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115TH CONGRESS }
1st Session }

SENATE

{ REPORT
115-186

COORDINATED OCEAN MONITORING AND
RESEARCH ACT

R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION

ON

S. 1425



November 27, 2017.—Ordered to be printed

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

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COORDINATED OCEAN MONITORING AND RESEARCH ACT

NOVEMBER 27, 2017.—Ordered to be printed

Mr. THUNE, from the Committee on Commerce, Science, and
Transportation, submitted the following

R E P O R T

[To accompany S. 1425]

[Including cost estimate of the Congressional Budget Office]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 1425) to reauthorize the Integrated Coastal and Ocean Observation System Act of 2009, and for other purposes, having considered the same, reports favorably thereon with an amendment (in the nature of a substitute) and recommends that the bill (as amended) do pass.

PURPOSE OF THE BILL

The purpose of S. 1425 is to reauthorize the Integrated Coastal and Ocean Observation System (ICOOS) Act of 2009 (Act of 2009). It also would encourage the national Integrated Ocean Observing System (IOOS) to increase modeling capabilities and product development, ensure data are easily used and understood to address societal needs in real time, and continue to increase interagency and private sector partnerships.

BACKGROUND AND NEEDS

The Act of 2009 consolidated and coordinated the efforts of hundreds of Federal, State, and local ocean observing programs.¹ Prior to the implementation of the Act of 2009, these programs collected, distributed, and archived the same types of ocean data (e.g., temperature and salinity) but with different formats and standards, which wasted time and resources. IOOS is a coordinated network

¹ 33 U.S.C. §3601 et seq.

of people and technology that generates and disseminates continuous data, information, models, products, and services on coastal waters, the Great Lakes, and oceans in the U.S. Exclusive Economic Zone. The data consist of standardized and accessible information on key environmental variables such as temperature, salinity, sea level, surface currents, ocean color, pH, wind speed, wave height, dissolved oxygen, and nutrient, pathogen, and contaminant concentrations. The National Oceanic and Atmospheric Administration (NOAA) and other agencies need real-time as well as long-term oceanographic databases to effectively monitor changes in the ocean, such as El Niño events, hypoxia, and harmful algal blooms.

Data from IOOS provide the Nation with better predictions of hazardous events and help improve forecasting. IOOS data standards and protocols also allow information to be easily integrated into weather models, increasing accuracy.

Each of the 11 regions of IOOS are, or are working to become, certified by the Federal Government as regional information coordination entities, which means their data are held to the highest standards that NOAA requires for decision making.² IOOS is on track for full implementation by 2018.

In addition to working as a cohesive unit nationally, each of the 11 regions tailors its work to address local needs. Among other missions, IOOS uses floats, gliders, and buoys deployed under IOOS to improve hurricane track, intensity, and impact forecasts in the Atlantic. IOOS data also are used to enhance the safety and efficiency of marine operations, including routing ships more cost-effectively through U.S. waterways.

Furthermore, the Coast Guard uses high frequency radar data from IOOS to determine surface current speed and direction in near real time, improving the probability of saving lives and reducing search costs.³ IOOS data also are used to predict public health risks by monitoring water quality and harmful algal blooms, and are incorporated into ocean, marine, and coastal ecosystems research.⁴

Table 1. Recent Budget Requests and Appropriations for IOOS in millions of dollars.⁵

	Requested	Appropriated
FY 2011	\$28.6	\$28.6
FY 2012	\$29.4	\$29.4
FY 2013	\$35.1	\$35.1
FY2014	\$35.1	\$35.1
FY 2015	\$36.2	\$36.2
FY 2016	\$36.2	\$36.2

² Integrated Ocean Observing System (IOOS), “Certification: Extending the Reach of Regional Data,” at <https://ioos.noaa.gov/about/governance-and-management/certification-extending-reach-regional-data/>.

³ IOOS, “HF Radar,” accessed July 19, 2017, at <https://ioos.noaa.gov/project/hf-radar>.

⁴ IOOS, “IOOS in Action,” accessed July 19, 2017, at <https://ioos.noaa.gov/ioos-in-action>.

⁵ Appropriations for the ICOOS program were authorized for FY 2009 through FY 2013 for “sums as are necessary to fulfill the purposes of this subtitle and support activities identified in the annual coordinated System budget developed by the Interagency Ocean Observation Committee and submitted to the Congress.”

	Requested	Appropriated
FY 2017	\$36.3	\$37.4
FY 2018	\$36.2	House bill: \$37.5 Senate bill \$40.2

SUMMARY OF PROVISIONS

The Coordinated Ocean Monitoring and Research Act would reauthorize the Act of 2009 through fiscal year (FY) 2019. The bill also would do the following:

- Reauthorize the International Coastal Ocean Observation System through fiscal year 2019.
- Add requirements for public data access.
- Require the advisory committee to consider certain planning priorities.
- Require reporting to Congress on existing gaps in observation infrastructure, an economic vulnerability report, a monitoring prioritization plan, and a strategic research plan.
- Require a mechanism for stakeholder input on monitoring.

LEGISLATIVE HISTORY

S. 1425 was introduced by Senator Wicker on June 22, 2017, and is cosponsored by Senators Cantwell, Cassidy, Collins, Graham, Hassan, Markey, Murkowski, Peters, Schatz, and Sullivan. On August 2, 2017, the Committee met in open Executive Session and, by voice vote, ordered S. 1425 reported favorably with an amendment (in the nature of a substitute). A substitute amendment from Senator Wicker made the reported bill identical to the version that was reported out of the Committee in the 114th Congress. An amendment from Senator Booker added ocean chemistry and marine sound monitoring to a list of existing gaps in data collection to be included in a report to Congress.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

S. 1425—Coordinated Ocean Monitoring and Research Act

Summary: S. 1425 would reauthorize and amend the Integrated Coastal and Ocean Observation System Act. The bill also would modify existing reporting and planning requirements under the Federal Ocean Acidification Research and Monitoring Act. Based on information provided by the National Oceanic and Atmospheric Administration (NOAA), CBO estimates that implementing S. 1425 would cost \$71 million over the 2018–2022 period, assuming appropriation of the necessary amounts.

Enacting S. 1425 would not affect direct spending or revenues; therefore, pay-as-you-go procedures do not apply. CBO estimates that enacting the bill would not increase net direct spending or on-budget deficits in any of the four consecutive 10-year periods beginning in 2028.

S. 1425 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

Estimated cost to the Federal Government: The estimated budgetary effect of S. 1425 is shown in the following table. The costs of this legislation fall within budget function 300 (natural resources and environment).

