

**Calendar No. 205**

115TH CONGRESS }  
*1st Session* }

SENATE

{ REPORT  
115-145

HARMFUL ALGAL BLOOM AND HYPOXIA RE-  
SEARCH AND CONTROL AMENDMENTS  
ACT OF 2017

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R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND  
TRANSPORTATION

ON

S. 1057



AUGUST 3, 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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## Calendar No. 205

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### HARMFUL ALGAL BLOOM AND HYPOXIA RESEARCH AND CONTROL AMENDMENTS ACT OF 2017

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

### R E P O R T

[To accompany S. 1057]

[Including cost estimate of the Congressional Budget Office]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 1057) to amend the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998 to address harmful algal blooms, 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.

#### BACKGROUND AND NEEDS

S. 1057 would reauthorize the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998 (HABHRCA)<sup>1</sup>, which was last reauthorized in 2014, from fiscal year (FY) 2018 through FY 2022. Congress passed the HABHRCA in 1998 to address more frequent harmful algal blooms (HABs) and hypoxic events (severe oxygen depletion). These events cause significant economic harm to affected communities and can create massive “dead zones” that have deleterious consequences for local ecosystems and economies.

This Act would build on previous authorizations by doing the following: requiring more collaboration between agencies; granting the Federal Government the authority to declare severe algal blooms or hypoxic events as events of national significance, trig-

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<sup>1</sup> 33 U.S.C. §4001 et seq.

gering access to disaster-like funding; and allowing private donations to be used to fund recovery for events of national significance.

### **Harmful Algal Blooms**

HABs occur when environmental conditions promote the rapid growth of large numbers of single-celled algae in salt or fresh water. While not all algal blooms are harmful, a small percentage can produce toxins that negatively affect people, fish, shellfish, and other animals. These blooms often discolor the water and result in “red tides” or “brown tides” and may directly or indirectly cause illness in people. Ingestion of these toxins can cause gastric distress, liver damage, and lung paralysis, and can lead to hospitalization or death.<sup>2</sup> Swimming in or breathing the air near HABs can cause eye, nose, and throat irritation, as well as shortness of breath.<sup>3</sup>

In addition to producing toxins, HABs may clog or lacerate fish gills, decrease oxygen in the water (hypoxia), or block sunlight for aquatic plants.<sup>4</sup> A National Oceanic and Atmospheric Administration (NOAA)-funded study by the Woods Hole Oceanographic Institute estimated that the annual economic impact of HABs in the United States is approximately \$50,000,000, including a cost of \$18,000,000 to commercial fishing industries, \$7,000,000 for recreation and tourism effects, and \$2,000,000 for monitoring and management.<sup>5</sup>

### **Hypoxia**

In aquatic systems, hypoxia refers to a situation where the concentration of dissolved oxygen is reduced to less than 2 to 3 parts per million.<sup>6</sup> Hypoxic areas, sometimes referred to as “dead zones,” frequently occur in coastal and estuarine areas after the rapid growth of algae. When this explosive growth has consumed all of the available nutrients, the algae begins to die and decompose, aided by oxygen-consuming bacteria. As these bacteria consume most of the available oxygen, a dead zone develops. Animals that are able to swim away are less affected by these dead zones; however, slow-moving fauna, such as shellfish, are particularly susceptible to hypoxia and suffocate.<sup>7</sup>

### **Impacted Areas**

Almost every State in the United States experiences some kind of HAB event. Domoic acid from HABs frequently causes closures in the Dungeness crab and shellfish fisheries on the West Coast, and was particularly devastating in the 2015 and 2016 seasons.<sup>8</sup> Every spring, a large “dead zone” forms near the mouth of the Mis-

<sup>2</sup>International Joint Commission Health Professionals Advisory Board, “Human Health Effects from Harmful Algal Blooms: a Synthesis,” November 22, 2013, at [http://www.ijc.org/files/publications/Attachment 2 Human Health Effects from Harmful Algal Blooms.pdf](http://www.ijc.org/files/publications/Attachment%20Human%20Health%20Effects%20from%20Harmful%20Algal%20Blooms.pdf).

<sup>3</sup>National Ocean Service (NOS), “What is a red tide?,” March 02, 2017, at <http://oceanservice.noaa.gov/facts/redtide.html>.

<sup>4</sup>NOS, “Harmful Algal Blooms,” February 23, 2017, at <http://oceanservice.noaa.gov/hazards/hab>.

<sup>5</sup>Woods Hole Oceanographic Institute, Harmful Algae , July 11, 2016, at <http://www.whoi.edu/redtide/page.do?pid=1531>.

