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119TH CONGRESS
1ST SESSION**S. 1378****[Report No. 119–88]**

To enhance the use by the National Oceanic and Atmospheric Administration of artificial intelligence for weather forecasting, and for other purposes.

IN THE SENATE OF THE UNITED STATES

APRIL 9, 2025

Mr. SCHATZ (for himself, Mr. SHEEHY, Mr. LUJÁN, and Mr. WELCH) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

OCTOBER 21, 2025

Reported by Mr. CRUZ, with an amendment

[Strike out all after the enacting clause and insert the part printed in *italic*]

A BILL

To enhance the use by the National Oceanic and Atmospheric Administration of artificial intelligence for weather forecasting, 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 “Transformational Arti-
5 ficial intelligence to Modernize the Economy against Ex-

1 treme Weather and Wildfires Act” or the “TAME Ex-
 2 treme Weather and Wildfires Act”.

3 **SEC. 2. ARTIFICIAL INTELLIGENCE FOR WEATHER FORE-**
 4 **CASTING.**

5 (a) DEFINITIONS.—In this section:

6 (1) ARTIFICIAL INTELLIGENCE.—The term “ar-
 7 tificial intelligence”—

8 (A) has the meaning given that term in
 9 section 5002 of the National Artificial Intel-
 10 ligence Initiative Act of 2020 (15 U.S.C. 9401);
 11 and

12 (B) includes machine learning, neural net-
 13 works, and natural language processing.

14 (2) ARTIFICIAL INTELLIGENCE WEATHER
 15 MODEL.—The term “artificial intelligence weather
 16 model” means a weather model based primarily on
 17 artificial intelligence technology to project future
 18 Earth system conditions based on machine learning
 19 using weather forecasting training datasets.

20 (3) CURATE.—The term “curate”, with respect
 21 to a dataset, means—

22 (A) to collect and maintain the dataset—

23 (i) to ensure and document its quality;

24 and

1 (ii) to provide metadata on its prove-
 2 nance; and

3 (B) to update the dataset periodically, as
 4 appropriate and practicable.

5 (4) NUMERICAL WEATHER MODEL.—The term
 6 “numerical weather model” means a weather model
 7 based primarily on coupled Earth System processes
 8 that uses numerical computation to forecast future
 9 Earth system conditions.

10 (5) OBSERVATIONAL DATA.—The term “obser-
 11 vational data” means data and metadata from ac-
 12 tual observations of environmental conditions, in-
 13 cluding remote sensing and in situ platforms.

14 (6) SEASONAL, SUBSEASONAL, UNDER SEC-
 15 RETARY, WEATHER ENTERPRISE.—the terms “sea-
 16 sonal”, “subseasonal”, “Under Secretary”, and
 17 “weather enterprise” have the meanings given those
 18 terms in section 2 of the Weather Research and
 19 Forecasting Innovation Act of 2017 (15 U.S.C.
 20 8501).

21 (7) SYNTHETIC DATA.—The term “synthetic
 22 data” means data produced from a model or statis-
 23 tical method in order to fill gaps in observational
 24 data.

1 (8) WEATHER DATA.—The term “weather
2 data” means information used to track and predict
3 weather conditions and patterns, including forecasts,
4 observations, and derivative products from such in-
5 formation.

6 (b) PURPOSE.—The purpose of this section is—

7 (1) to improve accuracy and timeliness of
8 weather, water, and space weather forecasts and ef-
9 fective dissemination of critical information;

10 (2) to strengthen analytic capacity to inform re-
11 source deployments in response to and to mitigate
12 harm from weather, water, wildfires, and space
13 weather hazards through the mandated exploration
14 and use of artificial intelligence by Federal agencies;

15 (3) to strengthen public-private partnerships to
16 accelerate adoption and outcomes of the use of arti-
17 ficial intelligence in response to and to mitigate such
18 harm; and

19 (4) to strengthen public-private partnerships in
20 highly technical, high-risk, and high-reward fields re-
21 lated to weather, water, wildfires, and space weather
22 forecasts.