	By fiscal year, in millions of dollars—						
	2017	2018	2019	2020	2021	2022	2017–2022
Ocean Monitoring:							
Estimated Authorization Level	0	35	35	0	0	0	70
Estimated Outlays	0	23	30	11	5	1	70
Reporting and Planning:							
Estimated Authorization Level	0	*	*	*	*	*	1
Estimated Outlays	0	*	*	*	*	*	1
Total Increases:							
Authorization Level	0	35	35	*	*	*	71
Estimated	0	23	30	11	5	1	71

Note: * = between zero and \$500,000, components may not sum to totals because of rounding.

Basis of estimate: For this estimate, CBO assumes that S. 1425 will be enacted near the end of fiscal year 2017, that the necessary amounts will be appropriated for each fiscal year, and that spending will follow historical patterns for similar programs.

Ocean monitoring

S. 1425 would authorize the appropriation of such sums as may be necessary for 2018 and 2019 to carry out activities under the Integrated Coastal and Ocean Observation System Act. That act requires the federal government to monitor ocean characteristics and perform other activities, including weather forecasting, making water quality assessments, and monitoring shipping operations. Over the 2013–2017 period, the agency received an average appropriation of \$35 million a year to carry out those activities. On the basis of that historical information, CBO estimates that carrying out similar activities in the future would cost \$70 million over the 2018–2022 period, assuming appropriation of the necessary amounts.

Reporting and planning

The bill also would require an interagency body to complete a report identifying potential dangers to coastal communities from changes in the acidification (decline in the pH value) of sea water and to develop a strategic plan to research and monitor ocean acidification.

Based on information provided by NOAA, CBO estimates that carrying out those activities would cost roughly \$1 million over the 2018–2022 period, assuming the availability of appropriated funds.

Pay-As-You-Go considerations: None.

Increase in long-term direct spending and deficits: CBO estimates that enacting S. 1425 would not increase net direct spending or on-budget deficits in any of the four consecutive 10-year periods beginning in 2028.

Intergovernmental and private-sector impact: S. 1425 contains no intergovernmental or private-sector mandates as defined in UMRA

and would benefit state and local agencies, as well as other public entities, by authorizing funds for ocean observation and research activities. Any costs incurred by those entities, including cost-sharing contributions, would result from participation in a voluntary federal program.

Estimate prepared by: Federal costs: Robert Reese; Impact on state, local, and tribal governments: Jon Sperl; Impact on the private sector: Amy Petz.

Estimate approved by: Theresa Gullo, Assistant Director for Budget Analysis.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported:

NUMBER OF PERSONS COVERED

S. 1425, as reported, would not create any new programs or impose any new regulatory requirements and, therefore, would not subject any individuals or businesses to new regulations.

ECONOMIC IMPACT

S. 1425, as reported, is not expected to have a negative impact on the Nation's economy.

PRIVACY

The reported bill would have no impact on the personal privacy of individuals.

PAPERWORK

S. 1425, as reported, would not increase paperwork requirements for either the private or public sectors.

CONGRESSIONALLY DIRECTED SPENDING

In compliance with paragraph 4(b) of rule XLIV of the Standing Rules of the Senate, the Committee provides that no provisions contained in the bill, as reported, meet the definition of congressionally directed spending items under the rule.

SECTION-BY-SECTION ANALYSIS

Section 1. Short title.

This section would provide that the Act may be cited as the "Coordinated Ocean Monitoring and Research Act."

Section 2. Purposes.

This section would add modeling capabilities and product development to IOOS and require easy access to data while promoting data sharing between Federal and non-Federal sources and with the public. It also would include advanced observing technologies needed to address critical data gaps to the list of authorized activities, add a requirement to monitor and model ocean chemistry, and make technical fixes to the names of observing system components.

Section 3. Definitions.

This section would define the term “Federal assets” as being managed through the Regional Coastal Observing Systems (RCOS), NOAA, or the Interagency Ocean Observation Committee (IOOC). It also would add tribal interests to the list of coordinating interests and make technical fixes.

Section 4. Integrated Coastal and Ocean Observation System.

This section would require IOOS to include a product development system to transform observations to readily used and understood products and make data available for research and for use in product development to meet societal needs. It would include an advanced observing technology development program, models to improve regional weather forecasting capabilities and products, and reviews of data collection procedures to meet national needs within the research development program. It would require IOOC to submit annual and long term plans to the National Ocean Research Leadership Council (Council) at the same time as the President’s budget. The section also would add a requirement that this report define protocols for collection, configuration standards, and formats for new and existing assets within the IOOS network.

Additionally, this section would add contract requirements for RCOS to be established and require the periodic review of the system plan and submission of recommendations for improvements. A requirement to operate the IOOS program office within NOAA and to maintain the established competitive funding process and administrative procedures would be added. It would require periodic updates of the plan to integrate new technology into the system and require NOAA to work with users and RCOS to develop products for real time data sharing for weather forecasting, search and rescue, corrosive sea water, water quality, and harmful algal bloom forecasting.

The section would allow employees of Federal agencies to be members of the RCOS governing body and would require the advisory committee to consider priorities in planning, including national surface current mapping, underwater vehicle fleet acquisition, integrative mapping for manned and unmanned vehicles, remote sensing and data assimilation, coastal sediment monitoring, and marine sound monitoring. It also would allow the Secretary of Commerce (Secretary) to stagger the terms of system advisory committee members and make technical fixes to the names of observing system components.

Section 5. Financing and agreements.

This section would allow the Secretary to execute agreements on a reimbursable or non-reimbursable basis.

Section 6. Reports to Congress.

This section would add a summary of existing gaps in observation infrastructure to an existing report to Congress, including national sea surface current mapping networks, coastal buoys, ocean chemistry monitoring, and marine sound monitoring.

Section 7. Public-private use policy.

This section would require the Council to maintain a policy defining the decision-making process for involved parties. It also would require the Administrator of NOAA to ensure that NOAA adheres to the decision-making process.

Section 8. Repeal of independent cost estimate.

This section would repeal outdated language that requires the IOOC and the National Science Foundation (NSF) to obtain an independent cost estimate for operations and maintenance of existing Federal assets within 1 year of the Act of 2009. The independent cost estimate has been completed and submitted to Congress.

Section 9. Authorization of appropriations.

This section would authorize appropriations through FY 2019 at such sums as are necessary.

Section 10. Reports and research plans.

This section would require the Joint Subcommittee on Ocean Science and Technology (JSOST) of the National Science and Technology Council to submit an economic vulnerability report and a monitoring prioritization plan to Congress.

Section 11. Strategic research plan.

This section would require the strategic research plan to make recommendations for research to address key knowledge gaps identified in the economic vulnerability report.

Section 12. Stakeholder input on monitoring.

This section would add a requirement for the JSOST to include an ongoing mechanism to allow industry, stakeholders, fishery management councils and commissions, non-Federal resource managers, and scientific experts to provide input on monitoring needs.

