

119TH CONGRESS
2D SESSION

S. _____

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

IN THE SENATE OF THE UNITED STATES

Mr. CRUZ (for himself, Ms. CANTWELL, Mr. SULLIVAN, Ms. BLUNT ROCHESTER, Mr. MORAN, Mr. SCHATZ, Mr. SHEEHY, and Ms. ROSEN) introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

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

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

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

4 (a) SHORT TITLE.—This Act may be cited as the
5 “Weather Research and Forecasting Innovation Reauthor-
6 ization Act of 2026”.

1 (b) TABLE OF CONTENTS.—The table of contents for
 2 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—
 United States of America (VORTEX–USA).
 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. Precipitation forecast improvement program.

TITLE II—ENHANCING FEDERAL WEATHER FORECASTING AND
 INNOVATION

- Sec. 201. Next-generation numerical weather prediction initiative.
 Sec. 202. Radar Next Program.
 Sec. 203. Data voids in under observed areas of the United States.
 Sec. 204. Atmospheric rivers forecast improvement program.
 Sec. 205. Coastal flooding and storm surge forecast improvement program.
 Sec. 206. National Integrated Heat Health Information System.
 Sec. 207. Aviation weather and data innovation.
 Sec. 208. National Environmental Satellite, Data, and Information Service
 partnership program, transition program, and operational plan-
 ning.
 Sec. 209. Advanced weather interactive processing system.
 Sec. 210. Reanalysis and reforecasting.
 Sec. 211. National Weather Service workforce.
 Sec. 212. Artificial intelligence for weather forecasting.
 Sec. 213. Composition of the atmosphere and atmospheric observations.
 Sec. 214. Project to improve forecasts of coastal marine fog.

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.

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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. NOAA Weather Radio.
- Sec. 405. National standards for weather warning systems in flash flood zones.
- 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 information for 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 briefing.

TITLE VI—HARMFUL ALGAL BLOOM AND HYPOXIA RESEARCH
AND CONTROL

- Sec. 601. Amendments to the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998.
- Sec. 602. Other harmful algal bloom and hypoxia matters.

TITLE VII—FIRE READY NATION

- Sec. 701. Definitions.
- Sec. 702. Establishment of fire weather services program.
- Sec. 703. Fire weather testbed.
- Sec. 704. Data management and technology modernization.
- Sec. 705. Surveys and assessments.
- Sec. 706. Incident Meteorologist Service.
- Sec. 707. Emergency response activities.
- Sec. 708. Submissions to Congress regarding the Fire Weather Services Program, incident meteorologist workforce needs, and National Weather Service workforce support.
- Sec. 709. Fire Science and Technology Working Group; strategic plan.
- Sec. 710. Fire weather rating system.
- Sec. 711. Government Accountability Office reports.
- Sec. 712. Cooperation and coordination.
- Sec. 713. General provisions.
- Sec. 714. Authorization of appropriations.

TITLE VIII—PRECIPITATION ESTIMATES AND LANDSLIDE
PREPAREDNESS

- Sec. 801. Inclusion of atmospheric rivers and extreme precipitation events in estimates of precipitation frequency.
- Sec. 802. Reauthorization of National Landslide Preparedness Act.
- Sec. 803. Next Generation Water Observing System.
- Sec. 804. Water data enhancement and national groundwater resources monitoring by United States Geological Survey.

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TITLE IX—IMPORTATION OF RED SNAPPER

- Sec. 901. Methodology for identifying the country of origin of seafood.
Sec. 902. Technical assistance for illegal, unreported, or unregulated fishing enforcement.

TITLE X—IMPROVING CYBERSECURITY AND
TELECOMMUNICATIONS FOR OCEANIC RESEARCH

- Sec. 1001. Definitions.
Sec. 1002. Plan to improve cybersecurity and telecommunications of U.S. Academic Research Fleet.

TITLE XI—OTHER AUTHORITIES

- Sec. 1101. Relocation allowances.
Sec. 1102. Unfunded priorities list, reports, and plans.
Sec. 1103. Miscellaneous authorities.

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—

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

13 (2) by inserting after paragraph (4) the fol-
14 lowing:

15 “(5) WEATHER DATA.—The term ‘weather
16 data’ means information used to track and predict
17 weather conditions and patterns, including forecasts,

1 observations, and derivative products from such in-
2 formation.”.

3 **TITLE I—REAUTHORIZATION OF**
4 **THE WEATHER RESEARCH**
5 **AND FORECASTING INNOVA-**
6 **TION ACT OF 2017**

7 **SEC. 101. PUBLIC SAFETY PRIORITY.**

8 Section 101 of the Weather Research and Fore-
9 casting Innovation Act of 2017 (15 U.S.C. 8511) is
10 amended to read as follows:

11 **“SEC. 101. PUBLIC SAFETY PRIORITY.**

12 “(a) IN GENERAL.—The Under Secretary shall en-
13 sure that the National Oceanic and Atmospheric Adminis-
14 tration focuses on providing accurate and timely weather
15 forecasts that protect lives and property and enhance the
16 national economy, including by—

17 “(1) coordinating and modernizing observa-
18 tional infrastructure, weather forecasting systems,
19 communications, and impact-based decision support
20 services; and

21 “(2) improving operational weather forecasts,
22 products, and services.

23 “(b) RESEARCH.—In conducting research, the Under
24 Secretary shall prioritize improving weather data, mod-
25 eling, computing, forecasting, and warnings and support

1 transition of advancements into operational forecasting
2 and services, for the protection of life and property and
3 for the enhancement of the national economy.”.

4 **SEC. 102. UNITED STATES WEATHER RESEARCH AND FORE-**
5 **CASTING.**

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

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

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

14 “(1) \$166,736,000 for fiscal year 2026, of
15 which—

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

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

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

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

1 “(2) \$168,403,000 for fiscal year 2027, of
2 which—

3 “(A) \$94,940,000 is authorized for weath-
4 er laboratories and cooperative institutes;

5 “(B) \$39,886,000 is authorized for the
6 United States Weather Research Program;

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

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

13 “(3) \$170,089,000 for fiscal year 2028, of
14 which—

15 “(A) \$95,890,000 is authorized for weath-
16 er laboratories and cooperative institutes;

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

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

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

1 “(4) \$171,789,000 for fiscal year 2029, of
2 which—

3 “(A) \$96,849,000 is authorized for weath-
4 er laboratories and cooperative institutes;

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

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

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

13 “(5) \$173,506,000 for fiscal year 2030, of
14 which—

15 “(A) \$97,817,000 is authorized for weath-
16 er laboratories and cooperative institutes;

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

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

22 “(D) \$12,612,000 is authorized for the
23 joint technology transfer initiative described in
24 section 102(b)(4) of this title.

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

4 **SEC. 103. VERIFICATION OF THE ORIGINS OF ROTATION IN**
5 **TORNADOES EXPERIMENT-UNITED STATES**
6 **OF AMERICA (VORTEX-USA).**

7 (a) IN GENERAL.—Section 103 of the Weather Re-
8 search and Forecasting Innovation Act of 2017 (15 U.S.C.
9 8513) is amended to read as follows:

10 **“SEC. 103. VERIFICATION OF THE ORIGINS OF ROTATION IN**
11 **TORNADOES EXPERIMENT-UNITED STATES**
12 **OF AMERICA (VORTEX-USA).**

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

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

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

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

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

5 “(c) INNOVATIVE OBSERVATIONS.—The Under Sec-
6 retary shall ensure the program under subsection (a) peri-
7 odically examines, tests, and evaluates the value of incor-
8 porating innovative observations, such as novel sensor
9 technologies, observation tools or networks, crewed or
10 uncrewed systems, and hosted instruments on commercial
11 aircrafts, vessels, and satellites, with respect to the im-
12 provement of tornado forecasts, predictions, and warnings.

13 “(d) ACTIVITIES.—In carrying out the program
14 under subsection (a), the Under Secretary shall award
15 grants for research, including relating to the following:

16 “(1) Implementing key goals and achieving pro-
17 gram milestones to the maximum extent practicable,
18 as outlined by the 2019 report of the National Oce-
19 anic and Atmospheric Administration entitled, ‘Tor-
20 nado Warning Improvement and Extension Program
21 Plan’.

22 “(2) In coordination with the Social and Behav-
23 ioral Sciences Subcommittee of the National Science
24 and Technology Council, improving the social, behav-
25 ioral and economic sciences regarding risk commu-

1 nication, and delivery of information critical for re-
2 ducing the loss of life or property related to torna-
3 does.

4 “(3) Improving the physical sciences, computer
5 modeling, and tools related to tornado formation, the
6 impacts of tornadoes on the built and natural envi-
7 ronment, and the interaction of tornadoes and hurri-
8 canes.

9 “(e) PRIORITY INSTITUTIONS.—

10 “(1) IN GENERAL.—In awarding grants under
11 subsection (d), the Under Secretary shall give pri-
12 ority to eligible institutions selected through a com-
13 petitive, merit-based process.

14 “(2) ELIGIBLE INSTITUTION DEFINED.—In this
15 subsection, the term ‘eligible institution’ means any
16 of the following:

17 “(A) An institution that is frequently sub-
18 jected to severe weather, such as tornadoes,
19 hurricanes, or floods.

20 “(B) An institution of higher education in
21 close proximity to a Weather Forecast Office of
22 the National Weather Service.

23 “(f) WARNINGS.—In carrying out subsection (a), the
24 Under Secretary, in coordination with the program estab-
25 lished under section 403(a) of the Weather Research and

1 Forecasting Innovation Reauthorization Act of 2026,
2 shall—

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

7 “(2) incorporate into tornado modeling and
8 forecasting, as appropriate, social, behavioral, risk,
9 communication, and economic sciences;

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

12 “(4) expand computational resources, including
13 cloud computing, to support higher-resolution mod-
14 eling to advance the capability for warn-on-forecast.

15 “(g) TORNADO RATING SYSTEM.—The Under Sec-
16 retary, in collaboration with local communities and emer-
17 gency managers, shall—

18 “(1) evaluate the system used as of the date of
19 the enactment of this section to rate the severity of
20 tornadoes;

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

24 “(3) if determined necessary, update such sys-
25 tem.

1 “(h) ANNUAL BUDGET.—The Under Secretary shall
2 submit to Congress, with the budget of the President sub-
3 mitted under section 1105 of title 31, United States Code,
4 for a fiscal year, a proposed budget for activities to carry
5 out this section in that fiscal year.

6 “(i) AUTHORIZATION OF APPROPRIATIONS.—There is
7 authorized to be appropriated to the Under Secretary to
8 carry out this section \$11,000,000 for each of fiscal years
9 2026 through 2030, of which not less than \$2,000,000
10 each fiscal year shall be used for grants awarded to insti-
11 tutions under subsection (e).”.

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

“Sec. 103. Verification of the Origins of Rotation in Tornadoes Experiment—
United States of America (VORTEX–USA).”.

16 **SEC. 104. HURRICANE FORECAST IMPROVEMENT PRO-**
17 **GRAM.**

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

21 **“SEC. 104. HURRICANE FORECAST IMPROVEMENT PRO-**
22 **GRAM.**

23 “(a) IN GENERAL.—The Under Secretary, in collabo-
24 ration with the United States weather industry and aca-

1 demic partners, shall maintain a program to improve hur-
2 ricane forecasting, predictions, and warnings.

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

8 “(1) Improving the understanding, prediction,
9 and communication of rapid intensity change and
10 projected path of hurricanes, including probabilistic
11 methods for hurricane hazard mapping.

12 “(2) Improving the forecast and impact-based
13 communication of inland flooding, compound flood-
14 ing, and storm surges from hurricanes, in coordina-
15 tion with the program established under section 205
16 of the Weather Research and Forecasting Innovation
17 Reauthorization Act of 2026.

18 “(3) Incorporating social, behavioral, risk, com-
19 munication, and economic sciences to clearly inform
20 response to prevent the loss of life or property.

21 “(4) Evaluating and incorporating, as appro-
22 priate, innovative observations, including acoustic or
23 infrasonic measurements, novel sensor technologies,
24 observation tools or networks, crewed or uncrewed

1 systems, and hosted instruments on commercial air-
2 crafts, vessels, and satellites.

3 “(c) ACTIVITIES.—In carrying out subsection (a), the
4 Under Secretary shall award grants for research, includ-
5 ing relating to the following:

6 “(1) Implementing key strategies and following
7 priorities and objectives outlined by the 2019 report
8 of the National Oceanic and Atmospheric Adminis-
9 tration entitled, ‘Hurricane Forecast Improvement
10 Program’.

11 “(2) In coordination with the Social and Behav-
12 ioral Sciences Subcommittee of the National Science
13 and Technology Council and other relevant inter-
14 agency committees, improving the social, behavioral,
15 and economic sciences related to risk communica-
16 tion, and delivery of information critical for reducing
17 the loss of life or property related to hurricanes.

18 “(3) Improving the physical sciences, oper-
19 ational modeling, and tools related to hurricane for-
20 mation, the impacts of wind and water-based hurri-
21 cane hazards on the built and natural environment,
22 and the interaction of hurricanes and tornadoes.

23 “(d) WARNINGS.—In carrying out subsection (a), the
24 Under Secretary, in coordination with the program estab-
25 lished under section 403(a) of the Weather Research and

1 Forecasting Innovation Reauthorization Act of 2026,
2 shall—

3 “(1) conduct and transition to operations the
4 research necessary to develop and deploy prob-
5 abilistic weather forecast guidance technology relat-
6 ing to hurricanes and related weather phenomena;

7 “(2) incorporate into hurricane modeling and
8 forecasting, as appropriate, social, behavioral, and
9 economic sciences research; and

10 “(3) expand computational resources, including
11 cloud computing, to support and improve higher res-
12 olution operational modeling of hurricanes and re-
13 lated weather phenomena.

14 “(e) ANNUAL REPORT.—Not later than June 1 of
15 each year until 2029, the Under Secretary, in consultation
16 with the Secretary of Defense, shall submit to the Com-
17 mittee on Commerce, Science, and Transportation of the
18 Senate and the Committee on Science, Space, and Tech-
19 nology of the House of Representatives a report that in-
20 cludes the following:

21 “(1) The number and causes of missed mission
22 requirements for the National Hurricane Operations
23 Plan and the National Winter Season Operations
24 Plan, including those related to equipment malfunc-
25 tion, aircraft availability, aircraft maintenance, flight

1 hour limits, and availability of pilots or other air and
2 maintenance crew members.

3 “(2) Requirements related to the plans de-
4 scribed in paragraph (1) that were requested by
5 forecasters but not tasked, and the reasons why
6 those were not tasked.

7 “(3) A workforce management plan addressing
8 any shortfalls in human capital resources that are
9 necessary for hurricane observational data collection
10 aboard aircraft or uncrewed systems.

11 “(4) A summary of—

12 “(A) hurricane technology that is under re-
13 search and development to improve confidence
14 in hurricane track and intensity predictions;

15 “(B) hurricane technology that is at the
16 prototype demonstration stage or beyond; and

17 “(C) plans for transitioning the hurricane
18 technology described in subparagraph (B) into
19 operations.”.

20 **SEC. 105. TSUNAMI WARNING AND EDUCATION ACT REAU-**
21 **THORIZATION.**

22 (a) **TITLE HEADING.**—The Tsunami Warning and
23 Education Act (enacted as title VIII of the Magnuson-Ste-
24 vens Fishery Conservation and Management Reauthoriza-
25 tion Act of 2006 (Public Law 109–479)) is amended in

1 the title heading, by inserting “, **RESEARCH**,” after
2 “**WARNING**”.

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

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

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

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

11 (4) by adding at the end the following:

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

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

20 (1) in subsection (b)—

21 (A) in paragraph (4), by inserting “, using
22 industry and scientific best practices,” after
23 “operational condition”;

24 (B) in paragraph (5)—

1 (i) in subparagraph (C), by striking
2 “global seismic network” and inserting
3 “Global Seismic Network”;

4 (ii) by redesignating subparagraphs
5 (D), (E), (F), and (G), as subparagraphs
6 (E), (F), (G), and (H), respectively; and

7 (iii) by inserting after subparagraph
8 (C) the following:

9 “(D) the global navigation satellite system
10 network;”;

11 (C) by amending paragraph (6) to read as
12 follows:

13 “(6) ensure data quality and management sys-
14 tems, support data and metadata access and
15 archiving, and support the requirements of the pro-
16 gram pursuant to the Foundations for Evidence-
17 Based Policymaking Act of 2018 (Public Law 115-
18 435) and chapter 31 of title 44, United States
19 Code;”;

20 (D) in paragraph (7)—

21 (i) by amending the matter preceding
22 subparagraph (A) to read as follows: “in-
23 clude a cooperative effort among the Ad-
24 ministration, the United States Geological
25 Survey, the National Aeronautics and

1 Space Administration, and the National
2 Science Foundation under which the Direc-
3 tor of the United States Geological Survey,
4 the Director of the National Science Foun-
5 dation, and the Administrator of the Na-
6 tional Aeronautics and Space Administra-
7 tion shall—”;

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

10 (iii) by adding at the end the fol-
11 lowing:

12 “(C) provide reliable and real-time support
13 for the global navigation satellite system net-
14 work data streams from networks maintained
15 by the National Science Foundation, the Na-
16 tional Aeronautics and Space Administration,
17 and the United States Geological Survey, and
18 supplement instrumentation coverage for rapid
19 earthquake assessment;

20 “(D) assess the data and information re-
21 lating to warning systems of collaborating agen-
22 cies for potential utilization in the warning sys-
23 tem of the National Oceanic and Atmospheric
24 Administration, taking into consideration ad-
25 vancement in research and technology;

1 “(E) incorporate, as practicable, tsunami
2 notifications and warnings in the Earthquake
3 Early Warning System of the United States Ge-
4 ological Survey; and

5 “(F) incorporate, as practicable, prelimi-
6 nary analysis or data from the National Earth-
7 quake Information Center regarding the source
8 and magnitude of an offshore earthquake with-
9 in 5 minutes of detection;”;

10 (E) in paragraph (8)—

11 (i) by inserting “and decision support
12 aides” after “graphical warning prod-
13 ucts,”; and

14 (ii) by inserting “-prone” after “tsu-
15 nami”;

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

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

20 (H) by adding at the end the following:

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

25 (2) in subsection (c)—

1 (A) by striking paragraph (1) and redesignig-
2 nating paragraphs (2) and (3) as paragraphs
3 (1) and (2), respectively; and

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

5 (i) by striking “the Atlantic Ocean,
6 including the Caribbean Sea and Gulf of
7 Mexico, that are determined—” and insert-
8 ing “the Pacific, Arctic, and Atlantic
9 Oceans, including the Caribbean Sea and
10 Gulf of Mexico, that are determined to
11 pose significant risks of tsunami for States
12 and United States territories along the
13 coastal areas of such regions; and”;

14 (ii) by striking subparagraphs (A) and
15 (B);

16 (3) by redesignating subsections (d), (e), (f),
17 and (g) as subsections (e), (f), (g), and (h), respec-
18 tively;

19 (4) by inserting after subsection (c) the fol-
20 lowing:

21 “(d) TSUNAMI WARNING ALERT LEVEL EVALUA-
22 TION.—The Administrator, in collaboration with social sci-
23 entists, emergency personnel, and high-risk communities,
24 shall—

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

3 “(2) determine if such alerts produce the de-
4 sired response and understanding from possible tsu-
5 nami-prone communities; and

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

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

9 (A) in paragraph (1)—

10 (i) in the matter preceding subpara-
11 graph (A), by inserting “responsible for
12 Alaska, the continental United States, Ha-
13 waii, United States territories, and inter-
14 national entities the Administrator deter-
15 mines appropriate” before the period;

16 (ii) in subparagraph (A), by striking
17 “, which is primarily responsible for Alaska
18 and the continental United States”; and

19 (iii) in subparagraph (B), by striking
20 “, which is primarily responsible for Ha-
21 waii, the Caribbean, and other areas of the
22 Pacific not covered by the National Cen-
23 ter”;

24 (B) in paragraph (2)—

24

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

3 (ii) in subparagraph (B), by striking
4 “and volcanic eruptions” and inserting
5 “volcanic eruptions, or other sources”;

6 (iii) in subparagraph (C), by striking
7 “buoy data and tidal” and inserting “and
8 coastal”;

9 (iv) in subparagraph (E), by striking
10 “Integrated Ocean Observing System of
11 the Administration” and inserting “United
12 States and global ocean and coastal observ-
13 ing system”;

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

16 (vi) by amending subparagraph (I) to
17 read as follows:

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

22 (C) by amending paragraph (3) to read as
23 follows:

24 “(3) FAIL-SAFE WARNING CAPABILITY.—The
25 Administrator shall support and maintain fail-safe

1 warning capability for the tsunami warning centers
2 supported or maintained under paragraph (1), and
3 such centers shall conduct at least one service
4 backup drill biannually.”;

5 (D) in paragraph (4)—

6 (i) by amending the matter preceding
7 subparagraph (A) to read as follows: “The
8 Administrator shall coordinate with the
9 weather forecast offices of the National
10 Weather Service, the centers supported or
11 maintained under paragraph (1), and such
12 national and regional program offices of
13 the Administration as the Administrator or
14 the coordinating committee, as established
15 in section 805(b), consider appropriate to
16 ensure that regional and local weather
17 forecast offices—”;

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

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

22 (iv) by adding at the end the fol-
23 lowing:

1 “(ii) ensuring product consistency;

2 “(iii) enabling consistent operational
3 process for backup capabilities;

4 “(iv) mitigating existing operational
5 security risks; and

6 “(v) meeting information security re-
7 quirements specified in chapter 35 of title
8 44, United States Code.”; and

9 (F) by adding at the end the following:

10 “(7) REPORTING.—Not later than 180 days
11 after the date of the enactment of this paragraph
12 and annually thereafter until such time as all rel-
13 evant requirements have been satisfied, the Adminis-
14 trator shall provide to the Committee on Commerce,
15 Science, and Transportation of the Senate and the
16 Committee on Science, Space, and Technology of the
17 House of Representatives an update briefing on the
18 progress of the following:

19 “(A) Standardizing products and proce-
20 dures under paragraph (5), including tsunami
21 assessments, forecast guidance, and related
22 products.

23 “(B) Migrating the message generation
24 systems of the centers supported or maintained
25 under paragraph (1) to the Advanced Weather

1 Information Processing System, or successor
2 systems.

3 “(C) The structural reorganization effort,
4 if necessary, to align the organizational charts
5 of those centers.

6 “(D) The expected timeline for the full
7 completion of standardizing the products and
8 procedures of those centers.”;

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

10 (A) in paragraph (1)—

11 (i) in the matter preceding subpara-
12 graph (A), by inserting “detect, measure,
13 and” after “used to”;

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

16 (iii) in subparagraph (C), by striking
17 “and the Advanced National Seismic Sys-
18 tem;” and inserting “the Advanced Na-
19 tional Seismic System, and the global navi-
20 gation satellite system; and”;

21 (iv) by adding at the end the fol-
22 lowing:

23 “(D) by ensuring research is coordinated
24 with tsunami warning operations;”;

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

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

8 (d) ASSESSMENT OF TSUNAMI WATCHES AND WARN-
9 INGS.—

10 (1) IN GENERAL.—The Tsunami Warning and
11 Education Act (enacted as title VIII of the Magnu-
12 son-Stevens Fishery Conservation and Management
13 Reauthorization Act of 2006 (Public Law 109–479))
14 is amended by inserting after section 804 (33 U.S.C.
15 3203) the following:

16 **“SEC. 804A. ASSESSMENT OF TSUNAMI WATCHES AND**
17 **WARNINGS.**

18 “(a) ASSESSMENT OF TSUNAMI WATCHES AND
19 WARNINGS.—

20 “(1) IN GENERAL.—Not later than 2 years
21 after the date of the enactment of this section, the
22 Under Secretary shall—

23 “(A) conduct an assessment of—

24 “(i) the tsunami watches and warn-
25 ings of the National Weather Service; and

1 “(ii) the information delivery to sup-
2 port preparation and responses to
3 tsunamis; and

4 “(B) submit to Congress a report on the
5 findings of the Under Secretary with respect to
6 the assessment required by subparagraph (A).

7 “(2) ELEMENTS.—The assessment required by
8 paragraph (1)(A) shall include the following:

9 “(A) An evaluation of whether the watch-
10 es, warnings, and information described in
11 paragraph (1)(A) effectively—

12 “(i) communicate risk to the general
13 public;

14 “(ii) inform action to prevent loss of
15 life and property;

16 “(iii) inform action to support tsu-
17 nami preparation and response; and

18 “(iv) deliver information in a manner
19 designed to lead to appropriate action.

20 “(B) Subject to subsection (b)(2), such
21 recommendations as the Under Secretary may
22 have for—

23 “(i) legislative and administrative ac-
24 tion to improve the watches and warnings
25 described in paragraph (1)(A)(i); and

1 “(ii) such research as the Under Sec-
2 retary considers necessary to address the
3 focus areas described in paragraph (3).

4 “(3) FOCUS AREAS.—The assessment required
5 by paragraph (1)(A) shall focus on the following
6 areas:

7 “(A) Ways to communicate the risks posed
8 by hazardous tsunami events to the public that
9 are most likely to result in informed decision
10 making regarding the mitigation of those risks.

11 “(B) Ways to provide actionable geo-
12 graphic information to the recipient of a watch
13 or warning for tsunami, including partnering
14 with emergency response agencies, as appro-
15 priate.

16 “(C) Evaluation of information delivery to
17 support the preparation for and response to
18 tsunamis.

19 “(4) CONSULTATION.—In conducting the as-
20 sessment required by paragraph (1)(A), the Under
21 Secretary shall consult with—

22 “(A) individuals in the academic sector, in-
23 cluding individuals in the fields of social and
24 behavioral sciences;

25 “(B) other weather services;

1 “(C) media outlets and other entities that
2 distribute the watches and warnings described
3 in paragraph (1)(A)(i);

4 “(D) emergency planners and responders,
5 including State, local, and Tribal emergency
6 management agencies;

7 “(E) other government users of the watch-
8 es and warnings described in paragraph
9 (1)(A)(i), including the Federal Highway Ad-
10 ministration; and

11 “(F) such other Federal agencies as the
12 Under Secretary determines rely on watches
13 and warnings regarding tsunamis for oper-
14 ational decisions.

15 “(5) METHODOLOGIES.—In conducting the as-
16 sessment required by paragraph (1)(A), the Under
17 Secretary shall use such methodologies as the Under
18 Secretary considers are generally accepted by the
19 weather enterprise, including methodologies of the
20 fields of social and behavioral sciences.

21 “(b) IMPROVEMENTS TO TSUNAMI WATCHES AND
22 WARNINGS.—

23 “(1) IN GENERAL.—Based on the assessment
24 required by subsection (a)(1)(A), the Under Sec-
25 retary shall make such improvements to the watches

1 and warnings described in that subsection as the
2 Under Secretary considers necessary—

3 “(A) to improve the communication of the
4 risks posed by tsunami events; and

5 “(B) to provide actionable geographic in-
6 formation to the recipient of a watch or warn-
7 ing for a tsunami.

8 “(2) REQUIREMENTS REGARDING REC-
9 OMMENDATIONS.—In conducting the assessment re-
10 quired by subsection (a)(1)(A), the Under Secretary
11 shall ensure that any recommendation under sub-
12 section (a)(2)(B) that the Under Secretary considers
13 a major change—

14 “(A) is validated by social and behavioral
15 science using a generalizable sample;

16 “(B) accounts for the needs of various de-
17 mographics, vulnerable populations, and geo-
18 graphic regions;

19 “(C) responds to the needs of Federal,
20 State, local, and Tribal government partners
21 and media partners; and

22 “(D) accounts for necessary changes to
23 federally operated watch and warning propaga-
24 tion and dissemination infrastructure and pro-
25 tocols.”.

1 (2) CLERICAL AMENDMENT.—The table of con-
2 tents for the Tsunami Warning and Education Act
3 (enacted as title VIII of the Magnuson-Stevens Fish-
4 ery Conservation and Management Reauthorization
5 Act of 2006 (Public Law 109–479)) is amended by
6 inserting after the item relating to section 804 the
7 following:

 “Sec. 804A. Assessment of tsunami watches and warnings.”.

8 (e) NATIONAL TSUNAMI HAZARD MITIGATION PRO-
9 GRAM.—Section 805(e) of the Tsunami Warning and Edu-
10 cation Act (33 U.S.C. 3204(c)) is amended—

11 (1) in paragraph (5)—

12 (A) by redesignating subparagraphs (B),
13 (C), (D), (E), (F), and (G) as subparagraphs
14 (C), (D), (E), (F), (G), and (H), respectively;

15 (B) by inserting after subparagraph (A)
16 the following:

17 “(B) Coastal digital elevation models to
18 support the development of inundation maps.”;

19 and

20 (C) by adding at the end the following:

21 “(I) Evaluation of the variation of inunda-
22 tion impact resulting from tsunami-driven sedi-
23 ment transport.

24 “(J) Evaluation of tsunami debris impact
25 on critical infrastructure (as defined in sub-

1 section (e) of the Critical Infrastructures Pro-
2 tection Act of 2001 (42 U.S.C. 5195e) and
3 lifelines.

4 “(K) High-resolution and high-quality dig-
5 ital elevation models needed for at-risk coast-
6 lines, ports, and harbors, particularly for re-
7 gions not covered by existing inundation
8 maps.”; and

9 (2) in paragraph (7)(C), by inserting “and be-
10 havioral” after “social”.

11 (f) TSUNAMI RESEARCH PROGRAM.—Section 806 of
12 the Tsunami Warning and Education Act (33 U.S.C.
13 3205) is amended—

14 (1) in subsection (a)—

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

17 (B) by inserting “and management” after
18 “data collection”;

19 (2) in subsection (b)—

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

22 (B) in paragraph (3), by striking “social
23 science research” and inserting “social and be-
24 havioral science research, including data collec-
25 tion,”;

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

3 (D) by redesignating paragraph (5) as
4 paragraph (7); and

5 (E) by inserting after paragraph (4) the
6 following:

7 “(5) develop decision support tools;

8 “(6) leverage and prioritize research opportuni-
9 ties; and”; and

10 (3) by adding at the end the following:

11 “(c) RESEARCH AND DEVELOPMENT PLAN.—Not
12 later than 1 year after the date of the enactment of this
13 subsection, and not less frequently than every 3 years
14 thereafter, the Administrator, in consultation with the
15 Interagency Council for Advancing Meteorological Serv-
16 ices, shall develop a research and development and re-
17 search to operations plan to improve tsunami detection
18 and forecasting capabilities that—

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

21 “(2) identifies key research needs for better de-
22 tecting tsunamis that may occur in open ocean and
23 along the coastlines of the United States and the
24 territories of the United States, improve forecasting

1 of tsunamis that are not seismically driven, and
2 other opportunities determined appropriate;

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

5 “(4) identifies collaboration opportunities that
6 may advance and align tsunami research, develop-
7 ment, warnings, and operations between the centers
8 supported or maintained under section 804, the Na-
9 tional Tsunami Hazard Mitigation Program, the Na-
10 tional Oceanic and Atmospheric Administration Cen-
11 ter for Tsunami Research, the National Science
12 Foundation, the United States Geological Survey,
13 the Federal Emergency Management Agency, insti-
14 tutions of higher education, private entities and
15 other appropriate stakeholders.”.

16 (g) GLOBAL TSUNAMI WARNING AND MITIGATION
17 NETWORK.—Section 807(d) of the Tsunami Warning and
18 Education Act (33 U.S.C. 3206(d)) is amended by insert-
19 ing “and management” after “data sharing”;

20 (h) TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY
21 PANEL.—Section 808 of the Tsunami Warning and Edu-
22 cation Act (33 U.S.C. 3206a) is amended—

23 (1) in subsection (b)(1), by inserting “and be-
24 havioral” after “social”; and

25 (2) by adding at the end the following:

1 “(e) SUNSET.—The Panel shall terminate not later
2 than 6 years after the date of the enactment of the Weath-
3 er Research and Forecasting Innovation Reauthorization
4 Act of 2026.”.

5 (i) AUTHORIZATION OF APPROPRIATIONS.—Section
6 809 of the Tsunami Warning and Education Act (33
7 U.S.C. 3207) is amended to read as follows:

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

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

12 “(1) not less than 27 percent of the amount ap-
13 propriated for each fiscal year shall be for activities
14 conducted at the State level under the national tsu-
15 nami hazard mitigation program under section 805;
16 and

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

20 **SEC. 106. OBSERVING SYSTEM PLANNING.**

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

24 (1) in paragraph (3)—

1 (A) by inserting “Federal” before “observ-
2 ing capabilities”; and

3 (B) by striking “and” after the semicolon;
4 (2) in paragraph (4)—

5 (A) by inserting “, including private sector
6 partnerships or commercial acquisition,” after
7 “options”; and

8 (B) by striking the period and inserting a
9 semicolon; and

10 (3) by adding at the end the following:

11 “(5) compare costs and schedule, including
12 cost-benefit analyses, of Federal and private sector
13 supplemental options to fill the observation data re-
14 quirements under paragraph (1) and gaps identified
15 pursuant to paragraph (3); and

16 “(6) not later than 1 year after the date of the
17 enactment of the Weather Research and Forecasting
18 Innovation Reauthorization Act of 2026, submit to
19 Congress a report that provides an analysis of the
20 technical, schedule, cost, and cost-benefit analyses
21 relating to placing an operational polar-orbiting en-
22 vironmental satellite capability in the early morning
23 orbit to support the weather enterprise and the mis-
24 sion of the National Oceanic and Atmospheric Ad-
25 ministration.”.

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

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

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

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

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

12 (4) by redesignating subsection (e) as sub-
13 section (d).

14 **SEC. 108. COMPUTING RESOURCES PRIORITIZATION.**

15 (a) COMPUTING RESEARCH INITIATIVE.—Section
16 108 of the Weather Research and Forecasting Innovation
17 Act of 2017 (15 U.S.C. 8518) is amended by striking sub-
18 section (a)(3)(C) and all that follows through subsection
19 (b)(7) and inserting the following:

20 “(b) ARTIFICIAL INTELLIGENCE INVESTMENTS.—

21 “(1) IN GENERAL.—The Under Secretary shall
22 leverage artificial intelligence and machine learning
23 technologies to facilitate, optimize, and further lever-
24 age advanced computing to accomplish critical mis-
25 sions of the National Oceanic and Atmospheric Ad-
26 ministration.

1 “(2) ACQUISITION OF SYSTEMS.—The Under
2 Secretary shall include computing requirements
3 needed to support technologies specified in para-
4 graph (1) as part of major acquisitions of high-per-
5 formance computing systems or cloud computing
6 services for research, testing and evaluation, and op-
7 erations.

8 “(c) CENTERS OF EXCELLENCE.—

9 “(1) IN GENERAL.—The Under Secretary may
10 expand, and where applicable establish, centers of
11 excellence to aid the adoption of next-generation ar-
12 tificial intelligence and machine learning-enabled ad-
13 vanced computing capabilities.

14 “(2) ACTIVITIES.—Each center expanded or es-
15 tablished under paragraph (1) may carry out activi-
16 ties that include the following:

17 “(A) Leveraging public-private partner-
18 ships for infrastructure development training,
19 and workforce development.

20 “(B) Developing and optimizing tools, li-
21 braries, algorithms, data structures, and other
22 supporting software necessary for specific appli-
23 cations on high-performance computing sys-
24 tems.

1 “(C) Applying modern artificial intel-
2 ligence, deep machine learning, and advanced
3 data analysis technologies to address current
4 and emerging challenges.

5 “(D) To the maximum extent practicable,
6 exploring quantum computing and related part-
7 nerships with public, private, and academic en-
8 tities to improve the accuracy and resolution of
9 weather predictions.

10 “(d) MULTIYEAR CONTRACTS.—

11 “(1) IN GENERAL.—The Under Secretary may
12 enter into multiyear contracts in accordance with
13 section 3903 of title 41, United States Code, and
14 shall ensure compliance with all contract clauses
15 provided in such section.

16 “(2) EXCEPTION FOR CONTRACT DURATION
17 LIMITATION.—The limitation on the duration of
18 such contracts provided under subsection (a) of such
19 section of title 41, United States Code, shall not
20 apply to contracts for operations, research, and de-
21 velopment related to high-performance and cloud
22 computing infrastructure or systems, including any
23 associated services or support, provided that such
24 contracts comply with applicable law and include ap-

1 appropriate safeguards for any with an unfunded con-
2 tingent liability in the event of cancellation.

3 “(e) REPORT.—Not later than 2 years after the date
4 of the enactment of the Weather Research and Fore-
5 casting Innovation Reauthorization Act of 2026, the
6 Under Secretary, in collaboration with the Secretary of
7 Energy, shall submit to the Committee on Commerce,
8 Science, and Transportation of the Senate, the Committee
9 on Energy and Natural Resources of the Senate, and the
10 Committee on Science, Space, and Technology of the
11 House of Representatives a report evaluating the fol-
12 lowing:

13 “(1) A best estimate of the overall value of
14 high-resolution probabilistic forecast guidance for
15 hazardous weather or water events (as defined in
16 section 401 of the Weather Research and Fore-
17 casting Innovation Reauthorization Act of 2026)
18 using a next-generation weather forecast and warn-
19 ing framework.

20 “(2) The need for cloud computing, quantum
21 computing, or high-performance computing, visual-
22 ization, and dissemination collaboration between the
23 Department of Energy and the National Oceanic
24 and Atmospheric Administration.

1 “(3) A timeline and guidance for implementa-
2 tion of the following:

3 “(A) High-resolution numerical weather
4 prediction models.

