

AMENDMENT NO. \_\_\_\_\_

Calendar No. \_\_\_\_\_

Purpose: In the nature of a substitute.

**IN THE SENATE OF THE UNITED STATES—114th Cong., 1st Sess.**

**S. 1886**

To reauthorize the Integrated Coastal and Ocean Observation System Act of 2009 and for other purposes.

Referred to the Committee on \_\_\_\_\_ and ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENT IN THE NATURE OF A SUBSTITUTE intended to be proposed by Ms. CANTWELL *for herself and Mr. Wicker*

Viz:

1 Strike all after the enacting clause and insert the following:  
2

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Coordinated Ocean  
5 Monitoring and Research Act”.

6 **SEC. 2. PURPOSES.**

7 Section 12302 of the Integrated Coastal and Ocean  
8 Observation System Act of 2009 (33 U.S.C. 3601) is  
9 amended to read as follows:

10 **“SEC. 12302. PURPOSES.**

11 “The purposes of this subtitle are—

1           “(1) to establish and sustain a national inte-  
2           grated System of ocean, coastal, and Great Lakes  
3           observing systems, comprised of Federal and non-  
4           Federal components coordinated at the national level  
5           by the Council and at the regional level by a network  
6           of Regional Coastal Observing Systems, and that in-  
7           cludes in situ, remote, and other coastal and ocean  
8           observation and modeling capabilities, technologies,  
9           data management systems, communication systems,  
10          and product development systems, and is designed to  
11          address regional and national needs for ocean and  
12          coastal information, to gather specific data on key  
13          coastal, ocean, and Great Lakes variables, and to en-  
14          sure timely and sustained dissemination and avail-  
15          ability of these data—

16                   “(A) to the public;

17                   “(B) to support national defense, search  
18                   and rescue operations, marine commerce, navi-  
19                   gation safety, weather, climate, and marine  
20                   forecasting, energy siting and production, eco-  
21                   nomic development, ecosystem-based marine,  
22                   coastal, and Great Lakes resource management,  
23                   public safety, and public outreach and edu-  
24                   cation;

1           “(C) to promote greater public awareness  
2           and stewardship of the Nation’s ocean, coastal,  
3           and Great Lakes resources and the general  
4           public welfare;

5           “(D) to provide easy access to ocean,  
6           coastal, and Great Lakes data and promote  
7           data sharing between Federal and non-Federal  
8           sources and promote public data sharing;

9           “(E) to enable advances in scientific un-  
10          derstanding to support the sustainable use, con-  
11          servation, management, and understanding of  
12          healthy ocean, coastal, and Great Lakes re-  
13          sources; and

14          “(F) to monitor and model changes in  
15          ocean chemistry;

16          “(2) to improve the Nation’s capability to meas-  
17          ure, track, observe, understand, and predict events  
18          related directly and indirectly to weather and climate  
19          change, natural climate variability, and interactions  
20          between the oceanic and atmospheric environments,  
21          including the Great Lakes; and

22          “(3) to authorize activities—

23                 “(A) to promote basic and applied research  
24                 to develop, test, and deploy innovations and im-  
25                 provements in coastal and ocean observation

1 technologies, including advanced observing tech-  
2 nologies needed to address critical data gaps,  
3 modeling systems, other scientific and techno-  
4 logical capabilities to improve the under-  
5 standing of weather and climate, ocean-atmos-  
6 phere dynamics, global climate change, and the  
7 physical, chemical, and biological dynamics of  
8 the ocean, coastal and Great Lakes environ-  
9 ments; and

10 “(B) to conserve healthy and restore de-  
11 graded coastal ecosystems.”.

