

117TH CONGRESS  
1ST SESSION

# S. 558

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## AN ACT

To establish a national integrated flood information system within the National Oceanic and Atmospheric Administration, and for other purposes.

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

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

2 (a) SHORT TITLE.—This Act may be cited as the  
 3 “Flood Level Observation, Operations, and Decision Sup-  
 4 port Act” or the “FLOODS Act”.

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

- Sec. 1. Short title; table of contents.
- Sec. 2. Definitions.
- Sec. 3. National Integrated Flood Information System.
- Sec. 4. Observations and modeling for total water prediction.
- Sec. 5. Service coordination hydrologists at River Forecast Centers of the Na-  
tional Weather Service.
- Sec. 6. Improving National Oceanic and Atmospheric Administration commu-  
nication of future flood risks and hazardous flash flood events.
- Sec. 7. Freshwater monitoring along the coast.
- Sec. 8. Tornado warning improvement.
- Sec. 9. Hurricane forecast improvement program.
- Sec. 10. Weather and water research and development planning.
- Sec. 11. Forecast communication coordinators.
- Sec. 12. Estimates of precipitation frequency in the United States.
- Sec. 13. Interagency Committee on Water Management and Infrastructure.
- Sec. 14. National Weather Service hydrologic research fellowship program.
- Sec. 15. Identification and support of consistent, Federal set of forward-look-  
ing, long-term meteorological information.
- Sec. 16. Gap analysis on availability of snow-related data to assess and predict  
flood and flood impacts.
- Sec. 17. Availability to the public of flood-related data.

7 **SEC. 2. DEFINITIONS.**

8 In this Act:

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

12 (2) STATE.—The term “State” means each  
 13 State of the United States, the District of Columbia,  
 14 the Commonwealth of Puerto Rico, American  
 15 Samoa, Guam, the Commonwealth of the Northern  
 16 Mariana Islands, the Virgin Islands of the United

1 States, and any other territory or possession of the  
2 United States.

3 **SEC. 3. NATIONAL INTEGRATED FLOOD INFORMATION SYS-**  
4 **TEM.**

5 (a) IN GENERAL.—The Administrator shall establish  
6 a system, to be known as the “National Integrated Flood  
7 Information System”, to better inform and provide for  
8 more timely decision making to reduce flood-related effects  
9 and costs.

10 (b) SYSTEM FUNCTIONS.—The Administrator,  
11 through the National Integrated Flood Information Sys-  
12 tem, shall—

13 (1) provide an effective flood early warning sys-  
14 tem that—

15 (A) collects and integrates information on  
16 the key indicators of floods and flood impacts,  
17 including streamflow, reservoir release and di-  
18 version, precipitation, soil moisture, snow water  
19 equivalent, land cover, and evaporative demand;

20 (B) makes usable, reliable, and timely fore-  
21 casts of floods;

22 (C) assesses the severity of flood conditions  
23 and effects;

24 (D) provides information described in sub-  
25 paragraph (A), forecasts described in subpara-

graph (B), and assessments described in subparagraph (C) at the national, regional, and local levels, as appropriate; and

(E) communicates flood forecasts, flood conditions, and flood impacts to appropriate entities engaged in flood planning, preparedness, and response and post-event flood extent, including—

(i) decision makers at the Federal, State, local, and Tribal levels of government; and

(ii) the public;

(2) provide timely data, information, and products that reflect differences in flood conditions among localities, regions, watersheds, and States;

(3) coordinate and integrate, through inter-agency agreements as practicable, Federal research and monitoring in support of the flood early warning information system provided under paragraph (1);

(4) use existing forecasting and assessment programs and partnerships;

(5) make improvements in seasonal precipitation and temperature, subseasonal precipitation and temperature, and flood water prediction; and

1           (6) continue ongoing research and monitoring  
2           activities relating to floods, including research activi-  
3           ties relating to—

4                   (A) the prediction, length, severity, and  
5                   impacts of floods and improvement of the accu-  
6                   racy, timing, and specificity of flash flood warn-  
7                   ings;

8                   (B) the role of extreme weather events and  
9                   climate variability in floods; and

10                  (C) how water travels over and through  
11                  surfaces.

