

116TH CONGRESS
1ST SESSION

S. _____

To reauthorize the Federal Ocean Acidification Research and Monitoring Act of 2009, and for other purposes.

IN THE SENATE OF THE UNITED STATES

Mr. MARKEY (for himself and Mr. SULLIVAN) introduced the following bill; which was read twice and referred to the Committee on

A BILL

To reauthorize the Federal Ocean Acidification Research and Monitoring Act of 2009, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Ocean, Coastal, and
5 Estuarine Acidification Necessitates Research Act of
6 2019” or the “OCEAN Research Act”.

7 **SEC. 2. PURPOSES.**

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

1 (1) by striking “(a) PURPOSES.—”;

2 (2) in paragraph (1)—

3 (A) in the matter preceding subparagraph
4 (A), by striking “development and coordina-
5 tion” and inserting “coordination and imple-
6 mentation”;

7 (B) in subparagraph (A), by striking
8 “acidification on marine organisms” and insert-
9 ing “acidification and coastal acidification on
10 marine organisms”; and

11 (C) in subparagraph (B), by striking “es-
12 tablish” and all that follows and inserting
13 “maintain an interagency research, monitoring,
14 and public outreach program on ocean acidifica-
15 tion and coastal acidification;”;

16 (3) in paragraph (2), by striking “establishment
17 of an ocean acidification program” and inserting
18 “maintenance of an ocean acidification and coastal
19 acidification program”;

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

22 (5) in paragraph (4), by inserting “and coastal
23 acidification that take into account other environ-
24 mental and anthropogenic stressors” after “ocean
25 acidification”.

1 **SEC. 3. DEFINITIONS.**

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

5 (1) in paragraph (1), by striking “of the
6 Earth’s oceans” and all that follows and inserting
7 “and changes in the water chemistry of the Earth’s
8 oceans, coastal estuaries, and waterways caused by
9 carbon dioxide from the atmosphere and the break-
10 down of organic matter.”;

11 (2) in paragraph (3), by striking “Joint Sub-
12 committee on Ocean Science and Technology” and
13 inserting “Subcommittee on Ocean Science and
14 Technology of the Committee on Environment”;

15 (3) by redesignating paragraphs (1), (2), and
16 (3) as paragraphs (2), (4), and (5), respectively;

17 (4) by inserting before paragraph (2), as so re-
18 designated, the following:

19 “(1) COASTAL ACIDIFICATION.—The term
20 ‘coastal acidification’ means the combined decrease
21 in pH and changes in the water chemistry of coastal
22 oceans, estuaries, and other bodies of water from
23 chemical inputs (including carbon dioxide from the
24 atmosphere), freshwater inputs, and excess nutrient
25 run-off from land and coastal atmospheric pollution
26 that result in processes that release carbon dioxide,

1 acidic nitrogen, and sulfur compounds as byproducts
2 which end up in coastal waters.”;

3 (5) by inserting after paragraph (2), as so re-
4 designated, the following:

5 “(3) INSTITUTION OF HIGHER EDUCATION.—
6 The term ‘institution of higher education’ has the
7 meaning given the term in section 101 of the Higher
8 Education Act of 1965 (20 U.S.C. 1001).”;

9 (6) by adding at the end the following:

10 “(6) STATE.—The term ‘State’ means each
11 State of the United States, the District of Columbia,
12 the Commonwealth of Puerto Rico, American
13 Samoa, Guam, the Commonwealth of the Northern
14 Mariana Islands, the Virgin Islands of the United
15 States, and any other territory or possession of the
16 United States.

17 “(7) TRIBAL ORGANIZATION.—The term ‘Tribal
18 organization’ has the meaning given the term ‘tribal
19 organization’ in section 4 of the Indian Self-Deter-
20 mination and Education Assistance Act (25 U.S.C.
21 5304).”.