<sup>6</sup>Mississippi River Gulf of Mexico Watershed Nutrient Task Force, “Hypoxia 101,” at <http://water.epa.gov/type/watersheds/named/msbasin/hypoxia101.cfm>.

<sup>7</sup>NOS, “What is a dead zone?,” September 03, 2014, at <http://oceanservice.noaa.gov/facts/deadzone.html>.

<sup>8</sup>NOS, “West Coast Harmful Algal Bloom,” May 2, 2016, at <http://oceanservice.noaa.gov/news/sep15/westcoast-habs.html>.

issippi in the Gulf of Mexico from hypoxia, affecting the fishing and tourism economy.<sup>9</sup> Long Island Sound waters, shared by New York, Connecticut, and Rhode Island, have frequent HAB events and fishery and shellfish fishery closures, as well as warnings to keep pets and people out of the water.<sup>10</sup> Blooms in the Great Lakes and inland fresh water lakes are frequent as well.<sup>11</sup> The Environmental Protection Agency (EPA) studied freshwater lakes with risk conditions for exposure to cyanotoxins, a result of HABs, and found that most States have at least one lake at risk.<sup>12</sup>

A massive HAB in 2016 off the south coast of Florida demonstrated that, in addition to studying freshwater and marine HABs, Federal scientific assessments also should address blooms that begin in freshwater systems and migrate to coastal waters. In 2016, a toxic bloom began in Lake Okeechobee and spread to the Indian River Lagoon and the coastline, which caused severe environmental and economic damage.<sup>13</sup> However, the HABHRCA currently only includes provisions for Federal agencies to assess freshwater blooms and marine blooms, not freshwater blooms that become marine blooms. This bill would specify that future specific assessments include HABs that begin in freshwater and spread to coastal waters.

### **Federal Efforts**

The HABHRCA was enacted as title VI of the Coast Guard Authorization Act of 1998.<sup>14</sup> The HABHRCA aimed to facilitate the development of a comprehensive Federal response to the problems of HABs and hypoxia. The HABHRCA requires the establishment of the Inter-agency Task Force on Harmful Algal Blooms and Hypoxia (Inter-Agency Task Force) through the White House Office of Science and Technology Policy (OSTP), which is tasked with producing the following reports: an assessment of HABs; an assessment of hypoxia; and an assessment on hypoxia in the Northern Gulf of Mexico, which is required to be followed by a plan for addressing that problem. The HABHRCA authorized \$25,500,000 in appropriations to the Secretary of Commerce for FY 1999 through FY 2001.

The Harmful Algal Bloom and Hypoxia Amendments Act of 2004 (2004 Amendments Act),<sup>15</sup> requires the Inter-Agency Task Force to report to Congress on methods for prediction and for prevention, control, and mitigation of HABs,<sup>16</sup> and to develop a National Sci-

<sup>9</sup>National Centers for Coastal Ocean Science, "Price of Shrimp Impacted by Gulf of Mexico Dead Zone," January 30, 2017, at <https://coastalscience.noaa.gov/news/coastal-pollution/price-of-shrimp-affected-by-gulf-of-mexico-dead-zone>.

<sup>10</sup>New York Sea Grant, "Harmful Algal Blooms: What's New," at <http://seagrant.sunysb.edu/articles/t/harmful-algal-blooms-what-s-new>.

<sup>11</sup>Michigan Sea Grant, "Harmful Algal Blooms in the Great Lakes," at <http://www.miseagrant.umich.edu/explore/coastal-communities/harmful-algal-blooms-in-the-great-lakes>.

<sup>12</sup>Environmental Protection Agency, "Lakes Presenting Risk for Exposure to Harmful Algal Toxins," January 24, 2017, at <https://www.epa.gov/nutrient-policy-data/lakes-presenting-risk-exposure-harmful-algal-toxins>.

<sup>13</sup>Kozacek, C. "Toxic Algae Flourish as Everglades Solution Eludes Florida," *WaterNews*, at <http://www.circleofblue.org/2016/north-america/toxic-algae-flourish-everglades-solution-eludes-florida>.

<sup>14</sup>P.L. 105-383

<sup>15</sup>P.L. 108-456

<sup>16</sup>Jewett, E. B., C. B. Lopez, Q. Dortch, S. M. Etheridge, L. C. Backer, 2008, "Harmful Algal Bloom Management and Response: Assessment and Plan," Inter-Agency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean

entific Research, Development, Demonstration, and Technology Transfer Plan on Reducing Impacts from HABs.<sup>17</sup> The 2004 Amendments Act also requires new assessments, including the following: regional-scale assessments of HABs and hypoxia;<sup>18</sup> a scientific assessment of freshwater HABs;<sup>19</sup> a scientific assessment of coastal HABs;<sup>20</sup> and scientific assessments of hypoxia.<sup>21</sup> The National Algal Bloom and Hypoxia Program (Program) was authorized at \$19,000,000 annually from FY 2005 through FY 2007.