12           (c) PARTNERSHIPS.—The Administrator, through the  
13           National Integrated Flood Information System, may—

14                  (1) engage with the private sector to improve  
15                  flood monitoring, forecasts, land and topography  
16                  data, and communication, if the Administrator de-  
17                  termines that such engagement is appropriate, cost  
18                  effective, and beneficial to the public and decision  
19                  makers described in subsection (b)(1)(E)(i);

20                  (2) facilitate the development of 1 or more aca-  
21                  demic cooperative partnerships to assist in carrying  
22                  out the functions of the National Integrated Flood  
23                  Information System described in subsection (b);

24                  (3) use and support monitoring by citizen sci-  
25                  entists, including by developing best practices to fa-

1 cilitate maximum data integration, as the Adminis-  
2 trator considers appropriate;

3 (4) engage with, and leverage the resources of,  
4 entities within the National Oceanic and Atmos-  
5 pheric Administration in existence as of the date of  
6 the enactment of this Act, such as the National  
7 Weather Service with respect to forecast and warn-  
8 ing functions, the National Integrated Drought In-  
9 formation System, the Regional Climate Center, and  
10 the National Mesonet Program, to improve coordina-  
11 tion of water monitoring, forecasting, and manage-  
12 ment; and

13 (5) engage with and support water monitoring  
14 by the United States Geological Survey—

15 (A) to improve the availability and con-  
16 tinuity of streamflow data at critical locations  
17 through the deployment of rapid deployment  
18 gages and the flood-hardening of at-risk  
19 streamflow gauges; and

20 (B) to increase storm surge monitoring  
21 data through the deployment of additional  
22 storm surge sensors.

23 (d) CONSULTATION.—In developing and maintaining  
24 the National Integrated Flood Information System, the  
25 Administrator shall consult with relevant Federal, State,

1 local, and Tribal government agencies, research institu-  
 2 tions, and the private sector.

3 (e) COOPERATION FROM OTHER FEDERAL AGEN-  
 4 CIES.—Each Federal agency shall cooperate as appro-  
 5 priate with the Administrator in carrying out this section.

6 **SEC. 4. OBSERVATIONS AND MODELING FOR TOTAL WATER**  
 7 **PREDICTION.**

8 (a) PARTNERSHIPS.—

9 (1) IN GENERAL.—The Administrator shall es-  
 10 tablish partnerships with 1 or more institutions of  
 11 higher education (as defined in section 101 of the  
 12 Higher Education Act of 1965 (20 U.S.C. 1001)) to  
 13 evaluate observations that would improve total water  
 14 prediction.

15 (2) PRIORITY OBSERVATIONS.—In establishing  
 16 partnerships under paragraph (1), the Administrator  
 17 shall prioritize partnerships to evaluate observations  
 18 from uncrewed aerial systems.

19 (b) MAINTAINED OBSERVATIONS.—If the Adminis-  
 20 trator determines that incorporating additional observa-  
 21 tions improves total water prediction, the Administrator  
 22 shall, to the extent practicable, continue incorporating  
 23 those observations.

24 (c) MODELING IMPROVEMENTS.—The Administrator  
 25 shall advance geographic coverage, resolution, skill, and

1 efficiency of coastal oceanographic modeling, including ef-  
 2 fects that improve the coupling of and interoperability be-  
 3 tween hydrological models and coastal ocean models.

4 **SEC. 5. SERVICE COORDINATION HYDROLOGISTS AT RIVER**  
 5 **FORECAST CENTERS OF THE NATIONAL**  
 6 **WEATHER SERVICE.**

7 (a) DESIGNATION OF SERVICE COORDINATION HY-  
 8 DROLOGISTS.—

9 (1) IN GENERAL.—The Director of the National  
 10 Weather Service (in this section referred to as the  
 11 “Director”) shall designate at least 1 service coordi-  
 12 nation hydrologist at each River Forecast Center of  
 13 the National Weather Service.

14 (2) PERFORMANCE BY OTHER EMPLOYEES.—  
 15 Performance of the responsibilities outlined in this  
 16 section is not limited to the service coordination hy-  
 17 drologist position.

18 (b) PRIMARY ROLE OF SERVICE COORDINATION HY-  
 19 DROLOGISTS.—The primary role of the service coordina-  
 20 tion hydrologist shall be to carry out the responsibilities  
 21 required by this section.

