

117TH CONGRESS  
1ST SESSION

# H. R. 5781

To improve the Federal effort to reduce wildland fire risks, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

OCTOBER 28, 2021

Ms. LOFGREN (for herself, Mr. MCNERNEY, Mr. PERLMUTTER, and Ms. BONAMICI) introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Transportation and Infrastructure, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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## A BILL

To improve the Federal effort to reduce wildland fire risks,  
and for other purposes.

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

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “National Wildland Fire  
5 Risk Reduction Program Act”.

6 **SEC. 2. ESTABLISHMENT.**

7 The President shall establish a National Wildland  
8 Fire Risk Reduction Program with the purpose of achiev-

1 ing major measurable reductions in the losses of life and  
2 property from wildland fires through a coordinated Fed-  
3 eral effort to—

4 (1) improve the assessment of fire environments  
5 and the understanding and prediction of wildland  
6 fires, associated smoke, and their impacts, includ-  
7 ing—

8 (A) at the wildland-urban interface;

9 (B) on communities, buildings and other  
10 infrastructure; and

11 (C) social and economic impacts;

12 (2) develop and encourage the adoption of  
13 science-based and cost-effective measures to prevent  
14 and mitigate wildland fire and associated smoke im-  
15 pacts; and

16 (3) improve the understanding and mitigation  
17 of the impacts of climate change and variability on  
18 wildland fire risk, frequency, and severity, and to in-  
19 form paragraphs (1) and (2).

20 **SEC. 3. PROGRAM ACTIVITIES.**

21 The Program shall consist of the activities described  
22 under section 6, which shall be designed—

23 (1) to support research and development, in-  
24 cluding interdisciplinary research, related to fire en-  
25 vironments, wildland fires, associated smoke, and

1        their impacts, in furtherance of a coordinated inter-  
2        agency effort to address wildland fire risk reduction;

3            (2) to support data management and steward-  
4        ship, and the development and coordination of data  
5        systems and computational tools to accelerate the  
6        understanding of fire environments, wildland fires,  
7        associated smoke, and their impacts;

8            (3) to support the development of novel tools  
9        and technologies to improve understanding, moni-  
10       toring, prediction, and mitigation of wildland fires,  
11       associated smoke, and their impacts;

12           (4) to support education and training to expand  
13       the number of students and researchers in areas of  
14       study and research related to wildland fires;

15           (5) to accelerate the translation of research re-  
16       lated to wildland fires and associated smoke into op-  
17       erations to reduce harm to communities, buildings,  
18       and other infrastructure;

19           (6) to conduct communication and outreach re-  
20       garding wildland fire science and wildland fire risk  
21       mitigation, to communities, energy utilities and op-  
22       erators of other critical infrastructure, and other rel-  
23       evant stakeholders;

24           (7) to support research and development  
25       projects funded under joint solicitations or through

1 memoranda of understanding between no fewer than  
2 two agencies participating in the Program; and

3 (8) to disseminate, to the extent practicable,  
4 scientific data and related products and services in  
5 formats meeting shared standards to enhance the  
6 interoperability, usability, and accessibility of Pro-  
7 gram Agency data in order to better meet the needs  
8 of Program agencies, other Federal agencies, and  
9 relevant stakeholders.

10 **SEC. 4. INTERAGENCY COORDINATING COMMITTEE ON**  
11 **WILDLAND FIRE RISK REDUCTION.**

12 (a) ESTABLISHMENT.—Not later than 90 days after  
13 enactment of this Act, the Director of the Office of Science  
14 and Technology Policy shall establish an Interagency Co-  
15 ordinating Committee on Wildland Fire Risk Reduction,  
16 to be co-chaired by the Director and the Director of the  
17 National Institute of Standards and Technology.

18 (b) MEMBERSHIP.—In addition to the co-chairs, the  
19 Committee shall be composed of—

20 (1) the Director of the National Science Foun-  
21 dation;

22 (2) the Administrator of the National Oceanic  
23 and Atmospheric Administration;

24 (3) the Administrator of the Federal Emer-  
25 gency Management Agency;

1 (4) the United States Fire Administration;

2 (5) the Chief of the Forest Service;

3 (6) the Administrator of the National Aero-  
4 nautics and Space Administration;

5 (7) the Administrator of the Environmental  
6 Protection Agency;

7 (8) the Secretary of Energy;

8 (9) the Director of the Office of Science and  
9 Technology Policy;

10 (10) the Director of the Office of Management  
11 and Budget;

12 (11) the Secretary of the Interior;

13 (12) the Director of United States Geological  
14 Survey;

15 (13) the Secretary of Health and Human Serv-  
16 ices;

17 (14) the Secretary of Defense;

18 (15) the Secretary of Housing and Urban De-  
19 velopment; and

20 (16) the head of any other Federal agency that  
21 the Director considers appropriate.