5 “(B) Methods for meeting the cloud com-
6 puting, quantum computing, or high-perform-
7 ance computing, visualization, and dissemina-
8 tion needs identified under paragraph (2).”.

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

11 (1) IN GENERAL.—The Under Secretary shall
12 make publicly available not later than 1 year after
13 the date of the enactment of this Act, and update
14 every 5 years thereafter until 2035, a 10-year stra-
15 tegic plan that outlines the high-performance com-
16 puting and data management requirements and
17 needs of the National Oceanic and Atmospheric Ad-
18 ministration and actions and strategies to address
19 those requirements and needs.

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

23 (A) A 10-year prospective outlook of com-
24 puting resources and upgrades needed to meet
25 the mission needs of the National Oceanic and

1 Atmospheric Administration for fisheries man-
2 agement, oceanographic forecasting, and eco-
3 logical forecasting.

4 (B) A discussion of—

5 (i) computing and processing re-
6 sources of the Administration and a 10-
7 year projected need for such resources,
8 disaggregated by line office of the Admin-
9 istration;

10 (ii) facilities, commercial contracts,
11 and partnerships (with other Federal agen-
12 cies or other institutions or entities) of the
13 Administration that are providing com-
14 puting and data management support or
15 capacity as of the date of the plan;

16 (iii) the use by the Administration of
17 cloud computing and other emerging tech-
18 nologies, such as artificial intelligence and
19 machine learning;

20 (iv) additional technologies that have
21 the potential to increase effectiveness and
22 efficiency for data storage and processing
23 power, including challenges to access and
24 use of those technologies;

1 (v) the distribution of computing re-
2 sources among the operations and research
3 functions of the Administration;

4 (vi) products and services of the Ad-
5 ministration that have not become avail-
6 able to the public because of a lack of com-
7 puting resources;

8 (vii) current and future workforce de-
9 velopment needs of the Administration,
10 such as information technology and soft-
11 ware engineering needs; and

12 (viii) the high-performance computing
13 requirements of the Administration, with a
14 special focus on requirements that are
15 common across line offices of the Adminis-
16 tration.

17 (C) Timelines, and performance measures
18 for assessing progress toward attaining goals
19 for—

20 (i) computing infrastructure and ar-
21 chitecture of the Administration (including
22 facilities, hardware, and software); and

23 (ii) use by the Administration of tech-
24 nologies that will increase effectiveness and
25 efficiency for data storage and processing

1 power, including challenges to access and
2 use of such technologies.

3 (D) A 10-year life cycle analysis of the
4 management of facilities, hardware, and engi-
5 neering involved in the strategic plan that in-
6 cludes—

7 (i) program formulation for project
8 conception, implementation, and closure;
9 and

10 (ii) technical infrastructure, products,
11 processes, data, and personnel resources
12 required to achieve defined cost, schedule,
13 and performance objectives.

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

16 (3) PUBLIC INVOLVEMENT.—In developing the
17 strategic plan required by paragraph (1), the Under
18 Secretary shall invite comments and other feedback
19 from the public to inform the strategic plan.

20 (4) ANNUAL BRIEFINGS.—

21 (A) IN GENERAL.—Not later than 1 year
22 after the date of the enactment of this Act, and
23 annually thereafter until 2029, the Under Sec-
24 retary shall brief Congress on the progress

1 made toward the objectives of the strategic plan
2 required by paragraph (1).

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

5 (i) An evaluation of the progress
6 made in implementing the strategic plan.

7 (ii) Such updates to the strategic plan
8 as the Under Secretary considers appro-
9 priate.

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

11 Section 102(b)(5) of the Weather Research and Fore-
12 casting Innovation Act of 2017 (15 U.S.C. 8512(b)(5))
13 is amended—

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

16 (2) by striking subparagraph (E) and inserting
17 the following:

18 “(E) developing community weather re-
19 search modeling systems that—

20 “(i) are accessible by the public in ac-
21 cordance with section 10601 of the James
22 M. Inhofe National Defense Authorization
23 Act for Fiscal Year 2023 (15 U.S.C.
24 8512a) and available for archive and long-
25 term study;

1 “(ii) meet basic end-user requirements
2 for running on public computers and net-
3 works located outside of secure National
4 Oceanic and Atmospheric Administration
5 information and technology systems;

6 “(iii) utilize, whenever appropriate
7 and cost effective, innovative strategies and
8 methods, including cloud-based computing
9 capabilities, for hosting and management
10 of part or all of the systems described in
11 this subparagraph;

12 “(iv) utilize modeling systems that
13 allow for interoperability with new model
14 components, modules, and next-generation
15 software and coding languages;

16 “(v) allow for open testing and inte-
17 gration of promising operational model im-
18 provements from the broader community;

19 “(vi) access on as close to a real-time
20 basis as possible operational data and
21 metadata, including commercially pur-
22 chased data for use in the model testing
23 conducted by the Earth Prediction Innova-
24 tion Center pursuant to redistribution re-

1 restrictions, licensing agreements, and appli-
2 cable laws (including regulations); and

3 “(vii) provide supported and portable
4 versions of the unified forecast system, in-
5 cluding applications for fire weather, sub-
6 seasonal to seasonal forecasting, hurricane,
7 space weather, ocean, cryosphere, air qual-
8 ity, and coastal models, that can reproduce
9 current operational global and regional
10 model prediction; and

11 “(F) establishing a National Oceanic and
12 Atmospheric Administration Data Lake, to be
13 maintained by the Administration, a commercial
14 partner, or non-profit entity, that consolidates
15 and maintains a publicly available and continu-
16 ously updated collection of data and metadata
17 used in numerical weather prediction for use in
18 the Earth Prediction Innovation Center’s model
19 testing, pursuant to redistribution restrictions,
20 licensing agreements, and applicable laws (in-
21 cluding regulations).”.

22 **SEC. 110. SATELLITE ARCHITECTURE PLANNING.**

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

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

4 (2) by amending subsection (b) to read as fol-
5 lows:

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

8 “(1) IN GENERAL.—The Under Secretary shall
9 maintain a fleet of National Oceanic and Atmos-
10 pheric Administration space-based observation plat-
11 forms that provide critical operations-focused data
12 and information to support the mission of the Ad-
13 ministration in order to protect lives and property
14 from extreme weather and other natural phenomena.

15 “(2) COLLABORATION.—The Under Secretary
16 shall implement recommendations from the National
17 Oceanic and Atmospheric Administration Observing
18 Systems Council to ensure an appropriate mix of
19 government, academic, commercial sector, and inter-
20 national partnerships in the provision of data and
21 information, including a broadened effort on data
22 acquisition through the Commercial Data Program
23 under section 302 when cost effective and beneficial
24 to the Administration.

1 “(ii) modernize core weather-moni-
2 toring capabilities, while ensuring imaging
3 and sounding remain core instruments on
4 all satellites; and

5 “(iii) launch not later than 2032.

6 “(B) MISSION ARCHITECTURE AND IMPLE-
7 MENTATION PLAN.—

8 “(i) IN GENERAL.—Before termi-
9 nating any program elements relating to
10 geostationary extended observations under
11 subparagraph (A), the Under Secretary
12 shall submit to the appropriate committees
13 of Congress a revised mission architecture
14 and implementation plan, including compo-
15 nent costs, costs associated with termi-
16 nating or altering current mission architec-
17 ture, and a planned launch schedule.

18 “(ii) APPROPRIATE COMMITTEES OF
19 CONGRESS DEFINED.—In this subpara-
20 graph, the term ‘appropriate committees of
21 Congress’ means—

22 “(I) the Committee on Com-
23 merce, Science, and Transportation
24 and the Committee on Appropriations
25 of the Senate; and

1 “(II) the Committee on Science,
2 Space, and Technology and the Com-
3 mittee on Appropriations of the House
4 of Representatives.”; and

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

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

8 (a) RESEARCH AND DEVELOPMENT.—Section
9 102(b)(3) of the Weather Research and Forecasting Inno-
10 vation Act of 2017 (15 U.S.C. 8512(b)(3)) is amended—

11 (1) in subparagraph (B), by striking “aerial”
12 and inserting “crewed and uncrewed aerial and sur-
13 face”; and

14 (2) in subparagraph (G), by striking “, includ-
15 ing commercial observing systems” and inserting “,
16 including stationary and mobile commercial observ-
17 ing systems, such as uncrewed aircraft and marine
18 systems, to provide observations of the atmosphere
19 and ocean, and other observations, in cooperation
20 with the Office of Marine and Aviation Operations”.

21 (b) USE OF UNCREWED AERIAL SYSTEMS.—Section
22 102 of the Weather Research and Forecasting Innovation
23 Act of 2017 (15 U.S.C. 8512) is further amended—

24 (1) by redesignating subsections (c) and (d) as
25 subsections (d) and (e), respectively; and

1 (2) by inserting after subsection (b) the fol-
2 lowing:

3 “(c) USE OF UNCREWED AERIAL SYSTEMS.—

4 “(1) IN GENERAL.—In carrying out the pro-
5 gram under this section, the Assistant Administrator
6 for Oceanic and Atmospheric Research and the As-
7 sistant Administrator for the Office of Marine and
8 Aviation Operations, whenever practical, shall use
9 uncrewed aerial systems to assess damage and assist
10 recovery after an extreme weather or water event.

11 “(2) AUTHORITY.—In carrying out the program
12 under this section, the Assistant Administrator for
13 Oceanic and Atmospheric Research and the Assist-
14 ant Administrator for the Office of Marine and Avia-
15 tion Operations may acquire uncrewed aerial sys-
16 tems and training resources for the regional offices
17 and partners of the National Oceanic and Atmos-
18 pheric Administration for the use and deployment of
19 those systems in storm assessments and response.”.

20 **SEC. 112. INTERAGENCY COUNCIL FOR ADVANCING METE-**
21 **OROLOGICAL SERVICES.**

22 (a) IN GENERAL.—Section 402 of the Weather Re-
23 search and Forecasting Innovation Act of 2017 (15 U.S.C.
24 8542) is amended—

25 (1) in subsection (a)—

1 (A) by striking “Interagency Committee
2 for Advancing Weather Services” and inserting
3 “Interagency Council for Advancing Meteorological
4 Services (in this section referred to as
5 the ‘Interagency Council’)”; and

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

8 (2) by amending subsections (b) and (c) to read
9 as follows:

10 “(b) CO-CHAIRS; FEDERAL COORDINATOR.—The Di-
11 rector of the Office of Science and Technology Policy and
12 the Under Secretary shall serve as co-chairs of the Inter-
13 agency Council. The Under Secretary shall serve as the
14 Federal Coordinator for Meteorology.

15 “(c) FURTHER COORDINATION.—The Director of the
16 Office of Science and Technology Policy shall take such
17 steps as are necessary to coordinate the activities of the
18 Federal Government with stakeholders in the United
19 States weather industry, academic partners, State govern-
20 ments, and emergency managers.”; and

21 (3) by adding at the end the following:

22 “(d) FUNCTIONS.—The Interagency Council shall be
23 the formal mechanism by which all relevant Federal agen-
24 cies coordinate implementation of policy and practices to
25 ensure United States global leadership in meteorological

1 services. In doing so, the Interagency Council shall review
2 programs and support relevant weather research and fore-
3 cast innovation activities, and other related implementa-
4 tion activities, related to Federal meteorological services,
5 including by carrying out the following:

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

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

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

24 “(4) Facilitating the expansion and strength-
25 ening of partnerships with private sector entities to

1 advance meteorological research, communications,
2 and computing.

3 “(5) Sharing information regarding meteorolog-
4 ical research improvement needs and science oppor-
5 tunities across relevant Federal agencies.

6 “(6) Providing advice to all relevant Federal
7 agencies regarding potential collaborations and ex-
8 pected levels of resources needed to maintain and
9 operate the Interagency Council.

10 “(7) Enhancing communication and coordina-
11 tion and promoting sharing within relevant Federal
12 agencies and across the Interagency Council.

13 “(8) Developing, recruiting, and sustaining a
14 professional workforce for meteorological research
15 and services.

16 “(e) DATA INVENTORY.—The Interagency Council, in
17 coordination with, and avoiding duplication with the ef-
18 forts of, the United States Group on Earth Observations,
19 shall promote data and metadata access and archive ac-
20 tivities to increase accessibility, interoperability, and
21 reusability by maintaining a data inventory of meteorolog-
22 ical observations. Not less frequently than once every 2
23 years for a period of 10 years beginning on the date of
24 the enactment of this subsection, the Interagency Council
25 shall solicit updated information from private sector enti-

1 ties identifying current and near future sources of such
2 data. Such data shall be made available to participating
3 agencies of the Interagency Council specified under sub-
4 section (a).

5 “(f) COORDINATION OFFICE.—The Interagency Me-
6 teorological Coordination Office shall provide to the Inter-
7 agency Council such administrative and logistical support
8 as the Interagency Council may require, as determined by
9 the co-chairs.

10 “(g) COST SHARE.—Participating agencies of the
11 Interagency Council specified under subsection (a) may
12 provide reimbursable financial support to the Interagency
13 Meteorological Coordinating Office to enhance cost shar-
14 ing and collaboration related to weather research and fore-
15 cast innovation activities.

16 “(h) REPORT.—Not later than 1 year after the date
17 of the enactment of this subsection, and annually there-
18 after until 2030, the Interagency Council shall publish a
19 report that identifies among participating agencies of the
20 Interagency Council specified under subsection (a) the fol-
21 lowing:

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

1 “(2) Federal programs that acquire such obser-
2 vations, data, and capabilities from private sector
3 entities.

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

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

10 (b) REFERENCES.—Any reference to the Interagency
11 Committee for Advancing Weather Services in any law,
12 rule, regulation, paper, document, map, or other record
13 of the United States shall be deemed to be a reference
14 to the Interagency Council for Advancing Meteorological
15 Services.

16 **SEC. 113. OCEAN OBSERVATIONS.**

17 Section 12304(b) of the Integrated Coastal and
18 Ocean Observation System Act of 2009 (33 U.S.C.
19 3603(b)) is amended by adding at the end the following:

20 “(5) SHIPS OF OPPORTUNITY PILOT PROGRAMS
21 AND PROJECTS.—

22 “(A) IN GENERAL.—The Administrator, in
23 coordination with the heads of relevant Federal
24 agencies, shall, subject to relevant regulations
25 and certifications, maintain pilot programs or

1 projects to contract with research or commer-
2 cial ship operators for data collection and as-
3 sess the potential costs, benefits, and viability
4 of a network of ocean and atmospheric observ-
5 ing instruments operating on research or com-
6 mercial ocean vessels, including in the Arctic, in
7 order to supplement the Integrated Coastal,
8 Great Lakes, and Ocean Observation System in
9 improving understanding of coastal and ocean
10 systems and their relationships to human activi-
11 ties.

12 “(B) STANDARDS AND SPECIFICATIONS.—
13 The Administrator shall ensure that data ac-
14 quired through the pilot programs or projects
15 established pursuant to subparagraph (A)
16 meets the most recent standards and specifica-
17 tions required for observation services and data
18 as published pursuant to section 302(d) of the
19 Weather Research and Forecasting Innovation
20 Act of 2017.

21 “(C) REPORT.—Not later than 5 years
22 after the date of the enactment of this para-
23 graph, the Administrator, in consultation with
24 the Secretary of Transportation, shall submit to
25 Congress a report on the requirements for a

1 global network of ocean and atmospheric instru-
2 ments operating on research or commercial
3 ocean vessels for measurement and data trans-
4 mission.

5 “(D) SUNSET.—This paragraph shall ter-
6minate on the earlier of—

7 “(i) September 30, 2030; or

8 “(ii) 1 year after the date on which
9 the report required under subparagraph
10 (B) is submitted by the Administrator.”.

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

12 (a) WEATHER RESEARCH AND FORECASTING INNO-
13 VATION ACT OF 2017.—

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

16 (A) in section 102 (15 U.S.C. 8512), as
17 amended by section 111(b)(1) of this Act, by
18 striking subsection (e);

19 (B) by amending section 105 (15 U.S.C.
20 8515) to read as follows:

21 **“SEC. 105. WEATHER RESEARCH AND DEVELOPMENT PLAN-
22 NING.**

23 “Not later than 2 years after the date of the enact-
24 ment of this section, and not less frequently than once
25 every 2 years thereafter, the Under Secretary, acting

1 through the Assistant Administrator for Oceanic and At-
2 mospheric Research, and in coordination with the Director
3 of the National Weather Service and the Assistant Admin-
4 istrator for Satellite and Information Services, shall issue
5 a research and development and research to operations
6 plan to maintain United States leadership in numerical
7 weather prediction and forecasting that—

8 “(1) describes the forecasting skill and tech-
9 nology goals, technology transfer plan, and progress
10 of the National Oceanic and Atmospheric Adminis-
11 tration in carrying out the program conducted under
12 section 102;

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

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

1 academic partners, and the role of each in advancing
2 weather forecasting and communications;

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

10 “(5) describes the ongoing research projects of
11 the United States Weather Research Program, the
12 goals of those projects, and those projects related to
13 weather observations, short-term weather, or subsea-
14 sonal forecasts within the Office of Oceanic and At-
15 mospheric Research that are closest to
16 operationalization; and

17 “(6) describes how the National Oceanic and
18 Atmospheric Administration is advancing community
19 weather modeling.”;

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

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

23 (ii) by amending subsection (d) to
24 read as follows:

1 “(d) ANNUAL BRIEFING.—Not less frequently than
2 once each year, the Under Secretary shall—

3 “(1) brief the Committee on Commerce,
4 Science, and Transportation of the Senate and the
5 Committee on Science, Space, and Technology of the
6 House of Representatives on participation in the
7 program under subsection (a); and

8 “(2) highlight any innovations that come from
9 the interaction described in subsection (b).”; and

10 (D) by striking sections 408 through 411
11 and section 414 and redesignating sections 412
12 and 413 as sections 408 and 409, respectively.

13 (2) CLERICAL AMENDMENTS.—The table of
14 contents in section 1(b) of the Weather Research
15 and Forecasting Innovation Act of 2017 is amended
16 by striking the items relating to sections 408
17 through 414 and inserting the following:

“Sec. 408. Weather enterprise outreach.

“Sec. 409. Hurricane hunter aircraft.”.

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

22 (1) in section 106, by striking subsection (c)
23 (15 U.S.C. 1537); and

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

- 1 (A) in subsection (a)—
2 (i) by striking paragraph (5); and
3 (ii) by redesignating paragraphs (6)
4 through (12) as paragraphs (5) through
5 (11), respectively;
6 (B) by striking subsection (b); and
7 (C) by redesignating subsection (c) as sub-
8 section (b).

9 **SEC. 115. PRECIPITATION FORECAST IMPROVEMENT PRO-**
10 **GRAM.**

11 (a) IN GENERAL.—Title VI of the Weather Research
12 and Forecasting Innovation Act of 2017 (15 U.S.C. 8561
13 et seq.) is amended—

14 (1) by redesignating section 603 as section 604;
15 and

16 (2) by inserting after section 602 the following:

17 **“SEC. 603. PRECIPITATION FORECAST IMPROVEMENT PRO-**
18 **GRAM.**

19 “(a) IN GENERAL.—The Under Secretary, in collabo-
20 ration with the United States weather industry, other Fed-
21 eral agencies, and academic partners, shall maintain a
22 program to improve precipitation forecasting across
23 timescales.

24 “(b) GOAL.—The goal of the program under sub-
25 section (a) shall be to provide more accurate, reliable, and

1 timely precipitation forecasts across timescales through
2 the development and application of a fully coupled Earth
3 system prediction model in order to reduce the loss of life
4 or property related to precipitation extremes, with a focus
5 on the following:

6 “(1) Improving the understanding and pre-
7 diction of precipitation extremes from a variety of
8 weather systems, including atmospheric rivers.

9 “(2) Evaluating and incorporating, as appro-
10 prium, innovative observations into operational moni-
11 toring and forecast systems to improve precipitation
12 forecasts.

13 “(3) Improving Earth system model predictions
14 of precipitation extremes from atmospheric rivers,
15 tropical cyclones, summertime thunderstorms, winter
16 storms, and other phenomena, in coordination with
17 relevant programs.

18 “(4) Enhancing research-to-operations transi-
19 tion through testbeds, including the evaluation of
20 physical and social science, technology, and other re-
21 search to develop products and services for imple-
22 mentation and use by relevant stakeholders.

23 “(5) Incorporating best practices from the so-
24 cial, behavioral, and economic sciences into oper-
25 ations for more effective and actionable watch and

1 warning products that support public safety and
2 damage mitigation decisions in coordination with the
3 programs established in accordance with this Act.

4 “(6) Ensuring data and metadata management
5 processes are in place to support data access and ar-
6 chive for long-term research and operations among
7 multiple partners.

8 “(c) ACTIVITIES.—In carrying out the program
9 under subsection (a), the Under Secretary shall support
10 research-to-operations work, including the following:

11 “(1) Implementing key strategies and following
12 priorities and objectives outlined in the Precipitation
13 Prediction Grand Challenge Strategy of the National
14 Oceanic and Atmospheric Administration.

15 “(2) Improving the physical science, operational
16 modeling and tools, and technology related to better
17 forecasting precipitation extremes across timescales.

18 “(3) Improving the social, behavioral, and eco-
19 nomic sciences related to risk communication, and
20 delivery of information critical for reducing the loss
21 of life or property related to extreme precipitation.

22 “(4) Conducting the research necessary to de-
23 velop and deploy probabilistic weather forecast guid-
24 ance technology relating to precipitation extremes in
25 operational practice.

1 “(5) Enhancing the operational capacity of the
2 National Weather Service to deliver decision support
3 for extreme precipitation.

4 “(6) Expanding computational resources to im-
5 prove precipitation modeling.

6 “(d) ANNUAL BUDGET.—The Under Secretary shall
7 submit to Congress, with the budget of the President sub-
8 mitted under section 1105 of title 31, United States Code,
9 for a fiscal year, a proposed budget for activities to carry
10 out this section in that fiscal year.

11 “(e) SENSE OF CONGRESS.—It is the sense of Con-
12 gress that improved precipitation forecasts should support
13 improved water resource management and resilience to ex-
14 treme water related events, such as floods and drought,
15 which may include the use of enhanced streamflow pre-
16 diction.”.

17 (b) CLERICAL AMENDMENT.—The table of contents
18 in section 1(b) of the Weather Research and Forecasting
19 Innovation Act of 2017 is amended by striking the item
20 relating to section 603 and inserting the following:

“Sec. 603. Precipitation forecast improvement program.

“Sec. 604. Definitions.”.

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

4 **SEC. 201. NEXT-GENERATION NUMERICAL WEATHER PRE-**
5 **DICTION INITIATIVE.**

6 (a) **IN GENERAL.**—The Under Secretary may estab-
7 lish a long-term, agency-wide initiative to focus and align
8 numerical weather prediction activities around a shared
9 strategic vision for the future to further protect lives and
10 property, enhance the national economy, and promote
11 international leadership.

12 (b) **INITIATIVE GOALS.**—An initiative under sub-
13 section (a) shall encourage physics-based and data-driven
14 modeling approaches, the use of ensemble systems, contin-
15 uous and collaborative model development, and the mod-
16 ernization of modeling infrastructure and software prac-
17 tices.

18 (c) **ACTIVITIES.**—In carrying out an initiative under
19 subsection (a), the Under Secretary should seek to—

20 (1) enhance forecast accuracy, efficiency, and
21 interpretability;

22 (2) leverage innovation from the broader weath-
23 er enterprise;

24 (3) use advanced computing technologies and
25 observational data;

1 (4) periodically evaluate existing modeling sys-
2 tems to ensure resources are focused on the most ca-
3 pable and impactful forecast solutions while main-
4 taining operational continuity; and

5 (5) explore artificial intelligence-based modeling
6 capabilities and related training data needs.

7 **SEC. 202. RADAR NEXT PROGRAM.**

8 (a) IN GENERAL.—The Under Secretary, in consulta-
9 tion with the Director of the National Weather Service,
10 shall establish a program to be known as the “Radar Next
11 Program” (in this section referred to as the “program”).

12 (b) REQUIREMENTS.—In carrying out the program,
13 the Under Secretary shall—

14 (1) develop performance and coverage require-
15 ments for the weather radar network of the United
16 States, including for the territories of the United
17 States;

18 (2) collaborate with the weather enterprise to
19 determine potential solutions to update the weather
20 radar network of the United States that meet the re-
21 quirements developed under paragraph (1); and

22 (3) develop a plan in accordance with sub-
23 section (c).

24 (c) PLAN.—

1 (1) IN GENERAL.—The Under Secretary shall
2 develop a plan to replace the Next Generation
3 Weather Radar system of the National Weather
4 Service in existence as of the date of the enactment
5 of this Act (in this subsection referred to as the
6 “NEXRAD system”).

7 (2) ELEMENTS.—The plan developed under this
8 subsection shall seek to continue and improve weath-
9 er radar coverage in the United States and its terri-
10 tories and include the following:

11 (A) Estimates of quantifiable improve-
12 ments in performance, coverage, and accuracy
13 to be made from potential options for replace-
14 ment of the NEXRAD system.

15 (B) Development of a phased array radar
16 to test and determine the specifications and re-
17 quirements for such replacement.

18 (C) Expected actions needed to implement
19 the recommendations of the report published by
20 the Environmental Information Services Work-
21 ing Group of the Science Advisory Board of the
22 National Oceanic and Atmospheric Administra-
23 tion on November 15, 2023, and entitled “A
24 NESDIS Observing System Backbone Frame-
25 work” to assist in defining a radar backbone

1 architecture that will best serve the United
2 States.

3 (D) Establishment of a weather surveil-
4 lance radar testbed for the following:

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

8 (ii) Providing technical assistance for
9 the use of small, gap-filling radars with
10 private and local partners in regions where
11 geographical topography prevents the full
12 use of large systems or in locations where
13 such systems may not be commercially via-
14 ble.

15 (E) Consultation and input solicited from
16 academia, meteorologists, emergency managers,
17 and public safety or utility officials regarding
18 the specifications and requirements for replace-
19 ment of the NEXRAD system.

20 (F) Prioritized locations for initial deploy-
21 ment of the system that will replace the
22 NEXRAD system.

23 (G) Expected locations of the system that
24 will replace the NEXRAD system, including
25 sites located more than 75 miles away from an

1 existing NEXRAD system station and addi-
2 tional appropriate locations.

3 (H) Expected or planned improvements to
4 data available for weather and water-related
5 forecasts and warnings from the system that
6 will replace the NEXRAD system.

7 (3) PROCUREMENT DEADLINE.—The Under
8 Secretary shall take such actions as may be nec-
9 essary to ensure the plan developed under this sub-
10 section is fully implemented and executed by not
11 later than September 30, 2040.

12 (d) RADAR-AS-A-SERVICE.—

13 (1) IN GENERAL.—The Under Secretary may
14 partner or contract with entities outside of the Na-
15 tional Oceanic and Atmospheric Administration to
16 fill data gaps in weather radar coverage using
17 weather radars and data assimilation technologies in
18 order to—

19 (A) supplement data gaps in weather radar
20 coverage, including at low levels and in wide
21 areas, in existence as of the date of the enact-
22 ment of this Act;

23 (B) ensure the continued performance of
24 the weather radar network of the United
25 States; and

1 coverage, impact-based decision support services, and
2 emergency information sharing in the United States, in-
3 cluding the following:

4 (1) Identifying regions in the United States and
5 the territories of the United States that are under
6 observed, and as a result, have data gaps or experi-
7 ence disproportionate impacts from hazardous
8 weather that threatens human life, health, and prop-
9 erty.

10 (2) Identifying any challenges that contribute to
11 the lack of weather observations under paragraph
12 (1).

13 (3) Increasing weather observations and devel-
14 oping new weather observational capabilities with re-
15 spect to the regions identified under paragraph (1).

16 (4) Establishing or supporting testbeds and de-
17 ployments of decision support services to Federal,
18 State, and local emergency operations centers to de-
19 velop and integrate new weather, water, and climate
20 observation or emergency information sharing tools,
21 with respect to the regions identified under para-
22 graph (1).

23 (5) To the maximum extent practicable, ad-
24 vancing weather and water forecasting and subsea-

1 sonal to seasonal modeling capabilities for the re-
2 gions identified under paragraph (1).

3 (6) Undertaking workforce development efforts
4 for emergency management officials and meteorolo-
5 gists in the regions identified under paragraph (1).

6 (7) Using observations to fill voids in data and
7 better understand extreme rainfall in complex topog-
8 raphy.

9 (8) Contributing to a national integrated heat
10 health information system.

11 (b) CONSULTATION; COORDINATION.—The Under
12 Secretary shall carry out activities under subsection (a)—

13 (1) in coordination with the Director of the Na-
14 tional Weather Service and the Administrator of the
15 Federal Emergency Management Agency;

16 (2) in consultation with the United States
17 weather industry and academic partners; and

18 (3) in accordance with activities implemented
19 through existing regional atmospheric, coastal,
20 ocean, and Great Lakes observing systems.

21 (c) INTERAGENCY PARTNERSHIP TO SUPPORT PILOT
22 PROJECTS.—

23 (1) IN GENERAL.—In carrying out this section,
24 the Under Secretary, acting through the Director of
25 the National Weather Service and in collaboration

1 with the Administrator of the Federal Emergency
2 Management Agency, shall establish an interagency
3 partnership to support pilot projects that accelerate
4 coordination and use of localized weather, water, and
5 subseasonal to seasonal data and impact-based deci-
6 sion support services in infrastructure and emer-
7 gency management decisions by Federal, State, and
8 local officials.

9 (2) PRIORITY.—At least one pilot project under
10 paragraph (1) shall address key science challenges to
11 using mesonet data in local decision making and de-
12 velopment of new tools and training for owners and
13 operators of critical infrastructure (as defined in
14 subsection (e) of the Critical Infrastructures Protec-
15 tion Act of 2001 (42 U.S.C. 5195c)), such as dams,
16 energy generation and distribution facilities, nuclear
17 power plants, and transportation networks.

18 **SEC. 204. ATMOSPHERIC RIVERS FORECAST IMPROVEMENT**

19 **PROGRAM.**

20 (a) IN GENERAL.—The Under Secretary, in collabo-
21 ration with the United States weather industry and aca-
22 demic partners and in coordination with the precipitation
23 forecast improvement program under section 603 of the
24 Weather Research and Forecasting Innovation Act of
25 2017, as added by section 115 of this Act, shall establish

1 an atmospheric river forecast improvement program (in
2 this section referred to as the “program”).

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

8 (1) establishing skill metrics for atmospheric
9 river forecasts that include assessing the benefits of
10 dynamical modeling, data assimilation, and machine
11 learning improvements in the probabilistic forecasts
12 of landfall location, extreme wind and precipitation,
13 and cascading impacts;

14 (2) developing an atmospheric river forecast
15 system within a unified forecast system, and advanc-
16 ing next-generation coupled modeling systems, with
17 the capability of providing seasonal to short-range
18 atmospheric river forecasts that include forecasts of
19 snow accumulation and other hydrologic compo-
20 nents;

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

1 (4) developing tools and improved forecast
2 products to predict periods of active or inactive at-
3 mospheric river landfalls and inland penetration over
4 the United States with a focus on addressing stake-
5 holder and public needs related to perceiving, com-
6 prehending, and responding to atmospheric river
7 forecast improvements;

8 (5) enhancing the transition of research to op-
9 erations through testbeds of the National Oceanic
10 and Atmospheric Administration, including the eval-
11 uation of physical and social science, technology, and
12 other research to develop products and services for
13 implementation and use by relevant stakeholders;
14 and

15 (6) incorporating social, behavioral, and eco-
16 nomic sciences into atmospheric river modeling and
17 forecasting, as appropriate.

18 (c) INNOVATIVE OBSERVATIONS, DATA ASSIMILA-
19 TION, AND MODELING.—The Under Secretary shall en-
20 sure the program periodically examines, tests, and evalu-
21 ates the value of incorporating innovative observations,
22 data, and measurements with respect to the improvement
23 of atmospheric river analysis, modeling, forecasts, pre-
24 dictions, and warnings.

1 (d) PROGRAM PLAN.—Not later than 270 days after
2 the date of the enactment of this Act, the Under Sec-
3 retary, in consultation with the Secretary of the Air Force
4 or the Commander of the 53rd Weather Reconnaissance
5 Squadron of the Air Force Reserve Command, shall de-
6 velop a plan that details the specific activities relating to
7 research, development, data acquisition, partnerships with
8 the weather industry and academic partners, and tech-
9 nology transfer, and corresponding resources and
10 timelines, necessary to achieve the goal of the program
11 under subsection (b). Such plan shall be made available
12 to the public on release.

13 (e) ANNUAL BUDGET FOR PLAN SUBMITTAL.—After
14 the development of the plan pursuant to subsection (d),
15 the Under Secretary shall submit to Congress, with the
16 budget of the President submitted under section 1105 of
17 title 31, United States Code, for a fiscal year, a proposed
18 budget for the activities identified in such plan for that
19 fiscal year.

20 (f) IMPROVED MODELING.—In carrying out the pro-
21 gram, the Under Secretary may—

22 (1) develop, test, and operationalize prototype
23 high-resolution Atmospheric River Analysis and
24 Forecasting System models through research and
25 operations partnerships with institutions of higher

1 education and other partners outside the National
2 Oceanic and Atmospheric Administration;

3 (2) enhance data assimilation of current and
4 new satellite and ocean observations that is useful
5 for atmospheric river analysis and forecasting pre-
6 dictions;

7 (3) improve data processing techniques related
8 to atmospheric river analysis and forecasting pre-
9 dictions;

10 (4) use artificial intelligence and machine learn-
11 ing methods as applicable to atmospheric river anal-
12 ysis and forecasting predictions;

13 (5) ensure the surface and subsurface observa-
14 tions of the ocean meet the needs of atmospheric
15 river analysis and forecasting predictions on dif-
16 ferent timescales; and

17 (6) to the maximum extent practicable, improve
18 or establish baseline weather monitoring services in
19 areas that have historically experienced, or are pre-
20 dicted to experience, atmospheric rivers.

21 (g) CONDUCT OF RECONNAISSANCE.—The Under
22 Secretary shall acquire and sustain adequate aircraft, sci-
23 entific equipment, and personnel—

1 (1) to meet mission requirements of the Na-
2 tional Hurricane Operations Plan and the National
3 Winter Season Operations plan;

4 (2) to ensure atmospheric river air reconnais-
5 sance observations are available throughout the ex-
6 pected seasons of tropical cyclones and atmospheric
7 rivers;

8 (3) to the maximum extent practicable and in
9 accordance with paragraph (5), to ensure data and
10 information collected are made available for research
11 and operations purposes;

12 (4) to participate in research and operations
13 partnerships that guide flight planning and use re-
14 search methods to improve and expand the capabili-
15 ties and effectiveness of atmospheric river reconnais-
16 sance over time;

17 (5) to develop data management strategies to
18 ensure that data and metadata are adequately
19 stewarded, maintained, and archived; and

20 (6) to undertake such other additional activities
21 as the Under Secretary, in consultation with the
22 Secretary of the Air Force, considers appropriate to
23 improve and grow the hurricane hunter and atmos-
24 pheric river reconnaissance mission.

1 (h) IMPROVED ATMOSPHERIC RIVER HAZARD COM-
2 MUNICATION.—The Under Secretary may conduct re-
3 search and development activities in coordination with the
4 program established under section 403(a)—

5 (1) to, as appropriate, develop and refine—

6 (A) methods to categorize the intensity of
7 weather and oceans hazards, including tropical
8 cyclones and atmospheric rivers, on a quan-
9 titative scale; and

10 (B) the effectiveness of such scale in haz-
11 ard communication;

12 (2) to develop best practices for communication
13 of atmospheric river events and hazards across re-
14 gions of the United States;

15 (3) to gather information from areas prone to
16 hurricanes and atmospheric rivers regarding levels of
17 knowledge and preparedness, including responses to
18 early forecasts and warnings by the National Oce-
19 anic and Atmospheric Administration; and

20 (4) to explore strategies to communicate, and
21 the effectiveness of communicating, that hurricane
22 and atmospheric river events are beneficial at lower
23 intensities versus hazardous at higher intensity.

1 **SEC. 205. COASTAL FLOODING AND STORM SURGE FORE-**
2 **CAST IMPROVEMENT PROGRAM.**

3 (a) IN GENERAL.—The Under Secretary, in collabo-
4 ration with the United States weather industry and aca-
5 demic partners, shall establish a coastal flooding and
6 storm surge forecast improvement program (in this section
7 referred to as the “program”).

8 (b) GOAL.—The goal of the program shall be to re-
9 duce the loss of life or property from coastal flooding, in-
10 cluding high tide flooding, and storm surge events through
11 the development and extension of accurate, effective, ac-
12 tionable, and probable forecasts and warnings.

13 (c) PRIORITY.—In implementing the program, the
14 Under Secretary shall prioritize activities that carry out
15 the following:

16 (1) Improving understanding and capacity for
17 real-time operational prediction of the ocean’s role in
18 coastal flooding, including high tide flooding, and
19 storm surge events.

20 (2) Improving the capacity to mitigate, adapt
21 to, or prevent the impacts of coastal flooding, includ-
22 ing high tide flooding, and storm surge events, in-
23 cluding by improving the understanding of coastal
24 communities and the capacity of such communities
25 to perceive, comprehend, and respond to forecast in-
26 formation.

1 (3) Incorporating data from in situ distributed
2 sensors into predictive models and re-analyses.

3 (4) Developing probabilistic coastal flooding, in-
4 cluding high tide flooding, and storm surge esti-
5 mates to complement worst-case scenario estimates,
6 including for use in long-term planning and risk
7 management by States, Tribal governments, local-
8 ities, and emergency managers in coordination with
9 the Federal Emergency Management Agency, as ap-
10 propriate.