22 **SEC. 4. INTERAGENCY WORKING GROUP.**

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

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

3 (2) in subsection (a)—

4 (A) by amending paragraph (1) to read as
5 follows:

6 “(1) IN GENERAL.—The Subcommittee shall es-
7 tablish an interagency working group on ocean acidi-
8 fication and coastal acidification.”;

9 (B) by amending paragraph (2) to read as
10 follows:

11 “(2) MEMBERSHIP.—The interagency working
12 group on ocean acidification shall be comprised of
13 senior representatives from—

14 “(A) the National Oceanic and Atmos-
15 pheric Administration;

16 “(B) the National Science Foundation;

17 “(C) the National Aeronautics and Space
18 Administration;

19 “(D) the United States Geological Survey;

20 “(E) the United States Fish and Wildlife
21 Service;

22 “(F) the Bureau of Ocean Energy Man-
23 agement;

24 “(G) the Environmental Protection Agen-
25 cy;

1 “(H) the Department of Agriculture;
2 “(I) the Department of State;
3 “(J) the Department of Energy;
4 “(K) the Department of the Navy;
5 “(L) the National Park Service;
6 “(M) the Bureau of Indian Affairs;
7 “(N) the National Institute of Standards
8 and Technology;
9 “(O) the Smithsonian Institution; and
10 “(P) such other Federal agencies as the
11 Subcommittee considers appropriate.”; and
12 (C) in paragraph (3), in the paragraph
13 heading, by striking “CHAIRMAN” and inserting
14 “CHAIR”;
15 (3) in subsection (b)—
16 (A) in paragraph (1)—
17 (i) by inserting “and coastal acidifica-
18 tion” after “acidification”; and
19 (ii) by inserting “, including the ef-
20 forts of the National Oceanic and Atmos-
21 pheric Administration to facilitate such im-
22 plementation” after “of the plan”;
23 (B) in paragraph (2)—

1 (i) in subparagraph (A), by inserting
2 “and coastal acidification” after “ocean
3 acidification”; and

4 (ii) in subparagraph (B), by inserting
5 “or coastal acidification” after “ocean
6 acidification”;

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

9 (D) in paragraph (5)—

10 (i) by inserting “and Coastal” after
11 “Ocean”;

12 (ii) by striking “developed” and in-
13 serting “and coastal acidification devel-
14 oped”; and

15 (iii) by striking the period at the end
16 and inserting “and coastal acidification;
17 and”; and

18 (E) by adding at the end the following:

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

21 “(A) participates in the Ocean and Coastal
22 Acidification Information Exchange established
23 under paragraph (5); and

1 “(B) delivers data and information to sup-
2 port the data archive system established under
3 section 12406(d).”; and

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

5 (A) in the matter preceding subparagraph
6 (A), by inserting “, and to the Director of the
7 Office of Management and Budget,” after
8 “House of Representatives”; and

9 (B) in subparagraph (B), by striking “the
10 interagency research” and inserting “inter-
11 agency strategic research”.

12 **SEC. 5. OCEAN AND COASTAL ACIDIFICATION ADVISORY**
13 **BOARD.**

14 The Federal Ocean Acidification Research and Moni-
15 toring Act of 2009 (33 U.S.C. 3701 et seq.) is amended
16 by inserting after section 12404 the following:

17 **“SEC. 12404A. OCEAN AND COASTAL ACIDIFICATION ADVI-**
18 **SORY BOARD.**

19 “(a) ESTABLISHMENT.—The Chair of the Sub-
20 committee shall establish an Ocean and Coastal Acidifica-
21 tion Advisory Board (in this section referred to as the ‘Ad-
22 visory Board’).

23 “(b) DUTIES.—The Advisory Board shall—

1 “(1) not later than 180 days before the Sub-
2 committee submits a report under section
3 12404(c)(2)—

4 “(A) review a draft of the report;

5 “(B) submit to the Subcommittee an anal-
6 ysis of the draft for consideration before sub-
7 mitting the report under section 12404(c)(2);
8 and

9 “(C) concurrently with the submission by
10 the Subcommittee of the report under that sec-
11 tion, submit a copy of the analysis provided to
12 the Subcommittee under subparagraph (B) to—

13 “(i) the Committee on Commerce,
14 Science, and Transportation of the Senate;
15 and

16 “(ii) the Committee on Science,
17 Space, and Technology and the Committee
18 on Natural Resources of the House of Rep-
19 resentatives;

20 “(2) not later than 180 days before the Sub-
21 committee submits a strategic research plan under
22 section 12404(c)(3)—

23 “(A) review a draft of the plan;

24 “(B) submit to the Subcommittee an anal-
25 ysis of the plan, and recommendations for the

1 implementation of the plan, for consideration
2 before submitting the plan under section
3 12404(c)(3); and