Section 13. Research activities.

This section would include the impacts of multiple stressors among the list of research activities for which the Director of the NSF shall continue to support competitive research proposals.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, 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 material is printed in italic, existing law in which no change is proposed is shown in roman):

INTEGRATED COASTAL AND OCEAN OBSERVATION SYSTEM
ACT OF 2009

[33 U.S.C. 3601 et seq.]

[SEC. 12302. PURPOSES.

[33 U.S.C. 3601]

[The purposes of this subtitle are to—

【(1) establish a national integrated System of ocean, coastal, and Great Lakes observing systems, comprised of Federal and non-Federal components coordinated at the national level by the National Ocean Research Leadership Council and at the regional level by a network of regional information coordination entities, and that includes in situ, remote, and other coastal and ocean observation, technologies, and data management and communication systems, and is designed to address regional and national needs for ocean information, to gather specific data on key coastal, ocean, and Great Lakes variables, and to ensure timely and sustained dissemination and availability of these data to—

【(A) support national defense, marine commerce, navigation safety, weather, climate, and marine forecasting, energy siting and production, economic development, ecosystem-based marine, coastal, and Great Lakes resource management, public safety, and public outreach training and education;

【(B) promote greater public awareness and stewardship of the Nation’s ocean, coastal, and Great Lakes resources and the general public welfare; and

【(C) enable advances in scientific understanding to support the sustainable use, conservation, management, and understanding of healthy ocean, coastal, and Great Lakes resources;

【(2) improve the Nation’s capability to measure, track, explain, and predict events related directly and indirectly to weather and climate change, natural climate variability, and interactions between the oceanic and atmospheric environments, including the Great Lakes; and

【(3) authorize activities to promote basic and applied research to develop, test, and deploy innovations and improvements in coastal and ocean observation technologies, modeling systems, and other scientific and technological capabilities to improve our conceptual understanding of weather and climate, ocean-atmosphere dynamics, global climate change, physical, chemical, and biological dynamics of the ocean, coastal and Great Lakes environments, and to conserve healthy and restore degraded coastal ecosystems.】

SEC. 12302. PURPOSES.

The purposes of this subtitle are—

(1) to establish and sustain a national integrated System of ocean, coastal, and Great Lakes observing systems, comprised of Federal and non-Federal components coordinated at the national level by the Council and at the regional level by a network of regional coastal observing systems, and that includes in situ, remote, and other coastal and ocean observation and modeling capabilities, technologies, data management systems, communication systems, and product development systems, and is designed to address regional and national needs for ocean and coastal information, to gather specific data on key coastal, ocean, and Great Lakes variables, and to ensure timely and sustained dissemination and availability of these data—

(A) to the public;

(B) to support national defense, search and rescue operations, marine commerce, navigation safety, weather, climate, and marine forecasting, energy siting and production, economic development, ecosystem-based marine, coastal, and Great Lakes resource management, public safety, and public outreach and education;

(C) to promote greater public awareness and stewardship of the Nation's ocean, coastal, and Great Lakes resources and the general public welfare;

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

(E) to enable advances in scientific understanding to support the sustainable use, conservation, management, and understanding of healthy ocean, coastal, and Great Lakes resources; and

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

(2) to improve the Nation's capability to measure, track, observe, understand, and predict events related directly and indirectly to weather and climate change, natural climate variability, and interactions between the oceanic and atmospheric environments, including the Great Lakes; and

(3) to authorize activities—

(A) to promote basic and applied research to develop, test, and deploy innovations and improvements in coastal and ocean observation technologies, including advanced observing technologies needed to address critical data gaps, modeling systems, other scientific and technological capabilities to improve the understanding of weather and climate, ocean-atmosphere dynamics, global climate change, and the physical, chemical, and biological dynamics of the ocean, coastal and Great Lakes environments; and

(B) to conserve healthy and restore degraded coastal ecosystems.

SEC. 12303. DEFINITIONS.

[33 U.S.C. 3602]

In this subtitle:

(1) **ADMINISTRATOR.**—The term “Administrator” means the Under Secretary of Commerce for Oceans and Atmosphere in the Under Secretary’s capacity as Administrator of the National Oceanic and Atmospheric Administration.

(2) **COUNCIL.**—The term “Council” means the National Ocean Research Leadership Council established by section 7902 of title 10, United States Code.

(3) **FEDERAL ASSETS.**—The term “Federal assets” means all relevant non-classified civilian coastal and ocean observations, technologies, and related modeling, research, data management, basic and applied technology research and development, and public education and outreach programs, that are managed by member agencies of the Council.

(4) **INTERAGENCY OCEAN OBSERVATION COMMITTEE.**—The term “Interagency Ocean Observation Committee” means the committee established under section 12304(c)(2).

(5) **NON-FEDERAL ASSETS.**—The term “non-Federal assets” means all relevant coastal and ocean observation technologies,

related basic and applied technology research and development, and public education and outreach programs that are [integrated into the System and are managed through States, regional organizations, universities, nongovernmental organizations, or the private sector] *managed through States, regional organizations, universities, nongovernmental organizations, or the private sector and integrated into the system by the regional coastal ocean observing system, the National Oceanic and Atmospheric Administration, or the agencies on the Inter-agency Ocean Observation Committee.*

[(6) REGIONAL INFORMATION COORDINATION ENTITIES.—

[(A) IN GENERAL.—The term “regional information coordination entity” means an organizational body that is certified or established by contract or memorandum by the lead Federal agency designated in section 12304(c)(3) of this subtitle and coordinates State, Federal, local, and private interests at a regional level with the responsibility of engaging the private and public sectors in designing, operating, and improving regional coastal and ocean observing systems in order to ensure the provision of data and information that meet the needs of user groups from the respective regions.

[(B) CERTAIN INCLUDED ASSOCIATIONS.—The term “regional information coordination entity” includes regional associations described in the System Plan.]

(6) REGIONAL COASTAL OBSERVING SYSTEM.—The term “regional coastal observing system” means an organizational body that is certified or established by contract or memorandum by the lead Federal agency designated in section 12304(c)(3) and coordinates State, Federal, local, tribal, and private interests at a regional level with the responsibility of engaging the private and public sectors in designing, operating, and improving regional coastal and ocean observing systems in order to ensure the provision of data and information that meet the needs of user groups from the respective regions.

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

(8) SYSTEM.—The term “System” means the National Integrated Coastal and Ocean Observation System established under section 12304.

(9) SYSTEM PLAN.—The term “System Plan” means the plan contained in the document entitled “Ocean. US Publication No. 9, The First Integrated Ocean Observing System (IOOS) Development Plan”, as updated by the Council under this subtitle.

SEC. 12304. INTEGRATED COASTAL AND OCEAN OBSERVATION SYSTEM.

