

118TH CONGRESS  
1ST SESSION

# H. R. 1715

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

MARCH 22, 2023

Mr. MILLER of Ohio (for himself and Ms. ROSS) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

## 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”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

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

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

7           (3) SECRETARY.—The term “Secretary” means  
8 the Secretary of Energy.

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

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

16       (a) IN GENERAL.—The Secretary and Administrator  
17 shall carry out collaborative research and development ac-  
18 tivities in artificial intelligence and high performance com-  
19 puting focused on the advancement of climate models and  
20 operational numerical weather prediction relevant to agen-  
21 cy missions.

22       (b) MEMORANDUM OF UNDERSTANDING.—The Sec-  
23 retary and Administrator shall carry out the activities  
24 under subsection (a) through the establishment of a  
25 memorandum of understanding, or other appropriate

1 interagency agreement. Such memorandum or agreement,  
2 as the case may be, shall require the use of a competitive,  
3 merit-reviewed process, which considers applications from  
4 Federal agencies, National Laboratories, institutions of  
5 higher education, nonprofit institutions, and other appro-  
6 priate entities.

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

9 (1) conduct collaborative research to develop  
10 new methods and optimization of modeling and sim-  
11 ulation, machine learning, data assimilation, large  
12 scale data analytics, and predictive analysis tech-  
13 niques;

14 (2) explore options for performance portability  
15 of the optimized weather model codes between the  
16 operational computing systems of the National Oce-  
17 anic and Atmospheric Administration and the De-  
18 partment’s high performance computers;

19 (3) develop methods to accommodate large data  
20 sets of weather and climate information;

21 (4) to the maximum extent practicable, and in  
22 compliance with national security policies, promote  
23 collaboration, open community-based development,  
24 and data sharing between Federal agencies, National  
25 Laboratories, institutions of higher education, non-

1 profit institutions, and other appropriate entities by  
2 providing the necessary access and secure data  
3 transfer capabilities; and

4 (5) support maintenance of and improvements  
5 to scientific computing infrastructure that the Sec-  
6 retary and Administrator determine appropriate.

7 (d) COORDINATION.—In carrying out the activities  
8 under subsection (a), the Secretary and Administrator are  
9 authorized to—

10 (1) carry out reimbursable agreements between  
11 the Department, the National Oceanic and Atmos-  
12 pheric Administration, and other entities in order to  
13 maximize the effectiveness of research and develop-  
14 ment; and

15 (2) collaborate with other Federal agencies as  
16 appropriate.

17 (e) REPORT.—Not later than two years after the date  
18 of the enactment of this Act, the Secretary and Adminis-  
19 trator shall submit to the Committee on Science, Space,  
20 and Technology of the House of Representatives, and the  
21 Committee on Commerce, Science, and Transportation  
22 and the Committee on Energy and Natural Resources of  
23 the Senate, a report detailing the following:

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

4           (2) Potential opportunities to expand the tech-  
5           nical capabilities of the Department and the Na-  
6           tional Oceanic and Atmospheric Administration.

7           (3) Collaborative research achievements.

8           (4) Areas of future mutually beneficial gains as  
9           a result of the activities described in subsection (c).

10          (5) Continuation of coordination between the  
11          Department and the National Oceanic and Atmos-  
12          pheric Administration on activities described in sub-  
13          section (c).

14 **SEC. 4. CLIMATE AND WEATHER PREDICTION ON HIGH**  
15 **PERFORMANCE COMPUTERS INITIATIVE.**

16          (a) IN GENERAL.—The Administrator, in collabora-  
17          tion with the Secretary, shall carry out an initiative, which  
18          may leverage Department high performance computers or  
19          expertise, to run advanced models in order to conduct  
20          proof of concept scenarios in comparison with current  
21          issued forecasts and models. The Secretary and Adminis-  
22          trator shall carry out the initiative through a competitive,  
23          merit-reviewed process, and consider applications from  
24          Federal agencies, National Laboratories, institutions of

1 higher education, nonprofit institutions, and other appro-  
2 priate entities.

3 (b) COMPONENTS.—In carrying out the initiative  
4 under subsection (a), the Administrator shall prevent du-  
5 plication and coordinate research efforts in artificial intel-  
6 ligence, high performance computing, modeling and sim-  
7 ulation, machine learning, data assimilation, large scale  
8 data analytics, and predictive analysis across the Depart-  
9 ment, and may—

10 (1) run real-time weather forecast scenarios to  
11 conduct comparative research between National  
12 Weather Service issued forecasts to forecasts devel-  
13 oped through the use of operational models run on  
14 high performance computers;

15 (2) share relevant modeling system and applica-  
16 tions innovations developed through the initiative,  
17 including Unified Forecast System-based applica-  
18 tions, through community-based activities; and

19 (3) leverage related weather and climate efforts  
20 and data from the National Science and Technology  
21 Council, the Interagency Council for Advancing Me-  
22 teorological Services, and other relevant interagency  
23 entities.

24 (c) REPORT.—Not later than two years after the date  
25 of the enactment of this Act, the Administrator shall sub-

1 mit to the Committee on Science, Space, and Technology  
2 of the House of Representatives and the Committee on  
3 Commerce, Science, and Transportation and the Com-  
4 mittee on Energy and Natural Resources of the Senate  
5 a report evaluating the following:

6 (1) The effectiveness of the initiative under sub-  
7 section (a), including applied research discoveries,  
8 and advanced modeling improvements achieved.

9 (2) Potential opportunities to expand the high  
10 performance computing capabilities of the Depart-  
11 ment and the National Oceanic and Atmospheric  
12 Administration.

13 (d) SUNSET.—The authority under this section shall  
14 terminate five years after the date of the enactment of  
15 this section.

16 **SEC. 5. RESEARCH SECURITY.**

17 The activities authorized under this Act shall be ap-  
18 plied in a manner consistent with subtitle D of title VI  
19 of the Research and Development, Competition, and Inno-  
20 vation Act (enacted as division B of the CHIPS Act of  
21 2022 (Public Law 117–167; 42 U.S.C. 19231 et seq.)).

○