12 **SEC. 3. DEFINITIONS.**

13 Section 12303 of the Integrated Coastal and Ocean  
14 Observation System Act of 2009 (33 U.S.C. 3602) is  
15 amended—

16 (1) in paragraph (5), by striking “States, re-  
17 gional organizations, universities, nongovernmental  
18 organizations, or the private sector.” and inserting  
19 “the regional coastal observing systems, the Na-  
20 tional Oceanic and Atmospheric Administration, or  
21 the Interagency Ocean Observation Committee.”;

22 (2) by amending paragraph (6) to read as fol-  
23 lows:

24 “(6) REGIONAL COASTAL OBSERVING SYS-  
25 TEM.—The term ‘regional coastal observing system’

1 means an organizational body that is certified or es-  
2 tablished by contract or memorandum by the lead  
3 Federal agency designated in section 12304(c)(3)  
4 and coordinates State, Federal, local, tribal, and pri-  
5 vate interests at a regional level with the responsi-  
6 bility of engaging the private and public sectors in  
7 designing, operating, and improving regional coastal  
8 and ocean observing systems in order to ensure the  
9 provision of data and information that meet the  
10 needs of user groups from the respective regions.”;  
11 and

12 (3) in paragraph (7), by striking “National  
13 Oceanic and Atmospheric Administration.” and in-  
14 serting “Administrator.”.

15 **SEC. 4. INTEGRATED COASTAL AND OCEAN OBSERVATION**  
16 **SYSTEM.**

17 (a) SYSTEM ELEMENTS.—

18 (1) IN GENERAL.—Section 12304(b) of the In-  
19 tegrated Coastal and Ocean Observation System Act  
20 of 2009 (33 U.S.C. 3603(b)) is amended by striking  
21 paragraph (1) and inserting the following:

22 “(1) IN GENERAL.—In order to fulfill the pur-  
23 poses of this subtitle, the System shall be national  
24 in scope and consist of—

1           “(A) Federal assets to fulfill national and  
2 international observation missions and prior-  
3 ities;

4           “(B) non-Federal assets, including a net-  
5 work of regional coastal observing systems iden-  
6 tified under subsection (c)(4), to fulfill regional  
7 and national observation missions and prior-  
8 ities;

9           “(C) data management, communication,  
10 and modeling systems for the timely integration  
11 and dissemination of data and information  
12 products from the System;

13           “(D) a product development system to  
14 transform observations into products in a for-  
15 mat that may be readily used and understood;  
16 and

17           “(E) a research and development program  
18 conducted under the guidance of the Council,  
19 consisting of—

20                   “(i) basic and applied research and  
21 technology development—

22                           “(I) to improve understanding of  
23 coastal and ocean systems and their  
24 relationships to human activities; and

1                   “(II) to ensure improvement of  
2                   operational assets and products, in-  
3                   cluding related infrastructure, observ-  
4                   ing technologies, and information and  
5                   data processing and management  
6                   technologies;

7                   “(ii) an advanced observing tech-  
8                   nology development program to fill gaps in  
9                   technology;

10                  “(iii) large scale computing resources  
11                  and research to advance modeling of coast-  
12                  al and ocean processes;

13                  “(iv) models to improve regional  
14                  weather forecasting capabilities and re-  
15                  gional weather forecasting products; and

16                  “(v) reviews of data collection proce-  
17                  dures across regions and programs to  
18                  make recommendations for data collection  
19                  standards across the System to meet na-  
20                  tional ocean observation, applied research,  
21                  and weather forecasting needs.”.

22                  (2) AVAILABILITY OF DATA.—Paragraph (3) of  
23                  section 12304(b) of the Integrated Coastal and  
24                  Ocean Observation System Act of 2009 (33 U.S.C.  
25                  3603(b)) is amended by striking the period at the

1 end and inserting “for research and for use in the  
2 development of products to address societal needs.”.

3 (3) COORDINATION OF NON-FEDERAL AS-  
4 SETS.—Paragraph (4) of section 12304(b) of the In-  
5 tegrated Coastal and Ocean Observation System Act  
6 of 2009 (33 U.S.C. 3603(b)) is amended—

7 (A) in the paragraph heading, by striking  
8 “NON-FEDERAL” and inserting “COORDINA-  
9 TION OF NON-FEDERAL”; and

10 (B) by inserting “, the regional coastal ob-  
11 serving system,” after “Interagency Ocean Ob-  
12 serving Committee”.