4 “(C) concurrently with the submission of
5 the Subcommittee of the plan under that sec-
6 tion, submit a copy of the analysis provided to
7 the Subcommittee under subparagraph (B) to
8 the committees specified in clauses (i) and (ii)
9 of paragraph (1)(C);

10 “(3) provide ongoing advice to the Sub-
11 committee and the interagency working group estab-
12 lished under section 12404 on matters related to
13 Federal activities on ocean acidification and coastal
14 acidification;

15 “(4) advise the Subcommittee and the inter-
16 agency working group on—

17 “(A) efforts to coordinate research and
18 monitoring activities related to ocean acidifica-
19 tion and coastal acidification; and

20 “(B) the best practices for the standards
21 developed for data archiving under section
22 12406(e);

23 “(5) publish in the Federal Register a charter;

24 “(6) provide to the Library of Congress—

1 “(A) the charter required by paragraph
2 (5);

3 “(B) any schedules and minutes for meet-
4 ings of the Advisory Board;

5 “(C) any documents that are approved by
6 the Advisory Board; and

7 “(D) any reports and analysis prepared by
8 the Advisory Board; and

9 “(7) establish a publicly accessible page on the
10 website of the National Oceanic and Atmospheric
11 Administration that contains the information de-
12 scribed in subparagraphs (A) through (D) of para-
13 graph (6).

14 “(c) MEMBERSHIP.—The Advisory Board shall con-
15 sist of 24 members as follows:

16 “(1) Two representatives of the shellfish and
17 crab industry.

18 “(2) One representative of the finfish industry.

19 “(3) One representative of seafood processors.

20 “(4) Three representatives from institutions of
21 higher education, including both natural and social
22 sciences.

23 “(5) One representative of recreational fishing.

24 “(6) One representative of relevant nongovern-
25 mental organizations.

1 “(7) Six representatives from relevant State
2 and local governments and Tribal organizations.

3 “(8) One representative from the Alaska Ocean
4 Acidification Network.

5 “(9) One representative from the California
6 Current Acidification Network.

7 “(10) One representative from the Northeast
8 Coastal Acidification Network.

9 “(11) One representative from the Southeast
10 Ocean and Coastal Acidification Network.

11 “(12) One representative from the Gulf of Mex-
12 ico Ocean Acidification Network.

13 “(13) One representative from the Mid-Atlantic
14 Coastal Acidification Network.

15 “(14) One representative from the Pacific Is-
16 lands Ocean Observing System or a similar entity
17 representing—

18 “(A) the island territories and possessions
19 of the United States in the Pacific Ocean; and

20 “(B) the State of Hawaii.

21 “(15) One representative from the Caribbean
22 Regional Association for Coastal Ocean Observing or
23 a similar entity representing Puerto Rico and the
24 United States Virgin Islands.

1 “(16) One representative from the National
2 Oceanic and Atmospheric Administration, who shall
3 serve as an ex officio member of the Advisory Board
4 without a vote.

5 “(d) APPOINTMENT OF MEMBERS.—The Chair of the
6 Subcommittee shall—

7 “(1) appoint members to the Advisory Board
8 (taking into account the geographical interests of
9 each individual to be appointed as a member to en-
10 sure that an appropriate balance of geographical in-
11 terests are represented by the members of the Advi-
12 sory Board) who—

13 “(A) represent the interest group for which
14 each seat is designated;

15 “(B) demonstrate expertise on ocean acidi-
16 fication or coastal acidification and its sci-
17 entific, economic, industry, cultural, and com-
18 munity impacts; and

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

22 “(2) give consideration to nominations and rec-
23 ommendations from the members of the interagency
24 working group and the public for such appointments;
25 and

1 “(3) ensure that an appropriate balance of sci-
2 entific, industry, and geographical interests are rep-
3 resented by the members of the Advisory Board.

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

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

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

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

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

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

19 “(i) FEDERAL ADVISORY COMMITTEE ACT.—Section
20 14 of the Federal Advisory Committee Act (5 U.S.C.
21 App.) shall not apply to the Advisory Board.”.

