	2021	2022	2023	2024	2019–2024
Authorization .....	0	51	51	51	51	51	253
Estimated Outlays .....	0	21	35	45	51	51	202

Components may not sum to totals because of rounding.

The CBO staff contacts for this estimate are Robert Reese and Janani Shankaran. The estimate was reviewed by Theresa Gullo, Assistant Director for Budget Analysis.

## XI. FEDERAL MANDATES STATEMENT

H.R. 1237 contains no unfunded mandates.

## XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The Committee's oversight findings and recommendations are reflected in the body of this report.

## XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

The goals of H.R. 1237 are to expand the scope of research and monitoring on ocean acidification and coastal acidification; direct NOAA to maintain a data archive system to process, store, archive, all existing data; designate NOAA as the lead federal agency responsible for implementing the federal ocean acidification response; and establish an Ocean Acidification Advisory Board to provide ongoing advice to the National Science and Technology Council's Subcommittee on Ocean Science and Technology and the Interagency Working Group on Ocean Acidification on federal activities relating to ocean and coastal acidification.

## XIV. FEDERAL ADVISORY COMMITTEE STATEMENT

The Ocean Acidification Advisory Board that H.R. 1237 establishes in Section 4(c)(9) is a federal advisory committee. H.R. 1237 states that Section 14 of the Federal Advisory Committee Act, which would sunset the Advisory Board, shall not apply to the Ocean Acidification Advisory Board.

The functions of the advisory board authorized in H.R. 1237 are not currently being nor could they be performed by one or more

agencies or by enlarging the mandate of another existing advisory committee.

#### XV. DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII of the Rules of the House of Representatives, the Committee finds that no provision of H.R. 1237 establishes or reauthorizes a program of the federal government known to be duplicative of another federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111-139 or the most recent Catalog of Federal Domestic Assistance.

#### XVI. EARMARK IDENTIFICATION

Pursuant to clause 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 1237 contains no earmarks, limited tax benefits, or limited tariff benefits.

#### XVII. APPLICABILITY TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 1237 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104-1).

#### XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

#### XIX. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, and existing law in which no change is proposed is shown in roman):

#### **FEDERAL OCEAN ACIDIFICATION RESEARCH AND MONITORING ACT OF 2009**

\* \* \* \* \*

#### **TITLE XII—NOAA UNDERSEA RESEARCH PROGRAM ACT OF 2009**

\* \* \* \* \*

#### **Subtitle D—Federal Ocean Acidification Research and Monitoring Act of 2009**

\* \* \* \* \*

**SEC. 12402. PURPOSES.**

[(a) PURPOSES.—]The purposes of this subtitle are to provide for—

- (1) [development and coordination] *coordination and implementation* of a comprehensive interagency plan to—
  - (A) monitor and conduct research on the processes and consequences of ocean [acidification on marine organisms] *acidification and coastal acidification on marine organisms* and ecosystems; and
  - (B) [establish an interagency research and monitoring program on ocean acidification;] *maintain and advise an interagency research, monitoring, and public outreach program on ocean acidification and coastal acidification;*
- (2) [establishment] *maintenance* of an ocean acidification program within the National Oceanic and Atmospheric Administration;
- (3) assessment and consideration of regional and national ecosystem and socioeconomic impacts of increased ocean acidification *and coastal acidification*; and
- (4) research adaptation strategies and techniques for effectively conserving marine ecosystems as they cope with increased ocean acidification *and coastal acidification that take into account other environmental and anthropogenic stressors.*

**SEC. 12403. DEFINITIONS.**

In this subtitle:

(1) *COASTAL ACIDIFICATION.*—The term “coastal acidification” means the combined decrease in pH and changes in the water chemistry of coastal oceans, estuaries, and other bodies of water from chemical inputs (including carbon dioxide from the atmosphere), freshwater inputs, and excess nutrient run-off from land and coastal atmospheric pollution that result in processes that release carbon dioxide, acidic nitrogen, and sulfur compounds as byproducts which end up in coastal waters.

[(1)] (2) *OCEAN ACIDIFICATION.*—The term “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] and changes in the water chemistry of the Earth’s oceans, coastal estuaries, and waterways caused by carbon dioxide from the atmosphere and the breakdown of organic matter.

[(2)] (3) *SECRETARY.*—The term “Secretary” means the Secretary of Commerce, acting through the Administrator of the National Oceanic and Atmospheric Administration.

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

(5) *STATE.*—The term “State” means each State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, the Virgin Islands of the United States, and any other territory or possession of the United States.

**SEC. 12404. INTERAGENCY [SUBCOMMITTEE] WORKING GROUP.**

## (a) DESIGNATION.—

(1) IN GENERAL.—The [Joint Subcommittee on Ocean Science and Technology of the National Science and Technology Council shall coordinate Federal activities on ocean acidification and] *Subcommittee shall* establish an interagency working group.

(2) MEMBERSHIP.—The interagency working group on ocean acidification shall be comprised of senior representatives from the National Oceanic and Atmospheric Administration, the National Science Foundation, the National Aeronautics and Space Administration, the United States Geological Survey, the United States Fish and [Wildlife Service,] *Wildlife Service, the Bureau of Ocean Energy Management, the Environmental Protection Agency, the Department of Agriculture, the Department of State, the Department of Energy, the Department of the Navy, the National Park Service, the Bureau of Indian Affairs, the National Institute of Standards and Technology, the Smithsonian Institution*, and such other Federal agencies as appropriate.

(3) [CHAIRMAN] CHAIR.—The interagency working group shall be chaired by the representative from the National Oceanic and Atmospheric Administration.

## (b) DUTIES.—The Subcommittee shall—

(1) develop the strategic research and monitoring plan to guide Federal research on ocean acidification required under section 12405 of this subtitle and oversee the implementation of the plan, *including the efforts of the National Oceanic and Atmospheric Administration to facilitate such implementation*;

(2) oversee the development of—

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

(B) adaptation and mitigation strategies to conserve marine organisms and ecosystems exposed to ocean acidification *and coastal acidification*;

(3) facilitate communication and outreach opportunities with nongovernmental organizations and members of the stakeholder community with interests in marine resources;

(4) coordinate the United States Federal research and monitoring program with research and monitoring programs and scientists from other nations[; and],

(5) establish or designate an Ocean Acidification Information Exchange to make information on ocean acidification [developed] *and coastal 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[.] *and coastal acidification*; and

(6) ensure that each of the Federal agencies represented on the interagency working group—

(A) participates in the Ocean Acidification Information Exchange established under paragraph (5); and

*(B) delivers data and information to support the data archive system established under section 12406(d).*

*(c) ADVISORY BOARD.—*

*(1) ESTABLISHMENT.—The Chair of the Subcommittee shall establish an Ocean Acidification Advisory Board.*

*(2) DUTIES.—The Advisory Board shall—*

*(A) not later than 180 days before the Subcommittee submits the most recent report under subsection (d)(2)—*

*(i) review such report;*

*(ii) submit an analysis of such report to the Subcommittee for consideration in the final report submitted under subsection (d)(2); and*

*(iii) concurrently with the Subcommittee's final submission of the report under subsection (d)(2), the Advisory Board shall submit a copy of the analysis provided to the Subcommittee to the Committee on Commerce, Science, and Transportation of the Senate, the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Natural Resources of the House of Representatives;*

*(B) not later than 180 days before the Subcommittee submits the most recent strategic research plan under subsection (d)(3) to Congress—*

*(i) review such plan;*

*(ii) submit an analysis of such plan and the implementation thereof to the Subcommittee for consideration in the final strategic research plan submitted under subsection (d)(3); and*

*(iii) concurrently with the Subcommittee's final submission of the strategic research plan under subsection (d)(3), the Advisory Board shall submit a copy of the analysis provided to the Subcommittee to the Committee on Commerce, Science, and Transportation of the Senate, the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Natural Resources of the House of Representatives;*

*(C) provide ongoing advice to the Subcommittee and the interagency working group on matters related to Federal activities on ocean acidification and coastal acidification;*

*(D) advise the Subcommittee and the interagency working group on—*

*(i) efforts to coordinate research and monitoring activities related to ocean acidification and coastal acidification; and*

*(ii) the best practices for the standards developed for data archiving under section 12406(e);*

*(E) publish in the Federal Register a charter;*

*(F) provide the Library of Congress with—*

*(i) the charter described in subparagraph (E);*

*(ii) any schedules and minutes for meetings of the Advisory Board;*

*(iii) any documents that are approved by the Advisory Board; and*

(iv) any reports and analysis prepared by the Advisory Board; and

(G) establish a publicly accessible web page on the website of the National Oceanic and Atmospheric Administration, that contains the information described in clauses (i) through (iv) of subparagraph (F).

(3) **MEMBERSHIP.**—The Advisory Board shall consist of 24 members as follows:

(A) 2 representatives of the shellfish and crab industry.

(B) 1 representative of the finfish industry.

(C) 1 representative of seafood processors.

(D) 3 representatives from academia, including both natural and social sciences.

(E) 1 representative of recreational fishing.

(F) 1 representative of relevant nongovernmental organizations.

(G) 6 representatives from relevant State, local, and Tribal governments.

(H) 1 representative from the Alaska Ocean Acidification Network.

(I) 1 representative from the California Current Acidification Network.

(J) 1 representative from the Northeast Coastal Acidification Network.

(K) 1 representative from the Southeast Coastal Acidification Network.

(L) 1 representative from the Gulf of Mexico Coastal Acidification Network.

(M) 1 representative from the Mid-Atlantic Coastal Acidification Network.

(N) 1 representative from the Pacific Islands Ocean Observing System or similar entity representing the island territories and possessions of the United States in the Pacific Ocean, and the State of Hawaii.

(O) 1 representative from the Caribbean Regional Association for Coastal Ocean Observing or a similar entity representing Puerto Rico and the U.S. Virgin Islands.

(P) 1 representative from the National Oceanic and Atmospheric Administration shall serve as an ex-officio member of the Advisory Board without a vote.

(4) **APPOINTMENT OF MEMBERS.**—The Chair of the Subcommittee shall—

(A) appoint members to the Advisory Board (taking into account the geographical interests of each individual to be appointed as a member of the Advisory Board to ensure that an appropriate balance of geographical interests are represented by the members of the Advisory Board) who—

(i) represent the interest group for which each seat is designated;

(ii) demonstrate expertise on ocean acidification or coastal acidification and its scientific, economic, industry, cultural, and community impacts; and

(iii) have a record of distinguished service with respect to ocean acidification or coastal acidification, and such impacts;

(B) give consideration to nominations and recommendations from the members of the interagency working group and the public for such appointments; and

(C) ensure that an appropriate balance of scientific, industry, and geographical interests are represented by the members of the Advisory Board.

(5) TERM OF MEMBERSHIP.—Each member of the Advisory Board—

(A) shall be appointed for a 5-year term; and  
 (B) may be appointed to more than one term.

(6) CHAIR.—The Chair of the Subcommittee shall appoint one member of the Advisory Board to serve as the Chair of the Advisory Board.

(7) MEETINGS.—Not less than once each calendar year, the Advisory Board shall meet at such times and places as may be designated by the Chair of the Advisory Board, in consultation with the Chair of the Subcommittee and the Chair of the interagency working group.

(8) BRIEFING.—The Chair of the Advisory Board shall brief the Subcommittee and the interagency working group on the progress of the Advisory Board as necessary.

(9) FEDERAL ADVISORY COMMITTEE ACT.—Section 14 of the Federal Advisory Committee Act shall not apply to the Advisory Board.

**[(c)] (d) REPORTS TO CONGRESS.—**

(1) INITIAL REPORT.—Not later than 1 year after the date of enactment of this Act, the Subcommittee shall transmit a report to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology and the Committee on Natural Resources of the House of Representatives that—

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

(B) describes the progress in developing the plan required under section 12405 of this subtitle.

(2) BIENNIAL REPORT.—Not later than 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 Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology and the Committee on Natural Resources of the House of Representatives, and to the Office of Management and Budget, that includes—

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

(B) an analysis of the progress made toward achieving the goals and priorities for [the interagency research] interagency strategic research plan developed by the Subcommittee under section 12405.

(3) STRATEGIC RESEARCH PLAN.—Not later than 2 years after the date of enactment of this Act, the Subcommittee shall transmit the strategic research plan developed under section 12405 to the Committee on Commerce, Science, and Transpor-

tation of the Senate and the Committee on Science and Technology and the Committee on Natural Resources of the House of Representatives. A revised plan shall be submitted at least once every 5 years thereafter.

**SEC. 12405. STRATEGIC RESEARCH PLAN.**

(a) IN GENERAL.—Not later than 2 years after the date of enactment of this Act, *and not later than every 5 years thereafter*, the Subcommittee shall develop a strategic plan for Federal research and monitoring on ocean ~~acidification~~ acidification and coastal acidification that will provide for an assessment of the impacts of ocean ~~acidification~~ acidification and coastal acidification on marine organisms and ~~marine ecosystems~~ ecosystems and the development of adaptation and mitigation strategies to *address the socioeconomic impacts of ocean acidification and coastal acidification and coastal acidification and coastal acidification and to conserve marine organisms and [marine ecosystems] ecosystems*. In developing the plan, the Subcommittee shall consider and use information, reports, and studies of ocean ~~acidification~~ acidification and coastal acidification that have identified research and monitoring needed to better understand ocean ~~acidification~~ acidification and coastal acidification and its potential impacts, and recommendations made by the National Academy of Sciences in the review of the plan required under subsection (d) *and recommendations made by the Advisory Board in the review of the plan required under section 12404(c)(2)(B)(i)*.

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

(1) provide for interdisciplinary research among the ocean sciences and social sciences, and coordinated research and activities to improve the understanding of ocean chemistry that will affect marine ecosystems;

(2) establish, for the 10-year period beginning in the year the plan is submitted, the goals and priorities for Federal research and monitoring which will—

(A) advance understanding of ocean acidification and its physical, chemical, and biological ~~impacts~~ impacts, *including trends of changes in ocean chemistry*, on marine organisms and marine ecosystems;

(B) ~~improve the ability to assess the~~ *assess the short-term and long-term socioeconomic impacts of ocean acidification*; and;

(C) provide information for the development of adaptation and mitigation strategies to conserve marine organisms and marine ecosystems;]

(C) provide information for the—

(i) development of adaptation and mitigation strategies to address the socioeconomic impacts of ocean acidification and coastal acidification;

(ii) conservation of marine organisms and ecosystems; and

(iii) assessment of the effectiveness of such adaptation and mitigation strategies; and

(D) improve research on—

(i) ocean acidification and coastal acidification;

(ii) the interactions between and effects of multiple combined stressors including changes in water chem-

*istry, changes in sediment delivery, hypoxia, and harmful algal blooms, on ocean acidification and coastal acidification; and*

*(iii) the effect of environmental stressors on marine resources and ecosystems;*

(3) describe specific activities, including—

- (A) efforts to determine user needs;
- (B) research activities;
- (C) monitoring activities;
- (D) technology and methods development;
- (E) data collection;
- (F) **[database development]** *data management;*
- (G) modeling activities;
- (H) assessment of ocean acidification impacts; **[and]**
- (I) participation in international research efforts;
- (J) *assessment of adaptation and mitigation strategies;*

*and*

*(K) education and outreach activities;*

(4) identify relevant programs and activities of the Federal agencies that contribute to the interagency program directly and indirectly and **[set forth]** *ensure an appropriate balance of contribution in establishing the role of each Federal agency in implementing the plan;*

(5) consider and utilize, as appropriate, **[reports]** *the best available peer-reviewed scientific reports* and studies conducted by Federal agencies, the National Research Council, or other entities;

(6) make recommendations for the coordination of the ocean acidification *and coastal acidification* research and monitoring activities **[of the United States]** *within the United States* with such activities of other nations and international organizations;

(7) **[outline budget requirements]** *estimate costs associated for full implementation of each element of the plan by fiscal year* for Federal ocean acidification research and monitoring and assessment activities to be conducted by each agency under the plan;

(8) identify the monitoring systems and sampling programs currently employed in collecting data relevant to ocean acidification *and coastal acidification* and prioritize additional monitoring systems that may be needed to ensure adequate data collection and monitoring of ocean acidification *and coastal acidification* and **[its]** *their impacts***[; and]**;

(9) describe specific activities designed to facilitate outreach and data and information exchange with stakeholder communities**[.]** *and*

*(10) describe monitoring needs necessary to support potentially affected industry members, coastal stakeholders, fishery management councils and commissions, non-Federal resource managers, and scientific experts on decision-making and adaptation related to ocean acidification and coastal acidification.*

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

(1) 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—

- (A) marine ecosystems;
- (B) changes in marine productivity; and
- (C) changes in [surface] ocean chemistry.

(2) Research to understand the species specific physiological responses of marine organisms to ocean acidification *and coastal acidification*, impacts on marine food webs of ocean acidification *and coastal acidification*, and to develop environmental and ecological indices that track marine ecosystem responses to ocean acidification *and coastal acidification*.

(3) 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] inputs, modeling to determine impacts on marine ecosystems, *marine food webs*, and individual marine organisms, *and modeling that supports fisheries management*.

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

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

(6) *Research to understand related and cumulative stressors and other biogeochemical processes occurring in conjunction with ocean acidification and coastal acidification.*

(d) NATIONAL ACADEMY OF SCIENCES EVALUATION.—The Secretary shall enter into an agreement with the National Academy of Sciences to review the plan.

[(e) PUBLIC PARTICIPATION.—In developing the plan, the Subcommittee shall consult with representatives of academic, State, 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 published in the Federal Register for a public comment period of not less than 60 days.]

(e) ADVISORY BOARD EVALUATION.—*Not later than 180 days before a plan is submitted to Congress, the Subcommittee shall provide the Advisory Board established under section 12404(c) a copy of the plan for purposes of review under paragraph (2)(B)(i) of such section.*

(f) PUBLICATION AND PUBLIC COMMENT.—*Not later than 90 days before the strategic research plan, or any revision thereof, is submitted to Congress, the Subcommittee shall publish the plan in the Federal Register and provide an opportunity for submission of public comments for a period of not less than 60 days.*

**SEC. 12406. NOAA OCEAN ACIDIFICATION ACTIVITIES.**

(a) IN GENERAL.—The Secretary shall establish and maintain an ocean acidification program within the National Oceanic and Atmospheric Administration to conduct research, monitoring, *coordination*, and other activities consistent with the strategic research and implementation plan developed by the Subcommittee under section 12405 that—

- (1) includes—

(A) interdisciplinary research among the ocean and atmospheric sciences, and coordinated research and activities to improve understanding of ocean [acidification] acidification and coastal acidification;

(B) the establishment of a long-term monitoring program of ocean [acidification] acidification and coastal acidification utilizing existing global and national ocean observing assets, including the *Integrated Ocean Observing System and the ocean observing assets of other Federal and State agencies*, and adding instrumentation and sampling stations as appropriate to the aims of the research program and agency and department missions, prioritizing the location of monitoring instruments, assets, and projects to maximize the efficiency of resources and to optimize understanding of socioeconomic impacts and ecosystem health;

(C) research to identify and develop [adaptation] adaptation and mitigation strategies and techniques for effectively conserving marine ecosystems and supporting socioeconomically vulnerable communities and industries as they cope with increased ocean [acidification] acidification and coastal acidification;

(D) as an integral part of the research programs described in this subtitle, educational opportunities that encourage an interdisciplinary and international approach to exploring the impacts of ocean [acidification] acidification and coastal acidification;

(E) as an integral part of the research programs described in this subtitle, national public outreach activities to improve the understanding of current scientific knowledge of ocean [acidification] acidification and coastal acidification and [its impacts] their respective impacts on marine resources; and

(F) coordination of ocean [acidification] acidification and coastal acidification [monitoring and impacts research] research, monitoring, and adaptation and mitigation strategies with other appropriate international ocean science bodies such as the International Oceanographic Commission, the International Council for the Exploration of the Sea, the North Pacific Marine Science Organization, and others;

(G) research to improve understanding of the effect of—

(i) other environmental stressors on ocean acidification and coastal acidification;

(ii) multiple environmental stressors on living marine resources and coastal ecosystems; and

(iii) adaptation and mitigation strategies to address the socioeconomic impacts of ocean acidification and coastal acidification.

