

119TH CONGRESS  
1ST SESSION

# H. R. 5089

To improve the National Oceanic and Atmospheric Administration's weather research, support improvements in weather forecasting and prediction, expand commercial opportunities for the provision of weather data, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 2, 2025

Mr. LUCAS (for himself, Ms. LOFGREN, Mr. BABIN, Ms. BONAMICI, Mr. WEBER of Texas, Ms. STEVENS, Mr. FLEISCHMANN, Ms. ROSS, Mr. SCOTT FRANKLIN of Florida, Mrs. FOUSHEE, Mr. HARIDOPOLOS, Mr. WHITESIDES, Mr. MILLER of Ohio, Mr. AMO, Mr. ROUZER, Ms. MCBRIDE, Ms. TENNEY, Mr. FROST, Mrs. MCCLAIN DELANEY, and Ms. FRIEDMAN) introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Natural Resources, 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

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## A BILL

To improve the National Oceanic and Atmospheric Administration's weather research, support improvements in weather forecasting and prediction, expand commercial opportunities for the provision of weather data, 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,*

1 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

2 (a) SHORT TITLE.—This Act may be cited as the  
 3 “Weather Research and Forecasting Innovation Reauthor-  
 4 ization Act of 2025” or the “Weather Act Reauthorization  
 5 Act of 2025”.

6 (b) TABLE OF CONTENTS.—The table of contents for  
 7 this Act is as follows:

Sec. 1. Short title; table of contents.  
 Sec. 2. Definitions.

**TITLE I—REAUTHORIZATION OF THE WEATHER RESEARCH AND  
 FORECASTING INNOVATION ACT OF 2017**

Sec. 101. Public safety priority.  
 Sec. 102. United States weather research and forecasting.  
 Sec. 103. Verification of the Origins of Rotation in Tornadoes Experiment  
 (VORTEX).  
 Sec. 104. Hurricane forecast improvement program.  
 Sec. 105. Tsunami Warning and Education Act reauthorization.  
 Sec. 106. Observing system planning.  
 Sec. 107. Observing system simulation experiments.  
 Sec. 108. Computing resources prioritization.  
 Sec. 109. Earth prediction innovation center.  
 Sec. 110. Satellite architecture planning.  
 Sec. 111. Improving uncrewed activities.  
 Sec. 112. Interagency Council for Advancing Meteorological Services.  
 Sec. 113. Ocean observations.  
 Sec. 114. Consolidation of reports.  
 Sec. 115. Certain definitions under Flood Level Observation, Operations, and  
 Decision Support Act.  
 Sec. 116. Reauthorization of National Landslide Preparedness Act.  
 Sec. 117. Amendments to Harmful Algal Bloom and Hypoxia Research and  
 Control Act of 1998.

**TITLE II—ENHANCING FEDERAL WEATHER FORECASTING AND  
 INNOVATION**

Sec. 201. Weather innovation for the next generation.  
 Sec. 202. Next generation radar.  
 Sec. 203. Data voids in highly vulnerable areas of the United States.  
 Sec. 204. Atmospheric rivers forecast improvement program.  
 Sec. 205. Coastal flooding and storm surge forecast improvement program.  
 Sec. 206. Aviation weather and data innovation.  
 Sec. 207. NESDIS joint venture partnership transition program.  
 Sec. 208. Advanced weather interactive processing system.  
 Sec. 209. Reanalysis and reforecasting.  
 Sec. 210. National Weather Service workforce.

TITLE III—COMMERCIAL WEATHER AND ENVIRONMENTAL  
OBSERVATIONS

- Sec. 301. Commercial Data Program.
- Sec. 302. Commercial Data Pilot Program.
- Sec. 303. Contracting authority and avoidance of duplication.
- Sec. 304. Data assimilation, management, and sharing practices.
- Sec. 305. Clerical amendment.

TITLE IV—COMMUNICATING WEATHER TO THE PUBLIC

- Sec. 401. Definitions.
- Sec. 402. Hazardous weather or water event risk communication.
- Sec. 403. Hazard communication research and engagement.
- Sec. 404. National Weather Service communications improvement.
- Sec. 405. NOAA Weather Radio modernization.
- Sec. 406. Post-storm surveys and assessments.
- Sec. 407. Government Accountability Office report on alert dissemination for hazardous weather or water events.
- Sec. 408. Data collection management and protection.

TITLE V—IMPROVING WEATHER INFORMATION FOR  
AGRICULTURE AND WATER MANAGEMENT

- Sec. 501. Weather and climate information in agriculture and water management.
- Sec. 502. National Integrated Drought Information System.
- Sec. 503. National Mesonet Program.
- Sec. 504. National Coordinated Soil Moisture Monitoring Network.
- Sec. 505. National water center.
- Sec. 506. Satellite transfers report.
- Sec. 507. Precipitation forecast improvement program.

**1 SEC. 2. DEFINITIONS.**

2       (a) IN GENERAL.—In this Act, the terms “seasonal”,  
3 “State”, “subseasonal”, “Under Secretary”, “weather en-  
4 terprise”, “weather data”, and “weather industry” have  
5 the meanings given such terms in section 2 of the Weather  
6 Research and Forecasting Innovation Act of 2017 (15  
7 U.S.C. 8501).

8       (b) WEATHER DATA DEFINED.—Section 2 of the  
9 Weather Research and Forecasting Innovation Act of  
10 2017 (15 U.S.C. 8501) is amended—

1 (1) by redesignating paragraph (5) as para-  
2 graph (6); and

3 (2) by inserting after paragraph (4) the fol-  
4 lowing new paragraph:

5 “(5) WEATHER DATA.—The term ‘weather  
6 data’ means information used to track and predict  
7 weather conditions and patterns, including forecasts,  
8 observations, and derivative products from such in-  
9 formation.”.

10 **TITLE I—REAUTHORIZATION OF**  
11 **THE WEATHER RESEARCH**  
12 **AND FORECASTING INNOVA-**  
13 **TION ACT OF 2017**

14 **SEC. 101. PUBLIC SAFETY PRIORITY.**

15 Section 101 of the Weather Research and Fore-  
16 casting Innovation Act of 2017 (15 U.S.C. 8511) is  
17 amended by adding at the end the following new sentence:  
18 “The Under Secretary shall ensure the National Oceanic  
19 and Atmospheric Administration remains focused on pro-  
20 viding accurate and timely weather forecasts that protect  
21 lives and property and enhance the national economy by  
22 disseminating to the public and core partners through  
23 nimble, flexible, and mobile methods critical weather infor-  
24 mation and impact-based decision support services.”.

1 **SEC. 102. UNITED STATES WEATHER RESEARCH AND FORE-**  
2 **CASTING.**

3 Section 110 of the Weather Research and Fore-  
4 casting Innovation Act of 2017 (15 U.S.C. 8519) is  
5 amended to read as follows:

6 **“SEC. 110. AUTHORIZATION OF APPROPRIATIONS.**

7 “(a) AUTHORIZATION OF APPROPRIATIONS.—There  
8 are authorized to be appropriated to the Office of Oceanic  
9 and Atmospheric Research to carry out this title the fol-  
10 lowing:

11 “(1) \$163,794,000 for fiscal year 2026, of  
12 which—

13 “(A) \$91,058,000 is authorized for weath-  
14 er laboratories and cooperative institutes;

15 “(B) \$39,491,000 is authorized for the  
16 United States Weather Research Program;

17 “(C) \$21,125,000 is authorized for tor-  
18 nado, severe storm, and next generation radar  
19 research; and

20 “(D) \$12,120,000 is authorized for the  
21 joint technology transfer initiative described in  
22 section 102(b)(4) of this title.

23 “(2) \$165,432,000 for fiscal year 2027, of  
24 which—

25 “(A) \$91,968,000 is authorized for weath-  
26 er laboratories and cooperative institutes;

1           “(B) \$39,866,000 is authorized for the  
2           United States Weather Research Program;

3           “(C) \$21,336,000 is authorized for tor-  
4           nado, severe storm, and next generation radar  
5           research; and

6           “(D) \$12,241,000 is authorized for the  
7           joint technology transfer initiative described in  
8           section 102(b)(4) of this title.

9           “(3) \$167,086,000 for fiscal year 2028, of  
10          which—

11           “(A) \$92,888,000 is authorized for weath-  
12           er laboratories and cooperative institutes;

13           “(B) \$40,285,000 is authorized for the  
14           United States Weather Research Program;

15           “(C) \$21,550,000 is authorized for tor-  
16           nado, severe storm, and next generation radar  
17           research; and

18           “(D) \$12,364,000 is authorized for the  
19           joint technology transfer initiative described in  
20           section 102(b)(4) of this title.

21           “(4) \$168,757,000 for fiscal year 2029, of  
22          which—

23           “(A) \$93,817,000 is authorized for weath-  
24           er laboratories and cooperative institutes;

1           “(B) \$40,688,000 is authorized for the  
2           United States Weather Research Program;

3           “(C) \$21,765,000 is authorized for tor-  
4           nado, severe storm, and next generation radar  
5           research; and

6           “(D) \$12,487,000 is authorized for the  
7           joint technology transfer initiative described in  
8           section 102(b)(4) of this title.

9           “(5) \$170,444,000 for fiscal year 2030, of  
10          which—

11           “(A) \$94,755,000 is authorized for weath-  
12           er laboratories and cooperative institutes;

13           “(B) \$41,094,000 is authorized for the  
14           United States Weather Research Program;

15           “(C) \$21,983,000 is authorized for tor-  
16           nado, severe storm, and next generation radar  
17           research; and

18           “(D) \$12,612,000 is authorized for the  
19           joint technology transfer initiative described in  
20           section 8512(b)(4) of this title.

21          “(b) LIMITATION.—No additional funds are author-  
22          ized to carry out this title or the amendments made by  
23          this title.”.

1 **SEC. 103. VERIFICATION OF THE ORIGINS OF ROTATION IN**  
2 **TORNADOES EXPERIMENT (VORTEX).**

3 (a) IN GENERAL.—Section 103 of the Weather Re-  
4 search and Forecasting Innovation Act of 2017 (15 U.S.C.  
5 8513) is amended to read as follows:

6 **“SEC. 103. VERIFICATION OF THE ORIGINS OF ROTATION IN**  
7 **TORNADOES EXPERIMENT (VORTEX).**

8 “(a) IN GENERAL.—The Under Secretary, in collabo-  
9 ration with the United States weather industry and aca-  
10 demic partners, shall maintain a program for rapidly im-  
11 proving tornado forecasts, predictions, and warnings, in-  
12 cluding forecaster training in radar interpretation and in-  
13 formation integration from new sources.

14 “(b) GOAL.—The goal of the program under sub-  
15 section (a) shall be to develop and extend accurate tornado  
16 forecasts, predictions, and warnings in order to reduce the  
17 loss of life or property related to tornadoes, with a focus  
18 on the following:

19 “(1) Improving the effectiveness and timeliness  
20 of tornado forecasts, predictions, and warnings.

21 “(2) Optimizing lead time and providing action-  
22 able information beyond one hour in advance.

23 “(3) Transitioning from warn-on-detection to  
24 warn-on-forecast.

25 “(c) INNOVATIVE OBSERVATIONS.—The Under Sec-  
26 retary shall ensure the program under subsection (a) peri-



1 odically examines, tests, and evaluates the value of incor-  
2 porating innovative observations, such as novel sensor  
3 technologies, observation tools or networks, crewed or  
4 uncrewed systems, and hosted instruments on commercial  
5 aircrafts, vessels, and satellites, with respect to the im-  
6 provement of tornado forecasts, predictions, and warnings.

7 “(d) ACTIVITIES.—The Under Secretary shall award  
8 grants for research, including relating to the following:

9 “(1) Implementing key goals and achieving pro-  
10 gram milestones to the maximum extent practicable  
11 as outlined by the National Oceanic and Atmos-  
12 pheric Administration’s 2019 report, ‘Tornado  
13 Warning Improvement and Extension Program  
14 Plan’.

15 “(2) In coordination with the National Science  
16 and Technology Council’s Social and Behavioral  
17 Sciences Subcommittee, improving the social, behav-  
18 ioral, risk, communication, and economic sciences re-  
19 garding vulnerabilities, risk communication, and de-  
20 livery of information critical for reducing the loss of  
21 life or property related to tornadoes.

22 “(3) Improving the physical sciences, computer  
23 modeling, and tools related to tornado formation, the  
24 impacts of tornadoes on the built and natural envi-

1       ronment, and the interaction of tornadoes and hurri-  
2       canes.

3       “(e) WARNINGS.—In carrying out subsection (a), the  
4 Under Secretary, in coordination with the program estab-  
5 lished under section 406, shall—

6               “(1) conduct and transition to operations the  
7 research necessary to develop and deploy prob-  
8 abilistic weather forecast guidance technology for  
9 tornadoes and related weather phenomena;

10              “(2) incorporate into tornado modeling and  
11 forecasting, as appropriate, social, behavioral, risk,  
12 communication, and economic sciences;

13              “(3) enhance workforce training on radar inter-  
14 pretation and use of tornado warning systems; and

15              “(4) expand computational resources to support  
16 higher-resolution modeling to advance the capability  
17 for warn-on-forecast.

18       “(f) TORNADO RATING SYSTEM.—The Under Sec-  
19 retary, in collaboration with local communities and emer-  
20 gency managers, shall—

21              “(1) evaluate the system used as of the date of  
22 the enactment of this section to rate the severity of  
23 tornadoes;

1 “(2) determine whether updates to such system  
 2 are required to ensure such ratings accurately reflect  
 3 the severity of tornados; and

4 “(3) if determined necessary, update such sys-  
 5 tem.

6 “(g) ANNUAL BUDGET.—The Under Secretary shall,  
 7 not less frequently than annually, submit to Congress a  
 8 proposed budget corresponding with carrying out this sec-  
 9 tion.”.

10 (b) CLERICAL AMENDMENT.—The table of contents  
 11 in section 1(b) of the Weather Research and Forecasting  
 12 Innovation Act of 2017 is amended by amending the item  
 13 relating to section 103 to read as follows:

“Sec. 103. Verification of the Origins of Rotation in Tornadoes Experiment  
 (VORTEX).”.

14 **SEC. 104. HURRICANE FORECAST IMPROVEMENT PRO-**  
 15 **GRAM.**

16 Section 104 of the Weather Research and Fore-  
 17 casting Innovation Act of 2017 (15 U.S.C. 8514) is  
 18 amended to read as follows:

19 **“SEC. 104. HURRICANE FORECAST IMPROVEMENT PRO-**  
 20 **GRAM.**

21 “(a) IN GENERAL.—The Under Secretary, in collabo-  
 22 ration with the United States weather industry and aca-  
 23 demic partners, shall maintain a program to improve hur-  
 24 ricane forecasting, predictions, and warnings.

1       “(b) GOAL.—The goal of the program under sub-  
2 section (a) shall be to develop and extend accurate hurri-  
3 cane forecasts, predictions, and warnings in order to re-  
4 duce the loss of life or property related to hurricanes, with  
5 a focus on the following:

6               “(1) Improving the understanding and pre-  
7 diction of rapid intensity change and projected path  
8 of hurricanes, including probabilistic methods for  
9 hurricane hazard mapping.

10              “(2) Improving the forecast and impact-based  
11 communication of inland flooding, compound flood-  
12 ing, and storm surges from hurricanes, in coordina-  
13 tion with the program established under section 205  
14 of the Weather Act Reauthorization Act of 2025.

15              “(3) Incorporating social, behavioral, risk, com-  
16 munication, and economic sciences to clearly inform  
17 response to prevent the loss of life or property, such  
18 as evacuation or shelter in place.

19              “(4) Evaluating and incorporating, as appro-  
20 priate, innovative observations, such as novel sensor  
21 technologies, observation tools or networks, crewed  
22 or uncrewed systems, and hosted instruments on  
23 commercial aircrafts, vessels, and satellites.

24       “(c) ACTIVITIES.—The Under Secretary shall award  
25 grants for research, including relating to the following:

1           “(1) Implementing key strategies and following  
2           priorities and objectives outlined by the National  
3           Oceanic and Atmospheric Administration’s 2019 re-  
4           port ‘Hurricane Forecast Improvement Program’.

5           “(2) In coordination with the National Science  
6           and Technology Council’s Social and Behavioral  
7           Sciences Subcommittee and other relevant inter-  
8           agency committees, improving the social, behavioral,  
9           risk, communications, and economic sciences related  
10          to vulnerabilities, risk communication, and delivery  
11          of information critical for reducing the loss of life or  
12          property related to hurricanes.

13          “(3) Improving the physical sciences, oper-  
14          ational modeling, and tools related to hurricane for-  
15          mation, the impacts of wind and water-based hurri-  
16          cane hazards on the built and natural environment,  
17          and the interaction of hurricanes and tornadoes.

18          “(d) WARNINGS.—In carrying out subsection (a), the  
19          Under Secretary, in coordination with the program estab-  
20          lished under section 406, shall—

21                 “(1) conduct and transition to operations the  
22                 research necessary to develop and deploy prob-  
23                 abilistic weather forecast guidance technology relat-  
24                 ing to hurricanes and related weather phenomena;

1 “(2) incorporate into hurricane modeling and  
2 forecasting, as appropriate, social, behavioral, risk,  
3 communication, and economic sciences research; and

4 “(3) expand computational resources to support  
5 and improve higher-resolution operational modeling  
6 of hurricanes and related weather phenomena.

7 “(e) ANNUAL BUDGET.—The Under Secretary shall,  
8 not less frequently than annually, submit to Congress a  
9 proposed budget corresponding with carrying out this sec-  
10 tion.”.

11 **SEC. 105. TSUNAMI WARNING AND EDUCATION ACT REAU-**  
12 **THORIZATION.**

13 (a) TITLE HEADING.—The Tsunami Warning and  
14 Education Act (enacted as title VIII of the Magnuson-Ste-  
15 vens Fishery Conservation and Management Reauthoriza-  
16 tion Act of 2006 (Public Law 109–479)) is amended, in  
17 the title heading for title VIII, by inserting “**RE-**  
18 **SEARCH,**” after “**WARNING,**”.

19 (b) PURPOSES.—Section 803 of the Tsunami Warn-  
20 ing and Education Act (33 U.S.C. 3202) is amended—

21 (1) in paragraph (2), by inserting “timeliness  
22 and” before “accuracy”;

23 (2) in paragraph (7), by striking “and” after  
24 the semicolon;

1           (3) in paragraph (8), by striking the period and  
2     inserting “; and”; and

3           (4) by adding at the end the following new  
4     paragraph:

5           “(9) to ensure data and metadata are managed,  
6     archived, and made available for operations, re-  
7     search, education, and mitigation activities in ac-  
8     cordance with section 305 of the Weather Research  
9     and Forecasting Innovation Act of 2017.”.

10       (c) TSUNAMI FORECASTING AND WARNING PRO-  
11     GRAM.—Section 804 of the Tsunami Warning and Edu-  
12     cation Act (33 U.S.C. 3203) is amended—

13           (1) in subsection (b)—

14                (A) in paragraph (4), by inserting “, using  
15                industry and scientific best practices,” after  
16                “operational condition”;

17                (B) in paragraph (5)—

18                   (i) in subparagraph (C), by striking  
19                   “global seismic network” and inserting  
20                   “Global Seismic Network”;

21                   (ii) by redesignating subparagraphs  
22                   (D), (E), (F), and (G), as subparagraphs  
23                   (E), (F), (G), and (H), respectively; and

24                   (iii) by inserting after subparagraph  
25                   (C) the following new subparagraph:

1           “(D) the global navigation satellite system  
2           (GNSS) network;”;

3           (C) by amending paragraph (6) to read as  
4           follows:

5           “(6) ensure data quality and management sys-  
6           tems, support data and metadata access and  
7           archiving, and support the requirements of the pro-  
8           gram pursuant to the Foundations for Evidence-  
9           Based Policymaking Act of 2018 (Public Law 115–  
10          435) and chapter 31 of title 44, United States  
11          Code;”;

12          (D) in paragraph (7)—

13               (i) by amending the matter preceding  
14               subparagraph (A) to read as follows: “in-  
15               clude a cooperative effort among the Ad-  
16               ministration, the United States Geological  
17               Survey (USGS), the National Aeronautics  
18               and Space Administration (NASA), and  
19               the National Science Foundation (NSF)  
20               under which the Director of USGS, the Di-  
21               rector of the NSF, and the Administrator  
22               of NASA shall—”;

23               (ii) in subparagraph (A), by striking  
24               “and” at the end; and



1 (iii) by adding at the end the fol-  
2 lowing new subparagraphs:

3 “(C) provide reliable and real-time support  
4 for the GNSS network data streams from NSF,  
5 NASA, and USGS maintained networks, and  
6 supplement instrumentation coverage for rapid  
7 earthquake assessment;

8 “(D) assess the data and information re-  
9 lating to warning systems of collaborating agen-  
10 cies for potential utilization in NOAA’s warning  
11 system, taking into consideration advancement  
12 in research and technology;

13 “(E) incorporate, as practicable, tsunami  
14 notifications and warnings in the USGS Earth-  
15 quake Early Warning System; and

16 “(F) incorporate, as practicable, prelimi-  
17 nary analysis or data from the National Earth-  
18 quake Information Center regarding the source  
19 and magnitude of an offshore earthquake with-  
20 in five minutes of detection;”;

21 (E) in paragraph (8)—

22 (i) by inserting “and decision support  
23 aides” after “graphical warning prod-  
24 ucts,”; and

1 (ii) by inserting “-prone” after “tsu-  
2 nami”;

3 (F) in paragraph (9), by striking “and”  
4 after the semicolon;

5 (G) in paragraph (10), by striking the pe-  
6 riod and inserting “; and”; and

7 (H) by adding at the end the following new  
8 paragraph:

9 “(11) update tsunami inundation maps, models,  
10 or other geographic products, in order to best sup-  
11 port, as appropriate, relevant agencies with tsunami  
12 mitigation and recovery activities.”;

13 (2) in subsection (c)—

14 (A) by striking paragraph (1) and redesign-  
15 ating paragraphs (2) and (3) as paragraphs  
16 (1) and (2), respectively; and

17 (B) in paragraph (1), as so redesignated—

18 (i) by striking “the Atlantic Ocean,  
19 including the Caribbean Sea and Gulf of  
20 Mexico, that are determined—” and insert-  
21 ing “the Pacific, Arctic, and Atlantic  
22 Oceans, including the Caribbean Sea and  
23 Gulf of Mexico, that are determined to  
24 pose significant risks of tsunami for States

1 and United States territories along the  
2 coastal areas of such regions; and”;

3 (ii) by striking subparagraphs (A) and  
4 (B);

5 (3) by redesignating subsections (d), (e), (f),  
6 and (g) as subsections (e), (f), (g), and (h), respec-  
7 tively;

8 (4) by inserting after subsection (c) the fol-  
9 lowing new subsection:

10 “(d) TSUNAMI WARNING ALERT LEVEL EVALUA-  
11 TION.—The Administrator, in collaboration with social sci-  
12 entists, emergency personnel, and high-risk communities,  
13 shall—

14 “(1) evaluate tsunami alert levels terminology,  
15 timing, and effectiveness;

16 “(2) determine if such alerts produce the de-  
17 sired response and understanding from possible tsu-  
18 nami-prone communities; and

19 “(3) if necessary, update the alert level system  
20 for increased effectiveness.”;

21 (5) in subsection (e), as so redesignated—

22 (A) in paragraph (1)—

23 (i) in the matter preceding subpara-  
24 graph (A), by inserting “responsible for  
25 Alaska, the continental United States, Ha-

1 waii, United States territories, and inter-  
2 national entities the Administrator deter-  
3 mines appropriate” before the period;

4 (ii) in subparagraph (A), by striking  
5 “which is primarily responsible for Alaska  
6 and the continental United States”; and

7 (iii) in subparagraph (B), by striking  
8 “, which is primarily responsible for Ha-  
9 waii, the Caribbean, and other areas of the  
10 Pacific not covered by the National Cen-  
11 ter”;

12 (B) in paragraph (2)—

13 (i) in subparagraph (A), by inserting  
14 “current,” after “sea level,”;

15 (ii) in subparagraph (B), by striking  
16 “and volcanic eruptions” and inserting  
17 “volcanic eruptions, or other sources”;

18 (iii) in subparagraph (C), by striking  
19 “buoy data and tidal” and inserting “and  
20 coastal”;

21 (iv) in subparagraph (E), by striking  
22 “Integrated Ocean Observing System of  
23 the Administration” and inserting “United  
24 States and global ocean and coastal observ-  
25 ing system”;

1 (v) in subparagraph (H), by inserting  
2 “monitoring needs,” after “response,”; and

3 (vi) by amending subparagraph (I) to  
4 read as follows:

5 “(I) Providing a Tsunami Warning Coordi-  
6 nator to coordinate with partners and stake-  
7 holders products and services of the centers  
8 supported or maintained under paragraph (1).”;

9 (C) by amending paragraph (3) to read as  
10 follows:

11 “(3) FAIL-SAFE WARNING CAPABILITY.—The  
12 Administrator shall support and maintain fail-safe  
13 warning capability for the tsunami warning centers  
14 supported or maintained under paragraph (1), and  
15 such centers shall conduct at least one service back  
16 up drill biannually.”;

17 (D) in paragraph (4)—

18 (i) by amending the matter preceding  
19 subparagraph (A) to read as follows: “The  
20 Administrator shall coordinate with the  
21 weather forecast offices of the National  
22 Weather Service, the centers supported or  
23 maintained under paragraph (1), and such  
24 national and regional program offices of  
25 the Administration as the Administrator or

1 the coordinating committee, as established  
2 in section 805(b), consider appropriate to  
3 ensure that regional and local weather  
4 forecast offices—”;

5 (ii) in subparagraph (B), by striking  
6 “and” after the semicolon;

7 (iii) in subparagraph (C), by striking  
8 the period and inserting “; and”; and

9 (iv) by adding at the end the following  
10 new subparagraph:

11 “(D) conduct education and outreach ef-  
12 forts to help prepare coastal communities for  
13 tsunami hazards.”;

14 (E) in paragraph (5)—

15 (i) in the section heading, by striking  
16 “UNIFORM” and inserting “STANDARD-  
17 IZED”;

18 (ii) in subparagraph (A), by striking  
19 “uniform” and inserting “standardized”;

20 (iii) in subparagraph (C)(ii), by strik-  
21 ing “uniform” and inserting “standard-  
22 ized”;

23 (iv) in subparagraph (D), by striking  
24 “and” after the semicolon;

1 (v) in subparagraph (E), by striking  
2 the period and inserting “; and”; and

3 (vi) by adding at the end the following  
4 new subparagraph:

5 “(F) align the analytic techniques and  
6 methodologies of the existing tsunami warning  
7 centers supported or maintained under para-  
8 graph (1) to ensure seamless continuity of oper-  
9 ations and mitigate risk of operational failure  
10 by prioritizing investments that include—

11 “(i) replacing end of life equipment;

12 “(ii) ensuring product consistency;

13 “(iii) enabling consistent operational  
14 process for backup capabilities;

15 “(iv) mitigating existing operational  
16 security risks; and

17 “(v) meeting information security re-  
18 quirements specified in chapter 35 of title  
19 44, United States Code.”; and

20 (F) by adding at the end the following new  
21 paragraph:

22 “(7) REPORTING.—Not later than 180 days  
23 after the date of the enactment of this paragraph  
24 and annually thereafter until such time as all rel-  
25 evant requirements have been satisfied, the Adminis-

1       trator shall provide to the Committee on Science,  
2       Space, and Technology of the House of Representa-  
3       tives and the Committee on Commerce, Science, and  
4       Transportation of the Senate an update briefing on  
5       the progress of the following:

6               “(A) Standardizing products and proce-  
7               dures under paragraph (5), including tsunami  
8               assessments, forecast guidance, and related  
9               products.