22 **SEC. 6. STRATEGIC RESEARCH PLAN.**

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

1 (1) by inserting “and coastal acidification”
2 after “acidification” each place it appears;

3 (2) in subsection (a)—

4 (A) in the first sentence—

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

8 (ii) by inserting “address the socio-
9 economic impacts of ocean acidification
10 and coastal acidification and to” after
11 “mitigation strategies to”; and

12 (iii) by striking “marine ecosystems”
13 each place it appears and inserting “eco-
14 systems”; and

15 (B) in the second sentence—

16 (i) by striking “its potential impacts”
17 and inserting “their potential impacts”;
18 and

19 (ii) by inserting “and recommenda-
20 tions made by the Advisory Board in the
21 review of the plan required under section
22 12404A(b)(2)(A)” after “subsection (d)”;

23 (3) in subsection (b)—

24 (A) in paragraph (1), by inserting “and so-
25 cial sciences” after “among the ocean sciences”;

16

1 (B) in paragraph (2)—

2 (i) in subparagraph (A), by striking
3 “its physical, chemical, and biological im-
4 pacts” and inserting “their physical, chem-
5 ical, and biological impacts, including
6 trends of changes in ocean chemistry,”;

7 (ii) in subparagraph (B)—

8 (I) by striking “improve the abil-
9 ity to assess the” and inserting “as-
10 sess the short-term and long-term”;
11 and

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

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

16 “(C) provide information for the—

17 “(i) development of adaptation and
18 mitigation strategies to address the socio-
19 economic impacts of ocean acidification
20 and coastal acidification;

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

23 “(iii) assessment of the effectiveness
24 of such adaptation and mitigation strate-
25 gies; and”;

1 (iv) by adding at the end the fol-
2 lowing:

3 “(D) improve research on—

4 “(i) ocean acidification and coastal
5 acidification;

6 “(ii) the interactions between and ef-
7 fects of multiple combined stressors includ-
8 ing changes in water chemistry, changes in
9 sediment delivery, hypoxia, and harmful
10 algal blooms, on ocean acidification and
11 coastal acidification; and

12 “(iii) the effect of environmental
13 stressors on marine resources and eco-
14 systems;”;

15 (C) in paragraph (3)—

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

19 (ii) in subparagraph (H), by striking
20 “; and” and inserting a semicolon; and

21 (iii) by adding at the end the fol-
22 lowing:

23 “(J) assessment of adaptation and mitiga-
24 tion strategies; and

25 “(K) education and outreach activities;”;

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

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

7 (F) in paragraph (6), by striking “of the
8 United States” and inserting “within the
9 United States”;

10 (G) in paragraph (7), by striking “outline
11 budget requirements” and inserting “estimate
12 costs associated for full implementation of each
13 element of the plan by fiscal year”;

14 (H) in paragraph (8)—

15 (i) by striking “its” and inserting
16 “their”; and

17 (ii) by striking “; and” and inserting
18 a semicolon;

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

21 (J) by adding at the end the following:

22 “(10) describe monitoring needs necessary to
23 support potentially affected industry members,
24 coastal stakeholders, fishery management councils
25 and commissions, non-Federal resource managers,

1 and scientific experts on decisionmaking and adapta-
2 tion related to ocean acidification and coastal acidifi-
3 cation.”;

4 (4) in subsection (c)—

5 (A) in paragraph (1)(C), by striking “sur-
6 face”;

7 (B) 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”; and

15 (C) by adding at the end the following:

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

20 (5) by striking subsection (e) and inserting the
21 following:

22 “(e) ADVISORY BOARD EVALUATION.—Not later
23 than 180 days before the strategic research plan is sub-
24 mitted to Congress under section 12404(c)(3), the Sub-
25 committee shall provide the Advisory Board established

1 under section 12404A a copy of the plan for purposes of
2 review under subsection (b)(2)(A) of such section.

3 “(f) PUBLICATION AND PUBLIC COMMENT.—Not
4 later than 90 days before the strategic research plan is
5 submitted to Congress under section 12404(c)(3), the
6 Subcommittee shall—

7 “(1) publish a draft of the plan in the Federal
8 Register; and

9 “(2) provide an opportunity for submission of
10 public comments for a period of not less than 60
11 days.”.