In 2014, the HABHRCA was reauthorized and expanded, giving NOAA the primary responsibility for administering the Program and adding the Centers for Disease Control and Prevention (CDC) to the Inter-Agency Task Force. At that time, the Task Force's functions also were expanded to include coordinating the inter-agency review process and promoting the development of new technologies for predicting, monitoring, and mitigating HABs and hypoxic conditions.<sup>22</sup> The 2014 amendments to the HABHRCA authorized \$20,500,000 in appropriations for FY 2014 through FY 2017.

As lead on the Program, NOAA's mandate is to advance the scientific understanding and ability to detect, monitor, assess, and predict HAB and hypoxia events. This is accomplished with funding for intramural and competitive research programs, observing systems, and forecasting models. NOAA and the EPA co-chair the Inter-Agency Task Force (with NOAA as lead for marine environments and the EPA as lead for freshwater), which is tasked with coordinating and convening Federal agencies and their stakeholders to develop action plans and assessments of HABs and hypoxia.<sup>23</sup>

The Inter-Agency Task Force currently includes the Department of Commerce (who serves as the Chairperson of the Task Force), the EPA, the Department of Agriculture, the Department of the Interior, the Department of the Navy, the Department of Health and Human Services, the National Science Foundation, the National Aeronautics and Space Administration, the Food and Drug Administration, OSTP, the Council on Environmental Quality, the CDC,

Science and Technology. Washington, D.C., at [http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/HABMngmt\\_resp\\_9\\_08.pdf](http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/HABMngmt_resp_9_08.pdf).

<sup>17</sup> See also the workshop report: Dortch, Q., D. M. Anderson, D. L. Ayres, P. M. Glibert (eds.), "Harmful Algal Bloom Research, Development, Demonstration, and Technology Transfer National Workshop Report," 2008, Woods Hole, Massachusetts, at <http://www.whoi.edu/files/server.do?id=43464pt=10p=19132>.

<sup>18</sup> For example, Mississippi River Gulf of Mexico Watershed Nutrient Task Force, 2008, Gulf Hypoxia Action Plan, at [http://water.epa.gov/type/watersheds/named/msbasin/upload/2008\\_8\\_28\\_msbasin\\_ghap2008\\_update082608.pdf](http://water.epa.gov/type/watersheds/named/msbasin/upload/2008_8_28_msbasin_ghap2008_update082608.pdf).

<sup>19</sup> Lopez, C. B., E. B. Jewett, Q. Dortch, B. T. Walton, H. K. Hudnell, "Scientific Assessment of Freshwater Harmful Algal Blooms," 2008, Inter-Agency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean Science and Technology. Washington, D.C., at [http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/FreshwaterReport\\_final\\_2008.pdf](http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/FreshwaterReport_final_2008.pdf).

<sup>20</sup> Lopez, C. B., Q. Dortch, E. B. Jewett, D. Garrison, 2008, "Scientific Assessment of Marine Harmful Algal Blooms," Inter-Agency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean Science and Technology. Washington, D.C., at [http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/assess\\_12-08.pdf](http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/assess_12-08.pdf).

<sup>21</sup> Committee on Environment and Natural Resources, "Scientific Assessment of Hypoxia in U.S. Coastal Waters," 2010, Inter-Agency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean Science and Technology. Washington, D.C., at <http://www.cop.noaa.gov/stressors/extremeevents/hab/habhrca/hypoxiacoastalwaters.pdf>.

<sup>22</sup> P.L. 113-124

<sup>23</sup> National Centers for Coastal and Ocean Science, "Harmful Algal Bloom and Hypoxia Research and Control Act," May 11, 2017, at <http://oceanservice.noaa.gov/facts/redtide.html>.

and such other Federal agencies as the President considers appropriate.<sup>24</sup>

#### SUMMARY OF PROVISIONS

This Act would reauthorize the Program from FY 2018 through FY 2022. The bill also would do the following:

- Require more collaboration between agencies.
- Add the Army Corps of Engineers to the Inter-Agency Task Force.
- Grant the Federal Government the authority to declare severe algal blooms or hypoxic events as events of national significance.
- Allow private donations to be used, along with any Federal disaster-like funding, to fund recovery for events of national significance.