10              “(B) Migrating the message generation  
11              systems of the centers supported or maintained  
12              under paragraph (1) to the Advanced Weather  
13              Information Processing Systems, or successor  
14              systems.

15              “(C) The structural reorganization effort,  
16              if necessary, to align such centers’ organiza-  
17              tional charts.

18              “(D) The expected timeline for the full  
19              completion of standardizing such centers’ prod-  
20              ucts and procedures.”;

21       (6) in subsection (f), as so redesignated—

22               (A) in paragraph (1)—

23                   (i) in the matter preceding subpara-  
24                   graph (A), by inserting “detect, measure,  
25                   and” after “used to”;



1 (ii) in subparagraph (B), by striking  
2 “and” after the semicolon;

3 (iii) in subparagraph (C), by striking  
4 “and the Advanced National Seismic Sys-  
5 tem” and inserting “the Advanced Na-  
6 tional Seismic System, and the global navi-  
7 gation satellite system (GNSS); and”; and

8 (iv) by adding at the end the following  
9 new subparagraph:

10 “(D) ensure research is coordinated with  
11 tsunami warning operations;”; and

12 (B) in paragraph (3), by inserting “accord-  
13 ing to industry best practices” before the pe-  
14 riod; and

15 (7) in subsection (h)(2)(A), as so redesignated,  
16 by striking “accuracy of the tsunami model used”  
17 and inserting “timeliness and accuracy of the fore-  
18 cast used to issue the warning”.

19 (d) NATIONAL TSUNAMI HAZARD MITIGATION PRO-  
20 GRAM.—Section 805(c) of the Tsunami Warning and Edu-  
21 cation Act (33 U.S.C. 3204(c)) is amended—

22 (1) in paragraph (5)—

23 (A) by redesignating subparagraphs (B),  
24 (C), (D), (E), (F), and (G) as subparagraphs  
25 (C), (D), (E), (F), (G), and (H), respectively;

1 (B) by inserting after subparagraph (A)  
2 the following new subparagraph:

3 “(B) Coastal digital elevation models  
4 (DEMs) to support the development of inunda-  
5 tion maps.”; and

6 (C) by adding at the end the following new  
7 subparagraphs:

8 “(I) Evaluation of the variation of inunda-  
9 tion impact resulting from tsunami-driven sedi-  
10 ment transport.

11 “(J) Evaluation of tsunami debris impact  
12 on critical infrastructure (as such term is de-  
13 fined in section 1016(e) of Public Law 107–56  
14 (42 U.S.C. 5195c(e))) and lifelines.

15 “(K) High-resolution and high-quality dig-  
16 ital elevation models needed for at-risk coast-  
17 lines, ports, and harbors, particularly for re-  
18 gions not covered by existing inundation  
19 maps.”; and

20 (2) in paragraph (7)(C), by inserting “and be-  
21 havioral” after “social”;

22 (e) TSUNAMI RESEARCH PROGRAM.—Section 806 of  
23 the Tsunami Warning and Education Act (33 U.S.C.  
24 3205) is amended—

25 (1) in subsection (a)—

1 (A) by striking “section 805(d)” and in-  
2 serting “section 805(b)”; and

3 (B) by inserting “and management” after  
4 “data collection”;  
5 (2) in subsection (b)—

6 (A) in paragraph (1), by inserting “deploy-  
7 ment and” after “may include”;

8 (B) in paragraph (3), by striking “social  
9 science research” and inserting “social and be-  
10 havioral science research, including data collec-  
11 tion,”;

12 (C) in paragraph (4), by striking “and”  
13 after the semicolon;

14 (D) by redesignating paragraph (5) as  
15 paragraph (7); and

16 (E) by inserting after paragraph (4) the  
17 following new paragraphs:

18 “(5) develop decision support tools;

19 “(6) leverage and prioritize research opportuni-  
20 ties; and”; and

21 (3) by adding at the end the following new sub-  
22 section:

23 “(c) RESEARCH AND DEVELOPMENT PLAN.—Not  
24 later than 12 months after the date of the enactment of  
25 this subsection and not less frequently than every 36

1 months thereafter, the Administrator, in consultation with  
2 the Interagency Council for Advancing Meteorological  
3 Services, shall develop a research and development and re-  
4 search to operations plan to improve tsunami detection  
5 and forecasting capabilities that—

6 “(1) identifies and prioritizes research and de-  
7 velopment priorities to satisfy section 804;

8 “(2) identifies key research needs for better de-  
9 tecting tsunamis that may occur in open ocean and  
10 along the coastlines of the United States and its ter-  
11 ritories, improve forecasting of tsunamis that are  
12 not seismically driven, and other opportunities deter-  
13 mined appropriate;

14 “(3) develops plans for transitioning research to  
15 operations; and

16 “(4) identifies collaboration opportunities that  
17 may further and align tsunami research, develop-  
18 ment, warnings, and operations between the centers  
19 supported or maintained under section 804, the Na-  
20 tional Tsunami Hazard Mitigation Program, the Na-  
21 tional Oceanic and Atmospheric Administration Cen-  
22 ter for Tsunami Research, the National Science  
23 Foundation, the United States Geological Survey,  
24 the Federal Emergency Management Agency, insti-

1       tutions of higher education, private entities, stake-  
 2       holders, and others determined appropriate.”;

3       (f) GLOBAL TSUNAMI WARNING AND MITIGATION  
 4 NETWORK.—Section 807(d) of the Tsunami Warning and  
 5 Education Act (33 U.S.C. 3206(d)) is amended by insert-  
 6 ing “and management” after “data sharing”.

7       (g) TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY  
 8 PANEL.—Section 808(b)(1) of the Tsunami Warning and  
 9 Education Act (33 U.S.C. 3206a(b)(1)) is amended by in-  
 10 serting “and behavioral” after “social”.

11       (h) AUTHORIZATION OF APPROPRIATIONS.—Section  
 12 809 of the Tsunami Warning and Education Act (33  
 13 U.S.C. 3207) is amended to read as follows:

14 **“SEC. 809. AUTHORIZATION OF APPROPRIATIONS.**

15       “There are authorized to be appropriated to the Ad-  
 16 ministrator to carry out this title \$30,000,000 for each  
 17 of fiscal years 2026 through 2030, of which—

18               “(1) not less than 27 percent of the amount ap-  
 19 propriated for each fiscal year shall be for activities  
 20 conducted at the State level under the national tsu-  
 21 nami hazard mitigation program under section 805;  
 22 and

23               “(2) not less than 8 percent of the amount ap-  
 24 propriated shall be for the tsunami research pro-  
 25 gram under section 806.”.

1 **SEC. 106. OBSERVING SYSTEM PLANNING.**

2 Section 106 of the Weather Research and Fore-  
3 casting Innovation Act of 2017 (15 U.S.C. 8516) is  
4 amended—

5 (1) in paragraph (3)—

6 (A) by inserting “Federal” before “observ-  
7 ing capabilities”; and

8 (B) by striking “and” after the semicolon;

9 (2) in paragraph (4)—

10 (A) by inserting “, including private sector  
11 partnerships or commercial acquisition,” after  
12 “options”; and

13 (B) by striking the period and inserting a  
14 semicolon; and

15 (3) by adding at the end the following new  
16 paragraphs:

17 “(5) compare costs and schedule, including  
18 cost-benefit analysis, of Federal and private sector  
19 supplemental options to fill the observation data re-  
20 quirements under paragraph (1) and gaps identified  
21 pursuant to paragraph (3); and

22 “(6) not later than one year after the date of  
23 the enactment of this paragraph, submit to Congress  
24 a report that provides an analysis of the technical,  
25 schedule, cost, and cost benefit analyses to place an  
26 operational polar-orbiting environmental satellite ca-

1       pability in the early morning orbit to support the  
 2       weather enterprise and the Administration’s mis-  
 3       sion.”.

4   **SEC. 107. OBSERVING SYSTEM SIMULATION EXPERIMENTS.**

5       Section 107 of the Weather Research and Fore-  
 6       casting Innovation Act of 2017 (15 U.S.C. 8517) is  
 7       amended—

8               (1) in subsection (b)(3), by striking “providing  
 9       data” and inserting “comparison to current or ex-  
 10      perimental commercial system capabilities that pro-  
 11      vide data”;

12              (2) in subsection (c)(1), by striking “, including  
 13      polar-orbiting and geostationary satellite systems,”;

14              (3) by striking subsection (d); and

15              (4) by redesignating subsection (e) as sub-  
 16      section (d).

17   **SEC. 108. COMPUTING RESOURCES PRIORITIZATION.**

18       Section 108 of the Weather Research and Fore-  
 19       casting Innovation Act of 2017 (15 U.S.C. 8518) is  
 20       amended by striking subsection (a)(3)(C) and all that fol-  
 21       lows through subsection (b)(7) and inserting the following  
 22       new subsections:

23       “(b) COMPUTING RESEARCH INITIATIVE.—

24               “(1) IN GENERAL.—The Under Secretary, in  
 25       collaboration with the Secretary of Energy, shall

1 carry out an initiative, which may leverage Depart-  
2 ment of Energy high performance computers, cloud  
3 computing, or expertise, to run advanced coupled  
4 models in order to conduct proof of concept sce-  
5 narios in comparison with current issued forecasts  
6 and models. The Under Secretary and Secretary of  
7 Energy shall carry out the initiative through a com-  
8 petitive, merit-reviewed process, and consider appli-  
9 cations from Federal agencies, National Labora-  
10 tories, institutions of higher education (as such term  
11 is defined in section 101 of the Higher Education  
12 Act of 1965 (20 U.S.C. 1001)), nonprofit institu-  
13 tions, and other appropriate entities (or a consortia  
14 thereof).

15 “(2) COMPONENTS.—In carrying out the initia-  
16 tive under paragraph (1), the Under Secretary shall  
17 prevent duplication and coordinate research efforts  
18 in artificial intelligence, high performance com-  
19 puting, cloud computing, quantum computing, mod-  
20 eling and simulation, machine learning, data assim-  
21 lation, large scale data analytics, and predictive  
22 analysis across the National Oceanic and Atmos-  
23 pheric Administration, and may—

24 “(A) conduct research to compare National  
25 Weather Service forecast and model outputs to



1 predictions and model outputs developed  
2 through such initiative;

3 “(B) share relevant modeling system and  
4 applications innovations developed through such  
5 initiative, including Unified Forecast System-  
6 based applications, through community-based  
7 activities, in accordance with section 10601 of  
8 the James M. Inhofe National Defense Author-  
9 ization Act for Fiscal Year 2023 (15 U.S.C.  
10 8512a);

11 “(C) leverage coordinating activities man-  
12 aged by the National Science and Technology  
13 Council, the Interagency Council for Advancing  
14 Meteorological Services, and other relevant  
15 interagency entities;

16 “(D) provide sufficient capacity for long-  
17 term archive and access of model output to sup-  
18 port research and long-term study;

19 “(E) determine computing decisions based  
20 on an agile requirements framework; and

21 “(F) support the training, recruitment,  
22 and retention of the next generation weather,  
23 water, and climate computing workforce  
24 through incentives and pathways for career de-  
25 velopment and employment opportunities.

1           “(3) RESEARCH SECURITY.—The activities au-  
2           thorized under this section shall be applied in a  
3           manner consistent with subtitle D of title VI of the  
4           Research and Development, Competition, and Inno-  
5           vation Act (enacted as division B of Public Law  
6           117–167; 42 U.S.C. 19231 et seq.).

7           “(4) TERMINATION.—The authority under this  
8           subsection shall terminate five years after the date  
9           of the enactment of this subsection.

10          “(c) ARTIFICIAL INTELLIGENCE INVESTMENTS.—  
11          The Under Secretary shall leverage artificial intelligence  
12          and machine learning technologies to facilitate, optimize,  
13          and further leverage advanced computing to accomplish  
14          critical missions of the National Oceanic and Atmospheric  
15          Administration by enhancing existing and forthcoming  
16          high-performance and cloud computing infrastructure or  
17          systems.

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

24                 “(1) Leveraging robust public-private partner-  
25                 ship models to provide access to training, experience,

1       and long-term development of workforce and infra-  
2       structure.

3           “(2) Developing and optimizing tools, libraries,  
4       algorithms, data structures, and other supporting  
5       software necessary for specific applications on high  
6       performance computing systems.

7           “(3) Applying modern artificial intelligence,  
8       deep machine-learning, and advanced data analysis  
9       technologies to address current and future mission  
10      challenges.

11          “(4) To the maximum extent practicable, ex-  
12      plore quantum computing and related application  
13      partnerships with public, private, and academic enti-  
14      ties to improve the accuracy and resolution of weath-  
15      er predictions.

16          “(e) MULTI-YEAR CONTRACTS.—The Under Sec-  
17      retary may enter into multi-year contracts in accordance  
18      with section 3903 of title 41, United States Code, and  
19      shall ensure compliance with all clauses provided in such  
20      section to support operations, research, and development  
21      related to high performance and cloud computing infra-  
22      structure or systems with an unfunded contingent liability  
23      in the event of cancellation.

24          “(f) REPORT.—Not later than two years after the  
25      date of the enactment of this subsection, the Under Sec-

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

6           “(1) The effectiveness of the initiative required  
7           under subsection (b), including applied research dis-  
8           coveries and advanced modeling improvements  
9           achieved.

10          “(2) A best estimate of the overall value of  
11          high-resolution probabilistic forecast guidance for  
12          hazardous weather or water events (as such term is  
13          defined in section 406) using a next-generation  
14          weather forecast and warning framework.

15          “(3) The needs for cloud computing, quantum  
16          computing, or high-performance computing, visual-  
17          ization, and dissemination collaboration between the  
18          Department of Energy and the National Oceanic  
19          and Atmospheric Administration.

20          “(4) A timeline and guidance for implementa-  
21          tion of the following:

22                  “(A) High-resolution numerical weather  
23                  prediction models.

24                  “(B) Methods for meeting the cloud com-  
25                  puting, quantum computing, or high-perform-

1           ance computing, visualization, and dissemina-  
2           tion needs identified under paragraph (3).”.

3 **SEC. 109. EARTH PREDICTION INNOVATION CENTER.**

4           Paragraph (5) of section 102(b) of the Weather Re-  
5   search and Forecasting Innovation Act of 2017 (15 U.S.C.  
6   8512(b)) is amended—

7           (1) in subparagraph (D), by striking “and”  
8           after the semicolon; and

9           (2) by striking subparagraph (E) and inserting  
10          the following new subparagraphs:

11               “(E) developing community weather re-  
12               search modeling systems that—

13                       “(i) are accessible by the public in ac-  
14                       cordance with section 10601 of the James  
15                       M. Inhofe National Defense Authorization  
16                       Act for Fiscal Year 2023 (15 U.S.C.  
17                       8512a) and available for archive and long-  
18                       term study;

19                       “(ii) meet basic end-user requirements  
20                       for running on public computers and net-  
21                       works located outside of secure National  
22                       Oceanic and Atmospheric Administration  
23                       information and technology systems;

24                       “(iii) utilize, whenever appropriate  
25                       and cost-effective, innovative strategies and

1 methods, including cloud-based computing  
2 capabilities, for hosting and management  
3 of part or all of the system described in  
4 this subparagraph;

5 “(iv) utilize modeling systems that  
6 allow for interoperability with new model  
7 components, modules, and next-generation  
8 software and coding languages;

9 “(v) allow for open testing and inte-  
10 gration of promising operational model im-  
11 provements from the broader community;

12 “(vi) access as close to a real-time  
13 basis as possible operational data and  
14 metadata, including commercially pur-  
15 chased data for use in Earth Prediction  
16 Innovation Center research and develop-  
17 ment testing grounds pursuant to redis-  
18 tribution restrictions, licensing agreements,  
19 and applicable existing laws and regula-  
20 tions; and

21 “(vii) provide supported and portable  
22 versions of the unified forecast system, in-  
23 cluding applications for hurricane, space  
24 weather, ocean, cryosphere, air quality,  
25 and coastal models, that can reproduce

1 current operational global and regional  
 2 model prediction; and

3 “(F) establishing a National Oceanic and  
 4 Atmospheric Administration Data Lake, to be  
 5 maintained by the Administration, a commercial  
 6 partner, or non-profit entity, that consolidates  
 7 and maintains a publicly available and continu-  
 8 ously updated collection of data and metadata  
 9 used in numerical weather prediction for use in  
 10 the Earth Prediction Innovation Center’s model  
 11 testing, pursuant to redistribution restrictions,  
 12 licensing agreements, and applicable existing  
 13 laws and regulations.”.

14 **SEC. 110. SATELLITE ARCHITECTURE PLANNING.**

15 Section 301 of the Weather Research and Fore-  
 16 casting Innovation Act of 2017 (15 U.S.C. 8531) is  
 17 amended—

18 (1) in subsection (a), by striking paragraph (1)  
 19 and redesignating paragraphs (2), (3), and (4) as  
 20 paragraphs (1), (2), and (3), respectively;

21 (2) by amending subsection (b) to read as fol-  
 22 lows:

23 “(b) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-  
 24 ISTRATION SATELLITE SYSTEMS AND DATA.—

1           “(1) IN GENERAL.—The Under Secretary shall  
2       maintain a fleet of Administration space-based ob-  
3       servation platforms that provide critical operations-  
4       focused data and information to support the Na-  
5       tional Oceanic and Atmospheric Administration’s  
6       mission to monitor the global environment in order  
7       to protect lives and property from extreme weather  
8       and other natural phenomena.

9           “(2) COLLABORATION.—The Under Secretary  
10      shall implement recommendations from the NOAA  
11      Observing Systems Council to ensure an appropriate  
12      mix of government, academic, commercial sector,  
13      and international partnerships in the provision of  
14      data and information, including a broadened effort  
15      on data acquisition through the Commercial Data  
16      Program under section 302 when cost effective and  
17      beneficial to the Administration.

18          “(3) PRIORITY.—The Under Secretary shall en-  
19      sure that Administration platforms maintained  
20      under paragraph (1) prioritize the development of  
21      products and services that are tailored to meet the  
22      National Oceanic and Atmospheric Administration’s  
23      mission.

24          “(4) NATIONAL CENTERS FOR ENVIRONMENTAL  
25      INFORMATION.—The Under Secretary shall maintain



1 the National Centers for Environmental Information  
 2 to provide a long-term archive and access to the Ad-  
 3 ministration’s national and global data and  
 4 metadata.”; and

5 (3) in subsection (f)(1), by striking “2023” and  
 6 inserting “2030”.

7 **SEC. 111. IMPROVING UNCREWED ACTIVITIES.**

8 Subparagraph (G) of section 102(b)(3) of the Weath-  
 9 er Research and Forecasting Innovation Act of 2017 (15  
 10 U.S.C. 8512(b)(3)) is amended by striking “, including  
 11 commercial observing systems” and inserting “, including  
 12 stationary and mobile commercial observing systems, such  
 13 as uncrewed aircraft and marine systems, to provide ob-  
 14 servations of the atmosphere and ocean, and other obser-  
 15 vations, in cooperation with the Office of Marine and Avia-  
 16 tion Operations”.

17 **SEC. 112. INTERAGENCY COUNCIL FOR ADVANCING METE-**  
 18 **OROLOGICAL SERVICES.**

19 (a) IN GENERAL.—Section 402 of the Weather Re-  
 20 search and Forecasting Innovation Act of 2017 (15 U.S.C.  
 21 8542) is amended—

22 (1) in subsection (a)—

23 (A) by striking “Advancing Weather Serv-  
 24 ices” and inserting “Advancing Meteorological

1 Services (in this section referred to as the  
2 ‘Interagency Council’)); and

3 (B) by striking “Committee” each place it  
4 appears and inserting “Council”;

5 (2) by amending subsections (b) and (c) to read  
6 as follows:

7 “(b) CO-CHAIRS.—The Director of the Office of  
8 Science and Technology Policy and the Under Secretary  
9 shall serve as co-chairs of the Interagency Council. The  
10 Under Secretary shall serve as the Federal Coordinator  
11 for Meteorology.

12 “(c) FURTHER COORDINATION.—The Director of the  
13 Office of Science and Technology Policy shall take such  
14 steps as are necessary to coordinate the activities of the  
15 Federal Government with stakeholders in the United  
16 States weather industry, academic partners, State govern-  
17 ments, and emergency managers, including by imple-  
18 menting mechanisms to encourage and enable the partici-  
19 pation of non-Federal employees in the functions of the  
20 Interagency Council.”;

21 (3) by adding at the end the following new sub-  
22 sections:

23 “(d) FUNCTIONS.—The Interagency Council shall be  
24 the formal mechanism by which all relevant Federal de-  
25 partments and agencies coordinate implementation of pol-

1 icy and practices to ensure United States global leadership  
2 in meteorological services. In doing so, the Interagency  
3 Council shall review programs and support relevant weath-  
4 er research and forecast innovation activities, as well as  
5 other related implementation activities, related to Federal  
6 meteorological services, including by carrying out the fol-  
7 lowing:

8           “(1) Identifying and helping prioritize meteoro-  
9           logical research and service delivery needs, including  
10          relating to observations, operational systems, com-  
11          munications, and infrastructure.

12          “(2) Providing recommendations to streamline  
13          or consolidate activities and develop greater effi-  
14          ciencies in cross-agency activities.

15          “(3) Leveraging Earth system science research  
16          outcomes of the National Oceanic and Atmospheric  
17          Administration, the National Aeronautics and Space  
18          Administration, and other relevant Federal depart-  
19          ments and agencies, including research outcomes re-  
20          lated to the relevant recommended key science and  
21          applications questions and priorities in the National  
22          Academies of Sciences, Engineering, and Medicine’s  
23          2018 report ‘Thriving on Our Changing Planet: A  
24          Decadal Strategy for Earth Observation from

1       Space’, to understand and predict high-impact  
2       weather phenomena.

3               “(4) Facilitating the expansion and strength-  
4       ening of partnerships with private sector entities to  
5       advance meteorological research, communications,  
6       and computing in collaboration with the Earth sys-  
7       tem science, service, and stakeholder communities.

8               “(5) Sharing information regarding meteorolog-  
9       ical research improvement needs and science oppor-  
10      tunities across relevant Federal departments and  
11      agencies.

12              “(6) Providing advice to all relevant Federal de-  
13      partments and agencies regarding potential collabo-  
14      rations and expected level of resources needed to  
15      maintain and operate the Interagency Council.

16              “(7) Enhancing communication and coordina-  
17      tion and promoting sharing within relevant Federal  
18      departments and agencies and across the Inter-  
19      agency Council.

20              “(8) Developing, recruiting, and sustaining a  
21      professional and diverse workforce for meteorological  
22      research and services.