23 (c) EARTH SYSTEM FORECASTING AND INFORMA-
24 TION DELIVERY.—

1 (1) TRAINING DATASETS.—Not later than 4
2 years after the date of the enactment of this Act, the
3 Under Secretary, in consultation with the Secretary
4 of Energy, the Administrator of the National Aero-
5 nautics and Space Administration, the Director of
6 the National Science Foundation, the Director of the
7 National Center for Atmospheric Research, the
8 Interagency Council on Advancing Meteorological
9 Services, other appropriate Federal advisory commit-
10 tees as determined by the Under Secretary, and such
11 other technical experts as the Under Secretary con-
12 siders appropriate, shall develop and curate com-
13 prehensive weather forecasting training datasets
14 with relevant Earth system data, quality informa-
15 tion, and metadata necessary for weather fore-
16 casting.

17 (2) USE OF EXISTING DATASETS.—In order to
18 speed the development of the weather forecasting
19 training datasets required under paragraph (1), the
20 Under Secretary shall assess, and to the greatest ex-
21 tent practicable build on, existing Earth system rea-
22 nalysis datasets of the Federal Government.

23 (3) ARTIFICIAL INTELLIGENCE WEATHER
24 MODEL.—

1 (A) GLOBAL MODEL.—In carrying out this
2 subsection, the Under Secretary, in consultation
3 with appropriate Federal advisory committees
4 as determined by the Under Secretary, may de-
5 velop and test a global weather model based on
6 artificial intelligence technologies utilizing data
7 of the National Oceanic and Atmospheric Ad-
8 ministration to the extent possible.

9 (B) REGIONAL AND LOCAL MODELS.—In
10 addition to a global weather model under sub-
11 paragraph (A), the Under Secretary may exper-
12 iment with regional and local weather models
13 based on artificial intelligence technologies.

14 (4) USE OF ARTIFICIAL INTELLIGENCE TO DIS-
15 SEMINATE INFORMATION.—In coordination with an
16 artificial intelligence weather model or models devel-
17 oped under paragraph (3), the Under Secretary may
18 explore the use of artificial intelligence to enhance
19 the dissemination of information with respect to
20 weather and wildfire risks and evaluate the effective-
21 ness of communication for improved public under-
22 standing and preparedness.

23 (5) CONTINUED SUPPORT FOR OBSERVATIONS,
24 BASIC RESEARCH, AND NUMERICAL WEATHER MOD-
25 ELS.—Notwithstanding the requirements of this sub-

section, the Under Secretary shall continue to support and advance the activities of the National Oceanic and Atmospheric Administration—

(A) to collect and acquire traditional and novel observational data relevant for artificial intelligence and numerical weather, water, and space weather forecasting;

(B) to advance research on the Earth system and numerical weather model forecasting;

(C) to develop and advance numerical Earth system modeling for predictions;

(D) to develop weather model data post-processing techniques; and

(E) to improve data assimilation techniques.

(6) OBSERVING SYSTEM COVERAGE.—In carrying out this subsection, the Under Secretary may evaluate the use of cost functions in data-driven machine learning model training to balance inequities in observing system coverage and data poor areas.

(7) UNCERTAINTY QUANTIFICATION RESEARCH.—In carrying out this subsection, the Under Secretary may develop uncertainty quantification research for the purpose of accurate environmental

1 risk and hazard communications of probabilistic pre-
 2 dictions and forecasts.

3 (8) REPORT.—Not later than 2 years after the
 4 date of the enactment of this Act, and not less fre-
 5 quently than every 2 years thereafter through 2035,
 6 the Under Secretary shall submit to the Committee
 7 on Commerce, Science, and Transportation of the
 8 Senate and the Committee on Science, Space, and
 9 Technology of the House of Representatives a report
 10 on the activities conducted under this subsection.

11 (d) ADVANCED ARTIFICIAL INTELLIGENCE APPLICA-
 12 TIONS FOR WEATHER FORECASTS AND INFORMATION DE-
 13 LIVERY.—The Under Secretary shall explore advanced ap-
 14 plications of artificial intelligence to improve weather fore-
 15 casts and information delivery, such as by—

16 (1) improving data assimilation;

17 (2) accounting for coupled Earth system pro-
 18 cesses;

19 (3) improving readiness and preparedness to
 20 combat wildfires, mitigation of the risk from
 21 wildfires, and improving safety for firefighters and
 22 communities at risk from wildfires;

23 (4) using artificial intelligence weather models
 24 to generate ensemble forecasts to more accurately
 25 assess flow-dependent forecast uncertainties; and

1 (5) improving impact-based decision support to
 2 diverse users and communities for greater societal
 3 benefits based on those forecasts.

