

private sector, and nongovernmental programs, consistent with NOAA's mission to understand, observe, and model the Earth's atmosphere and biosphere, including the oceans, in an integrated manner.

**(c) Report**

No later than 12 months after January 4, 2011, the Administrator, in consultation with the National Science Foundation or other such agencies with mature transformational research portfolios, shall develop and submit a report to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science and Technology that describes NOAA's strategy for enhancing transformational research in its research and development portfolio to increase United States competitiveness in oceanic and atmospheric science and technology. The report shall—

- (1) define "transformational research";
- (2) identify emerging and innovative areas of research and development where transformational research has the potential to make significant and revolutionary<sup>1</sup> advancements in both understanding and U.S. science leadership;
- (3) describe how transformational research priorities are identified and appropriately<sup>1</sup> balanced in the context of NOAA's broader research portfolio;
- (4) describe NOAA's plan for developing a competitive peer review and priority-setting<sup>1</sup> process, funding mechanisms, performance and evaluation measures, and transition-to-operation guidelines for transformational research; and
- (5) describe partnerships with other agencies involved in transformational research.

(Pub. L. 110-69, title IV, §4001, Aug. 9, 2007, 121 Stat. 599; Pub. L. 111-358, title III, §301, Jan. 4, 2011, 124 Stat. 3996.)

**Editorial Notes**

AMENDMENTS

2011—Pub. L. 111-358 designated existing provisions as subsec. (a), inserted heading, and added subsecs. (b) and (c).

**Statutory Notes and Related Subsidiaries**

CHANGE OF NAME

Committee on Science and Technology of House of Representatives changed to Committee on Science, Space, and Technology of House of Representatives by House Resolution No. 5, One Hundred Twelfth Congress, Jan. 5, 2011.

**§ 893a. NOAA ocean and atmospheric science education programs**

**(a) In general**

The Administrator of the National Oceanic and Atmospheric Administration shall conduct, develop, support, promote, and coordinate formal and informal educational activities at all levels to enhance public awareness and understanding of ocean, coastal, Great Lakes, and atmospheric science and stewardship by the gen-

eral public and other coastal stakeholders, including underrepresented groups in ocean and atmospheric science and policy careers. In conducting those activities, the Administrator shall build upon the educational programs and activities of the agency, with consideration given to the goal of promoting the participation of individuals identified in sections 1885a and 1885b of title 42 in STEM fields and in promoting the acquisition and retention of highly qualified and motivated young scientists to complement and supplement workforce needs.

**(b) Educational program goals**

The education programs developed by NOAA shall, to the extent applicable—

- (1) carry out and support research based programs and activities designed to increase student interest and participation in STEM;
- (2) improve public literacy in STEM;
- (3) employ proven strategies and methods for improving student learning and teaching in STEM;
- (4) provide curriculum support materials and other resources that—
  - (A) are designed to be integrated with comprehensive STEM education;
  - (B) are aligned with national science education standards;
  - (C) are designed considering the unique needs of underrepresented groups, translating such materials and other resources;
  - (D) promote the adoption and implementation of high-quality education practices that build toward college and career-readiness; and
  - (E) are promoted widely, especially among individuals identified in sections 1885a and 1885b of title 42; and
- (5) create and support opportunities for enhanced and ongoing professional development for teachers using best practices that improves the STEM content and knowledge of the teachers, including through programs linking STEM teachers with STEM educators at the higher education level.

**(c) NOAA science education plan**

The Administrator, appropriate National Oceanic and Atmospheric Administration programs, ocean atmospheric science and education experts, and interested members of the public shall maintain a science education plan setting forth education goals and strategies for the Administration, as well as programmatic actions to carry out such goals and priorities over the next 20 years, and evaluate and update such plan every 5 years.

**(d) Metrics**

In executing the National Oceanic and Atmospheric Administration science education plan under subsection (c), the Administrator shall maintain a comprehensive system for evaluating the Administration's educational programs and activities. In so doing, the Administrator shall ensure that such education programs have measurable objectives and milestones as well as clear, documented metrics for evaluating programs. For each such education program or portfolio of similar programs, the Administrator shall—

<sup>1</sup> So in original.

(1) encourage the collection of evidence as relevant to the measurable objectives and milestones; and

(2) ensure that program or portfolio evaluations focus on educational outcomes and not just inputs, activities completed, or the number of participants.

**(e) Construction**

Nothing in this section may be construed to affect the application of section 1232a of title 20 or sections 794 and 794d of title 29.

**(f) STEM defined**

In this section, the term “STEM” means the academic and professional disciplines of science, technology, engineering, and mathematics.