23              “(e) DATA INVENTORY.—The Interagency Council, in  
24      coordination and avoidance of duplication with the United  
25      States Group on Earth Observations, shall promote data

1 and metadata access and archive activities to increase ac-  
2 cessibility, interoperability, and reusability by maintaining  
3 a data inventory of meteorological observations. Not less  
4 frequently than annually for a period of five years begin-  
5 ning on the date of the enactment of this subsection, the  
6 Interagency Council shall solicit updated information from  
7 private sector entities identifying current and near future  
8 sources of such data. Such data shall be made available  
9 to member departments and agencies under subsection  
10 (a).

11 “(f) COORDINATION OFFICE.—The Interagency Me-  
12 teorological Coordination Office shall provide to the Inter-  
13 agency Council such administrative and logistical support  
14 as the Interagency Council may require, as determined by  
15 the co-chairs.

16 “(g) COST SHARE.—Member departments and agen-  
17 cies of the Interagency Council under subsection (a) may  
18 provide reimbursable financial support to the Interagency  
19 Meteorological Coordinating Office to enhance cost-shar-  
20 ing and collaboration related to weather research and fore-  
21 cast innovation activities.

22 “(h) REPORT.—Not later than one year after the  
23 date of the enactment of this subsection and annually  
24 thereafter, the Interagency Council shall publish a report  
25 which identifies among member agencies the following:

1           “(1) Federal programs that use meteorological  
2       observations, data sources, and capabilities.

3           “(2) Federal programs that acquire such data  
4       from private sector entities.

5           “(3) Advancements in meteorological data col-  
6       lection, assimilation, and forecasting that could im-  
7       prove Federal programmatic operational capabilities.

8           “(4) Barriers to acquiring meteorological obser-  
9       vations, data sources, and capabilities that could be  
10      used to better meet Federal programmatic needs.”.

11       (b) REFERENCES.—Any reference to the Interagency  
12      Committee for Advancing Weather Services in any law,  
13      rule, regulation, paper, record, map, or other such docu-  
14      ment of the United States shall be deemed to be a ref-  
15      erence to the Interagency Council for Advancing Meteoro-  
16      logical Services.

17      **SEC. 113. OCEAN OBSERVATIONS.**

18       Subsection (b) of section 12304 of the Integrated  
19      Coastal and Ocean Observation System Act of 2009 (33  
20      U.S.C. 3603) is amended by adding at the end the fol-  
21      lowing new paragraph:

22           “(5) SHIPS OF OPPORTUNITY PILOT PRO-  
23      GRAM.—

24           “(A) IN GENERAL.—The Administrator, in  
25      coordination with the heads of relevant Federal

1 departments and agencies, shall, subject to rel-  
2 evant regulations and certifications, maintain  
3 pilot programs or projects to contract with re-  
4 search or commercial ship operators for data  
5 collection and assess the potential costs, bene-  
6 fits, and viability of a global network of ocean  
7 and atmospheric observing instruments oper-  
8 ating on research or commercial ocean vessels,  
9 including in the Arctic, in order to supplement  
10 the Integrated Coastal, Great Lakes, and Ocean  
11 Observation System in improving understanding  
12 of coastal and ocean systems and their relation-  
13 ships to human activities.

14 “(B) STANDARDS AND SPECIFICATIONS.—

15 The Administrator shall ensure that data ac-  
16 quired through the pilot program established  
17 pursuant to subparagraph (A) meets the most  
18 recent standards and specifications required for  
19 observation services and data as published pur-  
20 suant to subsection (c) of section 302 of the  
21 Weather Research and Forecasting Innovation  
22 Act of 2017.

23 “(C) REPORT.—Not later than five years  
24 after the date of the enactment of this para-  
25 graph, the Administrator, in consultation with

the Secretary of Transportation, shall submit to Congress a report on the requirements for a global network of ocean and atmospheric instruments operating on research or commercial ocean vessels for measurement and data transmission.

“(D) SUNSET.—This paragraph shall terminate on the earlier of—

“(i) September 30, 2030; or

“(ii) one year after the date on which the report required under subparagraph (B) is submitted by the Administrator.”.

**SEC. 114. CONSOLIDATION OF REPORTS.**

(a) WEATHER RESEARCH AND FORECASTING INNOVATION ACT OF 2017.—

(1) IN GENERAL.—The Weather Research and Forecasting Innovation Act of 2017 is amended—

(A) in section 102 (15 U.S.C. 8512), by striking subsection (d);

(B) by amending section 105 (15 U.S.C. 8515) to read as follows:

**“SEC. 105. WEATHER RESEARCH AND DEVELOPMENT PLANNING.**

“Not later than two years after the date of the enactment of this section and not less frequently than semi-



1 annually thereafter, the Under Secretary, acting through  
2 the Assistant Administrator for Oceanic and Atmospheric  
3 Research, and in coordination with the Director of the Na-  
4 tional Weather Service and the Assistant Administrator  
5 for Satellite and Information Services, shall issue a re-  
6 search and development and research to operations plan  
7 to maintain United States leadership in numerical weather  
8 prediction and forecasting that—

9           “(1) describes the forecasting skill and tech-  
10 nology goals, objectives, expected budget, and  
11 progress of the National Oceanic and Atmospheric  
12 Administration in carrying out the program con-  
13 ducted under section 102;

14           “(2) identifies and prioritizes specific research  
15 and development activities, data collection and anal-  
16 ysis, predictive modeling, demonstration of potential  
17 operational forecast application, education, training,  
18 and performance metrics, weighted to meet the oper-  
19 ational weather and flood-event mission of the Na-  
20 tional Weather Service to achieve a weather-ready  
21 Nation;

22           “(3) describes how the program conducted  
23 under section 102 will collaborate with Federal  
24 agencies and departments, international partners,  
25 and stakeholders, including the United States weath-

1 er industry and academic partners, and the role of  
2 each in advancing weather forecasting and commu-  
3 nication;

4 “(4) identifies, through consultation with the  
5 National Science Foundation, the United States  
6 weather industry, and academic partners, research  
7 necessary to advance the scientific understanding of  
8 weather processes and provide information to im-  
9 prove weather warning and forecast systems in the  
10 United States most effectively; and

11 “(5) describes how the National Oceanic and  
12 Atmospheric Administration is advancing community  
13 weather modeling.”;

14 (C) in section 403 (15 U.S.C. 8543)—

15 (i) in subsection (a), by inserting  
16 “the” after “Director of”; and

17 (ii) by amending subsection (d) to  
18 read as follows:

19 “(d) ANNUAL BRIEFING.—Not less frequently than  
20 once each year, the Under Secretary shall brief the Com-  
21 mittee on Commerce, Science, and Transportation of the  
22 Senate and the Committee on Science, Space, and Tech-  
23 nology of the House of Representatives on participation  
24 in the program under subsection (a) and shall highlight

1 any innovations that come from the interaction described  
2 in subsection (b).”; and

3 (D) by striking sections 408 through 411  
4 and section 414 and redesignating sections 412  
5 and 413 as sections 408 and 409, respectively.

6 (2) CLERICAL AMENDMENTS.—The table of  
7 contents in section 1(b) of the Weather Research  
8 and Forecasting Innovation Act of 2017 is amended  
9 by striking the items relating to sections 408  
10 through 414 and inserting the following new items:

“Sec. 408. Weather enterprise outreach.

“Sec. 409. Hurricane hunter aircraft.”.

11 (b) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-  
12 ISTRATION AUTHORIZATION ACT OF 1992.—The National  
13 Oceanic and Atmospheric Administration Authorization  
14 Act of 1992 (Public Law 102–567) is amended—

15 (1) in section 106, by striking subsection (c)  
16 (15 U.S.C. 1537); and

17 (2) in section 108 (15 U.S.C. 8520)—

18 (A) by striking subsection (b); and

19 (B) by redesignating subsection (c) as sub-  
20 section (b).

1 **SEC. 115. CERTAIN DEFINITIONS UNDER FLOOD LEVEL OB-**  
2 **SERVATION, OPERATIONS, AND DECISION**  
3 **SUPPORT ACT.**

4 (a) DEFINITIONS.—Section 12(a) of the Flood Level  
5 Observation, Operations, and Decision Support Act (15  
6 U.S.C. 9707(a)) is amended—

7 (1) by redesignating paragraphs (1) and (2) as  
8 paragraphs (4) and (5), respectively; and

9 (2) by inserting before paragraph (4) (as so re-  
10 designated) the following:

11 “(1) ATMOSPHERIC RIVER.—The term ‘atmos-  
12 pheric river’ means a transient corridor of strong  
13 water vapor in the atmosphere that—

14 “(A) produces significant quantities of rain  
15 or snow; and

16 “(B) may be primarily beneficial to the  
17 water supply or hazardous due to flooding.

18 “(2) ATMOSPHERIC RIVER FLOODING EVENT.—  
19 The term ‘atmospheric river flooding event’ means  
20 an atmospheric river that—

21 “(A) results in flooding of rivers and  
22 streams or other hazards to human life, prop-  
23 erty, or the economy; and

24 “(B) is of particular concern to human  
25 health, property, and the economy, as deter-  
26 mined by the Secretary of Commerce.

1           “(3) EXTREME PRECIPITATION EVENT.—The  
 2           term ‘extreme precipitation event’ means precipita-  
 3           tion quantities exceeding the 5-year annual recur-  
 4           rence interval for a specific location.”.

5           (b) REQUIREMENTS.—Section 12(d)(1) of the Flood  
 6           Level Observation, Operations, and Decision Support Act  
 7           (15 U.S.C. 9707(d)(1)) is amended by inserting “, such  
 8           as precipitation resulting from hurricanes, atmospheric  
 9           river flooding events, and extreme precipitation events”  
 10          before the period at the end.

11   **SEC. 116. REAUTHORIZATION OF NATIONAL LANDSLIDE**  
 12                           **PREPAREDNESS ACT.**

13          (a) DEFINITIONS.—Section 2 of the National Land-  
 14          slide Preparedness Act (43 U.S.C. 3101) is amended—

15               (1) by redesignating paragraphs (4), (5), (6),  
 16               (7), (8), (9), (10), (11), and (12) as paragraphs (7),  
 17               (8), (10), (11), (13), (14), (15), and (16), respec-  
 18               tively;

19               (2) by inserting after paragraph (3) the fol-  
 20          lowing:

21               “(4) ATMOSPHERIC RIVER.—The term ‘atmos-  
 22               pheric river’ has the meaning given the term in sec-  
 23               tion 12(a) of the Flood Level Observation, Oper-  
 24               ations, and Decision Support Act (15 U.S.C.  
 25               9707(a)).

1 “(5) ATMOSPHERIC RIVER FLOODING EVENT.—

2 The term ‘atmospheric river flooding event’ has the  
3 meaning given the term in section 12(a) of the  
4 Flood Level Observation, Operations, and Decision  
5 Support Act (15 U.S.C. 9707(a)).

6 “(6) EXTREME PRECIPITATION EVENT.—The  
7 term ‘extreme precipitation event’ has the meaning  
8 given the term in section 12(a) of the Flood Level  
9 Observation, Operations, and Decision Support Act  
10 (15 U.S.C. 9707(a)).”;

11 (3) by inserting after paragraph (8), as so re-  
12 designated, the following:

13 “(9) INSTITUTION OF HIGHER EDUCATION.—  
14 The term ‘institution of higher education’ has the  
15 meaning given the term in section 101(a) of the  
16 Higher Education Act of 1965 (20 U.S.C.  
17 1001(a)).”;

18 (4) by inserting after paragraph (11), as so re-  
19 designated, the following:

20 “(12) NATIVE HAWAIIAN ORGANIZATION.—The  
21 term ‘Native Hawaiian organization’ has the mean-  
22 ing given the term in section 6207 of the Elemen-  
23 tary and Secondary Education Act of 1965 (20  
24 U.S.C. 7517), except that the term includes the De-

partment of Hawaiian Home Lands and the Office of Hawaiian Affairs.”; and

(5) by adding at the end the following:

“(17) TRIBAL ORGANIZATION.—The term ‘Tribal organization’ has the meaning given the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 5304).”.

(b) NATIONAL LANDSLIDE HAZARDS REDUCTION PROGRAM.—

(1) ESTABLISHMENT.—Section 3(a)(3) of the National Landslide Preparedness Act (43 U.S.C. 3102(a)(3)) is amended by striking “protect” and inserting “contribute to protecting”.

(2) PROGRAM ACTIVITIES.—Section 3(b)(1)(C)(ii) of the National Landslide Preparedness Act (43 U.S.C. 3102(b)(1)(C)(ii)) is amended by striking “implement” and inserting “disseminate”.

(3) NATIONAL STRATEGY.—Section 3(b)(2) of the National Landslide Preparedness Act (43 U.S.C. 3102(b)(2)) is amended—

(A) by redesignating subparagraphs (A) through (C) as clauses (i) through (iii), respectively, and indenting appropriately;

(B) in the matter preceding clause (i) (as so redesignated), by striking “Not later than” and inserting the following:

“(A) IN GENERAL.—Not later than”; and  
(C) by adding at the end the following:

“(B) ASSESSMENT.—For purposes of the first national strategy published after the date of enactment of the National Landslide Preparedness Act Reauthorization Act of 2025 under subparagraph (A), the Secretary, in consultation with the Secretary of Commerce, shall include an assessment of the risks that atmospheric river flooding events and extreme precipitation events pose to the safety of life and property in the United States with respect to landslide hazards.”.

(4) NATIONAL LANDSLIDE HAZARDS DATABASE.—Section 3(b)(3) of the National Landslide Preparedness Act (43 U.S.C. 3102(b)(3)) is amended—

(A) by redesignating subparagraphs (C) and (D) as subparagraphs (D) and (E), respectively; and

(B) by inserting after subparagraph (B) the following:



1 “(C) the identification of areas in need of  
2 additional hazard risk assessment, including  
3 areas that may be at risk due to—

4 “(i) hydrology or changes in hydrology  
5 that may include erosion, drought, or other  
6 characteristics that could impact landslide  
7 risk;

8 “(ii) atmospheric river flooding events  
9 and extreme precipitation events, as identi-  
10 fied by the Secretary of Commerce and the  
11 Secretary;

12 “(iii) geologic activity, such as vol-  
13 canic eruptions, earthquakes, or tsunamis;  
14 or

15 “(iv) data-poor areas or hazards with  
16 poor monitoring that could contribute to  
17 increased landslide risk;”.

18 (5) LANDSLIDE HAZARD AND RISK PREPARED  
19 NESS FOR COMMUNITIES.—Section 3(b)(4) of the  
20 National Landslide Preparedness Act (43 U.S.C.  
21 3102(b)(4)) is amended—

22 (A) in the matter preceding subparagraph  
23 (A), by inserting “Native Hawaiian organiza-  
24 tions and other stakeholders, as appropriate,”  
25 before “and Indian tribes”;

1 (B) in subparagraph (A)—

2 (i) in the matter preceding clause (i),  
3 by striking “local, and Tribal governments  
4 and decisionmakers” and inserting “and  
5 local governments, Indian tribes, Tribal or-  
6 ganizations, Native Hawaiian organiza-  
7 tions, and other decisionmakers”;

8 (ii) by striking clause (iii) and insert-  
9 ing the following:

10 “(iii) health and safety with respect to  
11 landslides;”;

12 (iii) by redesignating clause (iv) as  
13 clause (v); and

14 (iv) by inserting after clause (iii) the  
15 following:

16 “(iv) reducing losses from landslides,  
17 including the threats caused by atmos-  
18 pheric rivers and other extreme precipita-  
19 tion events; and”; and

20 (C) in subparagraph (B)—

21 (i) in clause (i), by striking “local,  
22 and Tribal officials” and inserting “and  
23 local officials, Indian tribes, Tribal organi-  
24 zations, and Native Hawaiian organiza-  
25 tions”; and

1 (ii) in clause (ii), by striking “local,  
 2 and Tribal emergency managers” and in-  
 3 serting “and local emergency managers  
 4 and emergency managers of Indian tribes,  
 5 Tribal organizations, and Native Hawaiian  
 6 organizations”.

7 (6) DEBRIS FLOW EARLY WARNING SYSTEM.—  
 8 Section 3(b)(5) of the National Landslide Prepared-  
 9 ness Act (43 U.S.C. 3102(b)(5)) is amended—

10 (A) in subparagraph (B), by striking  
 11 “State, territorial, local, and Tribal govern-  
 12 ments” and inserting “State, territorial, and  
 13 local governments, Indian tribes, Tribal organi-  
 14 zations, and Native Hawaiian organizations”;

15 (B) by redesignating subparagraphs (A)  
 16 through (C) as clauses (i) through (iii), respec-  
 17 tively, and indenting appropriately;

18 (C) in the matter preceding clause (i) (as  
 19 so redesignated), by striking “In carrying out”  
 20 and inserting the following:

21 “(A) IN GENERAL.—In carrying out”; and

22 (D) by adding at the end the following:

23 “(B) CONSULTATION.—In carrying out  
 24 subparagraph (A), the Secretary may consult  
 25 with an institution of higher education de-

1           scribed in subsection (d)(2)(B)(iv) and other  
2           stakeholders to establish and support emer-  
3           gency response procedures, as appropriate.”.

4           (7) EMERGENCY RESPONSE ACTIVITIES.—Sec-  
5           tion 3(b)(6) of the National Landslide Preparedness  
6           Act (43 U.S.C. 3102(b)(6)) is amended—

7                   (A) by redesignating subparagraphs (A)  
8                   through (C) as clauses (i) through (iii), respec-  
9                   tively, and indenting appropriately;

10                   (B) in the matter preceding clause (i) (as  
11                   so redesignated), by striking “In carrying” and  
12                   inserting the following:

13                           “(A) IN GENERAL.—In carrying”;

14                   (C) in subparagraph (A) (as so des-  
15                   ignated)—

16                           (i) in the matter preceding clause (i)  
17                           (as so redesignated), by inserting “Native  
18                           Hawaiian organizations,” before “and In-  
19                           dian tribes”;

20                           (ii) in clause (ii) (as so redesignated),  
21                           by striking “and” at the end;

22                           (iii) in clause (iii) (as so redesign-  
23                           ated), by striking the period at the end  
24                           and inserting “; and”; and

1 (iv) by adding at the end the fol-  
2 lowing:

3 “(iv) to improve real-time risk man-  
4 agement during landslide events, including  
5 with respect to landslide events caused  
6 by—

7 “(I) hydrology or changes in hy-  
8 drology that may include erosion,  
9 drought, or other characteristics that  
10 could impact landslide risk;

11 “(II) atmospheric river flooding  
12 events and extreme precipitation  
13 events, as identified by the Secretary  
14 of Commerce and the Secretary;

15 “(III) geologic activity, such as  
16 volcanic eruptions, earthquakes, or  
17 tsunamis;

18 “(IV) data-poor areas or hazards  
19 with poor monitoring that could con-  
20 tribute to increased landslide risk; or

21 “(V) thawing permafrost and gla-  
22 cial retreat causing destabilization of  
23 slopes.”; and

24 (D) by adding at the end the following:

1           “(B) CONSULTATION.—In carrying out  
 2           subparagraph (A), the Secretary may consult  
 3           with an institution of higher education de-  
 4           scribed in subsection (d)(2)(B)(iv) and the pri-  
 5           vate sector.”.

6           (8) INTERAGENCY COORDINATING COMMITTEE  
 7           ON LANDSLIDE HAZARDS.—Section 3(c)(2) of the  
 8           National Landslide Preparedness Act (43 U.S.C.  
 9           3102(c)(2)) is amended by adding at the end the fol-  
 10          lowing:

11                   “(J) The Administrator of the National  
 12           Aeronautics and Space Administration.”.

13           (9) ADVISORY COMMITTEE.—Section 3(d)(2)(B)  
 14           of the National Landslide Preparedness Act (43  
 15           U.S.C. 3102(d)(2)(B)) is amended—

16                   (A) in clause (iii), by striking “geological”;  
 17                   and

18                   (B) in clause (vi), by striking “local, and  
 19           Tribal emergency management agencies” and  
 20           inserting “and local emergency management  
 21           agencies and emergency management agencies  
 22           of Indian tribes and Native Hawaiian organiza-  
 23           tions”.

1           (10) REGIONAL PARTNERSHIPS.—Section 3 of  
2           the National Landslide Preparedness Act (43 U.S.C.  
3           3102) is amended—

4                   (A) by redesignating subsections (e)  
5                   through (i) as subsections (f) through (j), re-  
6                   spectively; and

7                   (B) by inserting after subsection (d) the  
8                   following:

9           “(e) REGIONAL PARTNERSHIPS.—

10                   “(1) IN GENERAL.—As soon as practicable  
11                   after the date of enactment of the National Land-  
12                   slide Preparedness Act Reauthorization Act of 2025,  
13                   the Secretary shall establish in the State of Alaska  
14                   and other regions, as the Secretary determines to be  
15                   appropriate, a regional partnership with an eligible  
16                   partner described in paragraph (2).

17                   “(2) ELIGIBLE PARTNERS.—An organization or  
18                   institution of higher education with expertise in  
19                   landslide mapping, research, and monitoring shall be  
20                   eligible for a regional partnership under paragraph  
21                   (1).

22                   “(3) PURPOSES AND DUTIES.—A regional part-  
23                   nership established under paragraph (1) shall—

24                           “(A) allow the Secretary to leverage appli-  
25                           cable expertise in regional organizations;

1 “(B) coordinate long-term landslide re-  
 2 search specific to the applicable region; and

3 “(C) align interagency landslide moni-  
 4 toring efforts.”.

5 (11) GRANT PROGRAMS.—Section 3 of the Na-  
 6 tional Landslide Preparedness Act (43 U.S.C. 3102)  
 7 is amended, in paragraph (1) of subsection (f) (as  
 8 so redesignated)—

9 (A) in subparagraph (A)(i), by striking  
 10 “local, and Tribal governments to research,  
 11 map, assess” and inserting “and local govern-  
 12 ments, Indian tribes, Tribal organizations, and  
 13 Native Hawaiian organizations to research,  
 14 map, assess, monitor”;

15 (B) in subparagraph (B)—

16 (i) in clause (i), by inserting “institu-  
 17 tions of higher education described in sub-  
 18 section (d)(2)(B)(iv),” before “and Indian  
 19 tribes”; and

20 (ii) in clause (ii)—

21 (I) by redesignating subclauses  
 22 (II) through (IV) as subclauses (III)  
 23 through (V), respectively; and

24 (II) by inserting after subclause  
 25 (I) the following:



1 “(II) in regions that have re-  
2 cently experienced loss of life due to  
3 landslides;” and

4 (C) in subparagraph (C)—

5 (i) in clause (i), by inserting “award-  
6 ed” after “grants”; and

7 (ii) in clause (ii), by striking “made”  
8 and inserting “or other accomplishments  
9 resulting”.

10 (12) SIGNIFICANT EVENTS.—Section 3 of the  
11 National Landslide Preparedness Act (43 U.S.C.  
12 3102) is amended, in subsection (h)(3) (as so redes-  
13 ignated), by striking “local, and Tribal partners”  
14 and inserting “and local partners, Indian tribes,  
15 Tribal organizations, and Native Hawaiian organiza-  
16 tions”.

17 (13) FUNDING.—Section 3 of the National  
18 Landslide Preparedness Act (43 U.S.C. 3102) is  
19 amended, in subsection (i) (as so redesignated), in  
20 the matter preceding paragraph (1), by striking  
21 “2024” and inserting “2030”.

22 (c) 3D ELEVATION PROGRAM.—

23 (1) ESTABLISHMENT.—Section 5(a) of the Na-  
24 tional Landslide Preparedness Act (43 U.S.C.  
25 3104(a)) is amended—

1 (A) in paragraph (1)(A), by inserting “and  
 2 derivative” after “3D elevation”; and

3 (B) in paragraph (2)(B)(i), by inserting “,  
 4 process, and integrate” after “acquire”.

5 (2) 3D ELEVATION FEDERAL INTERAGENCY CO-  
 6 ORDINATING COMMITTEE.—Section 5(b)(3) of the  
 7 National Landslide Preparedness Act (43 U.S.C.  
 8 3104(b)(3)) is amended—

9 (A) by redesignating subparagraphs (D)  
 10 and (E) as subparagraphs (E) and (F), respec-  
 11 tively; and

12 (B) by inserting after subparagraph (C)  
 13 the following:

14 “(D) the 3D Hydrography Program Work-  
 15 ing Group;”.

16 (3) GRANTS AND COOPERATIVE AGREE-  
 17 MENTS.—Section 5(d)(3) of the National Landslide  
 18 Preparedness Act (43 U.S.C. 3104(d)(3)) is amend-  
 19 ed by striking “publically” and inserting “publicly”.

20 (4) FUNDING.—Section 5(e) of the National  
 21 Landslide Preparedness Act (43 U.S.C. 3104(e)) is  
 22 amended by striking “2024” and inserting “2030”.