13 (b) POLICY OVERSIGHT, ADMINISTRATION, AND RE-  
14 GIONAL COORDINATION.—Section 12304(c) of the Inte-  
15 grated Coastal and Ocean Observation System Act of  
16 2009 (33 U.S.C. 3603(c)) is amended by striking para-  
17 graphs (2), (3), and (4), and inserting the following:

18 “(2) INTERAGENCY OCEAN OBSERVATION COM-  
19 MITTEE.—

20 “(A) ESTABLISHMENT.—The Council shall  
21 establish or designate a committee which shall  
22 be known as the Interagency Ocean Observation  
23 Committee.

24 “(B) DUTIES.—The Interagency Ocean  
25 Observation Committee shall—



1           “(i) prepare annual and long-term  
2 plans for consideration and approval by the  
3 Council for the integrated design, oper-  
4 ation, maintenance, enhancement, and ex-  
5 pansion of the System to meet the objec-  
6 tives of this chapter and the System Plan;

7           “(ii) develop and transmit to Con-  
8 gress, along with the budget submitted by  
9 the President to Congress pursuant to sec-  
10 tion 1105(a) of title 31, United States  
11 Code, an annual coordinated, comprehen-  
12 sive budget—

13           “(I) to operate all elements of  
14 the System identified in subsection  
15 (b); and

16           “(II) to ensure continuity of data  
17 streams from Federal and non-Fed-  
18 eral assets;

19           “(iii) establish requirements for obser-  
20 vation data variables to be gathered by  
21 both Federal and non-Federal assets and  
22 identify, in consultation with regional in-  
23 formation coordination entities, priorities  
24 for System observations;



1           petitive matching grant or other pro-  
2           grams—

3                   “(I) to promote intramural and  
4                   extramural research and development  
5                   of new, innovative, and emerging ob-  
6                   servation technologies including test-  
7                   ing and field trials; and

8                   “(II) to facilitate the migration  
9                   of new, innovative, and emerging sci-  
10                  entific and technological advances  
11                  from research and development to  
12                  operational deployment;

13                  “(viii) periodically—

14                   “(I) review the System Plan; and

15                   “(II) submit to the Council such  
16                   recommendations as the Interagency  
17                   Ocean Observation Committee may  
18                   have for improvements to the System  
19                   Plan;

20                   “(ix) ensure collaboration among Fed-  
21                   eral agencies participating in the activities  
22                   of the Interagency Ocean Observation  
23                   Committee; and

24                   “(x) perform such additional duties as  
25                   the Council may delegate.





1 and develop and implement a process for  
2 the periodic review and evaluation of the  
3 regional associations;

4 “(vi) provide opportunities for com-  
5 petitive contracts and grants for dem-  
6 onstration projects to design, develop, inte-  
7 grate, deploy, maintain, and support com-  
8 ponents of the System;

9 “(vii) establish and maintain efficient  
10 and effective administrative procedures for  
11 the timely allocation of funds among con-  
12 tractors, grantees, and non-Federal assets,  
13 including regional associations;

14 “(viii) develop and implement a proc-  
15 ess for the periodic review and evaluation  
16 of the Regional Coastal Observing Sys-  
17 tems;

18 “(ix) formulate an annual process by  
19 which gaps in observation coverage or  
20 needs for capital improvements of Federal  
21 assets and non-Federal assets of the Sys-  
22 tem are—

23 “(I) identified by the regional as-  
24 sociations described in the System

1 Plan, the Administrator, or other  
2 members of the System; and

3 “(II) submitted to the Inter-  
4 agency Ocean Observing Committee;

5 “(x) develop and be responsible for a  
6 data management and communication sys-  
7 tem, in accordance with standards and  
8 protocols established by the Interagency  
9 Ocean Observing Committee, by which all  
10 data collected by the System regarding  
11 ocean and coastal waters of the United  
12 States including the Great Lakes, are proc-  
13 essed, stored, integrated, and made avail-  
14 able to all end-user communities;