4 (e) TECHNICAL ASSISTANCE ON USE OF ARTIFICIAL
 5 INTELLIGENCE WEATHER, WATER, AND SPACE WEATH-
 6 ER MODELS.—

7 (1) IN GENERAL.—The Under Secretary shall
 8 provide—

9 (A) technical assistance, data access, and
 10 support for forecasters, scientists, social sci-
 11 entists, and engineers to test and evaluate the
 12 use and effectiveness of the artificial intel-
 13 ligence models of the National Oceanic and At-
 14 mospheric Administration, including within the
 15 testbeds of the Administration;

16 (B) best practices on providing forecasts
 17 based on outputs from artificial intelligence
 18 weather models and numerical weather models;
 19 or a combination thereof; and

20 (C) support for emergency managers to
 21 make operational decisions based on outputs
 22 from artificial intelligence weather models and
 23 numerical weather models, or a combination
 24 thereof.

25 (2) ASSESSMENT OF WEATHER MODELS.—

1 (A) IN GENERAL.—The Under Secretary
2 shall support the development of a common
3 framework for the assessment of numerical
4 weather models and artificial intelligence weath-
5 er models by comparing model output and ob-
6 servational data over a period of time in the
7 past through the use of such methodologies as
8 the Under Secretary considers appropriate.

9 (B) BEST PRACTICES.—In carrying out
10 this paragraph, the Under Secretary may de-
11 velop and disseminate best practices in collabo-
12 ration with—

13 (i) the National Institute of Standards
14 and Technology, the National Aeronautics
15 and Space Administration, the National
16 Science Foundation, and the Department
17 of Energy;

18 (ii) academic and research institu-
19 tions; and

20 (iii) the private sector.

21 (3) TECHNICAL ASSISTANCE.—In carrying out
22 this subsection, the Under Secretary may provide
23 technical assistance, best practices, and support re-
24 quired under paragraph (1) through the National
25 Weather Service.

1 (4) INDEPENDENT STUDY ON THE IMPACTS OF
 2 ARTIFICIAL INTELLIGENCE WEATHER, WATER, AND
 3 SPACE WEATHER MODELS.—The Under Secretary
 4 may enter into an agreement with the National
 5 Academy of Sciences or another entity as determined
 6 appropriate by the Under Secretary to assess the
 7 impacts of artificial intelligence weather models on
 8 the weather enterprise and make recommendations
 9 to improve the integration of such models in oper-
 10 ational forecasting.

11 (f) PARTNERSHIPS FOR TRANSFORMATIONAL INNO-
 12 VATION.—

13 (1) IN GENERAL.—The Under Secretary may
 14 explore novel structures for partnerships with pri-
 15 vate, academic, and international entities for re-
 16 search and development of transformative innovation
 17 in weather forecasting and other environmental fore-
 18 casts—

19 (A) to further the understanding of weath-
 20 er, water, wildfires, and space weather, and
 21 their societal impact;

22 (B) to advance the science of weather and
 23 water forecasting, including seasonal and sub-
 24 seasonal forecasting; and

1 (C) to develop, evaluate, and transition ar-
 2 tificial intelligence weather, water, and hazard
 3 forecasting applications to operations.

4 (2) CO-INVESTMENT.—Subject to applicable
 5 law, the Under Secretary may consider and adopt
 6 novel co-investment strategies with the private aca-
 7 demic and international sectors to carry out para-
 8 graph (1), including—

9 (A) non-Federal Government contributions
 10 to resource and support high-risk, high-return
 11 research and development in environmental
 12 forecasting, data science, artificial intelligence,
 13 and related fields;

14 (B) shared rights to intellectual property
 15 from research and development activities under
 16 this subsection; and

17 (C) other approaches to sharing resources
 18 and results under this subsection.

19 (g) AVAILABILITY OF DATASET.—

20 (1) IN GENERAL.—The Under Secretary shall
 21 develop and implement a plan to make available to
 22 the public, at no cost and subject to applicable law
 23 and policy, the following:

1 (A) Operational artificial intelligence
2 weather models developed by the National Oee-
3 anie and Atmospheric Administration.

4 (B) Artificial intelligence weather models
5 that are not operational models, including ex-
6 perimental and developmental models, as the
7 Under Secretary determines appropriate.