22 (c) RESPONSIBILITIES.—

23 (1) IN GENERAL.—Subject to paragraph (2),  
 24 consistent with the analysis described in section 409  
 25 of the Weather Research and Forecasting Innovation



1 Act of 2017 (Public Law 115–25; 131 Stat. 112),  
2 and in order to increase impact-based decision sup-  
3 port services, each service coordination hydrologist  
4 designated under subsection (a) shall, with respect  
5 to hydrology—

6 (A) be responsible for providing service to  
7 the geographic area of responsibility covered by  
8 the River Forecast Center at which the service  
9 coordination hydrologist is employed to help en-  
10 sure that users of products and services of the  
11 National Weather Service can respond effec-  
12 tively to improve outcomes from flood events;

13 (B) liaise with users of products and serv-  
14 ices of the National Weather Service, such as  
15 the public, academia, media outlets, users in the  
16 hydropower, transportation, recreation, and ag-  
17 ricultural communities, and forestry, land, fish-  
18 eries, and water management interests, to  
19 evaluate the adequacy and usefulness of the  
20 products and services of the National Weather  
21 Service;

22 (C) collaborate with such River Forecast  
23 Centers and Weather Forecast Offices and Fed-  
24 eral, State, local, and Tribal government agen-  
25 cies as the Director considers appropriate in de-

1           veloping, proposing, and implementing plans to  
2           develop, modify, or tailor products and services  
3           of the National Weather Service to improve the  
4           usefulness of such products and services;

5           (D) engage in interagency partnerships  
6           with Federal, State, local, and Tribal govern-  
7           ment agencies to explore the use of forecast-in-  
8           formed reservoir operations to reduce flood risk;

9           (E) ensure the maintenance and accuracy  
10          of flooding call lists, appropriate office flooding  
11          policy or procedures, and other flooding infor-  
12          mation or dissemination methodologies or strat-  
13          egies; and

14          (F) work closely with Federal, State, local,  
15          and Tribal emergency and floodplain manage-  
16          ment agencies, and other agencies relating to  
17          disaster management, to ensure a planned, co-  
18          ordinated, and effective preparedness and re-  
19          sponse effort.

20          (2) OTHER STAFF.—The Director may assign a  
21          responsibility set forth in paragraph (1) to such  
22          other staff as the Director considers appropriate to  
23          carry out such responsibility.

24          (d) ADDITIONAL RESPONSIBILITIES.—

1           (1) IN GENERAL.—Subject to paragraph (2), a  
2       service coordination hydrologist designated under  
3       subsection (a) may, with respect to hydrology—

4           (A) work with a State agency to develop  
5       plans for promoting more effective use of prod-  
6       ucts and services of the National Weather Serv-  
7       ice throughout the State;

8           (B) identify priority community prepared-  
9       ness objectives;

10          (C) develop plans to meet the objectives  
11       identified under subparagraph (B); and

12          (D) conduct flooding event preparedness  
13       planning and citizen education efforts with and  
14       through various State, local, and Tribal govern-  
15       ment agencies and other disaster management-  
16       related organizations.

17       (2) OTHER STAFF.—The Director may assign a  
18       responsibility set forth in paragraph (1) to such  
19       other staff as the Director considers appropriate to  
20       carry out such responsibility.

1 **SEC. 6. IMPROVING NATIONAL OCEANIC AND ATMOS-**  
2 **PHERIC ADMINISTRATION COMMUNICATION**  
3 **OF FUTURE FLOOD RISKS AND HAZARDOUS**  
4 **FLASH FLOOD EVENTS.**

5 (a) ASSESSMENT OF FLASH FLOOD WATCHES AND  
6 WARNINGS.—

7 (1) IN GENERAL.—Not later than 2 years after  
8 the date of the enactment of this Act, the Adminis-  
9 trator shall—

10 (A) conduct an assessment of—

11 (i) the flash flood watches and warn-  
12 ings of the National Weather Service; and

13 (ii) the information delivery to sup-  
14 port preparation and responses to floods;  
15 and

16 (B) submit to Congress a report on the  
17 findings of the Administrator with respect to  
18 the assessment required by subparagraph (A).

19 (2) ELEMENTS.—The assessment required by  
20 paragraph (1)(A) shall include the following:

21 (A) An evaluation of whether the watches,  
22 warnings, and information described in para-  
23 graph (1)(A) effectively—

24 (i) communicate risk to the general  
25 public;

1 (ii) inform action to prevent loss of  
2 life and property;

3 (iii) inform action to support flood  
4 preparation and response; and

5 (iv) deliver information in a manner  
6 designed to lead to appropriate action.

7 (B) Subject to subsection (b)(2), such rec-  
8 ommendations as the Administrator may have  
9 for—

10 (i) legislative and administrative ac-  
11 tion to improve the watches and warnings  
12 described in paragraph (1)(A)(i); and

13 (ii) such research as the Adminis-  
14 trator considers necessary to address the  
15 focus areas described in paragraph (3).

16 (3) FOCUS AREAS.—The assessment required  
17 by paragraph (1)(A) shall focus on the following  
18 areas:

19 (A) Ways to communicate the risks posed  
20 by hazardous flash flood events to the public  
21 that are most likely to result in informed deci-  
22 sion making regarding the mitigation of those  
23 risks.