15 “(xi) not less frequently than once  
16 each year, submit to the Interagency  
17 Ocean Observing Observation Committee a  
18 report on the accomplishments, operational  
19 needs, and performance of the System to  
20 contribute to the annual and long-term  
21 plans prepared pursuant to paragraph  
22 (2)(B)(i);

23 “(xii) develop and periodically update  
24 a plan to efficiently integrate into the Sys-  
25 tem new, innovative, or emerging tech-

1 nologies that have been demonstrated to be  
2 useful to the System and which will fulfill  
3 the purposes of this chapter and the Sys-  
4 tem Plan; and

5 “(xiii) work with users and Regional  
6 Associations to develop products to enable  
7 real-time data sharing for decision makers,  
8 including with respect to weather fore-  
9 casting and modeling, search and rescue  
10 operations, corrosive seawater forecasts,  
11 water quality monitoring and communica-  
12 tion, and harmful algal bloom forecasting.

13 “(4) REGIONAL COASTAL OBSERVING SYS-  
14 TEMS.—

15 “(A) IN GENERAL.—A Regional Coastal  
16 Observing System operated by a Regional Asso-  
17 ciation described in the System Plan may not  
18 be certified or established under this subtitle  
19 unless it—

20 “(i) has been or shall be certified or  
21 established by contract or agreement by  
22 the Administrator;

23 “(ii) meets—



1                   “(I) the certification standards  
2                   and compliance procedure guidelines  
3                   issued by the Administrator; and

4                   “(II) the information needs of  
5                   user groups in the region while adher-  
6                   ing to national standards;

7                   “(iii) demonstrates an organizational  
8                   structure, that under funding limitations is  
9                   capable of—

10                   “(I) gathering required System  
11                   observation data;

12                   “(II) supporting and integrating  
13                   all aspects of coastal and ocean ob-  
14                   serving and information programs  
15                   within a region; and

16                   “(III) reflecting the needs of  
17                   State, local, and tribal governments,  
18                   commercial interests, and other users  
19                   and beneficiaries of the System and  
20                   other requirements specified under  
21                   this subtitle and the System Plan;

22                   “(iv) identifies—

23                   “(I) gaps in observation coverage  
24                   needs for capital improvements of

1 Federal assets and non-Federal assets  
2 of the System; and

3 “(II) other recommendations to  
4 assist in the development of the an-  
5 nual and long-term plans prepared  
6 pursuant to paragraph (2)(B)(i) and  
7 transmits such information to the  
8 Interagency Ocean Observation Com-  
9 mittee via the Program Office estab-  
10 lished under paragraph (3)(C)(i);

11 “(v) develops and operates under a  
12 strategic operational plan that will ensure  
13 the efficient and effective administration of  
14 programs and assets to support daily data  
15 observations for integration into the Sys-  
16 tem, pursuant to the standards approved  
17 by the Council;

18 “(vi) works cooperatively with govern-  
19 mental and nongovernmental entities at all  
20 levels to identify and provide information  
21 products of the System for multiple users  
22 within the service area of the regional  
23 coastal observing system; and

24 “(vii) complies with all financial over-  
25 sight requirements established by the Ad-

1 administrator, including requirements relat-  
2 ing to audits.

3 “(B) PARTICIPATION.—For the purposes  
4 of this title, employees of Federal agencies are  
5 permitted to be members of the governing body  
6 for the Regional Coastal Observing Systems  
7 and may participate in the functions of the re-  
8 gional information coordination entities.”.

