

119TH CONGRESS
1ST SESSION

H. R. 4141

To direct the Department of Energy and the National Oceanic and Atmospheric Administration to conduct collaborative research in order to advance numerical weather and climate prediction in the United States, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 25, 2025

Mr. MILLER of Ohio (for himself and Mrs. FOUSHEE) introduced the following bill; which was referred to the Committee on Natural Resources, and in addition to the Committee on Science, Space, and Technology, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To direct the Department of Energy and the National Oceanic and Atmospheric Administration to conduct collaborative research in order to advance numerical weather and climate prediction in the United States, and for other purposes.

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

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Advanced Weather
5 Model Computing Development Act”.

1 **SEC. 2. COMPUTING RESEARCH INITIATIVE.**

2 (a) IN GENERAL.—Section 108 of the Weather Re-
3 search and Forecasting Innovation Act of 2017 (15 U.S.C.
4 8518) is amended by striking subsection (a)(3)(C) and all
5 that follows through subsection (b)(7) and inserting the
6 following:

7 “(b) ARTIFICIAL INTELLIGENCE INVESTMENTS.—
8 The Under Secretary shall leverage artificial intelligence
9 and machine learning technologies to facilitate, optimize,
10 and further leverage advanced computing to accomplish
11 critical missions of the National Oceanic and Atmospheric
12 Administration.

13 “(c) CENTERS OF EXCELLENCE.—The Under Sec-
14 retary may expand, and where applicable establish, centers
15 of excellence to aid the adoption of next-generation artifi-
16 cial intelligence and machine learning enabled advanced
17 computing capabilities. Each such center may carry out
18 activities that include the following:

19 “(1) Leveraging robust public-private partner-
20 ship models to provide access to training, experience,
21 and long-term development of workforce and infra-
22 structure.

23 “(2) Developing and optimizing tools, libraries,
24 algorithms, data structures, and other supporting
25 software necessary for specific applications on high
26 performance computing systems.

1 “(3) Applying modern artificial intelligence,
2 deep machine-learning, and advanced data analysis
3 technologies to address current and future mission
4 challenges.

5 “(4) To the maximum extent practicable, ex-
6 ploring quantum computing and related application
7 partnerships with public, private, and academic enti-
8 ties to improve the accuracy and resolution of weath-
9 er predictions.

10 “(d) MULTI-YEAR CONTRACTS.—The Under Sec-
11 retary may enter into multi-year contracts in accordance
12 with section 3903 of title 41, United States Code, and
13 shall ensure compliance with all contract clauses provided
14 in such section to support operations, research, and devel-
15 opment related to high performance and cloud computing
16 infrastructure or systems with an unfunded contingent li-
17 ability in the event of cancellation.

18 “(e) REPORT.—

19 “(1) IN GENERAL.—Not later than two years
20 after the date of the enactment of this subsection,
21 the Under Secretary, in collaboration with the Sec-
22 retary of Energy shall submit to the Committee on
23 Science, Space, and Technology of the House of
24 Representatives and the Committee on Commerce,
25 Science, and Transportation and the Committee on

1 Energy and Natural Resources of the Senate a re-
2 port evaluating the following:

3 “(A) A best estimate of the overall value of
4 high-resolution probabilistic forecast guidance
5 for hazardous weather or water events using a
6 next-generation weather forecast and warning
7 framework.

8 “(B) The needs for cloud computing, quan-
9 tum computing, or high-performance com-
10 puting, visualization, and dissemination collabo-
11 ration between the Department of Energy and
12 the National Oceanic and Atmospheric Admin-
13 istration.

14 “(C) A timeline and guidance for imple-
15 mentation of the following:

16 “(i) High-resolution numerical weath-
17 er prediction models.

18 “(ii) Methods for meeting the cloud
19 computing, quantum computing, or high-
20 performance computing, visualization, and
21 dissemination needs identified under sub-
22 paragraph (b).

23 “(2) HAZARDOUS WEATHER OR WATER EVENTS
24 DEFINED.—In this subsection, the term ‘hazardous
25 weather or water events’ means weather or water

1 events that have a high risk of loss of life or prop-
2 erty, including the following:

3 “(A) Severe storms, such as hurricanes
4 and short-fused, small-scale hazardous weather
5 or hydrologic events produced by thunder-
6 storms, including large hail, damaging winds,
7 tornadoes, and flash floods.