1 **SEC. 117. AMENDMENTS TO HARMFUL ALGAL BLOOM AND**  
2 **HYPOXIA RESEARCH AND CONTROL ACT OF**  
3 **1998.**

4 (a) ASSESSMENTS.—Section 603 of the Harmful  
5 Algal Bloom and Hypoxia Research and Control Act of  
6 1998 (33 U.S.C. 4001) is amended—

7 (1) in subsection (a)—

8 (A) by redesignating paragraphs (13) and  
9 (14) as paragraphs (14) and (15); and

10 (B) by inserting after paragraph (12) the  
11 following new paragraph:

12 “(13) the Department of Energy;”;

13 (2) by striking subsections (b), (c), (d), (e), (h),  
14 and (i) and redesignating subsections (f) and (g) as  
15 subsections (b) and (c), respectively;

16 (3) in subsection (b), as so redesignated—

17 (A) in paragraph (1), by striking “coastal  
18 waters including the Great Lakes” and insert-  
19 ing “marine, estuarine, and freshwater sys-  
20 tems”; and

21 (B) in paragraph (2)—

22 (i) by amending subparagraph (A) to  
23 read as follows:

24 “(A) examine the causes and ecological con-  
25 sequences of hypoxia on marine and aquatic species  
26 in their natural environments, and socio-cultural or

1 economic costs of hypoxia, including impacts on food  
 2 safety and security;”;

3 (ii) by redesignating subparagraphs  
 4 (B) through (D) as subparagraphs (D)  
 5 through (F), respectively;

6 (iii) by inserting after subparagraph  
 7 (A) the following new subparagraphs:

8 “(B) examine the effect of other environmental  
 9 stressors on hypoxia;

10 “(C) evaluate alternatives for reducing, miti-  
 11 gating, and controlling hypoxia and its environ-  
 12 mental impacts;”;

13 (iv) in subparagraph (D), as so redes-  
 14 ignated, by inserting “, social,” after “eco-  
 15 logical”; and

16 (v) in subparagraph (E), as so redes-  
 17 ignated, by striking “hypoxia modeling and  
 18 monitoring data” and inserting “hypoxia  
 19 modeling, forecasting, and monitoring and  
 20 observation data”; and

21 (4) in subsection (c), as so redesignated, to  
 22 read as follows:

23 “(c) ACTION STRATEGY AND SCIENTIFIC ASSESS-  
 24 MENT FOR MARINE AND FRESHWATER HARMFUL ALGAL  
 25 BLOOMS.—

1           “(1) Not less often than once every 5 years, the  
2           Task Force shall complete and submit to Congress  
3           an action strategy, including a scientific assessment,  
4           of harmful algal blooms in the United States (in this  
5           Act referred to as the ‘Action Strategy’). Each such  
6           Action Strategy, including scientific assessment,  
7           shall examine both marine and freshwater harmful  
8           algal blooms, including those in the Great Lakes and  
9           upper reaches of estuaries, those in freshwater lakes  
10          and rivers, and those that originate in freshwater  
11          lakes or rivers and migrate to coastal waters.

12          “(2) Each Action Strategy under this sub-  
13          section shall—

14               “(A) examine the causes and ecological  
15               consequences, and the socio-cultural or eco-  
16               nomic costs, including impacts food safety and  
17               security, of harmful algal blooms;

18               “(B) examine the effect of other environ-  
19               mental stressors on harmful algal blooms;

20               “(C) examine potential methods to prevent,  
21               control, and mitigate harmful algal blooms and  
22               the potential ecological, social, cultural, and  
23               economic costs and benefits of such methods;

24               “(D) identify priorities for research needed  
25               to advance techniques and technologies to de-

1 tect, predict, monitor, respond to, and minimize  
2 the occurrence, duration, and severity of harm-  
3 ful algal blooms, including recommendations to  
4 eliminate significant gaps in harmful algal  
5 bloom forecasting, monitoring, and observation  
6 data;

7 “(E) evaluate progress made by, and the  
8 needs of, Task Force activities and actions to  
9 prevent, control, and mitigate harmful algal  
10 blooms;

11 “(F) identify ways to improve coordination  
12 and prevent unnecessary duplication of effort  
13 among Federal departments and agencies with  
14 respect to research on harmful algal blooms;

15 “(G) include regional chapters relating to  
16 the requirements described in this paragraph in  
17 order to highlight geographically and eco-  
18 logically diverse locations with significant eco-  
19 logical, social, cultural, and economic impacts  
20 from harmful algal blooms; and

21 “(H) define methodology used to determine  
22 ecological, social, cultural and economic impacts  
23 from harmful algal blooms and hypoxia.”.

1 (b) CONSULTATIONS.—Section 102 of the Harmful  
2 Algal Bloom and Hypoxia Amendments Act of 2004 (33  
3 U.S.C. 4001a) is amended—

4 (1) by striking “the coastal”;

5 (2) by inserting “and” after “Indian tribes,”;

6 (3) by inserting “and” after “local govern-  
7 ments,”; and

8 (4) by striking “with expertise in coastal zone  
9 science and management” and inserting “with rel-  
10 evant expertise”.

11 (c) NATIONAL HARMFUL ALGAL BLOOM AND HY-  
12 POXIA PROGRAM.—Section 603A of the Harmful Algal  
13 Bloom and Hypoxia Research and Control Act of 1998  
14 (33 U.S.C. 4002) is amended—

15 (1) in subsection (a)—

16 (A) in paragraph (1)—

17 (i) by striking “predicting,” and in-  
18 serting “monitoring, observing, fore-  
19 casting,”; and

20 (ii) by striking “and” after the semi-  
21 colon;

22 (B) in paragraph (2)—

23 (i) by striking “comprehensive re-  
24 search plan and action strategy under sec-  
25 tion 603B” and inserting “Action Strat-

1                   egy, including scientific assessment, under  
2                   section 603(c)”; and

3                   (ii) by striking the period and insert-  
4                   ing “; and”; and

5                   (C) by adding at the end the following new  
6                   paragraph:

7                   “(3) the scientific assessment under section  
8                   603(b).”;

9                   (2) in subsection (c)—

10                  (A) in paragraph (3), by striking “ocean  
11                  and Great Lakes” and inserting “marine, estu-  
12                  arine, and freshwater systems”; and

13                  (B) in paragraph (5), by inserting “while  
14                  recognizing each agency is acting under its own  
15                  independent mission and authority” before the  
16                  semicolon;

17                  (3) in subsection (d), by striking “Except as  
18                  provided in subsection (h), the” and inserting  
19                  “The”;

20                  (4) in subsection (e)—

21                  (A) by amending paragraph (2) to read as  
22                  follows:

23                  “(2) examine, in collaboration with State and  
24                  local entities and Indian Tribes, including island  
25                  communities, low-population rural communities, In-



1       digenous communities, subsistence communities,  
2       fisheries, and recreation industries that are most de-  
3       pendent on coastal and water resources that may be  
4       impacted by marine and freshwater harmful algal  
5       blooms and hypoxia, the causes, ecological con-  
6       sequences, cultural impacts, and social and economic  
7       costs of harmful algal blooms and hypoxia;”;

8               (B) by striking paragraph (3);

9               (C) by redesignating paragraphs (4), (5),  
10       and (6) as paragraphs (3), (4), and (5), respec-  
11       tively;

12              (D) in paragraph (3), as so redesignated—

13                   (i) by striking “to, regional” and in-  
14                   serting “to regional”; and

15                   (ii) by striking “agencies” and insert-  
16                   ing “entities, and regional coastal observ-  
17                   ing systems (as such term is defined in  
18                   section 12330(6) of the Integrated Coastal  
19                   and Ocean Observation System Act of  
20                   2009 (33 U.S.C. 3602(6)))”;

21              (E) in paragraph (5), as so redesignated,  
22       by inserting “and communities” after “eco-  
23       systems”;

24              (F) by inserting after paragraph (5) the  
25       following new paragraph:

1 “(6) support sustained observations, including  
2 through peer-reviewed, merit-based, competitive  
3 grant funding, to provide State and local entities,  
4 Indian Tribes, and others access to real-time or near  
5 real-time observation data for decision-making to  
6 protect human and ecological health and local econo-  
7 mies;”;

8 (G) in paragraph (8), by striking “State  
9 and local” and inserting “State, local, and Trib-  
10 al”; and

11 (H) in paragraph (9)(A), by striking “trib-  
12 al” and inserting “Tribal”;

13 (5) by amending subsections (f) and (g) to read  
14 as follows:

15 “(f) COOPERATIVE EFFORTS.—The Under Secretary  
16 shall work cooperatively with and avoid duplication of ef-  
17 fort of other agencies on the Task Force, and with and  
18 of States, Indian tribes, and nongovernmental organiza-  
19 tions concerned with marine and freshwater issues, and  
20 shall coordinate harmful algal bloom and hypoxia and re-  
21 lated activities and research.

22 “(g) FRESHWATER AND ESTUARINE PROGRAM DU-  
23 TIES.—

24 “(1) IN GENERAL.—The Administrator shall—

1           “(A) with respect to freshwater aspects of  
2           the Program, in coordination with the Task  
3           Force, carry out the duties under subsection (e)  
4           through the activities required under section  
5           603C; and

6           “(B) with respect to estuarine aspects of  
7           the Program, coordinate with the Under Sec-  
8           retary to carry out activities required under this  
9           section.

10          “(2) NONDUPLICATION.—The Administrator  
11          shall ensure that activities carried out under this  
12          subsection focus on new approaches to addressing  
13          freshwater harmful algal blooms and are not dupli-  
14          cative of existing research and development pro-  
15          grams authorized under this Act or any other law.”;  
16          and

17          (6) by amending subsection (h) to read as fol-  
18          lows:

19          “(h) ANTI-DEFICIENCY ACT APPLIED TO HARMFUL  
20          ALGAL BLOOM SERVICES.—Any services by an officer or  
21          employee under this title relating to the immediate devel-  
22          opment and dissemination of the Harmful Algal Bloom  
23          Operational Forecast System of the National Centers for  
24          Coastal Ocean Science and the National Oceanic and At-  
25          mospheric Administration shall be considered, for pur-

1 poses of section 1342 of title 31, United States Code, serv-  
 2 ices for emergencies involving the safety of human life or  
 3 the protection of property. Such consideration shall only  
 4 apply to areas with active harmful algal blooms during any  
 5 lapse in appropriations beginning on or after the date of  
 6 the enactment of this subsection.”.

7 (d) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-  
 8 ISTRATION ACTIVITIES.—

9 (1) IN GENERAL.—Section 603B of the Harm-  
 10 ful Algal Bloom and Hypoxia Research and Control  
 11 Act of 1998 (33 U.S.C. 4003) is amended to read  
 12 as follows:

13 **“SEC. 603B. NATIONAL OCEANIC AND ATMOSPHERIC AD-  
 14 MINISTRATION ACTIVITIES.**

15 “(a) IN GENERAL.—The Under Secretary shall—

16 “(1) carry out marine, coastal, and Great  
 17 Lakes harmful algal bloom and hypoxia events re-  
 18 sponse activities;

19 “(2) develop and enhance operational harmful  
 20 algal bloom observing and forecasting programs, in-  
 21 cluding operational observations and forecasting,  
 22 monitoring, modeling, data management, and infor-  
 23 mation dissemination;

1           “(3) maintain and enhance peer-reviewed,  
2           merit-based, competitive grant funding relating to  
3           harmful algal blooms and hypoxia to—

4                   “(A) maintain and enhance baseline moni-  
5                   toring programs established by the Program;

6                   “(B) support the projects maintained and  
7                   established by the Program;

8                   “(C) address the research and manage-  
9                   ment needs and priorities identified in the Ac-  
10                  tion Strategy under section 603(c);

11                  “(D) accelerate the utilization of effective  
12                  methods of intervention and mitigation to re-  
13                  duce the frequency, severity, and impacts of  
14                  harmful algal bloom and hypoxia events;

15                  “(E) identify opportunities to improve  
16                  monitoring of harmful algal bloom and hypoxia,  
17                  with a particular focus on coastal waters that  
18                  may affect fisheries, public health, or subsist-  
19                  ence harvest;

20                  “(F) examine the effects of other environ-  
21                  mental stressors on harmful algal blooms and  
22                  hypoxia;

23                  “(G) assess the effects of multiple environ-  
24                  mental stressors on living marine resources and  
25                  coastal ecosystems; and

1           “(H) evaluate adaptation and mitigation  
2           strategies to address the impacts of harmful  
3           algal blooms and hypoxia;

4           “(4) enhance communication and coordination  
5           among Federal agencies carrying out marine and  
6           freshwater harmful algal bloom and hypoxia activi-  
7           ties and research;

8           “(5) to the greatest extent practicable, leverage  
9           existing resources and expertise available from local  
10          research universities and institutions; and

11          “(6) use cost effective methods in carrying out  
12          this section.

13          “(b) INTEGRATED COASTAL AND OCEAN OBSERVA-  
14          TION SYSTEM.—The collection of monitoring and observ-  
15          ing data under this section shall comply with all data  
16          standards and protocols developed pursuant to the Inte-  
17          grated Coastal and Ocean Observation System Act of  
18          2009 (33 U.S.C. 3601 et seq.). Such data shall be made  
19          available through the system established under that Act.”.

20          (2) CLERICAL AMENDMENT.—The table of con-  
21          tents in section 2 of the Coast Guard Authorization  
22          Act of 1998 (Public Law 105–383) is amended by  
23          amending the item relating to section 603B to read  
24          as follows:

“Sec. 603B. National Oceanic and Atmospheric Administration activities.”.

1 (e) ENVIRONMENTAL PROTECTION AGENCY ACTIVI-  
2 TIES.—

3 (1) IN GENERAL.—The Harmful Algal Bloom  
4 and Hypoxia Research and Control Act of 1998 (33  
5 U.S.C. 4001 et seq.) is amended by inserting after  
6 section 603B of that Act (33 U.S.C. 4003), as  
7 amended by subsection (d), the following new sec-  
8 tion:

9 **“SEC. 603C. ENVIRONMENTAL PROTECTION AGENCY AC-**  
10 **TIVITIES.**

11 “The Administrator shall—

12 “(1) carry out research on the ecology and  
13 human health impacts of freshwater harmful algal  
14 blooms;

15 “(2) develop and maintain forecasting and mon-  
16 itoring of, and event response to, freshwater harmful  
17 algal blooms in lakes, reservoirs, rivers, and estu-  
18 aries (including tributaries thereof);

19 “(3) enhance communication and coordination  
20 among Federal agencies carrying out freshwater  
21 harmful algal bloom and hypoxia activities and re-  
22 search;

23 “(4) to the greatest extent practicable, leverage  
24 existing resources and expertise available from local  
25 research universities and institutions; and

1           “(5) use cost effective methods in carrying out  
2       this section.”.

3           (2) CLERICAL AMENDMENT.—The table of con-  
4       tents in section 2 of the Coast Guard Authorization  
5       Act of 1998 (Public Law 105–383) is amended by  
6       inserting after the item relating to section 603B, as  
7       amended by subsection (e), the following new item:  
      “Sec. 603C. Environmental Protection Agency activities.”.

8           (f) NATIONAL HARMFUL ALGAL BLOOM AND HY-  
9       POXIA OBSERVING NETWORK.—

10          (1) IN GENERAL.—Section 606 of the Harmful  
11       Algal Bloom and Hypoxia Research and Control Act  
12       of 1998 (33 U.S.C. 4005) is amended to read as fol-  
13       lows:

14       **“SEC. 606. NATIONAL HARMFUL ALGAL BLOOM OBSERVING**  
15               **NETWORK.**

16       “(a) IN GENERAL.—The Under Secretary, acting  
17       through the National Centers for Coastal Ocean Science  
18       (referred to in this section as ‘NCCOS’) and the Inte-  
19       grated Ocean Observing System (referred to in this section  
20       as ‘IOOS’) of the National Oceanic and Atmospheric Ad-  
21       ministration, shall integrate Federal, State, regional, and  
22       local observing capabilities to establish a national network  
23       of harmful algal bloom observing systems for the moni-  
24       toring, detection, and forecasting of harmful algal blooms  
25       by leveraging the capacity of IOOS regional associations,



1 including through the incorporation of emerging tech-  
2 nologies and new data integration methods, such as artifi-  
3 cial intelligence.

4 “(b) COORDINATION.—In carrying out subsection  
5 (a), the IOOS Program Office shall—

6 “(1) coordinate with NCCOS regarding obser-  
7 vations, data integration, and information dissemi-  
8 nation; and

9 “(2) establish a Harmful Algal Bloom Data As-  
10 sembly Center to integrate, disseminate, and provide  
11 a central architecture to support ecological fore-  
12 casting.”.

13 (2) CLERICAL AMENDMENT.—The table of con-  
14 tents in section 2 of the Coast Guard Authorization  
15 Act of 1998 (Public Law 105–383) is amended by  
16 amending the item relating to section 606 to read as  
17 follows:

“Sec. 606. National harmful algal bloom observing network.”.

18 (g) DEFINITIONS.—Section 609 of the Harmful Algal  
19 Bloom and Hypoxia Research and Control Act of 1998  
20 (33 U.S.C. 4008) is amended—

21 (1) in paragraph (1), by striking “means the  
22 comprehensive research plan and action strategy es-  
23 tablished under section 603B” and inserting “means  
24 the action strategy, including scientific assessment,

1 for marine and freshwater harmful algal blooms es-  
2 tablished under section 603(c)”;

3 (2) in paragraph (3), to read as follows:

4 “(3) APPROPRIATE FEDERAL OFFICIAL.—The  
5 term ‘appropriate Federal official’ means—

6 “(A) in the case of marine systems or  
7 Great Lakes hypoxia or harmful algal bloom  
8 event, including those in estuarine areas, the  
9 Under Secretary; and

10 “(B) in the case of a freshwater hypoxia or  
11 harmful algal bloom event, the Administrator,  
12 in consultation with the Under Secretary.”;

13 (3) by striking paragraph (9);

14 (4) by redesignating paragraphs (4), (5), (6),  
15 (7), and (8) as paragraphs (6), (7), (8), (10), and  
16 (11);

17 (5) by inserting after paragraph (3) the fol-  
18 lowing new paragraphs:

19 “(4) HARMFUL ALGAL BLOOM; HARMFUL  
20 ALGAL BLOOM AND HYPOXIA EVENT.—

21 “(A) HARMFUL ALGAL BLOOM.—The term  
22 ‘harmful algal bloom’ means marine or fresh-  
23 water algae or macroalgae, including  
24 Sargassum, that proliferate to high concentra-  
25 tions, resulting in nuisance conditions or harm-

ful impacts on marine and freshwater ecosystems, communities, or human health through the production of toxic compounds or other biological, chemical, or physical impacts of the algae outbreak.

“(B) HARMFUL ALGAL BLOOM AND HYPOXIA EVENT.—The term ‘harmful algal bloom and hypoxia event’ means the occurrence of a harmful algal bloom or hypoxia as a result of a natural, anthropogenic, or undetermined cause.

“(5) HARMFUL ALGAL BLOOM OR HYPOXIA EVENT OF SIGNIFICANCE.—The term ‘harmful algal bloom or hypoxia event of significance’ means a harmful algal bloom or hypoxia event that has had or will likely have significant detrimental environmental, economic, social, subsistence use, or public health impacts.”;

(6) in paragraph (6), as so redesignated—

(A) by striking “aquatic” and inserting “marine or freshwater”; and

(B) by striking “resident” and inserting “marine or freshwater”; and

(7) by inserting after paragraph (8), as so redesignated, the following new paragraph:

1           “(9) SUBSISTENCE USE.—The term ‘subsist-  
 2           ence use’ means the customary and traditional use  
 3           of fish, wildlife, or other freshwater, coastal, or ma-  
 4           rine resources by any individual or community to  
 5           meet personal or family needs, including essential  
 6           economic, nutritional, or cultural applications.”.

7           (h) AUTHORIZATION OF APPROPRIATIONS.—Section  
 8   610 of the Harmful Algal Bloom and Hypoxia Research  
 9   and Control Act of 1998 (33 U.S.C. 4009) is amended—  
 10           (1) in subsection (a), to read as follows:

11           “(a) IN GENERAL.—There is authorized to be appro-  
 12           priated to the Under Secretary to carry out this title  
 13           \$27,500,000 for each of fiscal years 2026 through 2030.”;  
 14           and

15           (2) by adding at the end the following new sub-  
 16           section:

17           “(c) TRANSFER AUTHORITY.—The Under Secretary  
 18           is authorized to make a direct non-expenditure transfer  
 19           of funds authorized to be appropriated pursuant to sub-  
 20           section (a) to the head of any Federal department or agen-  
 21           cy, with the concurrence of such head, to carry out, as  
 22           appropriate, relevant provisions of this title.”.

23           (i) NATIONAL LEVEL INCUBATOR PROGRAM; HARM-  
 24           FUL ALGAL BLOOM OR HYPOXIA EVENT OF SIGNIFI-  
 25           CANCE.—

1           (1) IN GENERAL.—The Harmful Algal Bloom  
2           and Hypoxia Research and Control Act of 1998 (33  
3           U.S.C. 4001 et seq.) is amended by adding at the  
4           end the following new section:

5   **“SEC. 611. NATIONAL LEVEL INCUBATOR PROGRAM.**

6           “(a) IN GENERAL.—The Under Secretary, in collabo-  
7           ration with research universities and institutions, shall es-  
8           tablish a national level incubator program to increase the  
9           number of available control strategies and technologies re-  
10          lating to harmful algal blooms. Such incubator shall estab-  
11          lish a framework for preliminary assessments of novel  
12          harmful algal bloom prevention, mitigation, and control  
13          technologies in order to determine the potential for effec-  
14          tiveness and scalability.

15          “(b) OPERATION.—The incubator established under  
16          subsection (a) shall provide merit-based funding for harm-  
17          ful algal bloom control strategies and technologies that  
18          eliminate or reduce through biological, chemical, or phys-  
19          ical means the levels of harmful algae and associated tox-  
20          ins.

21          “(c) DATABASE.—The incubator established under  
22          subsection (a) shall include a database to catalog the li-  
23          censing and permitting requirements, economic costs, fea-  
24          sibility, effectiveness, and scalability of both novel and es-  
25          tablished prevention, control, and mitigation measures.

1       “(d) PRIORITIZATION.—In carrying out the incubator  
 2 established under subsection (a), the Under Secretary  
 3 shall prioritize proposed activities that would, to the max-  
 4 imum extent practicable—

5               “(1) protect key habitats for fish and wildlife;

6               “(2) maintain biodiversity;

7               “(3) protect public health;

8               “(4) protect coastal resources of national, his-  
 9 torical, and cultural significance; or

10              “(5) seek to partially or fully benefit commu-  
 11 nities of color, low-income communities, Indian  
 12 Tribes or Indigenous communities, and rural com-  
 13 munities.”.

14              (2) CLERICAL AMENDMENT.—The table of con-  
 15 tents in section 2 of the Coast Guard Authorization  
 16 Act of 1998 (Public Law 105–383) is amended by  
 17 inserting after the item relating to section 610 the  
 18 following new item:

“Sec. 611. National level incubator program.”.

19              (j) HARMFUL ALGAL BLOOM OR HYPOXIA EVENT OF  
 20 SIGNIFICANCE.—Section 9(g) of the National Integrated  
 21 Drought Information System Reauthorization Act of 2018  
 22 (33 U.S.C. 4010(g)) is amended—

23                      (1) in paragraph (1)—

24                              (A) in subparagraph (B), by adding at the  
 25 end the following new sentence: “The appro-

1           priate Federal official may waive the non-Fed-  
2           eral share requirements of this subsection if  
3           such official determines no reasonable means  
4           are available through which the recipient of the  
5           Federal share can meet the non-Federal share  
6           requirement.”; and

7                   (B) by adding at the end the following new  
8           subparagraph:

9                   “(D) CONTRACT, GRANT, AND COOPERA-  
10           TIVE AGREEMENT AUTHORITY.—The Under  
11           Secretary of Commerce for Oceans and Atmos-  
12           phere may enter into agreements and grants  
13           with States, Indian Tribes, local governments,  
14           or other entities to pay for or reimburse costs  
15           incurred for the purposes of supporting the de-  
16           termination of and assessing the environmental,  
17           economic, social, subsistence use, and public  
18           health effects of a harmful algal bloom or hy-  
19           poxia event of significance.”;

20                   (2) in paragraph (2)(A), by inserting “, leader-  
21           ship official of an affected Indian Tribe, the execu-  
22           tive official of the District of Columbia, or a terri-  
23           tory or possession of the United States, including  
24           Puerto Rico, the Virgin Islands, Guam, the Com-  
25           monwealth of the Northern Mariana Islands, the

1 Trust Territories of the Pacific Islands, and Amer-  
2 ican Samoa, if affected” after “State”; and

3 (3) by adding at the end the following new  
4 paragraph:

5 “(4) FUNDING AUTHORITY.—To carry out this  
6 subsection, notwithstanding any other provision of  
7 law, there is authorized to be appropriated from the  
8 amounts made available to the Under Secretary of  
9 Commerce for Oceans and Atmosphere \$2,000,000,  
10 to remain available until expended.”.

11 (k) PROTECT FAMILIES FROM TOXIC ALGAL  
12 BLOOMS.—Section 128 of the Water Resources Develop-  
13 ment Act of 2020 (33 U.S.C. 610 note) is amended—

14 (1) by redesignating subsection (e) as sub-  
15 section (f); and

16 (2) by inserting after subsection (d) the fol-  
17 lowing new subsection:

18 “(e) HARMFUL ALGAL BLOOM TECHNOLOGIES.—In  
19 carrying out the demonstration program under subsection  
20 (a), the Secretary may enter into agreements with water  
21 and irrigation districts located in the focus areas described  
22 in subsections (c) and (d) for the use or sale of any new  
23 technologies developed under the program to expedite the  
24 removal of harmful algal blooms in such areas.”.