9 (c) SYSTEM ADVISORY COMMITTEE.—Section  
10 12304(d) of the Integrated Coastal and Ocean Observa-  
11 tion System Act of 2009 (33 U.S.C. 3603(d)) is amend-  
12 ed—

13 (1) in paragraph (1), by striking “or the Inter-  
14 agency Ocean Observing Observation Committee.”  
15 and inserting “the Council under this subtitle”; and

16 (2) in paragraph (2)—

17 (A) in subparagraph (A), by inserting  
18 “data sharing,” after “data management”;

19 (B) in subparagraph (C), by striking  
20 “and” at the end; and

21 (C) by striking subparagraph (D) and in-  
22 serting the following:

23 “(D) additional priorities, including—

24 “(i) a national surface current map-  
25 ping network designed to improve fine

1 scale sea surface mapping using high fre-  
2 quency radar technology and other emerg-  
3 ing technologies to address national prior-  
4 ities, including Coast Guard search and  
5 rescue operation planning and harmful  
6 algal bloom forecasting and detection  
7 that—

8 “(I) is comprised of existing high  
9 frequency radar and other sea surface  
10 current mapping infrastructure oper-  
11 ated by regional associations;

12 “(II) incorporates new high fre-  
13 quency radar assets or other fine scale  
14 sea surface mapping technology as-  
15 sets, and other assets needed to fill  
16 gaps in coverage on United States  
17 coastlines; and

18 “(III) follows a deployment plan  
19 that prioritizes closing gaps in high  
20 frequency radar infrastructure in the  
21 United States, starting with areas  
22 demonstrating significant sea surface  
23 current data needs, especially in areas  
24 where additional data will improve

1 Coast Guard search and rescue mod-  
2 els;

3 “(ii) fleet acquisition for autonomous  
4 underwater and surface vehicles for deploy-  
5 ment and data integration to fulfill the  
6 purposes of the Act;

7 “(iii) an integrative survey program  
8 for application of manned and unmanned  
9 vehicles to the real-time or near real-time  
10 collection and transmission of seafloor,  
11 water column, and sea surface data on bi-  
12 ology, chemistry, geology, physics, and hy-  
13 drography;

14 “(iv) remote sensing and data assimi-  
15 lation to develop new analytical methodolo-  
16 gies to assimilate data from the Integrated  
17 Ocean Observing System into hydro-  
18 dynamic models;

19 “(v) integrated, multistate monitoring  
20 to assess sources, movement and fate of  
21 sediments in coastal regions;

22 “(vi) a multiregion marine sound  
23 monitoring system to be—

24 “(I) planned in consultation with  
25 the International Ocean Observing

1 Committee, the National Oceanic and  
2 Atmospheric Administration, the De-  
3 partment of the Navy, and academic  
4 research institutions; and

5 “(II) developed, installed, and op-  
6 erated in coordination with the Na-  
7 tional Oceanic and Atmospheric Ad-  
8 ministration, the Department of the  
9 Navy, and academic research institu-  
10 tions; and

11 “(E) any other purpose identified by the  
12 Administrator or the Council.”;

13 (D) in paragraph (3)(B), by inserting  
14 “The Administrator has the ability to stagger  
15 the terms of the System advisory committee  
16 members.” before “Members”; and

17 (E) in paragraph (4)—

18 (i) in subparagraph (A), by striking  
19 “and the Interagency Ocean Observing  
20 Committee”; and

21 (ii) in subparagraph (C), by striking  
22 “Observing” and inserting “Observation”.

23 (d) CIVIL LIABILITY.—Section 12304(e) of the Inte-  
24 grated Coastal and Ocean Observation System Act of  
25 2009 (33 U.S.C. 3603(e)) is amended—

1           (1) by striking “information coordination enti-  
2           ty” and inserting “coastal observation system”; and

3           (2) by striking “non-Federal asset or regional  
4           information coordination entity” and inserting “Re-  
5           gional Coastal Observing System,”.

6 **SEC. 5. INTERAGENCY FINANCING AND AGREEMENTS.**

7           Section 12305(a) of the Integrated Coastal and  
8           Ocean Observation System Act of 2009 (33 U.S.C.  
9           3604(a)) is amended to read as follows:

10          “(a) IN GENERAL.—To carry out interagency activi-  
11          ties under this subtitle, the Secretary of Commerce may  
12          execute an agreement, on a reimbursable or nonreimburs-  
13          able basis, with any State or subdivision thereof, any Fed-  
14          eral agency, or any public or private organization, or indi-  
15          vidual to carry out interagency activities under this sub-  
16          title.”.