12 **SEC. 7. NOAA OCEAN AND COASTAL ACIDIFICATION ACTIVI-**
13 **TIES.**

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

17 (1) in the section heading, by inserting “**AND**
18 **COASTAL**” after “**OCEAN**”;

19 (2) by inserting “and coastal acidification”
20 after “acidification” each place it appears;

21 (3) in subsection (a)—

22 (A) in the matter preceding paragraph

23 (1)—

24 (i) by inserting “coordination,” after
25 “research, monitoring,”; and

1 (ii) by striking “and implementation”;

2 (B) in paragraph (1)—

3 (i) in subparagraph (B)—

4 (I) by inserting “including the
5 Integrated Ocean Observing System
6 and the ocean observing assets of
7 other Federal and State agencies,”
8 after “ocean observing assets,”; and

9 (II) by inserting “and agency
10 and department missions, prioritizing
11 the location of monitoring instru-
12 ments, assets, and projects to maxi-
13 mize the efficiency of resources and to
14 optimize understanding of socio-
15 economic impacts and ecosystem
16 health” after “research program”;

17 (ii) in subparagraph (C)—

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

21 (II) by inserting “and supporting
22 socioeconomically vulnerable commu-
23 nities and industries” after “marine
24 ecosystems”;

25 (iii) in subparagraph (E)—

1 (I) by striking “its impacts” and
2 inserting “their impacts”; and

3 (II) by striking “; and” and in-
4 serting a semicolon;

5 (iv) in subparagraph (F)—

6 (I) by striking “monitoring and
7 impacts research” and inserting “re-
8 search, monitoring, and adaptation
9 and mitigation strategies”; and

10 (II) by striking the semicolon
11 and inserting “; and”; and

12 (v) by adding at the end the following:

13 “(G) research to improve understanding of
14 the effect of—

15 “(i) other environmental stressors on
16 ocean acidification and coastal acidifica-
17 tion;

18 “(ii) multiple environmental stressors
19 on living marine resources and coastal eco-
20 systems; and

21 “(iii) adaptation and mitigation strat-
22 egies to address the socioeconomic impacts
23 of ocean acidification and coastal acidifica-
24 tion.”;

1 (C) in paragraph (2), by striking “critical
2 research projects that explore” and inserting
3 “critical research and education projects that
4 explore and communicate”; and

5 (4) by adding at the end the following:

6 “(c) RELATIONSHIP TO INTERAGENCY WORKING
7 GROUP.—The National Oceanic and Atmospheric Admin-
8 istration shall serve as the lead Federal agency responsible
9 for coordinating the Federal response to ocean acidifica-
10 tion and coastal acidification, by—

11 “(1) leading the interagency working group es-
12 tablished under section 12404 in implementing the
13 strategic research plan under section 12405;

14 “(2) coordinating monitoring and research ef-
15 forts among Federal agencies in cooperation with
16 State and local governments, Tribal organizations,
17 and international partners;

18 “(3) maintaining the Ocean and Coastal Acidi-
19 fication Information Exchange required by section
20 12404(b)(5) to allow for information to be electroni-
21 cally accessible, including information—

22 “(A) on ocean acidification and coastal
23 acidification developed through or used by the
24 ocean acidification and coastal acidification pro-
25 gram described in subsection (a); or

1 “(B) that would be useful to State or local
2 governments, Tribal organizations, resource
3 managers, policymakers, researchers, and other
4 stakeholders in mitigating or adapting to the
5 impacts of ocean acidification and coastal acidi-
6 fication; and

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

9 “(d) DATA ARCHIVE SYSTEM.—

10 “(1) MANAGEMENT.—The Secretary, in coordi-
11 nation with members of the interagency working
12 group established under section 12404, shall provide
13 for the long-term stewardship of, and access to, data
14 relating to ocean acidification and coastal acidifica-
15 tion by establishing and maintaining a data archive
16 system that the National Centers for Environmental
17 Information uses to process, store, archive, provide
18 access to, and incorporate to the extent possible,
19 such data collected—

20 “(A) through relevant federally funded re-
21 search; and

22 “(B) by a Federal, State, or local agency,
23 Tribal organization, scientist at an institution
24 of higher education, citizen scientist, or indus-
25 try organization.

1 “(2) EXISTING GLOBAL OR NATIONAL DATA AS-
2 SETS.—In establishing and maintaining the data ar-
3 chive system under paragraph (1), the Secretary
4 shall ensure that existing global or national data as-
5 sets (including the data assets maintained by the
6 National Centers for Environmental Information,
7 the Integrated Ocean Observing System, and other
8 existing data systems within Federal agencies) are
9 incorporated to the greatest extent possible.