24 (B) Ways to provide actionable geographic  
25 information to the recipient of a watch or warn-

1 ing for a flash flood, including partnering with  
2 emergency response agencies, as appropriate.

3 (C) Evaluation of information delivery to  
4 support the preparation for and response to  
5 floods.

6 (4) CONSULTATION.—In conducting the assess-  
7 ment required by paragraph (1)(A), the Adminis-  
8 trator shall consult with—

9 (A) individuals in the academic sector, in-  
10 cluding individuals in the field of social and be-  
11 havioral sciences;

12 (B) other weather services;

13 (C) media outlets and other entities that  
14 distribute the watches and warnings described  
15 in paragraph (1)(A)(i);

16 (D) floodplain managers and emergency  
17 planners and responders, including State, local,  
18 and Tribal emergency management agencies;

19 (E) other government users of the watches  
20 and warnings described in paragraph (1)(A)(i),  
21 including the Federal Highway Administration;  
22 and

23 (F) such other Federal agencies as the Ad-  
24 ministrator determines rely on watches and

1           warnings regarding flash floods for operational  
2           decisions.

3           (5) NATIONAL ACADEMY OF SCIENCES.—The  
4           Administrator shall engage with the National Acad-  
5           emy of Sciences, as the Administrator considers nec-  
6           essary and practicable, including by contracting with  
7           the National Research Council to review the sci-  
8           entific and technical soundness of the assessment re-  
9           quired by paragraph (1)(A), including the rec-  
10          ommendations under paragraph (2)(B).

11          (6) METHODOLOGIES.—In conducting the as-  
12          sessment required by paragraph (1)(A), the Admin-  
13          istrator shall use such methodologies as the Admin-  
14          istrator considers are generally accepted by the  
15          weather enterprise, including social and behavioral  
16          sciences.

17          (b) IMPROVEMENTS TO FLASH FLOOD WATCHES  
18          AND WARNINGS.—

19               (1) IN GENERAL.—Based on the assessment re-  
20          quired by subsection (a)(1)(A), the Administrator  
21          shall make such improvements to the watches and  
22          warnings described in that subsection as the Admin-  
23          istrator considers necessary—

24                       (A) to improve the communication of the  
25          risks posed by hazardous flash flood events; and

1 (B) to provide actionable geographic infor-  
 2 mation to the recipient of a watch or warning  
 3 for a flash flood.

4 (2) REQUIREMENTS REGARDING RECOMMENDA-  
 5 TIONS.—In conducting the assessment required by  
 6 subsection (a)(1)(A), the Administrator shall ensure  
 7 that any recommendation under subsection (a)(2)(B)  
 8 that the Administrator considers a major change—

9 (A) is validated by social and behavioral  
 10 science using a generalizable sample;

11 (B) accounts for the needs of various de-  
 12 mographics, vulnerable populations, and geo-  
 13 graphic regions;

14 (C) responds to the needs of Federal,  
 15 State, local, and Tribal government partners  
 16 and media partners; and

17 (D) accounts for necessary changes to fed-  
 18 erally operated watch and warning propagation  
 19 and dissemination infrastructure and protocols.

20 (c) DEFINITIONS.—In this section:

21 (1) WATCH; WARNING.—

22 (A) IN GENERAL.—Except as provided in  
 23 subparagraph (B), the terms “watch” and  
 24 “warning”, with respect to a hazardous flash  
 25 flood event, mean products issued by the Na-



1           tional Oceanic and Atmospheric Administration,  
2           intended for use by the general public—

3                   (i) to alert the general public to the  
4                   potential for or presence of the event; and

5                   (ii) to inform action to prevent loss of  
6                   life and property.

7           (B) EXCLUSION.—The terms “watch” and  
8           “warning” do not include technical or special-  
9           ized meteorological and hydrological forecasts,  
10          outlooks, or model guidance products.

11          (2) WEATHER ENTERPRISE.—The term  
12          “weather enterprise” has the meaning given that  
13          term in section 2 of the Weather Research and  
14          Forecasting Innovation Act of 2017 (15 U.S.C.  
15          8501).

16 **SEC. 7. FRESHWATER MONITORING ALONG THE COAST.**

17          (a) DATA AVAILABILITY ASSESSMENT.—The Admin-  
18          istrator shall assess the availability of short- and long-  
19          term data on large-scale freshwater flooding into oceans,  
20          bays, and estuaries, including data on—

21                   (1) flow rate, including discharge;

22                   (2) conductivity;

23                   (3) oxygen concentration;

24                   (4) nutrient load;

25                   (5) water temperature; and

1 (6) sediment load.