17 **SEC. 6. REPORTS TO CONGRESS.**

18          Section 12307 of the Integrated Coastal and Ocean  
19          Observation System Act of 2009 (33 U.S.C. 3606) is  
20          amended to read as follows:

21 **“SEC. 12307. REPORT TO CONGRESS.**

22          “(a) REQUIREMENT.—Not later than 2 years after  
23          March 30, 2009, and every 3 years thereafter, the Admin-  
24          istrator shall prepare and the President acting through the

1 Council shall approve and transmit to the Congress a re-  
2 port on progress made in implementing this subtitle.

3 “(b) CONTENTS.—Each report required by sub-  
4 section (a) shall include—

5 “(1) a description of activities carried out under  
6 this subtitle and the System Plan;

7 “(2) an evaluation of the effectiveness of the  
8 System, including an evaluation of progress made by  
9 the Council to achieve the goals identified under the  
10 System Plan;

11 “(3) identification of Federal and non-Federal  
12 assets as determined by the Council that have been  
13 integrated into the System, including assets essential  
14 to the gathering of required observation data vari-  
15 ables necessary to meet the respective missions of  
16 Council agencies;

17 “(4) a review of procurements, planned or initi-  
18 ated, by each Council agency to enhance, expand, or  
19 modernize the observation capabilities and data  
20 products provided by the System, including data  
21 management and communication subsystems;

22 “(5) a summary of the existing gaps in observa-  
23 tion infrastructure and monitoring data collection,  
24 including—



1           “(A) priorities considered by the System  
2 advisory committee;

3           “(B) the national sea surface current map-  
4 ping network;

5           “(C) coastal buoys, and;

6           “(D) ocean chemistry monitoring;

7           “(6) an assessment regarding activities to inte-  
8 grate Federal and non-Federal assets, nationally and  
9 on the regional level, and discussion of the perform-  
10 ance and effectiveness of regional information co-  
11 ordination entities to coordinate regional observation  
12 operations;

13           “(7) a description of benefits of the program to  
14 users of data products resulting from the System  
15 (including the general public, industries, scientists,  
16 resource managers, emergency responders, policy  
17 makers, and educators);

18           “(8) recommendations concerning—

19           “(A) modifications to the System; and

20           “(B) funding levels for the System in sub-  
21 sequent fiscal years; and

22           “(9) the results of a periodic external inde-  
23 pendent programmatic audit of the System.”.

1 **SEC. 7. PUBLIC-PRIVATE USE POLICY.**

2 Section 12308 of the Integrated Coastal and Ocean  
3 Observation System Act of 2009 (33 U.S.C. 3607) is  
4 amended to read as follows:

5 **“SEC. 12308. PUBLIC-PRIVATE USE POLICY.**

6 “The Council shall maintain a policy that defines  
7 processes for making decisions about the roles of the Fed-  
8 eral Government, the States, regional information coordi-  
9 nation entities, the academic community, and the private  
10 sector in providing to end-user communities environmental  
11 information, products, technologies, and services related to  
12 the System. The Administrator shall ensure that National  
13 Oceanic and Atmospheric Administration adheres to the  
14 decision making process developed by the Council regard-  
15 ing the roles of the Federal Government, the States, the  
16 Regional Coastal Observing Systems, the academic com-  
17 munities, and the private sector in providing the end-user  
18 communities environmental information, data products,  
19 technologies, and services related to the System.”.

20 **SEC. 8. REPEAL OF INDEPENDENT COST ESTIMATE.**

21 (a) IN GENERAL.—The Integrated Coastal and  
22 Ocean Observation System Act of 2009 is amended by  
23 striking section 12309 (33 U.S.C. 3608).

24 (b) TABLE OF CONTENTS AMENDMENT.—The table  
25 of contents in section 1(b) of the Omnibus Public Land  
26 Management Act of 2009 (Public Law 111–11; 123 Stat.

1 991) is amended by striking the item related to section  
2 12309.