(2) provides grants for [critical research projects that explore] critical research and education projects that explore and communicate the effects of ocean [acidification] acidification and coastal acidification on ecosystems and the socioeconomic impacts of increased ocean [acidification] acidification and coastal acidification that are relevant to the goals and priorities of the strategic research plan; and

(3) incorporates a competitive merit-based process for awarding grants that may be conducted jointly with other participating agencies or under the National Oceanographic Partnership Program under section 8931 of title 10, United States Code.

(b) ADDITIONAL AUTHORITY.—In conducting the Program, the Secretary may enter into and perform such contracts, leases, grants, or cooperative agreements as may be necessary to carry out the purposes of this subtitle on such terms as the Secretary considers appropriate.

(c) *RELATIONSHIP TO INTERAGENCY WORKING GROUP.*—*The National Oceanic and Atmospheric Administration shall serve as the lead Federal agency responsible for coordinating the Federal response to ocean acidification and coastal acidification, by—*

*(1) leading the interagency working group in implementing the strategic research plan under section 12405;*

*(2) coordinating monitoring and research efforts among Federal agencies in cooperation with State, local, and Tribal government and international partners;*

*(3) maintaining an Ocean Acidification Information Exchange described under section 12404(b)(5) to allow for information to be electronically accessible, including information—*

*(A) on ocean acidification developed through or used by the ocean acidification program described under section 12406(a); or*

*(B) that would be useful to State governments, local governments, Tribal governments, resource managers, policy-makers, researchers, and other stakeholders in mitigating or adapting to the impacts of ocean acidification and coastal acidification; and*

*(4) establishing and maintaining the data archive system under subsection (d).*

(d) *DATA ARCHIVE SYSTEM.*—

*(1) MANAGEMENT.*—*The Secretary, in coordination with members of the interagency working group, shall provide for the long-term stewardship of, and access to, data relating to ocean acidification and coastal acidification by establishing and maintaining a data archive system that the National Center for Environmental Information uses to process, store, archive, provide access to, and incorporate to the extent possible, such data collected—*

*(A) through relevant federally-funded research; and*

*(B) by a Federal agency, State agency, local agency, Tribe, academic scientist, citizen scientist, or industry organization.*

*(2) EXISTING GLOBAL OR NATIONAL DATA ASSETS.*—*In establishing and maintaining the data archive system under paragraph (1), the Secretary shall ensure that existing global or national data assets (including the data assets maintained by the National Centers for Environmental Information, the Integrated Ocean Observing System, and other existing data systems within Federal agencies) are incorporated to the greatest extent possible.*

(e) *STANDARDS, PROTOCOLS, AND PROCEDURES.*—*With respect to the data described in subsection (d), the Secretary, in coordination*

with members of the interagency working group, shall establish and revise as necessary the standards, protocols, or procedures for—

- (1) processing, storing, archiving, and providing access to such data;
- (2) the interoperability and intercalibration of such data;
- (3) the collection of any metadata underlying such data; and
- (4) sharing such data with State, local, and Tribal government programs, potentially affected industry members, coastal stakeholders, fishery management councils and commissions, non-Federal resource managers, and academia.

(f) **DISSEMINATION OF OCEAN ACIDIFICATION DATA AND COASTAL ACIDIFICATION DATA.**—The Secretary, in coordination with members of the interagency working group, shall disseminate the data described under subsection (d) to the greatest extent practicable by sharing such data on full and open access exchanges, including the Ocean Acidification Information Exchange described in section 12404(b)(5).

(g) **REQUIREMENT.**—Recipients of grants from the National Oceanic and Atmospheric Administration under this subtitle that collect data described under subsection (d) shall—

- (1) collect such data in accordance with the standards, protocols, or procedures established pursuant to subsection (e); and
- (2) submit such data to the data archive system under subsection (d), in accordance with any rules promulgated by the Secretary.

**SEC. 12407. NSF OCEAN ACIDIFICATION ACTIVITIES.**

(a) **RESEARCH ACTIVITIES.**—The Director of the National Science Foundation shall [continue to carry out research activities on ocean acidification which shall] support competitive, merit-based, peer-reviewed [proposals for research] *proposals for the research* and monitoring of [ocean acidification] *ocean acidification and coastal acidification and [its impacts] their respective impacts*, including—

- (1) impacts on marine organisms and [marine ecosystems] *ecosystems*;
- (2) impacts on ocean, coastal, and estuarine biogeochemistry[; and];
- (3) the development of methodologies and technologies to evaluate [ocean acidification] *ocean acidification and coastal acidification [and its impacts] and their respective impacts [.]*; and
- (4) *adaptation and mitigation strategies to address socio-economic effects of ocean acidification and coastal acidification.*

(b) **CONSISTENCY.**—The research activities shall be consistent with the strategic research plan developed by the Subcommittee under section 12405.

(c) **COORDINATION.**—The Director shall encourage coordination of the Foundation's [ocean acidification] *ocean acidification and coastal acidification* activities with such activities of other nations and international organizations.

(d) **REQUIREMENT.**—Recipients of grants from the National Science Foundation under this subtitle that collect data described under section 12406(d) shall—

- (1) collect data in accordance with the standards, protocols, or procedures established pursuant to section 12406(e); and

(2) submit such data to the Director and the Secretary, in accordance with any rules promulgated by the Director or the Secretary.

**SEC. 12408. NASA OCEAN ACIDIFICATION ACTIVITIES.**

(a) OCEAN ACIDIFICATION ACTIVITIES.—The Administrator of the National Aeronautics and Space Administration, in coordination with other relevant agencies, shall ensure that space-based monitoring assets are used in as productive a manner as possible for monitoring of [ocean acidification] *ocean acidification and coastal acidification and [its impacts] their respective impacts*.

(b) PROGRAM CONSISTENCY.—The Administrator shall ensure that the Agency's research and monitoring activities on [ocean acidification] *ocean acidification and coastal acidification* are carried out in a manner consistent with the strategic research plan developed by the Subcommittee under section 12405.

(c) COORDINATION.—The Administrator shall encourage coordination of the Agency's [ocean acidification] *ocean acidification and coastal acidification* activities with such activities of other nations and international organizations.

(d) REQUIREMENT.—*Researchers from the National Aeronautics and Space Administration under this subtitle that collect data described under section 12406(d) shall—*

(1) collect such data in accordance with the standards, protocols, or procedures established pursuant to section 12406(e); and

(2) submit such data to the Administrator and the Secretary, in accordance with any rules promulgated by the Administrator or the Secretary.

**SEC. 12409. AUTHORIZATION OF APPROPRIATIONS.**

(a) NOAA.—There are authorized to be appropriated to the National Oceanic and Atmospheric Administration to carry out the purposes of this [subtitle—

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

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

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

[(4) \$20,000,000 for fiscal year 2012.] subtitle \$30,500,000 for each of the fiscal years 2020 through 2024.

(b) NSF.—There are authorized to be appropriated to the National Science Foundation to carry out the purposes of this [subtitle—

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

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

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

[(4) \$15,000,000 for fiscal year 2012.] subtitle \$20,000,000 for each of the fiscal years 2020 through 2024.

\* \* \* \* \*

## XX. EXCHANGE OF COMMITTEE CORRESPONDENCE

EDDIE BERNICE JOHNSON, Texas  
CHAIRWOMANFRANK D. LUCAS, Oklahoma  
RANKING MEMBER

May 14, 2019

Chairman Raúl M. Grijalva  
 Committee on Natural Resources  
 U.S. House of Representatives  
 1324 Longworth House Office Building  
 Washington, DC 20515

Dear Chairman Grijalva,

I am writing to you concerning H.R. 1237, the “COAST Research Act of 2019,” which was referred to the Committee on Science, Space, and Technology on March 13, 2019.

I appreciate your willingness to work cooperatively on this bill. I recognize that the bill contains provisions that fall within the jurisdiction of the Committee on Natural Resources. I acknowledge that your Committee will waive further consideration of H.R. 1237 and that this action is not a waiver of future jurisdictional claims by the Committee on Natural Resources over this subject matter.

I will make sure to include our exchange of letters in the *Congressional Record* and legislative reports. Thank you for your cooperation on this legislation.

Sincerely,

Eddie Bernice Johnson  
Chairwoman

cc: Ranking Member Frank D. Lucas, Committee on Science, Space, and Technology  
Ranking Member Rob Bishop, Committee on Natural Resources  
Tom Wickham, Parliamentarian

RAUL M. GRIJALVA OF ARIZONA  
CHAIRMAN

DAVID WATKINS  
STAFF DIRECTOR

ROB BISHOP OF UTAH  
RANKING REPUBLICAN

PATRICK BRADEN  
REPUBLICAN STAFF DIRECTOR

**U.S. House of Representatives**  
Committee on Natural Resources  
Washington, DC 20515

May 16, 2019

The Honorable Eddie Bernice Johnson  
Chairwoman  
Committee on Science, Space, and Technology  
U.S. House of Representatives  
2321 Rayburn House Office Building  
Washington, DC 20515

Dear Chairwoman Johnson,

In recognition of the goal of expediting consideration of H.R. 1237, the “COAST Research Act of 2019,” the Committee on Natural Resources agrees to waive formal consideration of the bill as to provisions that fall within the Rule X jurisdiction of the Committee on Natural Resources.

The Committee on Natural Resources takes this action with the mutual understanding that, in doing so, we do not waive any jurisdiction over the subject matter contained in this or similar legislation, and that the Committee will be appropriately consulted and involved as the bill or similar legislation moves forward so that we may address any remaining issues within our jurisdiction. Our Committee also reserves the right to seek appointment of conferees to any House–Senate conference involving this or similar legislation.

Thank you for agreeing to include our exchange of letters in the *Congressional Record*. I appreciate your cooperation regarding this legislation and look forward to continuing to work with you as this measure moves through the legislative process.

Sincerely,

  
Raúl M. Grijalva  
Chair

cc: The Honorable Rob Bishop, Ranking Member, Committee on Natural Resources  
The Honorable Frank Lucas, Ranking Member, Committee on Science, Space, and Technology  
The Honorable Thomas J. Wickham, Jr., Parliamentarian

## XXI. PROCEEDINGS OF THE SUBCOMMITTEE MARKUP

**MARKUPS: H.R. 1237,  
COAST RESEARCH ACT OF 2019;  
H.R. 1716, COASTAL COMMUNITIES  
OCEAN ACIDIFICATION ACT OF 2019;  
H.R. 1921, OCEAN ACIDIFICATION  
INNOVATION ACT OF 2019; AND  
H.R. 988, NEAR ACT OF 2019**

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TUESDAY, APRIL 9, 2019

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON ENVIRONMENT,  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 2:10 p.m., in room 2318 of the Rayburn House Office Building, Hon. Lizzie Fletcher [Chairwoman of the Subcommittee] presiding.

Chairwoman FLETCHER. Good afternoon. The Subcommittee will come to order. Without objection, the Chair is authorized to declare recess at any time. Pursuant to Committee Rule 2(e) and House Rule 11, the Chair announces that she may postpone roll call votes.

Pursuant to notice, the Subcommittee on the Environment meets to consider the following measures: H.R. 1237, the *COAST Research Act*; H.R. 1716, the *Coastal Communities Ocean Acidification Act of 2019*; H.R. 1921, the *Ocean Acidification Innovation Act of 2019*; and H.R. 988, the *NEAR Act of 2019*.

Welcome to our first Environment Subcommittee markup. Today we will be marking up four bipartisan bills that address an invisible but growing threat to our ocean and coastal economies and communities: Ocean acidification. At our March 7 Subcommittee hearing entitled, “Sea Change: Impacts of Climate Change on Our Nation’s Oceans and Coasts,” we heard from a variety of experts from the research community and industry who recognized ocean acidification as one of the top threats facing our oceans and coasts. Before going into the bills we will be marking up, I first want to give a brief explanation of why we need to address ocean acidification.

Ocean acidification is the gradual decrease in oceanic pH due to absorption of excess carbon dioxide in the atmosphere. It is often called the “other CO<sub>2</sub> problem” because, like climate change, it is caused primarily by excess CO<sub>2</sub> in the atmosphere. Since the beginning of the Industrial Revolution, the oceans have absorbed about a third of anthropogenic CO<sub>2</sub> emissions, resulting in a 30-percent increase in acidity levels. This increase in ocean acidity can cause

a number of problems that we are only beginning to fully understand.

In the mid-2000s, the multimillion-dollar Pacific Northwest shellfish hatchery industry experienced a near economic collapse due to shellfish larvae struggling to develop shells, which was eventually linked to more acidic ocean waters. This was a wake up call for the shellfish industry, researchers, and coastal communities. Recognizing the growing threat of ocean acidification, Congress enacted the *Federal Ocean Acidification Research and Monitoring Act*, or *FOARM*, in 2009 to support research and monitoring efforts to better understand ocean acidification and its impacts. The bill established the Ocean Acidification Program at the National Oceanic and Atmospheric Administration, NOAA, and the Interagency Working Group on Ocean Acidification, which provides a coordinated response by Federal agencies to understand, monitor, and address ocean acidification.

Since *FOARM* was passed into law, our understanding of ocean acidification impacts has increased substantially. For example, we know much more about why shelled marine organisms, such as oysters, mussels, clams, and corals, are particularly sensitive to low pH conditions. It is also predicted that many other fisheries will be negatively impacted, with some models predicting that acidification will cause widespread declines in fish catch. Thanks to *FOARM*, the engagement of multiple sectors, including Federal and non-Federal researchers, shellfish industry, resource managers, and others, there has been success in adapting the shellfish hatchery industry to ocean acidification. Now we need to help prepare other potentially vulnerable communities and industries. However, there is still a long way to go in understanding, predicting, and preparing for changes in ocean chemistry, which is why we need to enhance existing Federal efforts and add more tools to the toolbox, as the bills we're marking up today will accomplish.

H.R. 1237, the *Coastal and Ocean Acidification Stressors and Threats, COAST, Research Act of 2019*, reauthorizes and updates the *FOARM Act of 2009* to broaden the scope of Federal efforts to better understand the effects of ocean and coastal acidification. H.R. 1716, the *Coastal Communities Ocean Acidification Act of 2019*, supports Federal research and monitoring efforts by identifying the socioeconomic needs of coastal communities vulnerable to ocean acidification through requiring NOAA to conduct vulnerability assessments. H.R. 1921, the *Ocean Acidification Innovation Act of 2019*, creates prize competitions to incentivize innovative solutions to help vulnerable communities better understand, monitor, and respond to ocean acidification. Finally, H.R. 988, the *National Estuaries and Acidification Research, NEAR, Act of 2019*, improves our understanding of the impacts of ocean acidification on our Nation's ecologically and economically important estuarine environments.

Before I yield back, I would also like to place into the record this letter of support for all four bills from Ocean Conservancy. I do so without objection.

[The information referred to follows:]

1300 19th Street NW  
8th Floor  
Washington DC 20036

**Ocean Conservancy**

202.429.5609 Telephone  
202.872.0619 Facsimile  
[www.oceanconservancy.org](http://www.oceanconservancy.org)

April 8, 2019

The Honorable Lizzie Fletcher  
Chairwoman  
Environment Subcommittee  
Committee on Science, Space, and Technology  
U.S. House of Representatives  
Washington, D.C. 20515

The Honorable Roger Marshall  
Ranking Member  
Environment Subcommittee  
Committee on Science, Space, and Technology  
U.S. House of Representatives  
Washington, D.C. 20515

Dear Chairwoman Fletcher and Ranking Member Marshall:

On behalf of Ocean Conservancy, I write to provide our organization's support for several bills scheduled for markup by the House Science, Space, and Technology Environment Subcommittee, including H.R.1237, the *COAST Research Act of 2019*, H.R.1716, the *Coastal Communities Ocean Acidification Act of 2019*, H.R.1921, the *Ocean Acidification Innovation Act of 2019*, and H.R.988, the *NEAR Act of 2019*. These bills will improve how the federal government prepares for and responds to the impacts from ocean acidification, and deserve further consideration and approval by the Committee and the full U.S. House of Representatives.

Ocean acidification is changing the chemistry of our ocean, and coastal communities are already seeing the effects. As the ocean absorbs much of the carbon dioxide from the atmosphere, it mixes with seawater, causing an increase in the water's acidity. This increase in acidity causes a broad range of negative impacts that disrupt the benefits that ocean systems and resources provide to human communities. Coral reef-associated fisheries and tourism are put at risk as corals, oysters, clams, and other animals struggle to build their shells and skeletons in more acidic waters. Additionally, fishery revenues could decline if ocean acidification decreases the recruitment or slows the growth of lucrative species like sea scallops and red king or Tanner crab.

Following the widespread death of larval shellfish that nearly bankrupted hatcheries in the Pacific Northwest in the mid-2000s because of ocean acidification, Congress took action to better understand the impact of ocean acidification on people and marine resources. In 2009, the *Federal Ocean Acidification Research and Monitoring Act* (FOARAM) was signed into law. FOARAM established the NOAA Ocean Acidification Program and the Inter-Agency Working Group on Ocean Acidification, which provides a coordinated response by U.S. federal agencies to understand, track, and address ocean acidification. Much of our knowledge and understanding of ocean acidification that has emerged in the last decade can be credited to the work authorized by FOARAM, and it is crucial that Congress continue to build upon this foundation to better understand and address the impacts from ocean acidification.

The bills under consideration by the Committee will strengthen our nation's investments in ocean acidification research and monitoring. The *Coastal Communities Ocean Acidification Act of 2019* would better inform federal research and monitoring plans by taking into consideration the needs of coastal communities vulnerable to ocean acidification, and the *Ocean Acidification Innovation Act of 2019* would incentivize technological innovation in our nation's ability to understand, research, monitor, or adapt to ocean acidification. Further, the *NEAR Act of 2019* would improve our ability to understand the impacts from ocean acidification in estuarine environments, and the *COAST Research Act of 2019* would

reauthorize our nation's investments in ocean acidification and broaden the scope of federal work to better understand the effects from acidification not only in the open ocean but also in the coastal zone.