[33 U.S.C. 3603]

(a) ESTABLISHMENT.—The President, acting through the Council, shall establish a National Integrated Coastal and Ocean Observation System to fulfill the purposes set forth in section 12302 of this subtitle and the System Plan and to fulfill the Nation’s international obligations to contribute to the Global Earth Observation System of Systems and the Global Ocean Observing System.

(b) SYSTEM ELEMENTS.—

【(1) IN GENERAL.—In order to fulfill the purposes of this subtitle, the System shall be national in scope and consist of—

【(A) Federal assets to fulfill national and international observation missions and priorities;

【(B) non-Federal assets, including a network of regional information coordination entities identified under subsection (c)(4), to fulfill regional observation missions and priorities;

【(C) data management, communication, and modeling systems for the timely integration and dissemination of data and information products from the System;

【(D) a research and development program conducted under the guidance of the Council, consisting of—

【(i) basic and applied research and technology development to improve understanding of coastal and ocean systems and their relationships to human activities and to ensure improvement of operational assets and products, including related infrastructure, observing technologies, and information and data processing and management technologies; and

【(ii) large scale computing resources and research to advance modeling of coastal and ocean processes.】

(1) IN GENERAL.—In order to fulfill the purposes of this subtitle, the System shall be national in scope and consist of—

(A) Federal assets to fulfill national and international observation missions and priorities;

(B) non-Federal assets, including a network of regional coastal observing systems identified under subsection (c)(4), to fulfill regional and national observation missions and priorities;

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

(D) a product development system to transform observations into products in a format that may be readily used and understood; and

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

(i) basic and applied research and technology development—

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

(II) to ensure improvement of operational assets and products, including related infrastructure, observing technologies, and information and data processing and management technologies;

(ii) an advanced observing technology development program to fill gaps in technology;

(iii) large scale computing resources and research to advance modeling of coastal, ocean, and Great Lakes processes;

(iv) models to improve regional weather forecasting capabilities and regional weather forecasting products; and

(v) reviews of data collection procedures across regions and programs to make recommendations for data collection standards across the System to meet national ocean, coastal, and Great Lakes observation, applied research, and weather forecasting needs.

(2) ENHANCING ADMINISTRATION AND MANAGEMENT.—The head of each Federal agency that has administrative jurisdiction over a Federal asset shall support the purposes of this subtitle and may take appropriate actions to enhance internal agency administration and management to better support, integrate, finance, and utilize observation data, products, and services developed under this section to further its own agency mission and responsibilities.

(3) AVAILABILITY OF DATA.—The head of each Federal agency that has administrative jurisdiction over a Federal asset shall make available data that are produced by that asset and that are not otherwise restricted for integration, management, and dissemination by the System *for research and for use in the development of products to address societal needs.*

(4) **NON-FEDERAL** COORDINATION OF NON-FEDERAL ASSETS.—Non-Federal assets shall be coordinated, as appropriate, by the Interagency Ocean Observing Committee **or by**, *the regional coastal observing system, or regional information coordination entities.*

(c) POLICY OVERSIGHT, ADMINISTRATION, AND REGIONAL COORDINATION.—

(1) COUNCIL FUNCTIONS.—The Council shall serve as the policy and coordination oversight body for all aspects of the System. In carrying out its responsibilities under this subtitle, the Council shall—

(A) approve and adopt comprehensive System budgets developed and maintained by the Interagency Ocean Observing Committee to support System operations, including operations of both Federal and non-Federal assets;

(B) ensure coordination of the System with other domestic and international earth observing activities including the Global Ocean Observing System and the Global Earth Observing System of Systems, and provide, as appropriate, support for and representation on United States delegations to international meetings on coastal and ocean observing programs; and

(C) encourage coordinated intramural and extramural research and technology development, and a process to transition developing technology and methods into operations of the System.

[(2) INTERAGENCY OCEAN OBSERVATION COMMITTEE.—The Council shall establish or designate an Interagency Ocean Observing Committee which shall—

[(A) prepare annual and long-term plans for consideration and approval by the Council for the integrated design, operation, maintenance, enhancement and expansion of the System to meet the objectives of this subtitle and the System Plan;

[(B) develop and transmit to Congress at the time of submission of the President's annual budget request an

annual coordinated, comprehensive budget to operate all elements of the System identified in subsection (b), and to ensure continuity of data streams from Federal and non-Federal assets;

[(C) establish required observation data variables to be gathered by both Federal and non-Federal assets and identify, in consultation with regional information coordination entities, priorities for System observations;

[(D) establish protocols and standards for System data processing, management, and communication;

[(E) develop contract certification standards and compliance procedures for all non-Federal assets, including regional information coordination entities, to establish eligibility for integration into the System and to ensure compliance with all applicable standards and protocols established by the Council, and ensure that regional observations are integrated into the System on a sustained basis;

[(F) identify gaps in observation coverage or needs for capital improvements of both Federal assets and non-Federal assets;

[(G) subject to the availability of appropriations, establish through one or more participating Federal agencies, in consultation with the System advisory committee established under subsection (d), a competitive matching grant or other programs—

[(i) to promote intramural and extramural research and development of new, innovative, and emerging observation technologies including testing and field trials; and

[(ii) to facilitate the migration of new, innovative, and emerging scientific and technological advances from research and development to operational deployment;

[(H) periodically review and recommend to the Council, in consultation with the Administrator, revisions to the System Plan;

[(I) ensure collaboration among Federal agencies participating in the activities of the Committee; and

[(J) perform such additional duties as the Council may delegate.

[(3) LEAD FEDERAL AGENCY.—The National Oceanic and Atmospheric Administration shall function as the lead Federal agency for the implementation and administration of the System, in consultation with the Council, the Interagency Ocean Observation Committee, other Federal agencies that maintain portions of the System, and the regional information coordination entities, and shall—

[(A) establish an Integrated Ocean Observing Program Office within the National Oceanic and Atmospheric Administration utilizing to the extent necessary, personnel from member agencies participating on the Interagency Ocean Observation Committee, to oversee daily operations and coordination of the System;

[(B) implement policies, protocols, and standards approved by the Council and delegated by the Interagency Ocean Observing Committee;

[(C) promulgate program guidelines to certify and integrate non-Federal assets, including regional information coordination entities, into the System to provide regional coastal and ocean observation data that meet the needs of user groups from the respective regions;

[(D) have the authority to enter into and oversee contracts, leases, grants or cooperative agreements with non-Federal assets, including regional information coordination entities, to support the purposes of this subtitle on such terms as the Administrator deems appropriate;

[(E) implement a merit-based, competitive funding process to support non-Federal assets, including the development and maintenance of a network of regional information coordination entities, and develop and implement a process for the periodic review and evaluation of all non-Federal assets, including regional information coordination entities;