11 (5) Establishing skill metrics for coastal inun-
12 dation forecasting that quantify the benefits of dy-
13 namical modeling, data assimilation, and machine
14 learning improvements in the probabilistic forecast
15 of coastal flooding, including high tide flooding, and
16 storm surge risk and impacts.

17 (6) Improving operational regional storm surge
18 models and, in collaboration with the United States
19 Geological Survey, wave prediction models to en-
20 hance probabilistic guidance and messaging.

21 (d) INNOVATIVE OBSERVATIONS AND MODELING.—

22 The Under Secretary shall ensure the program periodically
23 examines, tests, and evaluates the value of incorporating
24 enhanced model physics, hybrid dynamical or machine
25 learning-based prediction systems, and innovative observa-

1 tions, such as novel sensor technologies, observation net-
2 works, crewed or uncrewed systems, and hosted instru-
3 ments on commercial aircrafts, vessels, and satellites, with
4 respect to the improvement of coastal flooding, including
5 high tide flooding, and storm surge forecasts, predictions,
6 and warnings.

7 (e) PROGRAM PLAN.—Not later than 180 days after
8 the date of the enactment of this Act, the Under Secretary
9 shall develop a plan that details the specific research, de-
10 velopment, data acquisition, and technology transfer ac-
11 tivities, and corresponding resources and timelines, nec-
12 essary to achieve the goal of the program under subsection
13 (b).

14 (f) ANNUAL BUDGET FOR PLAN SUBMITTAL.—After
15 the development of the plan pursuant to subsection (e),
16 the Under Secretary shall submit to Congress, with the
17 budget of the President submitted under section 1105 of
18 title 31, United States Code, for a fiscal year, a proposed
19 budget for the activities identified in that plan for that
20 fiscal year.

21 **SEC. 206. NATIONAL INTEGRATED HEAT HEALTH INFORMA-**
22 **TION SYSTEM.**

23 (a) NATIONAL INTEGRATED HEAT HEALTH INFOR-
24 MATION SYSTEM.—

1 (1) ESTABLISHMENT.—The Under Secretary
2 shall establish within the National Oceanic and At-
3 mospheric Administration a system, to be known as
4 the “National Integrated Heat Health Information
5 System” (in this section referred to as the “Sys-
6 tem”).

7 (2) PURPOSE.—The purpose of the System is to
8 reduce heat-related impacts by—

9 (A) improving the delivery of data, infor-
10 mation, forecasts, and warnings related to tem-
11 perature and extreme heat and related impacts;

12 (B) developing science-based solutions and
13 tools to improve impact-based decision support
14 services for heat impacts to human life, prop-
15 erty, and the United States economy; and

16 (C) supporting a research program on heat
17 health, in coordination with the agencies rep-
18 resented on the National Integrated Heat
19 Health Information System Interagency Com-
20 mittee.

21 (b) NATIONAL INTEGRATED HEAT HEALTH INFOR-
22 MATION SYSTEM INTERAGENCY COMMITTEE.—

23 (1) ESTABLISHMENT OF COMMITTEE.—There is
24 established within the National Oceanic and Atmos-
25 pheric Administration an interagency committee, to

1 be known as the “National Integrated Heat Health
2 Information System Interagency Committee” (in
3 this section referred to as the “Committee”).

4 (2) PURPOSE.—The Committee shall coordinate
5 relevant agencies to execute, as appropriate, activi-
6 ties across such agencies to ensure a united Federal
7 approach to reducing health risks from heat.

8 (c) AUTHORIZATION OF APPROPRIATIONS.—There is
9 authorized to be appropriated to the National Oceanic and
10 Atmospheric Administration to carry out this section, in-
11 cluding for any administrative costs for the Committee
12 and the System, \$5,000,000 for each of fiscal years 2026
13 through 2030.

14 **SEC. 207. AVIATION WEATHER AND DATA INNOVATION.**

15 (a) AIRBORNE OBSERVATION PROGRAM.—

16 (1) IN GENERAL.—The Under Secretary shall
17 maintain an airborne observation program (in this
18 subsection referred to as the “program”) for the ac-
19 quisition of atmospheric sensor data and the deploy-
20 ment of critical atmospheric sensors, including in
21 partnership with the weather enterprise.

22 (2) ACTIVITIES.—The program shall include ac-
23 tivities that carry out the following:

1 (A) Procurement of weather data available
2 from commercial aircraft, as determined by the
3 Under Secretary.

4 (B) Acquisition of additional vertical pro-
5 file observations that provide spatial and tem-
6 poral density, as determined by the Under Sec-
7 retary.

8 (C) Analysis of procured data when incor-
9 porated into the unified forecast system of the
10 National Oceanic and Atmospheric Administra-
11 tion in order to provide improved forecast infor-
12 mation for aircraft.

13 (3) BUDGET.—The Under Secretary shall sub-
14 mit to Congress, with the budget of the President
15 submitted under section 1105 of title 31, United
16 States Code, for a fiscal year, a proposed budget for
17 the activities described in paragraph (2) for that fis-
18 cal year, including and analysis of activities that can
19 be complemented by aircraft of the National Oceanic
20 and Atmospheric Administration.

21 (4) AUTHORIZATION OF APPROPRIATIONS.—
22 There is authorized to be appropriated \$10,000,000
23 for each of fiscal years 2026 through 2030 to carry
24 out the program.

1 (b) AVIATION WEATHER AND TURBULENCE FORE-
2 CASTING.—

3 (1) IN GENERAL.—The Director of the National
4 Weather Service shall—

5 (A) include turbulence events, icing condi-
6 tions, or other phenomena in the forecasting ca-
7 pabilities of the Aviation Weather Center and
8 the Center Weather Service Units; and

9 (B) deliver operational forecasts with con-
10 sistent, timely, and accurate weather and turbu-
11 lence information for the airspace system and
12 the protection of lives and property.

13 (2) COORDINATION.—In carrying out para-
14 graph (1), the Director of the National Weather
15 Service shall—

16 (A) give consideration to recommendations
17 of the Administrator of the Federal Aviation
18 Administration under section 44720 of title 49,
19 United States Code; and

20 (B) improve weather and turbulence fore-
21 casting capabilities by—

22 (i) designating or establishing within
23 the Federal Government an interagency
24 working group to determine weather and
25 environmental data or observation require-

1 ments, needs, and potential solutions re-
2 lated to aviation weather and turbulence
3 modeling or forecasting;

4 (ii) identifying current and future po-
5 tential data gaps related to turbulence
6 events or phenomena that can—

7 (I) identify or inform route-spe-
8 cific flight planning; and

9 (II) be supplemented or filled by
10 commercial aviation tools;

11 (iii) transitioning research initiatives
12 and pilot programs, including a pilot pro-
13 gram of instrumentation deployed on com-
14 mercial aircraft for observing atmospheric
15 composition and other atmospheric factors
16 and support for the evaluation of a sus-
17 tained observing network using such in-
18 strumentation, into operations that im-
19 prove the forecasting capabilities of the
20 Aviation Weather Center;

21 (iv) developing and deploying im-
22 proved probabilistic aviation weather fore-
23 cast guidance technology; and

1 (v) updating interagency agreements
2 as appropriate, including to address reim-
3 bursable agreements.

4 (c) NEXT GENERATION AVIATION RESEARCH.—Sec-
5 tion 102(b)(3) of the Weather Research and Forecasting
6 Innovation Act of 2017 (15 U.S.C. 8512(b)(3)), as
7 amended by section 111(a) of this Act, is further amend-
8 ed—

9 (1) by redesignating subparagraphs (F) and
10 (G) as subparagraphs (G) and (H), respectively; and

11 (2) by inserting after subparagraph (E) the fol-
12 lowing:

13 “(F) aviation weather phenomena, includ-
14 ing atmospheric composition and turbulence, to
15 improve scientific understanding and forecast
16 capabilities for the airspace system;”.

17 (d) AVIATION INFORMATION DISSEMINATION.—The
18 Under Secretary shall ensure the Aviation Weather Center
19 is able, to the maximum extent possible, to disseminate
20 in a timely manner full-resolution aviation weather data,
21 forecasts, and information to meet the needs of aviation
22 users.

23 (e) PROVISION OF WEATHER SERVICES TO THE FED-
24 ERAL AVIATION ADMINISTRATION.—

1 (1) SENSE OF CONGRESS.—It is the sense of
2 Congress that the aviation weather services provided
3 to the Federal Aviation Administration by the Na-
4 tional Oceanic and Atmospheric Administration are
5 critical to the functions of the Federal Aviation Ad-
6 ministration and the safety of the flying public.

7 (2) INTERAGENCY AGREEMENT AND SUPPLE-
8 MENTAL SERVICES.—

9 (A) IN GENERAL.—The Under Secretary
10 and the Administrator of the Federal Aviation
11 Administration shall enter into or otherwise
12 participate in an interagency agreement for a
13 period of not less than 5 years under which the
14 National Oceanic and Atmospheric Administra-
15 tion provides weather services to the Federal
16 Aviation Administration.

17 (B) REQUEST FOR PROPOSALS.—To in-
18 form the interagency agreement under subpara-
19 graph (A), the Administrator of the Federal
20 Aviation Administration shall, in consultation
21 with the Under Secretary, request proposals
22 from the weather enterprise to evaluate com-
23 mercial opportunities to supplement, and not
24 replace, weather services or data at central

1 weather service units provided by the National
2 Oceanic and Atmospheric Administration.

3 (C) COMPENSATION.—The interagency
4 agreement under subparagraph (A) shall ensure
5 that the Administrator of the Federal Aviation
6 Administration fairly compensates the National
7 Oceanic and Atmospheric Administration, in a
8 timely manner, for utilizing services under this
9 agreement.

10 (3) BRIEFINGS.—Not later than 90 days after
11 the date of the enactment of this Act, and every 90
12 days thereafter through December 31, 2030, the
13 Under Secretary and the Administrator of the Fed-
14 eral Aviation Administration shall provide a briefing
15 to the Committee on Commerce, Science, and Trans-
16 portation of the Senate and the Committee on
17 Science, Space, and Technology of the House of
18 Representatives on the status of—

19 (A) the provision by the National Oceanic
20 and Atmospheric Administration of weather
21 services to the Federal Aviation Administration;
22 and

23 (B) the interagency agreement under para-
24 graph (2).

1 **SEC. 208. NATIONAL ENVIRONMENTAL SATELLITE, DATA,**
2 **AND INFORMATION SERVICE PARTNERSHIP**
3 **PROGRAM, TRANSITION PROGRAM, AND**
4 **OPERATIONAL PLANNING.**

5 (a) PARTNERSHIP PROGRAM.—

6 (1) IN GENERAL.—The Assistant Administrator
7 of the National Environmental Satellite, Data, and
8 Information Service (in this section referred to as
9 the “Assistant Administrator”) shall maintain a
10 partnership program to enhance engagement with
11 the private sector, academia, and other Federal
12 agencies (in this subsection referred to as the “part-
13 nership program”).

14 (2) ADMINISTRATION.—The Assistant Adminis-
15 trator, in consultation with the Administrator of the
16 National Aeronautics and Space Administration,
17 shall administer broad agency announcements and
18 other transactional authority or contracting mecha-
19 nisms, on an annual or more frequent basis, to sup-
20 port the partnership program.

21 (b) TRANSITION PROGRAM.—

22 (1) IN GENERAL.—To support the development
23 of next-generation technologies, missions, data sys-
24 tems, spacecraft, and instrument design, the Assist-
25 ant Administrator, in consultation with the Adminis-
26 trator of the National Aeronautics and Space Ad-

1 ministration, shall maintain a program to transition
2 selected awards from research and study phases into
3 demonstration (in this subsection referred to as the
4 “transition program”).

5 (2) CONSIDERATIONS.—In selecting awardees
6 for demonstrations under the transition program,
7 the Assistant Administrator shall consider tech-
8 nologies, missions, data systems, spacecraft, and in-
9 strument design that—

10 (A) improve upon the satellite architecture
11 of the National Oceanic and Atmospheric Ad-
12 ministration;

13 (B) have a direct impact on implementing
14 the recommendations of the Satellite Observing
15 System Architecture Study of the National Oce-
16 anic and Atmospheric Administration entitled,
17 “Building a Plan for NOAA’s 21st Century
18 Satellite Observing System” and dated May 31,
19 2018; and

20 (C) meet current or future mission require-
21 ments.

22 (3) OPERATIONAL PLANNING.—In carrying out
23 the transition program, the Assistant Administrator
24 shall monitor demonstration phase progress and
25 plan for promising results that meet mission require-

1 active Processing System to an operational cloud-based
2 environment.

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

10 (1) Integrating and displaying forecast data, in-
11 cluding meteorological, hydrological, climate, ocean,
12 satellite, and radar data, for field offices and na-
13 tional centers of the National Weather Service.

14 (2) Acquiring and processing observational data
15 from sensors and local sources.

16 (3) Providing an interactive communications
17 system, including any relevant capabilities of the ex-
18 isting satellite broadcast network, to connect rel-
19 evant employees and sites of the National Weather
20 Service.

21 (4) Initiating the dissemination of weather,
22 water, marine, ecological, subseasonal to seasonal,
23 aviation, and space warnings and forecasts in a
24 rapid and highly reliable manner.

1 (c) ELEMENTS.—The transition of operations re-
2 quired under subsection (a) may include the following:

3 (1) Establishment or support of testbeds, pilot
4 projects, and functional testing activities to facilitate
5 remote evaluation and automated testing.

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

11 (3) Evaluation of bandwidth requirements to
12 achieve a quality user experience.

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

15 (5) Establishment of a cloud-based, remotely
16 accessible repository for data referred to in sub-
17 section (b)(2).

18 (6) Development and deployment of virtualized
19 systems to replace physical hardware at operational
20 sites.

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

23 (8) Development, testing, demonstration, eval-
24 uation, and operationalization of forecast and warn-
25 ing products, consistent with the mission and sci-

1 entific expertise of the National Oceanic and Atmos-
2 pheric Administration.

3 (d) UPDATES TO CONGRESS.—The Under Secretary
4 shall submit to the Committee on Commerce, Science, and
5 Transportation of the Senate and the Committee on
6 Science, Space, and Technology of the House of Rep-
7 resentatives periodic updates on the implementation of
8 this section.

9 (e) CONTINUED INNOVATION.—Nothing in this sec-
10 tion may be construed as prohibiting the development of
11 new forecast capabilities or sub-systems or implementing
12 modeling advancements on the operational computing sys-
13 tems of the Administration.

14 **SEC. 210. REANALYSIS AND REFORECASTING.**

15 The Under Secretary may support reanalysis and re-
16 forecasting activities within the National Oceanic and At-
17 mospheric Administration, including through weather
18 testbeds of the Administration—

19 (1) for improving weather forecasts, extreme
20 weather predictions, and weather and climate
21 datasets; and

22 (2) to serve as training data for artificial intel-
23 ligence and machine learning data-driven models.

24 **SEC. 211. NATIONAL WEATHER SERVICE WORKFORCE.**

25 (a) HIRING ASSESSMENT.—

1 (1) IN GENERAL.—Not later than 1 year after
2 the date of the enactment of this Act, and annually
3 thereafter, the Director of the National Weather
4 Service shall submit to the Under Secretary and
5 Congress an assessment of the milestones, timelines,
6 and service level expectations required for the expe-
7 ditious hiring and timely onboarding of employees of
8 the National Weather Service.

9 (2) ELEMENTS.—Each assessment required by
10 paragraph (1) may include the following:

11 (A) Recommendations to outsource hiring
12 to any entity other than the National Weather
13 Service in order to meet the milestones,
14 timelines, and service level expectations de-
15 scribed in paragraph (1).

16 (B) Determinations of the number of staff
17 and designated positions required at each fore-
18 casting office to provide services to protect lives
19 and property in the geographic region of re-
20 sponsibility.

21 (b) HEALTH AND MORALE ASSESSMENT.—

22 (1) IN GENERAL.—The Director of the National
23 Weather Service shall enter into a contract with, or
24 continue to partner with, an entity other than the
25 National Weather Service to conduct an assessment

1 of medical impacts, including stress and long-term
2 health impacts, on employees of the National Weath-
3 er Service related to required rotating shift work.

4 (2) ELEMENTS.—The assessment required by
5 paragraph (1) may include—

6 (A) options for mitigating the impacts on
7 employees described in that paragraph; and

8 (B) recommendations for improving bene-
9 fits related to required rotating shift work.

10 (c) ROLE OF THE DIRECTOR.—Notwithstanding the
11 results of the assessment under subsection (a), the Direc-
12 tor of the National Weather Service shall establish service
13 level standards based on staffing levels.

14 (d) DESIGNATION AND RESPONSIBILITIES OF SERV-
15 ICE HYDROLOGISTS.—

16 (1) IN GENERAL.—The Director of the National
17 Weather Service may designate at least one service
18 hydrologist at each Weather Forecast Office of the
19 National Weather Service.

20 (2) PERFORMANCE BY OTHER EMPLOYEES.—
21 Notwithstanding paragraphs (3) and (4), the Direc-
22 tor of the National Weather Service may assign the
23 performance of the responsibilities described in this
24 subsection to such other staff of the National

1 Weather Service as the Director considers appro-
2 priate.

3 (3) RESPONSIBILITIES.—In order to increase
4 impact-based decision support services, each service
5 coordination hydrologist designated under paragraph
6 (1) shall, with respect to hydrology, carry out the
7 following:

8 (A) Provide service to the geographic area
9 of responsibility covered by the Weather Fore-
10 cast Office at which the service coordination hy-
11 drologist is employed to help ensure that users
12 of products and services of the National Weath-
13 er Service can respond effectively to improve
14 outcomes from flood events.

15 (B) Liaise with users of products and serv-
16 ices of the National Oceanic and Atmospheric
17 Administration, such as emergency managers,
18 the public, academia, media outlets, users in the
19 hydropower, transportation, recreation, and ag-
20 ricultural communities, and forestry, land, fish-
21 eries, and water management interests, to
22 evaluate the adequacy and usefulness of the
23 products and services referred to in subpara-
24 graph (A), including extended-range streamflow
25 forecasts, water supply forecasts, drought out-

1 looks, flood inundation mapping, coastal inun-
2 dation, and flood warnings.

3 (C) Collaborate with the National Water
4 Center, the River Forecast Centers, other
5 Weather Forecast Offices, the National Inte-
6 grated Drought Information System, offices of
7 the National Oceanic and Atmospheric Admin-
8 istration, and Federal, State, local, and Tribal
9 government agencies, as the Director considers
10 appropriate, in developing, proposing, and im-
11 plementing plans to develop, modify, or tailor
12 such products and services to improve the use-
13 fulness of such products and services.

14 (D) Engage in interagency partnerships
15 with Federal, State, local, and Tribal govern-
16 ment agencies to explore the use of forecast-in-
17 formed reservoir operations to reduce flood risk
18 and inform decisions related to water resources
19 management.

20 (E) Ensure the maintenance and accuracy
21 of flooding and water resource management
22 partner call lists, appropriate office hydrologic
23 service policy or procedures, and other hydro-
24 logic information or dissemination methodolo-
25 gies or strategies.

1 (F) Work closely with Federal, State, local,
2 and Tribal emergency and floodplain manage-
3 ment agencies, and other agencies relating to
4 disaster management, to ensure a planned, co-
5 ordinated, and effective preparedness and re-
6 sponse effort.

7 (4) ADDITIONAL RESPONSIBILITIES.—A service
8 coordination hydrologist designated under paragraph
9 (1) may, with respect to hydrology—

10 (A) work with a State agency to develop
11 plans for promoting more effective use of prod-
12 ucts and services of the National Weather Serv-
13 ice throughout the State concerned;

14 (B) identify priority community prepared-
15 ness objectives;

16 (C) develop plans to carry out the respon-
17 sibilities described in paragraph (3); and

18 (D) conduct flooding event preparedness
19 planning and citizen education efforts with and
20 through various State, local, and Tribal govern-
21 ment agencies and other disaster management-
22 related organizations.

23 (e) PILOT PROJECTS.—

24 (1) IN GENERAL.—The Director of the National
25 Weather Service shall—

- 1 (A) perform pilot projects for—
- 2 (i) transformational services related to
- 3 decision support services and technology;
- 4 (ii) transitioning data and services to
- 5 the cloud;
- 6 (iii) provision of on-site decision sup-
- 7 port for emergency management oper-
- 8 ations; and
- 9 (iv) transitioning to and communica-
- 10 tion of probabilistic models, forecasts, and
- 11 hazard information; and
- 12 (B) conduct a study to assess the capabili-
- 13 ties needed to scale those pilot projects toward
- 14 a new and more efficient and effective oper-
- 15 ations model.
- 16 (2) SUNSET.—The authority under paragraph
- 17 (1) shall terminate on the date that is 2 years after
- 18 the date of the enactment of this Act.
- 19 (f) RULE OF CONSTRUCTION.—Nothing in this sec-
- 20 tion may be construed to authorize or require a change
- 21 in the authorized number of full-time equivalent employees
- 22 of the National Weather Service or otherwise result in the
- 23 employment of any additional employees.
- 24 (g) PROTECTION FROM HIRING FREEZES.—

1 (1) IN GENERAL.—Title IV of the Weather Re-
2 search and Forecasting Innovation Act of 2017 (15
3 U.S.C. 8541 et seq.), as amended by section 114(a),
4 is further amended by adding at the end the fol-
5 lowing:

6 **“SEC. 410. CLASSIFICATION OF AND STAFFING PLAN FOR**
7 **EMPLOYEES AND PROTECTION FROM HIRING**
8 **FREEZES.**

9 “(a) CLASSIFICATION OF CERTAIN EMPLOYEES.—

10 “(1) IN GENERAL.—Not later than 30 days
11 after the date of the enactment of this section, the
12 Director of the Office of Management and Budget
13 shall categorize each position in the National Ocean-
14 ographic and Atmospheric Administration specified
15 under paragraph (2) as a protective service occupa-
16 tion under the Standard Occupational Classification
17 System.

18 “(2) OCCUPATIONAL SERIES SPECIFIED.—The
19 positions that are specified in this paragraph are po-
20 sitions in the National Oceanic and Atmospheric Ad-
21 ministration that are—

22 “(A) determined by the Under Secretary to
23 be involved in supporting forecasts and warn-
24 ings to protect human life and property; and

1 “(B) determined by the Director of the Of-
2 fice of Personnel Management to be—

3 “(i) a position in the Engineering and
4 Architecture occupational series listed
5 under occupational series 0801, 0802,
6 0810, 0855, or 0856;

7 “(ii) a position in the Production Con-
8 troller (Aircraft) occupational series
9 (1152);

10 “(iii) a position in the Physical
11 Sciences occupational series listed under
12 occupational series 1301, 1313, 1315,
13 1340, 1341, 1360, 1370, or 1372;

14 “(iv) a position in the Equipment
15 Specialist Series (Aircraft) occupational se-
16 ries (1670);

17 “(v) a position in the Information
18 Technology Management occupational se-
19 ries (2210); or

20 “(vi) a position held by a professional
21 mariner (as defined in section 269B of the
22 National Oceanic and Atmospheric Admin-
23 istration Commissioned Officer Corps Act
24 of 2002 (33 U.S.C. 3079b)) , including a
25 position in occupational series 0865, 9901,

1 9916, 9920, 9923–24, 9927–28, 9931–34,
2 9944, 9954, 9960, 9965, 9968, 9971,
3 9973, and 9984).

4 “(3) CONGRESSIONAL BRIEFING.—Not later
5 than 1 year after the date of enactment of this sec-
6 tion, the Under Secretary of Commerce for Oceans
7 and Atmosphere shall provide a briefing on the im-
8 plementation of this section to the Committee on
9 Commerce, Science, and Transportation of the Sen-
10 ate and the Committee on Science, Space, and Tech-
11 nology of the House of Representatives.

12 “(b) 5-YEAR STAFFING PLAN FOR THE NATIONAL
13 OCEANIC AND ATMOSPHERIC ADMINISTRATION.—Not
14 later than 180 days after the date of the enactment of
15 this section, the Under Secretary shall submit to Congress
16 a 5-year staffing plan for—

17 “(1) the National Weather Service; and

18 “(2) any positions within the National Oceanic
19 and Atmospheric Administration that support fore-
20 casts and warnings to protect human life and prop-
21 erty, including positions that involve—

22 “(A) collection of data for incorporation
23 into watches and warnings;

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

3 (2) ARTIFICIAL INTELLIGENCE WEATHER
4 MODEL.—The term “artificial intelligence weather
5 model” means a weather model based primarily on
6 artificial intelligence technology to project future
7 Earth system conditions based on machine learning
8 using weather forecasting training datasets.

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

11 (A) to collect and maintain the dataset—

12 (i) to ensure and document its quality;

13 and

14 (ii) to provide metadata on its prove-
15 nance; and

16 (B) to update the dataset periodically, as
17 appropriate and practicable.

18 (4) NUMERICAL WEATHER MODEL.—The term
19 “numerical weather model” means a weather model
20 based primarily on coupled Earth System processes
21 that uses numerical computation to forecast future
22 Earth system conditions.

23 (5) OBSERVATIONAL DATA.—The term “obser-
24 vational data” means data and metadata from ac-

1 tual observations of environmental conditions, in-
2 cluding remote sensing and in situ platforms.

3 (6) SYNTHETIC DATA.—The term “synthetic
4 data” means data produced from a model or statis-
5 tical method in order to fill gaps in observational
6 data.

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

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

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

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

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

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

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

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

23 (3) ARTIFICIAL INTELLIGENCE WEATHER
24 MODEL.—

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

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

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

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

1 section, the Under Secretary shall continue to sup-
2 port and advance the activities of the National Oce-
3 anic and Atmospheric Administration—

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

8 (B) to advance research on the Earth sys-
9 tem and numerical weather model forecasting;

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

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

14 (E) to improve data assimilation tech-
15 niques.

16 (6) OBSERVING SYSTEM COVERAGE.—In car-
17 rying out this subsection, the Under Secretary may
18 evaluate the use of cost functions in data-driven ma-
19 chine learning model training to balance inequities
20 in observing system coverage and data poor areas.

21 (7) UNCERTAINTY QUANTIFICATION RE-
22 SEARCH.—In carrying out this subsection, the Under
23 Secretary may develop uncertainty quantification re-
24 search for the purpose of accurate environmental

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

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

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

16 (1) improving data assimilation;

17 (2) accounting for coupled Earth system proc-
18 esses;

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

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

1 (5) improving impact-based decision support for
2 greater societal benefits based on those forecasts.

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

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

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

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

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

24 (2) ASSESSMENT OF WEATHER MODELS.—

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

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

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

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

20 (iii) the private sector.

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

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

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

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

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

22 (B) to advance the science of weather and
23 water forecasting, including subseasonal to sea-
24 sonal forecasting; and

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

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

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

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

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

19 (g) AVAILABILITY OF DATASET.—

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

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

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

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

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

20 (i) relevant metadata; and

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

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

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

6 (A) national security;

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

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

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

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

18 (3) REPORT.—

19 (A) IN GENERAL.—Not later than 1 year
20 after the date of the enactment of this Act, the
21 Under Secretary shall submit to Congress a re-
22 port, in both unclassified and classified form,
23 regarding the risks to the economic and intellec-
24 tual security of the United States from foreign

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

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

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

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

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

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

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

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

5 (3) leveraging applicable hiring and retention
6 strategies authorized for Federal agencies.

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

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

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

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

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

24 (2) for each of fiscal years 2027 through 2030,
25 \$76,000,000.

1 **SEC. 213. COMPOSITION OF THE ATMOSPHERE AND ATMOS-**
2 **PHERIC OBSERVATIONS.**

3 (a) ASSESSMENTS.—Not later than 2 years after the
4 date of the enactment of this Act, the Under Secretary
5 shall submit to the appropriate committees of Congress
6 a report that includes the following:

7 (1) An identification of Federal observation ca-
8 pabilities and data gaps related to the composition
9 of Earth’s atmosphere, including the troposphere
10 and stratosphere.

11 (2) An analysis of Federal efforts that advance
12 scientific understanding of the effects on the Earth’s
13 radiation budget of direct or indirect actions that
14 may change the composition of Earth’s atmosphere.

15 (3) The current and projected use of ground-
16 based, space-based, and maritime-based remote and
17 in situ sensing capabilities, autonomous and manned
18 aerial platforms, and other commercially available
19 technologies and platforms of opportunity to accel-
20 erate research and increase observations and moni-
21 toring of Earth’s atmosphere.

22 (4) Recommendations for the adaptation or ex-
23 pansion of technologies and platforms identified
24 under paragraph (3).

25 (5) An identification and prioritization of addi-
26 tional observation and analysis capabilities needed to

1 ensure comprehensive monitoring that detects future
2 changes in atmospheric composition.

3 (b) CONSIDERATIONS.—In preparing an assessment
4 required by subsection (a), the Under Secretary shall con-
5 sider and use, as appropriate, reports and studies con-
6 ducted by Federal agencies, the National Research Coun-
7 cil, or other entities.

8 (c) PILOT PROJECTS.—

9 (1) IN GENERAL.—The Under Secretary may
10 conduct pilot projects of atmospheric composition
11 observational systems and platforms including—

12 (A) the use of atmospheric observing in-
13 struments on commercial and uncrewed air-
14 craft;

15 (B) the use of atmospheric and oceanic ob-
16 serving instruments on uncrewed ocean surface
17 platforms or deployed on commercial or other
18 nondedicated ocean vessels; and

19 (C) in situ observation capability to con-
20 duct regular atmospheric observations of the
21 troposphere and stratosphere.

22 (2) CONSULTATION AND COORDINATION.—The
23 Under Secretary shall consult and coordinate with
24 relevant Federal agencies to develop processes for
25 the appropriate deployment of systems and plat-

1 forms pursuant to pilot projects conducted under
2 paragraph (1).

3 (d) **AUTHORITY TO ENTER INTO AGREEMENTS.**—

4 Notwithstanding any other provision of law, the Under
5 Secretary may enter into agreements, to the extent nec-
6 essary to carry out this section, with governmental and
7 nongovernmental entities—

8 (1) for the purchase of atmospheric composition
9 data from commercial providers;

10 (2) for the hosting of observational instruments
11 on government or private platforms; and

12 (3) to leverage data from international plat-
13 forms as appropriate.

14 (e) **DEFINITION OF APPROPRIATE COMMITTEES OF**
15 **CONGRESS.**—In this section, the term “appropriate com-
16 mittees of Congress” means—

17 (1) the Committee on Commerce, Science, and
18 Transportation of the Senate; and

19 (2) the Committee on Science, Space, and
20 Technology of the House of Representatives.

21 **SEC. 214. PROJECT TO IMPROVE FORECASTS OF COASTAL**
22 **MARINE FOG.**

23 (a) **IN GENERAL.**—The Under Secretary shall con-
24 duct a project to improve forecasts of coastal marine fog.

1 (b) GOAL.—The goal of the project required under
2 subsection (a) is to enhance vessel safety and reduce the
3 economic impact of coastal marine fog events, with a focus
4 on—

5 (1) increasing the number of marine-based ob-
6 servations through additional Federal platforms and
7 commercially acquired observations in locations
8 where impacts from marine fog and reduced visi-
9 bility have major safety and economic impacts, in-
10 cluding through the use of—

11 (A) buoys;

12 (B) meteorological stations measuring visi-
13 bility, temperature, dewpoint, and wind speed
14 and direction as a stand-alone or co-located
15 with water level sensors, such as those that are
16 part of the physical oceanographic observation
17 system program of the National Oceanic and
18 Atmospheric Administration;

19 (C) stationary platforms or drifting instru-
20 ments;

21 (D) vessels;

22 (E) unmanned systems;

23 (F) remote sensing technologies, including
24 rapid refresh hyperspectral satellite imagery;
25 and

1 (G) advanced algorithms that extract ac-
2 tionable information from observational data,
3 including early detection and regular moni-
4 toring of marine fog;

5 (2) advancing geographic coverage, resolution,
6 skill, and accuracy of marine fog modeling, includ-
7 ing, when feasible, additional locations and advance-
8 ments in marine channel forecast capability;

9 (3) improving communication of marine fog
10 advisories by the National Oceanic and Atmospheric
11 Administration;

12 (4) communicating risks posed by hazardous
13 marine fog events in a way that maximizes informed
14 decision making by the public; and

15 (5) providing decision support services based on
16 environmental information that is actionable to the
17 recipient of a marine fog advisory.

18 (c) **STAKEHOLDER ENGAGEMENT.**—In implementing
19 the project required under subsection (a), the Under Sec-
20 retary shall meet with public and private stakeholders re-
21 garding the planning, development, and implementation of
22 the project.

23 (d) **TRIBAL ENGAGEMENT.**—The Under Secretary
24 shall meet with Indian tribes (as defined in section 4 of
25 the Indian Self-Determination and Education Assistance

1 Act (25 U.S.C. 5304)) regarding the planning, develop-
2 ment, and implementation of the project required under
3 subsection (a).

4 (e) PROJECT PLAN.—Not later than 1 year after the
5 date of the enactment of this Act, the Under Secretary
6 shall develop a plan for the project required under sub-
7 section (a) that details the specific research, development,
8 and technology transfer activities, as well as corresponding
9 resources and timelines, necessary to achieve the goal set
10 forth under subsection (b).

11 **TITLE III—COMMERCIAL WEATH-**
12 **ER AND ENVIRONMENTAL OB-**
13 **SERVATIONS**

14 **SEC. 301. COMMERCIAL DATA PROGRAM.**

15 Section 302 of the Weather Research and Fore-
16 casting Innovation Act of 2017 (15 U.S.C. 8532) is
17 amended to read as follows:

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

19 “(a) PROGRAM ESTABLISHMENT.—The Under Sec-
20 retary, in coordination with the heads of appropriate of-
21 fices of the National Oceanic and Atmospheric Adminis-
22 tration, shall maintain a program, to be known as the
23 ‘Commercial Data Program’, to coordinate and execute ac-
24 quisition of weather and environmental data and services
25 from private sector entities for operational use.

1 “(b) PROGRAM ELEMENTS.—The Under Secretary
2 may acquire satellite, ground-based, airborne, or marine-
3 based in situ, remote sensing, or crowd-sourced data and
4 services for operational use relating to weather and envi-
5 ronmental forecasting and modeling.

6 “(c) COORDINATION AND COLLABORATION.—The
7 Under Secretary shall ensure the Commercial Data Pro-
8 gram coordinates, collaborates, and ensures access to data
9 across the Administration, including among the following:

10 “(1) The National Mesonet Program.

11 “(2) The Aircraft Based Observation Program.

12 “(3) The National Integrated Drought Informa-
13 tion System, including the National Coordinated Soil
14 Moisture Monitoring Network.

15 “(4) The National Integrated Flood Informa-
16 tion System.

17 “(5) The Global Ocean Monitoring and Observ-
18 ing Program.

19 “(6) The National Data Buoy Center.

20 “(7) The Uncrewed Systems Operation Center.

21 “(8) The Ocean Exploration Program.

22 “(9) Any other program or office the Under
23 Secretary determines appropriate.

24 “(d) STANDARDS AND SPECIFICATIONS.—Not later
25 than 180 days after the date of the enactment of this sec-

1 tion and on a continuous basis thereafter, the Under Sec-
2 retary shall publish data, metadata, and service standards
3 and specifications required for acquired observation serv-
4 ices and data for use, licensing, and attribution to ensure
5 quality, impact, and compatibility of such services and
6 data with National Oceanic and Atmospheric Administra-
7 tion modeling capabilities, meteorological situational
8 awareness, and forecasting.

9 “(e) PRIORITIZATION.—In acquiring data and serv-
10 ices from private sector entities, the Under Secretary shall
11 prioritize obtaining surface-based, airborne-based, space-
12 based, and coastal- and ocean-based data, metadata, and
13 services for operational use from entities that participate
14 in the Commercial Data Pilot Program under section 303
15 or other programs of the National Oceanic and Atmos-
16 pheric Administration that acquire commercial data or ob-
17 servations.

18 “(f) NOAA OBSERVING SYSTEMS AND FLEET COUN-
19 CILS.—

20 “(1) IN GENERAL.—The Under Secretary shall
21 maintain the Observing Systems Council, or suc-
22 cessor program, and the Fleet Council of the Na-
23 tional Oceanic and Atmospheric Administration (in
24 this subsection collectively referred to as the ‘Coun-
25 cils’) to provide strategic recommendations and guid-

1 ance regarding the prioritization, design, develop-
2 ment, acquisition, upgrading, lifecycle, performance
3 monitoring, and retiring of major components of ob-
4 serving systems and portfolios, including related to
5 the acquisition of commercial weather and environ-
6 mental data and services.

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

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 pri-
19 vate sector 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 Systems Council under
2 subsection (f) related to commercial weather and environ-
3 mental data and services acquisitions. Such an Ombuds-
4 man shall act as the liaison between private sector data
5 and service providers and the National Oceanic and At-
6 mospheric 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 2 years after the date
12 of the enactment of this section, the Under Secretary shall
13 submit to the Committee on Commerce, Science, and
14 Transportation of the Senate and the Committee on
15 Science, Space, and Technology of the House of Rep-
16 resentatives a report evaluating the activities and needed
17 authorities 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 Section 303 of the Weather Research and Fore-
3 casting Innovation Act of 2017 (15 U.S.C. 8533) is
4 amended to read as follows:

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 to the maximum extent practicable, a pilot program, to
9 be known as the ‘Commercial Data Pilot Program’, to en-
10 gage with external partners and providers to test and de-
11 velop shared standards and methodologies for quality, use,
12 licensing, and attribution of observation services and data,
13 and to ensure quality, impact, and compatibility of such
14 services and data with National Oceanic and Atmospheric
15 Administration modeling capabilities, meteorological situa-
16 tional awareness, and forecasting.