1 **TITLE II—ENHANCING FEDERAL**  
2 **WEATHER FORECASTING AND**  
3 **INNOVATION**

4 **SEC. 201. WEATHER INNOVATION FOR THE NEXT GENERA-**  
5 **TION.**

6 (a) IN GENERAL.—Not later than 180 days after the  
7 date of the enactment of this Act, the Under Secretary  
8 shall establish a Research, Development, Test, and Eval-  
9 uation Program (in this section referred to as the “Pro-  
10 gram”) to ensure the continued performance of weather  
11 radar capabilities, including systems currently being devel-  
12 oped, with interferences in the line of sight of such radar.

13 (b) REQUIREMENTS.—In carrying out the Program,  
14 the Under Secretary, in consultation with the Interagency  
15 Council for Advancing Meteorological Services, shall—

16 (1) partner with the private sector, academia,  
17 Federal, State, and local government entities, and  
18 any other entity the Under Secretary considers ap-  
19 propriate;

20 (2) identify, evaluate, and test existing or near-  
21 commercial technologies and solutions that improve  
22 radar coverage and performance, including by miti-  
23 gating the potential impact of interferences on  
24 weather radar;

(3) to the maximum extent practicable, research additional solutions that could mitigate the effects of interferences on weather radar, such as—

(A) signal processing algorithms;

(B) short-term forecasting algorithms to replace contaminated data;

(C) the use of dual polarization characteristics in mitigating the effects of wind turbines on weather radar; and

(D) gap filling radars to provide supplemental or replacement observations in impacted areas; and

(4) develop, support, or partner with developers to provide commercially viable technical mitigation solutions for interferences to weather radar capabilities that are compatible with the operational requirements of the weather radar systems.

(c) PRIORITY.—In carrying out subsection (b), the Under Secretary shall prioritize consideration of the following technology-based mitigation solutions:

(1) Phased array weather radar systems.

(2) Supplementing or replacing contaminated data with commercial radar data.

1           (3) The utilization of data from private sector  
2           associated meteorological towers or similar capabili-  
3           ties.

4           (4) The display on local forecasting equipment  
5           of wind farm boundaries and consolidated wind farm  
6           areas.

7           (5) The installation and provision of access to  
8           rain gauges.

9           (6) Any other technology-based mitigation solu-  
10          tion the Under Secretary determines could improve  
11          radar coverage by overcoming interferences, beam  
12          blockage, or ghost echoes.

13         (d) REPORT; RECOMMENDATION.—

14                 (1) IN GENERAL.—Not later than two years  
15                 after the date of the enactment of this section and  
16                 annually thereafter until the Program terminates  
17                 pursuant to subsection (e), the Under Secretary  
18                 shall submit to Congress a report on the implemen-  
19                 tation of the Program, including an evaluation of  
20                 each technology-based mitigation solution identified  
21                 for priority consideration pursuant to subsection (e),  
22                 and a recommendation regarding additional identi-  
23                 fication and testing of new technologies based on  
24                 such consideration.

1           (2) FINAL RECOMMENDATION.—Not later than  
2       five years after the date of the enactment of this  
3       section, the Under Secretary shall provide to Con-  
4       gress a recommendation on whether additional re-  
5       search, testing, and development through the Pro-  
6       gram established under subsection (a) is needed, and  
7       a determination of whether a cessation of field re-  
8       search, testing, development and evaluation is appro-  
9       priate.

10       (e) TERMINATION.—The authority of the Under Sec-  
11      retary to carry out the Program shall terminate on the  
12      earlier of—

13           (1) September 30, 2030; or

14           (2) one year after the date on which the final  
15      recommendation required under subsection (d)(2) is  
16      submitted by the Under Secretary.

17       (f) DEFINITIONS.—In this section:

18           (1) BEAM BLOCKAGE.—The term “beam block-  
19      age” means a signal that is partially or fully blocked  
20      due to an interference.

21           (2) GHOST ECHO.—The term “ghost echo”  
22      means radar signal reflectivity or velocity return er-  
23      rors in radar data due to the proximity of an inter-  
24      ference.

1           (3) INTERFERENCE.—The term “interference”  
2 includes the following:

3           (A) a wind turbine that could limit the ef-  
4 fectiveness of a weather radar system;

5           (B) any building that disrupts or limits the  
6 effectiveness of a weather radar system; or

7           (C) any other natural or human built  
8 structure that affects a weather radar system.

9 **SEC. 202. NEXT GENERATION RADAR.**

10       (a) IN GENERAL.—The Under Secretary shall de-  
11 velop a plan to replace the Next Generation Weather  
12 Radar of the National Weather Service (“NEXRAD”)  
13 system in existence as of the date of the enactment of this  
14 section.

15       (b) PROCUREMENT DEADLINE.—The Under Sec-  
16 retary shall take such actions as may be necessary to en-  
17 sure the replacement described in subsection (a) is com-  
18 pleted by not later than September 30, 2040.

19       (c) ELEMENTS.—The plan developed pursuant to  
20 subsection (a) shall include the following:

21           (1) Estimates of quantifiable improvements in  
22 radar performance and service delivery, including  
23 coverage and accuracy, to be made from replacement  
24 of the NEXRAD system referred to in such sub-  
25 section.

1           (2) Development of a digital phased array radar  
2       test article designed to test and determine the speci-  
3       fications and requirements for such replacement.

4           (3) Establishment of a weather surveillance  
5       radar testbed for the following:

6           (A) Evaluation of commercial radars with  
7       the potential to replace or supplement the  
8       NEXRAD system.

9           (B) Providing technical assistance for com-  
10      mercial replacement or supplemental radars, in-  
11      cluding data void filling radars in regions where  
12      geographical topography prevents full utilization  
13      of conventional systems.

14          (4) Consultation and input solicited from mete-  
15      orologists, emergency managers, and public safety  
16      officials regarding the specifications and require-  
17      ments for the replacement of the NEXRAD system  
18      referred in such subsection.

19          (5) Prioritized locations for initial deployment  
20      of the replacement system described in subsection  
21      (a) that will replace the NEXRAD system.

22          (6) Expected locations of such replacement sys-  
23      tem described in subsection (a), including sites lo-  
24      cated more than 75 miles away from an existing

1 NEXRAD station and additional appropriate loca-  
2 tions.

3 (d) RADAR-AS-A-SERVICE.—

4 (1) IN GENERAL.—In order to supplement data  
5 voids in radar coverage in existence as of the date  
6 of the enactment of this section and ensure the con-  
7 tinued performance of weather radar capabilities,  
8 the Under Secretary may utilize and contract with  
9 third party entities to fill such low-level and wide-  
10 area radar data voids using diverse weather radars  
11 and data assimilation technologies to better detect  
12 significant precipitation and severe weather over a  
13 greater area across the population.

14 (2) CONSIDERATIONS.—In carrying out the ac-  
15 tivities under paragraph (1), the Under Secretary  
16 may consider—

17 (A) utilizing and contracting with third-  
18 party entities that have participated in the  
19 testbed established in accordance with sub-  
20 section (c)(3), the National Mesonet Program,  
21 or Cooperative Research and Development  
22 Agreements; and

23 (B) weather camera systems and services,  
24 including systems and services in consultation  
25 with the Federal Aviation Administration, as

1           viable technologies to supplement weather fore-  
2           casting and prediction needs.

3           (e) UPDATES TO CONGRESS.—The Under Secretary  
4 shall provide to the Committee on Science, Space, and  
5 Technology of the House of Representatives and the Com-  
6 mittee on Commerce, Science, and Transportation of the  
7 Senate periodic updates on the implementation of this sec-  
8 tion.

9   **SEC. 203. DATA VOIDS IN HIGHLY VULNERABLE AREAS OF**  
10                           **THE UNITED STATES.**

11          (a) IN GENERAL.—The Under Secretary, in coordi-  
12 nation with the Director of the National Weather Service  
13 and the Administrator of the Federal Emergency Manage-  
14 ment Agency, in consultation with the United States  
15 weather industry, academic partners, and in accordance  
16 with activities implemented through existing regional at-  
17 mospheric, coastal, ocean, and Great Lakes observing sys-  
18 tems, shall carry out activities to ensure equitable and  
19 comprehensive weather observation coverage and emer-  
20 gency information sharing in the United States, including  
21 relating to the following:

22           (1) Reviewing areas in the continental United  
23 States and the territories that are considered under-  
24 observed, underserved, or highly vulnerable for  
25 weather phenomenon, including urban and offshore



1 regions, and identifying associated challenges to pro-  
2 viding such coverage.

3 (2) Increasing weather observations and devel-  
4 oping new weather observational capabilities, such as  
5 urban heat island mapping campaigns, with respect  
6 to under-observed, underserved, or highly vulnerable  
7 regions.

8 (3) Establishing or supporting testbeds to de-  
9 velop and integrate new weather, water, and climate  
10 observation or emergency information sharing tools,  
11 such as next generational or supplemental radars for  
12 weather observations, in under-observed, under-  
13 served, or highly vulnerable regions.

14 (4) To the maximum extent practicable, ad-  
15 vancing weather and water forecasting and climate  
16 modeling capabilities for under-observed, under-  
17 served, or highly vulnerable regions.

18 (5) Undertaking workforce development efforts  
19 for emergency management officials and meteorolo-  
20 gists in under-observed, underserved, or highly vul-  
21 nerable areas, including urban regions, of the United  
22 States.

23 (6) Using data void filling observations to bet-  
24 ter resolve extreme rainfall in complex topography.

1           (7) Contributing to a national integrated heat  
2       health information systems.

3       (b) PILOT PROGRAM.—In carrying out this section,  
4       the Under Secretary, acting through the Director of the  
5       National Weather Service and the Administrator of the  
6       Federal Emergency Management Agency, shall establish  
7       an interagency partnership to support pilot projects that  
8       accelerate coordination and use of localized weather,  
9       water, and climate data and impact-based communications  
10      in infrastructure and emergency management decisions by  
11      Federal, State, and local officials.

12      (c) PRIORITY.—At least one pilot project under sub-  
13      section (b) shall address key science challenges to using  
14      mesonet data in local decision making and development  
15      of new tools and training for owners and operators of crit-  
16      ical infrastructure (as such term is defined in section  
17      1016(e) of Public Law 107–56 (42 U.S.C. 5195c(e))),  
18      such as dams, energy generation and distribution facili-  
19      ties, nuclear power plants, and transportation networks.

20      **SEC. 204. ATMOSPHERIC RIVERS FORECAST IMPROVEMENT**  
21                                   **PROGRAM.**

22      (a) IN GENERAL.—The Under Secretary, in collabo-  
23      ration with the United States weather industry and aca-  
24      demic partners, shall establish an atmospheric river fore-

1 cast improvement program (in this section referred to as  
2 the “program”).

3 (b) GOAL.—The goal of the program shall be to re-  
4 duce through the development and extension of accurate,  
5 effective, and actionable forecasts and warnings the loss  
6 of life or property from atmospheric rivers, including by—

7 (1) establishing quantitative atmospheric river  
8 forecast skill metrics that include quantifying the  
9 benefits of dynamical modeling, data assimilation,  
10 and machine learning improvements in the prob-  
11 abilistic forecasts of landfall location, extreme wind  
12 and precipitation, and cascading impacts;

13 (2) developing an atmospheric river forecast  
14 system within the unified forecast system, and ad-  
15 vancing next-generation coupled modeling systems,  
16 with the capability of providing seasonal to short-  
17 range atmospheric river forecasts that include fore-  
18 cast of snow accumulation and other hydrologic com-  
19 ponents;

20 (3) advancing scientific understanding of the  
21 roles of atmospheric rivers in subseasonal to sea-  
22 sonal precipitation and probabilistic predictions at  
23 subseasonal and seasonal scales;

24 (4) developing tools and improved forecast  
25 products to predict periods of active or inactive at-

1       mospheric river landfalls and inland penetration over  
2       the western United States with a focus on address-  
3       ing stakeholder and public needs related to per-  
4       ceiving, comprehending, and responding to atmos-  
5       pheric river forecast improvements; and

6               (5) enhancing research transition to operations  
7       through the Administration’s testbeds, including the  
8       evaluation of physical and social science, technology,  
9       and other research to develop products and services  
10      for implementation and use by relevant stakeholders.

11      (c) INNOVATIVE OBSERVATIONS AND MODELING.—  
12      The Under Secretary shall ensure the program periodically  
13      examines, tests, and evaluates the value of incorporating  
14      innovative observations, such as novel sensor technologies,  
15      observation networks, soil moisture monitoring systems,  
16      reservoir storage data, observations from crewed or  
17      uncrewed systems, and hosted instruments on commercial  
18      aircrafts, vessels, and satellites, and data assimilation  
19      tools, with respect to the improvement of atmospheric  
20      river forecasts, predictions, and warnings.

21      (d) PROGRAM PLAN.—Not later than 180 days after  
22      the date of the enactment of this Act, the Under Secretary  
23      shall develop a plan that details the specific research, de-  
24      velopment, data acquisition, and technology transfer ac-  
25      tivities, as well as corresponding resources, limitations,

1 and timelines, necessary to achieve the goal of the pro-  
2 gram under subsection (b).

3 (e) ANNUAL BUDGET FOR PLAN SUBMITTAL.—After  
4 the development of the plan pursuant to subsection (d),  
5 the Under Secretary shall, not less frequently than annu-  
6 ally, submit to Congress a proposed budget corresponding  
7 with the activities identified in such plan.

8 **SEC. 205. COASTAL FLOODING AND STORM SURGE FORE-**  
9 **CAST IMPROVEMENT PROGRAM.**

10 (a) IN GENERAL.—The Under Secretary, in collabo-  
11 ration with the Integrated Ocean Observing System, the  
12 United States weather industry, and academic partners,  
13 shall establish a coastal flooding and storm surge forecast  
14 improvement program (in this section referred to as the  
15 “program”).

16 (b) GOAL.—The goal of the program shall be to re-  
17 duce through the development and extension of accurate,  
18 effective, actionable, and probable forecasts and warnings  
19 the loss of life or property from coastal flooding, including  
20 high tide flooding, and storm surge events.

21 (c) PRIORITY.—In implementing the program, the  
22 Under Secretary shall prioritize activities that carry out  
23 the following:

24 (1) Improving understanding and capacity for  
25 real-time operational prediction of the ocean’s role in

1 coastal flooding, including high tide flooding, and  
2 storm surge events.

3 (2) Improving the capacity to mitigate or pre-  
4 vent the impacts of coastal flooding, including high  
5 tide flooding, and storm surge events, including by  
6 improving the understanding and capacity of coastal  
7 communities to perceive, comprehend, and respond  
8 to forecast information.

9 (3) Incorporating data from in situ distributed  
10 sensors into models.

11 (4) Developing probabilistic coastal flooding, in-  
12 cluding high tide flooding, and storm surge esti-  
13 mates to complement worst-case scenario estimates,  
14 including for use in long-term planning and risk  
15 management by States, Tribal governments, local-  
16 ities, and emergency managers in coordination with  
17 the Federal Emergency Management Agency, as ap-  
18 propriate.

19 (5) Establishing skill metrics for coastal inun-  
20 dation forecasting that quantify the benefits of dy-  
21 namical modeling, data assimilation, and machine  
22 learning improvements in the probabilistic forecast  
23 of coastal flooding, including high tide flooding, and  
24 storm surge risk and impacts.

1           (6) Improving operational regional storm surge  
2           and wave prediction models to enhance probabilistic  
3           guidance and messaging.

4           (d) INNOVATIVE OBSERVATIONS AND MODELING.—  
5   The Under Secretary shall ensure the program periodically  
6   examines, tests, and evaluates the value of incorporating  
7   enhanced model physics, hybrid dynamical or machine  
8   learning based prediction systems, and innovative observa-  
9   tions, such as novel sensor technologies, observation net-  
10   works, crewed or uncrewed systems, and hosted instru-  
11   ments on commercial aircrafts, vessels, and satellites, with  
12   respect to the improvement of coastal flooding, including  
13   high tide flooding, and storm surge forecasts, predictions,  
14   and warnings.

15          (e) PROGRAM PLAN.—Not later than 180 days after  
16   the date of the enactment of this Act, the Under Secretary  
17   shall develop a plan that details the specific research, de-  
18   velopment, data acquisition, and technology transfer ac-  
19   tivities, as well as corresponding resources and timelines,  
20   necessary to achieve the goal of the program under sub-  
21   section (b).

22          (f) ANNUAL BUDGET FOR PLAN SUBMITTAL.—After  
23   the development of the plan pursuant to subsection (e),  
24   the Under Secretary shall, not less frequently than annu-

1 ally, submit to Congress a proposed budget corresponding  
2 with the activities identified in such plan.

3 **SEC. 206. AVIATION WEATHER AND DATA INNOVATION.**

4 (a) PROGRAM.—The Under Secretary shall maintain  
5 an airborne observation program (in this section referred  
6 to as the “program”) for the acquisition of atmospheric  
7 sensor data and the deployment of critical atmospheric  
8 sensors, including in partnership with the weather enter-  
9 prise.

10 (b) ACTIVITIES.—The program shall include activi-  
11 ties that carry out the following:

12 (1) Procurement of weather data available from  
13 commercial aircraft, as determined by the Under  
14 Secretary.

15 (2) Acquisition of additional vertical profile ob-  
16 servations that provide spatial and temporal density,  
17 as determined by the Under Secretary.

18 (3) Analysis of procured data when incor-  
19 porated into the National Oceanic and Atmospheric  
20 Administration’s unified forecast system in order to  
21 provide improved forecast information for aircraft.

22 (c) BUDGET.—The Under Secretary shall, not less  
23 frequently than annually, submit to Congress a proposed  
24 budget corresponding with the activities described in sub-  
25 section (b), including and analysis of activities that can



1 be complemented by National Oceanic and Atmospheric  
2 Administration aircraft.

3 (d) AUTHORIZATION OF APPROPRIATIONS.—From  
4 amounts made available to the Commercial Data Program  
5 under section 302 of the Weather Research and Fore-  
6 casting Innovation Act of 2017, there is authorized to be  
7 appropriated up to \$10,000,000 for each of fiscal years  
8 2026 through 2030 to carry out the program.

9 (e) AVIATION WEATHER AND TURBULENCE FORE-  
10 CASTING.—The Director of the National Weather Service  
11 shall include turbulence events, icing conditions, or other  
12 phenomena in the forecasting capabilities of the National  
13 Weather Service’s Aviation Weather Center, and deliver  
14 operational forecasts with consistent, timely, and accurate  
15 weather and turbulence information for the airspace sys-  
16 tem and the protection of lives and property.

17 (f) COORDINATION.—In carrying out subsection (e),  
18 the Director of the National Weather Service shall give  
19 consideration to recommendations from the Administrator  
20 of the Federal Aviation Administration in furtherance of  
21 section 44720 of title 49, United States Code, and improve  
22 weather and turbulence forecasting capabilities by—

23 (1) designating or establishing within the Fed-  
24 eral Government an interagency working group to  
25 determine weather and environmental data or obser-

1 vation requirements, needs, and potential solutions  
2 related to aviation weather and turbulence modeling  
3 or forecasting;

4 (2) identifying current and future potential  
5 data gaps related to turbulence events or phenomena  
6 that can—

7 (A) identify or inform route specific flight  
8 planning; and

9 (B) be supplemented or filled by commer-  
10 cial aviation tools;

11 (3) transitioning research initiatives and pilot  
12 programs, including a pilot program of instrumenta-  
13 tion for observing greenhouse gases and other at-  
14 mospheric factors deployed on commercial aircraft  
15 and supporting the evaluation of a sustained observ-  
16 ing network using such platforms, into operations  
17 that improve the forecasting missions of the Aviation  
18 Weather Center;

19 (4) developing and deploying improved prob-  
20 abilistic aviation weather forecast guidance tech-  
21 nology; and

22 (5) updating interagency agreements as appro-  
23 priate, including to address reimbursable agree-  
24 ments.

1 (g) NEXT GENERATION AVIATION RESEARCH.—  
2 Paragraph (3) of section 102(b) of the Weather Research  
3 and Forecasting Innovation Act of 2017 (15 U.S.C.  
4 8512(b)), is amended—

5 (1) by redesignating subparagraphs (F) and  
6 (G) as subparagraphs (G) and (H), respectively; and

7 (2) by inserting after subparagraph (E) the fol-  
8 lowing new subparagraph:

9 “(F) aviation weather phenomena, includ-  
10 ing atmospheric composition and turbulence, to  
11 improve scientific understanding and forecast  
12 capabilities for the airspace system;”.

13 (h) AVIATION INFORMATION DISSEMINATION.—The  
14 Under Secretary shall ensure the Aviation Weather Center  
15 is able, to the maximum extent possible, to disseminate  
16 in a timely manner full resolution aviation weather data,  
17 forecasts, and information to meet the needs of aviation  
18 users.

19 **SEC. 207. NESDIS JOINT VENTURE PARTNERSHIP TRANSI-**  
20 **TION PROGRAM.**

21 (a) IN GENERAL.—The Assistant Administrator of  
22 the National Environmental Satellite, Data, and Informa-  
23 tion Service, in consultation with the Administrator of the  
24 National Aeronautics and Space Administration, shall ad-  
25 minister broad agency announcements and other trans-

1 actional authority or contracting mechanisms, on an an-  
2 nual or more frequent basis, to support a joint venture  
3 partnership program that allows the Service to prioritize  
4 engagement with the private sector, academia, and other  
5 Federal departments and agencies.

6 (b) TRANSITION PROGRAM.—To support the develop-  
7 ment of next-generation technologies, missions, data sys-  
8 tems, spacecraft, and instrument design, the Assistant Ad-  
9 ministrator of the National Environmental Satellite, Data,  
10 and Information Service, in consultation with the Admin-  
11 istrator of the National Aeronautics and Space Adminis-  
12 tration, shall maintain a program to transition selected  
13 awards from research and study phases into demonstra-  
14 tion. In selecting awardees for demonstrations, the Assist-  
15 ant Administrator shall consider technologies, missions,  
16 data systems, spacecraft, and instrument design that—

17 (1) improve upon the National Oceanic and At-  
18 mospheric Administration’s satellite architecture;

19 (2) have a direct impact on implementing the  
20 recommendations of the Administration’s 2018 Sat-  
21 ellite Observing System Architecture Study, “Build-  
22 ing a Plan for NOAA’s 21st Century Satellite Ob-  
23 serving System”; and

24 (3) meet current or future mission require-  
25 ments.

1       (c) OPERATIONAL PLANNING.—In carrying out the  
2 transition program under subsection (b), the Assistant  
3 Administrator of the National Environmental Satellite,  
4 Data, and Information Service shall monitor demonstra-  
5 tion phase progress and plan for promising results that  
6 meet mission requirements to be transitioned into Na-  
7 tional Oceanic and Atmospheric Administration’s oper-  
8 ational satellite architecture.

9       (d) ANNUAL PLAN.—The Assistant Administrator of  
10 the National Environmental Satellite, Data, and Informa-  
11 tion Service shall submit to the Committee on Science,  
12 Space, and Technology, and the Committee on Commerce,  
13 Science, and Transportation an annual plan that outlines  
14 the progress made in the joint venture partnership pro-  
15 gram under subsection (a), the transition program for  
16 demonstrations under section (b), and transition to oper-  
17 ational architecture planning under subsection (c).

18       (e) AUTHORIZATION OF APPROPRIATIONS.—From  
19 amounts authorized to be appropriated to the National  
20 Environmental Satellite, Data, and Information Service,  
21 there is authorized to be appropriated \$20,000,000 for fis-  
22 cal years 2026 through 2030 to carry out to this section.

1 **SEC. 208. ADVANCED WEATHER INTERACTIVE PROCESSING**  
2 **SYSTEM.**

3 (a) IN GENERAL.—The Under Secretary, acting  
4 through the Director of the National Weather Service,  
5 shall develop a strategy to transition operations of the Ad-  
6 vanced Weather Interactive Processing System to an oper-  
7 ational cloud-based environment in order to enable a more  
8 nimble, flexible, and mobile workforce.

9 (b) SERVICES.—The Under Secretary shall ensure  
10 that the Advanced Weather Interactive Processing System  
11 in an operational cloud-based environment referred to in  
12 subsection (a) provides impact-based decision support  
13 services to emergency managers at the Federal, State,  
14 local, and Tribal levels, and continues to provide the fol-  
15 lowing services:

16 (1) Integrating and displaying forecast data, in-  
17 cluding meteorological, hydrological, climate, ocean,  
18 satellite, and radar data, for National Weather Serv-  
19 ice field offices and national centers.

20 (2) Acquiring and processing observational data  
21 from sensors and local sources.

22 (3) Providing an interactive communications  
23 system, including the satellite broadcast network, to  
24 connect relevant National Weather Service employ-  
25 ees and sites.

1           (4) Initiating the dissemination of weather,  
2           water, marine, ecological, climate, aviation, and  
3           space warnings and forecasts in a rapid and highly  
4           reliable manner.

5           (c) ELEMENTS.—The transition strategy developed  
6           pursuant to subsection (a) may include the following:

7           (1) Establishment or support of testbeds, pilot  
8           projects, and functional testing activities to facilitate  
9           remote evaluation and automated testing.

10          (2) Coordinated training efforts needed for  
11          Federal and non-Federal users and operators of the  
12          Advanced Weather Interactive Processing System in  
13          an operational cloud-based environment referred to  
14          in subsection (a).

15          (3) Evaluation of bandwidth requirements to  
16          achieve a quality user experience.