[(F) provide opportunities for competitive contracts and grants for demonstration projects to design, develop, integrate, deploy, and support components of the System;

[(G) establish efficient and effective administrative procedures for allocation of funds among contractors, grantees, and non-Federal assets, including regional information coordination entities in a timely manner, and contingent on appropriations according to the budget adopted by the Council;

[(H) develop and implement a process for the periodic review and evaluation of regional information coordination entities;

[(I) formulate an annual process by which gaps in observation coverage or needs for capital improvements of Federal assets and non-Federal assets of the System are identified by the regional information coordination entities, the Administrator, or other members of the System and transmitted to the Interagency Ocean Observing Committee;

[(J) develop and be responsible for a data management and communication system, in accordance with standards and protocols established by the Council, by which all data collected by the System regarding ocean and coastal waters of the United States including the Great Lakes, are processed, stored, integrated, and made available to all end-user communities;

[(K) implement a program of public education and outreach to improve public awareness of global climate change and effects on the ocean, coastal, and Great Lakes environment;

[(L) report annually to the Interagency Ocean Observing Committee on the accomplishments, operational needs, and performance of the System to contribute to the annual and long-term plans developed pursuant to subsection (c)(2)(A)(i); and

[(M) develop a plan to efficiently integrate into the System new, innovative, or emerging technologies that have been demonstrated to be useful to the System and which will fulfill the purposes of this subtitle and the System Plan.]

[(4) REGIONAL INFORMATION COORDINATION ENTITIES.—

[(A) IN GENERAL.—To be certified or established under this subtitle, a regional information coordination entity shall be certified or established by contract or agreement by the Administrator, and shall agree to meet the certification standards and compliance procedure guidelines issued by the Administrator and information needs of user groups in the region while adhering to national standards and shall—

[(i) demonstrate an organizational structure capable of gathering required System observation data, supporting and integrating all aspects of coastal and ocean observing and information programs within a region and that reflects the needs of State and local governments, commercial interests, and other users and beneficiaries of the System and other requirements specified under this subtitle and the System Plan;

[(ii) identify gaps in observation coverage needs for capital improvements of Federal assets and non-Federal assets of the System, or other recommendations to assist in the development of the annual and long-term plans created pursuant to subsection (c)(2)(A)(i) and transmit such information to the Interagency Ocean Observing Committee via the Program Office;

[(iii) develop and operate under a strategic operational plan that will ensure the efficient and effective administration of programs and assets to support daily data observations for integration into the System, pursuant to the standards approved by the Council;

[(iv) work cooperatively with governmental and non-governmental entities at all levels to identify and provide information products of the System for multiple users within the service area of the regional information coordination entities; and

[(v) comply with all financial oversight requirements established by the Administrator, including requirements relating to audits.]

[(B) PARTICIPATION.—For the purposes of this subtitle, employees of Federal agencies may participate in the functions of the regional information coordination entities.]

(2) INTERAGENCY OCEAN OBSERVATION COMMITTEE.—

(A) ESTABLISHMENT.—*The Council shall establish or designate a committee, which shall be known as the Interagency Ocean Observation Committee.*

(B) DUTIES.—*The Interagency Ocean Observation Committee shall—*

(i) prepare annual and long-term plans for consideration and approval by the Council for the integrated design, operation, maintenance, enhancement, and ex-

pansion of the System to meet the objectives of this chapter and the System Plan;

(ii) develop and transmit to Congress, along with the budget submitted by the President to Congress pursuant to section 1105(a) of title 31, United States Code, an annual coordinated, comprehensive budget—

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

(II) to ensure continuity of data streams from Federal and non-Federal assets;

(iii) establish requirements for observation data variables to be gathered by both Federal and non-Federal assets and identify, in consultation with regional information coordination entities, priorities for System observations;

(iv) establish and define protocols and standards for System data processing, management, collection, configuration standards, formats, and communication for new and existing assets throughout the Integrated Ocean Observing System network;

(v) develop contract requirements for each regional coastal observing system—

(I) to establish eligibility for integration into the System;

(II) to ensure compliance with all applicable standards and protocols established by the Council; and

(III) to ensure that regional observations are integrated into the System on a sustained basis;

(vi) identify gaps in observation coverage or needs for capital improvements of both Federal assets and non-Federal assets;

(vii) subject to the availability of appropriations, establish through 1 or more participating Federal agencies, in consultation with the System advisory committee established under subsection (d), a competitive matching grant or other programs—

(I) to promote intramural and extramural research and development of new, innovative, and emerging observation technologies including testing and field trials; and

(II) to facilitate the migration of new, innovative, and emerging scientific and technological advances from research and development to operational deployment;

(viii) periodically—

(I) review the System Plan; and

(II) submit to the Council such recommendations as the Interagency Ocean Observation Committee may have for improvements to the System Plan;

(ix) ensure collaboration among Federal agencies participating in the activities of the Interagency Ocean Observation Committee; and

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

(3) *LEAD FEDERAL AGENCY.*—

(A) *IN GENERAL.*—*The National Oceanic and Atmospheric Administration shall function as the lead Federal agency for the implementation and administration of the System.*

(B) *CONSULTATION REQUIRED.*—*In carrying out this paragraph, the Administrator shall consult with the Council, the Interagency Ocean Observation Committee, other Federal agencies that maintain portions of the System, and the regional coastal observing systems.*

(C) *REQUIREMENTS.*—*In carrying out this paragraph, the Administrator shall—*

(i) *establish and operate an Integrated Ocean Observing System Program Office within the National Oceanic and Atmospheric Administration—*

(I) *that utilizes, to the extent necessary, personnel from member agencies participating on the Interagency Ocean Observation Committee; and*

(II) *oversees daily operations and coordination of the System;*

(ii) *implement policies, protocols, and standards approved by the Council and delegated by the Interagency Ocean Observation Committee;*

(iii) *promulgate program guidelines—*

(I) *to certify and integrate regional associations into the System; and*

(II) *to provide regional coastal and ocean observation data that meet the needs of user groups from the respective regions;*

(iv) *have the authority to enter into and oversee contracts, leases, grants, or cooperative agreements with non-Federal assets, including regional information coordination entities, to support the purposes of this chapter on such terms as the Administrator deems appropriate;*

(v) *implement and maintain a merit-based, competitive funding process to support non-Federal assets, including the development and maintenance of a network of regional coastal observing systems, and develop and implement a process for the periodic review and evaluation of the regional associations;*

(vi) *provide opportunities for competitive contracts and grants for demonstration projects to design, develop, integrate, deploy, maintain, and support components of the System;*

(vii) *establish and maintain efficient and effective administrative procedures for the timely allocation of funds among contractors, grantees, and non-Federal assets, including regional associations;*