8 (C) Applicable information and documenta-
9 tion for artificial intelligence weather models
10 described in subparagraphs (A) and (B), includ-
11 ing a description of intended model outputs.

12 (D) Subject to subsection (i), all data
13 owned by the Federal Government and data
14 that the Under Secretary has the legal right to
15 redistribute that are associated with artificial
16 intelligence weather models made available to
17 the public pursuant to the plan and used in
18 operational forecasting by the Administration,
19 including—

20 (i) relevant metadata; and

21 (ii) data used for operational artificial
22 intelligence weather models used by the
23 Administration.

24 (2) ACCOMMODATIONS.—In developing and im-
25 plementing the plan under paragraph (1), the Under

1 Secretary may make such accommodations as the
 2 Under Secretary considers appropriate to ensure
 3 that the public release of any artificial intelligence
 4 weather model, information, documentation, or data
 5 pursuant to the plan does not jeopardize—

6 (A) national security;

7 (B) intellectual property or redistribution
 8 rights, including under titles 17 and 35, United
 9 States Code;

10 (C) any trade secret or commercial or fi-
 11 nancial information subject to section 552(b)(4)
 12 of title 5, United States Code;

13 (D) any models or data that are otherwise
 14 restricted by contract or other written agree-
 15 ment; or

16 (E) the mission of the Administration to
 17 protect lives and property.

18 ~~(3) REPORT.—~~

19 ~~(A) IN GENERAL.—~~Not later than one year
 20 after the date of the enactment of this Act, the
 21 Under Secretary shall submit to Congress a re-
 22 port, in both unclassified and classified form,
 23 regarding the risks to the economic and intellec-
 24 tual security of the United States from foreign

1 countries of concern through access by those
 2 countries to weather data in the United States.

3 (B) ELEMENTS.—The report required
 4 under subparagraph (A) shall include—

5 (i) a full analysis of the national, in-
 6 tellectual, and economic security implica-
 7 tions for the United States with respect to
 8 intellectual property theft or cyber or
 9 human espionage through access to weath-
 10 er data; and

11 (ii) conclusions of the Under Sec-
 12 retary and recommendations for legislative
 13 and administrative action, if any.

14 (C) FOREIGN COUNTRY OF CONCERN DE-
 15 FINED.—In this paragraph, the term “foreign
 16 country of concern” has the meaning given that
 17 term in section 9901 of the William M. (Mac)
 18 Thornberry National Defense Authorization Act
 19 for Fiscal Year 2021 (15 U.S.C. 4651).

20 (h) RETENTION OF FEDERAL GOVERNMENT EXPER-
 21 TISE.—Subject to applicable law, the Under Secretary
 22 may consider novel methods to recruit, retrain, and retain
 23 expert personnel to support activities under this section,
 24 including by—

1 (1) using methods to be competitive with sala-
2 ries outside the Federal Government;

3 (2) developing staff exchange programs and
4 training programs; and

5 (3) leveraging diverse hiring strategies.

6 (i) PROTECTION OF NATIONAL SECURITY INTER-
7 ESTS.—

8 (1) IN GENERAL.—Notwithstanding any other
9 provision of this section, the Under Secretary, in
10 consultation with the Secretary of Defense, as ap-
11 propriate, may withhold models or data used under
12 this section if the Under Secretary determines doing
13 so to be necessary to protect the national security
14 interests of the United States.

15 (2) RULE OF CONSTRUCTION.—Nothing in this
16 section shall be construed to supersede any other
17 provision of law governing the protection of the na-
18 tional security interests of the United States.

19 (j) AUTHORIZATION OF APPROPRIATIONS.—There is
20 authorized to be appropriated to the Under Secretary to
21 carry out this section—

22 (1) for fiscal year 2026, \$311,000,000; and

23 (2) for each of fiscal years 2027 through 2030,
24 \$76,000,000.