17 “(b) AUTHORIZATION FOR TEST AND EVALUA-
18 TION.—The Commercial Data Pilot Program is authorized
19 to test and evaluate all sources and types of observation
20 services, imagery, products, and data from private sector
21 entities, including new and innovative surface-based, air-
22 borne-based, space-based, and coastal- and ocean-based
23 data, metadata, and model components.

24 “(c) CRITERIA.—The Under Secretary shall ensure
25 that data acquired through the Commercial Data Pilot
26 Program meet the most recent standards and specifica-

1 tions, as published pursuant to section 302(d), required
2 for observation services and data.

3 “(d) PILOT CONTRACTS.—The Under Secretary
4 shall, through an open competition, regularly enter into
5 pilot contracts with private sector entities capable of pro-
6 viding observation services and data referred to in sub-
7 section (a) that meet the standards and specifications pub-
8 lished pursuant to section 302(d) for providing such serv-
9 ices and data in a manner that allows the Under Secretary
10 to calibrate and evaluate such services and data for use
11 in National Oceanic and Atmospheric Administration ac-
12 tivities.

13 “(e) ASSESSMENT OF VIABILITY.—The Under Sec-
14 retary shall annually assess and submit to the Committee
15 on Commerce, Science, and Transportation of the Senate
16 and the Committee on Science, Space, and Technology of
17 the House of Representatives a summary of the pilot con-
18 tracts entered into pursuant to subsection (d), an assess-
19 ment of the extent to which such contracts meet the stand-
20 ards and specifications published pursuant to section
21 302(d), and any additional information determined nec-
22 essary related to the following:

23 “(1) The viability of integrating observation
24 services and data from private sector entities into

1 National Oceanic and Atmospheric Administration
2 forecasts and models.

3 “(2) The expected value added or improvements
4 from such services and data if integrated into Na-
5 tional Oceanic and Atmospheric Administration fore-
6 casts and models.

7 “(3) The accuracy, quality, timeliness, validity,
8 reliability, usability, information technology security,
9 and cost-effectiveness of obtaining observation serv-
10 ices and data from private sector entities.

11 “(4) If the Under Secretary determines it is
12 viable to integrate such services and data into the
13 forecasts and models of the National Oceanic and
14 Atmospheric Administration, the steps to integrate,
15 not later than 1 year after the date of the deter-
16 mination, such services and data into operational use
17 by the National Oceanic and Atmospheric Adminis-
18 tration or any associated challenges in doing so.

19 “(f) OBTAINING FUTURE DATA.—If an assessment
20 under subsection (e) demonstrates the ability of services
21 and data from private sector entities to meet the stand-
22 ards and specifications published pursuant to section
23 302(e), the Under Secretary shall—

24 “(1) when cost effective and feasible, obtain ob-
25 servation services and data from private sector enti-

1 ties through the Commercial Data Program under
2 section 302;

3 “(2) as early as possible in the acquisition proc-
4 ess for any future National Oceanic and Atmos-
5 pheric Administration satellite system, determine
6 whether there is a suitable cost effective, commercial
7 capability available or that will be available to meet
8 applicable instrument, spacecraft, or system require-
9 ments before completion of the critical design phase
10 of such planned satellite system;

11 “(3) if the Under Secretary determines under
12 paragraph (2) that a suitable cost effective, commer-
13 cial capability is or will be available, determine
14 whether and how such capability is in the national
15 interest if developed as a solely governmental sys-
16 tem; and

17 “(4) submit to the Committee on Commerce,
18 Science, and Transportation of the Senate and the
19 Committee on Science, Space, and Technology of the
20 House of Representatives a report detailing any de-
21 terminations made under paragraphs (2) and (3).”.

1 **SEC. 303. CONTRACTING AUTHORITY AND AVOIDANCE OF**
2 **DUPLICATION.**

3 Title III of the Weather Research and Forecasting
4 Innovation Act of 2017 (15 U.S.C. 8531 et seq.) is amend-
5 ed by adding at the end the following:

6 **“SEC. 304. CONTRACTING AUTHORITY AND AVOIDANCE OF**
7 **DUPLICATION.**

8 “(a) IN GENERAL.—Consistent with the authorities
9 of other Federal agencies that contract and partner with
10 private sector entities, including under section 3903 of
11 title 41, United States Code, the Under Secretary is au-
12 thorized to use contracting mechanisms and enter into
13 agreements that use multiyear contract options. In car-
14 rying out sections 302 and 303, the Under Secretary shall,
15 to the greatest extent possible—

16 “(1) enter into year-long or multiyear contracts
17 using contracting mechanisms that foster resiliency
18 of service and data purchased;

19 “(2) partner and contract with multiple obser-
20 vation service and data providers simultaneously to
21 reduce risks of data gaps and improve mission
22 robustness; and

23 “(3) use authorities, such as additional forms of
24 transaction agreements under section 301(d), that
25 allow for innovative partnerships with private sector
26 entities.

1 “(b) SAVINGS CLAUSE.—Nothing in this title may be
2 construed as infringing on the acquisition authority or
3 strategy of Federal entities authorized under title 10,
4 United States Code.

5 “(c) UNNECESSARY DUPLICATION.—In meeting the
6 requirements under this title, the Under Secretary shall
7 avoid unnecessary duplication between the National Oce-
8 anic and Atmospheric Administration, the National Aero-
9 nautics and Space Administration, other Federal agencies,
10 and private sector entities, including relating to cor-
11 responding expenditures of funds and employment of per-
12 sonnel by—

13 “(1) coordinating existing activities with other
14 civilian Federal agencies that provide, contract, or
15 partner with private sector entities to acquire weath-
16 er and environmental observations and data; and

17 “(2) coordinating and soliciting weather and en-
18 vironmental observations and data requirements and
19 needs from other civilian Federal agencies to be ac-
20 quired by the Commercial Data Program under sec-
21 tion 302.

22 “(d) FAIR COMPENSATION FOR INTERAGENCY
23 NEEDS.—The Under Secretary, to the maximum extent
24 practicable, shall ensure that Federal agencies utilizing
25 services and data under sections 302 and 303 fairly com-

1 pensate the National Oceanic and Atmospheric Adminis-
2 tration, or the non-Federal entities providing such services
3 or data, as appropriate, for use.”.

4 **SEC. 304. DATA ASSIMILATION, MANAGEMENT, AND SHAR-**
5 **ING PRACTICES.**

6 Title III of the Weather Research and Forecasting
7 Innovation Act of 2017, as amended by section 303 of this
8 Act, is further amended by adding at the end the fol-
9 lowing:

10 **“SEC. 305. DATA ASSIMILATION, MANAGEMENT, AND SHAR-**
11 **ING PRACTICES.**

12 “(a) DATA STANDARDS.—The Under Secretary, in
13 collaboration with the weather enterprise, shall seek to es-
14 tablish consistent and open data and metadata standards
15 to support open science, including simple cloud-optimized
16 data formats and application programming interfaces that
17 support findability, accessibility, usability, and
18 preservability.

19 “(b) DATA INFRASTRUCTURE.—

20 “(1) IN GENERAL.—The Under Secretary, in
21 consultation with the Chief Information Officer and
22 appropriate program heads, shall consolidate and ar-
23 range data infrastructure needs to ensure efficient
24 and effective data transfer between National Oceanic
25 and Atmospheric Administration offices by consid-

1 ering the use of commercial cloud technologies, or
2 similar hybrid structures, to host and transmit data
3 and metadata.

4 “(2) FEDERAL PARTNERSHIPS.—In carrying
5 out paragraph (1), the Under Secretary may partner
6 with the heads of other Federal agencies, including
7 the National Aeronautics and Space Administration,
8 the Department of Energy, the Space Force, the
9 Coast Guard, the Navy, the Federal Aviation Ad-
10 ministration, the Forest Service, the Environmental
11 Protection Agency, the National Science Foundation,
12 and the United States Geological Survey, to co-lo-
13 cate data with joint utility and support a transition
14 to cloud architectures, including commercial cloud
15 networks.

16 “(3) LONG-TERM DATA ARCHIVE.—The Under
17 Secretary shall ensure the long-term management,
18 maintenance, and stewardship of archival data and
19 metadata acquired through the Commercial Data
20 Program under section 302 is conducted within the
21 National Centers for Environmental Information.

22 “(c) DATA SHARING WITH THE WEATHER ENTER-
23 PRISE.—

24 “(1) IN GENERAL.—To the greatest extent
25 practicable, the Under Secretary shall—

1 “(A) continue to ensure the delivery of
2 data through sound and robust infrastructure,
3 such as data sharing capabilities of the industry
4 proving grounds; and

5 “(B) make accessible to members of the
6 weather enterprise that are United States per-
7 sons data that is—

8 “(i) not subject to redistribution con-
9 tract permissions; or

10 “(ii) purchased through the Commer-
11 cial Data Program under section 302 or
12 shared through international government
13 partners.

14 “(2) DATA ASSIMILATED INTO MODELS OR
15 FORECASTS.—If data described in paragraph (1)(B)
16 are required to be assimilated into numerical weath-
17 er prediction models or automated forecast guidance
18 to satisfy terms of a redistribution contract, the
19 Under Secretary shall make accessible without delay
20 to members of the weather enterprise that are
21 United States persons the numerical weather pre-
22 diction model or automated forecast guidance out-
23 put, as the case may be.

24 “(d) DATA ASSIMILATION.—

1 “(1) IN GENERAL.—The Under Secretary, in
2 coordination with the Commercial Data Program
3 under section 302, the National Centers for Envi-
4 ronmental Prediction, the National Centers for Envi-
5 ronmental Information, the Office of Oceanic and
6 Atmospheric Research, and any other relevant of-
7 fices within the National Oceanic and Atmospheric
8 Administration, shall establish a program to test,
9 advance, and implement data assimilation methods,
10 which may include artificial intelligence, machine
11 learning, data pre- and post-processing, efficient
12 input and output, and next-generation algorithms.

13 “(2) DATA ASSIMILATION UNIVERSITY CONSOR-
14 TIUM.—

15 “(A) IN GENERAL.—Through the program
16 established pursuant to paragraph (1), the
17 Under Secretary shall establish a consortium
18 consisting of institutions of higher education
19 (as defined in section 101 of the Higher Edu-
20 cation Act of 1965 (20 U.S.C. 1001)) to ad-
21 dress critical research challenges for data as-
22 similation and foster a growing data assimila-
23 tion workforce.

24 “(B) FUNCTIONS.—The consortium estab-
25 lished under subparagraph (A) shall seek—

1 “(i) to solve critical research issues re-
2 relating to data assimilation through innova-
3 tive research;

4 “(ii) to increase significantly the num-
5 ber of students, including Ph.D. candidates
6 and other graduate-level students, in data
7 assimilation;

8 “(iii) to use modern software and
9 frameworks, such as the Joint Effort for
10 Data Assimilation Integration, or emerging
11 technologies, such as artificial intelligence
12 and machine learning techniques, to con-
13 duct data assimilation research and devel-
14 opment and facilitate research-to-oper-
15 ations efforts to improve weather modeling
16 and prediction;

17 “(iv) to identify and prioritize critical
18 research areas in data assimilation and fa-
19 cilitate operations-to-research efforts;

20 “(v) to establish and enable an effec-
21 tive collaboration infrastructure between
22 National Oceanic and Atmospheric Admin-
23 istration facilities, such as laboratories,
24 centers, or joint agency institutes, and the
25 research community, including a mecha-

1 nism for external partners to host Admin-
2 istration employees; and

3 “(vi) to establish mechanisms to en-
4 able all members of the consortium to ar-
5 chive and access data required to support
6 the work under this subsection.

7 “(3) COORDINATION.—In carrying out this sub-
8 section, the Under Secretary shall ensure the Na-
9 tional Oceanic and Atmospheric Administration and
10 its associated activities focus on research-to-oper-
11 ations and operations-to-research efforts, including
12 by coordinating and collaborating with the Joint
13 Center for Satellite Data Assimilation.

14 “(4) DATA ASSIMILATION, MANAGEMENT, AND
15 SHARING PRACTICES SECURITY.—The activities au-
16 thorized under this subsection shall be conducted in
17 a manner consistent with subtitle D of title VI of
18 the Research and Development, Competition, and
19 Innovation Act (division B of Public Law 117–167;
20 42 U.S.C. 19231 et seq.).

21 “(e) STUDY ON DATA MANAGEMENT.—

22 “(1) IN GENERAL.—Not later than 90 days
23 after the date of the enactment of this section, the
24 Under Secretary shall seek to enter into an agree-
25 ment with a non-Federal entity to conduct a study

1 on matters concerning data practices and manage-
2 ment needs at the National Oceanic and Atmos-
3 pheric Administration.

4 “(2) ELEMENTS.—In conducting the study
5 under paragraph (1), the outside entity shall—

6 “(A) assess the costs and benefits of cur-
7 rent data management needs for observational
8 and operational mission requirements;

9 “(B) develop recommendations regarding
10 how to make the data portfolio of the National
11 Oceanic and Atmospheric Administration more
12 robust and cost effective;

13 “(C) identify data infrastructure tech-
14 nologies and needs that are essential to the per-
15 formance of modeling systems of the Adminis-
16 tration;

17 “(D) assess the sharing needs and prac-
18 tices of the Administration for both internal
19 and external dissemination;

20 “(E) develop recommendations for methods
21 of data infrastructure sharing, including data
22 purchased from the commercial sector; and

23 “(F) develop recommendations for data
24 standards, formats, and protocols to support ar-

1 tificial intelligence and machine learning tech-
2 niques.

3 “(3) AUTHORIZATION OF APPROPRIATIONS.—

4 There is authorized to be appropriated \$1,000,000
5 to carry out the study under paragraph (1) and shall
6 remain available until expended.”.

7 **SEC. 305. CLERICAL AMENDMENT.**

8 The table of contents in section 1(b) of the Weather
9 Research and Forecasting Innovation Act of 2017 is
10 amended by striking the items relating to sections 302 and
11 303 and inserting the following:

“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.”.

12 **TITLE IV—COMMUNICATING**
13 **WEATHER TO THE PUBLIC**

14 **SEC. 401. DEFINITIONS.**

15 In this title:

16 (1) HAZARDOUS WEATHER OR WATER
17 EVENTS.—The term “hazardous weather or water
18 events” means weather or water events that have a
19 high risk of loss of life or property, including the fol-
20 lowing:

21 (A) Severe storms, such as hurricanes and
22 short-fused, small-scale hazardous weather or
23 hydrologic events produced by thunderstorms,

1 including large hail, damaging winds, torna-
2 does, and flash floods.

3 (B) Winter storms, such as freezing or fro-
4 zen precipitation (including freezing rain, sleet,
5 and snow), or combined effects of freezing or
6 frozen precipitation and strong winds.

7 (C) Other weather hazards, such as ex-
8 treme heat or cold, wildfire, drought, dense fog,
9 high winds, and river, coastal, or lakeshore
10 flooding.

11 (2) INSTITUTION OF HIGHER EDUCATION.—The
12 term “institution of higher education” has the
13 meaning given that term in section 101 of the High-
14 er Education Act of 1965 (20 U.S.C. 1001).

15 (3) PUBLIC CLOUD.—The term “public cloud”
16 means an information technology model in which
17 service providers make computing services, including
18 compute and storage and develop-and-deploy envi-
19 ronments and applications, available on-demand to
20 organizations and individuals over the public inter-
21 net or other means that allows for the widest dis-
22 semination of information.

23 (4) WATCH; WARNING.—

24 (A) IN GENERAL.—The terms “watch” and
25 “warning”, with respect to a hazardous weather

1 or water event, mean products issued by the
2 National Oceanic and Atmospheric Administra-
3 tion, intended for consumption by the general
4 public, to alert the general public to the poten-
5 tial for or presence of such event and to inform
6 action to prevent loss of life or property.

7 (B) EXCEPTION.—The terms “watch” and
8 “warning” do not include technical or special-
9 ized meteorological or hydrological forecasts,
10 outlooks, or model guidance products.

11 **SEC. 402. HAZARDOUS WEATHER OR WATER EVENT RISK**
12 **COMMUNICATION.**

13 (a) IN GENERAL.—The Under Secretary shall main-
14 tain and improve the system of the National Oceanic and
15 Atmospheric Administration by which the risks of haz-
16 ardous weather and water events are communicated to the
17 general public, with the goal of informing action and en-
18 couraging response to prevent loss of life and property.

19 (b) HAZARD RISK COMMUNICATION IMPROVEMENT
20 AND SIMPLIFICATION.—

21 (1) IN GENERAL.—The Under Secretary shall
22 maintain a hazard risk communication program (in
23 this subsection referred to as the “program”), for
24 the purposes of simplifying and improving the com-

1 munication of hazardous weather and water event
2 risks.

3 (2) TERMINOLOGY.—The program shall iden-
4 tify, eliminate, or modify unnecessary, redundant, or
5 confusing terms for hazardous weather and water
6 event communications and add new terminology, as
7 appropriate.

8 (3) COMMUNICATIONS IMPROVEMENT.—The
9 program shall improve the form, content, and meth-
10 ods of hazardous weather and water event commu-
11 nications to more clearly inform action and increase
12 the likelihood that the public takes such action to
13 prevent the loss of life or property.

14 (4) EVALUATIONS.—The program shall, in co-
15 ordination with the performance branch of the Na-
16 tional Weather Service, develop metrics for that
17 branch to track and evaluate the degree to which
18 hazardous weather and water event communications
19 inform action and encourage response.

20 (5) SUPPORT PLAN.—The program shall de-
21 velop a plan for the purpose of supporting the activi-
22 ties described in paragraph (3). The plan shall be
23 periodically updated and informed by internal and
24 extramural research and the results of the evalua-

1 tion of hazardous weather and water event commu-
2 nications conducted under paragraph (4).

3 (6) RECOMMENDATIONS.—In carrying out this
4 subsection, the program shall develop and implement
5 recommendations that—

6 (A) are based on the best and most recent
7 understanding from social, behavioral, risk, and
8 communication science research;

9 (B) are validated by social, behavioral,
10 risk, and communication science, taking into ac-
11 count the importance of methods that support
12 reproduction and replication of scientific stud-
13 ies, use of rigorous statistical analyses, and, as
14 applicable, data analysis supported by artificial
15 intelligence and machine learning technologies;

16 (C) account for the needs of various demo-
17 graphics and geographic regions;

18 (D) account for the differences between
19 various types of weather and water hazards;

20 (E) respond to the needs of Federal, State,
21 and local government partners and media part-
22 ners;

23 (F) account for necessary changes in the
24 infrastructure, technology, and protocols for

1 creating and disseminating Federally operated
2 watches and warnings;

3 (G) account for artificial intelligence capa-
4 bilities, including models specifically trained on
5 weather terminology, that enable efficient and
6 accurate communication to the public; and

7 (H) account for the need for enhanced or
8 earlier communication of a hazardous weather
9 event to inform action and encourage response
10 when the event occurs in a geographic area
11 where the event is historically abnormal.

12 (7) COORDINATION.—The program shall coordi-
13 nate with—

14 (A) Federal partners, including National
15 Laboratories, cooperative institutes, and re-
16 gional integrated sciences and assessments pro-
17 grams;

18 (B) State and local government partners;

19 (C) Indian tribes;

20 (D) institutions of higher education; and

21 (E) media partners.

22 (8) TIMELINESS AND CONSISTENCY.—The pro-
23 gram shall develop best practices and guidance for
24 ensuring timely and consistent communication

1 across public-facing platforms that disseminate haz-
2 arduous weather and water event information.

3 **SEC. 403. HAZARD COMMUNICATION RESEARCH AND EN-**
4 **GAGEMENT.**

5 (a) IN GENERAL.—The Under Secretary may main-
6 tain, as appropriate, a program to—

7 (1) modernize the development and communica-
8 tion of risk-based, statistically reliable, probabilistic
9 hazard information, with the goal of informing ap-
10 propriate responses to hazardous weather or water
11 events; and

12 (2) improve the fundamental social, behavioral,
13 and economic science relating to communications, in-
14 cluding by means of collecting voluntary data, re-
15 garding hazardous weather or water events.

16 (b) COORDINATION.—In carrying out the program
17 under subsection (a), the Under Secretary shall coordinate
18 and communicate with States, Tribal governments, local-
19 ities, and emergency managers regarding research prior-
20 ities and results.

21 (c) PILOT PROGRAM FOR TORNADO HAZARD COMMU-
22 NICATIONS.—

23 (1) IN GENERAL.—The Under Secretary, in co-
24 ordination with the VORTEX–USA program under
25 section 103 of the Weather Research and Fore-

1 casting Innovation Act of 2017 (15 U.S.C. 8513), as
2 amended by section 103 of this Act, and in collabo-
3 ration with 1 or more eligible institutions (or con-
4 sortia thereof), shall establish a pilot program for
5 tornado hazard communications to test incorporation
6 of research into operations with respect to torna-
7 does.

8 (2) MERIT-BASED PROCESS.—Amounts under
9 the pilot program under paragraph (1) shall be
10 awarded to eligible institutions through a merit-
11 based competitive process.

12 (3) ELIGIBLE INSTITUTION DEFINED.—In this
13 subsection, the term “eligible institution” means any
14 of the following:

15 (A) An institution that is frequently sub-
16 jected to severe weather, such as tornadoes,
17 hurricanes, and floods.

18 (B) An institution of higher education in
19 close proximity to a Weather Forecast Office of
20 the National Weather Service.

21 (d) PILOT STUDY FOR HURRICANE HAZARD COMMU-
22 NICATION.—

23 (1) IN GENERAL.—The Under Secretary, in co-
24 ordination with the hurricane forecast improvement
25 program under section 104 of the Weather Research

1 and Forecasting Innovation Act of 2017 (15 U.S.C.
2 8514), as amended by section 104 of this Act, and
3 in collaboration with 1 or more eligible institutions
4 (or consortia thereof), shall enter into an agreement
5 with an appropriate entity, as determined by the
6 Under Secretary, to conduct a pilot study using a
7 mixed methods approach, including surveys, focus
8 groups, and interviews, to gather information from
9 hurricane-prone population areas regarding the lev-
10 els of preparedness of such areas for hurricanes or
11 in response to early forecasts and warnings of the
12 National Oceanic and Atmospheric Administration.

13 (2) ELEMENTS.—The pilot study required
14 under paragraph (1) shall evaluate the following:

15 (A) Possession of disaster supplies.

16 (B) Evacuation decisions.

17 (C) Levels of trust of tropical cyclone in-
18 formation and hurricane path prediction from
19 various sources.

20 (D) Access to tropical cyclone and hurri-
21 cane forecasts and warnings in the first lan-
22 guage of each individual interviewed as part of
23 the pilot study.

24 (E) Any reasoning or deliberation by the
25 individuals interviewed as part of the pilot

1 study that may hinder the ability or willingness
2 of the individuals to evacuate.

3 (3) ADDITIONAL CRITERIA.—The Under Sec-
4 retary shall publish the methodology of the pilot
5 study described in paragraph (1) on a publicly acces-
6 sible website of the National Oceanic and Atmos-
7 pheric Administration.

8 (4) ELIGIBLE INSTITUTION DEFINED.—In this
9 subsection, the term “eligible institution” means any
10 of the following:

11 (A) An institution of higher education,
12 nonprofit organization, or other institution lo-
13 cated in a jurisdiction eligible to participate in
14 the program under section 113 of the National
15 Science Foundation Authorization Act of 1988
16 (42 U.S.C. 1862g).

17 (B) An institution of higher education,
18 nonprofit organization, or other institution lo-
19 cated in proximity to a Weather Forecast Office
20 of the National Weather Service.

21 (e) HURRICANE SOCIAL, BEHAVIORAL, AND ECO-
22 NOMIC SCIENCES.—

23 (1) IN GENERAL.—The Under Secretary shall
24 carry out research and development activities to im-

1 prove how the public receives, interprets, responds
2 to, and values hurricane forecasts and warnings.

3 (2) ELEMENTS.—In conducting activities under
4 paragraph (1), the Under Secretary shall—

5 (A) conduct a comprehensive review of the
6 manner by which the public receives, interprets,
7 responds to, and makes decisions regarding
8 hurricane forecasts and warnings, including—

9 (i) how weather observations, down-
10 stream models, and processes affect the de-
11 cision tools or products derived from hurri-
12 cane forecasts and warnings;

13 (ii) how hurricane forecasts and warn-
14 ings generated by decision tools and prod-
15 ucts are used by emergency managers, gov-
16 ernments, and other users to benefit the
17 public and stakeholder groups;

18 (iii) how past experiences with hurri-
19 canes impact the decision making of the
20 general public;

21 (iv) how the source of such hurricane
22 forecasts and warnings affects interpreta-
23 tion;

1 (v) how tropical cyclone forecasts and
2 warnings are received and interpreted by
3 the general public;

4 (vi) how understanding of and re-
5 sponse to hurricane forecasts and warnings
6 varies across demographic groups, includ-
7 ing the elderly and people with disabilities;

8 (vii) the effect of language barriers on
9 the accessibility of hurricane forecasts and
10 warnings; and

11 (viii) how understanding of and re-
12 sponse to such hurricane forecasts and
13 warnings varies across geographic areas,
14 including rural, urban, and suburban
15 areas;

16 (B) identify communication data gaps
17 based on the review conducted pursuant to sub-
18 paragraph (A);

19 (C) carry out research, including data col-
20 lection and baseline assessments, in coordina-
21 tion with the hurricane forecast improvement
22 program under section 104 of the Weather Re-
23 search and Forecasting Innovation Act of 2017
24 (15 U.S.C. 8514), as amended by section 104
25 of this Act, to evaluate and quantify the eco-

1 nomic value of extending lead times of tropical
2 cyclone and hurricane forecasts and warnings;

3 (D) using the post-storm surveys and as-
4 sessments conducted under section 406 of this
5 Act to conduct retrospective or ex ante assess-
6 ments of previous hurricane forecasts and
7 warnings to better understand the key compo-
8 nents of such forecasts and warnings that af-
9 fected actions or initiated behavior changes;

10 (E) conduct cost-benefit analyses of fore-
11 casts and warnings improvement alternatives
12 developed through the hurricane forecast im-
13 provement program under section 104 of the
14 Weather Research and Forecasting Innovation
15 Act of 2017 (15 U.S.C. 8514), as amended by
16 section 104 of this Act; and

17 (F) conduct assessments of the risk to the
18 elderly for pre-, during, and post-storm periods
19 in regions and communities with significant el-
20 derly populations, including retirement commu-
21 nities.

22 **SEC. 404. NOAA WEATHER RADIO.**

23 (a) IN GENERAL.—The Weather Research and Fore-
24 casting Innovation Act of 2017 (15 U.S.C. 8501 et seq.)
25 is amended by adding at the end the following:

1 “(1) IN GENERAL.—To the maximum extent
2 practicable, the Under Secretary shall expand the
3 coverage of and modernize NOAA Weather Radio to
4 ensure it remains valuable to the public, including
5 by—

6 “(A) improving those methods of commu-
7 nicating the risks posed by hazardous weather
8 events to the public that are most likely to re-
9 sult in informed decision making regarding the
10 mitigation of such risks;

11 “(B) improving communication of haz-
12 ardous weather warnings and the urgency of
13 such warnings to areas that experience a high
14 frequency of such warnings;

15 “(C) enhancing the ability to amplify non-
16 weather emergency messages through NOAA
17 Weather Radio as necessary;

18 “(D) acquiring additional transmitters as
19 determined appropriate by the Under Secretary
20 to expand coverage to—

21 “(i) areas at high risk for rapid onset
22 weather disasters that require short-fuse
23 warnings;

24 “(ii) communities without—

1 “(I) mobile broadband internet
2 access service (as defined in section
3 8.1(b) of title 47, Code of Federal
4 Regulations (or a successor regula-
5 tion)) and as depicted by a map cre-
6 ated under section 802(c)(1)(C) of the
7 Communications Act of 1934 (47
8 U.S.C. 642(c)(1)(C));

9 “(II) State or local emergency
10 warning systems; or

11 “(III) satellite service; and

12 “(iii) Federal lands, such as land in
13 the National Park System or the National
14 Forest System and National Recreation
15 Areas;

16 “(E) adding the capability to disseminate
17 NOAA Weather Radio alerts by satellite
18 through the cloud or by means of any other
19 emerging technology determined by the Under
20 Secretary to satisfy the requirements of this
21 Act; and

22 “(F) modernizing the messaging system to
23 enable more geographically specific warnings.

24 “(2) ELEMENTS.—In carrying out paragraph
25 (1), the Under Secretary shall—

1 “(A) upgrade telecommunications infra-
2 structure of NOAA Weather Radio to accelerate
3 the transition of broadcasts to internet protocol-
4 based communications over non-copper media;

5 “(B) accelerate software upgrades to the
6 Advanced Weather Interactive Processing Sys-
7 tem, or any relevant system successors, in order
8 to implement partial county notifications and
9 alerts;

10 “(C) enhance accessibility and usability of
11 data and feeds of NOAA Weather Radio with
12 feedback from relevant stakeholders, including
13 the private sector;

14 “(D) develop options, including satellite
15 backup capability and commercial provider
16 partnerships, for continuity of service of NOAA
17 Weather Radio in the event of an outage at a
18 weather forecast office;

19 “(E) research and develop alternative op-
20 tions to transmit NOAA Weather Radio signals
21 to transmitters that are remote or do not have
22 internet protocol capability;

23 “(F) transition critical applications, includ-
24 ing artificial intelligence applications that sup-
25 port weather communications, to the Integrated

1 Dissemination Program, or any relevant pro-
2 gram successors; and

3 “(G) work with the General Services Ad-
4 ministration, and other relevant agencies, to de-
5 velop new, alternative, or updated expedited
6 mechanisms to secure priority space capacity,
7 such as leased land and tower space, for NOAA
8 Weather Radio critical infrastructure, including
9 transmitters and antennas that are best suited
10 for the national security and public safety mis-
11 sions of NOAA Weather Radio.

12 “(3) PRIORITY.—In carrying out paragraph (1),
13 the Under Secretary shall prioritize practices, capa-
14 bilities, and technologies recommended in accordance
15 with the assessment under subsection (d) to maxi-
16 mize the accessibility of NOAA Weather Radio, par-
17 ticularly in areas of the United States described in
18 paragraph (1)(D)(i).

19 “(d) ASSESSMENT FOR MANAGEMENT AND DIS-
20 TRIBUTION.—

21 “(1) IN GENERAL.—Not later than one year
22 after the date of the enactment of this section, the
23 Under Secretary shall complete an assessment of ac-
24 cess to NOAA Weather Radio.

1 “(2) ELEMENTS.—In conducting the assess-
2 ment required under paragraph (1), the Under Sec-
3 retary shall take into consideration and provide rec-
4 ommendations regarding the following:

5 “(A) The need for continuous, adequate,
6 and operational real-time broadcasts of NOAA
7 Weather Radio.

8 “(B) Input from relevant stakeholders that
9 provide access to NOAA Weather Radio, includ-
10 ing third-party platforms that provide online
11 services, such as websites and mobile device ap-
12 plications.

13 “(C) The manner by which existing or new
14 management systems may promote consistent,
15 efficient, and compatible access to NOAA
16 Weather Radio.

17 “(D) The ability of the National Oceanic
18 and Atmospheric Administration to aggregate
19 real-time broadcast feeds at one or more central
20 locations, as a redundancy to the broadcast feed
21 from the nearest weather forecast office.

22 “(E) Effective coordination between agen-
23 cies with responsibilities relating to emergencies
24 and natural disasters.

1 “(F) The potential effects of an electro-
2 magnetic pulse or geomagnetic disturbance on
3 NOAA Weather Radio.

4 “(e) AUTHORIZATION OF APPROPRIATIONS.—There
5 are authorized to be appropriated to the Under Sec-
6 retary—

7 “(1) for each of fiscal years 2026 through
8 2031, \$25,000,000 to operate NOAA Weather Radio
9 under subsections (a) and (b); and

10 “(2) for fiscal year 2026, \$100,000,000, which
11 shall remain available until expended, to carry out
12 subsections (c) and (d).”.

13 (b) WEATHER READY ALL HAZARDS AWARD PRO-
14 GRAM.—Section 407 of the Weather Research and Fore-
15 casting Innovation Act of 2017 (15 U.S.C. 8546) is—

16 (1) transferred to title VII of that Act, as
17 added by subsection (a);

18 (2) inserted after section 701 of that Act, as
19 added by subsection (a); and

20 (3) redesignated as section 702.

21 (c) CLERICAL AMENDMENTS.—The table of contents
22 for the Weather Research and Forecasting Innovation Act
23 of 2017 is amended—

24 (1) by striking the item relating to section 407;

25 and

1 (2) by adding at the end the following:

“TITLE VII—NOAA WEATHER RADIO

“Sec. 701. NOAA Weather Radio.

“Sec. 702. National Oceanic and Atmospheric Administration Weather Ready All Hazards Award Program.”.

2 **SEC. 405. NATIONAL STANDARDS FOR WEATHER WARNING**
3 **SYSTEMS IN FLASH FLOOD ZONES.**

4 (a) IN GENERAL.—The Under Secretary of Com-
5 merce for Standards and Technology, in consultation with
6 the Under Secretary of Commerce for Oceans and Atmos-
7 phere, shall develop standards for flash flood emergency
8 alert systems within the 100-year floodplain (as defined
9 in section 100202(a) of the Biggert-Waters Flood Insur-
10 ance Reform Act of 2012 (42 U.S.C. 4004(a))).

11 (b) REQUIREMENTS.—The Director shall ensure that
12 standards developed under subsection (a)—

13 (1) meet the needs of communities without—

14 (A) mobile broadband internet access serv-
15 ice (as defined in section 8.1(b) of title 47,
16 Code of Federal Regulations (or a successor
17 regulation)) and as depicted by a map created
18 under section 802(c)(1)(C) of the Communica-
19 tions Act of 1934 (47 U.S.C. 642(c)(1)(C));

20 (B) State or local emergency warning sys-
21 tems; or

22 (C) satellite service; and

1 (2) will result in reliable systems, especially
2 during hazardous events.

3 (c) **REPORT REQUIRED.**—Not later than 2 years
4 after the date of the enactment of this Act, the Under
5 Secretary of Commerce for Standards and Technology
6 shall submit to the Committee on Commerce, Science, and
7 Transportation of the Senate and the Committee on
8 Science, Space, and Technology of the House of Rep-
9 resentatives a report that includes a summary of the
10 standards developed under subsection (a).

11 **SEC. 406. POST-STORM SURVEYS AND ASSESSMENTS.**

12 (a) **IN GENERAL.**—The Under Secretary shall per-
13 form 1 or more post-storm surveys and assessments fol-
14 lowing every hazardous weather or water event determined
15 by the Under Secretary to be of sufficient societal impor-
16 tance to warrant a post-storm survey and assessment.

17 (b) **COORDINATION.**—The Under Secretary shall co-
18 ordinate with Federal, State, and local governments, pri-
19 vate entities, and relevant institutions of higher education
20 (or a consortia thereof) when conducting post-storm sur-
21 veys and assessments under this section to optimize data
22 collection, sharing, integration, archiving, and access, as
23 appropriate for research needs.

24 (c) **DATA AVAILABILITY.**—The Under Secretary shall
25 make the appropriate data obtained from each post-storm

1 survey or assessment conducted under this section avail-
2 able to the public as soon as practicable after conducting
3 each such survey or assessment.

4 (d) IMPROVEMENT.—In carrying out this section, the
5 Under Secretary shall—

6 (1) examine the role of uncrewed aerial and ma-
7 rine systems in data collection during post-storm
8 surveys and assessments conducted under this sec-
9 tion;

10 (2) identify gaps in tactics and procedures and
11 update such tactics and procedures to enhance the
12 efficiency and reliability of data obtained from post-
13 storm surveys and assessments; and

14 (3) as appropriate, integrate social, behavioral,
15 and economic sciences elements into existing post-
16 storm surveys and assessments, including elements
17 related to the efficacy of forecast and warning infor-
18 mation that was shared with the public, barriers
19 that affected the ability of the public to take action,
20 and any challenges with respect to messaging about
21 the hazardous weather or water event.

22 (e) SUPPORT FOR EMPLOYEES.—The Under Sec-
23 retary shall provide access to training, resources, and pro-
24 fessional counseling to support the mental health of em-

1 ployees conducting post-storm surveys and assessments
2 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 a post-storm survey or assessment
6 conducted under this section.

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 18 months after
11 the date of the enactment of this Act, the Comptroller
12 General of the United States shall submit to the Com-
13 mittee on Commerce, Science, and Transportation of the
14 Senate and the Committee on Science, Space, and Tech-
15 nology of the House of Representatives a report that ex-
16 amines the information technology infrastructure of the
17 National Weather Service, specifically regarding the sys-
18 tem for timely public notification via alerts and updates
19 regarding hazardous weather or water events.

20 (b) ELEMENTS.—The report required by subsection
21 (a) shall include the following:

22 (1) An analysis of the information technology
23 infrastructure of the National Weather Service, in-
24 cluding software and hardware capabilities and limi-
25 tations, including an examination of server and data

1 storage methods, broadband, data management, and
2 data sharing.

3 (2) An identification of secondary and tertiary
4 fail-safes for the timely distribution to the public of
5 notifications via alerts and updates regarding haz-
6 ardous weather or water events.

7 (3) A determination of the extent to which pub-
8 lic notifications via alerts and updates regarding
9 hazardous weather or water events have been de-
10 layed and an identification of possible improvements
11 or corrective measures to address delays in the noti-
12 fication process.

13 (4) An assessment of whether collaboration with
14 other Federal agencies, States, or private entities
15 could reduce delays in notifications to the public.