Importantly, each of these bills has support from members of both parties. These members recognize that coastal communities are experiencing the impacts from ocean acidification now, and there is a role for the federal government to play to better understand the science behind acidification and prepare communities for acidification's effects.

We appreciate the Committee's consideration of these bills, and encourage you and your colleagues to swiftly approve these bills and report them to the full U.S. House of Representatives for approval.

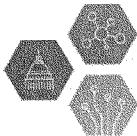
Sincerely,



Jeff Watters  
Director, Government Relations  
Ocean Conservancy

Chairwoman FLETCHER. I'm glad we're marking up this legislation today to address the growing impacts of ocean acidification, and look forward to moving these bills through the markup process, and eventually to the floor.

[The prepared statement of Chairwoman Fletcher follows:]



U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON  
**SCIENCE, SPACE, & TECHNOLOGY**

Opening Statement

**Chair Lizzie Fletcher (D-TX)**  
**Subcommittee on Environment**

Subcommittee Markup of:

*H.R. 1237, the "COAST Research Act of 2019",  
 H.R. 1716, the "Coastal Communities Ocean Acidification Act of 2019",  
 H.R. 1921, the "Ocean Acidification Innovation Act of 2019",  
 and H.R. 988, the "NEAR Act of 2019."*

April 9, 2019

Welcome to our first Environment Subcommittee markup. Today, we will be marking up four bipartisan bills that address an invisible but growing threat to our ocean and coastal economies and communities: ocean acidification. At our March 7th Subcommittee hearing, entitled "Sea Change: Impacts of Climate Change on Our Nation's Oceans and Coasts," we heard from a variety of experts from the research community and industry who recognized ocean acidification as one of the top threats facing our oceans and coasts. Before going into the bills we will be marking up, I first want to give a brief explanation of why we need to address ocean acidification.

Ocean acidification is the gradual decrease in oceanic pH due to absorption of excess carbon dioxide (CO<sub>2</sub>) in the atmosphere. It is often called "the other CO<sub>2</sub> problem," because, like climate change, it is caused primarily by excess CO<sub>2</sub> in the atmosphere. Since the beginning of the Industrial Revolution, the oceans have absorbed about a third of anthropogenic CO<sub>2</sub> emissions, resulting in a 30 percent increase in acidity levels. This increase in ocean acidity can cause a number of problems that we are only beginning to fully understand.

In the mid-2000s, the multi-million dollar Pacific Northwest shellfish hatchery industry experienced a near economic collapse due to shellfish larvae struggling to develop shells, which was eventually linked to more acidic ocean waters. This was a wake-up call for the shellfish industry, researchers, and coastal communities.

Recognizing the growing threat of ocean acidification, Congress enacted the Federal Ocean Acidification Research and Monitoring Act (or FOARAM) in 2009, to support research and monitoring efforts to better understand ocean acidification and its impacts. The bill established the Ocean Acidification Program at the National Oceanic and Atmospheric Administration (NOAA), and the Interagency Working Group on Ocean Acidification, which provides a coordinated response by federal agencies to understand, monitor, and address ocean acidification.

Since FOARAM was passed into law, our understanding of ocean acidification impacts has increased substantially. For example, we know much more about why shelled marine organisms, such as oysters, mussels, clams, and corals, are particularly sensitive to low pH conditions. It is predicted that many other fisheries will be negatively impacted, with some models predicting that acidification will cause widespread declines in fish catch.

Thanks to FOARAM and the engagement of multiple sectors, including federal and non-federal researchers, shellfish industry, resource managers, and others, there has been success in adapting the shellfish hatchery industry to ocean acidification. Now, we need to help prepare other potentially vulnerable communities and industries.

However, there is still a long way to go in understanding, predicting, and preparing for changes in ocean chemistry, which is why we need to enhance existing federal efforts and add more tools to the toolbox, as the bills we're marking up today will accomplish.

H.R. 1237, the Coastal and Ocean Acidification Stressors and Threats (COAST) Research Act of 2019, reauthorizes and updates the FOARAM Act of 2009 to broaden the scope of federal efforts to better understand the effects of ocean and coastal acidification.

H.R. 1716, the Coastal Communities Ocean Acidification Act of 2019, supports federal research and monitoring efforts by identifying the socioeconomic needs of coastal communities vulnerable to ocean acidification through requiring NOAA to conduct vulnerability assessments.

H.R. 1921, the Ocean Acidification Innovation Act of 2019, creates prize competitions to incentivize innovative solutions to help vulnerable communities better understand, monitor, and respond to ocean acidification.

Finally, H.R. 988, the National Estuaries and Acidification Research (NEAR) Act of 2019, improves our understanding of the impacts of ocean acidification on our nation's ecologically and economically important estuarine environments.

Before I yield back, I would also like to place into the record this letter of support for all four bills from Ocean Conservancy. Without objection.

I'm glad we're marking up this legislation today to address the growing impacts of ocean acidification and look forward to moving these bills through the markup process, and eventually to the floor.

Chairwoman FLETCHER. I now recognize Ranking Member Marshall to present his opening remarks.

Mr. MARSHALL. Yes, I thank you so much, Chairwoman Fletcher, for holding this markup today. But before I begin my statement, I want to welcome the newest member of our Subcommittee, my very good friend Congresswoman Jenniffer González-Colón. As Puerto Rico's only representative in Congress, she brings a unique and valued perspective to our Subcommittee, especially on ocean acidification, the topic of today's legislation. I look forward to working with her as a Member of this Subcommittee.

Now, while Kansas may be very far from our Nation's coastlines, discussing the impact of our climate on the country's resources is of top importance to our farmers and producers, both in Kansas, as well as across the country. As a grandfather, as well as an avid outdoorsman, I believe that we need to leave this world better than we found it for the next generation, and I hope this legislation we'll be discussing today will bring us one step closer to finding innovative solutions to the challenge of ocean acidification.

In 2009, Congress first passed the *Federal Ocean Acidification Research and Monitoring Act*, which was intended to help the National Oceanic Atmospheric Administration better understand the effects of ocean acidification on the ocean environment. You can't say this too quickly. There's too big of words, and they kind of run together there. Lots of vowels. This law created the Interagency Working Group on Ocean Acidification, which is made up of 14 different agencies and institutions to coordinate research and resource management related to ocean acidification. Despite their efforts, we learned in a hearing hosted by this Subcommittee in February that there's still more we can do to address the causes and impacts of the changing ocean chemistry, especially as it pertains to coastal regions. The measures today have been offered by a bipartisan group of members representing coastal districts most impacted by ocean acidification.

Whether through better coordination across Federal agencies, or through expansion and improvements to existing programs, these bills modify the way that we approach changes to marine ecosystems. The Earth's oceans are always in a state of evolution, and the steps we're taking today can improve the sustainability and overall health of our ecosystems, while still encouraging innovative approaches to addressing these fluctuations. I thank my colleagues for their leadership in addressing this issue, and encourage the Members of this Subcommittee to support these bills. Thank you, and I yield back.

[The prepared statement of Mr. Marshall follows:]

# Opening Statement of Ranking Member Roger Marshall at Environment Subcommittee Markup of Ocean Health Legislation

Apr 9, 2019

## Opening Statement

Thank you, Chairwoman Fletcher, for holding this markup today. Before I begin my statement, I want to welcome the newest member of our subcommittee, Congresswoman Jenniffer González-Colón. As Puerto Rico's only representative in Congress, she brings a unique perspective to our subcommittee, especially on ocean acidification, the topic of today's legislation. I look forward to working with her as a member of this subcommittee.

While Kansas may be far from our nation's coastlines, discussing the impact of our climate on the country's resources is of top importance to our farmers and producers both in Kansas as well as across the country. As a grandfather as well as an avid outdoorsman, I believe that we need to leave this world better than we found it for the next generation, and I hope that the legislation we will be discussing today will bring us one step closer to finding innovative solutions to the challenge of ocean acidification.

In 2009, Congress first passed the Federal Ocean Acidification Research and Monitoring Act, which was intended to help the National Oceanic and Atmospheric Administration (NOAA) better understand the effects of ocean acidification on the ocean environment. This law created the Interagency Working Group on Ocean Acidification, which is made up of 14 different agencies and institutions to coordinate research and resource management related to ocean acidification.

Despite their efforts, we learned in a hearing hosted by this subcommittee in February that there is still more that we can do to address the causes and

impacts of the changing ocean chemistry, especially as it pertains to coastal regions.

The measures today have been offered by a bipartisan group of Members representing coastal districts most impacted by ocean acidification. Whether through better coordination across federal agencies or through expansion and improvements to existing programs, these bills modify the way that we approach changes to marine ecosystems.

The earth's oceans are always in a state of evolution and the steps we're taking today can improve the sustainability and overall health of our ecosystems, while still encouraging innovative approaches to addressing these fluctuations.

I thank my colleagues for their leadership in addressing this issue and encourage the Members of this subcommittee to support these bills.

## H.R. 1237

Chairwoman FLETCHER. Thank you, Mr. Marshall. So we will now consider H.R. 1237, the *COAST Research Act*. The Clerk will report the bill.

The CLERK. H.R. 1237, a bill to amend the *Federal Ocean Acidification Research and Monitoring Act of 2009* to establish an ocean acidification advisory board to expand and improve the research on ocean acidification—

[The bill follows:]



116TH CONGRESS  
1ST SESSION

# H. R. 1237

To amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification, to establish and maintain a data archive system for Ocean Acidification data and Coastal Acidification data, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 14, 2019

Ms. BONAMICI (for herself, Mr. YOUNG, Ms. PINGREE, and Mr. POSEY) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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## A BILL

To amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification, to establish and maintain a data archive system for Ocean Acidification data and Coastal Acidification data, 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,*

**1 SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Coastal and Ocean  
3 Acidification Stressors and Threats Research Act of  
4 2019” or the “COAST Research Act of 2019”.

**5 SEC. 2. PURPOSES.**

6 (a) IN GENERAL.—Section 12402(a) of the Federal  
7 Ocean Acidification Research and Monitoring Act of 2009  
8 (33 U.S.C. 3701(a)) is amended—

9 (1) in paragraph (1)—

10 (A) in the matter preceding subparagraph  
11 (A), by striking “development and coordina-  
12 tion” and inserting “coordination and imple-  
13 mentation”;

14 (B) in subparagraph (A), by striking  
15 “acidification on marine organisms” and insert-  
16 ing “acidification and coastal acidification on  
17 marine organisms”; and

18 (C) in subparagraph (B), by striking “es-  
19 tablish” and all that follows before the semi-  
20 colon and inserting “maintain and advise an  
21 interagency research, monitoring, and public  
22 outreach program on ocean acidification and  
23 coastal acidification”;

24 (2) in paragraph (2), by striking “establish-  
25 ment” and inserting “maintenance”;

1 (3) in paragraph (3), by inserting "and coastal  
2 acidification" after "ocean acidification"; and

3 (4) in paragraph (4), by inserting "and coastal  
4 acidification that take into account other environ-  
5 mental and anthropogenic stressors" after "ocean  
6 acidification".

7 (b) TECHNICAL AND CONFORMING AMENDMENT.—

8 Section 12402 of the Federal Ocean Acidification Re-  
9 search and Monitoring Act of 2009 (33 U.S.C. 3701(a))  
10 is amended by striking “(a) PURPOSES.—”.

### 11 SEC. 3. DEFINITIONS.

12 Section 12403 of the Federal Ocean Acidification Re-  
13 search and Monitoring Act of 2009 (33 U.S.C. 3702) is  
14 amended—

22 (2) in paragraph (3), by striking "Joint Sub-  
23 committee on Ocean Science and Technology of the  
24 National Science and Technology Council" and in-

1       serting “National Science and Technology Council  
2       Subcommittee on Ocean Science and Technology”;

3               (3) by redesignating paragraphs (1), (2), and  
4               (3) as paragraphs (2), (3), and (4), respectively;

5               (4) by inserting before paragraph (2), as so re-  
6       designated, the following new paragraph:

7               “(1) COASTAL ACIDIFICATION.—The term  
8       ‘coastal acidification’ means the combined decrease  
9       in pH and changes in the water chemistry of coastal  
10      oceans, estuaries, and other bodies of water from  
11      chemical inputs (including carbon dioxide from the  
12      atmosphere), freshwater inputs, and excess nutrient  
13      run-off from land and coastal atmospheric pollution  
14      that result in processes that release carbon dioxide,  
15      acidic nitrogen, and sulfur compounds as byprod-  
16      ucts.”; and

17               (5) by adding at the end the following new  
18       paragraph:

19               “(5) STATE.—The term ‘State’ means each of  
20      the State of the United States, the District of Co-  
21      lumbia, the Commonwealth of Puerto Rico, Amer-  
22      ican Samoa, Guam, the Commonwealth of the  
23      Northern Mariana Islands, the Virgin Islands of the  
24      United States, and any other territory or possession  
25      of the United States.”.

## 1 SEC. 4. INTERAGENCY WORKING GROUP.

2 Section 12404 of the Federal Ocean Acidification Re-  
3 search and Monitoring Act of 2009 (33 U.S.C. 3703) is  
4 amended—

5 (1) in the heading, by striking “**SUB-**  
6 **COMMITTEE”** and inserting “**WORKING GROUP”**;

7 (2) in subsection (a)—

8 (A) in paragraph (1), by striking “Joint  
9 Subcommittee on Ocean Science and Tech-  
10 nology of the National Science and Technology  
11 Council shall coordinate Federal activities on  
12 ocean acidification and” and insert “Sub-  
13 committee shall”;

14 (B) in paragraph (2), by striking “Wildlife  
15 Service,” and inserting “Wildlife Service, the  
16 Bureau of Ocean Energy Management, the En-  
17 vironmental Protection Agency, the Department  
18 of Agriculture, the Department of State, the  
19 Department of Energy, the Department of the  
20 Navy, the National Park Service, the Bureau of  
21 Indian Affairs, the National Institute of Stand-  
22 ards and Technology, the Smithsonian Institu-  
23 tion,”; and

24 (C) in paragraph (3), in the heading, by  
25 striking “**CHAIRMAN”** and inserting “**CHAIR”**;

26 (3) in subsection (b)—

(A) in paragraph (1), by inserting “, including the efforts of the National Oceanic and Atmospheric Administration to facilitate such implementation” after “of the plan”;

5 (B) in paragraph (2)—

6 (i) in subparagraph (A), by inserting  
7 "and coastal acidification" after "ocean  
8 acidification"; and

9 (ii) in subparagraph (B), by inserting  
10 "and coastal acidification" after "ocean  
11 acidification";

12 (C) in paragraph (4), by striking “; and”  
13 and inserting a semicolon;

14 (D) in paragraph (5)—

15 (i) by striking “developed” and insert-  
16 ing “and coastal acidification developed”;  
17 and

18 (ii) by striking the period at the end  
19 and inserting "and coastal acidification;  
20 and"; and

21 (E) by adding at the end the following new  
22 paragraph:

23               “(6) ensure that each of the Federal agencies  
24               represented on the interagency working group—

1                 “(A) participates in the Ocean Acidifica-  
2                 tion Information Exchange established under  
3                 paragraph (5); and

4                 “(B) delivers data and information to sup-  
5                 port the data archive system established under  
6                 section 12406(d).”;

7                 (4) in subsection (c), in paragraph (2)—

8                     (A) by inserting “, and to the Office of  
9                 Management and Budget,” after “House of  
10                 Representatives”; and

11                     (B) in subparagraph (B), by striking “the  
12                 interagency research” and inserting “inter-  
13                 agency strategic research”;

14                 (5) by redesignating subsection (c) as sub-  
15                 section (d); and

16                 (6) by inserting after subsection (b) the fol-  
17                 lowing:

18                 “(c) ADVISORY BOARD.—

19                     “(1) ESTABLISHMENT.—The Chair of the Sub-  
20                 committee shall establish an Ocean Acidification Ad-  
21                 visory Board.

22                     “(2) DUTIES.—The Advisory Board shall—

23                             “(A) not later than 180 days after the  
24                 Subcommittee submits the most recent report  
25                 under subsection (d)(2) to Congress—

1                     “(i) review such report; and

2                     “(ii) submit an analysis of such report

3                     to the Subcommittee, the Committee on

4                     Commerce, Science, and Transportation of

5                     the Senate, the Committee on Science,

6                     Space, and Technology of the House of

7                     Representatives, and the Committee on

8                     Natural Resources of the House of Rep-

9                     resentatives;

10                    “(B) not later than 180 days after the

11                    Subcommittee submits the most recent strategic

12                    research plan under subsection (d)(3) to Con-

13                    gress—

14                    “(i) review such plan; and

15                    “(ii) submit an analysis of such plan

16                    and the implementation thereof to the Sub-

17                    committee, the Committee on Commerce,

18                    Science, and Transportation of the Senate,

19                    the Committee on Science, Space, and

20                    Technology of the House of Representa-

21                    tives, and the Committee on Natural Re-

22                    sources of the House of Representatives;

23                    “(C) provide ongoing advice to the Sub-

24                    committee and the interagency working group

1       on matters related to Federal activities on  
2       ocean acidification and coastal acidification;

3               “(D) advise the Subcommittee and the  
4       interagency working group on—

5               “(i) efforts to coordinate research and  
6       monitoring activities related to ocean acidifi-  
7       cation and coastal acidification; and

8               “(ii) the best practices for the stand-  
9       ards developed for data archiving under  
10      section 12406(e);

11               “(E) publish in the Federal Register the  
12       charter required under section 9(c) of the Fed-  
13       eral Advisory Committee Act (5 U.S.C. App.);

14               “(F) provide the Library of Congress  
15       with—

16               “(i) the charter described under sub-  
17       paragraph (E);

18               “(ii) any schedules and minutes for  
19       meetings of the Advisory Board;

20               “(iii) any documents described in sub-  
21       sections (b) and (c) of section 9 of the  
22       Federal Advisory Committee Act (5 U.S.C.  
23       App.) that are created by the Advisory  
24       Board; and

1                     “(iv) any reports prepared by the Ad-  
2                     visory Board; and

3                     “(G) establish a publicly accessible web  
4                     page on the website of the National Oceanic  
5                     and Atmospheric Administration, that contains  
6                     the information described in clause (i) through  
7                     (iv) of subparagraph (F).

8                     “(3) MEMBERSHIP.—The Advisory Board shall  
9                     consist of 21 members as follows:

10                    “(A) 2 representatives of the shellfish and  
11                    crab industry.

12                    “(B) 1 representative of the finfish indus-  
13                    try.

14                    “(C) 1 representative of seafood proc-  
15                    essors.

16                    “(D) 3 representatives from academia, in-  
17                    cluding both natural and social sciences.

18                    “(E) 1 representative of recreational fish-  
19                    ing.

20                    “(F) 1 representative of relevant non-  
21                    governmental organizations.

22                    “(G) 6 representatives from relevant State,  
23                    local, and Tribal governments.

24                    “(H) 1 representative from the Alaska  
25                    Ocean Acidification Network.

1                 “(I) 1 representative from the California  
2                 Current Acidification Network.

3                 “(J) 1 representative from the Northeast  
4                 Coastal Acidification Network.

5                 “(K) 1 representative from the Southeast  
6                 Coastal Acidification Network.