1 **SECTION 1. SHORT TITLE.**

2 *This Act may be cited as the “Transformational Artificial*
 3 *intelligence to Modernize the Economy against Extreme*
 4 *Weather and Wildfires Act” or the “TAME Extreme Weather*
 5 *and Wildfires Act”.*

6 **SEC. 2. ARTIFICIAL INTELLIGENCE FOR WEATHER FORE-**
 7 **CASTING.**

8 (a) *DEFINITIONS.—In this section:*

9 (1) *ARTIFICIAL INTELLIGENCE.—The term “artificial*
 10 *intelligence”—*

11 *(A) has the meaning given that term in section*
 12 *5002 of the National Artificial Intelligence*
 13 *Initiative Act of 2020 (15 U.S.C. 9401); and*

14 *(B) includes machine learning, neural net-*
 15 *works, and natural language processing.*

16 (2) *ARTIFICIAL INTELLIGENCE WEATHER*
 17 *MODEL.—The term “artificial intelligence weather*
 18 *model” means a weather model based primarily on*
 19 *artificial intelligence technology to project future*
 20 *Earth system conditions based on machine learning*
 21 *using weather forecasting training datasets.*

22 (3) *CURATE.—The term “curate”, with respect to*
 23 *a dataset, means—*

24 *(A) to collect and maintain the dataset—*

25 *(i) to ensure and document its quality;*

26 *and*

1 (ii) to provide metadata on its prove-
2 nance; and

3 (B) to update the dataset periodically, as
4 appropriate and practicable.

5 (4) *NUMERICAL WEATHER MODEL.*—The term
6 “numerical weather model” means a weather model
7 based primarily on coupled Earth System processes
8 that uses numerical computation to forecast future
9 Earth system conditions.

10 (5) *OBSERVATIONAL DATA.*—The term “observa-
11 tional data” means data and metadata from actual
12 observations of environmental conditions, including
13 remote sensing and in situ platforms.

14 (6) *SEASONAL, SUBSEASONAL, UNDER SEC-*
15 *RETARY, WEATHER ENTERPRISE.*—the terms “sea-
16 sonal”, “subseasonal”, “Under Secretary”, and
17 “weather enterprise” have the meanings given those
18 terms in section 2 of the Weather Research and Fore-
19 casting Innovation Act of 2017 (15 U.S.C. 8501).

20 (7) *SYNTHETIC DATA.*—The term “synthetic
21 data” means data produced from a model or statis-
22 tical method in order to fill gaps in observational
23 data.

24 (8) *WEATHER DATA.*—The term “weather data”
25 means information used to track and predict weather

1 *conditions and patterns, including forecasts, observa-*
 2 *tions, and derivative products from such information.*

3 *(b) PURPOSE.—The purpose of this section is—*

4 *(1) to improve accuracy and timeliness of weath-*
 5 *er, water, and space weather forecasts and effective*
 6 *dissemination of critical information;*

7 *(2) to strengthen analytic capacity to inform re-*
 8 *source deployments in response to and to mitigate*
 9 *harm from weather, water, wildfires, and space*
 10 *weather hazards through the mandated exploration*
 11 *and use of artificial intelligence by Federal agencies;*

12 *(3) to strengthen public-private partnerships to*
 13 *accelerate adoption and outcomes of the use of artifi-*
 14 *cial intelligence in response to and to mitigate such*
 15 *harm; and*

16 *(4) to strengthen public-private partnerships in*
 17 *highly technical, high-risk, and high-reward fields re-*
 18 *lated to weather, water, wildfires, and space weather*
 19 *forecasts.*

20 *(c) EARTH SYSTEM FORECASTING AND INFORMATION*
 21 *DELIVERY.—*

22 *(1) TRAINING DATASETS.—Not later than 4*
 23 *years after the date of the enactment of this Act, the*
 24 *Under Secretary, in consultation with the Secretary*
 25 *of Energy, the Administrator of the National Aero-*

1 *navitics and Space Administration, the Director of the*
 2 *National Science Foundation, the Director of the Na-*
 3 *tional Center for Atmospheric Research, the Inter-*
 4 *agency Council on Advancing Meteorological Services,*
 5 *other appropriate Federal advisory committees as de-*
 6 *termined by the Under Secretary, and such other*
 7 *technical experts as the Under Secretary considers ap-*
 8 *propriate, shall develop and curate comprehensive*
 9 *weather forecasting training datasets with relevant*
 10 *Earth system data, quality information, and*
 11 *metadata necessary for weather forecasting.*

12 (2) *USE OF EXISTING DATASETS.—In order to*
 13 *speed the development of the weather forecasting*
 14 *training datasets required under paragraph (1), the*
 15 *Under Secretary shall assess, and to the greatest ex-*
 16 *tent practicable build on, existing Earth system rea-*
 17 *nalysis datasets of the Federal Government.*