10 “(e) STANDARDS, PROTOCOLS, AND PROCEDURES.—
11 The Secretary, in coordination with members of the inter-
12 agency working group established under section 12404,
13 shall establish and revise as necessary the standards, pro-
14 tocols, or procedures for—

15 “(1) processing, storing, archiving, and pro-
16 viding access to data described in subsection (d);

17 “(2) the interoperability and intercalibration of
18 such data;

19 “(3) the collection of any metadata underlying
20 such data; and

21 “(4) sharing such data with State and local
22 governments, Tribal organizations, potentially af-
23 fected industry members, coastal stakeholders, fish-
24 ery management councils and commissions, non-Fed-

1 eral resource managers, and institutions of higher
2 education.

3 “(f) DISSEMINATION OF OCEAN ACIDIFICATION
4 DATA AND COASTAL ACIDIFICATION DATA.—The Sec-
5 retary, in coordination with members of the interagency
6 working group established under section 12404, shall dis-
7 seminate the data described in subsection (d) to the great-
8 est extent practicable by sharing such data on full and
9 open access exchanges, including the Ocean and Coastal
10 Acidification Information Exchange required by section
11 12404(b)(5).

12 “(g) REQUIREMENT.—Recipients of grants from the
13 National Oceanic and Atmospheric Administration under
14 this subtitle that collect data described in subsection (d)
15 shall—

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

19 “(2) submit such data to the data archive sys-
20 tem under subsection (d), in accordance with any
21 rules promulgated by the Secretary.”.

1 **SEC. 8. OCEAN ACIDIFICATION COLLABORATIVE RE-**
2 **SEARCH GRANTS.**

3 The Federal Ocean Acidification Research and Moni-
4 toring Act of 2009 (33 U.S.C. 3701 et seq.) is amended
5 by inserting after section 12406 the following:

6 **“SEC. 12406A. OCEAN ACIDIFICATION COLLABORATIVE RE-**
7 **SEARCH GRANTS.**

8 “(a) DEFINITIONS.—In this section:

9 “(1) ACADEMIC COMMUNITY.—The term ‘aca-
10 demic community’ includes faculty and other rep-
11 resentatives of institutions of higher education and
12 other schools, researchers, scientists, and natural re-
13 source managers.

14 “(2) SEAFOOD INDUSTRY.—The term ‘seafood
15 industry’ includes shellfish growers, shellfish har-
16 vesters, commercial fishermen, recreational fisher-
17 men, other members of the seafood harvesting or
18 supply chain, and organizations representing any of
19 such groups.

20 “(b) GRANTS.—The Secretary shall provide grants
21 for collaborative research projects on ocean acidification
22 developed and conducted through partnerships between
23 the seafood industry and the academic community.

24 “(c) CRITERIA FOR APPROVAL.—The Secretary may
25 not provide a grant for a project under this section unless
26 the project is—

1 “(1) consistent with the themes identified under
2 the strategic research plan developed by the Sub-
3 committee under section 12405; and

4 “(2) designed to—

5 “(A) develop and support partnerships,
6 communications, and shared understanding be-
7 tween the seafood industry and the academic
8 community;

9 “(B) include the seafood industry in re-
10 search on ocean acidification;

11 “(C) deliver research, monitoring, or adap-
12 tation results which will benefit both the sea-
13 food industry and the academic community;

14 “(D) incorporate into the research agenda
15 the expertise of both the seafood industry, in-
16 cluding their unique understanding of the nat-
17 ural environment, and the academic community;

18 “(E) promote better understanding of sea-
19 food industry research questions and priorities
20 within the academic community;

21 “(F) promote wider understanding of
22 ocean acidification among the academic commu-
23 nity, the seafood industry, and other stake-
24 holders as appropriate; and

1 “(G) include appropriately balanced sup-
2 port from both the seafood industry and the
3 academic community.

4 “(d) PRIORITY.—The Secretary shall prioritize fund-
5 ing under this section to projects which—

6 “(1) address ecosystems and communities vul-
7 nerable to the impacts of ocean acidification;

8 “(2) demonstrate support from local stake-
9 holders, such as representatives of States or other
10 governmental jurisdictions, community organiza-
11 tions, tribes, or educational institutions, as appro-
12 priate, located within the region in which the project
13 will be undertaken; or

14 “(3) utilize seafood industry assets as research
15 and monitoring platforms.