(viii) *develop and implement a process for the periodic review and evaluation of the regional coastal observing systems;*

(ix) *formulate an annual process by which gaps in observation coverage or needs for capital improvements of Federal assets and non-Federal assets of the System are—*

(I) identified by the regional associations described in the System Plan, the Administrator, or other members of the System; and

(II) submitted to the Interagency Ocean Observation Committee;

(x) develop and be responsible for a data management and communication system, in accordance with standards and protocols established by the Interagency Ocean Observation Committee, by which all data collected by the System regarding ocean and coastal waters of the United States including the Great Lakes, are processed, stored, integrated, and made available to all end-user communities;

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

(xii) develop and periodically update a plan to efficiently integrate into the System new, innovative, or emerging technologies that have been demonstrated to be useful to the System and which will fulfill the purposes of this chapter and the System Plan; and

(xiii) work with users and Regional Associations to develop products to enable real-time data sharing for decision makers, including with respect to weather forecasting and modeling, search and rescue operations, corrosive seawater forecasts, water quality monitoring and communication, and harmful algal bloom forecasting.

(4) REGIONAL COASTAL OBSERVING SYSTEMS.—

(A) IN GENERAL.—A regional coastal observing system operated by a Regional Association described in the System Plan may not be certified or established under this subtitle unless it—

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

(ii) meets—

(I) the certification standards and compliance procedure guidelines issued by the Administrator; and

(II) the information needs of user groups in the region while adhering to national standards;

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

(I) gathering required System observation data;

(II) supporting and integrating all aspects of coastal and ocean observing and information programs within a region; and

(III) reflecting the needs of State, local, and tribal governments, commercial interests, and other users and beneficiaries of the System and other requirements specified under this subtitle and the System Plan;

(iv) identifies—

(I) gaps in observation coverage needs for capital improvements of Federal assets and non-Federal assets of the System; and

(II) other recommendations to assist in the development of the annual and long-term plans prepared pursuant to paragraph (2)(B)(i) and transmits such information to the Interagency Ocean Observation Committee via the Program Office established under paragraph (3)(C)(i);

(v) develops and operates under a strategic operational plan that will ensure the efficient and effective administration of programs and assets to support daily data observations for integration into the System, pursuant to the standards approved by the Council;

(vi) works cooperatively with governmental and non-governmental entities at all levels to identify and provide information products of the System for multiple users within the service area of the regional coastal observing system; and

(vii) complies with all financial oversight requirements established by the Administrator, including requirements relating to audits.

(B) PARTICIPATION.—For the purposes of this title, employees of Federal agencies are permitted to be members of the governing body for the regional coastal observing systems and may participate in the functions of the regional information coordination entities.

(d) SYSTEM ADVISORY COMMITTEE.—

(1) IN GENERAL.—The Administrator shall establish or designate a System advisory committee, which shall provide advice as may be requested by the Administrator **[or the Interagency Ocean Observing Committee]** or the Council under this subtitle.

(2) PURPOSE.—The purpose of the System advisory committee is to advise the Administrator and the Interagency Ocean Observing Committee on—

(A) administration, operation, management, and maintenance of the System, including integration of Federal and non-Federal assets and data management, *data sharing*, and communication aspects of the System, and fulfillment of the purposes set forth in section 12302;

(B) expansion and periodic modernization and upgrade of technology components of the System;

(C) identification of end-user communities, their needs for information provided by the System, and the System's effectiveness in disseminating information to end-user communities and the general public; **[and]**

[(D) any other purpose identified by the Administrator or the Interagency Ocean Observing Committee.]

(D) additional priorities, including—

(i) a national surface current mapping network designed to improve fine scale sea surface mapping using high frequency radar technology and other emerging technologies to address national priorities, including

Coast Guard search and rescue operation planning and harmful algal bloom forecasting and detection that—

(I) is comprised of existing high frequency radar and other sea surface current mapping infrastructure operated by national programs and regional associations;

(II) incorporates new high frequency radar assets or other fine scale sea surface mapping technology assets, and other assets needed to fill gaps in coverage on United States coastlines; and

(III) follows a deployment plan that prioritizes closing gaps in high frequency radar infrastructure in the United States, starting with areas demonstrating significant sea surface current data needs, especially in areas where additional data will improve Coast Guard search and rescue models;

(ii) fleet acquisition for autonomous underwater and surface vehicles for deployment and data integration to fulfill the purposes of this Act;

(iii) an integrative survey program for application of manned and unmanned vehicles to the real-time or near real-time collection and transmission of sea floor, water column, and sea surface data on biology, chemistry, geology, physics, and hydrography;

(iv) remote sensing and data assimilation to develop new analytical methodologies to assimilate data from the Integrated Ocean Observing System into hydrodynamic models;

(v) integrated, multi-State monitoring to assess sources, movement, and fate of sediments in coastal regions;

(vi) a multi-region marine sound monitoring system to be—

(I) planned in consultation with the Interagency Ocean Observation Committee, the National Oceanic and Atmospheric Administration, the Department of the Navy, and academic research institutions; and

(II) developed, installed, and operated in coordination with the National Oceanic and Atmospheric Administration, the Department of the Navy, and academic research institutions; and

(E) any other purpose identified by the Administrator or the Council.

(3) MEMBERS.—

(A) IN GENERAL.—The System advisory committee shall be composed of members appointed by the Administrator. Members shall be qualified by education, training, and experience to evaluate scientific and technical information related to the design, operation, maintenance, or use of the System, or use of data products provided through the System.

(B) TERMS OF SERVICE.—*The Administrator may stagger the terms of the System advisory committee members.* Members shall be appointed for 3-year terms, renewable once. A vacancy appointment shall be for the remainder of the unexpired term of the vacancy, and an individual so appointed may subsequently be appointed for 2 full 3-year terms if the remainder of the unexpired term is less than 1 year.

(C) CHAIRPERSON.—The Administrator shall designate a chairperson from among the members of the System advisory committee.

(D) APPOINTMENT.—Members of the System advisory committee shall be appointed as special Government employees for purposes of section 202(a) of title 18, United States Code.

(4) ADMINISTRATIVE PROVISIONS.—

(A) REPORTING.—The System advisory committee shall report to the Administrator [and the Interagency Ocean Observing Committee], as appropriate.

(B) ADMINISTRATIVE SUPPORT.—The Administrator shall provide administrative support to the System advisory committee.

(C) MEETINGS.—The System advisory committee shall meet at least once each year, and at other times at the call of the Administrator, the Interagency Ocean [Observing] Observation Committee, or the chairperson.

(D) COMPENSATION AND EXPENSES.—Members of the System advisory committee shall not be compensated for service on that Committee, but may be allowed travel expenses, including per diem in lieu of subsistence, in accordance with subchapter I of chapter 57 of title 5, United States Code.