18 (3) *ARTIFICIAL INTELLIGENCE WEATHER*
 19 *MODEL.—*

20 (A) *GLOBAL MODEL.—In carrying out this*
 21 *subsection, the Under Secretary, in consultation*
 22 *with appropriate Federal advisory committees as*
 23 *determined by the Under Secretary, may develop*
 24 *and test a global weather model based on artifi-*
 25 *cial intelligence technologies utilizing data of the*

1 *National Oceanic and Atmospheric Administra-*
 2 *tion to the extent possible.*

3 (B) *REGIONAL AND LOCAL MODELS.*—*In*
 4 *addition to a global weather model under sub-*
 5 *paragraph (A), the Under Secretary may experi-*
 6 *ment with regional and local weather models*
 7 *based on artificial intelligence technologies.*

8 (4) *USE OF ARTIFICIAL INTELLIGENCE TO DIS-*
 9 *SEMINATE INFORMATION.*—*In coordination with an*
 10 *artificial intelligence weather model or models devel-*
 11 *oped under paragraph (3), the Under Secretary may*
 12 *explore the use of artificial intelligence to enhance the*
 13 *dissemination of information with respect to weather*
 14 *and wildfire risks and evaluate the effectiveness of*
 15 *communication for improved public understanding*
 16 *and preparedness.*

17 (5) *CONTINUED SUPPORT FOR OBSERVATIONS,*
 18 *BASIC RESEARCH, AND NUMERICAL WEATHER MOD-*
 19 *ELS.*—*Notwithstanding the requirements of this sub-*
 20 *section, the Under Secretary shall continue to support*
 21 *and advance the activities of the National Oceanic*
 22 *and Atmospheric Administration—*

23 (A) *to collect and acquire traditional and*
 24 *novel observational data relevant for artificial*

1 *intelligence and numerical weather, water, and*
 2 *space weather forecasting;*

3 *(B) to advance research on the Earth sys-*
 4 *tem and numerical weather model forecasting;*

5 *(C) to develop and advance numerical*
 6 *Earth system modeling for predictions;*

7 *(D) to develop weather model data post-*
 8 *processing techniques; and*

9 *(E) to improve data assimilation tech-*
 10 *niques.*

11 (6) *OBSERVING SYSTEM COVERAGE.*—*In car-*
 12 *rying out this subsection, the Under Secretary may*
 13 *evaluate the use of cost functions in data-driven ma-*
 14 *chine learning model training to balance inequities in*
 15 *observing system coverage and data poor areas.*

16 (7) *UNCERTAINTY QUANTIFICATION RESEARCH.*—
 17 *In carrying out this subsection, the Under Secretary*
 18 *may develop uncertainty quantification research for*
 19 *the purpose of accurate environmental risk and haz-*
 20 *ard communications of probabilistic predictions and*
 21 *forecasts.*

22 (8) *REPORT.*—*Not later than 2 years after the*
 23 *date of the enactment of this Act, and not less fre-*
 24 *quently than every 2 years thereafter through 2035,*
 25 *the Under Secretary shall submit to the Committee on*

1 *Commerce, Science, and Transportation of the Senate*
 2 *and the Committee on Science, Space, and Technology*
 3 *of the House of Representatives a report on the activi-*
 4 *ties conducted under this subsection.*

5 (d) *ADVANCED ARTIFICIAL INTELLIGENCE APPLICA-*
 6 *TIONS FOR WEATHER FORECASTS AND INFORMATION DE-*
 7 *LIVERY.—The Under Secretary shall explore advanced ap-*
 8 *plications of artificial intelligence to improve weather fore-*
 9 *casts and information delivery, such as by—*

10 (1) *improving data assimilation;*

11 (2) *accounting for coupled Earth system proc-*
 12 *esses;*

13 (3) *improving readiness and preparedness to*
 14 *combat wildfires, mitigation of the risk from*
 15 *wildfires, and improving safety for firefighters and*
 16 *communities at risk from wildfires;*

17 (4) *using artificial intelligence weather models to*
 18 *generate ensemble forecasts to more accurately assess*
 19 *flow-dependent forecast uncertainties; and*

20 (5) *improving impact-based decision support for*
 21 *greater societal benefits based on those forecasts.*