2 (b) DATA NEEDS ASSESSMENT.—The Administrator  
3 shall assess the need for additional data to assess and pre-  
4 dict the effect of the flooding and freshwater discharge  
5 described in subsection (a).

6 (c) INVENTORY OF DATA NEEDS.—Based on the as-  
7 sessments required by subsections (a) and (b), the Admin-  
8 istrator shall create an inventory of data needs with re-  
9 spect to the flooding and freshwater discharge described  
10 in subsections (a) and (b).

11 (d) PLANNING.—In planning for the collection of ad-  
12 ditional data necessary for ecosystem-based modeling of  
13 the effect of the flooding and freshwater discharge de-  
14 scribed in subsections (a) and (b), the Administrator shall  
15 use the inventory created under subsection (c).

16 **SEC. 8. TORNADO WARNING IMPROVEMENT.**

17 Section 103 of the Weather Research and Fore-  
18 casting Innovation Act of 2017 (15 U.S.C. 8513) is  
19 amended—

20 (1) by redesignating subsections (c) and (d) as  
21 subsections (d) and (e), respectively; and

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

24 “(c) INNOVATIVE OBSERVATIONS.—The Under Sec-  
25 retary shall ensure that the program periodically examines

1 the value of incorporating innovative observations, such as  
 2 acoustic or infrasonic measurements, observations from  
 3 phased array radars, and observations from mesonets,  
 4 with respect to the improvement of tornado forecasts, pre-  
 5 dictions, and warnings.”.

6 **SEC. 9. HURRICANE FORECAST IMPROVEMENT PROGRAM.**

7 Section 104(b) of the Weather Research and Fore-  
 8 casting Innovation Act of 2017 (15 U.S.C. 8514(b)) is  
 9 amended—

10 (1) in paragraph (2), by striking “; and” and  
 11 inserting a semicolon;

12 (2) in paragraph (3), by striking the period at  
 13 the end and inserting “; and”; and

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

15 “(4) evaluating and incorporating, as appro-  
 16 priate, innovative observations, including acoustic or  
 17 infrasonic measurements.”.

18 **SEC. 10. WEATHER AND WATER RESEARCH AND DEVELOP-**  
 19 **MENT PLANNING.**

20 Section 105(2) of the Weather Research and Fore-  
 21 casting Innovation Act of 2017 (15 U.S.C. 8515(2)) is  
 22 amended by inserting “and flood-event” after “operational  
 23 weather”.

1 **SEC. 11. FORECAST COMMUNICATION COORDINATORS.**

2 Section 1762(f)(1) of the Food Security Act of 1985  
3 (15 U.S.C. 8521(f)(1)) is amended, in the second sen-  
4 tence, by striking “may” and inserting “shall”.

5 **SEC. 12. ESTIMATES OF PRECIPITATION FREQUENCY IN**  
6 **THE UNITED STATES.**

7 (a) DEFINITIONS.—In this section:

8 (1) FREELY ASSOCIATED STATES.—The term  
9 “Freely Associated States” means the Republic of  
10 Palau, the Republic of the Marshall Islands, and the  
11 Federated States of Micronesia, which have each en-  
12 tered into a Compact of Free Association with the  
13 United States.

14 (2) UNITED STATES.—The term “United  
15 States” means the 50 States of the United States,  
16 the District of Columbia, the Commonwealth of  
17 Puerto Rico, the United States Virgin Islands,  
18 Guam, American Samoa, the Commonwealth of the  
19 Northern Mariana Islands, and the Freely Associ-  
20 ated States.

21 (b) IN GENERAL.—The Administrator shall establish  
22 a program, to be known as the “NOAA Precipitation Fre-  
23 quency Atlas of the United States”, to compile, estimate,  
24 analyze, and communicate the frequency of precipitation  
25 in the United States.

1       (c) FUNCTIONS.—The NOAA Precipitation Fre-  
2 quency Atlas of the United States—

3           (1) shall better inform the public and provide  
4 information on—

5               (A) temporal and spatial distribution of  
6 heavy precipitation;

7               (B) analyses of seasonality in precipitation;  
8 and

9               (C) trends in annual maximum series data;  
10 and

11           (2) may serve as the official source of the Fed-  
12 eral Government on estimates of precipitation fre-  
13 quency and associated information with respect to  
14 the United States.

15       (d) REQUIREMENTS.—

16           (1) COVERAGE.—The NOAA Precipitation Fre-  
17 quency Atlas of the United States shall include such  
18 estimates of the frequency of precipitation in the  
19 United States as the Administrator determines ap-  
20 propriate.