#### LEGISLATIVE HISTORY

S. 1057 was introduced on May 4, 2017, by Senators Nelson, Peters, and Portman. There were a number of proposed bills in the 114th Congress that addressed HABs, but none would have reauthorized the Program. On May 18th, 2017, the Committee met in open Executive Session and, by voice vote, ordered S. 1057 reported favorably with an amendment (in nature of a substitute).

#### 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. 1057—Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2017*

Summary: S. 1057 would reauthorize and modify the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998. The bill would authorize the appropriation of \$110 million over the 2019–2023 period for the National Oceanic and Atmospheric Administration (NOAA) to mitigate the harmful effects of algal blooms and hypoxia (reduced oxygen level) in certain bodies of water.

Assuming appropriation of the authorized amounts, CBO estimates that implementing the legislation would cost \$76 million over the 2018–2022 period and \$33 million after 2022. Enacting S. 1057 could affect direct spending; therefore, pay-as-you-go procedures apply. However, CBO estimates that the net effect would be negligible. Enacting the bill would not affect revenues.

CBO estimates that enacting S. 1057 would not increase net direct spending or on-budget deficits in any of the four consecutive 10-year periods beginning in 2028.

S. 1057 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 impact of S. 1057 is shown in the following table. The costs

<sup>24</sup> 33 U.S.C. §4001

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
INCREASES IN SPENDING SUBJECT TO APPROPRIATION							
Authorization Level .....	0	0	22	22	22	22	88
Estimated Outlays .....	0	0	14	19	21	22	76

Basis of estimate: For this estimate, CBO assumes that the legislation will be enacted near the end of fiscal year 2017 and that the authorized amounts will be appropriated for each fiscal year. Estimated outlays are based on historical spending patterns for similar NOAA activities.

S. 1057 would authorize the appropriation of \$22 million each year from 2019 through 2023 for certain NOAA activities related to mitigating and responding to the harmful effects of algal blooms and hypoxia in coastal waters and the Great Lakes. Those activities include providing grants, conducting research, preparing reports, and overseeing an interagency task force. In 2017, NOAA allocated \$14 million for similar activities. CBO estimates that implementing the legislation would cost \$76 million over the 2018–2022 period and \$33 million after 2022.

Pay-As-You-Go considerations: S. 1057 would allow NOAA to collect and spend, without further appropriation, monetary gifts to assist states and localities affected by significant hypoxia or harmful algal bloom events. Such gifts would be recorded in the budget as reductions in direct spending. Because CBO expects that any gifts would be spent soon after they are received, we estimate that any net change in direct spending would be negligible.

Intergovernmental and private-sector impact: S. 1057 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would benefit state and local governments by authorizing federal financial assistance for those entities to respond to major algal blooms. Any costs incurred by those entities, including cost-sharing contributions, would result from voluntary commitments.

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

Estimate approved by: H. Samuel Papenfuss, Deputy Assistant Director for Budget Analysis.

#### REGULATORY IMPACT

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. 1057, 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. 1057, 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. 1057, 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 the short title of the bill, the Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2017.

*Section 2. References to the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998.*

Any references of an amendment to or repeal of the Act would be considered made to the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998.

*Section 3. Inter-Agency Task Force.*

This section would add the Army Corps of Engineers to the Inter-Agency Task Force.

*Section 4. Scientific assessments of freshwater harmful algal blooms.*

This section would remove outdated scientific assessment language and would specify that future scientific assessments should include HABs in coastal waters and freshwater systems and those that originate in freshwater lakes or rivers and migrate to coastal waters.

*Section 5. National Harmful Algal Bloom and Hypoxia Program.*

This section would require the Under Secretary of Commerce to engage local and regional stakeholders via a website about the Program. It also would direct the Under Secretary to include intervention and mitigation research as projects available for competitive grant funding and provide technical assistance to regional, State, tribal, and local governments. It also would add unmanned systems as an option for infrastructure for observations and require the Under Secretary to develop contingency plans for long-term monitoring of hypoxia.

*Section 6. Consultation.*

This section would make a technical correction to clarify that assessments, reports, and plans are required under the HABHRCA.

*Section 7. Hypoxia or Harmful Algal Bloom of National Significance.*

During the 2016 HAB event in southern Florida, the Governor of Florida declared a state of emergency in four counties and requested an emergency declaration from FEMA in order to qualify for Federal disaster assistance. However, the request was denied by FEMA because HABs and hypoxic events do not qualify as disasters under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.).