16 (5) A description of actions being undertaken to
17 better identify critical steps in public notification via
18 alerts and updates for hazardous weather or water
19 events that may be vulnerable to disruption or fail-
20 ure in the event of communication, technologic, or
21 computational failure.

22 (6) The geographical differences in availability
23 and effectiveness of rural systems, including an esti-
24 mated number of rural areas affected by unreliable

1 or unavailable systems and barriers to obtain or up-
2 grade 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 data relating to Federal communication of hazardous
8 weather or water events and the public response to such
9 communications. Where appropriate, the Under Secretary
10 shall encourage the collection of secondary data, purchase
11 data, or partner with the private sector to obtain data.

12 (b) DATA MANAGEMENT.—The Under Secretary
13 shall establish and maintain a central repository system
14 for the National Oceanic and Atmospheric Administration
15 for data related to the communication of and related pub-
16 lic response to hazardous weather or water events, includ-
17 ing data developed or received pursuant to this title.

18 (c) PROTECTION OF DATA.—The Under Secretary
19 shall ensure that data is collected, managed, and used by
20 the National Oceanic and Atmospheric Administration in
21 accordance with legal, regulatory, and contractual obliga-
22 tions, including chapter 31 of title 44, United States Code,
23 and the Foundations for Evidence-Based Policymaking
24 Act of 2018 (Public Law 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 managing of data related to commu-
9 nity response, including the response of affected popu-
10 lations, to hazardous weather or water events.

11 **TITLE V—IMPROVING WEATHER**
12 **INFORMATION FOR AGRICULTURE AND WATER MAN-**
13 **CULTURE AND WATER MAN-**
14 **AGEMENT**

15 **SEC. 501. WEATHER INFORMATION FOR AGRICULTURE AND**
16 **WATER MANAGEMENT.**

17 Section 1762 of the Food Security Act of 1985 (15
18 U.S.C. 8521) is amended—

19 (1) by amending subsection (c) to read as fol-
20 lows:

21 “(c) FUNCTIONS.—The Under Secretary shall—

22 “(1) conduct and support research to improve
23 understanding of subseasonal to seasonal predict-
24 ability for temperature, precipitation, and other
25 Earth system variables and applications;

1 “(2) collect and use data to make usable, reli-
2 able, and timely foundational forecasts of subsea-
3 sonal to seasonal temperature and precipitation;

4 “(3) support the advancement of multi-model
5 ensemble forecast systems and forecast verification
6 and evaluation capacity, including by—

7 “(A) developing advanced coupled data as-
8 simation methods using robust Earth system
9 observational data;

10 “(B) developing improved coupled subsea-
11 sonal to seasonal ensemble prediction systems;

12 “(C) improving exchanges and interactions
13 between datasets across different models and
14 Earth system observations to increase model ac-
15 curacy of local relationships between and driv-
16 ers of ocean, land, snow, and ice observations;
17 and

18 “(D) developing data management strate-
19 gies to support operations and research activi-
20 ties;

21 “(4) leverage existing research and models from
22 the weather and Earth system enterprises to im-
23 prove the forecasts under paragraph (2);

24 “(5) accelerate the operationalization of emerg-
25 ing modeling technologies developed to support and

1 assist the cross development of fully coupled subsea-
2 sonal to seasonal forecast systems, including during
3 collaborations with other agencies and entities; and

4 “(6) determine and provide information on how
5 subseasonal to seasonal temperature and precipita-
6 tion may relate to—

7 “(A) droughts;

8 “(B) fires;

9 “(C) tornadoes;

10 “(D) hurricanes;

11 “(E) floods, storm surges, and coastal in-
12 undation;

13 “(F) heat waves and marine heat waves;

14 “(G) winter storms, snowpack, and perma-
15 frost thaw;

16 “(H) sea ice conditions; and

17 “(I) other high impact weather or relevant
18 weather disasters.”;

19 (2) 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 2 pilot projects, in ac-
25 cordance with paragraph (2), within the United

1 States Weather Research Program of the Office of
2 Oceanic and Atmospheric Research of the National
3 Oceanic and Atmospheric Administration to support
4 improved subseasonal to seasonal precipitation fore-
5 casts for—

6 “(A) water management in areas of the
7 United States in which there is—

8 “(i) a high level of drought; and

9 “(ii) a reliance on reservoirs for water
10 storage; and

11 “(B) agriculture in the central United
12 States.

13 “(2) OBJECTIVES.—In carrying out this sub-
14 section, the Under Secretary shall ensure the fol-
15 lowing:

16 “(A) A pilot project under subparagraph
17 (A) of paragraph (1) addresses key science
18 challenges to improving forecasts and devel-
19 oping related products for water management,
20 including the following:

21 “(i) Improving operational model reso-
22 lution, both horizontal and vertical, to re-
23 solve issues associated with mountainous
24 terrain, such as intensity of precipitation

1 and relative fraction of rain versus snow
2 precipitation.

3 “(ii) Improving modeling of interstate
4 or cross-boundary water movement and
5 storage through rivers, tributaries, and
6 aquifers with relation to water availability.

7 “(iii) Improving fidelity in the oper-
8 ational modeling of the atmospheric bound-
9 ary layer in mountainous regions.

10 “(iv) Resolving challenges in pre-
11 dicting winter atmospheric circulation and
12 storm tracks, including periods of blocked
13 versus unblocked flow over the eastern
14 North Pacific Ocean and western United
15 States.

16 “(v) Utilizing outcomes from the at-
17 mospheric rivers forecast improvement pro-
18 gram under section 204 of the Weather
19 Research and Forecasting Innovation Re-
20 authorization Act of 2026 and the precipi-
21 tation forecast improvement program
22 under section 603 of the Weather Research
23 and Forecasting Innovation Act of 2017 to
24 produce operational tools and services.

1 “(vi) Improving the quality and tem-
2 poral and spatial resolution of observations
3 and accurate operational modeling of air-
4 sea interactions, and the influence of
5 oceans on subseasonal to seasonal fore-
6 casting.

7 “(B) A pilot project under subparagraph
8 (B) of paragraph (1) addresses key science
9 challenges to improving forecasts and devel-
10 oping related products for agriculture in the
11 central United States, including the following:

12 “(i) Improving the quality and tem-
13 poral and spatial resolution of observations
14 and accurate operational modeling of the
15 land surface and hydrologic cycle, includ-
16 ing soil moisture and flash drought proc-
17 esses.

18 “(ii) Improving fidelity in the oper-
19 ational modeling of warm season precipita-
20 tion processes.

21 “(iii) Understanding and predicting
22 large-scale upper-level dynamical flow
23 anomalies that occur in spring and sum-
24 mer.

1 “(iv) Improving modeling of interstate
2 or cross-boundary water movement and
3 storage through rivers, tributaries, and
4 aquifers with relation to water availability
5 for agriculture.

6 “(3) ACTIVITIES.—A pilot project under this
7 subsection shall include activities that—

8 “(A) achieve measurable objectives for
9 operational forecast improvement; and

10 “(B) are carried out in coordination with
11 the Assistant Administrator for the Office of
12 Oceanic and Atmospheric Research and the Di-
13 rector of the National Weather Service.

14 “(4) SUNSET.—The authority under this sub-
15 section shall terminate on the date that is 5 years
16 after the date of the enactment of this subsection.”;
17 and

18 (3) by amending subsection (j) to read as fol-
19 lows:

20 “(j) AUTHORIZATION OF APPROPRIATIONS.—There
21 are authorized to be appropriated \$40,000,000 for each
22 of fiscal years 2026 through 2030 to carry out the activi-
23 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 (a), by striking “, through the
7 National Weather Service and other appropriate
8 weather and climate programs in the National Oce-
9 anic and Atmospheric Administration,”;

10 (2) in subsection (b)—

11 (A) in paragraph (1)—

12 (i) in subparagraph (A), by striking
13 “and” after the semicolon;

14 (ii) in subparagraph (B), by inserting
15 “and” after the semicolon; and

16 (iii) by adding at the end the fol-
17 lowing:

18 “(C) incorporates flash drought research
19 and tools to enhance timely response;”;

20 (B) in paragraph (5), by striking “im-
21 provements in seasonal precipitation and tem-
22 perature, subseasonal precipitation and tem-
23 perature, and low flow water prediction; and”
24 and inserting “support improvements in subsea-
25 sonal to seasonal precipitation and temperature,
26 and low flow water prediction;” and

1 (C) by striking paragraph (6) and insert-
2 ing the following:

3 “(6) continue ongoing research and monitoring
4 activities related to drought, including research ac-
5 tivities relating to the prediction, length, severity,
6 and impacts of drought and the role of weather
7 events and subseasonal to seasonal variability in
8 drought;

9 “(7) advance and deploy next-generation tech-
10 nologies related to drought, such as monitoring, pre-
11 paredness, and forecasting capabilities utilizing arti-
12 ficial intelligence, machine learning, and cloud tech-
13 nologies;

14 “(8) use observational networks, including the
15 National Weather Service cooperative observer pro-
16 gram and State or regional hydrological monitoring
17 projects;

18 “(9) refine drought indicators across multiple
19 spatial and temporal scales;

20 “(10) improve decision support products;

21 “(11) optimize data and resources from across
22 the Federal Government;

23 “(12) investigate and address data gaps, includ-
24 ing snowpack monitoring, space-based or in-situ soil

1 moisture monitoring, groundwater data, and data re-
2 lated to rapid intensification events; and

3 “(13) engage with, and leverage the resources
4 of, entities within the National Oceanic and Atmos-
5 pheric Administration in existence as of the date of
6 the enactment of the Weather Research and Fore-
7 casting Innovation Reauthorization Act of 2026 to
8 improve coordination of water monitoring, fore-
9 casting, and management.”;

10 (3) in subsection (c)—

11 (A) in paragraph (2), by striking “and”
12 after the semicolon;

13 (B) in paragraph (3), by striking the pe-
14 riod and inserting “; and”; and

15 (C) by adding at the end the following:

16 “(4) in partnership with the National Mesonet
17 Program, establish memoranda of understanding to
18 provide coordinated, high-quality data.”; and

19 (4) by adding at the end the following:

20 “(g) MODELING UPDATE.—Not later than 1 year
21 after the date of the enactment of the Weather Research
22 and Forecasting Innovation Reauthorization Act of 2026,
23 the Under Secretary, acting through the National Inte-
24 grated Drought Information System and the National
25 Weather Service, shall develop a plan to incorporate exist-

1 ing drought products of the National Oceanic and Atmos-
2 pheric Administration and improved dynamical and statis-
3 tical forecast modeling tools into probabilistic forecasts.”.

4 (b) AUTHORIZATION OF APPROPRIATIONS.—Section
5 4 of the National Integrated Drought Information System
6 Act of 2006 (Public Law 109–430; 15 U.S.C. 313d note)
7 is amended to read as follows:

8 **“SEC. 4. AUTHORIZATION OF APPROPRIATIONS.**

9 “There are authorized to be appropriated to carry out
10 this Act—

11 “(1) \$15,000,000 for fiscal year 2026.

12 “(2) \$15,500,000 for fiscal year 2027.

13 “(3) \$16,000,000 for fiscal year 2028.

14 “(4) \$16,500,000 for fiscal year 2029.

15 “(5) \$17,000,000 for fiscal year 2030.”.

16 **SEC. 503. NATIONAL MESONET PROGRAM.**

17 (a) IN GENERAL.—The Under Secretary shall main-
18 tain the National Mesonet Program (in this section re-
19 ferred to as the “Program”), which shall—

20 (1) obtain observations to improve under-
21 standing of and forecast capabilities for atmospheric,
22 drought, fire, and water events, with a prioritization
23 on leveraging available commercial, academic, and
24 other non-Federal Government environmental data
25 to enhance coordination across the private, public,

1 and academic sectors of the weather enterprise in
2 the United States;

3 (2) establish means to integrate greater density
4 and more types of environmental observations into
5 the Program on an annual basis, including by en-
6 couraging local and regional networks of environ-
7 mental monitoring stations and in situ sensor net-
8 works, including soil moisture and ground-based
9 profilers, to participate in the Program;

10 (3) establish memoranda of understanding with
11 networks outside of the scope of the Program in fur-
12 therance of this section; and

13 (4) coordinate with satellite data and services
14 acquired through the Commercial Data Program
15 under section 302 of the Weather Research and
16 Forecasting Innovation Act of 2017, as amended by
17 section 301 of this Act.

18 (b) PROGRAM ELEMENTS.—In carrying out the Pro-
19 gram, the Under Secretary shall—

20 (1) increase data density by—

21 (A) improving and increasing the quantity
22 and density of environmental observations used
23 by the National Oceanic and Atmospheric Ad-
24 ministration (in this section referred to as the
25 “Administration”) and the National Weather

1 Service to support baseline forecasts, including
2 nowcasts, warnings, and hyper-local forecasts
3 that protect individuals, businesses, agricultural
4 production, food security, and the military and
5 government agencies in the United States, and
6 enabling such individuals and entities to operate
7 in a safe, efficient, and orderly manner;

8 (B) yielding increased quantities of bound-
9 ary-layer data to improve numerical weather
10 prediction performance, including in subsea-
11 sonal to seasonal timescales;

12 (C) identifying available terrestrial or ma-
13 rine environmental data, or quantifiable gaps in
14 such data, to improve the understanding of air-
15 sea interactions; and

16 (D) supporting the National Weather Serv-
17 ice in reaching its target of a 30-minute warn-
18 ing time for severe weather through better pre-
19 dictive model algorithms driven by increasingly
20 effective observations;

21 (2) monitor local meteorological conditions by—

22 (A) acquiring soil and moisture data to
23 monitor soil moisture, vegetation water content,
24 and moisture loss from evaporation, in support
25 of operational forecasting, the National Inte-

1 grated Drought Information System, and local
2 commercial, agricultural, and emergency man-
3 agement needs;

4 (B) supporting the National Coordinated
5 Soil Moisture Monitoring Network in acquiring
6 soil moisture and related data to support the
7 development of decision support products and
8 other information services; and

9 (C) expanding and enhancing environ-
10 mental observational networks in the roadway
11 environment to provide real-time road weather
12 and surface conditions for surface transpor-
13 tation and related economic sectors; and

14 (3) administer the Program by—

15 (A) obtaining data in furtherance of this
16 section only when demonstrably cost effective
17 and meeting or exceeding data quality stand-
18 ards available to the Administration;

19 (B) subject to the requirement in subpara-
20 graph (A), leveraging existing networks of envi-
21 ronmental monitoring stations, including sup-
22 plemental radar systems, to increase the quan-
23 tity and density of environmental observations
24 and data available to the Administration;

1 (C) providing the critical technical and ad-
2 ministrative infrastructure needed to facilitate
3 rapid integration and sustained use of new and
4 emerging networks of environmental monitoring
5 stations anticipated in coming years from non-
6 Federal Government sources;

7 (D) coordinating with existing data devel-
8 oped by the Administration and used for fore-
9 casts, including data from the National Envi-
10 ronmental Satellite, Data, and Information
11 Service, the Integrated Ocean Observing Sys-
12 tem, the Global Ocean Monitoring and Observ-
13 ing Program, the National Data Buoy Center,
14 and the National Ocean Service; and

15 (E) identifying and communicating to the
16 Office of Oceanic and Atmospheric Research
17 and other partners priorities of research and
18 development needed to advance observations in
19 the Program.

20 (c) FINANCIAL AND TECHNICAL ASSISTANCE.—

21 (1) IN GENERAL.—In furtherance of the Pro-
22 gram, in a fiscal year, the Under Secretary may
23 award not less than 10 percent of the amount appro-
24 priated for the Program for that fiscal year for fi-
25 nancial assistance to State, Tribal, private, and aca-

1 demic entities seeking to build, expand, or upgrade
2 equipment and capacity of mesonet systems.

3 (2) OTHER FEDERAL AWARDS.—Financial as-
4 sistance under this subsection may be made in co-
5 ordination with and in addition to awards from
6 other Federal agencies.

7 (3) AGREEMENTS.—Before receiving financial
8 assistance under paragraph (1), the State, Tribal,
9 private, or academic entity seeking financial assist-
10 ance under this subsection shall enter into an agree-
11 ment with the Under Secretary to provide data to
12 the Program, subject to verification by the Program
13 of the relative operational value and evaluation of
14 the cost of such data, for use in weather prediction,
15 severe weather warnings, and emergency response.

16 (4) ASSISTANCE AND OTHER SUPPORT.—The
17 Under Secretary may provide—

18 (A) technical assistance, project implemen-
19 tation support, and guidance to State, Tribal,
20 private, and academic entities seeking financial
21 assistance under this subsection; and

22 (B) technical and financial assistance for
23 maintenance of monitoring stations in areas of
24 the country where it is financially unfeasible for

1 1 entity to operate such stations without such
2 assistance.

3 (5) TERMS.—In providing financial assistance
4 under this subsection, the Under Secretary shall es-
5 tablish terms to ensure that each State, Tribal, pri-
6 vate, or academic entity that receives financial as-
7 sistance under this subsection receives a level of sup-
8 port commensurate with the quality and other char-
9 acteristics of the data to be provided.

10 (6) DETERMINATION.—A State, Tribal, private,
11 or academic entity may only receive financial assist-
12 ance under this subsection if the Under Secretary
13 determines such entity will provide sufficient finan-
14 cial support from non-Federal Government sources
15 and fully maintain the quality of the mesonet system
16 and associated data standards required by the Pro-
17 gram for a period of not less than 5 years.

18 (7) PRIORITY.—The Under Secretary shall
19 prioritize providing assistance under paragraph (1)
20 to not fewer than 1 entity in a remote area or an
21 area that has a lack of environmental monitoring
22 stations described in subsection (a)(2).

23 (d) ADVISORY COMMITTEE.—

24 (1) IN GENERAL.—The Under Secretary shall
25 ensure the Program has an active advisory com-

1 mittee of subject matter experts to make rec-
2 ommendations to the Administration on the identi-
3 fication, implementation, procurement, and tracking
4 of data needed to supplement the Program, and rec-
5 ommend improvements, expansions, and acquisitions
6 of available data.

7 (2) DESIGNATION OF EXISTING COMMITTEE.—
8 The Under Secretary may designate an existing ad-
9 visory committee, subcommittee, or working group of
10 the Federal Government, including the Science Advi-
11 sory Board of the Administration, to carry out the
12 requirement under paragraph (1).

13 (3) ACADEMIC EXPERTISE.—The advisory com-
14 mittee under paragraph (1), in consultation with the
15 Program, shall include expertise from 1 or more in-
16 stitutions of higher education (as defined in section
17 101 of the Higher Education Act of 1965 (20
18 U.S.C. 1001)) to assist the advisory committee to
19 identify, evaluate, and recommend potential partner-
20 ships, regional or subregional consortia, and collabo-
21 rative methods that would expand the number of
22 participants and volume of data in the Program.

23 (e) REGULAR BRIEFINGS.—

24 (1) IN GENERAL.—Not less frequently than an-
25 nually through 2030, the Under Secretary shall pro-

1 vide regular briefings to the Committee on Com-
2 merce, Science, and Transportation of the Senate
3 and the Committee on Science, Space, and Tech-
4 nology of the House of Representatives on all activi-
5 ties under the Program.

6 (2) BRIEFING CONTENT.—Each briefing re-
7 quired under paragraph (1) shall include informa-
8 tion relating to the following:

9 (A) Efforts to implement the activities de-
10 scribed in subsection (b).

11 (B) Any financial or technical assistance
12 provided pursuant to subsection (c).

13 (C) Efforts to address recommendations
14 received from the advisory committee under
15 subsection (d), if any.

16 (D) The potential need and associated ben-
17 efits of a coastal and ocean mesonet, or other
18 emerging areas of weather data needs.

19 (E) Progress toward eliminating gaps in
20 weather observation data in States and regions
21 of the United States.

22 (F) Any other topic the Under Secretary
23 determines relevant.

24 (f) AUTHORIZATION OF APPROPRIATIONS.—From
25 amounts authorized to be appropriated to the National

1 Weather Service, there shall be available not more than
2 the following amounts to carry out this section:

3 (1) \$50,000,000 for fiscal year 2026.

4 (2) \$55,000,000 for fiscal year 2027.

5 (3) \$61,000,000 for fiscal year 2028.

6 (4) \$68,000,000 for fiscal year 2029.

7 (5) \$70,000,000 for fiscal year 2030.

8 **SEC. 504. NATIONAL COORDINATED SOIL MOISTURE MONI-**
9 **TORING NETWORK.**

10 (a) IN GENERAL.—The Under Secretary, in collabo-
11 ration with the Secretary of Agriculture, the Director of
12 the United States Geological Survey, the Administrator of
13 the National Aeronautics and Space Administration, and
14 the heads of other relevant Federal agencies, shall support
15 the development, deployment, and maintenance of soil
16 moisture monitoring networks by managing the National
17 Coordinated Soil Moisture Monitoring Network (in this
18 section referred to as the “Network”) within the National
19 Integrated Drought Information System.

20 (b) ACTIVITIES.—The Under Secretary shall ensure
21 the Network includes activities that carry out the fol-
22 lowing:

23 (1) Establishing a visible, user-friendly website.

24 (2) Developing a set of criteria for high-quality
25 data sources.

1 (3) Supporting research necessary to develop or
2 improve soil moisture monitoring products at a na-
3 tional scale.

4 (4) Increasing the number of long-term, high-
5 quality, in situ and remote sensing soil moisture
6 monitoring stations across the United States.

7 (5) Sharing methodologies and validation proto-
8 cols with the private sector.

9 (6) Developing, releasing, and promoting new
10 nationwide point-based and gridded soil moisture
11 data products.

12 (7) Supporting community, outreach, and data
13 sharing to the network of individuals engaged with
14 soil moisture monitoring, from data collection to
15 end-user decision making.

16 **SEC. 505. NATIONAL WATER CENTER.**

17 Section 301 of the Coordinated Ocean Observations
18 and Research Act of 2020 (42 U.S.C. 10371) is amend-
19 ed—

20 (1) in subsection (a)—

21 (A) in paragraph (1)(A)—

22 (i) in the matter preceding clause (i),
23 by inserting “, within the Office of Water
24 Prediction of the National Weather Serv-
25 ice,” after “shall establish”;

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

3 (iii) in clause (ii), by striking the pe-
4 riod and inserting “; and”; and

5 (iv) by adding at the end the following
6 new clause:

7 “(iii) to lead the transition of water
8 research by the Federal Government, in-
9 cluding model development, into operations
10 of the National Oceanic and Atmospheric
11 Administration and the National Weather
12 Service.”;

13 (B) in paragraph (2), by adding at the end
14 the following:

15 “(F) Serving as the primary center within
16 the National Oceanic and Atmospheric Admin-
17 istration for research, development, collabora-
18 tion, and coordination of the water research
19 and forecast activities of the Administration
20 and other centers and networks of the Federal
21 Government, including those of the Department
22 of Agriculture, the Army Corps of Engineers,
23 the Bureau of Reclamation, the United States
24 Geological Survey, and the Federal Emergency
25 Management Agency.

1 “(G) Integrating and promoting consist-
2 ency among national and regional hydrological
3 forecast operations and service delivery.”; and

4 (C) by adding at the end the following:

5 “(3) INCORPORATION INTO UNIFIED FORECAST
6 SYSTEM.—The Under Secretary shall use the Weath-
7 er and Climate Operational Supercomputing System,
8 or any successor system, to support the development
9 and implementation of advanced water resources
10 modeling capabilities under paragraph (2)(B) and
11 shall incorporate those modeling capabilities into the
12 unified forecast system.”;

13 (2) by striking subsection (b);

14 (3) by redesignating subsection (c) as sub-
15 sections (b);

16 (4) by inserting after subsection (b), as redesign-
17 ated by paragraph (3), the following:

18 “(c) ORGANIZATION AND ADMINISTRATION.—The
19 Under Secretary, acting through the Director of the Office
20 of Water Prediction of the National Weather Service,
21 shall—

22 “(1) supervise and oversee the administration,
23 management, and operations of each River Forecast
24 Center of the National Weather Service and coordi-

1 nate those operations with the National Water Cen-
2 ter; and

3 “(2) administer the duties and activities of the
4 National Oceanic and Atmospheric Administration
5 related to the Cooperative Institute for Research to
6 Operations in Hydrology, or any successor entity,
7 and coordinate the activities of the Institute with the
8 National Water Center.”; and

9 (5) in subsection (d)(4), by inserting before the
10 period the following: “and each of fiscal years 2026
11 through 2030”.

12 **SEC. 506. SATELLITE TRANSFERS BRIEFING.**

13 Not later than 180 days after the date of the enact-
14 ment of this Act, the Secretary of Commerce shall brief
15 the Committee on Commerce, Science, and Transportation
16 of the Senate and the Committee on Science, Space, and
17 Technology of the House of Representatives on the au-
18 thorities and policies of the Department of Commerce and
19 Federal Government wide policies related to transferring
20 any portion of the weather satellite systems operated by
21 the Department of Commerce to any other Federal agen-
22 cy, including—

23 (1) a description of the process for decommis-
24 sioning a Department of Commerce operational
25 weather satellite, any existing agreements related to

1 transfers of weather satellites, whether decommis-
2 sioned or not, and any reimbursable agreements re-
3 lated to the transfer of physical property or the op-
4 eration of Department of Commerce weather sat-
5 ellites on behalf of any other Federal agency; and

6 (2) a summary of any Department of Com-
7 merce plans for potential transfer of existing or fu-
8 ture weather satellite systems to any other Federal
9 agency.

10 **TITLE VI—HARMFUL ALGAL**
11 **BLOOM AND HYPOXIA RE-**
12 **SEARCH AND CONTROL**

13 **SEC. 601. AMENDMENTS TO THE HARMFUL ALGAL BLOOM**
14 **AND HYPOXIA RESEARCH AND CONTROL ACT**
15 **OF 1998.**

16 (a) ASSESSMENTS.—

17 (1) IN GENERAL.—Section 603 of the Harmful
18 Algal Bloom and Hypoxia Research and Control Act
19 of 1998 (33 U.S.C. 4001) is amended—

20 (A) in the section heading, by striking
21 “ASSESSMENTS” and inserting “**TASK**
22 **FORCE, ASSESSMENTS, AND ACTION**
23 **STRATEGY**”;

24 (B) in subsection (a)—

1 (i) by redesignating paragraphs (13)
2 and (14) as paragraphs (14) and (15), re-
3 spectively; and

4 (ii) by inserting after paragraph (12)
5 the following:

6 “(13) the Department of Energy;”;

7 (C) by striking subsections (b), (c), (d),
8 (e), (g), (h), and (i) and redesignating sub-
9 section (f) as subsection (b);

10 (D) in subsection (b), as so redesignated—

11 (i) in paragraph (1), in the first sen-
12 tence, by striking “coastal waters including
13 the Great Lakes” and inserting “marine,
14 estuarine, and freshwater systems”; and

15 (ii) in paragraph (2)—

16 (I) by amending subparagraph
17 (A) to read as follows:

18 “(A) examine—

19 “(i) the causes and ecological con-
20 sequences of hypoxia on marine and aquat-
21 ic species in their environments; and

22 “(ii) the costs of hypoxia, including
23 impacts on food safety and security;”;

1 (II) by redesignating subpara-
2 graphs (B), (C), and (D) as subpara-
3 graphs (D), (E), and (F), respectively;

4 (III) by inserting after subpara-
5 graph (A) the following:

6 “(B) examine the effect of other environ-
7 mental stressors on hypoxia;

8 “(C) evaluate alternatives for reducing,
9 mitigating, and controlling hypoxia and its envi-
10 ronmental impacts;”; and

11 (IV) in subparagraph (E), as re-
12 designated by subclause (II), by strik-
13 ing “hypoxia modeling and monitoring
14 data” and inserting “hypoxia mod-
15 eling, forecasting, and monitoring and
16 observation data”; and

17 (E) by adding at the end the following:

18 “(c) ACTION STRATEGY AND SCIENTIFIC ASSESS-
19 MENT FOR MARINE AND FRESHWATER HARMFUL ALGAL
20 BLOOMS.—

21 “(1) IN GENERAL.—Not less frequently than
22 once every 5 years, the Task Force shall complete
23 and submit to Congress an action strategy for harm-
24 ful algal blooms in the United States.

1 “(2) ELEMENTS.—Each Action Strategy
2 shall—

3 “(A) examine, and include a scientific as-
4 sessment of, marine and freshwater harmful
5 algal blooms, including such blooms—

6 “(i) in the Great Lakes;

7 “(ii) in the upper reaches of estuaries;

8 “(iii) in freshwater lakes and rivers;

9 “(iv) in coastal and marine waters;

10 and

11 “(v) that originate in freshwater lakes
12 or rivers and migrate to coastal waters;

13 “(B) examine the causes, ecological con-
14 sequences or physiological consequences on
15 wildlife function, and economic or cultural im-
16 pacts, including food safety and security and
17 subsistence use, of harmful algal blooms;

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

20 “(D) examine potential methods to pre-
21 vent, control, and mitigate harmful algal blooms
22 and the potential ecological, subsistence use,
23 and economic costs and benefits of such meth-
24 ods;

1 “(E) identify priorities for research needed
2 to advance techniques and technologies to de-
3 tect, predict, monitor, respond to, and minimize
4 the occurrence, duration, and severity of harm-
5 ful algal blooms, including recommendations to
6 eliminate significant gaps in harmful algal
7 bloom forecasting, monitoring, and observation
8 data;

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

13 “(G) identify ways to improve coordination
14 and prevent unnecessary duplication of effort
15 among Federal agencies with respect to re-
16 search on harmful algal blooms; and

17 “(H) include regional chapters relating to
18 the requirements described in this paragraph in
19 order to highlight geographically and eco-
20 logically diverse locations with significant eco-
21 logical, subsistence use, cultural, and economic
22 impacts from harmful algal blooms.

23 “(d) CONSULTATION.—In carrying out subsections
24 (b) and (c), the Task Force shall consult with—

1 “(1) States, Indian tribes, and local govern-
2 ments; and

3 “(2) appropriate industries (including fisheries,
4 agriculture, and fertilizer), academic institutions,
5 and nongovernmental organizations with relevant ex-
6 pertise.”.

7 (2) CLERICAL AMENDMENT.—The table of con-
8 tents in section 2 of the Coast Guard Authorization
9 Act of 1998 (Public Law 105–383; 112 Stat. 3412;
10 136 Stat. 1268) is amended by striking the item re-
11 lating to section 603 and inserting the following:

“Sec. 603. Task Force, assessments, and Action Strategy.”.

12 (3) CONFORMING AMENDMENT.—Section 102
13 of the Harmful Algal Bloom and Hypoxia Amend-
14 ments Act of 2004 (33 U.S.C. 4001a) is amended
15 by striking “In developing” and all that follows
16 through “management.”.

17 (b) NATIONAL HARMFUL ALGAL BLOOM AND HY-
18 POXIA PROGRAM.—Section 603A of the Harmful Algal
19 Bloom and Hypoxia Research and Control Act of 1998
20 (33 U.S.C. 4002) is amended—

21 (1) in subsection (a)—

22 (A) in paragraph (1)—

23 (i) by striking “predicting,” and in-
24 serting “monitoring, observing, fore-
25 casting,”; and

1 (ii) by striking “and” after the semi-
2 colon; and

3 (B) by striking paragraph (2) and insert-
4 ing the following:

5 “(2) the scientific assessment submitted under
6 section 603(b); and

7 “(3) the Action Strategy.”;

8 (2) in subsection (c)—

9 (A) in paragraph (3), by striking “ocean
10 and Great Lakes science and management pro-
11 grams and centers” and inserting “programs
12 and centers relating to the science and manage-
13 ment of marine, estuarine, and freshwater sys-
14 tems”; and

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

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

22 (4) in subsection (e)—

23 (A) by striking paragraph (2) and insert-
24 ing the following:

1 “(2) examine the causes, ecological con-
2 sequences, and costs of harmful algal blooms and
3 hypoxia;”;

4 (B) in paragraph (3)—

5 (i) in subparagraph (B), by inserting
6 “, including the annual Gulf of Mexico hy-
7 poxia zone mapping cruise” after “Pro-
8 gram”;

9 (ii) in subparagraph (C), by striking
10 “and” after the semicolon; and

11 (iii) by adding at the end the fol-
12 lowing:

13 “(E) to identify opportunities to improve
14 monitoring of harmful algal blooms and hy-
15 poxia, with a particular focus on waters that
16 may affect fisheries, public health, or subsist-
17 ence harvest;

18 “(F) to evaluate adaptation and mitigation
19 strategies to address the impacts of harmful
20 algal blooms and hypoxia;

21 “(G) to support the resilience of the sea-
22 food industry to harmful algal blooms and to
23 expand access to testing for harmful algal
24 bloom toxins, including for subsistence and rec-
25 reational harvesters, through innovative meth-

1 ods that increase the efficiency and effective-
2 ness of such testing in rural and remote areas;

3 “(H) to support sustained observations to
4 provide State and local entities, Indian tribes,
5 and other entities access to real-time or near
6 real-time observations data for decision making
7 to protect human and ecological health and
8 local economies; and

9 “(I) to assess the combined effects of
10 harmful algal blooms, hypoxia, and stressors
11 such as runoff and infrastructure changes on
12 marine, freshwater, or estuarine ecosystems and
13 living resources;”;

14 (C) in paragraph (4), by striking “agen-
15 cies” and inserting “entities, regional coastal
16 observing systems (as defined in section 12303
17 of the Integrated Coastal and Ocean Observa-
18 tion System Act of 2009 (33 U.S.C. 3602)),”;

19 (D) in paragraph (6), by inserting “and
20 communities” after “ecosystems”;

21 (E) in paragraph (8), by inserting “and
22 Indian tribes” after “managers”;

23 (F) in paragraph (9)(A), by striking “,
24 tribal, and local stakeholders” and inserting
25 “and local stakeholders and Indian tribes, Trib-

1 al organizations, and Native Hawaiian organi-
2 zations”;

3 (G) by redesignating paragraphs (3), (4),
4 (5), (6), (7), (8), (9), (10), and (11) as para-
5 graphs (4), (5), (6), (7), (8), (9), (10), (12),
6 and (13), respectively;

7 (H) by inserting after paragraph (2) the
8 following:

9 “(3) consult with entities that are most depend-
10 ent on coastal and water resources that may be im-
11 pacted by marine and freshwater harmful algal
12 blooms and hypoxia, including—

13 “(A) State and local entities;

14 “(B) Indian tribes, Tribal organizations,
15 and Native Hawaiians organizations;

16 “(C) island communities;

17 “(D) low-population rural communities;

18 “(E) subsistence communities; and

19 “(F) fisheries and recreation industries;”;

20 and

21 (I) by inserting after paragraph (10), as
22 redesignated by subparagraph (G), the fol-
23 lowing:

24 “(11) expand access to testing for harmful algal
25 bloom toxins, including for subsistence and rec-

1 reational harvesters, through innovative methods
2 that increase the efficiency and effectiveness of such
3 testing in rural and remote areas;”;

4 (5) by amending subsections (f) to read as fol-
5 lows:

6 “(f) COOPERATION; DUPLICATION OF EFFORT.—The
7 Under Secretary shall work cooperatively with and avoid
8 duplication of effort of other agencies on the Task Force
9 and States, Indian tribes, Tribal organizations, Native
10 Hawaiian organizations, and nongovernmental organiza-
11 tions concerned with marine and freshwater issues.”; and

12 (6) by striking subsection (g), (h), and (i).

13 (c) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-
14 ISTRATION ACTIVITIES.—

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

19 **“SEC. 603B. NATIONAL OCEANIC AND ATMOSPHERIC AD-
20 MINISTRATION ACTIVITIES.**

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

22 “(1) carry out response activities for marine,
23 coastal, and Great Lakes harmful algal bloom and
24 hypoxia events;

1 “(2) develop and enhance operational harmful
2 algal bloom observing and forecasting programs, in-
3 cluding operational observations and forecasting,
4 monitoring, modeling, data management, and infor-
5 mation dissemination;

6 “(3) develop forecast modeling that includes the
7 effect of hurricanes and other weather events on the
8 resuspension of bioavailable nutrients in sediments
9 and related interactions with harmful algal blooms;

10 “(4) enhance communication and coordination
11 among Federal agencies carrying out activities and
12 research relating to marine and freshwater harmful
13 algal blooms and hypoxia;

14 “(5) leverage existing resources and expertise
15 available from local research universities and institu-
16 tions; and

17 “(6) use cost effective methods in carrying out
18 this section.

19 “(b) INTEGRATED COASTAL AND OCEAN OBSERVA-
20 TION SYSTEM.—The collection of monitoring and observ-
21 ing data under this section shall comply with all data
22 standards and protocols developed pursuant to the Inte-
23 grated Coastal and Ocean Observation System Act of
24 2009 (33 U.S.C. 3601 et seq.). Such data shall be made
25 available through the National Integrated Coastal and

1 Ocean Observation System established under section
2 12304 of that Act (33 U.S.C. 3603).”.

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; 112 Stat. 3412;
6 136 Stat. 1268) is amended by striking the item re-
7 lating to section 603B and inserting the following:

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

8 (d) ENVIRONMENTAL PROTECTION AGENCY ACTIVI-
9 TIES.—

10 (1) IN GENERAL.—The Harmful Algal Bloom
11 and Hypoxia Research and Control Act of 1998 is
12 amended by inserting after section 603B (33 U.S.C.
13 4003) the following:

14 **“SEC. 603C. ENVIRONMENTAL PROTECTION AGENCY AC-**
15 **TIVITIES.**

16 “(a) IN GENERAL.—The Administrator shall—

17 “(1) carry out research on the ecology and
18 human health impacts of freshwater harmful algal
19 blooms and hypoxia events;

20 “(2) develop and enhance operational fresh-
21 water harmful algal bloom monitoring, observing,
22 and forecasting programs in lakes, rivers, and res-
23ervoirs, and coordinate with the National Oceanic
24 and Atmospheric Administration on such programs
25 in the Great Lakes and estuaries (including tribu-

1 taries thereof), including operational observations
2 and forecasting, monitoring, modeling, data manage-
3 ment, and information dissemination, to support
4 event response, prioritization, prevention, adapta-
5 tion, and mitigation activities;

6 “(3) enhance communication and coordination
7 among Federal agencies carrying out freshwater
8 harmful algal bloom and hypoxia activities and re-
9 search;

10 “(4) to the greatest extent practicable, leverage
11 existing resources and expertise available from Fed-
12 eral and State partners and local research univer-
13 sities and institutions; and

14 “(5) use cost-effective methods in carrying out
15 this section.