(E) EXPIRATION.—Section 14 of the Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the System advisory committee.

(e) CIVIL LIABILITY.—For purposes of determining liability arising from the dissemination and use of observation data gathered pursuant to this section, any non-Federal asset or regional [information coordination entity] *coastal observing system* incorporated into the System by contract, lease, grant, or cooperative agreement under subsection (c)(3)(D) that is participating in the System shall be considered to be part of the National Oceanic and Atmospheric Administration. Any employee of such a [non-Federal asset or regional information coordination entity,] *regional coastal observing system*, while operating within the scope of his or her employment in carrying out the purposes of this subtitle, with respect to tort liability, is deemed to be an employee of the Federal Government.

(f) LIMITATION.—Nothing in this subtitle shall be construed to invalidate existing certifications, contracts, or agreements between regional information coordination entities and other elements of the System.

SEC. 12305. INTERAGENCY FINANCING AND AGREEMENTS.

[33 U.S.C. 3604]

[(a) IN GENERAL.—To carry out interagency activities under this subtitle, the Secretary of Commerce may execute cooperative agree-

ments, or any other agreements, with, and receive and expend funds made available by, any State or subdivision thereof, any Federal agency, or any public or private organization, or individual.】

(a) *IN GENERAL.*—*To carry out activities under this subtitle, the Secretary of Commerce may execute an agreement, on a reimbursable or nonreimbursable basis, with any State or subdivision thereof, any Federal agency, any public or private organization, or any individual to carry out activities under this subtitle.*

(b) *RECIPROCITY.*—Member Departments and agencies of the Council shall have the authority to create, support, and maintain joint centers, and to enter into and perform such contracts, leases, grants, and cooperative agreements as may be necessary to carry out the purposes of this subtitle and fulfillment of the System Plan.

【SEC. 12307. REPORT TO CONGRESS.

[33 U.S.C. 3606]

【(a) *REQUIREMENT.*—Not later than 2 years after the date of the enactment of this Act and every 2 years thereafter, the Administrator shall prepare and the President acting through the Council shall approve and transmit to the Congress a report on progress made in implementing this subtitle.

【(b) *CONTENTS.*—The report shall include—

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

【(2) an evaluation of the effectiveness of the System, including an evaluation of progress made by the Council to achieve the goals identified under the System Plan;

【(3) identification of Federal and non-Federal assets as determined by the Council that have been integrated into the System, including assets essential to the gathering of required observation data variables necessary to meet the respective missions of Council agencies;

【(4) a review of procurements, planned or initiated, by each Council agency to enhance, expand, or modernize the observation capabilities and data products provided by the System, including data management and communication subsystems;

【(5) an assessment regarding activities to integrate Federal and non-Federal assets, nationally and on the regional level, and discussion of the performance and effectiveness of regional information coordination entities to coordinate regional observation operations;

【(6) a description of benefits of the program to users of data products resulting from the System (including the general public, industries, scientists, resource managers, emergency responders, policy makers, and educators);

【(7) recommendations concerning—

【(A) modifications to the System; and

【(B) funding levels for the System in subsequent fiscal years; and

【(8) the results of a periodic external independent programmatic audit of the System.】

SEC. 12307. REPORT TO CONGRESS.

(a) *REQUIREMENT.*—*Not later than 2 years after March 30, 2009, and every 3 years thereafter, the Administrator shall prepare, and the President acting through the Council shall approve and trans-*

mit to the Congress, a report on progress made in implementing this subtitle.

(b) *CONTENTS.*—Each report required under subsection (a) shall include—

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

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

(3) the identification of Federal and non-Federal assets as determined by the Council that have been integrated into the System, including assets essential to the gathering of required observation data variables necessary to meet the respective missions of Council agencies;

(4) a review of procurements, planned or initiated, by each Council agency to enhance, expand, or modernize the observation capabilities and data products provided by the System, including data management and communication subsystems;

(5) a summary of the existing gaps in observation infrastructure and monitoring data collection, including—

(A) priorities considered by the System advisory committee;

(B) the national sea surface current mapping network;

(C) coastal buoys;

(D) ocean chemistry monitoring;

(E) marine sound monitoring; and

(F) autonomous underwater and surface vehicle technology gaps;

(6) an assessment regarding activities to integrate Federal and non-Federal assets, nationally and on the regional level, and discussion of the performance and effectiveness of regional information coordination entities to coordinate regional observation operations;

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

(8) recommendations concerning—

(A) modifications to the System; and

(B) funding levels for the System in subsequent fiscal years; and

(9) the results of a periodic external independent programmatic audit of the System.

[SEC. 12308. PUBLIC-PRIVATE USE POLICY.

[33 U.S.C. 3607]

【The Council shall develop a policy within 6 months after the date of the enactment of this Act that defines processes for making decisions about the roles of the Federal Government, the States, regional information coordination entities, the academic community, and the private sector in providing to end-user communities environmental information, products, technologies, and services related to the System. The Council shall publish the policy in the Federal Register for public comment for a period not less than 60 days. Nothing in this section shall be construed to require changes in policy in effect on the date of enactment of this Act.】

SEC. 12308. PUBLIC-PRIVATE USE POLICY.

The Council shall maintain a policy that defines processes for making decisions about the roles of the Federal Government, the States, regional information coordination entities, the academic community, and the private sector in providing to end-user communities environmental information, products, technologies, and services related to the System. The Administrator shall ensure that National Oceanic and Atmospheric Administration adheres to the decision making process developed by the Council regarding the roles of the Federal Government, the States, the regional coastal observing systems, the academic communities, and the private sector in providing the end-user communities environmental information, data products, technologies, and services related to the System.

[SEC. 12309. INDEPENDENT COST ESTIMATE.

[33 U.S.C. 3608]

] Within 1 year after the date of enactment of this Act, the Interagency Ocean Observation Committee, through the Administrator and the Director of the National Science Foundation, shall obtain an independent cost estimate for operations and maintenance of existing Federal assets of the System, and planned or anticipated acquisition, operation, and maintenance of new Federal assets for the System, including operation facilities, observation equipment, modeling and software, data management and communication, and other essential components. The independent cost estimate shall be transmitted unabridged and without revision by the Administrator to Congress.]

SEC. 12310. AUTHORIZATION OF APPROPRIATIONS.

[33 U.S.C. 3610]

There are authorized to be appropriated to the Secretary of Commerce for fiscal years 2009 through [2013] 2019 such sums as are necessary to fulfill the purposes of this subtitle and support activities identified in the annual coordinated System budget developed by the Interagency Ocean Observation Committee and submitted to the Congress.

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

[33 U.S.C. 3701 et seq.]

SEC. 12404. INTERAGENCY SUBCOMMITTEE.

