

[DISCUSSION DRAFT]

118TH CONGRESS
1ST SESSION

H. R. _____

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

M. _____ introduced the following bill; which was referred to the Committee on _____

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. DEFINITIONS.**

2 In this Act:

3 (1) DEPARTMENT.—The term “Department”
4 means the Department of Energy.

5 (2) NATIONAL LABORATORY.—The term “Na-
6 tional Laboratory” has the meaning given such term
7 in section 2 of the Energy Policy Act of 2005 (42
8 U.S.C. 15801).

9 (3) SECRETARY.—The term “Secretary” means
10 the Secretary of Energy.

11 (4) ADMINISTRATOR.—The term “Adminis-
12 trator” means the Administrator of the National
13 Oceanic and Atmospheric Administration.

14 **SEC. 3. DEPARTMENT OF ENERGY AND NATIONAL OCEANIC**
15 **AND ATMOSPHERIC ADMINISTRATION RE-**
16 **SEARCH AND DEVELOPMENT COORDINA-**
17 **TION.**

18 (a) IN GENERAL.—The Secretary and Administrator
19 shall carry out collaborative research and development ac-
20 tivities in artificial intelligence and high performance com-
21 puting, focused on the advancement of climate models and
22 operational numerical weather prediction skill to support
23 National Oceanic and Atmospheric Administration mis-
24 sion requirements and the advancement of Department
25 computational and networking capabilities to analyze,
26 model, simulate, and predict complex phenomena.

1 (b) MEMORANDUM OF UNDERSTANDING.—The Sec-
2 retary and Administrator shall carry out the activities
3 under subsection (a) through the establishment of a
4 memorandum of understanding, or other appropriate
5 interagency agreement. Such memorandum or agreement,
6 as the case may be, shall require the use of a competitive,
7 merit-reviewed process, which considers applications from
8 Federal agencies, National Laboratories, institutions of
9 higher education, nonprofit institutions, and other appro-
10 priate entities.

11 (c) ACTIVITIES.—In carrying out the activities under
12 subsection (a), the Secretary and Administrator may—

13 (1) conduct collaborative research in modeling
14 and simulation, machine learning, data assimilation,
15 large scale data analytics, and predictive analysis in
16 order to optimize algorithms for climate modeling
17 and numerical weather prediction;

18 (2) explore options for performance portability
19 of the optimized weather model codes between the
20 operational computing systems of the National Oce-
21 anic and Atmospheric Administration and the De-
22 partment's high performance computers;

23 (3) develop methods to accommodate large data
24 sets on weather and climate information with vari-
25 able quality and scale;

1 (4) collaborate on new approaches and maxi-
2 mize the use of algorithms developed through artifi-
3 cial intelligence, machine learning, data analytics,
4 natural language processing, modeling and simula-
5 tion, with a focus on new algorithms suitable for
6 high performance computing systems and numerical
7 weather prediction or climate models;

8 (5) to the maximum extent practicable, and in
9 compliance with national security policies, promote
10 collaboration, open community-based development,
11 and data sharing between Federal agencies, National
12 Laboratories, institutions of higher education, non-
13 profit institutions, and other appropriate entities by
14 providing the necessary access and secure data
15 transfer capabilities; and

16 (6) support scientific computing infrastructure
17 as the Secretary and Administrator determine ap-
18 propriate.

19 (d) COORDINATION.—In carrying out the activities
20 under subsection (a), the Secretary and Administrator are
21 authorized to—

22 (1) carry out reimbursable agreements between
23 the Department, the National Oceanic and Atmos-
24 pheric Administration, and other entities in order to

1 maximize the effectiveness of research and develop-
2 ment to improve numerical weather prediction; and

3 (2) collaborate with other Federal agencies as
4 appropriate.

5 (e) REPORT.—Not later than two years after the date
6 of the enactment of this Act, the Secretary and Adminis-
7 trator shall submit to the Committee on Science, Space,
8 and Technology of the House of Representatives, and the
9 Committee on Commerce, Science, and Transportation
10 and the Committee on Energy and Natural Resources of
11 the Senate, a report detailing the following:

12 (1) Interagency coordination between each Fed-
13 eral agency involved in the research and development
14 activities carried out under this section.

15 (2) Potential opportunities to expand the tech-
16 nical capabilities of the Department and the Na-
17 tional Oceanic and Atmospheric Administration.

18 (3) Collaborative research achievements.

19 (4) Areas of future mutually beneficial gains by
20 such activities.

21 (5) Continuation of coordination between the
22 Department and the National Oceanic and Atmos-
23 pheric Administration.

1 **SEC. 4. CLIMATE AND WEATHER PREDICTION ON HIGH**
2 **PERFORMANCE COMPUTERS INITIATIVE.**

3 (a) IN GENERAL.—The Secretary and Administrator
4 shall carry out an initiative to run advanced model code,
5 including climate and operational weather models, on the
6 Department high performance computers in order to con-
7 duct proof of concept scenarios and comparison to current
8 issued forecasts and models. The Secretary and Adminis-
9 trator shall carry out such initiative through a competitive,
10 merit-reviewed process, and consider applications from
11 Federal agencies, National Laboratories, institutions of
12 higher education, nonprofit institutions, and other appro-
13 priate entities.

14 (b) COMPONENTS.—In carrying out the initiative
15 under subsection (a), the Secretary and Administrator
16 shall prevent duplication and coordinate research efforts
17 in artificial intelligence, high performance computing,
18 modeling and simulation, machine learning, and data as-
19 similation across the Department, and may—

20 (1) run real-time weather forecast scenarios to
21 conduct comparative research on National Weather
22 Service issued forecasts to forecasts issued through
23 the use of operational models run on high perform-
24 ance computers;

25 (2) share relevant modeling system and applica-
26 tions innovations developed through such initiative,

1 including Unified Forecast System-based applica-
2 tions, through community-based activities; and

3 (3) leverage related weather and climate efforts
4 and data from the National Science and Technology
5 Council and the Interagency Council for Advancing
6 Meteorological Services.

7 (c) REPORT.—Not later than two years after the date
8 of the enactment of this Act, the Secretary and Adminis-
9 trator shall submit to the Committee on Science, Space,
10 and Technology of the House of Representatives and the
11 Committee on Commerce, Science, and Transportation
12 and the Committee on Energy and Natural Resources of
13 the Senate a report evaluating the following:

14 (1) The effectiveness of the initiative under sub-
15 section (a), including applied research discoveries
16 and operational weather prediction improvements
17 achieved.

18 (2) Potential opportunities to expand the tech-
19 nical capabilities of the Department and the Na-
20 tional Oceanic and Atmospheric Administration
21 through the development of artificial intelligence and
22 data analytics technologies.

23 (d) SUNSET.—The authority under this section shall
24 terminate five years after the date of the enactment of
25 this section.

1 **SEC. 5. RESEARCH SECURITY.**

2 The activities authorized under this Act shall be ap-
3 plied in a manner consistent with subtitle D of title VI
4 of the Research and Development, Competition, and Inno-
5 vation Act (enacted as division B of the CHIPS Act of
6 2022 (Public Law 117–167; 42 U.S.C. 19231 et seq.)).