This section would establish a process for the Administrator of NOAA or the EPA to declare an event of national significance, which would trigger access to disaster-like funds in the case of a severe algae bloom or hypoxic event. An event of national significance would mean a hypoxia or HAB event that has had or will likely have significant environmental, economic, or public health impacts on an affected State. Geographic scope and the relative size in relation to past occurrences would be considered when making the determination. This section would require a 25 percent non-Federal match for any funding for an event of national significance. This is based on the fishery disaster provisions in the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), except that this provision would allow for non-Federal donations to be made for the purposes of funding recovery in the case of an event of national significance. As with the existing law, the designation would not result in automatic funding, but rather would make the designated event eligible to receive funds appropriated for remediation.

*Section 8. Authorization of Appropriations.*

Appropriations would be authorized for FY 2019 through FY 2023 at \$22,000,000 annually. The current authorization of \$22,500,000 would continue through FY 2018.

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):

HARMFUL ALGAL BLOOM AND HYPOXIA RESEARCH AND CONTROL ACT OF 1998

[33 U.S.C. 4001 et seq.]

**SEC. 603. ASSESSMENTS.**

[33 U.S.C. 4001]

(a) ESTABLISHMENT OF INTER-AGENCY TASK FORCE.—The President, through the Committee on Environment and Natural Resources of the National Science and Technology Council, shall establish an Inter-Agency Task Force on Harmful Algal Blooms and

Hypoxia (hereinafter referred to as the “Task Force”). The Task Force shall consist of a representative from—

- (1) the Department of Commerce (who shall serve as Chairman of the Task Force);
- (2) the Environmental Protection Agency;
- (3) the Department of Agriculture;
- (4) the Department of the Interior;
- (5) the Department of the Navy;
- (6) the Department of Health and Human Services;
- (7) the National Science Foundation;
- (8) the National Aeronautics and Space Administration;
- (9) the Food and Drug Administration;
- (10) the Office of Science and Technology Policy;
- (11) the Council on Environmental Quality;
- (12) the Centers for Disease Control and Prevention; **[and]**
- (13) *the Army Corps of Engineers; and*
- [(13)](14)** other Federal agencies as the President considers appropriate.

(b) ASSESSMENT OF HARMFUL ALGAL BLOOMS.—

(1) Not later than 12 months after the date of the enactment of this title, the Task Force, in cooperation with the coastal States, Indian tribes, and local governments, industry (including agricultural organizations), academic institutions, and non-governmental organizations with expertise in coastal zone management, shall complete and submit to the Congress an assessment which examines the ecological and economic consequences of harmful algal blooms, alternatives for reducing, mitigating, and controlling harmful algal blooms, and the social and economic costs and benefits of such alternatives.

(2) The assessment shall—

(A) identify alternatives for preventing unnecessary duplication of effort among Federal agencies and departments with respect to harmful algal blooms; and

(B) provide for Federal cooperation and coordination with and assistance to the coastal States, Indian tribes, and local governments in the prevention, reduction, management, mitigation, and control of harmful algal blooms and their environmental and public health impacts.

(c) ASSESSMENT OF HYPOXIA.—

(1) Not later than 12 months after the date of the enactment of this title, the Task Force, in cooperation with the States, Indian tribes, local governments, industry, agricultural, academic institutions, and non-governmental organizations with expertise in watershed and coastal zone management, shall complete and submit to the Congress an assessment which examines the ecological and economic consequences of hypoxia in United States coastal waters, alternatives for reducing, mitigating, and controlling hypoxia, and the social and economic costs and benefits of such alternatives.

(2) The assessment shall—

(A) establish needs, priorities, and guidelines for a peer-reviewed, interagency research program on the causes, characteristics, and impacts of hypoxia;

(B) identify alternatives for preventing unnecessary duplication of effort among Federal agencies and departments with respect to hypoxia; and

(C) provide for Federal cooperation and coordination with and assistance to the States, Indian tribes, and local governments in the prevention, reduction, management, mitigation, and control of hypoxia and its environmental impacts.

(d) REPORT TO CONGRESS ON HARMFUL ALGAL BLOOM IMPACTS.—

(1) DEVELOPMENT.—Not later than 12 months after the date of enactment of the Harmful Algal Bloom and Hypoxia Amendments Act of 2004, the President, in consultation with the chief executive officers of the States, shall develop and submit to the Congress a report that describes and evaluates the effectiveness of measures described in paragraph (2) that may be utilized to protect environmental and public health from impacts of harmful algal blooms. In developing the report, the President shall consult with the Task Force, the coastal States, Indian tribes, local governments, appropriate industries (including fisheries, agriculture, and fertilizer), academic institutions, and nongovernmental organizations with expertise in coastal zone science and management, and also consider the scientific assessments developed under this Act.