[33 U.S.C. 3703]

(a) * * *

(c) 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 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 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 Transportation 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.

(4) ECONOMIC VULNERABILITY REPORT.—

(A) *IN GENERAL.*—Not later than 2 years after the date of the enactment of the Coordinated Ocean Monitoring and Research Act, and every 5 years thereafter, the Subcommittee shall transmit to appropriate committees of Congress a report that—

(i) is named “The Ocean Chemistry Coastal Community Vulnerability Assessment”;

(ii) identifies gaps in ocean acidification monitoring by public, academic, and private assets in the network of regional coastal observing systems;

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

(iv) identifies United States coastal communities, including fishing communities, low-population rural communities, tribal and subsistence communities, and island communities, that may be impacted by ocean acidification;

(v) identifies impacts of changing ocean carbonate chemistry on the communities described in clause (iv), including impacts from changes in ocean and coastal marine resources that are not managed by the Federal Government;

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

(vii) identifies habitats that may be particularly vulnerable to corrosive sea water, including areas experiencing multiple stressors such as hypoxia, sedimentation, and harmful algal blooms;

(viii) identifies areas in which existing Integrated Ocean Observing System assets, including buoys and

gliders, may be leveraged as platforms for the deployment of new sensors or other applicable observing technologies; and

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

(B) FORM OF REPORT.—

(i) **INITIAL REPORT.**—The initial report required under subparagraph (A) shall include the information described in clauses (i) through (ix) on a national level.

(ii) **SUBSEQUENT REPORTS.**—Each report required under subparagraph (A) after the initial report—

(I) may describe the information described in clauses (i) through (ix) on a national level; or

(II) may consist of separate reports for each region of the National Oceanic and Atmospheric Administration.

(iii) **REGIONAL REPORTS.**—If the Subcommittee opts to prepare a report required under subparagraph (A) as separate regional reports under clause (ii)(II), the Subcommittee shall submit a report for each region of the National Oceanic and Atmospheric Administration not less frequently than once during each 5-year reporting period.

(C) APPROPRIATE COMMITTEES OF CONGRESS DEFINED.—

In this paragraph and in paragraph (5), the term “appropriate committees of Congress” means 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.

(5) MONITORING PRIORITIZATION PLAN.—Not later than 180 days after the date of the submission of the initial report under paragraph (4)(A), the Subcommittee shall transmit to the appropriate committees of Congress a report that develops a plan to deploy new sensors or other applicable observing technologies—

(A) based on such initial report;

(B) prioritized by—

(i) the threat to coastal economies and ecosystems;

(ii) gaps in data; and

(iii) research needs; and

(C) that leverage existing platforms, where possible.

SEC. 12405. STRATEGIC RESEARCH PLAN.

[33 U.S.C. 3704]

(a) **IN GENERAL.**—Not later than 2 years after the date of enactment of this Act, the Subcommittee shall develop a strategic plan for Federal research and monitoring on ocean acidification that will provide for an assessment of the impacts of ocean acidification on marine organisms and marine ecosystems and the development of adaptation and mitigation strategies to conserve marine organisms and marine ecosystems. In developing the plan, the Subcommittee shall consider and use information, reports, and studies of ocean acidification that have identified research and monitoring needed to better understand ocean acidification and its potential impacts,

and recommendations made by the National Academy of Sciences in the review of the plan required under subsection (d).

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

(1) provide for interdisciplinary research among the ocean 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 on marine organisms and marine ecosystems;

(B) improve the ability to assess the socioeconomic impacts of ocean acidification; and

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

(G) modeling activities;

(H) assessment of ocean acidification impacts; and

(I) participation in international research efforts;

(4) identify relevant programs and activities of the Federal agencies that contribute to the interagency program directly and indirectly and set forth the role of each Federal agency in implementing the plan;

(5) consider and utilize, as appropriate, reports and studies conducted by Federal agencies, the National Research Council, or other entities;

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

(7) outline budget requirements 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 prioritize additional monitoring systems that may be needed to ensure adequate data collection and monitoring of ocean acidification and its impacts; **[and]**

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

(10) *make recommendations for research to be conducted, including in the social sciences and economics, to address the key knowledge gaps identified in the economic vulnerability report conducted under section 12404(c)(4).*

(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, impacts on marine food webs of ocean acidification, and to develop environmental and ecological indices that track marine ecosystem responses to ocean 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 modeling to determine impacts on marine ecosystems and individual marine organisms.

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

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

(6) *Research to understand combined effects of changes in ocean chemistry, sediment delivery, hypoxia, and harmful algal blooms and the impact these processes have on each other, and how these multiple stressors impact living marine resources and coastal ecosystems.*

(7) *Applied research to identify adaptation strategies for species impacted by changes in ocean chemistry including vegetation-based systems, shell recycling, species and genetic diversity, applied technologies, aquaculture methodologies, and management recommendations.*

(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.

SEC. 12406. NOAA OCEAN ACIDIFICATION ACTIVITIES.

[33 U.S.C. 3705]

(a) IN GENERAL.—The Secretary shall establish and maintain an ocean acidification program within the National Oceanic and Atmospheric Administration to conduct research, monitoring, 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;

(B) the establishment of a long-term monitoring program of ocean acidification utilizing existing global and national ocean observing assets, and adding instrumentation and sampling stations as appropriate to the aims of the research program;

(C) research to identify and develop adaptation strategies and techniques for effectively conserving marine ecosystems as they cope with increased ocean 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;

(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 and its impacts on marine resources; and

(F) coordination of ocean acidification monitoring and impacts research 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;

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

(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 7901 of title 10, United States Code **[.]; and**

(4) includes an ongoing mechanism that allows potentially affected industry members, coastal stakeholders, fishery management councils and commissions, non-Federal resource managers, and scientific experts to provide input on monitoring needs that are necessary to support on the ground management, decision making, and adaptation related to ocean acidification.

(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.

SEC. 12407. NSF OCEAN ACIDIFICATION ACTIVITIES.

[33 U.S.C. 3706]

[(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 and monitoring of ocean acidification and its impacts, including—

[(1) impacts on marine organisms and marine ecosystems;

[(2) impacts on ocean, coastal, and estuarine biogeochemistry; and

【(3) the development of methodologies and technologies to evaluate ocean acidification and its impacts.】

(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, observatories and monitoring of ocean acidification and its impacts, including—*

- (1) *impacts on marine organisms and marine ecosystems;*
- (2) *impacts on ocean, coastal, and estuarine biogeochemistry;*
- (3) *the development of methodologies and technologies to evaluate ocean acidification and its impacts; and*
- (4) *impacts of multiple stressors on ecosystems exhibiting hypoxia, harmful algal blooms, or sediment delivery, combined with changes in ocean chemistry.*

(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 activities with such activities of other nations and international organizations.*