8 “(B) Winter storms, such as freezing or
9 frozen precipitation (including freezing rain,
10 sleet, and snow), or combined effects of freezing
11 or frozen precipitation and strong winds.

12 “(C) Other weather hazards, such as ex-
13 treme heat or cold, wildfire, drought, dense fog,
14 high winds, and river, coastal, or lakeshore
15 flooding.”.

16 (b) STRATEGIC PLAN ON HIGH-PERFORMANCE COM-
17 PUTING AND DATA MANAGEMENT NEEDS.—

18 (1) IN GENERAL.—The Under Secretary shall
19 make publicly available not later than one year after
20 the date of the enactment of this Act, and update
21 every five years thereafter until 2035, a 10-year
22 strategic plan that outlines the high-performance
23 computing and data management requirements and
24 needs of the National Oceanic and Atmospheric Ad-

1 ministration and actions and strategies to address
2 such requirements and needs.

3 (2) PLAN ELEMENTS.—At a minimum, the
4 strategic plan required by paragraph (1) shall in-
5 clude the following:

6 (A) A 10-year prospective outlook of com-
7 puting resources and upgrades needed to meet
8 the mission needs of the National Oceanic and
9 Atmospheric Administration for fisheries man-
10 agement, oceanographic forecasting, and eco-
11 logical forecasting missions.

12 (B) A discussion of the following:

13 (i) Computing and processing re-
14 sources of the Administration and a 10-
15 year projected need for such resources,
16 disaggregated by line office of the Admin-
17 istration.

18 (ii) Facilities, commercial contracts,
19 and partnerships (with other Federal agen-
20 cies or other institutions or entities) of the
21 Administration that are providing com-
22 puting and data management support or
23 capacity as of such date.

24 (iii) The use by the Administration of
25 cloud computing and other emerging tech-

1 nologies, such as artificial intelligence and
2 machine learning.

3 (iv) Additional technologies that have
4 the potential to increase effectiveness and
5 efficiency for data storage and processing
6 power, including challenges to access and
7 use of such technologies.

8 (v) The distribution of computing re-
9 sources among the operations and research
10 functions of the Administration.

11 (vi) Products and services of the Ad-
12 ministration that have not become avail-
13 able to the public because of a lack of com-
14 puting resources.

15 (vii) Current and future workforce de-
16 velopment needs, such as information tech-
17 nology and software engineering, of the
18 Administration.

19 (viii) The high-performance computing
20 requirements of the Administration, with a
21 special focus on requirements that are
22 common across line offices of the Adminis-
23 tration.

1 (C) Timelines, and performance measures
2 for assessing progress toward attaining goals
3 for the following:

4 (i) Computing infrastructure and ar-
5 chitecture of the Administration (including
6 facilities, hardware, and software).

7 (ii) Use by the Administration of tech-
8 nologies that will increase effectiveness and
9 efficiency for data storage and processing
10 power, including challenges to access and
11 use of such technologies.

12 (D) A 10-year life cycle analysis of the
13 management of facilities, hardware, and engi-
14 neering involved in the strategic plan that in-
15 cludes the following:

16 (i) Program formulation for project
17 conception, implementation, and closure.

18 (ii) Technical infrastructure, products,
19 processes, data, and personnel resources
20 required to achieve defined cost, schedule,
21 and performance objectives.

22 (E) If appropriate, a description of actions
23 taken to implement the previous plan.

24 (3) PUBLIC INVOLVEMENT.—In developing the
25 strategic plan required by paragraph (1), the Under

1 Secretary shall invite comments and other feedback
2 from the public to inform the strategic plan.

3 (4) ANNUAL BRIEFINGS.—

4 (A) IN GENERAL.—Not later than one year
5 after the date of the enactment of this Act and
6 annually thereafter until 2030, the Under Sec-
7 retary shall brief Congress on the progress
8 made toward the objectives of the strategic plan
9 required by paragraph (1).

10 (B) ELEMENTS.—Each briefing required
11 by subparagraph (A) shall include the following:

12 (i) An evaluation of the progress
13 made in implementing the strategic plan.

14 (ii) Such updates to the strategic plan
15 as the Under Secretary considers appro-
16 priate.

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