16 “(b) NONDUPLICATION.—The Administrator shall
17 ensure that activities carried out under subsection (a)
18 focus on new approaches to addressing freshwater harmful
19 algal blooms and are not duplicative of existing research
20 and development programs authorized by this title or any
21 other law.”.

22 (2) CLERICAL AMENDMENT.—The table of con-
23 tents in section 2 of the Coast Guard Authorization
24 Act of 1998 (Public Law 105–383; 112 Stat. 3412;

1 136 Stat. 1268) is amended by inserting after the
2 item relating to section 603B the following:

“Sec. 603C. Environmental Protection Agency activities.”.

3 (e) NATIONAL HARMFUL ALGAL BLOOM OBSERVING
4 NETWORK.—

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

9 **“SEC. 606. NATIONAL HARMFUL ALGAL BLOOM OBSERVING**
10 **NETWORK.**

11 “(a) IN GENERAL.—The Under Secretary, acting
12 through the National Centers for Coastal Ocean Science
13 and the Integrated Ocean Observing System of the Na-
14 tional Oceanic and Atmospheric Administration, shall in-
15 tegrate Federal, State, regional, and local observing capa-
16 bilities to establish a national network of observing sys-
17 tems for the monitoring, detection, and forecasting of
18 harmful algal blooms by leveraging the capacity of re-
19 gional associations of the Integrated Ocean Observing Sys-
20 tem, including through the incorporation of emerging tech-
21 nologies and new data integration methods.

22 “(b) COORDINATION AND DATA ASSEMBLY.—In car-
23 rying out subsection (a), the Program Office of the Inte-
24 grated Ocean Observing System shall—

1 “(1) coordinate with the National Centers for
2 Coastal Ocean Science regarding observations, data
3 integration, and information dissemination;

4 “(2) organize, integrate, disseminate, and pro-
5 vide a central architecture to support ecological fore-
6 casting of harmful algal blooms; and

7 “(3) coordinate with the Water Quality Portal
8 to store and serve discrete data related to the moni-
9 toring of freshwater, estuarine, and coastal harmful
10 algal blooms.”.

11 (2) CLERICAL AMENDMENT.—The table of con-
12 tents in section 2 of the Coast Guard Authorization
13 Act of 1998 (Public Law 105–383; 112 Stat. 3412;
14 136 Stat. 1268) is amended by striking the item re-
15 lating to section 606 and inserting the following:

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

16 (f) NATIONAL-LEVEL INCUBATOR PROGRAM.—

17 (1) IN GENERAL.—The Harmful Algal Bloom
18 and Hypoxia Research and Control Act of 1998 is
19 amended by inserting after section 606 (33 U.S.C.
20 4005) the following:

21 **“SEC. 606A. NATIONAL-LEVEL INCUBATOR PROGRAM.**

22 “(a) IN GENERAL.—The Under Secretary, in collabo-
23 ration with the Administrator and research universities
24 and institutions, shall establish a national-level incubator
25 program (in this section referred to as the ‘program’) to

1 increase the number of strategies, technologies, and meas-
2 ures available to prevent, mitigate, and control harmful
3 algal blooms.

4 “(b) FRAMEWORK.—The program shall establish a
5 framework for preliminary assessments of novel strategies,
6 technologies, and measures to prevent, mitigate, and con-
7 trol harmful algal blooms in order to determine the poten-
8 tial effectiveness and scalability of such technologies.

9 “(c) FUNDING.—The program shall provide merit-
10 based funding, using amounts otherwise available to the
11 Under Secretary for the award of grants, for strategies,
12 technologies, and measures that eliminate or reduce,
13 through biological, chemical, or physical means, the levels
14 of harmful algae and associated toxins resulting from
15 harmful algal blooms.

16 “(d) DATABASE.—The program shall include a data-
17 base for cataloging the licensing and permitting require-
18 ments, economic costs, feasibility, effectiveness, and
19 scalability of novel and established strategies, tech-
20 nologies, and measures to prevent, mitigate, and control
21 harmful algal blooms.

22 “(e) PRIORITIZATION.—In carrying out the program,
23 the Under Secretary shall prioritize proposed strategies,
24 technologies, and measures that would, to the maximum
25 extent practicable—

- 1 “(1) protect key habitats for fish and wildlife;
2 “(2) maintain biodiversity;
3 “(3) protect public health;
4 “(4) protect coastal resources of national, his-
5 torical, and cultural significance; or
6 “(5) benefit low-income communities, Indian
7 tribes, and rural communities.”.

8 (2) CLERICAL AMENDMENT.—The table of con-
9 tents in section 2 of the Coast Guard Authorization
10 Act of 1998 (Public Law 105–383; 112 Stat. 3412;
11 136 Stat. 1268) is amended by inserting after the
12 item relating to section 606 the following:

“Sec. 606A. National-level incubator program.”.

13 (g) DEFINITIONS.—Section 609 of the Harmful Algal
14 Bloom and Hypoxia Research and Control Act of 1998
15 (33 U.S.C. 4008) is amended—

16 (1) in paragraph (1), by striking “means the
17 comprehensive research plan and action strategy es-
18 tablished under section 603B” and inserting “means
19 the action strategy for harmful algal blooms in the
20 United States most recently submitted under section
21 603(c)”;

22 (2) by amending paragraph (3) to read as fol-
23 lows:

24 “(3) HARMFUL ALGAL BLOOM.—The term
25 ‘harmful algal bloom’ means a high concentration of

1 marine or freshwater algae (including diatoms),
2 macroalgae (including Sargassum), or cyanobacteria
3 resulting in nuisance conditions or harmful impacts
4 on marine and freshwater ecosystems, subsistence
5 resources, communities, or human health through
6 the production of toxic compounds or other biological,
7 chemical, or physical impacts of the bloom.”;

8 (3) by striking paragraph (9);

9 (4) by redesignating paragraphs (4), (5), (6),
10 (7), and (8) as paragraphs (5), (8), (9), (11), and
11 (13), respectively;

12 (5) by inserting after paragraph (3) the following:
13

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

17
18
19 (6) in paragraph (5), as redesignated by paragraph (4)—
20

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

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

1 (7) by inserting after paragraph (5), as redesignated by paragraph (4), the following:

2 “(6) INDIAN TRIBE.—The term ‘Indian tribe’
3 has the meaning given that term in section 4 of the
4 Indian Self-Determination and Education Assistance
5 Act (25 U.S.C. 5304).
6

7 “(7) NATIVE HAWAIIAN ORGANIZATION.—The
8 term ‘Native Hawaiian organization’ has the mean-
9 ing given that term in section 6207 of the Elemen-
10 tary and Secondary Education Act of 1965 (20
11 U.S.C. 7517) and includes the Department of Ha-
12 waiian Home Lands and the Office of Hawaiian Af-
13 fairs.”;

14 (8) by inserting after paragraph (9), as redesignated by paragraph (4), the following:

15 “(10) SUBSISTENCE USE.—The term ‘subsistence use’ means the customary and traditional use
16 of fish, wildlife, or other freshwater, coastal, or ma-
17 rine resources by any individual or community to
18 meet personal or family needs, including essential
19 economic, nutritional, or cultural applications.”; and
20 economic, nutritional, or cultural applications.”; and
21

22 (9) by inserting after paragraph (11), as redesignated by paragraph (4), the following:

23 “(12) TRIBAL ORGANIZATION.—The term ‘Tribal organization’ has the meaning given that term in
24 al organization’ has the meaning given that term in
25

1 section 4 of the Indian Self-Determination and Edu-
2 cation Assistance Act (25 U.S.C. 5304).”.

3 (h) AUTHORIZATION OF APPROPRIATIONS.—Section
4 610 of the Harmful Algal Bloom and Hypoxia Research
5 and Control Act of 1998 (33 U.S.C. 4009) is amended—

6 (1) by amending subsection (a) to read as fol-
7 lows:

8 “(a) IN GENERAL.—There is authorized to be appro-
9 priated to carry out this title, for each of fiscal years 2026
10 through 2030—

11 “(1) \$19,500,000 to the Under Secretary; and

12 “(2) \$8,000,000 to the Administrator.”; and

13 (2) by adding at the end the following:

14 “(c) TRANSFER AUTHORITY.—As specifically pro-
15 vided in advance in appropriations Acts, the Under Sec-
16 retary or the Administrator may transfer funds made
17 available to carry out this title to the head of any Federal
18 department or agency, with the concurrence of such head,
19 to carry out, as appropriate, relevant provisions of this
20 title and section 9(g) of the National Integrated Drought
21 Information System Reauthorization Act of 2018 (33
22 U.S.C. 4010).”.

1 **SEC. 602. OTHER HARMFUL ALGAL BLOOM AND HYPOXIA**
2 **MATTERS.**

3 Section 9(g) of the National Integrated Drought In-
4 formation System Reauthorization Act of 2018 (33 U.S.C.
5 4010) is amended—

6 (1) in paragraph (1)—

7 (A) in subparagraph (B), by adding at the
8 end the following new sentence: “The appro-
9 priate Federal official may waive the non-Fed-
10 eral share requirements of the preceding sen-
11 tence if such official determines no reasonable
12 means are available through which the recipient
13 of the Federal share can meet the non-Federal
14 share requirement.”; and

15 (B) by adding at the end the following:

16 “(D) CONTRACT, COOPERATIVE AGREE-
17 MENT, AND GRANT AUTHORITY.—The appro-
18 priate Federal official may enter into contracts,
19 cooperative agreements, and grants with States,
20 Indian tribes, Tribal organizations, Native Ha-
21 waiian organizations, local governments, or
22 other entities to pay for or reimburse costs in-
23 curred by such entities for the purposes of sup-
24 porting the determination of, and assessing the
25 environmental, economic, subsistence use, and

1 public health effects of, an event of national
2 significance.”;

3 (2) in paragraph (2)—

4 (A) in subparagraph (A), by inserting “a
5 leadership official of an affected Indian tribe,
6 the executive official of the District of Colum-
7 bia, or the executive official of an affected terri-
8 tory or possession of the United States,” after
9 “State,”; and

10 (B) in subparagraph (B), by striking “con-
11 sider” and all that follows through “boundary.”
12 and inserting “consider factors such as—

13 “(i) the risk to public health and the
14 potential severity of the detrimental envi-
15 ronmental effects of the hypoxia or harm-
16 ful algal bloom event, as indicated by—

17 “(I) data on shellfish or water
18 quality obtained through sampling
19 programs, including baseline data,
20 and regulatory or advisory thresholds
21 established to explain management ac-
22 tions related to the event;

23 “(II) toxin levels in fish, marine
24 mammals, seabirds, shellfish, or water
25 during the event;

1 “(III) toxic aerosols produced
2 during the event, including potential
3 human exposures to toxic aerosols;

4 “(IV) reports of human or ani-
5 mal illnesses or mortalities during the
6 event;

7 “(V) any closures of fishing or
8 shellfish harvesting locations or rec-
9 reational public waters, including
10 beaches, during the event;

11 “(VI) the duration and spatial
12 extent of the event; or

13 “(VII) impacts to habitats or
14 ecosystems associated with the event;

15 “(ii) the potential economic, food safe-
16 ty and security, and subsistence impacts
17 associated with the hypoxia or harmful
18 algal bloom event, including to fisheries
19 and aquaculture, recreation and tourism,
20 monitoring and management, resource use,
21 and event response activities, assessed in
22 comparison with historical data from when
23 a State or region did not experience such
24 an event, as possible, as indicated by—

1 “(I) increases in public health ex-
2 penditures;

3 “(II) losses to commercial fish-
4 eries and aquaculture industries,
5 recreation and tourism, real estate,
6 and other impacted industries or busi-
7 nesses;

8 “(III) increases in monitoring
9 and management expenditures, includ-
10 ing costs incurred for event response
11 and clean-up (such as for beach clean-
12 up following an influx of biomass or a
13 fish-kill) by public or private sectors;
14 or

15 “(IV) impacts to subsistence re-
16 sources, including nutritional, re-
17 source use, and economic effects on
18 subsistence communities;

19 “(iii) the relative magnitude of those
20 impacts in relation to past occurrences of
21 hypoxia or harmful algal bloom events that
22 occur on a recurrent or annual basis; and

23 “(iv) the geographic scope of the hy-
24 poxia or harmful algal bloom event, includ-
25 ing the potential of the event to affect sev-

1 eral municipalities, to affect more than 1
2 State, or to cross an international bound-
3 ary.”;

4 (3) in paragraph (3), by adding at the end the
5 following:

6 “(D) INDIAN TRIBE.—The term ‘Indian
7 tribe’ has the meaning given that term in sec-
8 tion 4 of the Indian Self-Determination and
9 Education Assistance Act (25 U.S.C. 5304).

10 “(E) NATIVE HAWAIIAN ORGANIZATION.—
11 The term ‘Native Hawaiian organization’ has
12 the meaning given that term in section 6207 of
13 the Elementary and Secondary Education Act
14 of 1965 (20 U.S.C. 7517) and includes the De-
15 partment of Hawaiian Home Lands and the Of-
16 fice of Hawaiian Affairs.

17 “(F) SUBSISTENCE USE.—The term ‘sub-
18 sistence use’ means the customary and tradi-
19 tional use of fish, wildlife, or other freshwater,
20 coastal, or marine resources by any individual
21 or community to meet personal or family needs,
22 including essential economic, nutritional, or cul-
23 tural applications.

24 “(G) TRIBAL ORGANIZATION.—The term
25 ‘Tribal organization’ has the meaning given

1 that term in section 4 of the Indian Self-Deter-
2 mination and Education Assistance Act (25
3 U.S.C. 5304).”; and

4 (4) by adding at the end the following:

5 “(4) AUTHORIZATION OF APPROPRIATIONS.—

6 There is authorized to be appropriated to carry out
7 this subsection \$2,000,000 for each of fiscal years
8 2026 through 2030, to remain available until ex-
9 pended.”.

10 **TITLE VII—FIRE READY NATION**

11 **SEC. 701. DEFINITIONS.**

12 In this title:

13 (1) ADMINISTRATION.—The term “Administra-
14 tion” means the National Oceanic and Atmospheric
15 Administration.

16 (2) APPROPRIATE COMMITTEES OF CON-
17 GRESS.—The term “appropriate committees of Con-
18 gress” means—

19 (A) the Committee on Commerce, Science,
20 and Transportation of the Senate; and

21 (B) the Committee on Science, Space, and
22 Technology of the House of Representatives.

23 (3) EARTH SYSTEM MODEL.—The term “Earth
24 system model” means a mathematical model con-
25 taining all relevant components of the Earth, namely

1 the atmosphere, oceans, land, cryosphere, and bio-
2 sphere.

3 (4) FIRE ENVIRONMENT.—The term “fire envi-
4 ronment” means—

5 (A) the environmental conditions, such as
6 soil moisture, vegetation, topography, snowpack,
7 atmospheric temperature, moisture, and wind,
8 that influence—

9 (i) fuel and fire behavior; and

10 (ii) the emission, chemical evolution,
11 and transport of wildfire smoke; and

12 (B) the associated environmental impacts
13 occurring during and after fire events.

14 (5) FIRE WEATHER.—The term “fire weather”
15 means the weather conditions that influence the
16 start, spread, character, or behavior of wildfires and
17 relevant meteorological and chemical phenomena, in-
18 cluding air quality, wildfire smoke, and meteorolog-
19 ical parameters such as relative humidity, air tem-
20 perature, wind speed and direction, and atmospheric
21 composition and chemistry, including emissions and
22 mixing heights.

23 (6) IMPACT-BASED DECISION SUPPORT SERV-
24 ICES.—The term “impact-based decision support
25 services” means scientific advice and interpretative

1 services the Administration provides to help core
2 partners, such as emergency personnel and public
3 safety officials, make decisions when the information
4 impacts the lives and livelihoods of the people of the
5 United States.

6 (7) INDIAN TRIBE.—The term “Indian tribe”
7 has the meaning given that term in section 4 of the
8 Indian Self-Determination and Education Assistance
9 Act (25 U.S.C. 5304).

10 (8) NATIVE HAWAIIAN ORGANIZATION.—The
11 term “Native Hawaiian organization” has the mean-
12 ing given that term in section 6207 of the Elemen-
13 tary and Secondary Education Act of 1965 (20
14 U.S.C. 7517), including the Department of Hawai-
15 ian Home Lands and the Office of Hawaiian Affairs.

16 (9) STATE.—The term “State” means a State,
17 the District of Columbia, the Commonwealth of
18 Puerto Rico, Guam, American Samoa, the Common-
19 wealth of the Northern Mariana Islands, the United
20 State Virgin Islands, the Federated States of Micro-
21 nesia, the Republic of the Marshall Islands, or the
22 Republic of Palau.

23 (10) TRIBAL ORGANIZATION.—The term “Trib-
24 al organization” has the meaning given that term in

1 section 4 of the Indian Self-Determination and Edu-
2 cation Assistance Act (25 U.S.C. 5304).

3 **SEC. 702. ESTABLISHMENT OF FIRE WEATHER SERVICES**
4 **PROGRAM.**

5 (a) IN GENERAL.—The Under Secretary shall estab-
6 lish and maintain a coordinated fire weather services pro-
7 gram among the offices of the Administration in existence
8 as of the date of the enactment of this Act.

9 (b) PROGRAM FUNCTIONS.—The functions of the
10 program established under subsection (a), consistent with
11 the priorities described in section 101 of the Weather Re-
12 search and Forecasting Innovation Act of 2017 (15 U.S.C.
13 8511), shall be—

14 (1) to support readiness, responsiveness, under-
15 standing, and resilience of the United States to
16 wildfires, fire weather, wildfire smoke, post-fire
17 flooding and debris flows, and associated hazards
18 and impacts in built and natural environments;

19 (2) to collaboratively develop and disseminate
20 accurate, precise, effective, and timely risk commu-
21 nications, forecasts, watches, and warnings relating
22 to wildfires, fire weather, wildfire smoke, post-fire
23 flooding and debris flows, and other associated con-
24 ditions, hazards, and impacts, as applicable, with
25 Federal land management agencies;

1 (3) to partner with and support the public,
2 Federal and State government entities, Indian
3 tribes, Native Hawaiian organizations, and academic
4 and local partners through the development of capa-
5 bilities, impact-based decision support services, and
6 overall service delivery and utility related to fire
7 weather;

8 (4) to conduct and support research and devel-
9 opment of new and innovative models, technologies,
10 techniques, products, systems, processes, and proce-
11 dures to predict and improve understanding of
12 wildfires, fire weather, related air quality, post-fire
13 flooding and debris flows, and the fire environment;

14 (5) to develop processes to transition research
15 into operational use and inform additional areas of
16 research to deliver fire weather products, services,
17 and decision support tools to operational users and
18 platforms;

19 (6) to develop communications networks and
20 strategies to ensure parity of fire forecasts, warning
21 services, and information about current fire location,
22 for remote, isolated, and rural communities, includ-
23 ing communities where the public acts as the first
24 responder to wildfire; and

1 (7) to develop, in coordination with Federal
2 land management agencies, impact-based decision
3 support services that operationalize and integrate
4 the functions described in paragraphs (1) through
5 (6) in order to provide comprehensive impact-based
6 decision support services that encompass the fire en-
7 vironment.

8 (c) PROGRAM PRIORITIES.—In developing and imple-
9 menting the program established under subsection (a), the
10 Under Secretary shall prioritize—

11 (1) development of a fire weather-enabled Earth
12 system model and data assimilation systems that—

13 (A) are capable of prediction and fore-
14 casting across relevant spatial and temporal
15 scales;

16 (B) include variables associated with fire
17 weather and the fire environment;

18 (C) improve understanding of the connec-
19 tions between fire weather and modes of climate
20 variability;

21 (D) incorporate emerging techniques such
22 as artificial intelligence, machine learning, and
23 cloud computing; and

24 (E) use a rapidly deployable network of
25 rain gauges for post-fire hazard monitoring;

1 (2) advancement of existing and new observa-
2 tional capabilities, including satellite-, airborne-, air-
3 , and ground-based systems and technologies, and
4 social networking and other public information-gath-
5 ering applications that—

6 (A) identify—

7 (i) high-risk pre-ignition conditions;

8 (ii) conditions that influence fire be-
9 havior and spread including those condi-
10 tions that suppress active fire events; and

11 (iii) fire weather threat levels;

12 (B) support real-time notification and
13 monitoring of ignitions;

14 (C) support observations and data collec-
15 tion of fire weather and fire environment vari-
16 ables, including vegetation state and profiles of
17 wildfire smoke, winds, temperature, and humid-
18 ity, for development of the model and systems
19 under paragraph (1); and

20 (D) support forecasts and research that
21 mitigate the impacts of wildfires on human life,
22 health, and the economy;

23 (3) development and implementation of ad-
24 vanced and user-oriented impact-based decision
25 tools, science, and technologies that—

1 (A) ensure real-time and retrospective
2 data, products, and services are findable, acces-
3 sible, interoperable, usable, inform further re-
4 search, and are analysis- and decision-ready;

5 (B) provide targeted information through-
6 out the fire lifecycle including pre-ignition, de-
7 tection, forecasting, post-fire, and monitoring
8 phases; and

9 (C) support early assessment of post-fire
10 hazards, such as air quality, debris flows,
11 mudslides, and flooding; and

12 (4) ensuring the parity of access to and support
13 from the tools, science, and technologies developed
14 under this subsection for remote, isolated, and rural
15 communities.

16 (d) PROGRAM ACTIVITIES.—In developing and imple-
17 menting the program established under subsection (a), the
18 Under Secretary may—

19 (1) conduct relevant physical and social science
20 research activities in support of the functions de-
21 scribed in subsection (b) and the priorities described
22 in subsection (c);

23 (2) conduct relevant activities, in coordination
24 with Federal land management agencies and Federal
25 science agencies, to assess fuel characteristics, in-

1 including moisture, loading, and other parameters
2 used to determine fire risk levels and outlooks;

3 (3) support and conduct research that assesses
4 impacts to marine, riverine, watershed, and other
5 relevant ecosystems, which may include forest and
6 rangeland ecosystems, resulting from activities asso-
7 ciated with mitigation of and response to wildfires;

8 (4) support and conduct attribution science re-
9 search relating to wildfires, fire weather, fire risk,
10 wildfire smoke, and associated conditions, risks, and
11 impacts;

12 (5) develop wildfire smoke and air quality fore-
13 casts, forecast guidance, and prescribed burn weath-
14 er forecasts, and conduct research on the impact of
15 such forecasts on response behavior that minimizes
16 health-related impacts from wildfire smoke exposure;

17 (6) use, in coordination with Federal land man-
18 agement agencies, wildland fuels information and
19 fire resource intelligence to inform fire environment
20 impact-based decision support services and products
21 for safety;

22 (7) work with Federal agencies to provide data,
23 tools, and services to support the implementation of
24 mitigation measures by such agencies;

1 (8) provide training and support to ensure ef-
2 fective media utilization of impact-based decision
3 support services and products to the public regard-
4 ing actions needing to be taken;

5 (9) provide comprehensive training to ensure
6 staff of the program established under subsection
7 (a) is properly equipped to deliver the impact-based
8 decision support services and products described in
9 paragraphs (1) through (6); and

10 (10) acquire, through contracted purchase, pri-
11 vate sector-produced observational data to fill identi-
12 fied gaps, as needed.

13 (e) PARITY FOR REMOTE, ISOLATED, AND RURAL
14 COMMUNITIES.—In developing and implementing the pro-
15 gram established under subsection (a), the Under Sec-
16 retary shall ensure parity of coverage and programmatic
17 activity for remote, isolated, and rural communities, in-
18 cluding communities where the public acts as the first re-
19 sponder to wildfire.

20 (f) COLLABORATION.—The Under Secretary shall, as
21 the Under Secretary considers appropriate, collaborate
22 with partners in the weather and climate enterprises, aca-
23 demic institutions, States, Indian tribes, Tribal organiza-
24 tions, Native Hawaiian organizations, local partners, and

1 Federal agencies in the development and implementation
2 of the program established under subsection (a).

3 (g) AGREEMENTS.—In carrying out the activities
4 under this title and the amendments made by this title,
5 the Under Secretary may provide support to non-Federal
6 entities by making funds and resources available
7 through—

8 (1) competitive grants;

9 (2) contracts under the mobility program under
10 subchapter VI of chapter 33 of title 5, United States
11 Code (commonly referred to as the “Intergovern-
12 mental Personnel Act Mobility Program”);

13 (3) cooperative agreements; and

14 (4) co-location agreements as described in sec-
15 tion 502 of the National Oceanic and Atmospheric
16 Administration Commissioned Officer Corps Amend-
17 ments Act of 2020 (33 U.S.C. 851 note prec.).

18 (h) PROGRAM ADMINISTRATION PLAN.—

19 (1) IN GENERAL.—Not later than 180 days
20 after the date of the enactment of this Act, the
21 Under Secretary shall submit to the appropriate
22 committees of Congress a plan that details how the
23 program established under subsection (a) will be ad-
24 ministered and governed within the Administration.

1 (2) ELEMENTS.—The plan required by para-
2 graph (1) should include a description of—

3 (A) how the functions described in sub-
4 section (b), the priorities described in sub-
5 section (c), and the activities described in sub-
6 section (d) will be distributed among the line of-
7 fices of the Administration; and

8 (B) the mechanisms in place to ensure
9 seamless coordination among those offices.

10 **SEC. 703. FIRE WEATHER TESTBED.**

11 (a) ESTABLISHMENT OF FIRE WEATHER
12 TESTBED.—The Under Secretary shall establish a fire
13 weather testbed that enables engagement across the Fed-
14 eral Government, State and local governments, academia,
15 private and federally funded research laboratories, the pri-
16 vate sector, and end-users in order to evaluate the accu-
17 racy and usability of technology, models, fire weather
18 products and services, and other research to accelerate the
19 implementation, transition to operations, and use of new
20 capabilities by the Administration, Federal and land man-
21 agement agencies, and other relevant stakeholders.

22 (b) UNCREWED SYSTEMS.—

23 (1) IN GENERAL.—The Under Secretary shall—

24 (A) establish and carry out a research and
25 development program to support the application

1 of uncrewed systems technologies to improve
2 data collection in support of modeling, observa-
3 tions, predictions, forecasts, and impact-based
4 decision support services, and for other pur-
5 poses of the Administration;

6 (B) transition uncrewed systems tech-
7 nologies from research to operations as the
8 Under Secretary considers appropriate; and

9 (C) coordinate with other Federal agencies
10 that may be developing uncrewed systems and
11 related technologies to meet the challenges of
12 wildland fire management.

13 (2) PILOTS REQUIRED.—In carrying out para-
14 graph (1), the Under Secretary shall conduct pilots
15 of uncrewed systems for fire weather and fire envi-
16 ronment observations, including—

17 (A) testing of uncrewed systems in ap-
18 proximations of real-world scenarios;

19 (B) assessment of the utility of meteoro-
20 logical data collected from fire response and as-
21 sessment aircraft;

22 (C) input of the collected data into appro-
23 priate models to predict fire behavior, including
24 coupled atmosphere and fire models; and

1 (D) collection of best management prac-
2 tices for deployment of uncrewed systems and
3 other remote data technology, including for
4 communication and coordination between the
5 stakeholders described in subsection (a).

6 (3) SAVINGS CLAUSE.—

7 (A) IN GENERAL.—In carrying out activi-
8 ties under this subsection, the Under Secretary
9 shall ensure that any testing or deployment of
10 uncrewed systems follow procedures, restric-
11 tions, and protocols established by the heads of
12 the Federal agencies with statutory or regu-
13 latory jurisdiction over any airspace in which
14 wildfire response activities are conducted during
15 an active wildfire event.

16 (B) CONSULTATION AND COORDINA-
17 TION.—The Under Secretary shall consult and
18 coordinate with relevant Federal land manage-
19 ment agencies, Federal science agencies, and
20 the Federal Aviation Administration to develop
21 processes for the appropriate deployment of the
22 systems described in subparagraph (A).

23 (c) ADDITIONAL PILOT PROJECTS.—The Under Sec-
24 retary shall establish additional pilot projects relating to

1 the fire weather testbed that may include the following ele-
2 ments:

3 (1) Advanced products to detect fire from sat-
4 ellites.

5 (2) Procurement and use of commercial data.

6 (3) Investigation and evaluation of information
7 needs of users and decision makers.

8 (d) REPORT.—Section 108(a)(5) of the National Oee-
9 anic and Atmospheric Administration Authorization Act
10 of 1992 (15 U.S.C. 8520(a)(5)) is amended—

11 (1) in subparagraph (C), by inserting “and”
12 after the semicolon; and

13 (2) in subparagraph (D)—

14 (A) in clause (ii), by striking “and”;

15 (B) in clause (iii), by inserting “and” after
16 the semicolon; and

17 (C) by adding at the end the following:

18 “(iv) a description of the research
19 that has been transitioned into operations,
20 including research at the fire weather
21 testbed established under section 703(a) of
22 the Weather Research and Forecasting In-
23 novation Reauthorization Act of 2026;”.

1 **SEC. 704. DATA MANAGEMENT AND TECHNOLOGY MOD-**
2 **ERNIZATION.**

3 (a) DATA AVAILABILITY AND MANAGEMENT.—Sec-
4 tion 301 of the Weather Research and Forecasting Inno-
5 vation Act of 2017 (15 U.S.C. 8531) is amended—

6 (1) by redesignating subsections (f) and (g) as
7 subsections (g) and (h), respectively; and

8 (2) by inserting after subsection (e) the fol-
9 lowing:

10 “(f) DATA AVAILABILITY AND MANAGEMENT.—

11 “(1) IN GENERAL.—The Under Secretary
12 shall—

13 “(A) make data and metadata generated
14 or collected by the National Oceanic and At-
15 mospheric Administration that the Under Sec-
16 retary has the legal right to redistribute fully
17 and openly available, in accordance with chap-
18 ter 35 of title 44, United States Code, and the
19 Foundations for Evidence-Based Policymaking
20 Act of 2018 (Public Law 115–435; 132 Stat.
21 5529) and the amendments made by that Act,
22 and preserve and curate such data and
23 metadata, in accordance with chapter 31 of title
24 44, United States Code (commonly known as
25 the ‘Federal Records Act of 1950’), in order to
26 maximize use of such data and metadata; and

1 “(B) manage and steward the access, ar-
2 chival, and retrieval activities for the data and
3 metadata described in subparagraph (A) by—

4 “(i) using—

5 “(I) enterprise-wide infrastruc-
6 ture, emerging technologies, commer-
7 cial partnerships, and the skilled
8 workforce needed to provide appro-
9 priate data management from collec-
10 tion to broad access; and

11 “(II) associated information serv-
12 ices; and

13 “(ii) pursuing the maximum inter-
14 operability of data and information by—

15 “(I) leveraging data, information,
16 knowledge, and tools from across the
17 Federal Government to support equi-
18 table access, cross-sectoral collabora-
19 tion and innovation, and local plan-
20 ning and decision making; and

21 “(II) developing standards and
22 practices for the adoption and citation
23 of digital object identifiers for
24 datasets, models, and analytical tools.

1 “(2) COLLABORATION.—In carrying out this
2 subsection, the Under Secretary shall collaborate
3 with such Federal partners and stakeholders as the
4 Under Secretary considers relevant—

5 “(A) to develop standards to pursue max-
6 imum interoperability of data, information,
7 knowledge, and tools across the Federal Gov-
8 ernment, convert historical records into com-
9 mon digital formats, and improve access and
10 usability of data by partners and stakeholders;

11 “(B) to identify and solicit relevant data
12 from Federal and international partners and
13 other relevant stakeholders, as the Under Sec-
14 retary considers appropriate; and

15 “(C) to develop standards and practices for
16 the adoption and citation of digital object iden-
17 tifiers for datasets, models, and analytical
18 tools.”.

19 (b) WILDFIRE TECHNOLOGY MODERNIZATION.—Sec-
20 tion 1114 of the John D. Dingell, Jr. Conservation, Man-
21 agement, and Recreation Act (43 U.S.C. 1748b–1) is
22 amended—

23 (1) in subsection (c)(3), by inserting “the Na-
24 tional Oceanic and Atmospheric Administration,”
25 after “Federal Aviation Administration,”;

1 (2) in subsection (e)(2)—

2 (A) by redesignating subparagraph (B) as
3 subparagraph (C); and

4 (B) by inserting after subparagraph (A)
5 the following:

6 “(B) CONSULTATION.—

7 “(i) IN GENERAL.—In carrying out
8 subparagraph (A), the Secretaries shall
9 consult with the Under Secretary of Com-
10 merce for Oceans and Atmosphere regard-
11 ing any development of impact-based deci-
12 sion support services that relate to wild-
13 fire-related activities of the National Oce-
14 anic and Atmospheric Administration.

15 “(ii) DEFINITION OF IMPACT-BASED
16 DECISION SUPPORT SERVICES.—In this
17 subparagraph, the term ‘impact-based deci-
18 sion support services’ means scientific ad-
19 vice and interpretative services the Na-
20 tional Oceanic and Atmospheric Adminis-
21 tration provides to help core partners, such
22 as emergency personnel and public safety
23 officials, make decisions when the informa-
24 tion impacts the lives and livelihoods of the
25 people of the United States.”; and

1 (3) in subsection (f)—

2 (A) by redesignating paragraphs (1) and
3 (2) as subparagraphs (A) and (B), respectively,
4 and moving such subparagraphs, as so redesign-
5 nated, 2 ems to the right;

6 (B) by striking “The Secretaries” and in-
7 serting the following:

8 “(1) IN GENERAL.—The Secretaries”; and

9 (C) by adding at the end the following:

10 “(2) COLLABORATION.—In carrying out para-
11 graph (1), the Secretaries shall collaborate with the
12 Under Secretary of Commerce for Oceans and At-
13 mosphere to improve coordination, utility of systems
14 and assets, and interoperability of data for wildfire
15 smoke prediction, forecasting, and modeling.”.

16 (c) DIGITAL PRESENCE.—

17 (1) IN GENERAL.—The Under Secretary shall
18 develop and maintain a comprehensive, centralized,
19 and publicly accessible digital presence designed to
20 promote findability, accessibility, interoperability,
21 usability, and utility of the services, tools, data, and
22 information produced by the program established
23 under section 702(a).

24 (2) DIGITAL PLATFORM AND TOOLS.—In car-
25 rying out paragraph (1), the Under Secretary shall

1 seek to ensure the digital platform and tools of the
2 Administration integrate geospatial data, decision
3 support tools, training, and best practices to provide
4 real-time fire weather forecasts and address fire-re-
5 lated issues and needs.

6 (d) HIGH-PERFORMANCE COMPUTING.—

7 (1) IN GENERAL.—The Under Secretary shall
8 seek to acquire sufficient high-performance com-
9 puting resources and capacity for research, oper-
10 ations, and data storage in support of the program
11 established under section 702(a).

12 (2) CONSIDERATIONS.—In acquiring high-per-
13 formance computing capacity under paragraph (1),
14 the Under Secretary shall consider requirements
15 needed for—

16 (A) conducting research, development, and
17 testbed experiments;

18 (B) the transition of research and testbed
19 developments into operations;

20 (C) sustaining capabilities in operations;

21 (D) capabilities existing in other Federal
22 agencies and the commercial sector; and

23 (E) skilled workforce development.

1 **SEC. 705. SURVEYS AND ASSESSMENTS.**

2 (a) POST-FIRE WEATHER SURVEYS AND ASSESS-
3 MENTS.—

4 (1) ANNUAL POST-FIRE-WEATHER-SEASON SUR-
5 VEY AND ASSESSMENT.—

6 (A) IN GENERAL.—During the second win-
7 ter following the date of the enactment of this
8 Act, and each year thereafter, the Under Sec-
9 retary shall conduct a post-fire-weather-season
10 survey and assessment.

11 (B) ELEMENTS.—After conducting a post-
12 fire-weather-season survey and assessment
13 under subparagraph (A), the Under Secretary
14 shall—

15 (i) investigate any gaps in weather
16 data collected during the assessment;

17 (ii) identify and implement strategies
18 and procedures to improve program serv-
19 ices and information dissemination;

20 (iii) update systems, processes, strate-
21 gies, and procedures to enhance the effi-
22 ciency and reliability of weather data ob-
23 tained from the assessment;

24 (iv) evaluate the accuracy and efficacy
25 of physical fire weather forecasting infor-

1 mation for each incident included in the
2 survey and assessment; and

3 (v) assess and refine performance
4 measures, as needed.

5 (2) SURVEYS AND ASSESSMENTS FOLLOWING
6 INDIVIDUAL WILDFIRE EVENTS.—The Under Sec-
7 retary may conduct surveys and assessments fol-
8 lowing individual wildfire events as the Under Sec-
9 retary determines necessary.

10 (3) GOAL.—In carrying out activities under this
11 subsection, the Under Secretary shall seek to in-
12 crease the number of post-wildfire community im-
13 pact studies, including by surveying individual and
14 collective responses and incorporating other applica-
15 ble topics of social science research.