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

4 Section 12311 of the Integrated Coastal and Ocean  
5 Observation System Act of 2009 (33 U.S.C. 3610) is  
6 amended by striking “2013” and inserting “2019”.

7 **SEC. 10. REPORTS AND RESEARCH PLANS.**

8 Section 12404(c) of the Federal Ocean Acidification  
9 Research And Monitoring Act of 2009 (33 U.S.C.  
10 3703(c)) is amended by adding at the end the following:

11 “(4) ECONOMIC VULNERABILITY REPORT.—

12 “(A) IN GENERAL.—Not later than 2 years  
13 after the date of the enactment of the Coordi-  
14 nated Ocean Monitoring and Research Act, and  
15 every 5 years thereafter, the Subcommittee  
16 shall transmit to appropriate committees of  
17 Congress a report that—

18 “(i) is named ‘The Ocean Chemistry  
19 Coastal Community Vulnerability Assess-  
20 ment’;

21 “(ii) identifies gaps in ocean acidifica-  
22 tion monitoring by public, academic, and  
23 private assets in the network of regional  
24 coastal observing systems;

1                   “(iii) identifies geographic areas which  
2                   have gaps in ocean acidification research;

3                   “(iv) identifies United States coastal  
4                   communities, including fishing commu-  
5                   nities, low-population rural communities,  
6                   tribal and subsistence communities, and is-  
7                   land communities, that may be impacted  
8                   by ocean acidification;

9                   “(v) identifies impacts of changing  
10                  ocean carbonate chemistry on the commu-  
11                  nities described in clause (iv), including  
12                  impacts from changes in ocean and coastal  
13                  marine resources that are not managed by  
14                  the Federal Government;

15                  “(vi) identifies gaps in understanding  
16                  of the impacts of ocean acidification on  
17                  economically or commercially important  
18                  species, particularly those which support  
19                  United States commercial, recreational,  
20                  and tribal fisheries and aquaculture;

21                  “(vii) identifies habitats that may be  
22                  particularly vulnerable to corrosive sea  
23                  water, including areas experiencing mul-  
24                  tiple stressors such as hypoxia, sedimenta-  
25                  tion, and harmful algal blooms;

1                   “(viii) identifies areas in which exist-  
2                   ing Integrated Ocean Observing System  
3                   assets, including buoys and gliders, may be  
4                   leveraged as platforms for the deployment  
5                   of new sensors or other applicable observ-  
6                   ing technologies; and

7                   “(ix) is written in collaboration with  
8                   the agencies responsible for carrying out  
9                   this Act.

10                  “(B) FORM OF REPORT.—

11                   “(i) INITIAL REPORT.—The initial re-  
12                   port required by subparagraph (A) shall  
13                   include the information described in  
14                   clauses (i) through (ix) on a national level.

15                   “(ii) SUBSEQUENT REPORTS.—Each  
16                   report required by subparagraph (A) after  
17                   the initial report—

18                   “(I) may describe the informa-  
19                   tion described in clauses (i) through  
20                   (ix) on a national level; or

21                   “(II) may consist of separate re-  
22                   ports for each region of the National  
23                   Oceanic and Atmospheric Administra-  
24                   tion.

1                   “(iii) REGIONAL REPORTS.—If the  
2                   Subcommittee opts to prepare a report re-  
3                   quired by subparagraph (A) as separate re-  
4                   gional reports under clause (ii)(II), the  
5                   Subcommittee shall submit a report for  
6                   each region of the National Oceanic and  
7                   Atmospheric Administration not less often  
8                   than once during each 5-year reporting pe-  
9                   riod.

10                   “(C) APPROPRIATE COMMITTEES OF CON-  
11                   GRESS DEFINED.—In this paragraph and in  
12                   paragraph (5), the term ‘appropriate commit-  
13                   tees of Congress’ means the Committee on  
14                   Commerce, Science, and Transportation of the  
15                   Senate and the Committee on Science, Space,  
16                   and Technology and the Committee on Natural  
17                   Resources of the House of Representatives.