(2) REQUIREMENTS.—The report shall—

(A) review techniques for prediction of the onset, course, and impacts of harmful algal blooms including evaluation of their accuracy and utility in protecting environmental and public health and provisions for their development;

(B) identify innovative research and development methods for the prevention, control, and mitigation of harmful algal blooms and provisions for their development; and

(C) include incentive-based partnership approaches regarding subparagraphs (A) and (B) where practicable.

(3) PUBLICATION AND OPPORTUNITY FOR COMMENT.—At least 90 days before submitting the report to the Congress, the President shall cause a summary of the proposed plan to be published in the Federal Register for a public comment period of not less than 60 days.

(4) FEDERAL ASSISTANCE.—The Secretary of Commerce, in coordination with the Task Force and to the extent of funds available, shall provide for Federal cooperation with and assistance to the coastal States, Indian tribes, and local governments regarding the measures described in paragraph (2), as requested.

(e) LOCAL AND REGIONAL SCIENTIFIC ASSESSMENTS.—

(1) IN GENERAL.—The Secretary of Commerce, in coordination with the Task Force and appropriate State, Indian tribe, and local governments, to the extent of funds available, shall provide for local and regional scientific assessments of hypoxia and harmful algal blooms, as requested by States, Indian tribes, and local governments, or for affected areas as identified by the Secretary. If the Secretary receives multiple requests, the Secretary shall ensure, to the extent practicable, that assessments under this subsection cover geographically and ecologically diverse locations with significant ecological

and economic impacts from hypoxia or harmful algal blooms. The Secretary shall establish a procedure for reviewing requests for local and regional assessments. The Secretary shall ensure, through consultation with Sea Grant Programs, that the findings of the assessments are communicated to the appropriate State, Indian tribe, and local governments, and to the general public.

(2) PURPOSE.—Local and regional assessments shall examine—

(A) the causes and ecological consequences, and the economic cost, of hypoxia or harmful algal blooms in that area;

(B) potential methods to prevent, control, and mitigate hypoxia or harmful algal blooms in that area and the potential ecological and economic costs and benefits of such methods; and

(C) other topics the Task Force considers appropriate.

**[(f) SCIENTIFIC ASSESSMENT OF FRESHWATER HARMFUL ALGAL BLOOMS.—**

**[(1) Not later than 24 months after the date of enactment of the Harmful Algal Bloom and Hypoxia Amendments Act of 2004 the Task Force shall complete and submit to Congress a scientific assessment of current knowledge about harmful algal blooms in freshwater, such as the Great Lakes and upper reaches of estuaries, including a research plan for coordinating Federal efforts to better understand freshwater harmful algal blooms.**

**[(2) The freshwater harmful algal bloom scientific assessment shall—**

**[(A) examine the causes and ecological consequences, and the economic costs, of harmful algal blooms with significant effects on freshwater, including estimations of the frequency and occurrence of significant events;**

**[(B) establish priorities and guidelines for a competitive, peer-reviewed, merit-based interagency research program, as part of the Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) project, to better understand the causes, characteristics, and impacts of harmful algal blooms in freshwater locations; and**

**[(C) identify ways to improve coordination and to prevent unnecessary duplication of effort among Federal agencies and departments with respect to research on harmful algal blooms in freshwater locations.]**

**[(g)](f) SCIENTIFIC ASSESSMENTS OF HYPOXIA.—**

**(1) Not less than once every 5 years the Task Force shall complete and submit to the Congress a scientific assessment of hypoxia in United States coastal waters including the Great Lakes. The first such assessment shall be completed not less than 24 months after the date of enactment of the Harmful Algal Bloom and Hypoxia Amendments Act of 2004.**

**(2) The assessments under this subsection shall—**

**(A) examine the causes and ecological consequences, and the economic costs, of hypoxia;**

(B) describe the potential ecological and economic costs and benefits of possible policy and management actions for preventing, controlling, and mitigating hypoxia;

(C) evaluate progress made by, and the needs of, Federal research programs on the causes, characteristics, and impacts of hypoxia, including recommendations of how to eliminate significant gaps in hypoxia modeling and monitoring data; and

(D) identify ways to improve coordination and to prevent unnecessary duplication of effort among Federal agencies and departments with respect to research on hypoxia.