16 (4) ANNUAL BRIEFING.—Not less frequently
17 than once each year, the Under Secretary shall join
18 other relevant agencies to provide a briefing to the
19 appropriate committees of Congress that provides—

20 (A) an overview of the fire season;

21 (B) an outlook for the fire season; and

22 (C) fire weather forecasts.

23 (5) COORDINATION.—In conducting any survey
24 or assessment under this subsection, the Under Sec-
25 retary shall coordinate with Federal, State, and local

1 partners, Indian tribes, Native Hawaiian organiza-
2 tions, private entities, and such institutions of high-
3 er education as the Under Secretary considers rel-
4 evant in order to—

5 (A) improve operations and collaboration;
6 and

7 (B) optimize data collection, sharing, inte-
8 gration, assimilation, and dissemination.

9 (6) DATA AVAILABILITY.—The Under Secretary
10 shall make the data and findings obtained from each
11 assessment conducted under this subsection available
12 to the public in an accessible digital format as soon
13 as practicable after conducting the assessment.

14 (7) SERVICE IMPROVEMENTS.—The Under Sec-
15 retary shall make best efforts to incorporate the re-
16 sults and recommendations of each assessment con-
17 ducted under this subsection into the research and
18 development plan and operations of the Administra-
19 tion.

20 (b) JOINT ASSESSMENT AND PLAN FOR AUTOMATED
21 SURFACE OBSERVING SYSTEM.—

22 (1) IN GENERAL.—The Under Secretary, in col-
23 laboration with the Administrator of the Federal
24 Aviation Administration and the Secretary of De-
25 fense, shall—

1 (A) conduct an assessment of resources,
2 personnel, procedures, and activities necessary
3 to maximize the functionality and utility of the
4 automated surface observing system of the
5 United States that identifies—

6 (i) key system upgrades needed to im-
7 prove observation quality and utility for
8 weather forecasting, aviation safety, and
9 other users;

10 (ii) improvements needed in observa-
11 tions within the planetary boundary layer,
12 including mixing height;

13 (iii) improvements needed in public
14 accessibility of observational data;

15 (iv) improvements needed to reduce
16 latency in reporting of observational data;

17 (v) relevant data to be collected for
18 the production of forecasts or forecast
19 guidance relating to atmospheric composi-
20 tion, including particulate and air quality
21 data related to wildfires, and aviation safe-
22 ty;

23 (vi) areas of concern regarding oper-
24 ational continuity and reliability of the sys-
25 tem, which may include needs for on-night

1 staff, particularly in remote and rural
2 areas and areas where system failure
3 would have the greatest negative impact to
4 the community;

5 (vii) stewardship, data handling, data
6 distribution, and product generation needs
7 arising from upgrading and changing the
8 automated surface observation systems;

9 (viii) possible solutions for areas of
10 concern identified under clause (vi), includ-
11 ing with respect to the potential use of
12 backup systems, power and communication
13 system reliability, staffing needs and per-
14 sonnel location, and the acquisition of crit-
15 ical component backups and proper storage
16 location to ensure rapid system repair nec-
17 essary to ensure system operational con-
18 tinuity; and

19 (ix) research, development, and transi-
20 tion to operations needed to develop ad-
21 vanced data collection, quality control, and
22 distribution so that the data are provided
23 to models, users, and decision support sys-
24 tems in a timely manner; and

1 (B) develop and implement a plan that ad-
2 dresses the findings of the assessment con-
3 ducted under subparagraph (A), including by
4 seeking and allocating resources necessary to
5 ensure that system upgrades are standardized
6 across the Administration, the Federal Aviation
7 Administration, and the Department of Defense
8 to the extent practicable.

9 (2) STANDARDIZATION.—Any system standard-
10 ization implemented under paragraph (1)(B) shall
11 not impede activities to upgrade or improve indi-
12 vidual units of the system.

13 (3) REMOTE AUTOMATIC WEATHER STATION
14 COORDINATION.—The Under Secretary, in collabora-
15 tion with relevant Federal agencies and the National
16 Interagency Coordination Center, shall assess and
17 develop cooperative agreements to improve coordina-
18 tion, interoperability standards, operations, and
19 placement of remote automatic weather stations for
20 the purpose of improving utility and coverage of re-
21 mote automatic weather stations, automated surface
22 observation systems, wildfire smoke monitoring plat-
23 forms, and other similar stations and systems for
24 weather and climate operations.

25 (4) REPORT TO CONGRESS.—

1 (A) IN GENERAL.—Not later than 2 years
2 after the date of the enactment of this Act, the
3 Under Secretary, in collaboration with the Ad-
4 ministrator of the Federal Aviation Administra-
5 tion and the Secretary of Defense, shall submit
6 to the appropriate committees of Congress a re-
7 port that—

8 (i) details the findings of the assess-
9 ment required by subparagraph (A) of
10 paragraph (1); and

11 (ii) the plan required by subparagraph
12 (B) of such paragraph.

13 (B) ELEMENTS.—The report required by
14 subparagraph (A) shall include a detailed as-
15 sessment of appropriations required—

16 (i) to address the findings of the as-
17 sessment required by subparagraph (A) of
18 paragraph (1); and

19 (ii) to implement the plan required by
20 subparagraph (B) of such paragraph.

21 **SEC. 706. INCIDENT METEOROLOGIST SERVICE.**

22 (a) ESTABLISHMENT.—The Under Secretary shall es-
23 tablish and maintain an Incident Meteorologist Service
24 within the National Weather Service (in this section re-
25 ferred to as the “Service”).

1 (b) INCLUSION OF EXISTING INCIDENT METEOROLO-
2 GISTS.—The Service shall include—

3 (1) the incident meteorologists of the Adminis-
4 tration as of the date of the enactment of this Act;
5 and

6 (2) such incident meteorologists of the Adminis-
7 tration as may be appointed after such date.

8 (c) FUNCTIONS.—The Service shall provide—

9 (1) on-site impact-based decision support serv-
10 ices to Federal, State, and local government emer-
11 gency response agencies, Indian tribes, and Native
12 Hawaiian organizations preceding, during, and fol-
13 lowing significant weather-related events, such as
14 wildland fires, that threaten human life, property, or
15 the economy; and

16 (2) support to Federal, State, and local govern-
17 ment decisionmakers, partners, and stakeholders, In-
18 dian tribes, Tribal organizations, and Native Hawai-
19 ian organizations for seasonal planning and pre-fire
20 mitigation activities.

21 (d) DEPLOYMENT.—The Service shall be deployed—

22 (1) as determined by the Under Secretary; or

23 (2) at the request of the head of another Fed-
24 eral agency and with the approval of the Under Sec-
25 retary.

1 (e) STAFFING AND RESOURCES.—In establishing and
2 maintaining the Service, the Under Secretary shall iden-
3 tify, acquire, and maintain adequate levels of staffing and
4 resources to meet user needs.

5 (f) SUPPORT FOR INCIDENT METEOROLOGISTS.—
6 The Under Secretary shall provide resources, access to
7 real-time fire weather forecasts, training, administrative
8 and logistical support, and access to professional coun-
9 seling or other forms of support as the Under Secretary
10 considers appropriate for the betterment of the emotional
11 and mental health and well-being of incident meteorolo-
12 gists and other employees of the Administration so long
13 as the need for such resources, training, access, or support
14 is due to the response of such employees to high-impact
15 and extreme fire weather events.

16 **SEC. 707. EMERGENCY RESPONSE ACTIVITIES.**

17 (a) DEFINITIONS.—In this section:

18 (1) BASIC PAY.—The term “basic pay” includes
19 any applicable locality-based comparability payment
20 under section 5304 of title 5, United States Code,
21 any applicable special rate supplement under section
22 5305 of such title, or any equivalent payment under
23 a similar provision of law.

24 (2) COVERED EMPLOYEE.—The term “covered
25 employee” means an employee of the Department of

1 Commerce, the Department of Agriculture, or the
2 Department of the Interior.

3 (3) COVERED SERVICES.—The term “covered
4 services” means services that are performed by a
5 covered employee while serving—

6 (A) as a wildland firefighter or a fire man-
7 agement response official, including a regional
8 fire director, a deputy regional fire director,
9 and a fire management officer;

10 (B) as an incident meteorologist accom-
11 panying a wildland firefighter crew; or

12 (C) on an incident management team, at
13 the National Interagency Fire Center, at a Geo-
14 graphic Area Coordinating Center, or at an op-
15 erations center.

16 (4) PREMIUM PAY.—The term “premium pay”
17 means premium pay paid under a provision of law
18 described in the matter preceding paragraph (1) of
19 section 5547(a) of title 5, United States Code.

20 (5) RELEVANT CONGRESSIONAL COMMIT-
21 TEES.—The term “relevant congressional commit-
22 tees” means—

23 (A) the Committee on Commerce, Science,
24 and Transportation of the Senate;

1 (B) the Committee on Homeland Security
2 and Governmental Affairs of the Senate;

3 (C) the Committee on Agriculture, Nutri-
4 tion, and Forestry of the Senate;

5 (D) the Committee on Appropriations of
6 the Senate;

7 (E) the Committee on Energy and Natural
8 Resources of the Senate;

9 (F) the Committee on Oversight and Gov-
10 ernment Reform of the House of Representa-
11 tives;

12 (G) the Committee on Natural Resources
13 of the House of Representatives;

14 (H) the Committee on Science, Space, and
15 Technology of the House of Representatives;

16 (I) the Committee on Agriculture of the
17 House of Representative; and

18 (J) the Committee on Appropriations of
19 the House of Representatives.

20 (6) SECRETARY CONCERNED.—The term “Sec-
21 retary concerned” means—

22 (A) the Secretary of Commerce, with re-
23 spect to an employee of the Department of
24 Commerce;

1 (B) the Secretary of Agriculture, with re-
2 spect to an employee of the Department of Ag-
3 riculture; and

4 (C) the Secretary of the Interior, with re-
5 spect to an employee of the Department of the
6 Interior.

7 (b) WAIVER.—

8 (1) IN GENERAL.—Any premium pay received
9 by a covered employee for covered services shall be
10 disregarded in calculating the aggregate of the basic
11 pay and premium pay for the covered employee for
12 purposes of applying the limitation on premium pay
13 under section 5547(a) of title 5, United States Code.

14 (2) CALCULATION OF AGGREGATE PAY.—Any
15 pay that is disregarded under paragraph (1) shall be
16 disregarded in calculating the aggregate pay of the
17 applicable covered employee for purposes of applying
18 the limitation under section 5307 of title 5, United
19 States Code, during calendar year 2026.

20 (3) LIMITATION.—A covered employee may not
21 be paid premium pay under this subsection if, or to
22 the extent that, the aggregate of the basic pay and
23 premium pay (including premium pay for covered
24 services) of the covered employee for a calendar year
25 would exceed the rate of basic pay payable for a po-

1 sition at level II of the Executive Schedule under
2 section 5313 of title 5, United States Code, as in ef-
3 fect at the end of that calendar year.

4 (4) TREATMENT OF ADDITIONAL PREMIUM
5 PAY.—If the application of this subsection results in
6 the payment of additional premium pay to a covered
7 employee of a type that is normally creditable as
8 basic pay for retirement or any other purpose, that
9 additional premium pay shall not be—

10 (A) considered to be basic pay of the cov-
11 ered employee for any purpose; or

12 (B) used in computing a lump-sum pay-
13 ment to the covered employee for accumulated
14 and accrued annual leave under section 5551 or
15 5552 of title 5, United States Code.

16 (5) EFFECTIVE PERIOD.—This subsection shall
17 be in effect during calendar year 2026 and apply to
18 premium pay payable during that year.

19 (c) AMENDMENT.—Section 5542(a)(5) of title 5,
20 United States Code, is amended by inserting “, the De-
21 partment of Commerce,” after “Interior”.

22 (d) PLAN TO ADDRESS NEEDS.—

23 (1) DEVELOPMENT AND IMPLEMENTATION.—
24 Not later than March 30, 2026, the Secretaries re-
25 ferred to in subsection (a)(6), in consultation with

1 the Director of the Office of Management and Budg-
2 et and the Director of the Office of Personnel Man-
3 agement, shall jointly develop and implement a plan
4 that addresses the needs of the Department of Com-
5 merce, the Department of Agriculture, and the De-
6 partment of the Interior, as applicable, to hire, ap-
7 point, promote, or train additional covered employees
8 who carry out covered services such that sufficient
9 covered employees are available throughout each fis-
10 cal year, beginning in fiscal year 2026, without the
11 need for waivers of premium pay limitations.

12 (2) SUBMITTAL.—Not later than 30 days before
13 the date on which the Secretaries implement the
14 plan developed under paragraph (1), the Secretaries
15 shall submit the plan to the relevant congressional
16 committees.

17 (3) LIMITATION.—The plan developed under
18 paragraph (1) shall not be contingent on any Sec-
19 retary receiving amounts appropriated for fiscal
20 years beginning in fiscal year 2026 in amounts
21 greater than amounts appropriated for fiscal year
22 2024.

23 (e) POLICIES AND PROCEDURES FOR HEALTH, SAFE-
24 TY, AND WELL-BEING.—The Secretary concerned shall

1 maintain policies and procedures to promote the health,
2 safety, and well-being of covered employees.

3 **SEC. 708. SUBMISSIONS TO CONGRESS REGARDING THE**
4 **FIRE WEATHER SERVICES PROGRAM, INCI-**
5 **DENT METEOROLOGIST WORKFORCE NEEDS,**
6 **AND NATIONAL WEATHER SERVICE WORK-**
7 **FORCE SUPPORT.**

8 (a) REPORT TO CONGRESS.—Not later than 18
9 months after the date of the enactment of this Act, the
10 Under Secretary shall submit to the appropriate commit-
11 tees of Congress—

- 12 (1) the plan described in subsection (b);
13 (2) the assessment described in subsection (c);
14 and
15 (3) the assessment described in subsection (d).

16 (b) FIRE WEATHER SERVICES PROGRAM PLAN.—

17 (1) ELEMENTS.—The plan submitted under
18 subsection (a)(1) shall detail—

- 19 (A) the observational data, modeling re-
20 quirements, ongoing computational needs, re-
21 search, development, and technology transfer
22 activities, data management, skilled-personnel
23 requirements, engagement with relevant Federal
24 emergency and land management agencies and
25 partners, and corresponding research, develop-

1 ment, and operational resources and timelines
2 necessary to achieve the functions described in
3 subsection (b) of section 702 and the priorities
4 described in subsection (c) of such section; and

5 (B) plans and needs for all other activities
6 and requirements under this title and the
7 amendments made by this title.

8 (2) SUBMITTAL OF ANNUAL BUDGET FOR
9 PLAN.—Following completion of the plan submitted
10 under subsection (a)(1), the Under Secretary shall,
11 not less frequently than once each year concurrent
12 with the submission of the budget by the President
13 to Congress under section 1105 of title 31, United
14 States Code, submit to Congress a proposed budget
15 corresponding with the elements detailed in the plan.

16 (c) INCIDENT METEOROLOGIST WORKFORCE NEEDS
17 ASSESSMENT.—

18 (1) IN GENERAL.—The Under Secretary shall
19 conduct a workforce needs assessment on the cur-
20 rent and future demand for additional incident me-
21 teorologists for wildfires and other high-impact fire
22 weather events.

23 (2) ELEMENTS.—The assessment required by
24 paragraph (1) shall include the following:

1 (A) A description of staffing levels as of
2 the date on which the assessment is submitted
3 under subsection (a)(2) and projected future
4 staffing levels.

5 (B) An assessment of the state of the re-
6 search, development, and operational infrastruc-
7 ture of the National Weather Service as of the
8 date on which the assessment is submitted and
9 future needs of such infrastructure in order to
10 meet current and future demands, including
11 with respect to information technology support
12 and logistical and administrative operations.

13 (3) CONSIDERATIONS.—In conducting the as-
14 sessment required by paragraph (1), the Under Sec-
15 retary shall consider user needs and feedback from
16 relevant stakeholders.

17 (d) SUPPORT SERVICES ASSESSMENT.—

18 (1) IN GENERAL.—The Under Secretary shall
19 conduct a workforce support services assessment
20 with respect to employees of the National Weather
21 Service engaged in emergency response.

22 (2) ELEMENTS.—The assessment required by
23 paragraph (1) shall include the following:

24 (A) An assessment of need for further sup-
25 port of employees of the National Weather

1 Service engaged in emergency response through
2 services provided by the Public Health Service.

3 (B) A detailed assessment of appropria-
4 tions required to secure the level of support
5 services needed as identified in the assessment
6 described in subparagraph (A).

7 (3) **ADDITIONAL SUPPORT SERVICES.**—Fol-
8 lowing the completion of the assessment required by
9 paragraph (1), the Under Secretary shall seek to ac-
10 quire additional support services to meet the needs
11 identified in the assessment.

12 **SEC. 709. FIRE SCIENCE AND TECHNOLOGY WORKING**
13 **GROUP; STRATEGIC PLAN.**

14 (a) **FIRE SCIENCE AND TECHNOLOGY WORKING**
15 **GROUP.**—

16 (1) **ESTABLISHMENT.**—Not later than 90 days
17 after the date of the enactment of this Act, the Ex-
18 ecutive Director of the Interagency Council for Ad-
19 vancing Weather Services established under section
20 402 of the Weather Research and Forecasting Inno-
21 vation Act of 2017 (15 U.S.C. 8542) (in this section
22 referred to as the “Interagency Council”) shall es-
23 tablish a working group, to be known as the “Fire
24 Science and Technology Working Group” (in this
25 section referred to as the “Working Group”).

1 (2) CHAIR.—The Working Group shall be
2 chaired by the Under Secretary, or designee.

3 (3) GENERAL DUTIES.—

4 (A) IN GENERAL.—The Working Group
5 shall seek to build efficiencies among the agen-
6 cies listed under section 711(c)(1) and coordi-
7 nate the planning and management of science,
8 research, technology, and operations related to
9 science and support services for wildland fire
10 prediction, detection, forecasting, modeling, re-
11 silience, response, management, and assess-
12 ments.

13 (B) INPUT.—The Working Group shall so-
14 licit input from non-Federal stakeholders.

15 (b) STRATEGIC PLAN.—

16 (1) IN GENERAL.—Not later than 18 months
17 after the date of the enactment of this Act, the
18 Interagency Council shall prepare and submit to
19 Congress a strategic plan for interagency coordina-
20 tion, research, and development that will improve
21 the assessment of fire environments and the under-
22 standing and prediction of wildland fires, associated
23 wildfire smoke, and the impacts of such fires and
24 smoke, including—

1 (A) on communities, buildings, and other
2 infrastructure;

3 (B) on ecosystem services and watersheds;

4 (C) social and economic impacts;

5 (D) by developing and encouraging the
6 adoption of science-based and cost-effective
7 measures—

8 (i) to enhance community resilience to
9 wildland fires;

10 (ii) to address and mitigate the im-
11 pacts of wildland fires and associated wild-
12 fire smoke; and

13 (iii) to restore natural fire regimes in
14 fire-dependent ecosystems;

15 (E) by improving the understanding and
16 mitigation of the effects of weather and long-
17 term drought on wildland fire risk, frequency,
18 and severity;

19 (F) through integrations of social and be-
20 havioral sciences in public safety fire commu-
21 nication;

22 (G) by improving the forecasting and un-
23 derstanding of prescribed fires and the impacts
24 of such fires, and how those impacts may differ

1 from impacts of wildland fires that originate
2 from an unplanned ignition; and

3 (H) consideration and adoption of any rec-
4 ommendations included in the report required
5 by section 711(c).

6 (2) PLAN ELEMENTS.—The strategic plan re-
7 quired by paragraph (1) shall include the following:

8 (A) A description of the priorities and
9 needs of vulnerable populations.

10 (B) A description of high-performance
11 computing, visualization, and dissemination
12 needs.

13 (C) A timeline and guidance for implemen-
14 tation of—

15 (i) an interagency data sharing sys-
16 tem for data relevant to performing fire
17 assessments and modeling fire risk and fire
18 behavior;

19 (ii) a system for ensuring that the fire
20 prediction models of relevant agencies can
21 be interconnected; and

22 (iii) to the maximum extent prac-
23 ticable, any recommendations included in
24 the report required by section 711(c).

1 (D) A plan for incorporating and coordi-
2 nating research and operational observations,
3 including from infrared technologies, micro-
4 wave, radars, satellites, mobile weather stations,
5 and uncrewed aerial systems.

6 (E) A flexible framework to communicate
7 clear and simple fire event information to the
8 public.

9 (F) Integration of social, behavioral, risk,
10 and communication research to improve the fire
11 operational environment and societal informa-
12 tion reception and response.

13 (c) SUNSET.—The Working Group shall terminate
14 not later than 1 year after the date of the enactment of
15 this Act.

16 **SEC. 710. FIRE WEATHER RATING SYSTEM.**

17 (a) IN GENERAL.—The Under Secretary shall, in col-
18 laboration with the Chief of the United States Forest
19 Service, the Director of the United States Geological Sur-
20 vey, the Director of the National Park Service, the Admin-
21 istrator of the Federal Emergency Management Agency,
22 the Director of the United States Fish and Wildlife Serv-
23 ice, the Director of the Bureau of Indian Affairs, the Di-
24 rector of the Bureau of Land Management, and such

1 stakeholders as the Under Secretary considers appro-
2 priate—

3 (1) evaluate the system used as of the date of
4 the enactment of this Act to rate the risk of wildfire;
5 and

6 (2) determine whether updates to that system
7 are required to ensure that the ratings accurately re-
8 flect the severity of fire risk.

9 (b) UPDATE REQUIRED.—If the Under Secretary de-
10 termines under subsection (a) that updates to the system
11 described in paragraph (1) of such subsection are nec-
12 essary, the Under Secretary shall update that system.

13 **SEC. 711. GOVERNMENT ACCOUNTABILITY OFFICE RE-**
14 **PORTS.**

15 (a) REPORT ON FIRE WEATHER SERVICES PRO-
16 GRAM.—

17 (1) IN GENERAL.—Not later than 3 years after
18 the date of the enactment of this Act, the Comp-
19 troller General of the United States shall submit to
20 Congress a report on the program established under
21 section 702(a).

22 (2) ELEMENTS.—The report required by para-
23 graph (1) shall—

24 (A) evaluate the performance of the pro-
25 gram by establishing initial baseline capabilities

1 and tracking progress made toward fully
2 operationalizing the functions described in sec-
3 tion 702(b); and

4 (B) include such other recommendations as
5 the Comptroller General determines are appro-
6 priate to improve the program.

7 (b) REPORT ON INTERAGENCY BODIES FOR WILD-
8 FIRE FORECASTING, PREVENTION, PLANNING, AND MAN-
9 AGEMENT.—Not later than 1 year after the date of the
10 enactment of this Act, the Comptroller General of the
11 United States shall submit to Congress a report that—

12 (1) identifies all Federal interagency bodies es-
13 tablished for the purpose of wildfire forecasting, pre-
14 vention, planning, and management (such as wildfire
15 councils, commissions, and workgroups), including—

16 (A) the Wildland Fire Leadership Council;

17 (B) the White House Wildfire Resilience
18 Interagency Group;

19 (C) the Wildland Fire Management Policy
20 Committee;

21 (D) the Wildland Fire Mitigation and
22 Management Commission;

23 (E) the Joint Science Fire Program;

24 (F) the National Interagency Coordination
25 Center;

1 (G) the National Predictive Services Over-
2 sight Group;

3 (H) the Interagency Council for Advancing
4 Meteorological Services;

5 (I) the National Wildfire Coordinating
6 Group;

7 (J) the National Multi-Agency Coordi-
8 nating Group; and

9 (K) the Mitigation Framework Leadership
10 Group;

11 (2) evaluates the roles, functionality, and utility
12 of such interagency bodies;

13 (3) evaluates the progress, performance, and
14 implementation of such interagency bodies;

15 (4) assesses efficacy and identifies potential
16 overlap and duplication of such interagency bodies in
17 carrying out interagency collaboration with respect
18 to wildfire prevention, planning, and management;
19 and

20 (5) includes such other recommendations as the
21 Comptroller General determines are appropriate to
22 streamline and improve wildfire forecasting, preven-
23 tion, planning, and management, including rec-
24 ommendations regarding the interagency bodies for
25 which the addition of the Administration is nec-

1 essary to improve wildfire forecasting, prevention,
2 planning, and management.

3 (c) REPORT ON INTERAGENCY COORDINATION.—Not
4 later than 1 year after the date of the enactment of this
5 Act, the Comptroller General of the United States shall
6 submit to Congress a report that identifies—

7 (1) the authorities, roles, and science and sup-
8 port services relating to wildland fire prediction, de-
9 tection, forecasting, modeling, resilience, response,
10 management, and assessment provided by—

11 (A) the Department of Commerce, includ-
12 ing the Administration and the National Insti-
13 tute of Standards and Technology;

14 (B) the National Aeronautics and Space
15 Administration;

16 (C) the Department of the Interior;

17 (D) the Department of Agriculture;

18 (E) the National Science Foundation;

19 (F) the Department of Energy;

20 (G) the Federal Emergency Management
21 Agency;

22 (H) the Department of Transportation;

23 (I) the Environmental Protection Agency;

24 and

25 (J) the Department of Defense; and

1 (2) recommended areas in and mechanisms by
2 which the agencies listed under paragraph (1) could
3 support and improve—

4 (A) coordination between Federal agencies,
5 State and local governments, Indian tribes,
6 Tribal organizations, Native Hawaiian organi-
7 zations, and other relevant stakeholders, includ-
8 ing through examination of possible public-pri-
9 vate partnerships;

10 (B) research and development, including
11 interdisciplinary research, related to fire envi-
12 ronments, wildland fires, associated wildfire
13 smoke, and the impacts of such environments,
14 fires, and smoke, in furtherance of a coordi-
15 nated interagency effort to address wildland fire
16 risk reduction;

17 (C) data management and stewardship, the
18 development and coordination of data systems
19 and computational tools, and the creation of a
20 centralized, integrated data collaboration envi-
21 ronment for agency data, including historical
22 data, relating to weather, fire environments,
23 wildland fires, associated wildfire smoke, and
24 the impacts of such environments, fires, and

1 smoke, and the assessment of wildland fire risk
2 mitigation measures;

3 (D) interoperability, usability, and accessi-
4 bility of the scientific data, data systems, and
5 computational and information tools of the
6 agencies listed under paragraph (1);

7 (E) coordinated public safety communica-
8 tions relating to fire weather events, fire haz-
9 ards, and wildland fire and smoke risk reduc-
10 tion strategies; and

11 (F) secure and accurate real-time data,
12 alerts, and advisories to wildland firefighters
13 and other decision support tools for wildland
14 fire incident command posts.

15 (d) REPORT ON AUTOMATED SURFACE OBSERVING
16 SYSTEM.—Not later than 4 years after the date of the
17 enactment of this Act, the Comptroller General of the
18 United States shall submit to Congress a report that—

19 (1) evaluates the functionality, utility, reli-
20 ability, and operational status of the automated sur-
21 face observing system across the Administration, the
22 Federal Aviation Administration, and the Depart-
23 ment of Defense;

1 (2) evaluates the progress, performance, and
2 implementation of the plan required by section
3 705(b)(1)(B);

4 (3) assesses the efficacy of cross-agency collabo-
5 ration and stakeholder engagement in carrying out
6 the plan and provides recommendations to improve
7 such activities;

8 (4) evaluates the operational continuity and re-
9 liability of the system, particularly in remote and
10 rural areas and areas where system failure would
11 have the greatest negative impact to the community,
12 and provides recommendations to improve such con-
13 tinuity and reliability;

14 (5) assesses Federal coordination regarding the
15 remote automatic weather station network, air re-
16 source advisors, and other Federal observing assets
17 used for weather and subseasonal to seasonal mod-
18 eling and response activities, and provides rec-
19 ommendations for improvements; and

20 (6) includes such other recommendations as the
21 Comptroller General determines are appropriate to
22 improve the system.

23 **SEC. 712. COOPERATION AND COORDINATION.**

24 (a) COOPERATION.—Each Federal agency shall co-
25 operate and coordinate with the Under Secretary, as ap-

1 appropriate, in carrying out this title and the amendments
2 made by this title.

3 (b) COORDINATION.—

4 (1) IN GENERAL.—In meeting the requirements
5 under this title and the amendments made by this
6 title, the Under Secretary shall coordinate, and as
7 appropriate, establish agreements with Federal and
8 external partners to fully use and leverage existing
9 assets, systems, networks, technologies, and sources
10 of data.

11 (2) INCLUSIONS.—Coordination carried out
12 under paragraph (1) shall include coordination
13 with—

14 (A) the agencies represented at the Na-
15 tional Interagency Fire Center;

16 (B) the Predictive Services Program of the
17 National Interagency Coordination Center;

18 (C) the National Wildfire Coordinating
19 Group; and

20 (D) relevant interagency bodies identified
21 in the report required by section 711(b).

22 (3) CONSULTATION.—In carrying out this sub-
23 section, the Under Secretary shall consult with Fed-
24 eral partners including—

- 1 (A) the National Aeronautics and Space
2 Administration;
- 3 (B) the Department of the Interior;
- 4 (C) the Federal Emergency Management
5 Agency;
- 6 (D) the National Science Foundation;
- 7 (E) the United States Geological Survey;
- 8 (F) the Department of Agriculture;
- 9 (G) the Environmental Protection Agency;
- 10 (H) the Department of Energy;
- 11 (I) the Department of Defense;
- 12 (J) the National Institute of Standards
13 and Technology; and
- 14 (K) such other departments and agencies
15 as the Under Secretary considers relevant.

16 (c) PROCESS FOR ANNUAL COORDINATION WITH
17 NON-FEDERAL ENTITIES.—Not later than 18 months
18 after the date of the enactment of this Act, the Under
19 Secretary shall develop and submit to the appropriate
20 committees of Congress a process for annual coordination
21 with State and local governments, Indian tribes, Tribal or-
22 ganizations, and Native Hawaiian organizations to assist
23 the development of improved fire weather products and
24 services.

25 (d) INTERNATIONAL COORDINATION.—

1 (1) IN GENERAL.—The Under Secretary may
2 develop collaborative relationships and agreements
3 with foreign partners and counterparts to address
4 transboundary issues pertaining to wildfires, fire
5 weather, wildfire smoke, air quality, and associated
6 conditions and hazards or other relevant meteorolog-
7 ical phenomena, as appropriate, to facilitate full and
8 open exchange of data and information.

9 (2) CONSULTATION.—In carrying out activities
10 under this subsection, the Under Secretary shall
11 consult with the Department of State and such other
12 Federal partners as the Under Secretary considers
13 relevant.

14 **SEC. 713. GENERAL PROVISIONS.**

15 (a) AVOIDANCE OF DUPLICATION.—

16 (1) IN GENERAL.—The Under Secretary shall
17 ensure, to the greatest extent practicable, that ac-
18 tivities carried out under this title and the amend-
19 ments made by this title are not duplicative of activi-
20 ties supported by other parts of the Administration
21 or other relevant Federal agencies.

22 (2) COORDINATION.—In carrying out activities
23 under this title and the amendments made by this
24 title, the Under Secretary shall coordinate with the

1 Administration and heads of other Federal research
2 agencies—

3 (A) to ensure those activities enhance and
4 complement, but do not constitute unnecessary
5 duplication of, efforts; and

6 (B) to ensure the responsible stewardship
7 of funds.

8 (b) **RULE OF CONSTRUCTION.**—Nothing in this title
9 may be construed—

10 (1) to satisfy any requirement for government-
11 to-government consultation with Indian tribes; or

12 (2) to affect or modify any treaty or other right
13 of any Indian tribe.

14 **SEC. 714. AUTHORIZATION OF APPROPRIATIONS.**

15 (a) **IN GENERAL.**—There are authorized to be appro-
16 priated to the Administration to carry out this title and
17 the amendments made by this title—

18 (1) \$15,000,000 for fiscal year 2026;

19 (2) \$20,000,000 for fiscal year 2027;

20 (3) \$27,000,000 for fiscal year 2028;

21 (4) \$36,000,000 for fiscal year 2029; and

22 (5) \$50,000,000 for fiscal year 2030.

23 (b) **PROHIBITION.**—None of the amounts authorized
24 to be appropriated by subsection (a) may be used to un-
25 necessarily duplicate activities funded under title VIII of

1 division D of the Infrastructure Investment and Jobs Act
2 (Public Law 117–58; 135 Stat. 1094).

3 **TITLE VIII—PRECIPITATION ES-**
4 **TIMATES AND LANDSLIDE**
5 **PREPAREDNESS**

6 **SEC. 801. INCLUSION OF ATMOSPHERIC RIVERS AND EX-**
7 **TREME PRECIPITATION EVENTS IN ESTI-**
8 **MATES OF PRECIPITATION FREQUENCY.**

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

12 (1) by redesignating paragraphs (1) and (2) as
13 paragraphs (4) and (5), respectively; and

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

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

19 “(A) produces significant quantities of rain
20 or snow; and

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

23 “(2) ATMOSPHERIC RIVER FLOODING EVENT.—
24 The term ‘atmospheric river flooding event’ means
25 an atmospheric river that—

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

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

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

11 (b) REQUIREMENTS.—Section 12(d)(1) of the Flood
12 Level Observation, Operations, and Decision Support Act
13 (15 U.S.C. 9707(d)(1)) is amended by inserting “, such
14 as precipitation resulting from hurricanes, atmospheric
15 river flooding events, and extreme precipitation events”
16 before the period at the end.

17 **SEC. 802. REAUTHORIZATION OF NATIONAL LANDSLIDE**
18 **PREPAREDNESS ACT.**

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

21 (1) by redesignating paragraphs (4) through
22 (11) as paragraphs (7), (8), (10), (11), (13), (14),
23 (15), and (16), respectively;

24 (2) by inserting after paragraph (3) the fol-
25 lowing:

1 “(4) ATMOSPHERIC RIVER.—The term ‘atmos-
2 pheric river’ has the meaning given the term in sec-
3 tion 12(a) of the Flood Level Observation, Oper-
4 ations, and Decision Support Act (15 U.S.C.
5 9707(a)).

6 “(5) ATMOSPHERIC RIVER FLOODING EVENT.—
7 The term ‘atmospheric river flooding event’ has the
8 meaning given the term in section 12(a) of the
9 Flood Level Observation, Operations, and Decision
10 Support Act (15 U.S.C. 9707(a)).

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

16 (3) by inserting after paragraph (8) (as so re-
17 designated) the following:

18 “(9) INSTITUTION OF HIGHER EDUCATION.—
19 The term ‘institution of higher education’ has the
20 meaning given the term in section 101(a) of the
21 Higher Education Act of 1965 (20 U.S.C.
22 1001(a)).”;

23 (4) by inserting after paragraph (11) (as so re-
24 designated) the following:

1 “(12) NATIVE HAWAIIAN ORGANIZATION.—The
2 term ‘Native Hawaiian organization’ has the mean-
3 ing given the term in section 6207 of the Elemen-
4 tary and Secondary Education Act of 1965 (20
5 U.S.C. 7517), except that the term includes the De-
6 partment of Hawaiian Home Lands and the Office
7 of Hawaiian Affairs.”; and

8 (5) by adding at the end the following:

9 “(17) TRIBAL ORGANIZATION.—The term ‘Trib-
10 al organization’ has the meaning given the term in
11 section 4 of the Indian Self-Determination and Edu-
12 cation Assistance Act (25 U.S.C. 5304).”.

13 (b) NATIONAL LANDSLIDE HAZARDS REDUCTION
14 PROGRAM.—

15 (1) ESTABLISHMENT.—Section 3(a)(3) of the
16 National Landslide Preparedness Act (43 U.S.C.
17 3102(a)(3)) is amended by striking “protect” and
18 inserting “contribute to protecting”.

19 (2) PROGRAM ACTIVITIES.—Section
20 3(b)(1)(C)(ii) of the National Landslide Prepared-
21 ness Act (43 U.S.C. 3102(b)(1)(C)(ii)) is amended
22 by striking “implement” and inserting “dissemi-
23 nate”.

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

4 (A) by redesignating subparagraphs (A)
5 through (C) as clauses (i) through (iii), respec-
6 tively, and indenting appropriately;

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

10 “(A) IN GENERAL.—Not later than”; and

11 (C) by adding at the end the following:

12 “(B) ASSESSMENT.—For purposes of the
13 first national strategy published after the date
14 of enactment of the Weather Research and
15 Forecasting Innovation Reauthorization Act of
16 2026 under subparagraph (A), the Secretary, in
17 consultation with the Secretary of Commerce,
18 shall include an assessment of the risks that at-
19 mospheric river flooding events and extreme
20 precipitation events pose to the safety of life
21 and property in the United States with respect
22 to landslide hazards.”.

23 (4) NATIONAL LANDSLIDE HAZARDS DATA-
24 BASE.—Section 3(b)(3) of the National Landslide

1 Preparedness Act (43 U.S.C. 3102(b)(3)) is amend-
2 ed—

3 (A) by redesignating subparagraphs (C)
4 and (D) as subparagraphs (D) and (E), respec-
5 tively; and

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

8 “(C) the identification of areas in need of
9 additional hazard risk assessment, including
10 areas that may be at risk due to—

11 “(i) hydrology or changes in hydrology
12 that may include erosion, drought, or other
13 characteristics that could impact landslide
14 risk;

15 “(ii) atmospheric river flooding events
16 and extreme precipitation events, as identi-
17 fied by the Secretary of Commerce and the
18 Secretary;

19 “(iii) geologic activity, such as vol-
20 canic eruptions, earthquakes, or tsunamis;
21 or

22 “(iv) data-poor areas or hazards with
23 poor monitoring that could contribute to
24 increased landslide risk;”.