17          (4) Installation of circuits to reduce lapses in  
18          network operations and support backup functions.

19          (5) Establishment of a cloud-based, remotely  
20          accessible repository for data referred to in sub-  
21          section (b)(2).

22          (6) Development and deployment of virtualized  
23          systems to replace physical hardware at operational  
24          sites.

1           (7) Evaluation of commercial cloud providers,  
2           including hybrid approaches, to meet mission needs.

3           (8) Development, testing, demonstration, eval-  
4           uation, and operationalization of forecast and warn-  
5           ing products, consistent with the mission and sci-  
6           entific expertise of the Administration.

7           (d) **TRANSITION DEADLINE.**—The Under Secretary  
8           shall take such actions as may be necessary to ensure the  
9           transition strategy described in subsection (a) is completed  
10          by not later than September 30, 2030.

11          (e) **UPDATES TO CONGRESS.**—The Under Secretary  
12          shall submit to the Committee on Science, Space, and  
13          Technology of the House of Representatives and the Com-  
14          mittee on Commerce, Science, and Transportation of the  
15          Senate periodic updates on the implementation of this sec-  
16          tion.

17          (f) **CONTINUED INNOVATION.**—Nothing in this sec-  
18          tion may be construed as prohibiting the development of  
19          new forecast capabilities, sub-systems, or implementing  
20          modeling advancements on the operational computing sys-  
21          tems of the Administration.

22          **SEC. 209. REANALYSIS AND REFORECASTING.**

23          The Under Secretary may support reanalysis and re-  
24          forecasting activities within the National Oceanic and At-  
25          mospheric Administration, including through the haz-



ardous weather testbed of the Administration, for improving weather forecasts, extreme weather predictions, and weather and climate datasets.

**SEC. 210. NATIONAL WEATHER SERVICE WORKFORCE.**

(a) **HIRING.**—The Director of the National Weather Service shall annually submit to the Under Secretary and Congress an assessment of the milestones, timelines, and service level expectations required for the expeditious hiring and timely on-boarding of employees of the National Weather Service. Each such assessment may include the following:

(1) Recommendations to outsource hiring to any entity other than the National Weather Service in order to meet such milestones, timelines, and service level expectations.

(2) Determinations of the number of staff and designated positions required at each forecasting office to provide services to protect lives and property in the geographic region of responsibility.

(b) **HEALTH AND MORALE ASSESSMENT.**—The Director of the National Weather Service shall contract or continue to partner with an entity other than the National Weather Service to conduct an assessment of medical impacts, including stress and long-term health impacts, on National Weather Service employees related to required

1 rotating shift work. Such assessment may include options  
2 for mitigating such impacts on employees and rec-  
3 ommendations for improving benefits related to required  
4 rotating shift work.

5 (c) DESIGNATION OF SERVICE HYDROLOGIST.—

6 (1) IN GENERAL.—The Director of the National  
7 Weather Service may designate at least one service  
8 hydrologist at each Weather Forecast Office of the  
9 National Weather Service.

10 (2) LIMITATION.—Nothing in this section may  
11 be construed to authorize or require a change in the  
12 authorized number of full time equivalent employees  
13 of the National Weather Service or otherwise result  
14 in the employment of any additional employees.

15 (3) PERFORMANCE BY OTHER EMPLOYEES.—

16 Notwithstanding paragraphs (4) and (5), the Direc-  
17 tor of the National Weather Service may assign the  
18 performance of the responsibilities described in this  
19 subsection to such other staff of the National  
20 Weather Service as the Director considers appro-  
21 priate.

22 (4) RESPONSIBILITIES.—In order to increase  
23 impact-based decision support services, each service  
24 coordination hydrologist designated under paragraph

1 (1) shall, with respect to hydrology, carry out the  
2 following:

3 (A) Be responsible for providing service to  
4 the geographic area of responsibility covered by  
5 the Weather Forecast Office at which the serv-  
6 ice coordination hydrologist is employed to help  
7 ensure that users of products and services of  
8 the National Weather Service can respond ef-  
9 fectively to improve outcomes from flood events.

10 (B) Liaise with users of products and serv-  
11 ices of the National Oceanic and Atmospheric  
12 Administration, such as emergency managers,  
13 the public, academia, media outlets, users in the  
14 hydropower, transportation, recreation, and ag-  
15 ricultural communities, and forestry, land, fish-  
16 eries, and water management interests, to  
17 evaluate the adequacy and usefulness of the  
18 products and services referred to in subpara-  
19 graph (A), including extended range streamflow  
20 forecasts, water supply forecasts, drought out-  
21 looks, flood inundation mapping, coastal inun-  
22 dation, and flood warnings.

23 (C) Collaborate with the National Water  
24 Center, River Forecast Centers, other Weather  
25 Forecast Offices, the National Integrate

1 Drought Information System, Administration  
2 offices, and Federal, State, local, and Tribal  
3 government agencies, as the Director considers  
4 appropriate, in developing, proposing, and im-  
5 plementing plans to develop, modify, or tailor  
6 such products and services to improve the use-  
7 fulness of such products and services.

8 (D) Engage in interagency partnerships  
9 with Federal, State, local, and Tribal govern-  
10 ment agencies to explore the use of forecast-in-  
11 formed reservoir operations to reduce flood risk  
12 and inform decisions related to water resources  
13 management.

14 (E) Ensure the maintenance and accuracy  
15 of flooding and water resource management  
16 partner call lists, appropriate office hydrologic  
17 service policy or procedures, and other hydro-  
18 logic information or dissemination methodolo-  
19 gies or strategies.

20 (F) Work closely with Federal, State, local,  
21 and Tribal emergency and floodplain manage-  
22 ment agencies, and other agencies relating to  
23 disaster management, to ensure a planned, co-  
24 ordinated, and effective preparedness and re-  
25 sponse effort.

(5) ADDITIONAL RESPONSIBILITIES.—A service coordination hydrologist designated under this subsection may, with respect to hydrology—

(A) work with a State agency to develop plans for promoting more effective use of products and services of the National Weather Service throughout the State concerned;

(B) identify priority community preparedness objectives;

(C) develop plans to carry out the responsibilities described in paragraph (4); and

(D) conduct flooding event preparedness planning and citizen education efforts with and through various State, local, and Tribal government agencies and other disaster management-related organizations.

## **TITLE III—COMMERCIAL WEATHER AND ENVIRONMENTAL OBSERVATIONS**

### **SEC. 301. COMMERCIAL DATA PROGRAM.**

The Weather Research and Forecasting Innovation Act of 2017 is amended by striking section 302 (15 U.S.C. 8532) and inserting the following new section:

1 **“SEC. 302. COMMERCIAL DATA PROGRAM.**

2       “(a) PROGRAM ESTABLISHMENT.—The Under Sec-  
3 retary, in coordination with the heads of appropriate of-  
4 fices of the National Oceanic and Atmospheric Adminis-  
5 tration, shall maintain a Commercial Data Program to co-  
6 ordinate and execute acquisition of weather and environ-  
7 mental data and services from private sector entities for  
8 operational use.

9       “(b) PROGRAM ELEMENTS.—The Under Secretary  
10 shall acquire satellite, ground-based, airborne, or marine-  
11 based in situ, remote sensing, or crowd-sourced data and  
12 services for operational use relating to weather and envi-  
13 ronmental forecasting and modeling. The Under Secretary  
14 shall ensure the Commercial Data Program coordinates,  
15 collaborates, and ensures access to data across the Admin-  
16 istration, including among the following:

17               “(1) The National Mesonet Program.

18               “(2) The Aircraft Based Observation Program.

19               “(3) The U.S. Integrated Ocean Observation  
20 Program, including existing regional associations.

21               “(4) The National Integrated Drought Informa-  
22 tion System, including the National Coordinated Soil  
23 Moisture Monitoring Network.

24               “(5) The Global Ocean Monitoring and Observ-  
25 ing Program.

26               “(6) The National Data Buoy Center.

1           “(7) The Uncrewed Systems Operation Center.

2           “(8) The Ocean Exploration Program.

3           “(9) Any other program or office the Under  
4       Secretary determines appropriate.

5       “(c) STANDARDS AND SPECIFICATIONS.—Not later  
6       than 180 days after the date of the enactment of this sec-  
7       tion and on a continuous basis thereafter, the Under Sec-  
8       retary shall publish data, metadata, and service standards  
9       and specifications required for acquired observation serv-  
10      ices and data for use, licensing, and attribution to ensure  
11      quality, impact, and compatibility of such services and  
12      data with National Oceanic and Atmospheric Administra-  
13      tion modeling capabilities, meteorological situational  
14      awareness, and forecasting.

15      “(d) PRIORITIZATION.—In acquiring commercial  
16      data and services, the Under Secretary shall prioritize ob-  
17      taining surface-based, airborne-based, space-based, and  
18      coastal- and ocean-based data, metadata, and services for  
19      operational use that participate in the Commercial Data  
20      Pilot Program or other programs of the National Oceanic  
21      and Atmospheric Administration that acquire commercial  
22      data or observations.

23      “(e) NOAA OBSERVING SYSTEMS AND FLEET COUN-  
24      CILS.—

1           “(1) IN GENERAL.—The Under Secretary shall  
2       maintain the National Oceanic and Atmospheric Ad-  
3       ministration Observing Systems Council and the  
4       NOAA Fleet Council (in this subsection referred to  
5       as the ‘Councils’) to provide strategic recommenda-  
6       tions and guidance regarding the prioritization, de-  
7       sign, development, acquisition, upgrading, lifecycle,  
8       performance monitoring, and retiring of major ob-  
9       serving systems portfolio components, including re-  
10      lated to the acquisition of commercial weather and  
11      environmental data and services.

12           “(2) LINE OFFICE COORDINATION.—The Coun-  
13      cils shall ensure coordination and adherence to uni-  
14      form policies by providing guidance to all line offices  
15      of the National Oceanic and Atmospheric Adminis-  
16      tration engaged in observing systems portfolio de-  
17      sign, technology, development, execution, and oper-  
18      ation.

19           “(3) COMMITTEE.—The Under Secretary shall  
20      maintain a Committee within the Councils to develop  
21      and approve procedural directives, guides, or hand-  
22      books relevant to management of data and informa-  
23      tion, including commercial data, and coordinate data  
24      governance and management practices across the



1 National Oceanic and Atmospheric Administration  
2 to promote consistent processes.

3 “(f) AUTHORIZATION OF APPROPRIATIONS.—

4 “(1) IN GENERAL.—There are authorized to be  
5 appropriated \$100,000,000 for each of fiscal years  
6 2026 through 2030 to carry out this section.

7 “(2) SENSE OF CONGRESS.—It is the sense of  
8 Congress that the Under Secretary should seek to  
9 enter into contracts or other appropriate agreements  
10 that enable the expenditure, to the maximum extent  
11 practicable, of amounts authorized to be appro-  
12 priated or otherwise made available in a fiscal year  
13 to carry out this section.

14 “(g) DATA AND HOSTED PAYLOADS.—Notwith-  
15 standing any other provision of law, the Secretary of Com-  
16 merce may enter into agreements relating to the following:

17 “(1) The purchase of weather and environ-  
18 mental data and services through contracts with  
19 commercial data and service providers.

20 “(2) The placement of weather instruments on  
21 co-hosted Federal, international, or private space,  
22 airborne, maritime, or ground platforms.

23 “(h) OMBUDSMAN.—The Under Secretary shall es-  
24 tablish or designate at least one Ombudsman position  
25 within the Commercial Data Program to implement the

1 recommendations of the Observing System Council under  
2 subsection (e) related to commercial weather and environ-  
3 mental data and services acquisitions. Such an Ombuds-  
4 man shall act as the liaison between commercial data and  
5 service providers and the National Oceanic and Atmos-  
6 pheric Administration with respect to receiving rec-  
7 ommendations and resolving issues related to engagement,  
8 testing, contracting, or other areas related to the Adminis-  
9 tration's efforts to acquire commercial weather and envi-  
10 ronmental data and services.

11       “(i) REPORT.—Not later than two years after the  
12 date of the enactment of this section, the Under Secretary  
13 shall submit to the Committee on Science, Space, and  
14 Technology of the House of Representatives and the Com-  
15 mittee on Commerce, Science, and Transportation of the  
16 Senate a report evaluating the activities and needed au-  
17 thorities related to data governance and management  
18 practices, including acquisition, collection, documentation,  
19 quality control, validation, reprocessing, storage, retrieval,  
20 dissemination, and long-term preservation activities across  
21 all National Oceanic and Atmospheric Administration line,  
22 staff, and corporate offices.”.

1 **SEC. 302. COMMERCIAL DATA PILOT PROGRAM.**

2       The Weather Research and Forecasting Innovation  
3 Act of 2017 is amended by striking section 303 (15 U.S.C.  
4 8533) and inserting the following new section:

5 **“SEC. 303. COMMERCIAL DATA PILOT PROGRAM.**

6       “(a) PROGRAM ESTABLISHMENT.—Within the Com-  
7 mercial Data Program under section 302, there shall be  
8 a Commercial Data Pilot Program to engage with external  
9 partners and providers to test and develop shared stand-  
10 ards and methodologies for quality, use, licensing, and at-  
11 tribution of observation services and data, and to ensure  
12 quality, impact, and compatibility of such services and  
13 data with National Oceanic and Atmospheric Administra-  
14 tion modeling capabilities, meteorological situational  
15 awareness, and forecasting. The Program is authorized to  
16 test and evaluate all sources and types of observation serv-  
17 ices, imagery, products, and data from private sector enti-  
18 ties, including new and innovative surface-based, airborne-  
19 based, space-based, and coastal- and ocean-based data,  
20 metadata, and model components.

21       “(b) CRITERIA.—The Under Secretary shall ensure  
22 that data acquired through the Commercial Data Pilot  
23 Program described in subsection (a) meets the most recent  
24 standards and specifications required for observation serv-  
25 ices and data as published pursuant to section 302(c).

1       “(c) PILOT CONTRACTS.—The Under Secretary shall,  
2 through an open competition, regularly enter into pilot  
3 contracts with private sector entities capable of providing  
4 observation services and data referred to in subsection (a)  
5 that meet the standards and specifications published pur-  
6 suant to section 302(c) for so providing such services and  
7 data in a manner that allows the Under Secretary to cali-  
8 brate and evaluate such services and data for use in Na-  
9 tional Oceanic and Atmospheric Administration activities.

10       “(d) ASSESSMENT OF VIABILITY.—The Under Sec-  
11 retary shall annually assess and submit to the Committee  
12 on Commerce, Science, and Transportation of the Senate  
13 and the Committee on Science, Space, and Technology of  
14 the House of Representatives a summary of the pilot con-  
15 tracts entered into pursuant to subsection (c), the extent  
16 to which such contracts meet the standards and specifica-  
17 tions published pursuant to section 302(c), and any addi-  
18 tional information determined necessary related to the fol-  
19 lowing:

20               “(1) The viability of assimilating observation  
21 services and data from private sector entities into  
22 National Oceanic and Atmospheric Administration  
23 forecasts and models.

24               “(2) The expected value added or improvements  
25 from such services and data so assimilated into Na-

1        tional Oceanic and Atmospheric Administration fore-  
2        casts and models.

3            “(3) The accuracy, quality, timeliness, validity,  
4        reliability, usability, information technology security,  
5        and cost-effectiveness of obtaining observation serv-  
6        ices and data from private sector entities.

7            “(4) Steps to integrate within one year such  
8        services and data into operational use by the Na-  
9        tional Oceanic and Atmospheric Administration or  
10       any associated challenges in doing so.

11        “(e) OBTAINING FUTURE DATA.—If an assessment  
12       under subsection (d) demonstrates the ability of commer-  
13       cial services and data to meet the standards and specifica-  
14       tions published pursuant to section 302(c), the Under Sec-  
15       retary shall—

16            “(1) when cost-effective and feasible, obtain ob-  
17        servation services and data from private sector enti-  
18        ties through the Commercial Data Program under  
19        section 302;

20            “(2) as early as possible in the acquisition proc-  
21        ess for any future National Oceanic and Atmos-  
22        pheric Administration satellite system, determine  
23        whether there is a suitable, cost-effective, commer-  
24        cial capability available or that will be available to  
25        meet applicable instrument, spacecraft, or system re-

1       quirements before completion of the critical design  
2       phase of such planned satellite system;

3           “(3) if a suitable, cost-effective, commercial ca-  
4       pability is or will be available as described in para-  
5       graph (2), determine whether and how such capa-  
6       bility is in the national interest if developed as a  
7       solely governmental system; and

8           “(4) submit to the Committee on Commerce,  
9       Science, and Transportation of the Senate and the  
10      Committee on Science, Space, and Technology of the  
11      House of Representatives a report detailing any de-  
12      terminations made under paragraphs (2) and (3).

13      “(f) AUTHORIZATION OF APPROPRIATIONS.—From  
14      amounts authorized to be appropriated pursuant to sec-  
15      tion 302 to carry out such section, not less than 15 per-  
16      cent of such amounts each fiscal year are authorized to  
17      be appropriated to carry out this section.”.

18      **SEC. 303. CONTRACTING AUTHORITY AND AVOIDANCE OF**  
19                                   **DUPLICATION.**

20      Title III of the Weather Research and Forecasting  
21      Innovation Act of 2017 is amended by adding at the end  
22      the following new section:

1   **“SEC. 304. CONTRACTING AUTHORITY AND AVOIDANCE OF**  
2                   **DUPLICATION.**

3           “(a) IN GENERAL.—Consistent with other Federal  
4 agencies that contract and partner with private sector en-  
5 titities, the Under Secretary is authorized to use con-  
6 tracting mechanisms and enter into agreements that uti-  
7 lize multiyear contract options. In carrying out sections  
8 302 and 303, the Under Secretary shall, to the greatest  
9 extent possible—

10           “(1) enter into year-long or multiyear contract  
11 options using contracting mechanisms that foster re-  
12 siliency of datatypes purchased;

13           “(2) partner and contract with multiple obser-  
14 vation service and data providers simultaneously to  
15 reduce risks of data gaps and improve mission  
16 robustness; and

17           “(3) utilize authorities, such as additional  
18 forms of transaction agreements under section 301,  
19 that allow for innovative partnerships with private  
20 sector entities.

21           “(b) SAVINGS CLAUSE.—Nothing in this title may be  
22 construed as infringing on the acquisition authority or  
23 strategy of Federal entities authorized under title 10,  
24 United States Code.

25           “(c) UNNECESSARY DUPLICATION.—In meeting the  
26 requirements under this title, the Under Secretary shall

1 avoid unnecessary duplication between the National Oce-  
2 anic and Atmospheric Administration, the National Aero-  
3 nautics and Space Administration, other Federal depart-  
4 ments and agencies, and private sector entities, including  
5 relating to corresponding expenditures of funds and em-  
6 ployment of personnel by—

7           “(1) coordinating existing activities with other  
8       civilian Federal departments and agencies which  
9       provide, contract, or partner with private sector enti-  
10      ties to acquire, weather and environmental observa-  
11      tions and data; and

12           “(2) coordinating and soliciting weather and en-  
13      vironmental observations and data requirements and  
14      needs from other civilian Federal departments and  
15      agencies to be acquired by the Commercial Data  
16      Program under section 302.

17       “(d) FAIR COMPENSATION FOR INTERAGENCY  
18 NEEDS.—The Under Secretary, to the maximum extent  
19 practicable, shall ensure that Federal departments and  
20 agencies utilizing services and data under sections 302  
21 and 303 fairly compensate the National Oceanic and At-  
22 mospheric Administration, or the non-Federal entities pro-  
23 viding such services or data, as appropriate, for use.”.



1 **SEC. 304. DATA ASSIMILATION, MANAGEMENT, AND SHAR-**  
2 **ING PRACTICES.**

3 Title III of the Weather Research and Forecasting  
4 Innovation Act of 2017, as amended by section 303 of this  
5 Act, is further amended by adding at the end the following  
6 new section:

7 **“SEC. 305. DATA ASSIMILATION, MANAGEMENT, AND SHAR-**  
8 **ING PRACTICES.**

9 “(a) DATA STANDARDS.—The Under Secretary, in  
10 collaboration with the weather enterprise, shall seek to es-  
11 tablish consistent and open data and metadata standards  
12 to support open science, including simple cloud-optimized  
13 data formats and application programming interfaces that  
14 support findability, accessibility, usability, and  
15 preservability.

16 “(b) DATA INFRASTRUCTURE.—

17 “(1) IN GENERAL.—The Under Secretary, in  
18 consultation with the Chief Information Officer and  
19 appropriate program heads, shall consolidate and ar-  
20 range data infrastructure needs to ensure efficient  
21 and effective data transfer between National Oceanic  
22 and Atmospheric Administration offices by consid-  
23 ering the use of commercial cloud technologies, or  
24 similar hybrid structures, to host and transmit data  
25 and metadata.

1           “(2) FEDERAL PARTNERSHIPS.—In carrying  
2           out paragraph (1), the Under Secretary may partner  
3           with the heads of other Federal departments and  
4           agencies, including the National Aeronautics and  
5           Space Administration, the Department of Energy,  
6           the United States Space Force, the United States  
7           Coast Guard, the United States Navy, the Federal  
8           Aviation Administration, the United States Forest  
9           Service, the Environmental Protection Agency, the  
10          National Science Foundation, and the United States  
11          Geological Survey, to collocate data with joint utility  
12          and support a transition to cloud architectures, in-  
13          cluding commercial cloud networks.

14          “(3) LONG TERM DATA ARCHIVE.—The Under  
15          Secretary shall ensure the long-term management,  
16          maintenance, and stewardship of archival data and  
17          metadata acquired through the Commercial Data  
18          Program under section 302 is conducted within the  
19          National Centers for Environmental Information.

20          “(c) DATA SHARING WITH THE WEATHER ENTER-  
21          PRISE.—To the greatest extent practicable, the Under  
22          Secretary shall make accessible to members of the weather  
23          enterprise that are United States persons data not subject  
24          to redistribution contract permissions and purchased  
25          through the Commercial Data Program under section 302

1 or shared through international government partners. If  
2 purchased data must be assimilated into numerical weath-  
3 er prediction models or automated forecast guidance to  
4 satisfy redistribution contract permissions, the Under Sec-  
5 retary shall make accessible without delay to members of  
6 the weather enterprise that are United States persons the  
7 numerical weather prediction model or automated forecast  
8 guidance output, as the case may be.

9 “(d) DATA ASSIMILATION.—

10 “(1) IN GENERAL.—The Under Secretary, in  
11 coordination with the Commercial Data Program  
12 under section 302, the National Centers for Envi-  
13 ronmental Information, and any other offices within  
14 the Administration, shall establish a program to  
15 test, advance, and implement data assimilation  
16 methods, which may include artificial intelligence,  
17 machine learning, data pre- and post-processing, ef-  
18 ficient input and output, and next-generation algo-  
19 rithms.

20 “(2) DATA ASSIMILATION UNIVERSITY CONSOR-  
21 TIUM.—Through the program established pursuant  
22 to paragraph (1), the Under Secretary shall estab-  
23 lish a consortium consisting of institutions of higher  
24 education (as such term is defined in section 101 of  
25 the Higher Education Act of 1965 (20 U.S.C.

1       1001)) to address critical research challenges for  
2       data assimilation and foster a growing data assimila-  
3       tion workforce. The consortium shall seek to—

4               “(A) solve critical research issues for data  
5               assimilation through innovative research;

6               “(B) increase significantly the number of  
7               students, including graduate level and Ph.D.  
8               candidates, in data assimilation;

9               “(C) utilize modern software and frame-  
10              works, such as the Joint Effort for Data As-  
11              similation Integration, to conduct data assimila-  
12              tion research and development and facilitate re-  
13              search to operations efforts;

14              “(D) identify and prioritize critical re-  
15              search areas in data assimilation and facilitate  
16              operations to research efforts;

17              “(E) establish and enable an effective col-  
18              laboration infrastructure between National Oce-  
19              anic and Atmospheric Administration facilities,  
20              such as labs, centers, or joint agency institutes,  
21              and the research community, including a mech-  
22              anism for external partners to host Administra-  
23              tion employees; and

24              “(F) establish mechanisms to enable all  
25              members of the consortium to archive and ac-

1           cess data required to support the work under  
2           this subsection.

3           “(3) COORDINATION.—In carrying out this sub-  
4           section, the Under Secretary shall ensure the Na-  
5           tional Oceanic and Atmospheric Administration and  
6           its associated activities focus on research to oper-  
7           ations and operations to research, including by co-  
8           ordinating and collaborating with the Joint Center  
9           for Satellite Data Assimilation.

10          “(4) DATA ASSIMILATION, MANAGEMENT, AND  
11          SHARING PRACTICES SECURITY.—The activities au-  
12          thorized under this subsection shall be applied in a  
13          manner consistent with subtitle D of title VI of the  
14          Research and Development, Competition, and Inno-  
15          vation Act (enacted as division B of Public Law  
16          117–167; 42 U.S.C. 19231 et seq.).