(Pub. L. 110–69, title IV, §4002, Aug. 9, 2007, 121 Stat. 600; Pub. L. 111–358, title III, §302, Jan. 4, 2011, 124 Stat. 3997; Pub. L. 114–329, title III, §314, Jan. 6, 2017, 130 Stat. 3015.)

**Editorial Notes**

AMENDMENTS

2017—Subsec. (a). Pub. L. 114–329, §314(a), substituted “the agency, with consideration given to the goal of promoting the participation of individuals identified in sections 1885a and 1885b of title 42” for “agency, with consideration given to the goal of promoting the participation of individuals from underrepresented groups”.

Subsec. (b)(4)(C) to (E). Pub. L. 114–329, §314(b), added subpars. (C) and (E) and redesignated former subpar. (C) as (D).

Subsecs. (d) to (f). Pub. L. 114–329, §314(c), added subsec. (d) and redesignated former subsecs. (d) and (e) as (e) and (f), respectively.

2011—Subsec. (a). Pub. L. 111–358, §302(1), substituted “agency, with consideration given to the goal of promoting the participation of individuals from underrepresented groups in STEM fields and in promoting the acquisition and retention of highly qualified and motivated young scientists to complement and supplement workforce needs.” for “the agency.”

Subsec. (b). Pub. L. 111–358, §302(3), added subsec. (b). Former subsec. (b) redesignated (c).

Subsec. (c). Pub. L. 111–358, §302(4), substituted “maintain” for “develop”.

Pub. L. 111–358, §302(2), redesignated subsec. (b) as (c). Former subsec. (c) redesignated (d).

Subsec. (d). Pub. L. 111–358, §302(2), redesignated subsec. (c) as (d).

Subsec. (e). Pub. L. 111–358, §302(5), added subsec. (e).

**§ 893b. NOAA’s contribution to innovation**

**(a) Participation in interagency activities**

The National Oceanic and Atmospheric Administration shall be a full participant in any interagency effort to promote innovation and economic competitiveness through near-term and long-term basic scientific research and development and the promotion of science, technology, engineering, and mathematics education, consistent with the agency mission, including authorized activities.

**(b) Historic foundation**

In order to carry out the participation described in subsection (a), the Administrator of the National Oceanic and Atmospheric Administration shall build on the historic role of the National Oceanic and Atmospheric Administration in stimulating excellence in the advancement of

ocean and atmospheric science and engineering disciplines and in providing opportunities and incentives for the pursuit of academic studies in science, technology, engineering, and mathematics.

(Pub. L. 110–69, title IV, §4003, Aug. 9, 2007, 121 Stat. 600.)

**§ 893c. Workforce study**

**(a) In general**

The Under Secretary of Commerce for Oceans and Atmosphere, in cooperation with the Secretary of Education, shall request the National Academy of Sciences to conduct a study on the scientific workforce in the areas of oceanic and atmospheric research and development. The study shall investigate—

(1) whether there is a shortage in the number of individuals with advanced degrees in oceanic and atmospheric sciences who have the ability to conduct high quality scientific research in physical and chemical oceanography, meteorology, and atmospheric modeling, and related fields, for government, non-profit, and private sector entities;

(2) whether there is a shortage in the number of individuals with technical or trade-based degrees, skillsets, or credentials suited to a career in oceanic and atmospheric data collection, processing, satellite production, or satellite operations;

(3) what Federal programs are available to help facilitate the education of students hoping to pursue these degrees, skillsets, or credentials;

(4) barriers to transitioning highly qualified oceanic and atmospheric scientists or highly qualified technical professionals and tradespeople into Federal civil service scientist career tracks;

(5) what institutions of higher education, the private sector, and the Congress could do to increase the number of individuals with such post baccalaureate degrees, skillsets, or credentials;

(6) the impact of an aging Federal workforce on the ability of Federal agencies to conduct high quality scientific research, observations, and monitoring;

(7) what actions the Federal government can take to assist the transition of highly qualified scientists, technical professionals, and tradespeople into Federal career positions;

(8) workforce diversity and actions the Federal Government can take to increase diversity in the scientific workforce; and

(9) actions the Federal Government can take to shorten the hiring backlog for such workforce.

**(b) Coordination**

The Under Secretary of Commerce for Oceans and Atmosphere and the Secretary of Education shall consult with the heads of other Federal agencies and departments with oceanic and atmospheric expertise or authority in preparing the specifications for the study.

**(c) Report**

No later than 18 months after December 23, 2022, the Under Secretary of Commerce for