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

5 (A) in the matter preceding subparagraph
6 (A), by inserting “Native Hawaiian organiza-
7 tions and other stakeholders, as appropriate,”
8 before “and Indian tribes”;

9 (B) in subparagraph (A)—

10 (i) in the matter preceding clause (i),
11 by striking “local, and Tribal governments
12 and decisionmakers” and inserting “and
13 local governments, Indian tribes, Tribal or-
14 ganizations, Native Hawaiian organiza-
15 tions, and other decisionmakers”;

16 (ii) by striking clause (iii) and insert-
17 ing the following:

18 “(iii) health and safety with respect to
19 landslides;”;

20 (iii) by redesignating clause (iv) as
21 clause (v); and

22 (iv) by inserting after clause (iii) the
23 following:

24 “(iv) reducing losses from landslides,
25 including the threats caused by atmos-

1 pheric rivers and other extreme precipita-
2 tion events; and”;

3 (C) in subparagraph (B)—

4 (i) in clause (i), by striking “local,
5 and Tribal officials” and inserting “and
6 local officials, Indian tribes, Tribal organi-
7 zations, and Native Hawaiian organiza-
8 tions”;

9 (ii) in clause (ii), by striking “local,
10 and Tribal emergency managers” and in-
11 serting “and local emergency managers
12 and emergency managers of Indian tribes,
13 Tribal organizations, and Native Hawaiian
14 organizations”.

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

18 (A) in subparagraph (B), by striking
19 “State, territorial, local, and Tribal govern-
20 ments” and inserting “State, territorial, and
21 local governments, Indian tribes, Tribal organi-
22 zations, and Native Hawaiian organizations”;

23 (B) by redesignating subparagraphs (A)
24 through (C) as clauses (i) through (iii), respec-
25 tively, and indenting appropriately;

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

4 “(A) IN GENERAL.—In carrying out”; and
5 (D) by adding at the end the following:

6 “(B) CONSULTATION.—In carrying out
7 subparagraph (A), the Secretary may consult
8 with an institution of higher education de-
9 scribed in subsection (d)(2)(B)(iv) and other
10 stakeholders to establish and support emer-
11 gency response procedures, as appropriate.”.

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

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

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

21 “(A) IN GENERAL.—In carrying”;

22 (C) in subparagraph (A) (as so des-
23 ignated)—

24 (i) in the matter preceding clause (i)
25 (as so redesignated), by inserting “Native

1 Hawaiian organizations,” before “and In-
2 dian tribes”;

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

5 (iii) in clause (iii) (as so redesign-
6 nated), by striking the period at the end
7 and inserting “; and”; and

8 (iv) by adding at the end the fol-
9 lowing:

10 “(iv) to improve real-time risk man-
11 agement during landslide events, including
12 with respect to landslide events caused
13 by—

14 “(I) hydrology or changes in hy-
15 drology that may include erosion,
16 drought, or other characteristics that
17 could impact landslide risk;

18 “(II) atmospheric river flooding
19 events and extreme precipitation
20 events, as identified by the Secretary
21 of Commerce and the Secretary;

22 “(III) geologic activity, such as
23 volcanic eruptions, earthquakes, or
24 tsunamis;

1 “(IV) data-poor areas or hazards
2 with poor monitoring that could con-
3 tribute to increased landslide risk; or

4 “(V) thawing permafrost and gla-
5 cial retreat causing destabilization of
6 slopes.”; and

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

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

13 (8) 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 (9) 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 the enactment of the Weather Re-
12 search and Forecasting Innovation Reauthorization
13 Act of 2026, the Secretary shall establish, in each
14 region in which the Secretary determines that there
15 is a high landslide hazard, a regional partnership
16 with an eligible 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 (10) 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 redesignated by paragraph (9)(A))—

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 (11) 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 reded-
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 (12) FUNDING.—Section 3 of the National
18 Landslide Preparedness Act (43 U.S.C. 3102) is
19 amended, in subsection (i) (as redesignated by para-
20 graph (9)(A))—

21 (A) in the matter preceding paragraph (1),
22 by striking “2024” and inserting “2030”; and

23 (B) in paragraph (1), by striking
24 “\$25,000,000 to carry out this section” and in-
25 serting “\$35,000,000 to carry out this section,

1 of which not less than \$10,000,000 shall be
2 made available for the purchase, deployment,
3 and repair of landslide early warning systems in
4 high-risk areas”.

5 (13) DEFICIT REDUCTION.—Section 3 of the
6 National Landslide Preparedness Act (43 U.S.C.
7 3102) is amended by striking subsection (j) (as re-
8 designated by paragraph (9)(A)) and inserting the
9 following:

10 “(j) FUNDING; DEFICIT REDUCTION.—

11 “(1) FUNDING.—Funds used by an agency to
12 carry out this section may, as provided in advance
13 in appropriations Acts, only come from amounts au-
14 thorized to be appropriated to that agency.

15 “(2) DEFICIT REDUCTION.—Any amount ap-
16 propriated to an account of a Federal agency for the
17 Federal agency to carry out a responsibility under
18 this section that is cancelled pursuant to section
19 1552(a) of title 31, United States Code, shall be
20 transferred to the general fund of the Treasury and
21 be applied to deficit reduction.”.

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 “2034”.

23 **SEC. 803. NEXT GENERATION WATER OBSERVING SYSTEM.**

24 The Act of December 24, 1942 (56 Stat. 1086, chap-
25 ter 822; 43 U.S.C. 36b), is amended—

1 (1) in the first section, by striking “That the
2 Secretary of the Interior” and inserting the fol-
3 lowing:

4 **“SECTION 1. GAGING STREAMS AND UNDERGROUND**
5 **WATER RESOURCES.**

6 “The Secretary of the Interior (referred to in this Act
7 as the ‘Secretary’);”;

8 (2) in section 1 (as so designated)—

9 (A) in the second sentence, by striking “of
10 the Interior”; and

11 (B) in the proviso—

12 (i) by striking “this Act” each place it
13 appears and inserting “this section”; and

14 (ii) by striking “of the Interior”; and

15 (3) by adding at the end the following:

16 **“SEC. 2. NEXT GENERATION WATER OBSERVING SYSTEM.**

17 “(a) ESTABLISHMENT.—The Secretary shall estab-
18 lish within the United States Geological Survey a system,
19 to be known as the ‘Next Generation Water Observing
20 System’ (referred to in this section as the ‘System’).

21 “(b) PURPOSE.—The purpose of the System is to
22 provide real-time data on water quantity and quality—

23 “(1) that, as compared to previous systems, is
24 more affordable, more rapid, and available in more
25 locations; and

- 1 “(2) to support advanced modeling tools—
- 2 “(A) to provide state-of-the-art flood and
- 3 drought forecasts;
- 4 “(B) to inform emergency- and water-man-
- 5 agement decision support systems; and
- 6 “(C) to help evaluate—
- 7 “(i) the near-term and long-term risks
- 8 of floods and droughts, including any sce-
- 9 narios that modify those risks;
- 10 “(ii) the quantity of water stored in
- 11 seasonal snow packs, and how changes in
- 12 seasonal snow packs affect water supplies;
- 13 “(iii) the early stages of drought;
- 14 “(iv) the predicted timelines for
- 15 drought recovery;
- 16 “(v) the quantity of water lost to
- 17 evapotranspiration;
- 18 “(vi) water quality differences during
- 19 wet and dry periods;
- 20 “(vii) the effects of streamflow on
- 21 groundwater;
- 22 “(viii) the effects of groundwater on
- 23 streamflow; and

1 “(ix) ice and water volume stored in
2 glaciers and changing water volumes due
3 to glacial retreat.

4 “(c) SYSTEM REQUIREMENTS.—The System shall
5 provide for—

6 “(1) state-of-the-art measurements;

7 “(2) a dense array of sensors at selected sites;

8 “(3) increased spatial and temporal coverage;

9 “(4) new technology testing and implementa-
10 tion;

11 “(5) improved operational efficiency; and

12 “(6) modernized and timely data storage and
13 delivery.

14 “(d) PRIORITY REGIONS.—In determining in which
15 regions of the United States Geological Survey to carry
16 out the System, the Secretary shall give priority to regions
17 of the United States Geological Survey in which there is—

18 “(1) a high level of drought;

19 “(2) a reliance on reservoirs for water storage;

20 “(3) a reliance on hydrologic storage, including
21 groundwater, aquifers, and snowpack; and

22 “(4) flooding and extreme rainfall.

23 “(e) AUTHORIZATION OF APPROPRIATIONS.—

24 “(1) IN GENERAL.—There is authorized to be
25 appropriated to carry out this section in 10 initial

1 basins, as determined by the Secretary, \$30,000,000
2 for fiscal year 2026, to remain available until ex-
3 pended.

4 “(2) DERIVATION OF FUNDS.—Amounts made
5 available to carry out this section shall be derived
6 from amounts appropriated or otherwise made avail-
7 able to the United States Geological Survey.”.

8 **SEC. 804. WATER DATA ENHANCEMENT AND NATIONAL**
9 **GROUNDWATER RESOURCES MONITORING**
10 **BY UNITED STATES GEOLOGICAL SURVEY.**

11 Section 9507 of the Omnibus Public Land Manage-
12 ment Act of 2009 (42 U.S.C. 10367) is amended—

13 (1) in subsection (a)—

14 (A) in paragraph (2)(C)—

15 (i) in clause (i), by striking “and” at
16 the end;

17 (ii) in clause (ii), by inserting “and”
18 after the semicolon at the end; and

19 (iii) by adding at the end the fol-
20 lowing:

21 “(iii) the conduct of groundwater
22 quality assessments relating to permafrost
23 thaw and changes in precipitation rates;”;

24 (B) in paragraph (4)—

25 (i) in subparagraph (A)—

1 (I) in the matter preceding clause
2 (i), by striking “10 years” and insert-
3 ing “11 years”; and

4 (II) in clause (i), by striking “na-
5 tional streamflow information pro-
6 gram” and inserting “Federal priority
7 streamgauge program”;

8 (ii) in subparagraph (B), by striking
9 “Federal Priority streamgauge program”
10 and inserting “Federal Priority
11 Streamgauge Network”; and

12 (iii) by adding at the end the fol-
13 lowing:

14 “(C) PRIORITY SITES.—In selecting sites
15 for the installation of streamgages under sub-
16 paragraph (A), the Secretary shall give priority
17 to regions of the United States Geological Sur-
18 vey in which there is—

19 “(i) a high level of drought;

20 “(ii) a reliance on reservoirs for water
21 storage;

22 “(iii) a reliance on hydrologic storage,
23 including groundwater, aquifers, and
24 snowpack; and

25 “(iv) flooding and extreme rainfall.

1 “(D) NO IMPACT ON EXISTING SITES.—
2 The priority provided under subparagraph (C)
3 shall have no impact on any site or region in
4 which a streamgage has been installed, and is
5 operating, as of the date of enactment of the
6 Weather Research and Forecasting Innovation
7 Reauthorization Act of 2026, subject to the
8 condition that the data from such a site or re-
9 gion are continuing to meet the priority needs
10 of stakeholders, as determined by the Sec-
11 retary.”; and

12 (C) in paragraph (6)—

13 (i) in subparagraph (B), by striking
14 “\$10,000,000 for each of fiscal years 2009
15 through 2028” and inserting “\$30,000,000
16 for each of fiscal years 2026 through
17 2033”; and

18 (ii) by adding at the end the fol-
19 lowing:

20 “(C) DERIVATION OF FUNDS.—Amounts
21 made available to carry out this subsection shall
22 be derived from amounts appropriated or other-
23 wise made available to the United States Geo-
24 logical Survey.”; and

25 (2) in subsection (b)—

1 (A) in paragraph (2)—

2 (i) in subparagraph (B), in the matter
3 preceding clause (i), by striking “and State
4 and local water resource agencies and
5 Tribes” and inserting “, State and local
6 water resource agencies, Indian tribes,
7 Tribal organizations, and Native Hawaiian
8 organizations”; and

9 (ii) in subparagraph (C), by striking
10 “State water resource agency or Tribe”
11 and inserting “State water resource agen-
12 cy, Indian tribe, Tribal organization, or
13 Native Hawaiian organization”;

14 (B) in paragraph (6)—

15 (i) by striking “give priority to those
16 activities” and inserting the following:
17 “give priority to—
18 “(A) activities”;

19 (ii) in subparagraph (A) (as so des-
20 ignated)—

21 (I) by striking “State, a Tribe”
22 and inserting “State, Indian tribe,
23 Tribal organization, Native Hawaiian
24 organization,”; and

1 (II) by striking the period at the
2 end and inserting “; and”; and

3 (iii) by adding at the end the fol-
4 lowing:

5 “(B) activities conducted in regions of the
6 United States Geological Survey in which there
7 is—

8 “(i) a high level of drought;

9 “(ii) a reliance on reservoirs for water
10 storage;

11 “(iii) a reliance on hydrologic storage,
12 including groundwater, aquifers, and
13 snowpack; and

14 “(iv) flooding and extreme rainfall.”;
15 and

16 (C) in paragraph (7)—

17 (i) by striking “There are authorized
18 to be appropriated” and inserting the fol-
19 lowing:

20 “(A) IN GENERAL.—There is authorized to
21 be appropriated”; and

22 (ii) by adding at the end the fol-
23 lowing:

24 “(B) DERIVATION OF FUNDS.—Amounts
25 made available to carry out this subsection shall

1 be derived from amounts appropriated or other-
2 wise made available to the United States Geo-
3 logical Survey.”.

4 **TITLE IX—IMPORTATION OF RED** 5 **SNAPPER**

6 **SEC. 901. METHODOLOGY FOR IDENTIFYING THE COUNTRY** 7 **OF ORIGIN OF SEAFOOD.**

8 (a) DEFINITIONS.—In this section:

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

12 (2) APPROPRIATE COMMITTEES OF CON-
13 GRESS.—The term “appropriate committees of Con-
14 gress” means—

15 (A) the Committee on Commerce, Science,
16 and Transportation of the Senate; and

17 (B) the Committee on Transportation and
18 Infrastructure and the Committee on Natural
19 Resources of the House of Representatives.

20 (3) KEY AGENCY LEADERSHIP.—The term “key
21 agency leadership” means the Administrator and the
22 Under Secretary in consultation with the Commis-
23 sioner of U.S. Customs and Border Protection and
24 the Commandant of the Coast Guard.

1 (4) RED SNAPPER.—The term “red snapper”
2 means the species *Lutjanus campechanus*.

3 (5) TUNA.—The term “tuna” means the fol-
4 lowing species of tuna:

5 (A) Bigeye tuna (*Thunnus obesus*).

6 (B) Yellowfin tuna (*Thunnus albacares*).

7 (C) Bluefin tuna (*Thunnus thynnus*).

8 (6) UNDER SECRETARY.—The term “Under
9 Secretary” means the Under Secretary of Commerce
10 for Standards and Technology and the Director of
11 the National Institute of Standards and Technology.

12 (b) STANDARD METHODOLOGY FOR IDENTIFICA-
13 TION.—

14 (1) IN GENERAL.—Key agency leadership shall,
15 in accordance with this section, jointly develop a
16 standard methodology, based on chemical analysis,
17 for identifying the country of origin of seafood to
18 support enforcement against illegal, unreported, and
19 unregulated fishing.

20 (2) REQUIREMENTS.—Key agency leadership
21 shall ensure that the methodology developed under
22 this subsection—

23 (A) is consistent with the needs of Federal
24 and State law enforcement agencies in com-

1 bating illegal, unreported, and unregulated fish-
2 ing;

3 (B) minimizes processing time;

4 (C) involves the use of a field kit that can
5 be easily carried by one individual; and

6 (D) to the extent practicable, can be used
7 to test prepared food, including raw prepara-
8 tions of seafood such as ceviche, sashimi, sushi,
9 and poke.

10 (3) INITIAL SPECIES FOR IDENTIFICATION.—In
11 developing the methodology under this subsection,
12 key agency leadership shall conduct pilot studies on
13 red snapper, as an example of a stationary stock,
14 and tuna, as an example of a highly migratory stock.

15 (c) REPORT.—Not later than 2 years after the date
16 of the enactment of this Act, the Under Secretary shall
17 submit to the appropriate committees of Congress a report
18 that includes the following:

19 (1) A summary of the methodology developed
20 under subsection (b).

21 (2) A plan for operationalizing the methodology
22 developed under subsection (b).

23 (3) In the event that any aspect of the method-
24 ology developed under subsection (b) is impracti-
25 cable, an explanation of why, whether additional re-

1 search would make developing such a methodology
2 practicable, and whether a different approach other
3 than chemical analysis might be practicable.

4 **SEC. 902. TECHNICAL ASSISTANCE FOR ILLEGAL, UNRE-**
5 **PORTED, OR UNREGULATED FISHING EN-**
6 **FORCEMENT.**

7 (a) IN GENERAL.—The Secretary of Defense is au-
8 thorized to, in coordination with the United States Coast
9 Guard, expend funds appropriated for the Department of
10 Defense for operation and maintenance to provide mari-
11 time technical assistance to maritime forces from other
12 nations in efforts to combat illegal, unreported, or unregu-
13 lated fishing (commonly known as “IUU fishing”) and
14 other transnational organized crime.

15 (b) APPLICATION OF AUTHORITY.—The authority
16 provided under subsection (a) shall apply to the use of—

17 (1) the United States Coast Guard members
18 deployed to and operating aboard Department of
19 Defense, partner nation, or international partner
20 platforms; and

21 (2) partner nation personnel operating aboard
22 United States military and Coast Guard assets or
23 international partner vessels, as appropriate.

1 **TITLE X—IMPROVING CYBERSE-**
2 **CURITY AND TELECOMMUNI-**
3 **CATIONS FOR OCEANIC RE-**
4 **SEARCH**

5 **SEC. 1001. DEFINITIONS.**

6 In this title:

7 (1) **DIRECTOR.**—The term “Director” means
8 the Director of the National Science Foundation.

9 (2) **OCEANOGRAPHIC RESEARCH VESSEL.**—The
10 term “oceanographic research vessel” has the mean-
11 ing given the term in section 2101 of title 46,
12 United States Code.

13 (3) **U.S. ACADEMIC RESEARCH FLEET.**—The
14 term “U.S. Academic Research Fleet” means the
15 United States flagged vessels that—

16 (A) have been accepted into, and are active
17 participants administered within, the Univer-
18 sity-National Oceanographic Laboratory Sys-
19 tem;

20 (B) are operated as oceanographic research
21 vessels by research universities and laboratories;

22 (C) receive funding from the National
23 Science Foundation; and

1 (D) have achieved designation as a mem-
2 ber vessel of the fleet through a standard eval-
3 uation process.

4 **SEC. 1002. PLAN TO IMPROVE CYBERSECURITY AND TELE-**
5 **COMMUNICATIONS OF U.S. ACADEMIC RE-**
6 **SEARCH FLEET.**

7 (a) IN GENERAL.—Not later than 1 year after the
8 date of enactment of this Act, the Director shall, in con-
9 sultation with the head of any Federal agency, university,
10 or laboratory that owns or operates a vessel of the U.S.
11 Academic Research Fleet, submit to the Committee on
12 Commerce, Science, and Transportation of the Senate and
13 the Committee on Science, Space, and Technology of the
14 House of Representatives a plan to improve the cybersecu-
15 rity and telecommunications of the U.S. Academic Re-
16 search Fleet.

17 (b) ELEMENTS.—The plan required by subsection (a)
18 shall include—

19 (1) an assessment of the telecommunications
20 and networking needs of the U.S. Academic Re-
21 search Fleet, consistent with the typical scientific
22 missions of the vessels of such fleet;

23 (2) in consultation with guidance issued by the
24 Cybersecurity and Infrastructure Security Agency
25 and the National Institute of Standards and Tech-

1 nology, an assessment of cybersecurity needs appro-
2 priate for—

3 (A) the ownership of vessels within the
4 U.S. Academic Research Fleet; and

5 (B) the scientific missions of such vessels;

6 (3) an assessment of the costs necessary to
7 meet the needs described in paragraphs (1) and (2),
8 including—

9 (A) any necessary equipment, such as sat-
10 ellite communications equipment, software,
11 high-performance computing clusters shipboard
12 and shoreside, or enterprise hardware; and

13 (B) estimated personnel costs in excess of
14 current expenditures, including any necessary
15 training, support, or logistics;

16 (4) an assessment of the time required to im-
17 plement any upgrades required to meet the needs
18 described in paragraphs (1) and (2) under varying
19 budgets and funding scenarios;

20 (5) the adoption of common solutions or
21 consortial licensing agreements, or by centralizing
22 elements of fleet cybersecurity, telecommunications,
23 or data management at a single facility; and

24 (6) in consultation with any non-Federal owners
25 of a vessel of the U.S. Academic Research Fleet, a

1 spending plan for the National Science Foundation,
2 the Office of Naval Research, non-Federal owners of
3 vessels of the U.S. Academic Research Fleet, users
4 of the U.S. Academic Research Fleet, or any com-
5 bination thereof, to provide funding to cover the
6 costs described in paragraph (3).

7 (c) CONSIDERATIONS.—The Director shall, in pre-
8 paring the plan required by subsection (a), consider—

9 (1) the network capabilities, including speed
10 and bandwidth targets, necessary to meet the sci-
11 entific mission needs of each class of vessel of the
12 U.S. Academic Research Fleet for such purposes
13 as—

14 (A) executing the critical functions and
15 communications of the vessels;

16 (B) providing network access to conduct
17 medical care via telemedicine or related crisis
18 response;

19 (C) as necessary to meet operations,
20 uploading any scientific data to a shoreside
21 server, including the copying of data off ship
22 for disaster recovery or risk mitigation pur-
23 poses;

24 (D) as appropriate, conducting real-time
25 streaming to enable shore-based observers to

1 participate in ship-based maintenance or re-
2 search activities; and

3 (E) real-time coordinated viewing of—

4 (i) scientific instrumentation so that it
5 is possible to conduct scientific surveys and
6 seafloor mapping with fully remote subject-
7 matter experts; and

8 (ii) critical operational technology by
9 manufacturers and vendors so that it is
10 possible to carry out maintenance and re-
11 pairs to systems with limited expertise on
12 the vessel, with fully remote subject-matter
13 experts advising; and

14 (2) in consultation with the Director of the Cy-
15 bersecurity and Infrastructure Security Agency, the
16 Director of the National Institute of Standards and
17 Technology, and the heads of other Federal agen-
18 cies, as appropriate—

19 (A) the cybersecurity recommendations in
20 the report of the private scientific advisory
21 group known as JASON entitled “Cybersecurity
22 at NSF Major Facilities” (JSR-21-10E) and
23 dated October 2021 as applied to the U.S. Aca-
24 demic Research Fleet;

1 (B) standards and guidance for informa-
2 tion security, including the use of encryption for
3 sensitive information, the detection and han-
4 dling of security incidents, and other areas de-
5 termined relevant by the Director;

6 (C) facilitating access to cybersecurity per-
7 sonnel and training of research and support
8 personnel; and

9 (D) the requirements for controlled unclas-
10 sified or classified information.

11 **TITLE XI—OTHER AUTHORITIES**

12 **SEC. 1101. RELOCATION ALLOWANCES.**

13 (a) IN GENERAL.—The Under Secretary, acting
14 through the Director of the National Weather Service,
15 may establish an alternative or fixed rate relocation allow-
16 ance for employees of the National Weather Service trans-
17 ferred in the interest of the Federal Government from one
18 official station to another for permanent duty, including
19 employees transferred to the National Weather Service
20 from another Federal agency, and for the immediate fam-
21 ily of the employee, notwithstanding subchapter II of
22 chapter 57 of title 5, United States Code, and any regula-
23 tions prescribed under that subchapter.

24 (b) SERVICE AGREEMENT.—Nothing in this section
25 shall be construed to abrogate the requirement that an

1 employee to be afforded a relocation allowance under sub-
2 section (a) agree in writing to remain in the Government
3 service as would otherwise be required by and under the
4 same terms as provided in sections 5722 and 5724 of title
5 5, United States Code, as relevant to transfers of employ-
6 ees to posts of duty outside the continental United States
7 and official stations within the continental United States,
8 respectively.

9 (c) RELOCATION ALLOWANCE DEFINED.—In this
10 section, the term “relocation allowance” includes any al-
11 lowance authorized under section 5724, 5724a, 5726,
12 5727, or 5729 of title 5, United States Code.

13 **SEC. 1102. UNFUNDED PRIORITIES LIST, REPORTS, AND**
14 **PLANS.**

15 (a) DEFINITIONS.—In this section:

16 (1) APPROPRIATE COMMITTEES OF CON-
17 GRESS.—The term “appropriate committees of Con-
18 gress” means—

19 (A) the Committee on Commerce, Science,
20 and Transportation of the Senate;

21 (B) the Committee on Appropriations of
22 the Senate;

23 (C) the Committee on Natural Resources
24 of the House of Representatives;

1 (D) the Committee on Science, Space, and
2 Technology of the House of Representatives;
3 and

4 (E) the Committee on Appropriations of
5 the House of Representatives.

6 (2) CAPITAL BUDGETARY LINE ITEM.—The
7 term “capital budgetary line item” means a line
8 item in the budget justification materials submitted
9 to Congress in support of the budget of the Presi-
10 dent for a fiscal year pursuant to section 1105 of
11 title 31, United States Code, for any aircraft or ves-
12 sel for the National Oceanic and Atmospheric Ad-
13 ministration valued at more than \$3,000,000.

14 (3) INFRASTRUCTURE AND ASSETS.—The term
15 “infrastructure and assets” means—

16 (A) repair and construction of infrastruc-
17 ture, facilities, and laboratories;

18 (B) instrumentation;

19 (C) resources for data storage and anal-
20 ysis, including options for cloud-based and
21 supercomputing services; and

22 (D) with respect to the Office of Marine
23 and Aviation Operations, aircraft, vessels, and
24 uncrewed systems, associated facility construc-
25 tion and repair needs, instrumentation, and re-

1 requirements to operate new and existing assets
2 to reliably meet the mission needs of the Na-
3 tional Oceanic and Atmospheric Administration.

4 (4) UNFUNDED PRIORITY.—The term “un-
5 funded priority” means a program or mission re-
6 quirement that—

7 (A) has not been selected for funding in
8 the applicable proposed budget;

9 (B) is necessary to fulfill a statutory or
10 mission requirement; and

11 (C) the Under Secretary would have rec-
12 ommended for inclusion in the applicable pro-
13 posed budget had additional resources been
14 available or had the requirement emerged be-
15 fore the budget was submitted.

16 (b) UNFUNDED PRIORITIES LIST.—

17 (1) IN GENERAL.—Not later than 15 days after
18 the date on which the President submits to Congress
19 the budget of the President for a fiscal year pursu-
20 ant to section 1105 of title 31, United States Code,
21 the Under Secretary, in consultation with the Assist-
22 ant Administrator for each line office of the Na-
23 tional Oceanic and Atmospheric Administration,
24 shall submit to the appropriate committees of Con-

1 gress a report that includes a list of unfunded prior-
2 ities of the Administration.

3 (2) INCLUSIONS.—The list required by para-
4 graph (1) shall include unfunded priorities related to
5 the needs of the National Oceanic and Atmospheric
6 Administration—

7 (A) to meet statutory and mission require-
8 ments to—

9 (i) protect human life, property, and
10 the economy from the impacts of weather
11 and water;

12 (ii) manage the Nation’s fisheries and
13 ocean, coastal, and Great Lakes resources;
14 and

15 (iii) manage, steward, and make im-
16 provements to data storage, accessibility,
17 interoperability, and utilization;

18 (B) with respect to infrastructure and as-
19 sets to meet statutory and mission require-
20 ments, including—

21 (i) needs with respect to—

22 (I) repair and construction of in-
23 frastructure, facilities, and labora-
24 tories;

1 (II) scientific support equipment
2 and instrumentation; and

3 (III) resources for data storage
4 and analysis, including options for
5 cloud-based and supercomputing serv-
6 ices; and

7 (ii) with respect to the Office of Ma-
8 rine and Aviation Operations, in coordina-
9 tion with the Assistant Administrator for
10 Marine and Aviation Operations, needs
11 with respect to aircraft and vessels, associ-
12 ated facility construction and repair needs,
13 and resources required to operate new and
14 existing assets;

15 (C) with respect to operational shortfalls
16 that compromise the ability of the National
17 Oceanic and Atmospheric Administration to
18 meet the statutory and mission requirements
19 described in subparagraph (A), including by
20 compromising the ability of the Administration
21 to meet those requirements in a timely manner;

22 (D) with respect to mitigating fishery dis-
23 asters, including in accordance with the require-
24 ments under the heading “FISHERIES DISASTER
25 ASSISTANCE” in title II of the Disaster Relief

1 Supplemental Appropriations Act, 2023 (divi-
2 sion N of Public Law 117–328; 136 Stat.
3 5205); and

4 (E) with respect to transitioning successful
5 experimental programs under the Office of Ocea-
6 nic and Atmospheric Research as of the date
7 of the enactment of this Act into an operational
8 capacity under another office of the National
9 Oceanic and Atmospheric Administration.

10 (3) PRIORITIZATION.—The list required by
11 paragraph (1) shall—

12 (A) present the unfunded priorities of the
13 National Oceanic and Atmospheric Administra-
14 tion in order from highest to lowest priority, as
15 determined by the Under Secretary; and

16 (B) with respect to each unfunded priority,
17 include—

18 (i) a brief description of the unfunded
19 priority and its relationship to the statu-
20 tory and mission requirements of the Na-
21 tional Oceanic and Atmospheric Adminis-
22 tration;

23 (ii) an estimate of the funding level
24 required; and

1 (iii) an assessment of the status of the
2 design or acquisition program, if applica-
3 ble.

4 (c) STOCK ASSESSMENTS AND SURVEYS.—

5 (1) PLANNED STOCK ASSESSMENTS AND SUR-
6 VEYS.—Not later than February 1 of each year, the
7 Under Secretary, in consultation with the Assistant
8 Administrator for Marine and Aviation Operations
9 and the Assistant Administrator for the National
10 Marine Fisheries Service, shall make available on a
11 publicly accessible website a list of planned stock as-
12 sessments and surveys for the upcoming fiscal year.

13 (2) PRIORITY STOCK ASSESSMENTS IN UN-
14 FUNDED PRIORITIES LIST.—The list required by
15 subsection (b)(1) shall include priority stock assess-
16 ments described in subparagraph (B)(ii) of section
17 304(e)(1) of the Magnuson-Stevens Fishery Con-
18 servation and Management Act (16 U.S.C.
19 1854(e)(1)), as added by paragraph (3), that are
20 unfunded priorities.

21 (3) DATA-POOR STOCKS.—Section 304(e)(1) of
22 the Magnuson-Stevens Fishery Conservation and
23 Management Act (16 U.S.C. 1854(e)(1)) is amend-
24 ed—

25 (A) by inserting “(A)” after “(1)”; and

1 (B) by adding at the end the following:

2 “(B) The report required by subparagraph (A)
3 shall include—

4 “(i) an assessment of whether stock survey
5 data is adequately available, not available, or
6 not sufficiently available;

7 “(ii) priority stock assessments and sur-
8 veys conducted for the purpose of—

9 “(I) significantly decreasing uncer-
10 tainty in stock assessments;

11 “(II) maintaining continuity of data
12 for species management; or

13 “(III) increasing the ability of the Na-
14 tional Oceanic and Atmospheric Adminis-
15 tration to meet the statutory and mission
16 requirements described in section
17 1103(b)(2)(A) of the Weather Research
18 and Forecasting Innovation Reauthoriza-
19 tion Act of 2026; and

20 “(iii) for the priority stock assessments
21 under clause (ii), a description of the type, re-
22 source needs, and estimated cost of increased
23 survey efforts to meet the goals under that
24 clause.”.

25 (d) CAPITAL INVESTMENT PLAN.—

1 (1) IN GENERAL.—Not later than 60 days after
2 the date on which the President submits to Congress
3 the budget of the President for a fiscal year pursu-
4 ant to section 1105 of title 31, United States Code,
5 the Under Secretary, in consultation with the Assist-
6 ant Administrator for Marine and Aviation Oper-
7 ations and the Assistant Administrators for the line
8 offices of the National Oceanic and Atmospheric Ad-
9 ministration, as appropriate, shall submit to the ap-
10 propriate committees of Congress a future-years
11 capital investment plan.

12 (2) INCLUSIONS.—The plan required by para-
13 graph (1) shall include—

14 (A) the fleet replacement and moderniza-
15 tion plan required by section 604 of the NOAA
16 Fleet Modernization Act (33 U.S.C. 891b);

17 (B) the NOAA Aircraft Recapitalization
18 Plan and any plan developed to carry out sec-
19 tion 11708 of the Don Young Coast Guard Au-
20 thorization Act of 2022 (division K of Public
21 Law 117–263; 33 U.S.C. 851 note prec.);

22 (C) a replacement and modernization plan
23 of any National Oceanic and Atmospheric Ad-
24 ministration spaced-based observation platforms
25 maintained under section 301 of the of the

1 Weather Research and Forecasting Innovation
2 Act of 2017 (15 U.S.C. 8531); and

3 (D) any other plan the Under Secretary
4 considers appropriate.

5 (3) ELEMENTS.—The plan required by para-
6 graph (1) shall identify, for each capital budgetary
7 line item—

8 (A) the proposed funding level included in
9 the applicable proposed budget;

10 (B) the total estimated cost of completion;

11 (C) projected funding levels for each fiscal
12 year for the next 5 fiscal years or until comple-
13 tion, whichever is earlier;

14 (D) an estimated completion date at the
15 projected funding levels; and

16 (E) changes, if any, in the total estimated
17 cost of completion or estimated completion date
18 from previous future-years capital investment
19 plans submitted under this subsection.

20 **SEC. 1103. MISCELLANEOUS AUTHORITIES.**

21 (a) TECHNICAL ASSISTANCE IN THE PACIFIC.—

22 (1) IN GENERAL.—Subject to the availability of
23 appropriations, and at the discretion of the Sec-
24 retary of Commerce, in consultation with the Sec-
25 retary of State, the Under Secretary may provide to

1 Pacific Island parties technical assistance and serv-
2 ices in line with the mission of the National Oceanic
3 and Atmospheric Administration.

4 (2) REGIONAL CAPACITY.—

5 (A) USE OF EXISTING PROGRAMS, OF-
6 FICES, AND SITES.—To implement this sub-
7 section, the Under Secretary shall primarily use
8 existing programs, offices, and sites of the Na-
9 tional Oceanic and Atmospheric Administration
10 in the Pacific Islands region.

11 (B) COOPERATIVE INSTITUTE.—In order
12 to further augment existing regional capacity in
13 the Pacific Islands region, the Under Secretary
14 may consider the formation of a cooperative in-
15 stitute to focus and advise on the unique needs
16 of that region.

17 (3) PACIFIC ISLAND PARTIES DEFINED.—In
18 this subsection, the term “Pacific Island parties”
19 means—

20 (A) the Trust Territories of the Pacific Is-
21 lands;

22 (B) the Republic of Palau, the Republic of
23 the Marshall Islands, and the Federated States
24 of Micronesia, which have each entered into a

1 Compact of Free Association with the United
2 States; and

3 (C) such other parties as the Under Sec-
4 retary considers appropriate.

5 (b) STATE ASSISTANCE.—The Under Secretary may
6 provide technical assistance, data, and operational prod-
7 ucts or services in support of State governments, or enti-
8 ties and institutions partnering or collaborating with State
9 governments, in the voluntary production of relevant State
10 assessments.

11 (c) INTERNATIONAL COLLABORATION.—

12 (1) IN GENERAL.—The Under Secretary, acting
13 through the Director of the National Weather Serv-
14 ice, may establish and maintain partnerships and
15 other relationships with national and regional weath-
16 er services around the world to support the co-devel-
17 opment and deployment of meteorological informa-
18 tion and instrumentation.

19 (2) EXISTING AGREEMENTS AND PARTNER-
20 SHIPS.—Partnerships and other relationships estab-
21 lished and maintained under paragraph (1), includ-
22 ing those provided by the international desks of the
23 National Centers for Environmental Prediction, shall
24 build upon existing agreements and partnerships
25 with the Department of State, other relevant Fed-

1 eral agencies, and the World Meteorological Organi-
2 zation.

3 (d) **AUTHORITY TO PAY CERTAIN MEETING EX-**
4 **PENSES.**—Notwithstanding section 1345 of title 31,
5 United States Code, the Under Secretary may, subject to
6 the availability for appropriations, may incur reasonable
7 subsistence expenses directly related to hosting a meeting
8 or conference in the United States, excluding expenses re-
9 lated to travel, transportation, lodging, and per diem for
10 non-Federal employees.

11 (e) **SERVICE MODERNIZATION.**—The Under Sec-
12 retary shall ensure that data, services, and products of the
13 National Oceanic and Atmospheric Administration comply
14 with the 21st Century Integrated Digital Experience Act
15 (Public Law 115–336; 44 U.S.C. 3501 note) to increase
16 the utility of and access to data, services, and products
17 of the National Oceanic and Atmospheric Administration.

18 (f) **BRIEFING.**—Not later than 1 year after the date
19 of enactment of this Act, the Under Secretary shall pro-
20 vide to the Committee on Commerce, Science, and Trans-
21 portation of the Senate and the Committee on Science,
22 Space, and Technology of the House of Representatives
23 a briefing on the topic, number, and time commitment of
24 intra-agency and interagency meetings, councils, boards,
25 and summits attended by each line office Assistant Admin-

1 istrator and Deputy Administrator of the National Oce-
2 anic and Atmospheric Administration.