7                 “(L) 1 representative from the Gulf of  
8                 Mexico Coastal Acidification Network.

9                 “(M) 1 representative from the Mid-Atlan-  
10                 tic Coastal Acidification Network.

11                 “(4) APPOINTMENT OF MEMBERS.—The Chair  
12                 of the Subcommittee shall—

13                 “(A) appoint members to the Advisory  
14                 Board (taking into account the geographical in-  
15                 terests of each individual to be appointed as a  
16                 member of the Advisory Board to ensure that  
17                 an appropriate balance of geographical interests  
18                 are represented by the members of the Advisory  
19                 Board) who—

20                 “(i) represent the interest group for  
21                 which each seat is designated;

22                 “(ii) demonstrate expertise on ocean  
23                 acidification or coastal acidification and its  
24                 scientific, economic, industry, cultural, and  
25                 community impacts; and

1                     “(iii) have a record of distinguished  
2                     service with respect to ocean acidification  
3                     or coastal acidification, and such impacts  
4                     thereof;

5                     “(B) give consideration to nominations and  
6                     recommendations from the members of the  
7                     interagency working group and the public for  
8                     such appointments; and

9                     “(C) ensure that an appropriate balance of  
10                    scientific, industry, and geographical interests  
11                    are represented by the members of the Advisory  
12                    Board.

13                    “(5) TERM OF MEMBERSHIP.—Each member of  
14                    the Advisory Board—

15                    “(A) shall be appointed for a 5-year term;  
16                    and

17                    “(B) may be appointed to more than one  
18                    term.

19                    “(6) CHAIR.—The Chair of the Subcommittee  
20                    shall appoint one member of the Advisory Board to  
21                    serve as the Chair of the Advisory Board.

22                    “(7) MEETINGS.—Not less than once each cal-  
23                    endar year, the Advisory Board shall meet at such  
24                    times and places as may be designated by the Chair  
25                    of the Advisory Board, in consultation with the

1       Chair of the Subcommittee and the Chair of the  
2       interagency working group.

3           “(8) BRIEFING.—The Chair of the Advisory  
4       Board shall brief the Subcommittee and the inter-  
5       agency working group on the progress of the Advi-  
6       sory Board as necessary.

7           “(9) FEDERAL ADVISORY COMMITTEE ACT.—  
8       The Federal Advisory Committee Act shall not apply  
9       to the Advisory Board, except for subsections (b)  
10      and (c) of section 9 and subsections (a) through (d)  
11      of section 10 of such Act.”.

12 **SEC. 5. STRATEGIC RESEARCH PLAN.**

13       Section 12405 of the Federal Ocean Acidification Re-  
14       search and Monitoring Act of 2009 (33 U.S.C. 3704) is  
15       amended—

16           (1) in subsection (a)—

17               (A) by striking “acidification” each place it  
18       appears and inserting “acidification and coastal  
19       acidification”;

20               (B) in the first sentence—

21                   (i) by inserting “, and not later than  
22       every 5 years thereafter” after “the date of  
23       enactment of this Act”;

24                   (ii) by inserting “address the socio-  
25       economic impacts of ocean acidification

1 and coastal acidification and to" after  
2 "mitigation strategies to"; and  
3 (iii) by striking "marine ecosystems"  
4 each place it appears and inserting "eco-  
5 systems"; and  
6 (C) in the second sentence, by inserting  
7 "and recommendations made by the Advisory  
8 Board in the review of the plan required under  
9 subsection (e)" after "subsection (d)";  
10 (2) in subsection (b)—  
11 (A) in paragraph (1), by inserting "and so-  
12 cial sciences" after "among the ocean sciences";  
13 (B) in paragraph (2)—  
14 (i) in subparagraph (A), by striking  
15 "impacts" and inserting "impacts, includ-  
16 ing trends of changes in ocean chemistry,";  
17 (ii) in subparagraph (B)—  
18 (I) by striking "improve the abil-  
19 ity to assess the" and inserting "assess the short-term and long-term";  
20 and  
21 (II) by striking ";" and" at the  
22 end and inserting a semicolon;  
23 (iii) by amending subparagraph (C) to  
24 read as follows:

1                     “(C) provide information for the—  
2                         “(i) development of adaptation and  
3                         mitigation strategies to address the socio-  
4                         economic impacts of ocean acidification  
5                         and coastal acidification;  
6                         “(ii) conservation of marine organisms  
7                         and ecosystems; and  
8                         “(iii) assessment of the effectiveness  
9                         of such adaptation and mitigation strate-  
10                         gies;”; and  
11                         (iv) by adding at the end the following  
12                         new subparagraph:  
13                     “(D) improve research on—  
14                         “(i) ocean acidification and coastal  
15                         acidification;  
16                         “(ii) the effect of environmental  
17                         stressors on each other, including research  
18                         on the effect of changes in water chem-  
19                         istry, changes in sediment delivery, hy-  
20                         poxia, and harmful algal blooms, on ocean  
21                         acidification and coastal acidification; and  
22                         “(iii) the effect of environmental  
23                         stressors on marine resources and eco-  
24                         systems;”;  
25                     (C) in paragraph (3)—

1 (i) in subparagraph (F), by inserting  
2 “and management” after “database devel-  
3 opment”;

4 (ii) in subparagraph (H) by striking  
5 “and” at the end; and

6 (iii) by adding at the end the fol-  
7 lowing new subparagraphs:  
8 “(J) assessment of adaptation and mitigation  
9 strategies; and  
10 “(K) education and outreach activities;”;

11 (D) in paragraph (4), by striking “set  
12 forth” and inserting “ensure an appropriate  
13 balance of contribution in establishing”;

14 (E) in paragraph (5), by striking “reports”  
15 and inserting “the best available peer-reviewed  
16 scientific reports”;

17 (F) in paragraph (6)—  
18 (i) by inserting “and coastal acidifica-  
19 tion” after “ocean acidification”; and  
20 (ii) by striking “of the United States”  
21 and inserting “within the United States”;

22 (G) in paragraph (7)—  
23 (i) by striking “outline budget re-  
24 quirements” and inserting “estimate budg-  
25 et requirements for each of the fiscal years

3 (ii) by inserting "over the course of  
4 10 years" after "under the plan";

5 (H) in paragraph (8)—

6 (i) by inserting "and coastal acidifica-  
7 tion" after "ocean acidification" each place  
8 it appears;

11 (iii) by striking “; and” at the end  
12 and inserting a semicolon;

13 (I) in paragraph (9), by striking the period  
14 at the end and inserting “; and”; and

15 (J) by adding at the end the following new  
16 paragraph:

17                 “(10) describe monitoring needs necessary to  
18                 support potentially affected industry members,  
19                 coastal stakeholders, fishery management councils  
20                 and commissions, non-Federal resource managers,  
21                 and scientific experts on decision-making and adap-  
22                 tation related to ocean acidification and coastal  
23                 acidification.”;

24 (3) in subsection (c)—

(B) in paragraph (2), by inserting "and coastal acidification" after "ocean acidification";

6 (C) in paragraph (3)—

7 (i) by striking "input, and" and in-  
8 serting "inputs,";

9 (ii) by inserting “, marine food webs,”  
10 after “marine ecosystems”; and

11 (iii) by inserting “, and modeling that  
12 supports fisheries management” after  
13 “marine organisms”;

14 (D) in paragraph (5), by inserting "and  
15 coastal acidification" after "ocean acidifica-  
16 tion"; and

17 (E) by adding at the end the following new  
18 paragraph:

19           “(6) Research to understand related and cumu-  
20       lative stressors and other biogeochemical processes  
21       occurring in conjunction with ocean acidification and  
22       coastal acidification ”; and

23 (4) by striking subsection (e) and inserting the  
24 following:

1       “(e) ADVISORY BOARD EVALUATION.—Not later  
2 than 60 days before a plan is submitted to Congress, the  
3 Subcommittee shall provide the Advisory Board estab-  
4 lished under section 12404(c) a copy of the plan.

5       “(f) PUBLICATION AND PUBLIC COMMENT.—Not  
6 later than 90 days before the strategic research plan, or  
7 any revision thereof, is submitted to Congress, the Sub-  
8 committee shall publish the plan in the Federal Register  
9 and provide an opportunity for submission of public com-  
10 ments for a period of not less than 60 days.”.

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

12       Section 12406 of the Federal Ocean Acidification Re-  
13 search and Monitoring Act of 2009 (33 U.S.C. 3705) is  
14 amended—

15           (1) in subsection (a)—

16              (A) in the matter preceding paragraph (1),  
17              by inserting “coordination,” after “research,  
18              monitoring;”;

19              (B) in paragraph (1)—

20                  (i) in subparagraph (B)—

21                      (I) by inserting “including the  
22                      Integrated Ocean Observing System  
23                      and the ocean observing assets of  
24                      other Federal agencies,” after “ocean  
25                      observing assets;” and

1 (II) by inserting “and agency  
2 and department missions, prioritizing  
3 the location of monitoring instru-  
4 ments, assets, and projects to maxi-  
5 mize the efficiency of resources and to  
6 optimize understanding of socio-  
7 economic impacts and ecosystem  
8 health” after “research program”;  
9 (ii) in subparagraph (C)—  
10 (I) by striking “adaptation” and  
11 inserting “adaptation and mitigation”;  
12 and  
13 (II) by inserting “and supporting  
14 socioeconomically vulnerable commu-  
15 nities and industries” after “marine  
16 ecosystems”;  
17 (iii) in subparagraph (E), by striking  
18 “its impacts” and inserting “their respec-  
19 tive impacts”;  
20 (iv) in subparagraph (F), by striking  
21 “monitoring and impacts research” and in-  
22 serting “research, monitoring, and adapta-  
23 tion and mitigation strategies”; and  
24 (v) by adding at the end the following  
25 new subparagraph:

1                     “(G) research to improve understanding of  
2                     the effect of—

3                         “(i) other environmental stressors on  
4                     ocean acidification and coastal acidifica-  
5                     tion;

6                         “(ii) multiple environmental stressors  
7                     on living marine resources and coastal eco-  
8                     systems; and

9                         “(iii) adaptation and mitigation strat-  
10                     egies to address the socioeconomic impacts  
11                     of ocean acidification and coastal acidifica-  
12                     tion.”;

13                     (C) in paragraph (2), by striking “critical  
14                     research projects that explore” and inserting  
15                     “critical research and education projects that  
16                     explore and communicate”; and

17                     (D) in paragraphs (1), (2), and (3), by  
18                     striking “acidification” each place it appears  
19                     and inserting “acidification and coastal acidifica-  
20                     tion”; and

21                     (2) by adding at the end the following new sub-  
22                     sections:

23                     “(c) RELATIONSHIP TO INTERAGENCY WORKING  
24                     GROUP.—The National Oceanic and Atmospheric Admin-  
25                     istration shall serve as the lead Federal agency responsible

1 for coordinating the Federal response to ocean acidifica-  
2 tion and coastal acidification, by—

3           “(1) leading the interagency working group in  
4           implementing the strategic research plan under sec-  
5           tion 12405;

6           “(2) coordinating monitoring and research ef-  
7           forts among Federal agencies in cooperation with  
8           State, local, and international partners;

9           “(3) maintaining an Ocean Acidification Infor-  
10           mation Exchange described under section  
11           12404(b)(5) to allow for information to be electronically  
12           accessible, including information—

13           “(A) on ocean acidification developed  
14           through or used by the ocean acidification pro-  
15           gram described under section 12406(a); or

16           “(B) that would be useful to State govern-  
17           ments, local governments, Tribal governments,  
18           resource managers, policymakers, researchers,  
19           and other stakeholders in mitigating or adapt-  
20           ing to the impacts of ocean acidification and  
21           coastal acidification; and

22           “(4) establishing and maintaining the data ar-  
23           chive system under subsection (d).

24           “(d) DATA ARCHIVE SYSTEM.—

1                 “(1) ESTABLISHMENT.—The Secretary, in co-  
2 ordination with members of the interagency working  
3 group, shall provide for the long-term stewardship  
4 of, and access to, data relating to ocean acidification  
5 and coastal acidification by establishing a data ar-  
6 chive system that processes, stores, archives, pro-  
7 vides access to, and incorporates to the extent pos-  
8 sible, such data collected—

9                 “(A) through relevant federally funded re-  
10 search; and

11                 “(B) by a Federal agency, State agency,  
12 local agency, Tribe, academic scientist, citizen  
13 scientist, or industry organization.

14                 “(2) EXISTING GLOBAL OR NATIONAL DATA AS-  
15 SETS.—In establishing the data archive system  
16 under paragraph (1), the Secretary shall ensure that  
17 existing global or national data assets (including the  
18 data assets of the National Centers for Environ-  
19 mental Information, the Integrated Ocean Observing  
20 System, and other existing data systems within Fed-  
21 eral agencies) are incorporated to the greatest extent  
22 possible.

23                 “(e) STANDARDS, PROTOCOLS, AND PROCEDURES.—  
24 With respect to the data described in subsection (d), the  
25 Secretary, in coordination with members of the inter-

1 agency working group, shall establish standards, protocols,  
2 or procedures for—

3           “(1) processing, storing, archiving, and pro-  
4       viding access to such data;

5           “(2) the interoperability and intercalibration of  
6       such data;

7           “(3) the collection of any metadata underlying  
8       such data; and

9           “(4) sharing such data with State, local, and  
10      Tribal government programs, potentially affected in-  
11       dustry members, coastal stakeholders, fishery man-  
12       agement councils and commissions, non-Federal re-  
13       source managers, and academia.

14       “(f) DISSEMINATION OF OCEAN ACIDIFICATION  
15 DATA AND COASTAL ACIDIFICATION DATA.—The Sec-  
16 retary, in coordination with members of the interagency  
17 working group, shall disseminate the data described under  
18 subsection (d) to the greatest extent practicable by sharing  
19 such data on full and open access exchanges, including  
20 the Ocean Acidification Information Exchange described  
21 in section 12404(b)(5).

22       “(g) REQUIREMENT.—Recipients of grants from the  
23 National Oceanic and Atmospheric Administration under  
24 this subtitle that collected data described under subsection  
25 (d) shall—

1               “(1) collect such data in accordance with the  
2        standards, protocols, or procedures established pur-  
3        suant to subsection (e); and

4               “(2) submit such data to the Secretary, in ac-  
5        cordance with any rules promulgated by the Sec-  
6        retary.”.

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

8        Section 12407 of the Federal Ocean Acidification Re-  
9        search and Monitoring Act of 2009 (33 U.S.C. 3706) is  
10      amended—

11               (1) by striking “ocean acidification” each place  
12        it appears and inserting “ocean acidification and  
13        coastal acidification”;

14               (2) in subsection (a)—

15                       (A) in the matter preceding paragraph  
16                       (1)—

17                               (i) by striking “continue to carry out  
18                               research activities on ocean acidification  
19                               which shall”;

20                               (ii) by striking “proposals for re-  
21                               search” and inserting “proposals for the  
22                               researching”; and

23                               (iii) by striking “its impacts” and in-  
24                               serting “their respective impacts”;

1 (B) in paragraph (1), by striking “marine  
2 ecosystems” and inserting “ecosystems”;  
3 (C) in paragraph (2), by striking “; and”  
4 at the end and inserting a semicolon;  
5 (D) in paragraph (3)—  
6 (i) by striking “and its impacts” and  
7 inserting “and their respective impacts”;  
8 and  
9 (ii) by striking the period at the end  
10 and inserting “; and”; and  
11 (E) by adding at the end the following new  
12 paragraph:  
13 “(4) adaptation and mitigation strategies to ad-  
14 dress socioeconomic effects of ocean acidification and  
15 coastal acidification.”; and  
16 (3) by adding at the end the following:  
17 “(d) REQUIREMENT.—Recipients of grants from the  
18 National Science Foundation under this subtitle that col-  
19 lect data described under section 12406(d) shall—  
20 “(1) collect data in accordance with the stand-  
21 ards, protocols, or procedures established pursuant  
22 to section 12406(e); and  
23 “(2) submit such data to the Director and the  
24 Secretary, in accordance with any rules promulgated  
25 by the Director or the Secretary.”.

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

2 Section 12408 of the Federal Ocean Acidification Re-  
3 search and Monitoring Act of 2009 (33 U.S.C. 3707) is  
4 amended—

5 (1) by striking “ocean acidification” each place  
6 it appears and inserting “ocean acidification and  
7 coastal acidification”;

8 (2) in subsection (a), by striking “its impaets”  
9 and inserting “their respective impacts”; and

10 (3) by adding at the end the following new sub-  
11 section:

12 “(d) REQUIREMENT.—Researchers from the National  
13 Aeronautics and Space Administration under this subtitle  
14 that collect data described under section 12406(d) shall—

15 “(1) collect such data in accordance with the  
16 standards, protocols, or procedures established pur-  
17 suant to section 12406(e); and

18 “(2) submit such data to the Administrator and  
19 the Secretary, in accordance with any rules promul-  
20 gated by the Administrator or the Secretary.”.

**21 SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

22 Section 12409 of the Federal Ocean Acidification Re-  
23 search and Monitoring Act of 2009 (33 U.S.C. 3708) is  
24 amended—

25 (1) in subsection (a), by striking “subtitle—”  
26 and all that follows through paragraph (4) and in-

1       serting the following: “subtitle \$30,500,000 for each  
2       of the fiscal years 2019 through 2023.”; and

3           (2) in subsection (b), by striking “subtitle—”  
4       and all that follows through paragraph (4) and in-  
5       serting the following: “subtitle \$20,000,000 for each  
6       of the fiscal years 2019 through 2023.”.

○

Chairwoman FLETCHER. So without objection the bill is considered read, and open to amendment at any point. I will recognize myself briefly to comment on the bill.

H.R. 1237, the *COAST Research Act of 2019*, reauthorizes and updates the *FOARM Act of 2009* to broaden the scope of Federal efforts to better understand the effects of ocean and coastal acidification. The bill establishes an advisory board composed of non-Federal members that represent a balance of geographical, scientific, and industry interests, and tasks it with advising and informing the Federal agencies on the Interagency Working Group on Ocean Acidification. The bill places NOAA in charge of coordinating the Federal efforts on ocean acidification, including establishing data management standards.

Finally, H.R. 1237 reauthorizes the program for each of the fiscal years 2019 through 2023 for NOAA and the National Science Foundation's activities under *FOARM*. I strongly support the bill, and I urge my colleagues to support it as well. Before I yield back, I want to note the important work of the bill's sponsor, Ms. Bonamici. She has done incredible work on this issue, and is unfortunately unavoidably detained at another committee. She asked that her statement on this bill, as well as the other three, be placed in the record. We'll do so without objection.

Does anyone else wish to be recognized? Chairwoman Johnson?

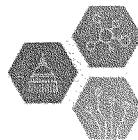
Chairwoman JOHNSON. Thank you very much, Madam Chair. I'm delighted that you're holding this markup to advance legislation that addresses ocean acidification as one of the major stressors to our oceans and coasts. The Environment Subcommittee's first hearing was on climate change impacts on our oceans and coasts. This hearing provided an opportunity to receive testimony from scientific experts and impacted industries about the effects of excess carbon dioxide emissions on the marine environment. Absorption of increasing carbon dioxide emissions from the atmosphere remains a leading cause of ocean acidification. The impacts of these increased acidity levels on marine and coastal ecosystems are both widespread and well—and not well understood. We must address these knowledge gaps in order to develop adaptation and mitigation strategies for this ocean change.