22 (e) *TECHNICAL ASSISTANCE ON USE OF ARTIFICIAL*
 23 *INTELLIGENCE WEATHER, WATER, AND SPACE WEATHER*
 24 *MODELS.—*

1 (1) *IN GENERAL.*—*The Under Secretary shall*
2 *provide—*

3 (A) *technical assistance, data access, and*
4 *support for forecasters, scientists, social sci-*
5 *entists, and engineers to test and evaluate the use*
6 *and effectiveness of the artificial intelligence*
7 *models of the National Oceanic and Atmospheric*
8 *Administration, including within the testbeds of*
9 *the Administration;*

10 (B) *best practices on providing forecasts*
11 *based on outputs from artificial intelligence*
12 *weather models and numerical weather models,*
13 *or a combination thereof; and*

14 (C) *support for emergency managers to*
15 *make operational decisions based on outputs*
16 *from artificial intelligence weather models and*
17 *numerical weather models, or a combination*
18 *thereof.*

19 (2) *ASSESSMENT OF WEATHER MODELS.*—

20 (A) *IN GENERAL.*—*The Under Secretary*
21 *shall support the development of a common*
22 *framework for the assessment of numerical*
23 *weather models and artificial intelligence weath-*
24 *er models by comparing model output and obser-*
25 *vational data over a period of time in the past*

1 *through the use of such methodologies as the*
 2 *Under Secretary considers appropriate.*

3 *(B) BEST PRACTICES.—In carrying out this*
 4 *paragraph, the Under Secretary may develop*
 5 *and disseminate best practices in collaboration*
 6 *with—*

7 *(i) the National Institute of Standards*
 8 *and Technology, the National Aeronautics*
 9 *and Space Administration, the National*
 10 *Science Foundation, and the Department of*
 11 *Energy;*

12 *(ii) academic and research institu-*
 13 *tions; and*

14 *(iii) the private sector.*

15 *(3) TECHNICAL ASSISTANCE.—In carrying out*
 16 *this subsection, the Under Secretary may provide*
 17 *technical assistance, best practices, and support re-*
 18 *quired under paragraph (1) through the National*
 19 *Weather Service.*

20 *(4) INDEPENDENT STUDY ON THE IMPACTS OF*
 21 *ARTIFICIAL INTELLIGENCE WEATHER, WATER, AND*
 22 *SPACE WEATHER MODELS.—The Under Secretary*
 23 *may enter into an agreement with the National Acad-*
 24 *emy of Sciences or another entity as determined ap-*
 25 *propriate by the Under Secretary to assess the im-*

1 *pacts of artificial intelligence weather models on the*
 2 *weather enterprise and make recommendations to im-*
 3 *prove the integration of such models in operational*
 4 *forecasting.*

5 *(f) PARTNERSHIPS FOR TRANSFORMATIONAL INNOVA-*
 6 *TION.—*

7 *(1) IN GENERAL.—The Under Secretary may ex-*
 8 *plore novel structures for partnerships with private,*
 9 *academic, and international entities for research and*
 10 *development of transformative innovation in weather*
 11 *forecasting and other environmental forecasts—*

12 *(A) to further the understanding of weather,*
 13 *water, wildfires, and space weather, and their so-*
 14 *cietal impact;*

15 *(B) to advance the science of weather and*
 16 *water forecasting, including seasonal and subsea-*
 17 *sonal forecasting; and*

18 *(C) to develop, evaluate, and transition ar-*
 19 *tificial intelligence weather, water, and hazard*
 20 *forecasting applications to operations.*

21 *(2) CO-INVESTMENT.—Subject to applicable law,*
 22 *the Under Secretary may consider and adopt novel*
 23 *co-investment strategies with the private academic*
 24 *and international sectors to carry out paragraph (1),*
 25 *including—*

1 (A) *non-Federal Government contributions*
2 *to resource and support high-risk, high-return re-*
3 *search and development in environmental fore-*
4 *casting, data science, artificial intelligence, and*
5 *related fields;*

6 (B) *shared rights to intellectual property*
7 *from research and development activities under*
8 *this subsection; and*

9 (C) *other approaches to sharing resources*
10 *and results under this subsection.*

11 (g) *AVAILABILITY OF DATASET.—*

12 (1) *IN GENERAL.—The Under Secretary shall de-*
13 *velop and implement a plan to make available to the*
14 *public, at no cost and subject to applicable law and*
15 *policy, the following:*

16 (A) *Operational artificial intelligence*
17 *weather models developed by the National Oce-*
18 *anic and Atmospheric Administration.*

19 (B) *Artificial intelligence weather models*
20 *that are not operational models, including exper-*
21 *imental and developmental models, as the Under*
22 *Secretary determines appropriate.*

23 (C) *Applicable information and documenta-*
24 *tion for artificial intelligence weather models de-*

scribed in subparagraphs (A) and (B), including
a description of intended model outputs.