17          “(e) STUDY ON DATA MANAGEMENT.—

18                 “(1) IN GENERAL.—Not later than 90 days  
19                 after the date of the enactment of this section, the  
20                 Under Secretary shall seek to enter into an agree-  
21                 ment with a non-Federal entity to conduct a study  
22                 on matters concerning data practices and manage-  
23                 ment needs at the National Oceanic and Atmos-  
24                 pheric Administration. In conducting the study, the  
25                 outside entity shall—

1           “(A) assess the costs and benefits of cur-  
 2           rent data management needs for observational  
 3           and operational mission requirements;

4           “(B) develop recommendations regarding  
 5           how to make more robust and cost-effective the  
 6           data portfolio of the Administration;

7           “(C) identify data infrastructure tech-  
 8           nologies and needs that are essential to the per-  
 9           formance of modeling systems of the Adminis-  
 10          tration;

11          “(D) assess the sharing needs and prac-  
 12          tices of the Administration for both internal  
 13          and external sharing dissemination; and

14          “(E) develop recommendations for methods  
 15          of data infrastructure sharing, including data  
 16          purchased from the commercial sector.

17          “(2) AUTHORIZATION OF APPROPRIATIONS.—  
 18          From amounts authorized to be appropriated to the  
 19          Commercial Data Program under section 302, there  
 20          are authorized to be appropriated to carry out the  
 21          study under paragraph (1) \$1,000,000, to remain  
 22          available until expended.”.

23 **SEC. 305. CLERICAL AMENDMENT.**

24          The table of contents in section 1(b) of the Weather  
 25          Research and Forecasting Innovation Act of 2017 is

1 amended by striking the items relating to sections 302 and  
 2 303 and inserting the following new items:

“Sec. 302. Commercial Data Program.

“Sec. 303. Commercial Data Pilot Program.

“Sec. 304. Contracting authority and avoidance of duplication.

“Sec. 305. Data assimilation, management, and sharing practices.”.

## 3 **TITLE IV—COMMUNICATING** 4 **WEATHER TO THE PUBLIC**

### 5 **SEC. 401. DEFINITIONS.**

6 In this title:

7 (1) HAZARDOUS WEATHER OR WATER  
 8 EVENTS.—The term “hazardous weather or water  
 9 events” has the meaning given such term in section  
 10 406 of the Weather Research and Forecasting Inno-  
 11 vation Act of 2017 (Public Law 115–25; 131 Stat.  
 12 109), as amended by section 402 of this Act.

13 (2) INSTITUTION OF HIGHER EDUCATION.—The  
 14 term “institution of higher education” has the  
 15 meaning given such term in section 101 of the High-  
 16 er Education Act of 1965 (20 U.S.C. 1001).

17 (3) NOAA WEATHER RADIO.—The term  
 18 “NOAA Weather Radio” means the National Oce-  
 19 anic and Atmospheric Administration Weather Radio  
 20 All Hazards network.

21 (4) PUBLIC CLOUD.—The term “public cloud”  
 22 means an information technology model in which  
 23 service providers make computing services, including

1 compute and storage and develop-and-deploy envi-  
 2 ronments and applications, available on-demand to  
 3 organizations and individuals over the public inter-  
 4 net or other means that allows for the widest dis-  
 5 semination of information.

6 (5) WATCH; WARNING.—The terms “watch”  
 7 and “warning” have the meanings given such terms  
 8 in section 406 of the Weather Research and Fore-  
 9 casting Innovation Act of 2017 (Public Law 115–25;  
 10 131 Stat. 109), as amended by section 402 of this  
 11 Act.

12 **SEC. 402. HAZARDOUS WEATHER OR WATER EVENT RISK**  
 13 **COMMUNICATION.**

14 (a) IN GENERAL.—Section 406 of the Weather Re-  
 15 search and Forecasting Innovation Act of 2017 (Public  
 16 Law 115–25; 131 Stat. 109) is amended to read as fol-  
 17 lows:

18 **“SEC. 406. HAZARDOUS WEATHER OR WATER EVENT RISK**  
 19 **COMMUNICATION.**

20 “(a) DEFINITIONS.—In this section:

21 “(1) HAZARDOUS WEATHER OR WATER  
 22 EVENTS.—The term ‘hazardous weather or water  
 23 events’ means weather or water events that have a  
 24 high risk of loss of life or property, including the fol-  
 25 lowing:



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

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

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

14           “(2) INSTITUTION OF HIGHER EDUCATION.—  
15           The term ‘institution of higher education’ has the  
16           meaning given such term in section 101 of the High-  
17           er Education Act of 1965 (20 U.S.C. 1001).

18           “(3) WATCH; WARNING.—

19           “(A) IN GENERAL.—The terms ‘watch’ and  
20           ‘warning’, with respect to a hazardous weather  
21           or water event, mean products issued by the  
22           National Oceanic and Atmospheric Administra-  
23           tion, intended for consumption by the general  
24           public, to alert the general public to the poten-

1            tial for or presence of such event and to inform  
2            action to prevent loss of life or property.

3            “(B) EXCEPTION.—The terms ‘watch’ and  
4            ‘warning’ do not include technical or specialized  
5            meteorological or hydrological forecasts, out-  
6            looks, or model guidance products.

7            “(b) SYSTEM COMMUNICATIONS.—The Under Sec-  
8            retary shall maintain and improve the system of the Na-  
9            tional Oceanic and Atmospheric Administration by which  
10          the risks of hazardous weather or water events are com-  
11          municated to the general public, with the goal of informing  
12          response to prevent loss of life or property.

13          “(c) HAZARD RISK COMMUNICATION IMPROVEMENT  
14          AND SIMPLIFICATION.—

15                “(1) IN GENERAL.—To carry out subsection  
16          (b), the Under Secretary shall maintain a social, be-  
17          havioral, risk, communication, and economic sciences  
18          program (in this section referred to as the ‘Pro-  
19          gram’), for the purpose of simplifying and improving  
20          the communication of hazardous weather or water  
21          events.

22                “(2) TERMINOLOGY.—The Program, in coordi-  
23          nation with social, behavioral, risk, communication,  
24          and economic science community and user feedback,  
25          shall identify, eliminate, or modify unnecessary, re-

1       dundant, or confusing terms for communications re-  
2       garding hazardous weather or water events and add  
3       new terminology, as appropriate.

4           “(3) COMMUNICATIONS IMPROVEMENT.—The  
5       Program shall improve the form, content, and meth-  
6       ods of communications regarding hazardous weather  
7       or water events and associated risks to more clearly  
8       inform response to prevent the loss of life or prop-  
9       erty.

10          “(4) EVALUATIONS.—The Program, in coordi-  
11       nation with the performance and evaluation  
12       branches of the National Weather Service and Oce-  
13       anic and Atmospheric Research, shall develop  
14       metrics for such branches to track and evaluate the  
15       degree to which communications regarding haz-  
16       ardous weather or water events inform response.

17          “(5) SUPPORT PLAN.—The Program shall de-  
18       velop a plan for the purpose of carrying out para-  
19       graph (3). Such plan shall be periodically updated  
20       and informed by internal and extramural research  
21       and the results of the evaluation of communications  
22       regarding hazardous weather or water events and as-  
23       sociated risks under paragraph (4).

1           “(6) METHODS.—In carrying out this section,  
2           the Program shall develop and implement rec-  
3           ommendations that—

4                   “(A) are based on the best and most re-  
5                   cent understanding from social, behavioral, eco-  
6                   nomic, risk, and communications science re-  
7                   search;

8                   “(B) are validated by social, behavioral,  
9                   risk, and communications science, taking into  
10                  account the importance of methods that support  
11                  reproduction and replication of scientific stud-  
12                  ies, use of rigorous statistical analyses, and, as  
13                  applicable, data analysis supported by artificial  
14                  intelligence and machine learning technologies;

15                  “(C) account for the needs of various de-  
16                  mographics, vulnerable populations, and geo-  
17                  graphic regions;

18                  “(D) account for the differences between  
19                  various types of hazardous weather or water  
20                  events;

21                  “(E) respond to the needs of Federal,  
22                  State, and local government partners and media  
23                  partners; and

24                  “(F) account for necessary changes in the  
25                  infrastructure, technology, and protocols for de-

1           veloping and disseminating watches and warn-  
2           ings.

3           “(7) COORDINATION.—In carrying out this sec-  
4           tion, the Program shall coordinate with the fol-  
5           lowing:

6                   “(A) Federal partners, including National  
7           Laboratories, cooperative institutes, and re-  
8           gional integrated sciences and assessments pro-  
9           grams.

10                   “(B) State and local government partners.

11                   “(C) Tribal governments.

12                   “(D) Institutions of higher education or a  
13           consortia thereof.

14                   “(E) Media partners.

15           “(8) TIMELINESS AND CONSISTENCY.—The  
16           Program shall develop best practices and guidance  
17           for ensuring timely and consistent communications  
18           across public facing platforms that disseminate in-  
19           formation related to hazardous weather or water  
20           events.”.

21           (b) TABLE OF CONTENTS.—The table of contents in  
22           section 1(b) of the Weather Research and Forecasting In-  
23           novation Act of 2017 is amended by amending the item  
24           relating to section 406 to read as follows:

“Sec. 406. Hazardous Weather or Water Event Risk Communication.”.

1 **SEC. 403. HAZARD COMMUNICATION RESEARCH AND EN-**  
2 **GAGEMENT.**

3 Section 406 of the Weather Research and Fore-  
4 casting Innovation Act of 2017 (Public Law 115–25; 131  
5 Stat. 109), as amended by section 402 of this Act, is fur-  
6 ther amended by adding at the end the following new sub-  
7 sections:

8 “(d) HAZARD COMMUNICATION RESEARCH AND EN-  
9 GAGEMENT.—

10 “(1) IN GENERAL.—The Under Secretary shall  
11 maintain, as appropriate, a program to—

12 “(A) modernize the development and com-  
13 munication of risk-based, statistically reliable,  
14 probabilistic hazard information, with the goal  
15 of informing appropriate responses to haz-  
16 ardous weather or water events; and

17 “(B) improve the fundamental social, be-  
18 havioral, economic, risk, and communication  
19 science relating to communications, including  
20 by means of collecting voluntary data, regarding  
21 hazardous weather or water events.

22 “(2) COORDINATION.—In carrying out the pro-  
23 gram under paragraph (1), the Under Secretary  
24 shall coordinate and communicate with States, Trib-  
25 al governments, localities, and emergency managers  
26 regarding research priorities and results.

1           “(3) PILOT PROGRAM FOR TORNADO HAZARD  
2       COMMUNICATION REQUIRED.—To further research  
3       into communications regarding hazardous weather  
4       or water events, the Under Secretary, in coordina-  
5       tion with the VORTEX program under section 103  
6       and in collaboration with one or more eligible insti-  
7       tutions (or a consortia thereof), shall establish a  
8       pilot program for tornado hazard communication to  
9       test the effectiveness of implementing research into  
10      operations with respect to tornadoes.

11           “(4) PILOT STUDY FOR HURRICANE HAZARD  
12      COMMUNICATION.—

13           “(A) IN GENERAL.—To further research  
14      into communications regarding hazardous  
15      weather or water events, the Under Secretary,  
16      in coordination with the hurricane forecast im-  
17      provement program under section 104, shall  
18      seek to enter into an agreement with an appro-  
19      priate entity, as determined by the Under Sec-  
20      retary, to conduct a pilot study using a mixed  
21      methods approach, such as surveys, focus  
22      groups, and interviews, to gather information  
23      from hurricane prone population areas regard-  
24      ing the levels of preparedness of such areas for  
25      hurricanes or in response to the National Oce-

anic and Atmospheric Administration’s early forecasts and warnings. Such study shall evaluate the following:

“(i) Possession of disaster supplies.

“(ii) Evacuation decisions.

“(iii) Levels of trust of tropical cyclone information and hurricane path prediction from various sources.

“(iv) Access to tropical cyclone and hurricane warnings in such study participant’s first language.

“(v) Determination regarding such study participant’s reasoning that may hinder the ability of such a participant to evacuate or willingness to evacuate.

“(B) ADDITIONAL CRITERIA.—The pilot study described in subparagraph (A) shall define its methodology and be made publicly available on a website of the National Oceanic and Atmospheric Administration.

“(5) ELIGIBLE INSTITUTION DEFINED.—In this subsection, the term ‘eligible institution’ means any of the following:

“(A) An institution of higher education, nonprofit organization, or other institution lo-



1 cated in a jurisdiction eligible to participate in  
2 the program under section 113 of the National  
3 Science Foundation Authorization Act of 1988  
4 (42 U.S.C. 1862g).

5 “(B) An institution of higher education,  
6 nonprofit organization, or other institution lo-  
7 cated in proximity to a Weather Forecast Office  
8 of the National Weather Service.

9 “(e) HURRICANE SOCIAL, BEHAVIORAL, AND ECO-  
10 NOMIC SCIENCES.—As part of the program carried out  
11 under subsection (d), the Under Secretary shall carry out  
12 research and development activities to improve how the  
13 public receives, interprets, responds to, and values hurri-  
14 cane forecasts and warnings. In conducting such activities,  
15 the Under Secretary shall—

16 “(1) conduct a comprehensive review of what is  
17 known about how the public receives, interprets, re-  
18 sponds to, and makes decisions regarding hurricane  
19 forecasts and warnings, including—

20 “(A) how the connections between weather  
21 observations, downstream models, and processes  
22 affect the decision tools or products derived  
23 from such hurricane forecasts and warnings;

24 “(B) how such hurricane forecasts and  
25 warnings generated by decision tools and prod-

1           ucts are used by emergency managers, govern-  
2           ments, and other users to benefit the public and  
3           stakeholder groups;

4           “(C) how past experiences with hurricanes  
5           impacts decision making;

6           “(D) how the source of such hurricane  
7           forecasts and warnings affects interpretation;

8           “(E) how tropical cyclone warnings and  
9           watches are received and interpreted;

10          “(F) how understanding of and response  
11          to such hurricane forecasts and warnings vary  
12          across demographic groups, including the elder-  
13          ly, people with disabilities, and other vulnerable  
14          populations;

15          “(G) language barriers; and

16          “(H) how understanding and response to  
17          such hurricane forecasts and warnings varies  
18          across geographic areas, including rural, urban,  
19          and suburban areas;

20          “(2) identify communication data gaps based on  
21          the review conducted pursuant to paragraph (1);

22          “(3) carry out research, including data collec-  
23          tion and baseline assessments, in coordination with  
24          the hurricane forecast improvement program under  
25          section 104 to evaluate and quantify the economic

1 value of extending lead times of tropical cyclone and  
2 hurricane warnings and watches, including identi-  
3 fying the most effected or vulnerable populations  
4 and potential impacts to those populations;

5 “(4) as part of post-storm surveys and assess-  
6 ments conducted under section 406 of the Weather  
7 Act Reauthorization Act of 2025, conduct retrospec-  
8 tive or ex ante assessments of previous hurricane  
9 forecasts and warnings with improvements to better  
10 understand the key components, including expected  
11 actions or behavior changes, of the value of the fore-  
12 casts and warnings provided;

13 “(5) conduct cost benefit analysis of forecasts  
14 and warnings improvement alternatives developed  
15 through the hurricane forecast improvement pro-  
16 gram under section 104; and

17 “(6) conduct risk assessments for pre-, during,  
18 and post-storm periods in regions and communities  
19 with significant elderly populations, including retire-  
20 ment communities.”.

21 **SEC. 404. NATIONAL WEATHER SERVICE COMMUNICATIONS**  
22 **IMPROVEMENT.**

23 (a) IMPROVEMENT OF NWS INSTANT MESSAGING  
24 SERVICE.—The Director of the National Weather Service  
25 shall improve the instant messaging service used by per-

1 sonnel of the National Weather Service by implementing,  
2 not later than October 1, 2027, a commercial off-the-shelf  
3 communications solution that replaces the instant mes-  
4 saging service commonly referred to as “NWSSchat”.

5 (b) REQUIREMENTS.—The communications solution  
6 implemented under this section shall—

7 (1) be hosted on the public cloud; and

8 (2) satisfy requirements set forth by the Direc-  
9 tor to ensure such solution—

10 (A) best accommodates future growth;

11 (B) performs successfully with increased  
12 numbers of users;

13 (C) is easy to use for the majority of users;  
14 and

15 (D) is similar to systems already in com-  
16 mercial use.

17 (c) FUNDING.—From amounts made available for  
18 Operations, Research, and Facilities, the Director of the  
19 National Weather Service shall allocate up to \$3,000,000  
20 for each of fiscal years 2026 through 2030 to carry out  
21 this section.

22 **SEC. 405. NOAA WEATHER RADIO MODERNIZATION.**

23 (a) IN GENERAL.—The Under Secretary shall, to the  
24 maximum extent practicable, expand coverage of the

1 NOAA Weather Radio and ensure its reliability. In car-  
2 rying out this subsection, the Under Secretary shall—

3           (1) maintain support for existing systems serv-  
4           ing areas not covered by or having poor quality cel-  
5           lular service;

6           (2) ensure consistent maintenance and oper-  
7           ations monitoring, with timely repairs to broadcast  
8           transmitter site equipment and antennas;

9           (3) enhance the ability to amplify Non-Weather  
10          Emergency Messages via NOAA Weather Radio as  
11          necessary; and

12          (4) acquire additional transmitters as required  
13          to expand coverage to rural and underserved com-  
14          munities, units of the National Park System, and  
15          National Recreation Areas.

16          (b) MODERNIZATION INITIATIVE.—To the maximum  
17          extent practicable, the Under Secretary shall enhance  
18          NOAA Weather Radio to ensure its capabilities and cov-  
19          erage remain valuable to the public. In carrying out this  
20          section, the Under Secretary shall—

21               (1) upgrade telecommunications infrastructure  
22               of NOAA Weather Radio to accelerate the transition  
23               of broadcasts to internet protocol-based communica-  
24               tions over non-copper media;

1           (2) accelerate software upgrades to the Ad-  
2           vanced Weather Interactive Processing System, or  
3           the relevant system successors, to implement partial  
4           county notifications and alerts;

5           (3) consult with relevant stakeholders, including  
6           the private sector, to enhance accessibility and  
7           usability of NOAA Weather Radio data and feeds;

8           (4) develop options, including satellite backup  
9           capability and commercial provider partnerships, for  
10          NOAA Weather Radio continuity in the event of  
11          Weather Forecast Office outages;

12          (5) research and develop alternative options, in-  
13          cluding microwave capabilities, to transmit NOAA  
14          Weather Radio signals to transmitters that are re-  
15          mote or do not have internet protocol capability; and

16          (6) transition critical applications to the Inte-  
17          grated Dissemination Program, or the relevant pro-  
18          gram successors.

19          (c) PRIORITY.—In carrying out subsection (b), the  
20          Under Secretary shall prioritize practices, capabilities, and  
21          technologies recommended in accordance with the assess-  
22          ment under subsection (d) to maximize accessibility, par-  
23          ticularly in remote and underserved areas of the United  
24          States.

1       (d) ASSESSMENT FOR MANAGEMENT AND DISTRIBUTION.—Not later than one year after the date of the enactment of this Act, the Under Secretary shall complete an  
2       assessment of access to NOAA Weather Radio. In conducting such assessment, the Under Secretary shall take  
3       into consideration and provide recommendations regarding  
4       the following:

5               (1) The need for continuous, adequate, and  
6               operational real-time broadcasts of the NOAA  
7               Weather Radio in both urban and rural areas.

8               (2) Solicited inputs from relevant stakeholders  
9               on the compatibility of NOAA Weather Radio data  
10              for third party platforms that provide online services, such as websites and mobile device applications,  
11              or deliver NOAA Weather Radio access.

12              (3) Existing or new management systems that  
13              promote consistent, efficient, and compatible access  
14              to NOAA Weather Radio.

15              (4) The ability of NOAA to aggregate real time  
16              broadcast feeds at one or more central locations.

17              (5) Effective interagency coordination.

18              (6) The potential effects of an electromagnetic  
19              pulse or geomagnetic disturbance on NOAA Weather  
20              Radio.

1           (7) Any other function the Under Secretary de-  
2       termines necessary.

3   **SEC. 406. POST-STORM SURVEYS AND ASSESSMENTS.**

4       (a) IN GENERAL.—The Under Secretary shall con-  
5       tinue to perform one or more post-storm surveys and as-  
6       sessments following every hazardous weather or water  
7       event determined by the Under Secretary to be of suffi-  
8       cient societal importance to warrant a post-event survey  
9       and assessment.

10      (b) COORDINATION.—The Under Secretary shall co-  
11     ordinate with Federal, State, local and Tribal govern-  
12     ments, private entities, and relevant institutions of higher  
13     education (or a consortia thereof) when conducting post-  
14     storm surveys and assessments under this section to opti-  
15     mize data collection, sharing, integration, archiving, and  
16     access, as appropriate for research needs.

17      (c) DATA AVAILABILITY.—The Under Secretary shall  
18     make the appropriate data obtained from each post-storm  
19     survey and assessment conducted under this section avail-  
20     able to the public as soon as practicable after conducting  
21     each such survey and assessment.

22      (d) IMPROVEMENT.—In carrying out this section, the  
23     Under Secretary shall—

24           (1) examine the role of uncrewed aerial and ma-  
25       rine systems in data collection during post-storm



1 surveys and assessments conducted under this sec-  
2 tion;

3 (2) identify gaps in and update tactics and pro-  
4 cedures to enhance the efficiency and reliability of  
5 data obtained from post-storm surveys and assess-  
6 ments;

7 (3) to the maximum extent practicable, increase  
8 the number of post-storm community impact studies,  
9 particularly among under-observed, underserved, or  
10 highly vulnerable populations, including—

11 (A) surveying-individual responses;

12 (B) conducting review of the accuracy of  
13 prior risk evaluations;

14 (C) evaluating the efficacy of prior mitiga-  
15 tion activity; and

16 (D) gathering survivability statistics; and

17 (4) as appropriate, integrate community-based,  
18 social, behavioral, risk, communication, and eco-  
19 nomic sciences elements into existing post-storm sur-  
20 veys and assessments, including relating to efficacy  
21 of forecast and warning information, barriers to ac-  
22 tion, and messaging challenges.

23 (e) SUPPORT FOR EMPLOYEES.—The Under Sec-  
24 retary shall provide training, resources, and access to pro-  
25 fessional counseling to support the emotional and mental

1 health and well-being of employees conducting post-storm  
2 surveys and assessments under this section.

3 (f) EXEMPTION.—Subchapter I of chapter 35 of title  
4 44, United States Code, shall not apply to the collection  
5 of information during the conduct of a survey or assess-  
6 ment authorized under subsection (a).

7 **SEC. 407. GOVERNMENT ACCOUNTABILITY OFFICE REPORT**  
8 **ON ALERT DISSEMINATION FOR HAZARDOUS**  
9 **WEATHER OR WATER EVENTS.**

10 (a) IN GENERAL.—Not later than 540 days after the  
11 date of the enactment of this Act, the Comptroller General  
12 of the United States shall submit to the Committee on  
13 Commerce, Science, and Transportation of the Senate and  
14 the Committee on Science, Space, and Technology of the  
15 House of Representatives a report that examines the infor-  
16 mation technology infrastructure of the National Weather  
17 Service of the National Oceanic and Atmospheric Adminis-  
18 tration, specifically regarding the system for timely public  
19 notification via alerts and updates regarding hazardous  
20 weather or water events.

21 (b) ELEMENTS.—The report required by subsection  
22 (a) shall include the following:

23 (1) An analysis of the information technology  
24 infrastructure of the National Weather Service, in-  
25 cluding software and hardware capabilities and limi-

1        tations, including an examination of server and data  
2        storage methods, broadband, data management, and  
3        data sharing.

4            (2) An identification of secondary and tertiary  
5        fail-safes for the timely distribution to the public of  
6        notifications via alerts and updates regarding haz-  
7        ardous weather or water events.

8            (3) A process analysis to determine the source  
9        and extent to which public notifications via alerts  
10       and updates regarding hazardous weather or water  
11       events have been delayed and an identification of  
12       possible improvements or corrective measures to ad-  
13       dress latency in the notification process.

14           (4) An assessment of whether collaboration with  
15       other Federal offices, States, or private entities  
16       could reduce delays in notifications to the public.

17           (5) A description of actions being undertaken to  
18       better identify critical steps in public notification via  
19       alerts and updates for hazardous weather or water  
20       events that may be vulnerable to disruption or fail-  
21       ure in the event of communication, technologic, or  
22       computational failure.

23           (6) The geographical differences in availability  
24       and effectiveness of rural systems, including an esti-  
25       mated number of rural areas affected by unreliable

1 or unavailable accurate systems and barriers to ob-  
2 tain or upgrade such systems.

3 **SEC. 408. DATA COLLECTION MANAGEMENT AND PROTEC-**  
4 **TION.**

5 (a) DATA COLLECTION.—The Under Secretary may  
6 collect social, behavioral, and economic data, including  
7 Federal communication and related public response to  
8 hazardous weather or water events. Where appropriate,  
9 the Under Secretary shall encourage use of secondary  
10 data, purchase data, or partner with the private sector.

11 (b) DATA MANAGEMENT.—The Under Secretary  
12 shall establish a central repository system for the National  
13 Oceanic and Atmospheric Administration for social, be-  
14 havioral, and economic data related to the communication  
15 of and related public response to hazardous weather or  
16 water events, including data developed or received pursu-  
17 ant to this title.

18 (c) PROTECTION OF DATA.—The Under Secretary  
19 shall ensure that all data collected and managed by the  
20 Administration is done within with all legal, regulatory,  
21 and contractual obligations and in accordance with chap-  
22 ter 31 of title 44, United States Code, and the Federal  
23 Evidence-Based Policymaking Act of 2018 (Public Law  
24 115–435).