16 “(e) IMPLEMENTATION GUIDELINES.—Not later
17 than 180 days after the date of enactment of this section,
18 the Secretary, in collaboration with the Subcommittee,
19 shall issue implementation guidelines under this section,
20 including criteria and priorities for grants. Those guide-
21 lines shall be developed in consultation, as appropriate,
22 with—

23 “(1) State, regional, and local decisionmakers
24 with ocean acidification experience;

1 “(2) the seafood industry and other marine-de-
2 pendent industries;

3 “(3) formal and informal educators, including
4 both those within academia and those who are not;

5 “(4) tribes;

6 “(5) nongovernmental organizations involved in
7 ocean acidification research, prevention, or adapta-
8 tion; and

9 “(6) any other appropriate community stake-
10 holders.

11 “(f) CONTENTS OF PROPOSALS.—Each proposal for
12 a grant under this section shall include—

13 “(1) a description of the qualifications of the
14 individuals or entities who will conduct the project;

15 “(2) a plan for ensuring full participation and
16 engagement of both industry and academic commu-
17 nity participants, including a description of how each
18 partner will contribute expertise to the project in
19 terms of design, execution, and interpretation of re-
20 sults;

21 “(3) a plan for the dissemination of the results
22 of the research project, which may include—

23 “(A) educational programs;

1 “(B) presentations to members of the sea-
2 food industry, the academic community, and
3 community stakeholders;

4 “(C) scientific publication; and

5 “(D) delivery to appropriate representa-
6 tives of States or other government jurisdictions
7 who would use the information;

8 “(4) a description of how the project is con-
9 sistent with the program elements described in sec-
10 tion 12405(c); and

11 “(5) any other information the Secretary con-
12 siders necessary for evaluating the eligibility of the
13 project for funding under this section.

14 “(g) ALTERNATIVE PARTICIPANTS.—The Secretary
15 may make a grant under this section to a partnership in
16 which a marine-dependent industry is substituted for the
17 seafood industry if the proposed project serves the pur-
18 poses of this section. In such a case, the participation and
19 interests of that marine-dependent industry shall be sub-
20 stituted for those of the seafood industry in applying the
21 requirements of this section.

22 “(h) PROJECT REPORTING.—Each grantee under
23 this section shall provide periodic reports as required by
24 the Secretary. Each such report shall include all informa-

1 tion required by the Secretary for evaluating the progress
2 and success of the project.

3 “(i) MATCHING REQUIREMENTS.—

4 “(1) IN GENERAL.—Except as provided in para-
5 graph (2), the total amount of Federal funding for
6 a collaborative research project supported under this
7 section may not exceed 85 percent of the total cost
8 of such project. For purposes of this paragraph, the
9 non-Federal share of project costs may be provided
10 by in-kind contributions and other noncash support.

11 “(2) WAIVER.—The Secretary may waive all or
12 part of the matching requirement under paragraph
13 (1) if the Secretary determines that no reasonable
14 means are available through which applicants can
15 meet the matching requirement and the probable
16 benefit of such project outweighs the public interest
17 in such matching requirement.

18 “(j) FUNDING.—Of the amount authorized to be ap-
19 propriated by section 12409(a) for each of fiscal years
20 2020 through 2024, \$5,000,000 shall be available to pro-
21 vide grants under this section.”.

1 **SEC. 9. NSF OCEAN AND COASTAL ACIDIFICATION ACTIVI-**
2 **TIES.**

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

6 (1) in the section heading, by inserting “**AND**
7 **COASTAL**” after “**OCEAN**”;

8 (2) by inserting “and coastal acidification”
9 after “acidification” each place it appears;

10 (3) in subsection (a)—

11 (A) in the matter preceding paragraph

12 (1)—

13 (i) by striking “continue” and all that
14 follows through “which shall”;

15 (ii) by striking “proposals for re-
16 search” and inserting “proposals for the
17 researching”; and

18 (iii) by striking “its impacts” and in-
19 serting “their impacts”;

20 (B) in paragraph (1), by striking “marine
21 ecosystems” and inserting “ecosystems”;

22 (C) in paragraph (2), by striking “; and”
23 at the end and inserting a semicolon;