**[(h) SCIENTIFIC ASSESSMENTS OF HARMFUL ALGAL BLOOMS.—**

**[(1) Not less than once every 5 years the Task Force shall complete and submit to Congress a scientific assessment of harmful algal blooms in United States coastal waters. The first such assessment shall be completed not later than 24 months after the date of enactment of the Harmful Algal Bloom and Hypoxia Amendments Act of 2004 and shall consider only marine harmful algal blooms. All subsequent assessments shall examine both marine and freshwater harmful algal blooms, including those in the Great Lakes and upper reaches of estuaries.**

**[(2) The assessments under this subsection shall—**

**[(A) examine the causes and ecological consequences, and economic costs, of harmful algal blooms;**

**[(B) describe the potential ecological and economic costs and benefits of possible actions for preventing, controlling, and mitigating harmful algal blooms;**

**[(C) evaluate progress made by, and the needs of, Federal research programs on the causes, characteristics, and impacts of harmful algal blooms; and**

**[(D) identify ways to improve coordination and to prevent unnecessary duplication of effort among Federal agencies and departments with respect to research on harmful algal blooms.]**

*(g) SCIENTIFIC ASSESSMENTS OF MARINE AND FRESHWATER HARMFUL ALGAL BLOOMS.—Not less than once every 5 years the Task Force shall complete and submit to Congress a scientific assessment of harmful algal blooms in United States coastal waters and freshwater systems. Each assessment shall examine both marine and freshwater harmful algal blooms, including those in the Great Lakes and upper reaches of estuaries, those in freshwater lakes and rivers, and those that originate in freshwater lakes or rivers and migrate to coastal waters.*

**[(i)](h) NATIONAL SCIENTIFIC RESEARCH, DEVELOPMENT, DEMONSTRATION, AND TECHNOLOGY TRANSFER PLAN ON REDUCING IMPACTS FROM HARMFUL ALGAL BLOOMS.—**

**(1) Not later than 12 months after the date of enactment of the Harmful Algal Bloom and Hypoxia Amendments Act of 2004, the Task Force shall develop and submit to Congress a plan providing for a comprehensive and coordinated national research program to develop and demonstrate prevention, control, and mitigation methods to reduce the impacts of harmful algal blooms on coastal ecosystems (including the Great Lakes), public health, and the economy.**

(2) The plan shall—

(A) establish priorities and guidelines for a competitive, peer reviewed, merit based interagency research, development, demonstration, and technology transfer program on methods for the prevention, control, and mitigation of harmful algal blooms;

(B) identify ways to improve coordination and to prevent unnecessary duplication of effort among Federal agencies and departments with respect to the actions described in paragraph (1); and

(C) include to the maximum extent practicable diverse institutions, including Historically Black Colleges and Universities and those serving large proportions of Hispanics, Native Americans, Asian Pacific Americans, and other underrepresented populations.

(3) The Secretary of Commerce, in conjunction with other appropriate Federal agencies, shall establish a research, development, demonstration, and technology transfer program that meets the priorities and guidelines established under paragraph (2)(A). The Secretary shall ensure, through consultation with Sea Grant Programs, that the results and findings of the program are communicated to State, Indian tribe, and local governments, and to the general public.

[(j)](i) REPORT.—Not later than 2 years after the date the Action Strategy is submitted under section 603B, the Under Secretary shall submit a report to Congress that describes—

(1) the proceedings of the annual Task Force meetings;

(2) the activities carried out under the Program, including the regional and subregional parts of the Action Strategy;

(3) the budget related to the activities under paragraph (2);

(4) the progress made on implementing the Action Strategy; and

(5) any need to revise or terminate research and activities under the Program.

**SEC. 603A. NATIONAL HARMFUL ALGAL BLOOM AND HYPOXIA PROGRAM.**

[33 U.S.C. 4002]

(a) \* \* \*

(e) PROGRAM DUTIES.—In administering the Program, the Under Secretary shall—

(1) promote the Program, *including to local and regional stakeholders through the establishment and maintenance of a publicly accessible Internet website that provides information as to Program activities completed under this section*;

(2) prepare work and spending plans for implementing the research and activities identified under the Action Strategy;

(3) administer peer-reviewed, merit-based, competitive grant funding—

(A) to maintain and enhance baseline monitoring programs established by the Program;

(B) to support the projects maintained and established by the Program[; and];

(C) to address the research and management needs and priorities identified in the Action Strategy; *and*

(D) to accelerate the utilization of effective methods of intervention and mitigation to reduce the frequency, severity, and impacts of harmful algal bloom and hypoxia events;

(4) coordinate with [and work cooperatively with], and work cooperatively to provide technical assistance to, regional, State, tribal, and local government agencies and programs that address marine and freshwater harmful algal blooms and hypoxia;

(5) coordinate with the Secretary of State to support international efforts on marine and freshwater harmful algal bloom and hypoxia information sharing, research, prediction, mitigation, control, and response activities;

(6) identify additional research, development, and demonstration needs and priorities relating to monitoring, prevention, control, mitigation, and response to marine and freshwater harmful algal blooms and hypoxia, including methods and technologies to protect the ecosystems affected by marine and freshwater harmful algal blooms and hypoxia;