Given the importance of this issue, and how it can impact our coastal community, regardless of political affiliation, I am glad to see that the Environment Subcommittee is marking up four bipartisan bills today. Ms. Bonamici's *COAST Research Act* would authorize and update the *Federal Ocean Acidification Research and Monitoring, FOARM, Act*. The original statute established the Ocean Acidification Program at NOAA, and the Interagency Working Group on Ocean Acidification. It is important for us, as Members of the Science Committee, to reauthorize critical programs within our Committee's jurisdiction that have expired. Providing Congressional direction through the reauthorization of Federal programs allows for an opportunity to re-evaluate these programs, and determine if they need to be updated and modernized.

The other three bills are—that are marking up today provide additional avenues to address ocean acidification and its impacts through vulnerability assessments, prize competitions, and a National Academy study. All of these activities would enhance the on-

going ocean acidification work currently conducted by NOAA, and other Federal agencies, and help address some of the knowledge gaps in this field. I again want to thank you, Chair, for convening this markup on this suite of ocean acidification bills. I look forward to these bills moving through the Science Committee in a bipartisan fashion before heading to the floor. And for that, I yield back.

[The prepared statement of Chairwoman Johnson follows:]



U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON  
**SCIENCE, SPACE, & TECHNOLOGY**

Opening Statement

**Chairwoman Eddie Bernice Johnson (D-TX)**

Subcommittee Markup of:

*H.R. 1237, the "COAST Research Act of 2019",  
 H.R. 1716, the "Coastal Communities Ocean Acidification Act of 2019",  
 H.R. 1921, the "Ocean Acidification Innovation Act of 2019",  
 and H.R. 988, the "NEAR Act of 2019."*

April 9, 2019

Good afternoon and thank you to Chair Fletcher for holding this markup to advance legislation that addresses ocean acidification, one of the major stressors to our oceans and coasts.

The Environment Subcommittee's first hearing was on climate change impacts on our oceans and coasts. This hearing provided an opportunity to receive testimony from scientific experts and impacted industries about the effects of excess carbon dioxide emissions on the marine environment. Absorption of increasing carbon dioxide emissions from the atmosphere remains a leading cause of ocean acidification. The impacts of these increased acidity levels on marine and coastal ecosystems are both widespread and not well understood. We must address these knowledge gaps in order to develop adaptation and mitigation strategies for this ocean change.

Given the importance of this issue, and how it can impact any coastal community regardless of political affiliation, I am happy to see that the Environment Subcommittee is marking up four bipartisan bills today. Ms. Bonamici's COAST Research Act would reauthorize and update the Federal Ocean Acidification Research and Monitoring, or FOARAM (FOE-ram), Act. The original statute established the Ocean Acidification Program at NOAA and the Interagency Working Group on ocean acidification.

It is important for us as Members of the Science Committee to reauthorize critical programs within our Committee's jurisdiction that have expired. Providing Congressional direction through reauthorization of federal programs allows for an opportunity to re-evaluate these programs and determine if they need to be updated and modernized.

The other three bills we are marking up today provide additional avenues to address ocean acidification and its impacts through vulnerability assessments, prize competitions, and a National Academies study. All of these activities would enhance the ongoing ocean acidification work currently conducted by NOAA and other federal agencies and help address some of the knowledge gaps in this field.

I again want to thank Chair Fletcher for convening this markup on this suite of ocean acidification bills. I look forward to these bills moving through the Science Committee in a bipartisan fashion before heading to the House floor.

And with that, I yield back.

Chairwoman FLETCHER. Thank you, Chairwoman Johnson. Does anyone else wish to be recognized? Are there any amendments to the bill?

If no, then, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 1237 to the Full Committee, with the recommendation that the bill be approved.

Those in favor of the motion will signify by saying aye.

Any opposed say no.

The ayes have it, and the bill is favorably reported.

Without objection, the Motion to Reconsider is laid upon the table. I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes to the bill. Without objection, so ordered. Members will have 2 subsequent calendar days in which to submit supplemental minority or additional views on the measure.

H.R. 1716

Chairwoman FLETCHER. We'll now consider H.R. 1716, the *Coast Communities Ocean Acidification Act of 2019*. The Clerk will report the bill.

The CLERK. H.R. 1716, a bill to direct the Secretary of Commerce, acting through the Administrator of the National Oceanic and Atmospheric Administration, to conduct coastal community vulnerability assessments related to ocean acidification, and for other purposes.

[The bill follows:]

## XXII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP

**MARKUPS: H.R. 34, ENERGY AND WATER  
RESEARCH INTEGRATION ACT OF 2019;  
H.R. 2397, AMERICAN MANUFACTURING  
LEADERSHIP ACT;  
H.R. 1237, COAST RESEARCH ACT OF 2019;  
H.R. 1716, COASTAL COMMUNITIES OCEAN  
ACIDIFICATION ACT OF 2019;  
H.R. 1921, OCEAN ACIDIFICATION  
INNOVATION ACT OF 2019;  
AND H.R. 988, NEAR ACT OF 2019**

WEDNESDAY, MAY 1, 2019

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,  
*Washington, D.C.*

The Committee met, pursuant to notice, at 10 a.m., in room 2318 of the Rayburn House Office Building, Hon. Eddie Bernice Johnson [Chairwoman of the Committee] presiding.

Chairwoman JOHNSON. Good morning. The Committee will come to order. And without objection, the Chair is authorized to declare recess at any time. Pursuant to Committee rule 2(e) and House rule XI, the Chair announces that she may postpone roll call votes.

Pursuant to notice, the Committee meets to consider the following measures—and before I start into the measures, let me say that it is historic for me and that this is the first time I'm presiding over a markup of the Full Committee—H.R. 34, *Energy and Water Research Integration Act of 2019*; H.R. 2397, *American Manufacturing Leadership Act*—that's the reauthorization—and H.R. 1237, *COAST Research Act*; H.R. 1716, *Coastal Communities Ocean Acidification Act of 2019*; H.R. 1921, *Ocean Acidification Innovation Act of 2019*; and H.R. 988, *NEAR Act of 2019*. And I want to welcome everyone to our first Full Committee markup on Science, Space, and Technology for the 116th Congress.

Today, we meet to markup six good bipartisan bills. Each of these bills address critical issues facing our Nation. First, we are considering H.R. 34, the *Energy and Water Research Integration Act of 2019*. I'll say more about this bill in a minute, but for now, I'll just say that the bill addresses complex ties between water and energy production in America.

As water resources are increasingly strained all across our country, in fact, across the world, I think it is critical that we better use and conserve those resources. I want to thank Ranking Mem-

ber Lucas for being an original cosponsor of the bill and helping me to make a good bill even better. We both come from a part of the country where a drop of water has long been a precious commodity. Unfortunately, as water resources are increasingly strained around the country, more and more people are realizing that water is going to be a precious resource in places we never think of as arid.

Next, we will consider H.R. 2397, the *American Manufacturing Leadership Act*, which is sponsored by the Research and Technology Chairwoman Stevens. This bill reauthorizes, updates, and improves the RAMI program, which was originally created by our colleagues Tom Reed and Joseph Kennedy in 2014. The RAMI program provides crucial support to American manufacturing that results in good, high-paying jobs for our constituents. I strongly support this bill, which is why I'm an original cosponsor, along with several of my Republican colleagues.

We will then take up four bills which addresses the issue of ocean acidification: H.R. 1237, the *COAST Research Act*, sponsored by Congresswoman Bonamici; H.R. 1716, the *Coastal Communities Ocean Acidification Act of 2019*, sponsored by Ms. Pingree; H.R. 1921, the *Ocean Acidification Innovation Act of 2019*, sponsored by Mr. Kilmer; and H.R. 988, the *NEAR Act of 2019*, sponsored by Mr. Posey. These bills collectively reauthorize and improve our government's research and response efforts to ocean acidification.

As we learned at the Environment Subcommittee hearing in March, the effects of ocean acidification are already showing up in our coastal communities. We need to have a much better understanding of this issue and how we can mitigate its effects to our coastal regions, and the bills before us today put us on the right path.

I look forward to a productive markup today and then moving these good bipartisan bills to the full House for passage. I also want to take a moment to thank our Ranking Member and his staff for their constructive input on the bills before us today. I can't promise that we will agree on every piece of legislation that comes before the Committee, but I will promise that we will try hard to do that to reach consensus whenever possible. That makes for better legislation, and ultimately makes it more likely that we can actually help address our constituents' needs.

[The prepared statement of Chairwoman Johnson follows:]

I want to welcome everyone to our first Full Committee markup of the Committee on Science, Space, and Technology for the 116th Congress. Today we meet to markup six good bipartisan bills. Each of these bills addresses critical issues facing our Nation.

First, we are considering H.R. 34, the *Energy and Water Research Integration Act of 2019*. I'll say more about this bill in a minute. For now, I'll just say that the bill addresses the complex ties between water and energy production in America.

As water resources are increasingly strained all across our country, I think it is critical that we better use and conserve those resources. I want to thank Ranking Member Lucas for being an original cosponsor of the bill and helping me to make a good bill even better. We both come from a part of the country where a drop of water has long been a precious commodity. Unfortunately, as water resources are increasingly strained around the country, more and more people are realizing that water is going to be a precious resource in places we never would think of as arid.

Next, we will consider H.R. 2397, the *American Manufacturing Leadership Act*, which is sponsored by Research and Technology Chairwoman Stevens. This bill reauthorizes, updates, and improves the RAMI program, which was originally created by our colleagues Tom Reed and Joseph Kennedy in 2014.

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We will then take up four bills which address the issue of ocean acidification:

H.R. 1237, the *COAST Research Act*, sponsored by Ms. Bonamici; H.R. 1716, the *Coastal Communities Ocean Acidification Act of 2019*, sponsored by Ms. Pingree; H.R. 1921, the *Ocean Acidification Innovation Act of 2019*, sponsored by Mr. Kilmer; and, H.R. 958, the *NEAR Act of 2019*, sponsored by Mr. Posey.

These bills collectively reauthorize and improve our government's research and response efforts to ocean acidification. As we learned at the Environment Subcommittee hearing in March, the effects of ocean acidification are already showing up in our coastal communities. We need to have a much better understanding of this issue and how we can mitigate its effects to our coastal regions, and the bills before us today put us on the right path.

I look forward to a productive markup today and then moving these good bipartisan bills to the full House for passage. I also want to take a moment to thank the Ranking Member and his staff for their constructive input on the bills before us today. I can't promise that we will agree on every piece of legislation that comes before the Committee, but I can promise that we will always work hard to reach consensus whenever possible. That makes for better legislation, and ultimately makes it more likely we can actually help address our constituents' needs.

Chairwoman JOHNSON. So I now recognize the Ranking Member to present his opening remarks.

Mr. LUCAS. Thank you, Chairman Johnson, for holding this markup.

Today, we'll consider six bipartisan bills. The first is H.R. 34, the *Energy and Water Research Integration Act*, a bill that aims to improve our understanding of the critical relationship between energy and water. Water and energy management is a regional issue with diverse challenges, ranging from agriculture and biofuels production to natural gas production. The energy-water nexus research authorized in this bill would improve efficiency and production in both sectors. That's why I cosponsored this legislation, and I'm committed to working with Chairwoman Johnson to move this bill forward.

I also want to thank the Chairwoman for working with us to incorporate comments from the Department of Energy and other stakeholders, which we've addressed through a bipartisan Manager's Amendment this morning.

Our second bill this morning is the *American Manufacturing Leadership Act*. This legislation reauthorizes and amends the bipartisan *Revitalize American Manufacturing and Innovation Act of 2014*. It includes important reforms to better coordinate centers for manufacturing innovation funded by all relevant agencies and incorporates GAO recommendations on the management. This bill also prioritizes manufacturing work force development and outreach to small and medium-sized manufacturers.

Next, we'll consider four bills addressing the issue of ocean acidification. H.R. 1237, the *COAST Act*, reauthorizes and updates the *Federal Ocean Acidification Research and Monitoring Act of 2009*. This bill will reauthorize ocean and coastal acidification research, monitoring, adoption programs, and improve coordination between Federal agencies exploring this challenge.

H.R. 1716, the *Coastal Communities Ocean Acidification Act of 2019*, directs the National Oceanic and Atmospheric Administration to study the impact of ocean acidification could have on our coastal communities and identify potential mitigation strategies.

H.R. 1921, the *Ocean Acidification Innovation Act of 2019*, creates a Federal prize competition to encourage innovative approaches to understanding this challenge or developing solutions to ocean acidification.

And finally, H.R. 988, the *NEAR Act of 2019*, sponsored by Congressman Posey, authorizes the National Academies of Science to conduct a study on the impacts of ocean acidification and their environmental stressors on the coastal waterways.

The research authorized in these four bills will bring us one step closer to finding innovative solutions to the challenge of ocean acidification and will improve the sustainability and overall health of our ecosystems. I want to thank the bipartisan group of Members representing coastal districts who developed this legislation.

And once again, thank you, Chairwoman Johnson, for holding today's markup, and I encourage the Members of the Committee to support these bills.

I yield back the balance of my time.

[The prepared statement of Mr. Lucas follows:]

Thank you, Chairman Johnson, for holding this mark-up. Today we will consider six bipartisan bills. The first is H.R. 34, the *Energy and Water Research Integration Act*, a bill that aims to improve our understanding of the critical relationship between energy and water.

Water and energy management is a regional issue with diverse challenges, ranging from agriculture and biofuels production to natural gas production.

The energy-water nexus research authorized in this bill could improve efficiency and production in both sectors. That's why I cosponsored this legislation, and I'm committed to working with Chairwoman Johnson to move this bill forward.

I also want to thank the Chairwoman for working with us to incorporate comments from the Department of Energy and other stakeholders, which we'll address through a bipartisan Manager's Amendment this morning.

Our second bill this morning is the American Manufacturing Leadership Act. This legislation reauthorizes and amends the bipartisan Revitalize American Manufacturing and Innovation (RAMI) Act of 2014.

It includes important reforms to better coordinate centers for manufacturing innovation funded by all relevant agencies and incorporates GAO recommendations on management. This bill also prioritizes manufacturing workforce development and outreach to small and medium-sized manufacturers.

Next, we will consider four bills addressing the issue of ocean acidification. H.R. 1237, the *COAST Act*, reauthorizes and updates the Federal Ocean Acidification Research and Monitoring Act of 2009.

This bill will reauthorize ocean and coastal acidification research, monitoring, and adaptation programs, and improve coordination between federal agencies exploring this challenge.

H.R. 1716, the *Coastal Communities Ocean Acidification Act of 2019*, directs the National Oceanic and Atmospheric Administration (NOAA) to study the impact ocean acidification could have on our coastal communities and identify potential mitigation strategies.

H.R. 1921, the *Ocean Acidification Innovation Act of 2019*, creates a federal prize competition to encourage innovative approaches to understanding this challenge or developing solutions to ocean acidification.

And finally, H.R. 988, the *NEAR Act of 2019*, sponsored by Congressman Posey, authorizes the National Academies of Science to conduct a study on the impacts of ocean acidification and other environmental stressors on coastal waterways.

The research authorized in these four bills will bring us one step closer to finding innovative solutions to the challenge of ocean acidification and will improve the sustainability and overall health of our ecosystems. I want to thank the bipartisan group of Members representing coastal districts who developed this legislation.

Once again, thank you Chairwoman Johnson for holding today's mark-up, and I encourage the Members of this Committee to support these bills.

I yield the balance of my time.

Chairwoman JOHNSON. Thank you very much.



116<sup>TH</sup> CONGRESS  
1<sup>ST</sup> SESSION

# H. R. 1237

To amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification, to establish and maintain a data archive system for Ocean Acidification data and Coastal Acidification data, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 14, 2019

Ms. BONAMICI (for herself, Mr. YOUNG, Ms. PINGREE, and Mr. POSEY) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

## A BILL

To amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification, to establish and maintain a data archive system for Ocean Acidification data and Coastal Acidification data, 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,*

**1 SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Coastal and Ocean  
3 Acidification Stressors and Threats Research Act of  
4 2019” or the “COAST Research Act of 2019”.

**5 SEC. 2. PURPOSES.**

6 (a) IN GENERAL.—Section 12402(a) of the Federal  
7 Ocean Acidification Research and Monitoring Act of 2009  
8 (33 U.S.C. 3701(a)) is amended—

9 (1) in paragraph (1)—

10 (A) in the matter preceding subparagraph  
11 (A), by striking “development and coordina-  
12 tion” and inserting “coordination and imple-  
13 mentation”;

14 (B) in subparagraph (A), by striking  
15 “acidification on marine organisms” and insert-  
16 ing “acidification and coastal acidification on  
17 marine organisms”; and

18 (C) in subparagraph (B), by striking “es-  
19 tablish” and all that follows before the semi-  
20 colon and inserting “maintain and advise an  
21 interagency research, monitoring, and public  
22 outreach program on ocean acidification and  
23 coastal acidification”;

24 (2) in paragraph (2), by striking “establish-  
25 ment” and inserting “maintenance”;

1 (3) in paragraph (3), by inserting "and coastal  
2 acidification" after "ocean acidification"; and

3 (4) in paragraph (4), by inserting "and coastal  
4 acidification that take into account other environ-  
5 mental and anthropogenic stressors" after "ocean  
6 acidification".

7 (b) TECHNICAL AND CONFORMING AMENDMENT.—

8 Section 12402 of the Federal Ocean Acidification Re-  
9 search and Monitoring Act of 2009 (33 U.S.C. 3701(a))  
10 is amended by striking “(a) PURPOSES.—”.

## 11 SEC. 3. DEFINITIONS.

12 Section 12403 of the Federal Ocean Acidification Re-  
13 search and Monitoring Act of 2009 (33 U.S.C. 3702) is  
14 amended—

22 (2) in paragraph (3), by striking "Joint Sub-  
23 committee on Ocean Science and Technology of the  
24 National Science and Technology Council" and in-

1       serting “National Science and Technology Council  
2       Subcommittee on Ocean Science and Technology”;

3               (3) by redesignating paragraphs (1), (2), and  
4       (3) as paragraphs (2), (3), and (4), respectively;

5               (4) by inserting before paragraph (2), as so re-  
6       designated, the following new paragraph:

7               “(1) COASTAL ACIDIFICATION.—The term  
8       ‘coastal acidification’ means the combined decrease  
9       in pH and changes in the water chemistry of coastal  
10      oceans, estuaries, and other bodies of water from  
11      chemical inputs (including carbon dioxide from the  
12      atmosphere), freshwater inputs, and excess nutrient  
13      run-off from land and coastal atmospheric pollution  
14      that result in processes that release carbon dioxide,  
15      acidic nitrogen, and sulfur compounds as byprod-  
16      ucts.”; and

17               (5) by adding at the end the following new  
18       paragraph:

19               “(5) STATE.—The term ‘State’ means each of  
20      the State of the United States, the District of Co-  
21      lumbia, the Commonwealth of Puerto Rico, Amer-  
22      ican Samoa, Guam, the Commonwealth of the  
23      Northern Mariana Islands, the Virgin Islands of the  
24      United States, and any other territory or possession  
25      of the United States.”.