21           (2) FREQUENCY.—Such estimates—

22               (A) shall be conducted not less frequently  
23 than once every 10 years; and

24               (B) may be conducted more frequently if  
25 determined appropriate by the Administrator.

1           (3) PUBLICATION.—Such estimates and meth-  
2           odologies used to conduct such estimates shall be—

3                   (A) subject to an appropriate, scientific  
4           process, as determined by the Administrator;  
5           and

6                   (B) published on a publicly accessible  
7           website of the National Oceanic and Atmos-  
8           pheric Administration.

9           (e) PARTNERSHIPS.—The Administrator may partner  
10   with other Federal agencies, members of the private sec-  
11   tor, academic cooperative partnerships, or nongovernment  
12   associations to assist in carrying out the functions de-  
13   scribed in subsection (c).

14          (f) CONSULTATION.—In carrying out this section, the  
15   Administrator may consult with relevant Federal, State,  
16   local, Tribal, and Territorial government agencies, re-  
17   search institutions, and the private sector, as the Adminis-  
18   trator determines necessary.

19          (g) COORDINATION.—In carrying out this section, the  
20   Administrator may coordinate with other Federal agen-  
21   cies.

22          (h) AUTHORIZATION OF APPROPRIATIONS.—There  
23   are authorized to be appropriated to carry out this section,  
24   from amounts otherwise authorized to be appropriated to

1 the Administrator to carry out this Act, \$3,500,000 for  
2 each of fiscal years 2022 through 2030.

3 **SEC. 13. INTERAGENCY COMMITTEE ON WATER MANAGE-**  
4 **MENT AND INFRASTRUCTURE.**

5 (a) ESTABLISHMENT.—There is established a com-  
6 mittee, to be known as the “Interagency Committee on  
7 Water Management and Infrastructure” (in this section  
8 referred to as the “Water Policy Committee”).

9 (b) MEMBERSHIP.—The Water Policy Committee  
10 shall be composed of the following members:

11 (1) The Administrator.

12 (2) The Secretary of the Interior.

13 (3) The Administrator of the Environmental  
14 Protection Agency.

15 (4) The Secretary of Agriculture.

16 (5) The Secretary of Commerce.

17 (6) The Secretary of Energy.

18 (7) The Secretary of the Army.

19 (8) The heads of such other agencies as the co-  
20 chairs consider appropriate.

21 (c) CO-CHAIRS.—The Water Policy Committee shall  
22 be co-chaired by the Secretary of the Interior and the Ad-  
23 ministrator of the Environmental Protection Agency.

1       (d) MEETINGS.—The Water Policy Committee shall  
2 meet not less frequently than 6 times each year, at the  
3 call of the co-chairs.

4       (e) GENERAL PURPOSE AND DUTIES.—The Water  
5 Policy Committee shall ensure that agencies and depart-  
6 ments across the Federal Government that engage in  
7 water-related matters, including water storage and sup-  
8 plies, water quality and restoration activities, water infra-  
9 structure, transportation on United States rivers and in-  
10 land waterways, and water forecasting, work together  
11 where such agencies and departments have joint or over-  
12 lapping responsibilities to—

13           (1) improve interagency coordination among  
14 Federal agencies and departments on water resource  
15 management and water infrastructure issues;

16           (2) coordinate existing water-related Federal  
17 task forces, working groups, and other formal cross-  
18 agency initiatives, as appropriate;

19           (3) prioritize managing the water resources of  
20 the United States and promoting resilience of the  
21 water-related infrastructure of the United States, in-  
22 cluding—

23               (A) increasing water storage, water supply  
24 reliability, and drought resiliency;



1 (B) improving water quality, source water  
2 protection, and nutrient management;

3 (C) promoting restoration activities;

4 (D) improving water systems, including  
5 with respect to drinking water, desalination,  
6 water reuse, wastewater, and flood control; and

7 (E) improving water data management, re-  
8 search, modeling, and forecasting;

9 (4) improve interagency coordination of data  
10 management, access, modeling, and visualization  
11 with respect to water-related matters;

12 (5) promote integrated planning for Federal in-  
13 vestments in water-related infrastructure to enhance  
14 coordination and protect taxpayer investment; and

15 (6) support workforce development and efforts  
16 to recruit, train, and retain professionals to operate  
17 and maintain essential drinking water, wastewater,  
18 flood control, hydropower, water delivery, and water  
19 storage facilities in the United States.

20 (f) CROSS-AGENCY PRIORITY RESEARCH NEEDS.—  
21 Not later than 1 year after the date of the enactment of  
22 this Act, the Water Policy Committee shall develop and  
23 submit to Congress a list of research needs that includes  
24 needs for cross-agency research and coordination.