24 (D) in paragraph (3)—

25 (i) by striking “and its impacts” and
26 inserting “and their impacts”; and

1 (ii) by striking the period at the end
2 and inserting “; and”; and

3 (E) by adding at the end the following:

4 “(4) adaptation and mitigation strategies to ad-
5 dress socioeconomic effects of ocean acidification and
6 coastal acidification.”; and

7 (4) by adding at the end the following:

8 “(d) REQUIREMENT.—Recipients of grants from the
9 National Science Foundation under this section that col-
10 lect data described under section 12406(d) shall—

11 “(1) collect data in accordance with the stand-
12 ards, protocols, or procedures established pursuant
13 to section 12406(e); and

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

17 **SEC. 10. NASA OCEAN AND COASTAL ACIDIFICATION AC-**
18 **TIVITIES.**

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

22 (1) in the section heading, by inserting “**AND**
23 **COASTAL**” after “**OCEAN**”;

24 (2) in subsection (a)—

1 (A) in the subsection heading, by inserting
2 “AND COASTAL” after “OCEAN”; and

3 (B) in the text, by striking “acidification
4 and its impacts” and inserting “acidification
5 and coastal acidification and their impacts”;

6 (3) in subsections (b) and (c), by inserting “and
7 coastal acidification” after “acidification” each place
8 it appears; and

9 (4) by adding at the end the following:

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

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

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

19 **SEC. 11. AUTHORIZATION OF APPROPRIATIONS.**

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

23 (1) in subsection (a), by striking “subtitle—”
24 and all that follows and inserting the following:

1 “subtitle \$35,500,000 for each of fiscal years 2020
2 through 2024.”; and

3 (2) in subsection (b), by striking “subtitle—”
4 and all that follows and inserting the following:
5 “subtitle \$20,000,000 for each of fiscal years 2020
6 through 2024.”.

7 **SEC. 12. STUDY EXAMINING THE IMPACT OF OCEAN ACIDI-**
8 **FICATION AND OTHER ENVIRONMENTAL**
9 **STRESSORS ON ESTUARINE ENVIRONMENTS.**

10 (a) IN GENERAL.—Not later than 60 days after the
11 date of enactment of this Act, the Secretary of Commerce
12 shall make appropriate arrangements with the National
13 Academies of Sciences, Engineering, and Medicine (re-
14 ferred to in this Act as the “National Academies”) under
15 which the National Academies shall conduct a study
16 that—

17 (1) examines the existing science of ocean acidi-
18 fication in estuarine environments;

19 (2) examines the challenges to studying ocean
20 acidification and ocean acidification’s interactions
21 with other environmental stressors in estuarine envi-
22 ronments, including harmful algal blooms, nutrient
23 loading, and hypoxia;

1 (3) provides recommendations for improving fu-
2 ture research with respect to ocean acidification in
3 estuarine environments; and

4 (4) identifies pathways for applying science in
5 management and mitigation decisions relating to
6 ocean acidification in estuarine environments.

7 (b) CONTENTS OF STUDY.—The study described
8 under subsection (a) shall include—

9 (1) the behavior of the carbonate system within
10 estuarine environments;

11 (2) the interactions of the carbonate system
12 with other biotic and abiotic characteristics of estua-
13 rine ecosystems;

14 (3) how environmental and anthropogenic
15 changes or disturbances could affect abiotic and bi-
16 otic processes within estuaries;

17 (4) how estuarine biotic and abiotic processes
18 will be affected under predicted environmental
19 changes;

20 (5) the current state of data collection, inter-
21 pretation, storage, and retrieval and observational
22 infrastructure of abiotic and biotic parameters in es-
23 tuarine ecosystems;

1 (6) the gaps that exist in understanding the
2 socio-economic and health impacts of ocean acidifica-
3 tion in estuaries;

4 (7) future directions for scientific research; and

5 (8) pathways for applying science in manage-
6 ment and mitigation decisions.

7 (c) REPORT.—In entering into an arrangement under
8 subsection (a), the Secretary shall request that the Na-
9 tional Academies transmit to Congress a report on the re-
10 sults of the study not later than 24 months after the date
11 of enactment of this Act.

12 (d) AUTHORIZATION OF APPROPRIATIONS.—There
13 are authorized to be appropriated to carry out this section
14 \$1,000,000.