18                   “(5) MONITORING PRIORITIZATION PLAN.—Not  
19                   later than 180 days after the date of the submission  
20                   of the initial report required by paragraph (4)(A),  
21                   the Subcommittee shall transmit to the appropriate  
22                   committees of Congress a report that develops a  
23                   plan to deploy new sensors or other applicable ob-  
24                   serving technologies—

25                   “(A) based on such initial report;

1                   “(B) prioritized by—  
2                    “(i) the threat to coastal economies  
3                   and ecosystems;  
4                    “(ii) gaps in data; and  
5                    “(iii) research needs; and  
6                   “(C) that leverage existing platforms,  
7                   where possible.”.

8 **SEC. 11. STRATEGIC RESEARCH PLAN.**

9           (a) CONTENTS.—Section 12405(b) of the Federal  
10 Ocean Acidification Research And Monitoring Act of 2009  
11 (33 U.S.C. 3704(b)) is amended—

12           (1) in paragraph (8), by striking “and” at the  
13 end;

14           (2) in paragraph (9), by striking the period at  
15 the end and inserting a semicolon and “and”; and

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

17           “(10) make recommendations for research to be  
18 conducted, including in the social sciences and eco-  
19 nomics, to address the key knowledge gaps identified  
20 in the economic vulnerability report conducted under  
21 section 12404(e).”.

22           (b) PROGRAM ELEMENTS.—Section 12405(c) of the  
23 Federal Ocean Acidification Research And Monitoring Act  
24 of 2009 (33 U.S.C. 3704(c)) is amended by adding at the  
25 end the following:

1           “(6) Research to understand combined effects  
2 of changes in ocean chemistry, sediment delivery, hy-  
3 poxia, and harmful algal blooms and the impact  
4 these processes have on each other, and how these  
5 multiple stressors impact living marine resources  
6 and coastal ecosystems.

7           “(7) Applied research to identify adaptation  
8 strategies for species impacted by changes in ocean  
9 chemistry including vegetation-based systems, shell  
10 recycling, species and genetic diversity, applied tech-  
11 nologies, aquaculture methodologies, and manage-  
12 ment recommendations.”.

13 **SEC. 12. STAKEHOLDER INPUT ON MONITORING.**

14           Section 12406(a) of the Federal Ocean Acidification  
15 Research And Monitoring Act of 2009 (33 U.S.C.  
16 3705(a)) is amended—

17           (1) in paragraph (2), by striking “and” at the  
18 end;

19           (2) in paragraph (3), by striking the period at  
20 the end and inserting a semicolon and “and”; and

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

22           “(4) includes an ongoing mechanism that allows  
23 potentially affected industry members, coastal stake-  
24 holders, fishery management councils and commis-  
25 sions, non-Federal resource managers, and scientific



1 experts to provide input on monitoring needs that  
2 are necessary to support on the ground manage-  
3 ment, decision making, and adaptation related to  
4 ocean acidification.”.

5 **SEC. 13. RESEARCH ACTIVITIES.**

6 Section 12407(a) of the Federal Ocean Acidification  
7 Research And Monitoring Act of 2009 (33 U.S.C.  
8 3706(a)) is amended to read as follows:

9 “(a) RESEARCH ACTIVITIES.—The Director of the  
10 National Science Foundation shall continue to carry out  
11 research activities on ocean acidification which shall sup-  
12 port competitive, merit-based, peer-reviewed proposals for  
13 research, observatories and monitoring of ocean acidifica-  
14 tion and its impacts, including—

15 “(1) impacts on marine organisms and marine  
16 ecosystems;

17 “(2) impacts on ocean, coastal, and estuarine  
18 biogeochemistry;

19 “(3) the development of methodologies and  
20 technologies to evaluate ocean acidification and its  
21 impacts, and;

22 “(4) impacts of multiple stressors on eco-  
23 systems exhibiting hypoxia, harmful algal blooms, or  
24 sediment delivery, combined with changes in ocean  
25 chemistry.”.