## 1 SEC. 4. INTERAGENCY WORKING GROUP.

2       Section 12404 of the Federal Ocean Acidification Re-  
3 search and Monitoring Act of 2009 (33 U.S.C. 3703) is  
4 amended—

5           (1) in the heading, by striking “**SUB-**  
6 **COMMITTEE**” and inserting “**WORKING GROUP**”;

7           (2) in subsection (a)—

8               (A) in paragraph (1), by striking “Joint  
9 Subcommittee on Ocean Science and Tech-  
10 nology of the National Science and Technology  
11 Council shall coordinate Federal activities on  
12 ocean acidification and” and insert “Sub-  
13 committee shall”;

14               (B) in paragraph (2), by striking “Wildlife  
15 Service,” and inserting “Wildlife Service, the  
16 Bureau of Ocean Energy Management, the En-  
17 vironmental Protection Agency, the Department  
18 of Agriculture, the Department of State, the  
19 Department of Energy, the Department of the  
20 Navy, the National Park Service, the Bureau of  
21 Indian Affairs, the National Institute of Stand-  
22 ards and Technology, the Smithsonian Institu-  
23 tion,”; and

24               (C) in paragraph (3), in the heading, by  
25 striking “**CHAIRMAN**” and inserting “**CHAIR**”;

26           (3) in subsection (b)—

5 (B) in paragraph (2)—

6 (i) in subparagraph (A), by inserting  
7 "and coastal acidification" after "ocean  
8 acidification"; and

9 (ii) in subparagraph (B), by inserting  
10 "and coastal acidification" after "ocean  
11 acidification";

12 (C) in paragraph (4), by striking “; and”  
13 and inserting a semicolon;

14 (D) in paragraph (5)—

15 (i) by striking “developed” and insert-  
16 ing “and coastal acidification developed”;  
17 and

18 (ii) by striking the period at the end  
19 and inserting "and coastal acidification;  
20 and"; and

21 (E) by adding at the end the following new  
22 paragraph:

23           “(6) ensure that each of the Federal agencies  
24           represented on the interagency working group—

1                 “(A) participates in the Ocean Acidifica-  
2                 tion Information Exchange established under  
3                 paragraph (5); and

4                 “(B) delivers data and information to sup-  
5                 port the data archive system established under  
6                 section 12406(d).”;

7                 (4) in subsection (e), in paragraph (2)—

8                     (A) by inserting “, and to the Office of  
9                 Management and Budget,” after “House of  
10                 Representatives”; and

11                     (B) in subparagraph (B), by striking “the  
12                 interagency research” and inserting “inter-  
13                 agency strategic research”;

14                     (5) by redesignating subsection (e) as sub-  
15                 section (d); and

16                     (6) by inserting after subsection (b) the fol-  
17                 lowing:

18                 “(e) ADVISORY BOARD.—

19                     “(1) ESTABLISHMENT.—The Chair of the Sub-  
20                 committee shall establish an Ocean Acidification Ad-  
21                 visory Board.

22                     “(2) DUTIES.—The Advisory Board shall—

23                             “(A) not later than 180 days after the  
24                 Subcommittee submits the most recent report  
25                 under subsection (d)(2) to Congress—

1                             “(i) review such report; and

2                             “(ii) submit an analysis of such report

3                             to the Subcommittee, the Committee on

4                             Commerce, Science, and Transportation of

5                             the Senate, the Committee on Science,

6                             Space, and Technology of the House of

7                             Representatives, and the Committee on

8                             Natural Resources of the House of Rep-

9                             resentatives;

10                            “(B) not later than 180 days after the

11                             Subcommittee submits the most recent strategic

12                             research plan under subsection (d)(3) to Con-

13                             gress—

14                             “(i) review such plan; and

15                             “(ii) submit an analysis of such plan

16                             and the implementation thereof to the Sub-

17                             committee, the Committee on Commerce,

18                             Science, and Transportation of the Senate,

19                             the Committee on Science, Space, and

20                             Technology of the House of Representa-

21                             tives, and the Committee on Natural Re-

22                             sources of the House of Representatives;

23                             “(C) provide ongoing advice to the Sub-

24                             committee and the interagency working group

1           on matters related to Federal activities on  
2           ocean acidification and coastal acidification;

3           “(D) advise the Subcommittee and the  
4           interagency working group on—

5           “(i) efforts to coordinate research and  
6           monitoring activities related to ocean acidifi-  
7           cation and coastal acidification; and

8           “(ii) the best practices for the stand-  
9           ards developed for data archiving under  
10           section 12406(e);

11           “(E) publish in the Federal Register the  
12           charter required under section 9(c) of the Fed-  
13           eral Advisory Committee Act (5 U.S.C. App.);

14           “(F) provide the Library of Congress  
15           with—

16           “(i) the charter described under sub-  
17           paragraph (E);

18           “(ii) any schedules and minutes for  
19           meetings of the Advisory Board;

20           “(iii) any documents described in sub-  
21           sections (b) and (c) of section 9 of the  
22           Federal Advisory Committee Act (5 U.S.C.  
23           App.) that are created by the Advisory  
24           Board; and

1                     “(iv) any reports prepared by the Ad-  
2                     visory Board; and

3                     “(G) establish a publicly accessible web  
4                     page on the website of the National Oceanic  
5                     and Atmospheric Administration, that contains  
6                     the information described in clause (i) through  
7                     (iv) of subparagraph (F).

8                     “(3) MEMBERSHIP.—The Advisory Board shall  
9                     consist of 21 members as follows:

10                    “(A) 2 representatives of the shellfish and  
11                    crab industry.

12                    “(B) 1 representative of the finfish indus-  
13                    try.

14                    “(C) 1 representative of seafood pro-  
15                    cessors.

16                    “(D) 3 representatives from academia, in-  
17                    cluding both natural and social sciences.

18                    “(E) 1 representative of recreational fish-  
19                    ing.

20                    “(F) 1 representative of relevant non-  
21                    governmental organizations.

22                    “(G) 6 representatives from relevant State,  
23                    local, and Tribal governments.

24                    “(H) 1 representative from the Alaska  
25                    Ocean Acidification Network.

1                 “(I) 1 representative from the California  
2                 Current Acidification Network.

3                 “(J) 1 representative from the Northeast  
4                 Coastal Acidification Network.

5                 “(K) 1 representative from the Southeast  
6                 Coastal Acidification Network.

7                 “(L) 1 representative from the Gulf of  
8                 Mexico Coastal Acidification Network.

9                 “(M) 1 representative from the Mid-Atlan-  
10                 tic Coastal Acidification Network.

11                 “(4) APPOINTMENT OF MEMBERS.—The Chair  
12                 of the Subcommittee shall—

13                 “(A) appoint members to the Advisory  
14                 Board (taking into account the geographical in-  
15                 terests of each individual to be appointed as a  
16                 member of the Advisory Board to ensure that  
17                 an appropriate balance of geographical interests  
18                 are represented by the members of the Advisory  
19                 Board) who—

20                 “(i) represent the interest group for  
21                 which each seat is designated;

22                 “(ii) demonstrate expertise on ocean  
23                 acidification or coastal acidification and its  
24                 scientific, economic, industry, cultural, and  
25                 community impacts; and

1                     “(iii) have a record of distinguished  
2                     service with respect to ocean acidification  
3                     or coastal acidification, and such impacts  
4                     thereof;

5                     “(B) give consideration to nominations and  
6                     recommendations from the members of the  
7                     interagency working group and the public for  
8                     such appointments; and

9                     “(C) ensure that an appropriate balance of  
10                    scientific, industry, and geographical interests  
11                    are represented by the members of the Advisory  
12                    Board.

13                    “(5) TERM OF MEMBERSHIP.—Each member of  
14                    the Advisory Board—

15                    “(A) shall be appointed for a 5-year term;  
16                    and

17                    “(B) may be appointed to more than one  
18                    term.

19                    “(6) CHAIR.—The Chair of the Subcommittee  
20                    shall appoint one member of the Advisory Board to  
21                    serve as the Chair of the Advisory Board.

22                    “(7) MEETINGS.—Not less than once each cal-  
23                    endar year, the Advisory Board shall meet at such  
24                    times and places as may be designated by the Chair  
25                    of the Advisory Board, in consultation with the

1       Chair of the Subcommittee and the Chair of the  
2       interagency working group.

3           “(8) BRIEFING.—The Chair of the Advisory  
4       Board shall brief the Subcommittee and the inter-  
5       agency working group on the progress of the Advi-  
6       sory Board as necessary.

7           “(9) FEDERAL ADVISORY COMMITTEE ACT.—  
8       The Federal Advisory Committee Act shall not apply  
9       to the Advisory Board, except for subsections (b)  
10      and (e) of section 9 and subsections (a) through (d)  
11      of section 10 of such Act.”.

12 **SEC. 5. STRATEGIC RESEARCH PLAN.**

13       Section 12405 of the Federal Ocean Acidification Re-  
14       search and Monitoring Act of 2009 (33 U.S.C. 3704) is  
15       amended—

16           (1) in subsection (a)—

17               (A) by striking “acidification” each place it  
18       appears and inserting “acidification and coastal  
19       acidification”;

20               (B) in the first sentence—

21                   (i) by inserting “, and not later than  
22       every 5 years thereafter” after “the date of  
23       enactment of this Act”;

24                   (ii) by inserting “address the socio-  
25       economic impacts of ocean acidification

1 and coastal acidification and to" after  
2 "mitigation strategies to"; and

3 (iii) by striking “marine ecosystems”  
4 each place it appears and inserting “eco-  
5 systems”; and

6 (C) in the second sentence, by inserting  
7 "and recommendations made by the Advisory  
8 Board in the review of the plan required under  
9 subsection (c)" after "subsection (d);

10 (2) in subsection (b)—

11 (A) in paragraph (1), by inserting "and so-  
12 cial sciences" after "among the ocean sciences";

13 (B) in paragraph (2)—

14 (i) in subparagraph (A), by striking  
15 "impacts" and inserting "impacts, includ-  
16 ing trends of changes in ocean chemistry.";

17 (ii) in subparagraph (B) =

18 (I) by striking “improve the ability  
19 to assess the” and inserting “assess  
20 the short-term and long-term”;  
21 and

22 (II) by striking “; and” at the  
23 end and inserting a semicolon:

24 (iii) by amending subparagraph (C) to  
25 read as follows:

1                     “(C) provide information for the—  
2                     “(i) development of adaptation and  
3                     mitigation strategies to address the socio-  
4                     economic impacts of ocean acidification  
5                     and coastal acidification;  
6                     “(ii) conservation of marine organisms  
7                     and ecosystems; and  
8                     “(iii) assessment of the effectiveness  
9                     of such adaptation and mitigation strate-  
10                     gies;”; and  
11                     (iv) by adding at the end the following  
12                     new subparagraph:  
13                     “(D) improve research on—  
14                     “(i) ocean acidification and coastal  
15                     acidification;  
16                     “(ii) the effect of environmental  
17                     stressors on each other, including research  
18                     on the effect of changes in water chem-  
19                     istry, changes in sediment delivery, hy-  
20                     poxia, and harmful algal blooms, on ocean  
21                     acidification and coastal acidification; and  
22                     “(iii) the effect of environmental  
23                     stressors on marine resources and eco-  
24                     systems;”;  
25                     (C) in paragraph (3)—

- (i) in subparagraph (F), by inserting “and management” after “database development”;
- (ii) in subparagraph (H) by striking “and” at the end; and
- (iii) by adding at the end the following new subparagraphs:
  - “(J) assessment of adaptation and mitigation strategies; and
  - “(K) education and outreach activities;”;
- (D) in paragraph (4), by striking “set forth” and inserting “ensure an appropriate balance of contribution in establishing”;
- (E) in paragraph (5), by striking “reports” and inserting “the best available peer-reviewed scientific reports”;
- (F) in paragraph (6)—
  - (i) by inserting “and coastal acidification” after “ocean acidification”; and
  - (ii) by striking “of the United States” and inserting “within the United States”;
- (G) in paragraph (7)—
  - (i) by striking “outline budget requirements” and inserting “estimate budget requirements for each of the fiscal years

3 (ii) by inserting "over the course of  
4 10 years" after "under the plan";

5 (H) in paragraph (8)—

6 (i) by inserting "and coastal acidifica-  
7 tion" after "ocean acidification" each place  
8 it appears;

9 (ii) by striking "its" and inserting  
10 "their"; and

11 (iii) by striking “; and” at the end  
12 and inserting a semicolon;

13 (I) in paragraph (9), by striking the period  
14 at the end and inserting “; and”; and

15 (J) by adding at the end the following new  
16 paragraph:

17                "(10) describe monitoring needs necessary to  
18                support potentially affected industry members,  
19                coastal stakeholders, fishery management councils  
20                and commissions, non-Federal resource managers,  
21                and scientific experts on decision-making and adap-  
22                tation related to ocean acidification and coastal  
23                acidification.":

24 (3) in subsection (c)—

(B) in paragraph (2), by inserting "and coastal acidification" after "ocean acidification";

6 (C) in paragraph (3)—

7 (i) by striking "input, and" and in-  
8 serting "inputs,";

9 (ii) by inserting “, marine food webs,”  
10 after “marine ecosystems”; and

11 (iii) by inserting “, and modeling that  
12 supports fisheries management” after  
13 “marine organisms”;

14 (D) in paragraph (5), by inserting "and  
15 coastal acidification" after "ocean acidifica-  
16 tion"; and

17 (E) by adding at the end the following new  
18 paragraph:

19               “(6) Research to understand related and cumu-  
20       lative stressors and other biogeochemical processes  
21       occurring in conjunction with ocean acidification and  
22       coastal acidification.”; and

23 (4) by striking subsection (e) and inserting the  
24 following:

1       “(e) ADVISORY BOARD EVALUATION.—Not later  
2 than 60 days before a plan is submitted to Congress, the  
3 Subcommittee shall provide the Advisory Board estab-  
4 lished under section 12404(e) a copy of the plan.

5       “(f) PUBLICATION AND PUBLIC COMMENT.—Not  
6 later than 90 days before the strategic research plan, or  
7 any revision thereof, is submitted to Congress, the Sub-  
8 committee shall publish the plan in the Federal Register  
9 and provide an opportunity for submission of public com-  
10 ments for a period of not less than 60 days.”.

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

12       Section 12406 of the Federal Ocean Acidification Re-  
13 search and Monitoring Act of 2009 (33 U.S.C. 3705) is  
14 amended—

15           (1) in subsection (a)—

16              (A) in the matter preceding paragraph (1),  
17              by inserting “coordination,” after “research,  
18              monitoring;”;

19              (B) in paragraph (1)—

20                  (i) in subparagraph (B)—

21                      (I) by inserting “including the  
22                      Integrated Ocean Observing System  
23                      and the ocean observing assets of  
24                      other Federal agencies,” after “ocean  
25                      observing assets;” and

(II) by inserting “and agency and department missions, prioritizing the location of monitoring instruments, assets, and projects to maximize the efficiency of resources and to optimize understanding of socio-economic impacts and ecosystem health” after “research program”;

(ii) in subparagraph (C)—

(I) by striking “adaptation” and inserting “adaptation and mitigation”; and

(II) by inserting "and supporting socioeconomically vulnerable communities and industries" after "marine ecosystems";

(iii) in subparagraph (E), by striking "its impacts" and inserting "their respective impacts":

(iv) in subparagraph (F), by striking “monitoring and impacts research” and inserting “research, monitoring, and adaptation and mitigation strategies”; and

(v) by adding at the end the following new subparagraph:

1                     “(G) research to improve understanding of  
2                     the effect of—

3                         “(i) other environmental stressors on  
4                     ocean acidification and coastal acidifica-  
5                     tion;

6                         “(ii) multiple environmental stressors  
7                     on living marine resources and coastal eco-  
8                     systems; and

9                         “(iii) adaptation and mitigation strat-  
10                     egies to address the socioeconomic impacts  
11                     of ocean acidification and coastal acidifica-  
12                     tion.”;

13                     (C) in paragraph (2), by striking “critical  
14                     research projects that explore” and inserting  
15                     “critical research and education projects that  
16                     explore and communicate”; and

17                     (D) in paragraphs (1), (2), and (3), by  
18                     striking “acidification” each place it appears  
19                     and inserting “acidification and coastal acidifi-  
20                     cation”; and

21                     (2) by adding at the end the following new sub-  
22                     sections:

23                     “(e) RELATIONSHIP TO INTERAGENCY WORKING  
24                     GROUP.—The National Oceanic and Atmospheric Admin-  
25                     istration shall serve as the lead Federal agency responsible

1 for coordinating the Federal response to ocean acidifica-  
2 tion and coastal acidification, by—

3           “(1) leading the interagency working group in  
4           implementing the strategic research plan under sec-  
5           tion 12405;

6           “(2) coordinating monitoring and research ef-  
7           forts among Federal agencies in cooperation with  
8           State, local, and international partners;

9           “(3) maintaining an Ocean Acidification Infor-  
10           mation Exchange described under section  
11           12404(b)(5) to allow for information to be electroni-  
12           cally accessible, including information—

13           “(A) on ocean acidification developed  
14           through or used by the ocean acidification pro-  
15           gram described under section 12406(a); or

16           “(B) that would be useful to State govern-  
17           ments, local governments, Tribal governments,  
18           resource managers, policymakers, researchers,  
19           and other stakeholders in mitigating or adapt-  
20           ing to the impacts of ocean acidification and  
21           coastal acidification; and

22           “(4) establishing and maintaining the data ar-  
23           chive system under subsection (d).

24           “(d) DATA ARCHIVE SYSTEM.—

1                 “(1) ESTABLISHMENT.—The Secretary, in co-  
2 ordination with members of the interagency working  
3 group, shall provide for the long-term stewardship  
4 of, and access to, data relating to ocean acidification  
5 and coastal acidification by establishing a data ar-  
6 chive system that processes, stores, archives, pro-  
7 vides access to, and incorporates to the extent pos-  
8 sible, such data collected—

9                 “(A) through relevant federally funded re-  
10 search; and

11                 “(B) by a Federal agency, State agency,  
12 local agency, Tribe, academic scientist, citizen  
13 scientist, or industry organization.

14                 “(2) EXISTING GLOBAL OR NATIONAL DATA AS-  
15 SETS.—In establishing the data archive system  
16 under paragraph (1), the Secretary shall ensure that  
17 existing global or national data assets (including the  
18 data assets of the National Centers for Environ-  
19 mental Information, the Integrated Ocean Observing  
20 System, and other existing data systems within Fed-  
21 eral agencies) are incorporated to the greatest extent  
22 possible.

23                 “(c) STANDARDS, PROTOCOLS, AND PROCEDURES.—

24 With respect to the data described in subsection (d), the  
25 Secretary, in coordination with members of the inter-

1 agency working group, shall establish standards, protocols,  
2 or procedures for—

3           “(1) processing, storing, archiving, and pro-  
4           viding access to such data;

5           “(2) the interoperability and intercalibration of  
6           such data;

7           “(3) the collection of any metadata underlying  
8           such data; and

9           “(4) sharing such data with State, local, and  
10           Tribal government programs, potentially affected in-  
11           dustry members, coastal stakeholders, fishery man-  
12           agement councils and commissions, non-Federal re-  
13           source managers, and academia.