(7) integrate, coordinate, and augment existing education and extension programs to improve public understanding and awareness of the causes, impacts, *intervention*, and mitigation efforts for marine and freshwater harmful algal blooms and hypoxia;

(8) facilitate and provide resources to train State and local coastal and water resource managers in the methods and technologies for monitoring, preventing, controlling, and mitigating marine and freshwater harmful algal blooms and hypoxia;

(9) support regional efforts to control and mitigate outbreaks through—

(A) communication of the contents of the Action Strategy and maintenance of online data portals for other information about harmful algal blooms and hypoxia to State, tribal, and local stakeholders; and

(B) overseeing the development, review, and periodic updating of the Action Strategy;

(10) convene at least 1 meeting of the Task Force each year; and

(11) perform such other tasks as may be delegated by the Task Force.

(f) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ACTIVITIES.—The Under Secretary shall—

(1) maintain and enhance the existing competitive programs at the National Oceanic and Atmospheric Administration relating to harmful algal blooms and hypoxia;

(2) carry out marine and Great Lakes harmful algal bloom and hypoxia events response activities;

(3) develop and enhance, including with respect to infrastructure, *which shall include unmanned systems*, as necessary, critical observations, monitoring, modeling, data management, information dissemination, and operational forecasts relevant to harmful algal blooms and hypoxia events;

(4) enhance communication and coordination among Federal agencies carrying out marine and freshwater harmful algal bloom and hypoxia activities and research;



(5) to the greatest extent practicable, leverage existing resources and expertise available from local research universities and institutions; **[and]**

(6) increase the availability to appropriate public and private entities of—

(A) analytical facilities and technologies;

(B) operational forecasts; and

(C) reference and research materials**[.]**;

(7) *use cost effective methods in carrying out this Act; and*

(8) *develop contingency plans for the long-term monitoring of hypoxia.*

(g) **COOPERATIVE EFFORTS.**—The Under Secretary shall work cooperatively and avoid duplication of effort with other offices, centers, and programs within the National Oceanic and Atmospheric Administration, other agencies on the Task Force, and States, tribes, and nongovernmental organizations concerned with marine and freshwater issues to coordinate harmful algal bloom and hypoxia (and related) activities and research.

(h) **FRESHWATER.**—With respect to the freshwater aspects of the Program, the Administrator, through the Task Force, shall carry out the duties otherwise assigned to the Under Secretary under this section, except the activities described in subsection (f).

(1) **PARTICIPATION.**—The Administrator’s participation under this section shall include—

(A) research on the ecology and impacts of freshwater harmful algal blooms; and

(B) forecasting and monitoring of and event response to freshwater harmful algal blooms in lakes, rivers, estuaries (including their tributaries), and reservoirs.

(2) **NONDUPLICATION.**—The Administrator shall ensure that activities carried out under this title focus on new approaches to addressing freshwater harmful algal blooms and are not duplicative of existing research and development programs authorized by this title or any other law.

(i) **INTEGRATED COASTAL AND OCEAN OBSERVATION SYSTEM.**—The collection of monitoring and observation data under this title shall comply with all data standards and protocols developed pursuant to the Integrated Coastal and Ocean Observation System Act of 2009 (33 U.S.C. 3601 et seq.). Such data shall be made available through the system established under that Act.

#### **SEC. 609. AUTHORIZATION OF APPROPRIATIONS.**

[33 U.S.C. 4009]

(a) **IN GENERAL.**—There is authorized to be appropriated to the Under Secretary to carry out sections 603A and 603B \$20,500,000 for each of fiscal years 2014 through 2018, *and \$22,000,000 for each of fiscal years 2019 through 2023.*

(b) **EXTRAMURAL RESEARCH ACTIVITIES.**—The Under Secretary shall ensure that a substantial portion of funds appropriated pursuant to subsection (a) that are used for research purposes are allocated to extramural research activities. For each fiscal year, the Under Secretary shall publish a list of all grant recipients and the amounts for all of the funds allocated for research purposes, specifying those allocated for extramural research activities.

HARMFUL ALGAL BLOOM AND HYPOXIA AMENDMENTS ACT  
OF 2004

[Public Law 108-456; 118 Stat. 3630]

**SEC. 102. RETENTION OF TASK FORCE.**

[33 U.S.C. 4001a]

In developing the assessments, reports, and plans under [the amendments made by this title] *the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998*, the Task Force shall consult with the coastal States, Indian tribes, local governments, appropriate industries (including fisheries, agriculture, and fertilizer), academic institutions, and nongovernmental organizations with expertise in coastal zone science and management.