1 **SEC. 14. NATIONAL WEATHER SERVICE HYDROLOGIC RE-**  
2 **SEARCH FELLOWSHIP PROGRAM.**

3 (a) DEFINITIONS.—In this section:

4 (1) ASSISTANT ADMINISTRATOR.—The term  
5 “Assistant Administrator” means the Assistant Ad-  
6 ministrator for Weather Services of the National  
7 Oceanic and Atmospheric Administration.

8 (2) DECISION SUPPORT SERVICES.—The term  
9 “decision support services” means information, in-  
10 cluding data and refined products, that supports  
11 water resources-related decision-making processes.

12 (3) INSTITUTION OF HIGHER EDUCATION.—The  
13 term “institution of higher education” has the  
14 meaning given that term in section 101 of the High-  
15 er Education Act of 1965 (20 U.S.C. 1001).

16 (4) NOAA LINE OFFICES.—The term “NOAA  
17 line offices” means the following offices of the Na-  
18 tional Oceanic and Atmospheric Administration:

19 (A) The National Ocean Service.

20 (B) The National Environmental Satellite,  
21 Data, and Information Service.

22 (C) The National Marine Fisheries Service.

23 (D) The Office of Oceanic and Atmos-  
24 pheric Research.

25 (E) The Office of Marine and Aviation Op-  
26 erations.

1 (b) HYDROLOGIC RESEARCH FELLOWSHIP PRO-  
2 GRAM.—

3 (1) ESTABLISHMENT.—The Administrator shall  
4 establish a hydrologic research fellowship program  
5 (in this section referred to as the “program”) for  
6 qualified individuals.

7 (2) QUALIFIED INDIVIDUAL.—For purposes of  
8 this section, a qualified individual is an individual  
9 who is—

10 (A) a citizen of the United States; and

11 (B) enrolled in a research-based graduate  
12 program, at an institution of higher education,  
13 in a field that advances the research priorities  
14 developed by the Assistant Administrator under  
15 paragraph (7), such as—

- 16 (i) hydrology;
- 17 (ii) earth sciences;
- 18 (iii) atmospheric sciences;
- 19 (iv) computer sciences;
- 20 (v) engineering;
- 21 (vi) environmental sciences;
- 22 (vii) geosciences;
- 23 (viii) urban planning; or
- 24 (ix) related social sciences.

1           (3) AWARD GUIDELINES.—Fellowships under  
2           the program shall be awarded pursuant to guidelines  
3           established by the Assistant Administrator.

4           (4) SELECTION PREFERENCE.—In selecting  
5           qualified individuals for participation in the pro-  
6           gram, the Assistant Administrator shall give pref-  
7           erence to applicants from historically Black colleges  
8           and universities and minority-serving institutions.

9           (5) PLACEMENT.—The program shall support  
10          the placement of qualified individuals in positions  
11          within the executive branch of the Federal Govern-  
12          ment where such individuals can address and ad-  
13          vance the research priorities developed by the Assist-  
14          ant Administrator under paragraph (7).

15          (6) FELLOWSHIP TERM.—A fellowship under  
16          the program shall be for a period of up to 2 years.

17          (7) FELLOWSHIP RESEARCH PRIORITIES.—The  
18          Assistant Administrator, in consultation with rep-  
19          resentatives from the NOAA line offices, the United  
20          States Geological Survey, the Federal Emergency  
21          Management Agency, and the Army Corps of Engi-  
22          neers, as appropriate, shall develop and publish pri-  
23          orities for the conduct of research by fellows, which  
24          may include the following:

1 (A) Advance the collaborative development  
2 of a flexible community-based water resources  
3 modeling system.

4 (B) Apply artificial intelligence and ma-  
5 chine learning capabilities to advance existing  
6 hydrologic modeling capabilities.

7 (C) Support the evolution and integration  
8 of hydrologic modeling within an Earth Systems  
9 Modeling Framework.

10 (D) Improve visualizations of hydrologic  
11 model outputs.

12 (E) Advance the state of coupled fresh-  
13 water and salt water modeling and forecasting  
14 capabilities.

15 (F) Advance understanding and process  
16 representation of water quality parameters.

17 (G) Advance the assimilation of in-situ and  
18 remotely sensed observations and data.

19 (H) Support the integration of social  
20 science to advance decision support services.

21 (I) Develop methods to study groundwater  
22 sustainability and estimate the efficiency of re-  
23 charge management.