14           “(f) DISSEMINATION OF OCEAN ACIDIFICATION  
15 DATA AND COASTAL ACIDIFICATION DATA.—The Sec-  
16 retary, in coordination with members of the interagency  
17 working group, shall disseminate the data described under  
18 subsection (d) to the greatest extent practicable by sharing  
19 such data on full and open access exchanges, including  
20 the Ocean Acidification Information Exchange described  
21 in section 12404(b)(5).

22           “(g) REQUIREMENT.—Recipients of grants from the  
23 National Oceanic and Atmospheric Administration under  
24 this subtitle that collected data described under subsection  
25 (d) shall—

1               “(1) collect such data in accordance with the  
2        standards, protocols, or procedures established pur-  
3        suant to subsection (e); and

4               “(2) submit such data to the Secretary, in ac-  
5        cordance with any rules promulgated by the Sec-  
6        retary.”.

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

8        Section 12407 of the Federal Ocean Acidification Re-  
9        search and Monitoring Act of 2009 (33 U.S.C. 3706) is  
10      amended—

11               (1) by striking “ocean acidification” each place  
12        it appears and inserting “ocean acidification and  
13        coastal acidification”;

14               (2) in subsection (a)—

15                       (A) in the matter preceding paragraph  
16               (1)—

17                               (i) by striking “continue to carry out  
18                               research activities on ocean acidification  
19                               which shall”;

20                               (ii) by striking “proposals for re-  
21                               search” and inserting “proposals for the  
22                               researching”; and

23                               (iii) by striking “its impacts” and in-  
24                               serting “their respective impacts”;



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

2       Section 12408 of the Federal Ocean Acidification Re-  
3 search and Monitoring Act of 2009 (33 U.S.C. 3707) is  
4 amended—

5           (1) by striking “ocean acidification” each place  
6       it appears and inserting “ocean acidification and  
7       coastal acidification”;

8           (2) in subsection (a), by striking “its impacts”  
9       and inserting “their respective impacts”; and

10           (3) by adding at the end the following new sub-  
11       section:

12       “(d) REQUIREMENT.—Researchers from the National  
13 Aeronautics and Space Administration under this subtitle  
14 that collect data described under section 12406(d) shall—

15           “(1) collect such data in accordance with the  
16       standards, protocols, or procedures established pur-  
17       suant to section 12406(e); and

18           “(2) submit such data to the Administrator and  
19       the Secretary, in accordance with any rules promul-  
20       gated by the Administrator or the Secretary.”.

**21 SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

22       Section 12409 of the Federal Ocean Acidification Re-  
23 search and Monitoring Act of 2009 (33 U.S.C. 3708) is  
24 amended—

25           (1) in subsection (a), by striking “subtitle—”  
26       and all that follows through paragraph (4) and in-

1       serting the following: “subtitle \$30,500,000 for each  
2       of the fiscal years 2019 through 2023.”; and

3           (2) in subsection (b), by striking “subtitle—”  
4       and all that follows through paragraph (4) and in-  
5       serting the following: “subtitle \$20,000,000 for each  
6       of the fiscal years 2019 through 2023.”.

○

Chairwoman JOHNSON. Without objection, the bill is considered as read and an open amendment—and open for amendments at any point.

I recognize Ms. Bonamici to explain her bill.

Ms. BONAMICI. Thank you very much, Chairman Johnson. I move to strike the last word.

Chairwoman JOHNSON. The gentlelady is recognized.

Ms. BONAMICI. Thank you, Chairwoman Johnson. Thank you to all the staff in my office and the Committee staff who worked so hard on this bill, along with all of my cosponsors.

According to the Fourth National Climate Assessment, atmospheric carbon dioxide concentrations are now higher than at any time in the last 3 million years. About 1/3 of the carbon dioxide in the atmosphere dissolves into our oceans and estuaries resulting in ocean warming, acidification, and deoxygenation.

In addition to atmospheric carbon dioxide, our oceans, estuaries, and coastal waterways are becoming more acidic as they absorb chemical inputs and excess nutrient runoff from land and coastal pollution. Ocean and coastal acidification make it difficult for shellfish, coral, and other marine organisms to build their shells and skeletal structures. Some finfish, including endangered salmon in the Pacific Northwest, lose their sense of smell for identifying prey, reproducing, and navigating their habitats.

Our understanding of the long-term consequences of ocean acidification on our marine ecosystems is still limited, but we do know that the changes in ocean chemistry are already affecting the fishers and shellfish farmers who depend on the oceans' resources to support their business and families and the tribes that have rights and deep cultural and historical connections to diminishing species.

I was proud to reintroduce the bipartisan *Coastal and Ocean Acidification Stressors and Threats*, or *COAST Research Act*, with Representatives Young, Pingree, and Posey to expand scientific research and monitoring to improve our understanding of ocean and coastal acidification. The bill would provide modest increases in authorizations for NOAA and the National Science Foundation. Authorization has lapsed for these programs since Fiscal Year 2012, and funding has lagged behind the needs of the scientific community.

Recent events like the so-called warm blob in the Pacific Northwest demonstrate how disruptive ocean acidification can be to marine ecosystems. During the legislative hearing on this bill in February, we heard one of the witnesses describe how the Pacific Coast Shellfish Growers Association is working with regional scientists at Oregon State University to monitor pH and carbon dioxide levels in real time and develop effective management practices.

Ocean acidification events are only projected to become more intense, longer, and increasingly common, especially on the Pacific coast. The *COAST Research Act* would improve research on ocean and coastal acidification and strengthen our understanding of how ocean acidification presents itself in the context of other environmental stressors. Importantly, the bill also expands the definition of ocean acidification to include estuaries, and it includes a definition of coastal acidification to recognize mechanisms that cause changes in coastal chemistry.

The most effective strategy for mitigating ocean acidification is reducing anthropogenic sources of carbon dioxide emissions worldwide. But there are actions that we can take at the local level to improve conditions, lessen exposure to ocean acidification, and manage local pollution and conditions that can exacerbate acidification. The bill would direct Federal agencies to assess adaptation and mitigation strategies.

A September 2015 Government Accountability Office report suggested that an independent national ocean acidification program could help advance our understanding of changing ocean conditions. The *COAST Research Act* would designate NOAA as the lead Federal agency responsible for implementing the Federal response to ocean and coastal acidification.

Ocean acidification research is still in its infancy, and the best way to mitigate its effects is through regionally coordinated scientific research. The *COAST Research Act* directs NOAA to maintain a data archives system to process, store, archive, and provide access to data on ocean and coastal acidification from federally funded research, including existing global or national data sets and research from State and local agencies, tribes, academic scientists, citizen scientists, and industry organizations.

Additionally, the *COAST Research Act* establishes an advisory board comprised of representatives of the shellfish and crab industry; finfish industry; seafood processors; recreational fishing; academia; nongovernmental organizations; State, local, and tribal governments; and regional coastal acidification networks. The regionally balanced group will advise the interagency working group on ocean and coastal acidification monitoring activities—excuse me—and increase our understanding of the socioeconomic effects of ocean and coastal acidification.

Our oceans and estuaries are facing the consequences of our inaction to reduce anthropogenic carbon emissions. We know even if carbon dioxide emissions are halted today, many of the reciprocal effects for our oceans will continue to occur over the course of the next few decades. We must support vulnerable communities, industries, and coastal and ocean managers by strengthening research on how they can best prepare and, when possible, adapt to ocean and coastal acidification. Our oceans and estuaries are resilient, and we can help them heal, but we cannot afford to wait any longer.

I urge my colleagues to support this bipartisan bill.

Chairwoman JOHNSON. Thank you very much.

We will now proceed with the amendments in the order of the roster, and I think the first one is—on the roster is in the nature of a substitute.

Ms. BONAMICI. Yes, Madam Chair, I have an amendment at the desk.

Chairwoman JOHNSON. The clerk will read the amendment—report the amendment.

The CLERK. Amendment number 1 offered by Ms. Bonamici.

[The amendment of Ms. Bonamici follows:]

**AMENDMENT IN THE NATURE OF A SUBSTITUTE**  
**TO H.R. 1237**  
**OFFERED BY MS. BONAMICI OF OREGON**

Strike all after the enacting clause and insert the following:

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Coastal and Ocean  
3 Acidification Stressors and Threats Research Act of  
4 2019” or the “COAST Research Act of 2019”.

5 **SEC. 2. PURPOSES.**

6 (a) IN GENERAL.—Section 12402(a) of the Federal  
7 Ocean Acidification Research and Monitoring Act of 2009  
8 (33 U.S.C. 3701(a)) is amended—

9 (1) in paragraph (1)—

10 (A) in the matter preceding subparagraph  
11 (A), by striking “development and coordina-  
12 tion” and inserting “coordination and imple-  
13 mentation”;

14 (B) in subparagraph (A), by striking  
15 “acidification on marine organisms” and insert-  
16 ing “acidification and coastal acidification on  
17 marine organisms”; and

15 (b) TECHNICAL AND CONFORMING AMENDMENT.—

16 Section 12402 of the Federal Ocean Acidification Re-  
17 search and Monitoring Act of 2009 (33 U.S.C. 3701(a))  
18 is amended by striking “**(a) PURPOSES.—**”.

### 19 SEC. 3. DEFINITIONS.

20 Section 12403 of the Federal Ocean Acidification Re-  
21 search and Monitoring Act of 2009 (33 U.S.C. 3702) is  
22 amended—

23 (1) in paragraph (1), by striking "of the  
24 Earth's oceans" and all that follows before the pe-  
25 riod at the end and inserting "and changes in the

1       water chemistry of the Earth's oceans, coastal estuaries, and waterways caused by carbon dioxide from  
2       the atmosphere and the breakdown of organic matter";

5           (2) in paragraph (3), by striking "Joint Subcommittee on Ocean Science and Technology of the  
6       National Science and Technology Council" and inserting "National Science and Technology Council  
7       Subcommittee on Ocean Science and Technology";

10           (3) by redesignating paragraphs (1), (2), and  
11       (3) as paragraphs (2), (3), and (4), respectively;

12           (4) by inserting before paragraph (2), as so redesignated, the following new paragraph:

14           "(1) COASTAL ACIDIFICATION.—The term  
15       'coastal acidification' means the combined decrease  
16       in pH and changes in the water chemistry of coastal  
17       oceans, estuaries, and other bodies of water from  
18       chemical inputs (including carbon dioxide from the  
19       atmosphere), freshwater inputs, and excess nutrient  
20       run-off from land and coastal atmospheric pollution  
21       that result in processes that release carbon dioxide,  
22       acidic nitrogen, and sulfur compounds as byproducts  
23       which end up in coastal waters.;" and

24           (5) by adding at the end the following new  
25       paragraph:

1                 “(5) STATE.—The term ‘State’ means each  
2         State of the United States, the District of Columbia,  
3         the Commonwealth of Puerto Rico, American  
4         Samoa, Guam, the Commonwealth of the Northern  
5         Mariana Islands, the Virgin Islands of the United  
6         States, and any other territory or possession of the  
7         United States.”.

8 **SEC. 4. INTERAGENCY WORKING GROUP.**

9         Section 12404 of the Federal Ocean Acidification Re-  
10    search and Monitoring Act of 2009 (33 U.S.C. 3703) is  
11    amended—

12                 (1) in the heading, by striking “**SUB-**  
13         **COMMITTEE”** and inserting “**WORKING GROUP”;**

14                 (2) in subsection (a)—

15                         (A) in paragraph (1), by striking “Joint  
16         Subcommittee on Ocean Science and Tech-  
17         nology of the National Science and Technology  
18         Council shall coordinate Federal activities on  
19         ocean acidification and” and insert “Sub-  
20         committee shall”;

21                         (B) in paragraph (2), by striking “Wildlife  
22         Service,” and inserting “Wildlife Service, the  
23         Bureau of Ocean Energy Management, the En-  
24         vironmental Protection Agency, the Department  
25         of Agriculture, the Department of State, the

6 (C) in paragraph (3), in the heading, by  
7 striking "CHAIRMAN" and inserting "CHAIR";  
8 (3) in subsection (b)—

13 (B) in paragraph (2)—

14 (i) in subparagraph (A), by inserting  
15 "and coastal acidification" after "ocean  
16 acidification"; and

17 (ii) in subparagraph (B), by inserting  
18 "and coastal acidification" after "ocean  
19 acidification":

20 (C) in paragraph (4), by striking ";" and"  
21 and inserting a semicolon;

22 (D) in paragraph (5)—

23 (i) by striking “developed” and insert-  
24 ing “and coastal acidification developed”;

1 (ii) by striking the period at the end  
2 and inserting "and coastal acidification;  
3 and"; and

4 (E) by adding at the end the following new  
5 paragraph:

6                   “(6) ensure that each of the Federal agencies  
7                   represented on the interagency working group—

8 " (A) participates in the Ocean Acidifica-  
9 tion Information Exchange established under  
10 paragraph (5); and

14 (4) in subsection (c), in paragraph (2)—

15 (A) by inserting “, and to the Office of  
16 Management and Budget,” after “House of  
17 Representatives”; and

(B) in subparagraph (B), by striking "the interagency research" and inserting "interagency strategic research";

21 (5) by redesignating subsection (e) as sub-  
22 section (d); and

23 (6) by inserting after subsection (b) the fol-  
24 lowing:

25        "(e) ADVISORY BOARD.—

1                 “(1) ESTABLISHMENT.—The Chair of the Sub-  
2         committee shall establish an Ocean Acidification Ad-  
3         visory Board.

4                 “(2) DUTIES.—The Advisory Board shall—  
5                         “(A) not later than 180 days before the  
6         Subcommittee submits the most recent report  
7         under subsection (d)(2)—

8                         “(i) review such report; and  
9                         “(ii) submit an analysis of such report  
10                         to the Subcommittee for consideration in  
11                         the final report submitted under subsection  
12                         (d)(2); and

13                         “(iii) concurrently with the Sub-  
14         committee’s final submission of the report  
15                         under subsection (d)(2), the Advisory  
16         Board shall submit a copy of the analysis  
17                         provided to the Subcommittee to the Com-  
18                         mittee on Commerce, Science, and Trans-  
19                         portation of the Senate, the Committee on  
20                         Science, Space, and Technology of the  
21                         House of Representatives, and the Com-  
22                         mittee on Natural Resources of the House  
23                         of Representatives;

24                         “(B) not later than 180 days before the  
25         Subcommittee submits the most recent strategic

1 research plan under subsection (d)(3) to Congress—  
2  
3 “(i) review such plan; and  
4  
5 “(ii) submit an analysis of such plan and the implementation thereof to the Sub-  
6 committee for consideration in the final  
7 strategic research plan submitted under  
8 subsection (d)(3); and  
9  
10 “(iii) concurrently with the Sub-  
11 committee’s final submission of the stra-  
12 tegic research plan under subsection  
13 (d)(3), the Advisory Board shall submit a  
14 copy of the analysis provided to the Sub-  
15 committee to the Committee on Commerce,  
16 Science, and Transportation of the Senate,  
17 the Committee on Science, Space, and  
18 Technology of the House of Representa-  
19 tives, and the Committee on Natural Re-  
20 sources of the House of Representatives;  
21  
22 “(C) provide ongoing advice to the Sub-  
23 committee and the interagency working group  
24 on matters related to Federal activities on  
25 ocean acidification and coastal acidification;  
26  
27 “(D) advise the Subcommittee and the  
28 interagency working group on—  
29

1                         “(i) efforts to coordinate research and  
2                         monitoring activities related to ocean acidifi-  
3                         cation and coastal acidification; and  
4                         “(ii) the best practices for the stand-  
5                         ards developed for data archiving under  
6                         section 12406(e);  
7                         “(E) publish in the Federal Register a  
8                         charter;  
9                         “(F) provide the Library of Congress  
10                         with—  
11                         “(i) the charter described in subpara-  
12                         graph (E);  
13                         “(ii) any schedules and minutes for  
14                         meetings of the Advisory Board;  
15                         “(iii) any documents that are ap-  
16                         proved by the Advisory Board; and  
17                         “(iv) any reports and analysis pre-  
18                         pared by the Advisory Board; and  
19                         “(G) establish a publicly accessible web  
20                         page on the website of the National Oceanic  
21                         and Atmospheric Administration, that contains  
22                         the information described in clauses (i) through  
23                         (iv) of subparagraph (F).  
24                         “(3) MEMBERSHIP.—The Advisory Board shall  
25                         consist of 24 members as follows:

10

1                     “(A) 2 representatives of the shellfish and  
2                     crab industry.

3                     “(B) 1 representative of the finfish indus-  
4                     try.

5                     “(C) 1 representative of seafood proc-  
6                     essors.

7                     “(D) 3 representatives from academia, in-  
8                     cluding both natural and social sciences.

9                     “(E) 1 representative of recreational fish-  
10                     ing.

11                     “(F) 1 representative of relevant non-  
12                     governmental organizations.

13                     “(G) 6 representatives from relevant State,  
14                     local, and Tribal governments.

15                     “(H) 1 representative from the Alaska  
16                     Ocean Acidification Network.

17                     “(I) 1 representative from the California  
18                     Current Acidification Network.

19                     “(J) 1 representative from the Northeast  
20                     Coastal Acidification Network.

21                     “(K) 1 representative from the Southeast  
22                     Coastal Acidification Network.

23                     “(L) 1 representative from the Gulf of  
24                     Mexico Coastal Acidification Network.

11

1               “(M) 1 representative from the Mid-Atlan-  
2               tic Coastal Acidification Network.

3               “(N) 1 representative from the Pacific Is-  
4               lands Ocean Observing System or similar entity  
5               representing the island territories and posses-  
6               sions of the United States in the Pacific Ocean,  
7               and the State of Hawaii.

8               “(O) 1 representative from the Caribbean  
9               Regional Association for Coastal Ocean Observ-  
10               ing or a similar entity representing Puerto Rico  
11               and the U.S. Virgin Islands.

12               “(P) 1 representative from the National  
13               Oceanic and Atmospheric Administration shall  
14               serve as an ex-officio member of the Advisory  
15               Board without a vote.

16               “(4) APPOINTMENT OF MEMBERS.—The Chair  
17               of the Subcommittee shall—

18               “(A) appoint members to the Advisory  
19               Board (taking into account the geographical in-  
20               terests of each individual to be appointed as a  
21               member of the Advisory Board to ensure that  
22               an appropriate balance of geographical interests  
23               are represented by the members of the Advisory  
24               Board) who—

12

1                     “(i) represent the interest group for  
2                     which each seat is designated;  
3                     “(ii) demonstrate expertise on ocean  
4                     acidification or coastal acidification and its  
5                     scientific, economic, industry, cultural, and  
6                     community impacts; and  
7                     “(iii) have a record of distinguished  
8                     service with respect to ocean acidification  
9                     or coastal acidification, and such impacts;  
10                    “(B) give consideration to nominations and  
11                     recommendations from the members of the  
12                     interagency working group and the public for  
13                     such appointments; and  
14                    “(C) ensure that an appropriate balance of  
15                     scientific, industry, and geographical interests  
16                     are represented by the members of the Advisory  
17                     Board.