(D) Subject to subsection (i), all data owned
by the Federal Government and data that the
Under Secretary has the legal right to redis-
tribute that are associated with artificial intel-
ligence weather models made available to the
public pursuant to the plan and used in oper-
ational forecasting by the Administration, in-
cluding—

(i) relevant metadata; and

(ii) data used for operational artificial
intelligence weather models used by the Ad-
ministration.

(2) ACCOMMODATIONS.—In developing and im-
plementing the plan under paragraph (1), the Under
Secretary may make such accommodations as the
Under Secretary considers appropriate to ensure that
the public release of any artificial intelligence weather
model, information, documentation, or data pursuant
to the plan does not jeopardize—

(A) national security;

(B) intellectual property or redistribution
rights, including under titles 17 and 35, United
States Code;

1 (C) any trade secret or commercial or fi-
 2 nancial information subject to section 552(b)(4)
 3 of title 5, United States Code;

4 (D) any models or data that are otherwise
 5 restricted by contract or other written agreement;
 6 or

7 (E) the mission of the Administration to
 8 protect lives and property.

9 (3) *REPORT.*—

10 (A) *IN GENERAL.*—Not later than one year
 11 after the date of the enactment of this Act, the
 12 Under Secretary shall submit to Congress a re-
 13 port, in both unclassified and classified form, re-
 14 garding the risks to the economic and intellectual
 15 security of the United States from foreign coun-
 16 tries of concern through access by those countries
 17 to weather data in the United States.

18 (B) *ELEMENTS.*—The report required under
 19 subparagraph (A) shall include—

20 (i) a full analysis of the national, in-
 21 tellectual, and economic security implica-
 22 tions for the United States with respect to
 23 intellectual property theft or cyber or
 24 human espionage through access to weather
 25 data; and

1 (ii) conclusions of the Under Secretary
 2 and recommendations for legislative and
 3 administrative action, if any.

4 (C) *FOREIGN COUNTRY OF CONCERN DE-*
 5 *FINED.*—In this paragraph, the term “foreign
 6 country of concern” has the meaning given that
 7 term in section 9901 of the William M. (Mac)
 8 Thornberry National Defense Authorization Act
 9 for Fiscal Year 2021 (15 U.S.C. 4651).

10 (h) *RETENTION OF FEDERAL GOVERNMENT EXPER-*
 11 *TISE.*—Subject to applicable law, the Under Secretary may
 12 consider novel methods to recruit, retrain, and retain expert
 13 personnel to support activities under this section, including
 14 by—

15 (1) using methods to be competitive with salaries
 16 outside the Federal Government;

17 (2) developing staff exchange programs and
 18 training programs; and

19 (3) leveraging applicable hiring and retention
 20 strategies authorized for Federal agencies.

21 (i) *PROTECTION OF NATIONAL SECURITY INTER-*
 22 *ESTS.*—

23 (1) *IN GENERAL.*—Notwithstanding any other
 24 provision of this section, the Under Secretary, in con-
 25 sultation with the Secretary of Defense, as appro-

1 *priate, may withhold models or data used under this*
2 *section if the Under Secretary determines doing so to*
3 *be necessary to protect the national security interests*
4 *of the United States.*

5 (2) *RULE OF CONSTRUCTION.—Nothing in this*
6 *section shall be construed to supersede any other pro-*
7 *vision of law governing the protection of the national*
8 *security interests of the United States.*

9 (j) *AUTHORIZATION OF APPROPRIATIONS.—There is*
10 *authorized to be appropriated to the Under Secretary to*
11 *carry out this section—*

12 (1) *for fiscal year 2026, \$105,000,000; and*

13 (2) *for each of fiscal years 2027 through 2030,*
14 *\$25,000,000.*

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[Report No. 119-88]

A BILL

To enhance the use by the National Oceanic and Atmospheric Administration of artificial intelligence for weather forecasting, and for other purposes.

OCTOBER 21, 2025

Reported with an amendment