24 (c) DIRECT HIRING.—

(1) AUTHORITY.—During fiscal year 2022 and any fiscal year thereafter, the head of any Federal agency may appoint, without regard to the provisions of subchapter I of chapter 33 of title 5, United States Code, other than sections 3303 and 3328 of that title, to a position with the Federal agency a recipient of a fellowship under the program who—

(A) earned a degree from a program described in subsection (b)(2)(B);

(B) successfully fulfilled the requirements of the fellowship within the executive branch of the Federal Government; and

(C) meets qualification standards established by the Office of Personnel Management.

(2) EXERCISE OF AUTHORITY.—The direct hire authority provided by this subsection shall be exercised with respect to an individual described in paragraph (1) not later than 2 years after the date on which the individual completed the fellowship under the program.

**SEC. 15. IDENTIFICATION AND SUPPORT OF CONSISTENT, FEDERAL SET OF FORWARD-LOOKING, LONG-TERM METEOROLOGICAL INFORMATION.**

(a) DEFINITIONS.—In this section:

1           (1) EXTREME WEATHER.—The term “extreme  
2 weather” includes observed or anticipated severe and  
3 unseasonable atmospheric conditions, including  
4 drought, heavy precipitation, hurricanes, tornadoes  
5 and other windstorms (including derechos), large  
6 hail, extreme heat, extreme cold, flooding, sustained  
7 temperatures or precipitation that deviate substan-  
8 tially from historical averages, and any other weath-  
9 er event that the Administrator determines qualifies  
10 as extreme weather.

11           (2) LONG-TERM.—The term “long-term” shall  
12 have such meaning as the Director of the National  
13 Institute of Standards and Technology, in consulta-  
14 tion with the Administrator, considers appropriate  
15 for purposes of this section.

16           (3) OTHER ENVIRONMENTAL TRENDS.—The  
17 term “other environmental trends” means wildfires,  
18 coastal flooding, inland flooding, land subsidence,  
19 rising sea levels, and any other challenges relating to  
20 changes in environmental systems over time that the  
21 Administrator determines qualify as environmental  
22 challenges other than extreme weather.

23           (b) IDENTIFICATION AND SUPPORT OF CONSISTENT,  
24 FEDERAL SET OF FORWARD-LOOKING, LONG-TERM ME-  
25 TEOROLOGICAL INFORMATION.—The Administrator shall

1 identify, and support research that enables, a consistent,  
2 Federal set of forward-looking, long-term meteorological  
3 information that models future extreme weather events,  
4 other environmental trends, projections, and up-to-date  
5 observations, including mesoscale information as deter-  
6 mined appropriate by the Administrator.

7 **SEC. 16. GAP ANALYSIS ON AVAILABILITY OF SNOW-RE-**  
8 **LATED DATA TO ASSESS AND PREDICT**  
9 **FLOOD AND FLOOD IMPACTS.**

10 (a) IN GENERAL.—The Administrator, in consulta-  
11 tion with the Department of Agriculture, the Department  
12 of the Interior, and the Army Corps of Engineers, shall  
13 conduct an analysis of gaps in the availability of snow-  
14 related data to assess and predict floods and flood im-  
15 pacts, including data on the following:

- 16 (1) Snow water equivalent.  
17 (2) Snow depth.  
18 (3) Snowpack temperature.  
19 (4) Snow and mixed-phase precipitation.  
20 (5) Snow melt.  
21 (6) Rain-snow line.

22 (b) REPORT.—Not later than 180 days after the date  
23 of the enactment of this Act, the Administrator shall sub-  
24 mit to the Committee on Commerce, Science, and Trans-  
25 portation of the Senate and the Committee on Science,



1 Space, and Technology of the House of Representatives

2 a report on—

3 (1) the findings of the gap analysis required by  
4 subsection (a); and

5 (2) opportunities for additional collaboration  
6 among Federal agencies to collect snow-related data  
7 to better assess and predict floods and flood im-  
8 pacts.

9 **SEC. 17. AVAILABILITY TO THE PUBLIC OF FLOOD-RE-**  
10 **LATED DATA.**

11 (a) IN GENERAL.—The Administrator shall make  
12 flood-related data available to the public on the website  
13 of the National Oceanic and Atmospheric Administration.

14 (b) COST.—The Administrator may make the data  
15 under subsection (a) freely accessible or available at a cost  
16 that does not exceed the cost of preparing the data.

Passed the Senate September 30, 2021.

Attest:

*Secretary.*

117<sup>TH</sup> CONGRESS  
1<sup>ST</sup> Session

**S. 558**

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**AN ACT**

To establish a national integrated flood information system within the National Oceanic and Atmospheric Administration, and for other purposes.