1 (d) DIGITAL WATERMARKING.—The Under Secretary  
 2 shall develop methods to reduce the likelihood of unauthor-  
 3 ized tampering with online public notifications of haz-  
 4 ardous weather or water events, such as developing digital  
 5 watermarks.

6 (e) POLICIES AND PROCEDURES.—The Under Sec-  
 7 retary shall establish policies and procedures for the collec-  
 8 tion, archiving, and stewardship of data on community re-  
 9 sponse, including the response of effected or vulnerable  
 10 populations, to hazardous weather or water events.

11 **TITLE V—IMPROVING WEATHER**  
 12 **INFORMATION FOR AGRICULTURE AND WATER MAN-**  
 13 **AGEMENT**  
 14

15 **SEC. 501. WEATHER AND CLIMATE INFORMATION IN AGRICULTURE AND WATER MANAGEMENT.**  
 16

17 Section 1762 of the Food Security Act of 1985 (15  
 18 U.S.C. 8521) is amended—

19 (1) by amending subsection (h) to read as fol-  
 20 lows:

21 “(h) SUBSEASONAL TO SEASONAL FORECASTING  
 22 PILOT PROJECTS.—

23 “(1) ESTABLISHMENT.—The Under Secretary  
 24 shall establish not fewer than two pilot projects, in  
 25 accordance with paragraph (2), within the U.S.

1 Weather Research Program of the Oceanic and At-  
2 mospheric Research office of the National Oceanic  
3 and Atmospheric Administration to support im-  
4 proved subseasonal to seasonal precipitation fore-  
5 casts for the following:

6 “(A) Water management in the western  
7 United States.

8 “(B) Agriculture in the central United  
9 States.

10 “(2) OBJECTIVES.—In carrying out this sub-  
11 section, the Under Secretary shall ensure the fol-  
12 lowing:

13 “(A) A pilot project under subparagraph  
14 (A) of paragraph (1) addresses key science  
15 challenges to improving forecasts and devel-  
16 oping related products for water management  
17 in the western United States, including the fol-  
18 lowing:

19 “(i) Improving operational model reso-  
20 lution, both horizontal and vertical, to re-  
21 solve issues associated with mountainous  
22 terrain, such as intensity of precipitation  
23 and relative fraction of rain versus snow  
24 precipitation.

1           “(ii) Improving fidelity in the oper-  
2           ational modeling of the atmospheric bound-  
3           ary layer in mountainous regions.

4           “(iii) Resolving challenges in pre-  
5           dicting winter atmospheric circulation and  
6           storm tracks, including periods of blocked  
7           versus unblocked flow over the eastern  
8           North Pacific Ocean and western United  
9           States.

10          “(iv) Utilizing outcomes from the At-  
11          mospheric Rivers Forecast Improvement  
12          Program as authorized in section 204 of  
13          the Weather Act Reauthorization Act of  
14          2025 to produce operational tools and  
15          services.

16          “(v) Improving the quality and tem-  
17          poral and spatial resolution of observations  
18          and accurate operational modeling of air-  
19          sea interactions, and the influence of  
20          oceans on subseasonal and seasonal fore-  
21          casting.

22          “(B) A pilot project under subparagraph  
23          (B) of paragraph (1) addresses key science  
24          challenges to improving forecasts and devel-

1           oping related products for agriculture in the  
2           central United States, including the following:

3                   “(i) Improving the quality and tem-  
4                   poral and spatial resolution of observations  
5                   and accurate operational modeling of the  
6                   land surface and hydrologic cycle, includ-  
7                   ing soil moisture and flash drought proc-  
8                   esses.

9                   “(ii) Improving fidelity in the oper-  
10                  ational modeling of warm season precipita-  
11                  tion processes.

12                  “(iii) Understanding and predicting  
13                  large-scale upper-level dynamical flow  
14                  anomalies that occur in spring and sum-  
15                  mer.

16           “(3) ACTIVITIES.—A pilot project under this  
17           subsection shall include activities that carry out the  
18           following:

19                   “(A) Best implement recommendations of  
20                   the National Weather Service’s 2020 Report,  
21                   entitled ‘Subseasonal and Seasonal Forecasting  
22                   Innovation: Plans for the Twenty-First Cen-  
23                   tury’.

24                   “(B) Achieve measurable objectives for  
25                   operational forecast improvement.



1           “(C) Engage with, and leverage the re-  
2           sources of, institutions of higher education (as  
3           such term is defined in section 101 of the High-  
4           er Education Act of 1965 (20 U.S.C. 1001)), or  
5           a consortia thereof, and entities within the Na-  
6           tional Oceanic and Atmospheric Administration  
7           in existence as of the date of the enactment of  
8           this subsection, including Regional Climate  
9           Centers and the National Centers for Environ-  
10          mental Information.

11           “(D) Are carried out in coordination with  
12          the Assistant Administrator for the Office of  
13          Oceanic and Atmospheric Research and the Di-  
14          rector of the National Weather Service.

15           “(4) SUNSET.—The authority under this sub-  
16          section shall terminate on the date that is five years  
17          after the date of the enactment of this subsection.”;  
18          and

19           (2) by amending subsection (j) to read as fol-  
20          lows:

21           “(j) AUTHORIZATION OF APPROPRIATIONS.—There  
22          are authorized to be appropriated \$50,300,000 for each  
23          of fiscal years 2026 through 2030 to carry out the activi-  
24          ties under this section.”.

1 **SEC. 502. NATIONAL INTEGRATED DROUGHT INFORMATION**  
2 **SYSTEM.**

3 (a) IN GENERAL.—Section 3 of the National Inte-  
4 grated Drought Information System Act of 2006 (15  
5 U.S.C. 313d) is amended—

6 (1) in subsection (b)—

7 (A) in paragraph (1)—

8 (i) in subparagraph (A), by striking  
9 “and” after the semicolon;

10 (ii) in subparagraph (B), by inserting  
11 “and” after the semicolon; and

12 (iii) by adding at the end the fol-  
13 lowing new subparagraph:

14 “(C) incorporates flash drought research  
15 and tools to enhance timely response;”;

16 (B) in paragraph (5), by striking “and”  
17 after the semicolon;

18 (C) in paragraph (6)—

19 (i) by inserting “(including ecological  
20 drought)” after “drought” each place it  
21 appears; and

22 (ii) by striking the period and insert-  
23 ing a semicolon; and

24 (D) by adding at the end the following new  
25 paragraphs:

1           “(7) advance and deploy next generation tech-  
2           nologies related to drought and related publicly  
3           available data, such as monitoring, preparedness,  
4           and forecasting capabilities utilizing artificial intel-  
5           ligence, machine learning, and cloud technologies;  
6           and

7           “(8) utilize observational networks, including  
8           the National Weather Service cooperative observer  
9           program and State or regional hydrological moni-  
10          toring projects, and refine drought indicators across  
11          a variety of spatial and temporal scales for decision-  
12          support products by optimizing data and resources  
13          from across the Federal Government, including  
14          snowpack, soil moisture, groundwater, and rapid in-  
15          tensification data.”;

16               (2) in subsection (c)—

17                       (A) in paragraph (2), by striking “and”  
18                       after the semicolon;

19                       (B) in paragraph (3), by striking the pe-  
20                       riod and inserting “; and”; and

21                       (C) by adding at the end the following new  
22                       paragraph:

23           “(4) in partnership with the National Mesonet  
24           Program, establish memoranda of understanding to  
25           provide coordinated, high-quality, nationwide

1 drought information for the public good, including  
2 integrated soil moisture information in accordance  
3 with the 2021 report, ‘A Strategy for the National  
4 Coordinated Soil Moisture Monitoring Network.’; and  
5

6 (3) by amending subsection (f) to read as fol-  
7 lows:

8 “(f) MODELING UPDATE.—The Under Secretary, in  
9 partnership with National Integrated Drought Informa-  
10 tion System and the Climate Prediction Center of the Na-  
11 tional Weather Service, shall undertake an effort to transi-  
12 tion existing drought products to probabilistic forecasts  
13 and incorporate new and improved dynamical and statis-  
14 tical forecast modeling tools.”.

15 (b) AUTHORIZATION OF APPROPRIATIONS.—Section  
16 4 of the National Integrated Drought Information System  
17 Act of 2006 (15 U.S.C. 313d note) is amended to read  
18 as follows:

19 **“SEC. 4. AUTHORIZATION OF APPROPRIATIONS.**

20 “From amounts made available to Operations, Re-  
21 search, and Facilities of the National Oceanic and Atmos-  
22 pheric Administration, there are authorized to be appro-  
23 priated to carry out this section the following:

24 “(1) \$15,000,000 for fiscal year 2026.

25 “(2) \$15,500,000 for fiscal year 2027.

1 “(3) \$16,000,000 for fiscal year 2028.

2 “(4) \$16,500,000 for fiscal year 2029.

3 “(5) \$17,000,000 for fiscal year 2030.”.

4 **SEC. 503. NATIONAL MESONET PROGRAM.**

5 (a) PROGRAM.—The Under Secretary shall maintain  
6 the National Mesonet Program (in this section referred  
7 to as the “Program”). The Program shall—

8 (1) obtain observations in all geographic envi-  
9 ronments to improve understanding of and forecast  
10 capabilities for atmospheric and water events, with  
11 a prioritization on leveraging available commercial,  
12 academic, and other non-Federal environmental data  
13 to enhance coordination across the private, public,  
14 and academic sectors of the United States weather  
15 enterprise; and

16 (2) establish memoranda of understanding with  
17 networks outside of the scope of the Program.

18 (b) PROGRAM ELEMENTS.—The Program shall carry  
19 out the following activities:

20 (1) Improve environmental observations used by  
21 the National Oceanic and Atmospheric Administra-  
22 tion and the National Weather Service to support  
23 baseline forecasts, including nowcasts, and warnings  
24 that protect the Nation’s citizens, businesses, mili-  
25 tary, and government agencies, and enable such in-

1 individuals and entities to operate in safe, efficient,  
2 and orderly manners.

3 (2) When demonstrably cost effective and meet-  
4 ing or exceeding agency data quality standards, le-  
5 verage existing networks of environmental moni-  
6 toring stations, including supplemental radar sys-  
7 tems, to increase the quantity and density of envi-  
8 ronmental observations and data available to the Ad-  
9 ministration.

10 (3) Establish means to integrate greater density  
11 and type of environmental observations into the Pro-  
12 gram on an annual basis, including by encouraging  
13 local and regional networks of environmental moni-  
14 toring stations, in situ sensor networks and satellite  
15 constellations to participate in the Program.

16 (4) Yield increased quantities of boundary-layer  
17 data to improve numerical weather prediction per-  
18 formance, including regarding subseasonal to sea-  
19 sonal timescales.

20 (5) Provide the critical technical and adminis-  
21 trative infrastructure needed to facilitate rapid inte-  
22 gration and sustained use of new and emerging net-  
23 works of environmental monitoring stations antici-  
24 pated in coming years from non-Federal sources.

1           (6) Expand and enhance environmental obser-  
2           vational networks in the roadway environment to  
3           provide real-time road weather and surface condi-  
4           tions for surface transportation and related eco-  
5           nomic sectors.

6           (7) Identify available terrestrial or marine envi-  
7           ronmental data, or quantifiable gaps in such data, to  
8           improve the understanding of air-sea interactions.

9           (8) Support the National Weather Service in  
10          reaching its target of a 30-minute warning time for  
11          severe weather through better predictive model algo-  
12          rithms driven by increasingly effective observations.

13          (9) Coordinate with existing Administration  
14          data used for forecasts, including data from the Na-  
15          tional Environmental Satellite, Data, and Informa-  
16          tion Service, the Integrated Ocean Observing Sys-  
17          tem, the Global Ocean Monitoring and Observing  
18          Program, the National Data Buoy Center, and the  
19          National Ocean Service.

20          (10) Identify and communicate to the Office of  
21          Oceanic and Atmospheric Research and other part-  
22          ners priorities of research and development needed  
23          to advance observations in the Program.

24          (11) Support the National Coordinated Soil  
25          Moisture Monitoring Network in acquiring soil mois-

1       ture and related data to support the development of  
2       decision-support products and other information  
3       services.

4       (c) FINANCIAL AND TECHNICAL ASSISTANCE.—

5           (1) IN GENERAL.—In furtherance of the Pro-  
6       gram, the Under Secretary may, to the extent  
7       amounts are made available, award up to 15 percent  
8       of the Program’s annual appropriations for financial  
9       assistance to State, Tribal, private, and academic  
10      entities seeking to build, expand, or upgrade equip-  
11      ment and capacity of mesonet systems. Financial as-  
12      sistance under this subsection may be made in co-  
13      ordination with and in addition to awards from  
14      other Federal agencies.

15          (2) AGREEMENTS.—Before receiving financial  
16      assistance under paragraph (1), the State, Tribal,  
17      private, or academic entity seeking financial assist-  
18      ance under this subsection shall enter into an agree-  
19      ment with the Under Secretary to provide data to  
20      the Program, subject to verification by the Program  
21      of the relative operational value and evaluation of  
22      the cost of such data, for use in weather prediction,  
23      severe weather warnings, and emergency response.

24          (3) ASSISTANCE AND OTHER SUPPORT.—The  
25      Under Secretary may provide technical assistance,



1 project implementation support, and guidance to  
2 State, Tribal, private, and academic entities seeking  
3 financial assistance under this subsection. The  
4 Under Secretary may provide technical and financial  
5 assistance for maintenance of monitoring stations in  
6 underrepresented or remote areas of the country  
7 where it is financially unfeasible for one entity to op-  
8 erate such stations without such assistance.

9 (4) TERMS.—In providing financial assistance  
10 under this subsection, the Under Secretary shall es-  
11 tablish terms to ensure that each State, Tribal, pri-  
12 vate, or academic entity that receives financial as-  
13 sistance under this subsection receives a level of  
14 Federal support commensurate with the quality and  
15 other characteristics of the data to be provided.

16 (5) DETERMINATION.—A State, Tribal, private,  
17 or academic entity may receive financial assistance  
18 under this subsection only if the Under Secretary  
19 determines such entity shall provide sufficient non-  
20 Federal financial support and full maintenance to  
21 maintain the quality of the mesonet system and as-  
22 sociated data standards required by the Program for  
23 a period of not less than five years.

24 (6) PRIORITY.—The Under Secretary shall  
25 prioritize providing assistance under paragraph (1)

1 to at least one entity in an underrepresented or re-  
2 mote area.

3 (d) ADVISORY COMMITTEE.—

4 (1) IN GENERAL.—The Under Secretary shall  
5 ensure the Program has an active advisory com-  
6 mittee of subject matter experts to make rec-  
7 ommendations to the National Oceanic and Atmos-  
8 pheric Administration on the identification, imple-  
9 mentation, procurement, and tracking of data need-  
10 ed to supplement the Program, and recommend im-  
11 provements, expansions, and acquisitions of available  
12 data. The Under Secretary may designate an exist-  
13 ing Federal advisory committee, subcommittee, or  
14 working group, including, if appropriate, the Science  
15 Advisory Board of the National Oceanic and Atmos-  
16 pheric Administration, to carry out this subsection.

17 (2) ACADEMIC EXPERTISE.—The advisory com-  
18 mittee under paragraph (1), in consultation with the  
19 Program, shall include expertise from one or more  
20 institutions of higher education (as such term is de-  
21 fined in section 101 of the Higher Education Act of  
22 1965 (20 U.S.C. 1001)) to assist the advisory com-  
23 mittee to identify, evaluate, and recommend poten-  
24 tial partnerships, regional or subregional consortia,  
25 and collaborative methods that would expand the

1        number of participants and volume of data in the  
2        Program.

3        (e) REGULAR REPORTING.—The Under Secretary  
4 shall provide regular briefings, not less than twice annu-  
5 ally, to the Committee on Science, Space, and Technology  
6 of the House of Representatives and the Committee on  
7 Commerce, Science, and Transportation of the Senate on  
8 all Program activities. Such briefings shall include infor-  
9 mation relating to the following:

10            (1) Efforts to implement the activities described  
11        in subsection (b).

12            (2) Any financial or technical assistance pro-  
13        vided pursuant to subsection (c).

14            (3) Efforts to address recommendations re-  
15        ceived from the advisory committee under subsection  
16        (d).

17            (4) The potential need and associated benefits  
18        of a coastal and ocean mesonet, or other emerging  
19        areas of weather data needs.

20            (5) Progress toward eliminating gaps in weath-  
21        er observation data by States and regions of the  
22        United States.

23            (6) Any other topic the Under Secretary deter-  
24        mines relevant.

1       (f) AUTHORIZATION OF APPROPRIATIONS.—From  
2 amounts made available to the National Weather Service,  
3 the Under Secretary, to carry out this section, shall allo-  
4 cate up to the following amounts for each specified fiscal  
5 year:

6           (1) \$50,000,000 for fiscal year 2026.

7           (2) \$55,000,000 for fiscal year 2027.

8           (3) \$61,000,000 for fiscal year 2028.

9           (4) \$68,000,000 for fiscal year 2029.

10          (5) \$70,000,000 for fiscal year 2030.

11 **SEC. 504. NATIONAL COORDINATED SOIL MOISTURE MONI-**  
12 **TORING NETWORK.**

13       (a) IN GENERAL.—The Under Secretary, in collabo-  
14 ration with the Secretary of Agriculture, the Director of  
15 the United States Geological Survey, the Administrator of  
16 the National Aeronautics and Space Administration, and  
17 the heads of other relevant Federal agencies and depart-  
18 ments, shall support the development, deployment, and  
19 maintenance of soil moisture monitoring networks by man-  
20 aging the National Coordinated Soil Moisture Monitoring  
21 Network (in this section referred to as the “Network”)  
22 within the National Integrated Drought Information Sys-  
23 tem.

1 (b) ACTIVITIES.—The Under Secretary shall ensure  
2 the Network includes activities that carry out the fol-  
3 lowing:

4 (1) Establishing a visible, user-friendly website.

5 (2) Developing a set of criteria for high-quality  
6 data sources.

7 (3) Supporting research necessary to develop or  
8 improve soil moisture monitoring products at a na-  
9 tional scale.

10 (4) Increasing the number of long-term, high-  
11 quality, in situ and remote sensing soil moisture  
12 monitoring stations across the United States.

13 (5) Sharing methodologies and validation proto-  
14 cols with the private sector.

15 (6) Engaging with the citizen science commu-  
16 nity.

17 (7) Developing, releasing, and promoting new,  
18 nationwide point-based and gridded soil moisture  
19 data products that meet the needs of diverse end-  
20 user groups.

21 (8) Supporting community building and out-  
22 reach to the network of individuals engaged with soil  
23 moisture information delivery, from data provision to  
24 end-user decision making.

1 **SEC. 505. NATIONAL WATER CENTER.**

2 Section 301 of the Coordinated Ocean Observations  
3 and Research Act of 2020 (42 U.S.C. 10371) is amend-  
4 ed—

5 (1) in subsection (a)—

6 (A) in paragraph (1)(A)—

7 (i) in the matter preceding clause (i),  
8 by inserting “as a component of the Na-  
9 tional Centers for Environmental Pre-  
10 diction” after “center”;

11 (ii) in clause (i), by striking “and”  
12 after the semicolon;

13 (iii) in clause (ii), by striking the pe-  
14 riod and inserting “; and”; and

15 (iv) by adding at the end the following  
16 new clause:

17 “(iii) to provide service backup capa-  
18 bilities and additional mission support  
19 services for River Forecast Centers.”; and

20 (B) in paragraph (2), by adding at the end  
21 the following new subparagraph:

22 “(F) Serving as the primary Center for  
23 collaboration and coordination of the National  
24 Oceanic and Atmospheric Administration’s  
25 water research and operational activities with  
26 existing Federal centers and networks, includ-

1 ing the Department of Agriculture, the Army  
2 Corps of Engineers, the Bureau of Reclamation,  
3 the United States Geological Survey, and the  
4 Federal Emergency Management Agency.”;

5 (2) by striking subsection (b) and redesignating  
6 subsections (c) through (e) as subsections (b)  
7 through (d) respectively; and

8 (3) by amending subsection (c), as so redesign-  
9 nated, to read as follows:

10 “(c) AUTHORIZATION OF APPROPRIATIONS.—There  
11 is authorized to be appropriated \$46,000,000 for each of  
12 fiscal years 2026 through 2030 to carry out this section.”.

13 **SEC. 506. SATELLITE TRANSFERS REPORT.**

14 Not later than 180 days after the date of the enact-  
15 ment of this Act, the Secretary of Commerce shall submit  
16 to the Committee on Commerce, Science, and Transpor-  
17 tation of the Senate and the Committee on Science, Space,  
18 and Technology of the House of Representatives a report  
19 describing the Department of Commerce’s authorities,  
20 policies, and Federal Government-wide policies related to  
21 transferring any portion of the weather satellite systems  
22 operated by the Department of Commerce to any other  
23 Federal department or agency. The report shall also in-  
24 clude the following:

1           (1) A description of the process for decommis-  
2           sioning a Department of Commerce operational  
3           weather satellite, any existing agreements related to  
4           transfers of weather satellites, whether decommis-  
5           sioned or not, and any reimbursable agreements re-  
6           lated to the transfer of physical property or the op-  
7           eration of Department of Commerce weather sat-  
8           ellites on behalf of any other Federal department or  
9           agency.

10          (2) A summary of any Department of Com-  
11          merce plans for potential transfer of existing or fu-  
12          ture weather satellite systems to any other Federal  
13          department or agency.

14   **SEC. 507. PRECIPITATION FORECAST IMPROVEMENT PRO-**  
15                           **GRAM.**

16          (a) IN GENERAL.—Title VI of the Weather Research  
17          and Forecasting Innovation Act of 2017 (15 U.S.C. 8501  
18          et seq.) is amended—

19               (1) by redesignating section 603 as section 604;  
20               and

21               (2) by inserting after section 602 the following  
22               new section:



1   **“SEC. 603. PRECIPITATION FORECAST IMPROVEMENT PRO-**  
2                           **GRAM.**

3           “(a) IN GENERAL.—The Under Secretary, in collabo-  
4   ration with the United States weather industry, other Fed-  
5   eral agencies, and academic partners, shall maintain a  
6   program to improve precipitation forecasting across  
7   timescales.

8           “(b) GOAL.—The goal of the program under sub-  
9   section (a) shall be to provide more accurate, reliable, and  
10  timely precipitation forecasts across timescales through  
11  the development and application of a fully coupled Earth  
12  system prediction model in order to reduce the loss of life  
13  or property related to precipitation extremes, with a focus  
14  on the following:

15           “(1) Improving the understanding and pre-  
16   diction of precipitation extremes from a variety of  
17   weather systems, including atmospheric rivers.

18           “(2) Evaluating and incorporating, as appro-  
19   priate, innovative observations into operational moni-  
20   toring and forecast systems to improve precipitation  
21   forecasts.

22           “(3) Improving earth system model predictions  
23   of precipitation extremes from atmospheric rivers,  
24   tropical cyclones, summer-time thunderstorms, win-  
25   ter storms, and other phenomena, in coordination  
26   with relevant programs.

1           “(4) Enhancing research transition to oper-  
2           ations through testbeds, including the evaluation of  
3           physical and social science, technology, and other re-  
4           search to develop products and services for imple-  
5           mentation and use by relevant stakeholders.

6           “(5) Incorporating social, behavioral, and eco-  
7           nomic sciences best practices into operations for  
8           more effective and actionable watch and warning  
9           products that help drive public safety and damage  
10          mitigation decisions in coordination with the pro-  
11          grams established in accordance with this Act.

12          “(6) Ensuring data and metadata management  
13          processes are in place to support data access and ar-  
14          chive for long term research and operations among  
15          multiple partners.

16          “(c) ACTIVITIES.—In carrying out the program  
17          under subsection (a), the Under Secretary shall support  
18          research-to-operations work, including relating to the fol-  
19          lowing:

20               “(1) Implementing key strategies and following  
21               priorities and objectives outlined by the National  
22               Oceanic and Atmospheric Administration’s ‘Precipi-  
23               tation Prediction Grand Challenge Strategy’.

1           “(2) Improving the physical science, operational  
2           modeling and tools, and technology related to better  
3           forecasting precipitation extremes across timescales.

4           “(3) Improving the social, behavioral, risk, com-  
5           munications, and economic sciences related to  
6           vulnerabilities, risk communication, and delivery of  
7           information critical for reducing the loss of life or  
8           property related to extreme precipitation.

9           “(4) Conducting the research necessary to de-  
10          velop and deploy probabilistic weather forecast guid-  
11          ance technology relating to precipitation extremes in  
12          operational practice.

13          “(5) Enhancing the operational capacity of the  
14          National Weather Service to deliver decision support  
15          for increasing precipitation extremes.

16          “(6) Expanding computational resources to im-  
17          prove precipitation modeling.

18          “(d) ANNUAL BUDGET.—The Under Secretary shall,  
19          not less frequently than annually, submit to Congress a  
20          proposed budget corresponding with carrying out this sec-  
21          tion.”.

22          (b) CLERICAL AMENDMENT.—The table of contents  
23          in section 1(b) of the Weather Research and Forecasting  
24          Innovation Act of 2017 is amended by striking the item

- 1 relating to section 603 and inserting the following new
- 2 items:

“Sec. 603. Precipitation forecast improvement program.

“Sec. 604. Definitions.”.