18                    “(5) TERM OF MEMBERSHIP.—Each member of  
19                     the Advisory Board—  
20                     “(A) shall be appointed for a 5-year term;  
21                     and  
22                     “(B) may be appointed to more than one  
23                     term.

1                 “(6) CHAIR.—The Chair of the Subcommittee  
2     shall appoint one member of the Advisory Board to  
3     serve as the Chair of the Advisory Board.

4                 “(7) MEETINGS.—Not less than once each cal-  
5     endar year, the Advisory Board shall meet at such  
6     times and places as may be designated by the Chair  
7     of the Advisory Board, in consultation with the  
8     Chair of the Subcommittee and the Chair of the  
9     interagency working group.

10                 “(8) BRIEFING.—The Chair of the Advisory  
11     Board shall brief the Subcommittee and the inter-  
12     agency working group on the progress of the Advi-  
13     sory Board as necessary.

14                 “(9) FEDERAL ADVISORY COMMITTEE ACT.—  
15     Section 14 of the Federal Advisory Committee Act  
16     shall not apply to the Advisory Board.”.

17 **SEC. 5. STRATEGIC RESEARCH PLAN.**

18     Section 12405 of the Federal Ocean Acidification Re-  
19     search and Monitoring Act of 2009 (33 U.S.C. 3704) is  
20     amended—

21                 (1) in subsection (a)—

22                     (A) by striking “acidification” each place it  
23     appears and inserting “acidification and coastal  
24     acidification”;

25                     (B) in the first sentence—

1 (i) by inserting “, and not later than  
2 every 5 years thereafter” after “the date of  
3 enactment of this Act”;

4 (ii) by inserting “address the socio-  
5 economic impacts of ocean acidification  
6 and coastal acidification and to” after  
7 “mitigation strategies to”; and

8 (iii) by striking “marine ecosystems”  
9 each place it appears and inserting “eco-  
10 systems”; and

11 (C) in the second sentence, by inserting  
12 “and recommendations made by the Advisory  
13 Board in the review of the plan required under  
14 section 12404(e)(2)(B)(i)” after “subsection  
15 (d);”;

16 (2) in subsection (b)—

17 (A) in paragraph (1), by inserting “and so-  
18 cial sciences” after “among the ocean sciences”;

19 (B) in paragraph (2)—

20 (i) in subparagraph (A), by striking  
21 “impacts” and inserting “impacts, includ-  
22 ing trends of changes in ocean chemistry”;

23 (ii) in subparagraph (B)—

24 (I) by striking “improve the abil-  
25 ity to assess the” and inserting “as-

15

1                   sess the short-term and long-term”;

2                   and

3                   (II) by striking “; and” at the  
4                   end and inserting a semicolon;

5                   (iii) by amending subparagraph (C) to  
6                   read as follows:

7                   “(C) provide information for the—

8                   “(i) development of adaptation and  
9                   mitigation strategies to address the socio-  
10                   economic impacts of ocean acidification  
11                   and coastal acidification;

12                   “(ii) conservation of marine organisms  
13                   and ecosystems; and

14                   “(iii) assessment of the effectiveness  
15                   of such adaptation and mitigation strate-  
16                   gies;” and

17                   (iv) by adding at the end the following  
18                   new subparagraph:

19                   “(D) improve research on—

20                   “(i) ocean acidification and coastal  
21                   acidification;

22                   “(ii) the interactions between and ef-  
23                   fects of multiple combined stressors includ-  
24                   ing changes in water chemistry, changes in  
25                   sediment delivery, hypoxia, and harmful

1 algal blooms, on ocean acidification and  
2 coastal acidification; and  
3 “(iii) the effect of environmental  
4 stressors on marine resources and eco-  
5 systems;”;  
6 (C) in paragraph (3)—  
7 (i) in subparagraph (F), by striking  
8 “database development” and inserting  
9 “data management”;  
10 (ii) in subparagraph (H) by striking  
11 “and” at the end; and  
12 (iii) by adding at the end the fol-  
13 lowing new subparagraphs:  
14 “(J) assessment of adaptation and mitiga-  
15 tion strategies; and  
16 “(K) education and outreach activities;”;  
17 (D) in paragraph (4), by striking “set  
18 forth” and inserting “ensure an appropriate  
19 balance of contribution in establishing”;  
20 (E) in paragraph (5), by striking “reports”  
21 and inserting “the best available peer-reviewed  
22 scientific reports”;  
23 (F) in paragraph (6)—  
24 (i) by inserting “and coastal acidifica-  
25 tion” after “ocean acidification”; and

1 (ii) by striking “of the United States”  
2 and inserting “within the United States”;  
3 (G) in paragraph (7), by striking “outline  
4 budget requirements” and inserting “estimate  
5 costs associated for full implementation of each  
6 element of the plan by fiscal year”;  
7 (H) in paragraph (8)—  
8 (i) by inserting “and coastal acidifica-  
9 tion” after “ocean acidification” each place  
10 it appears;  
11 (ii) by striking “its” and inserting  
12 “their”; and  
13 (iii) by striking “; and” at the end  
14 and inserting a semicolon;  
15 (I) in paragraph (9), by striking the period  
16 at the end and inserting “; and”; and  
17 (J) by adding at the end the following new  
18 paragraph:  
19 “(10) describe monitoring needs necessary to  
20 support potentially affected industry members,  
21 coastal stakeholders, fishery management councils  
22 and commissions, non-Federal resource managers,  
23 and scientific experts on decision-making and adap-  
24 tation related to ocean acidification and coastal  
25 acidification.”;

1 (3) in subsection (e)—

2 (A) in paragraph (1)(C), by striking "sur-  
3 face";

4 (B) in paragraph (2), by inserting "and  
5 coastal acidification" after "ocean acidification"  
6 each place it appears;

7 (C) in paragraph (3)—

8 (i) by striking "input, and" and in-  
9 serting "inputs,";

10 (ii) by inserting “, marine food webs,”  
11 after “marine ecosystems”; and

12 (iii) by inserting “, and modeling that  
13 supports fisheries management” after  
14 “marine organisms”;

15 (D) in paragraph (5), by inserting "and  
16 coastal acidification" after "ocean acidifica-  
17 tion"; and

18 (E) by adding at the end the following new  
19 paragraph:

20                   “(6) Research to understand related and cumu-  
21                   lative stressors and other biogeochemical processes  
22                   occurring in conjunction with ocean acidification and  
23                   coastal acidification”; and

24 (4) by striking subsection (e) and inserting the  
25 following:

1       “(e) ADVISORY BOARD EVALUATION.—Not later  
2 than 180 days before a plan is submitted to Congress, the  
3 Subcommittee shall provide the Advisory Board estab-  
4 lished under section 12404(c) a copy of the plan for pur-  
5 poses of review under paragraph (2)(B)(i) of such section.

6       “(f) PUBLICATION AND PUBLIC COMMENT.—Not  
7 later than 90 days before the strategic research plan, or  
8 any revision thereof, is submitted to Congress, the Sub-  
9 committee shall publish the plan in the Federal Register  
10 and provide an opportunity for submission of public com-  
11 ments for a period of not less than 60 days.”.

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

13       Section 12406 of the Federal Ocean Acidification Re-  
14 search and Monitoring Act of 2009 (33 U.S.C. 3705) is  
15 amended—

16           (1) in subsection (a)—

17              (A) in the matter preceding paragraph (1),  
18              by inserting “coordination,” after “research,  
19              monitoring,”;

20              (B) in paragraph (1)—

21                  (i) in subparagraph (B)—

22                      (I) by inserting “including the  
23                      Integrated Ocean Observing System  
24                      and the ocean observing assets of

20

1 other Federal and State agencies,”  
2 after “ocean observing assets;”; and  
3 (II) by inserting “and agency  
4 and department missions, prioritizing  
5 the location of monitoring instru-  
6 ments, assets, and projects to maxi-  
7 mize the efficiency of resources and to  
8 optimize understanding of socio-  
9 economic impacts and ecosystem  
10 health” after “research program”;  
11 (ii) in subparagraph (C)—  
12 (I) by striking “adaptation” and  
13 inserting “adaptation and mitigation”;  
14 and  
15 (II) by inserting “and supporting  
16 socioeconomically vulnerable commu-  
17 nities and industries” after “marine  
18 ecosystems”;  
19 (iii) in subparagraph (E), by striking  
20 “its impacts” and inserting “their respec-  
21 tive impacts”;  
22 (iv) in subparagraph (F), by striking  
23 “monitoring and impacts research” and in-  
24 serting “research, monitoring, and adapta-  
25 tion and mitigation strategies”; and

1 (v) by adding at the end the following  
2 new subparagraph:  
3 “(G) research to improve understanding of  
4 the effect of—  
5 “(i) other environmental stressors on  
6 ocean acidification and coastal acidifica-  
7 tion;  
8 “(ii) multiple environmental stressors  
9 on living marine resources and coastal eco-  
10 systems; and  
11 “(iii) adaptation and mitigation strat-  
12 egies to address the socioeconomic impacts  
13 of ocean acidification and coastal acidifica-  
14 tion.”;

15 (C) in paragraph (2), by striking “critical  
16 research projects that explore” and inserting  
17 “critical research and education projects that  
18 explore and communicate”; and

19 (D) in paragraphs (1), (2), and (3), by  
20 striking “acidification” each place it appears  
21 and inserting “acidification and coastal acidifi-  
22 cation”; and

23 (2) by adding at the end the following new sub-  
24 sections:

1        "(c) RELATIONSHIP TO INTERAGENCY WORKING  
2 GROUP.—The National Oceanic and Atmospheric Admin-  
3 istration shall serve as the lead Federal agency responsible  
4 for coordinating the Federal response to ocean acidifica-  
5 tion and coastal acidification, by—  
6            "(1) leading the interagency working group in  
7 implementing the strategic research plan under sec-  
8 tion 12405;  
9            "(2) coordinating monitoring and research ef-  
10 forts among Federal agencies in cooperation with  
11 State, local, and Tribal government and inter-  
12 national partners;  
13           "(3) maintaining an Ocean Acidification Infor-  
14 mation Exchange described under section  
15 12404(b)(5) to allow for information to be electroni-  
16 cally accessible, including information—  
17            "(A) on ocean acidification developed  
18 through or used by the ocean acidification pro-  
19 gram described under section 12406(a); or  
20            "(B) that would be useful to State govern-  
21 ments, local governments, Tribal governments,  
22 resource managers, policymakers, researchers,  
23 and other stakeholders in mitigating or adapt-  
24 ing to the impacts of ocean acidification and  
25 coastal acidification; and

1                 “(4) establishing and maintaining the data ar-  
2         chive system under subsection (d).

3         “(d) DATA ARCHIVE SYSTEM.—

4                 “(1) MANAGEMENT.—The Secretary, in coordi-  
5         nation with members of the interagency working  
6         group, shall provide for the long-term stewardship  
7         of, and access to, data relating to ocean acidification  
8         and coastal acidification by establishing and main-  
9         taining a data archive system that the National Cen-  
10         ter for Environmental Information uses to process,  
11         store, archive, provide access to, and incorporate to  
12         the extent possible, such data collected—

13                 “(A) through relevant federally-funded re-  
14         search; and

15                 “(B) by a Federal agency, State agency,  
16         local agency, Tribe, academic scientist, citizen  
17         scientist, or industry organization.

18                 “(2) EXISTING GLOBAL OR NATIONAL DATA AS-  
19         SETS.—In establishing and maintaining the data ar-  
20         chive system under paragraph (1), the Secretary  
21         shall ensure that existing global or national data as-  
22         sets (including the data assets maintained by the  
23         National Centers for Environmental Information,  
24         the Integrated Ocean Observing System, and other

1 existing data systems within Federal agencies) are  
2 incorporated to the greatest extent possible.

3 "(c) STANDARDS, PROTOCOLS, AND PROCEDURES.—

4 With respect to the data described in subsection (d), the  
5 Secretary, in coordination with members of the inter-  
6 agency working group, shall establish and revise as nec-  
7 essary the standards, protocols, or procedures for—

8        "(1) processing, storing, archiving, and pro-  
9 viding access to such data;

10        "(2) the interoperability and intercalibration of  
11 such data;

12        "(3) the collection of any metadata underlying  
13 such data; and

14        "(4) sharing such data with State, local, and  
15 Tribal government programs, potentially affected in-  
16 dustry members, coastal stakeholders, fishery man-  
17 agement councils and commissions, non-Federal re-  
18 source managers, and academia.

19 "(f) DISSEMINATION OF OCEAN ACIDIFICATION  
20 DATA AND COASTAL ACIDIFICATION DATA.—The Sec-  
21 retary, in coordination with members of the interagency  
22 working group, shall disseminate the data described under  
23 subsection (d) to the greatest extent practicable by sharing  
24 such data on full and open access exchanges, including

1 the Ocean Acidification Information Exchange described  
2 in section 12404(b)(5).

3       “(g) REQUIREMENT.—Recipients of grants from the  
4 National Oceanic and Atmospheric Administration under  
5 this subtitle that collect data described under subsection  
6 (d) shall—

7           “(1) collect such data in accordance with the  
8 standards, protocols, or procedures established pur-  
9 suant to subsection (e); and

10           “(2) submit such data to the data archive sys-  
11 tem under subsection (d), in accordance with any  
12 rules promulgated by the Secretary.”.

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

14       Section 12407 of the Federal Ocean Acidification Re-  
15 search and Monitoring Act of 2009 (33 U.S.C. 3706) is  
16 amended—

17           (1) by striking “ocean acidification” each place  
18 it appears and inserting “ocean acidification and  
19 coastal acidification”;

20           (2) in subsection (a)—

21               (A) in the matter preceding paragraph  
22               (1)—

23                   (i) by striking “continue to carry out  
24 research activities on ocean acidification  
25 which shall”;



1               “(1) collect data in accordance with the stand-  
2       ards, protocols, or procedures established pursuant  
3       to section 12406(e); and

4               “(2) submit such data to the Director and the  
5       Secretary, in accordance with any rules promulgated  
6       by the Director or the Secretary.”.

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

8       Section 12408 of the Federal Ocean Acidification Re-  
9       search and Monitoring Act of 2009 (33 U.S.C. 3707) is  
10      amended—

11               (1) by striking “ocean acidification” each place  
12       it appears and inserting “ocean acidification and  
13       coastal acidification”;

14               (2) in subsection (a), by striking “its impacts”  
15       and inserting “their respective impacts”; and

16               (3) by adding at the end the following new sub-  
17       section:

18               “(d) REQUIREMENT.—Researchers from the National  
19       Aeronautics and Space Administration under this subtitle  
20       that collect data described under section 12406(d) shall—

21               “(1) collect such data in accordance with the  
22       standards, protocols, or procedures established pur-  
23       suant to section 12406(e); and

1               “(2) submit such data to the Administrator and  
2               the Secretary, in accordance with any rules promul-  
3               gated by the Administrator or the Secretary.”.

4 **SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

5               Section 12409 of the Federal Ocean Acidification Re-  
6               search and Monitoring Act of 2009 (33 U.S.C. 3708) is  
7               amended—

8               (1) in subsection (a), by striking “subtitle—”  
9               and all that follows through paragraph (4) and in-  
10               serting the following: “subtitle \$30,500,000 for each  
11               of the fiscal years 2019 through 2023.”; and

12               (2) in subsection (b), by striking “subtitle—”  
13               and all that follows through paragraph (4) and in-  
14               serting the following: “subtitle \$20,000,000 for each  
15               of the fiscal years 2019 through 2023.”.

☒

Chairwoman JOHNSON. I ask unanimous consent to dispense with the reading, and without objection, so ordered.

I recognize the gentlelady for 5 minutes to explain her amendment.

Ms. BONAMICI. Thank you, Madam Chair. I won't take 5 minutes.

My amendment in the nature of a substitute makes technical changes to the *COAST Research Act* based on feedback from the NOAA Ocean Acidification Program. I urge my colleagues to support this amendment, and I yield back the balance of my time.

Chairwoman JOHNSON. Thank you.

Any further comments?

Mr. LUCAS.

Mr. LUCAS. Thank you, Chairwoman Johnson.

The amendment in the nature of a substitute offered by Representative Bonamici to H.R. 1237 incorporates technical assistance from NOAA, as well as feedback from stakeholders gathered after the introduction of the legislation. The amendment helps to define NOAA's role in researching the impacts of ocean acidification.

I thank the gentlewoman for working with Members of the Committee to address technical and policy issues raised during the Subcommittee markup process, and I encourage my colleagues to support this amendment. And I yield back.

Chairwoman JOHNSON. Thank you, Mr. Lucas. I recognize myself to comment on the amendment.

I want to commend Ms. Bonamici on her hard work and leadership on addressing ocean acidification. She's been a true champion of this issue since joining Congress in 2012. Her bipartisan *COAST Research Act* is much needed and—a much-needed update and enhancement to our Federal ocean acidification efforts, which began in 2009 with the passage of the *Federal Ocean Acidification Research and Monitoring Act*.

I fully support the amendment in the nature of a substitute. Ms. Bonamici has offered her bill, which makes some improvements to the underlying text. Among other changes, the amendment adds representatives from Puerto Rico, the Virgin Islands, Hawaii, and Pacific islands to the advisory board to ensure the group that is advising the interagency working group on ocean acidification is regionally balanced.

The amendment clarifies the definition of coastal acidification and improving our understanding of how ocean acidification interacts with other stresses such as hypoxia and harmful algal blooms.

The amendment clarifies that NOAA has already established an ocean acidification data archive system and makes sure all existing ocean acidification data is available and open to the public.

And I urge adoption of the amendment and yield back.

Any further discussions on the amendment?

The Chair recognizes Ms. Stevens—I mean Mrs. Fletcher.

Mrs. FLETCHER. Thank you, Chairwoman Johnson.

As the Chair of the Subcommittee on the Environment, I want to take just a minute to thank Ms. Bonamici for her work on this bill and all of my colleagues on the Committee, noting that this bipartisan bill also passed our Committee unanimously, and I encourage all to support the amendment in the form of a substitution for this bill. Thank you very much.

I yield back my time.

Chairwoman JOHNSON. Thank you very much, Mrs. Fletcher.

Any further comments?

Hearing none, all those—the vote occur on the amendment.

All those in favor, say aye.

Anyone opposing, say no.

Hearing none, the motion carries.

Are there any other amendments?

If no, then a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 1237, as amended, to the House with the recommendation that the bill be approved.

Those in favor of the motion will signify by saying aye.

Opposed, no.

The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table, and I asking animus consent that the staff be authorized to make any necessary technical and conforming changes to the bill. Without objection, so ordered.

Members will have 2 subsequent calendar days in which to supplement any minority or additional views on the measure.

H.R. 1716

Chairwoman JOHNSON. We now come to the consideration of 1716, the *Coastal Communities Ocean Acidification Act of 2019*. The clerk will report the bill.

The CLERK. H.R. 1716, a bill to direct the Secretary of Commerce—

[The bill follows:]