22 (c) MEETINGS.—The Committee shall meet not less  
23 than twice a year for the first 2 years and then not less  
24 than once a year at the call of the Director.

1 (d) GENERAL PURPOSE AND DUTIES.—The Com-  
2 mittee shall oversee the planning, management, and co-  
3 ordination of the Program, and solicit stakeholder input  
4 on Program goals.

5 (e) STRATEGIC PLAN.—The Committee shall develop  
6 and submit to Congress, not later than 1 year after enact-  
7 ment, a Strategic Plan for the Program that includes—

8 (1) prioritized goals for the Program, consistent  
9 with the purposes of the Program as described in  
10 section 2;

11 (2) short-term, mid-term, and long-term re-  
12 search and development objectives to achieve those  
13 goals;

14 (3) a description of the role of each Program  
15 agency in achieving the prioritized goals;

16 (4) a description of how the Committee will fos-  
17 ter collaboration between and among the Program  
18 agencies to help meet the goals of the Program;

19 (5) the methods by which progress toward the  
20 goals will be assessed;

21 (6) an explanation of how the Program will fos-  
22 ter the translation of research into measurable re-  
23 ductions in the losses of life and property from  
24 wildland fires, including recommended outcomes and  
25 metrics for each program goal and how operational

1 Program agencies will transition demonstrated tech-  
2 nologies and research findings into operations;

3 (7) a description of the research infrastructure,  
4 including databases and computational tools, needed  
5 to accomplish the research and development objec-  
6 tives outlined in paragraph (2), a description of how  
7 research infrastructure in existence at the time of  
8 the development of the plan will be used to meet the  
9 objectives, and an explanation of how new research  
10 infrastructure will be developed to meet the objec-  
11 tives;

12 (8) a description of how Program agencies will  
13 collaborate with stakeholders and take into account  
14 stakeholder needs and recommendations in devel-  
15 oping research and development objectives;

16 (9) recommendations on the most effective  
17 means to integrate the research results into wildland  
18 fire preparedness and response actions across Fed-  
19 eral, State, and local levels; and

20 (10) guidance on how the Committee's rec-  
21 ommendations are best used in climate adaptation  
22 planning for Federal, State, local, Tribal, and terri-  
23 torial entities.

24 (f) COORDINATION WITH OTHER FEDERAL EF-  
25 FORTS.—The Director shall ensure that the activities of

1 the Program are coordinated with other relevant Federal  
2 initiatives as appropriate.

3 (g) PROGRESS REPORT.—Not later than 18 months  
4 after the date transmission of the Strategic Plan from  
5 subsection (e) to Congress and not less frequently than  
6 once every 2 years thereafter, the Committee shall submit  
7 to the Congress a report on the progress of the Program  
8 that includes—

9 (1) a description of the activities funded under  
10 the Program, a description of how those activities  
11 align with the prioritized goals and research objec-  
12 tives established in the Strategic Plan, and the  
13 budgets, per agency, for these activities; and

14 (2) the outcomes achieved by the Program for  
15 each of the goals identified in the Strategic Plan.

16 **SEC. 5. GOVERNMENT ACCOUNTABILITY OFFICE REVIEW.**

17 Not later than 3 years after the date of enactment  
18 of this Act, the Comptroller General of the United States  
19 shall submit a report to Congress that—

20 (1) evaluates the progress and performance of  
21 the Program in establishing and making progress to-  
22 ward the goals of the Program as set forth in this  
23 Act; and



1           (2) includes such recommendations as the  
2       Comptroller General determines are appropriate to  
3       improve the Program.

4   **SEC. 6. RESPONSIBILITIES OF PROGRAM AGENCIES.**

5       (a) NATIONAL INSTITUTE OF STANDARDS AND  
6   TECHNOLOGY.—The responsibilities of the Director of the  
7   National Institute of Standards and Technology with re-  
8   spect to the Program are as follows:

9           (1) RESEARCH AND DEVELOPMENT ACTIVI-  
10   TIES.—The Director of the National Institute of  
11   Standards and Technology shall—

12           (A) carry out research on the impact of  
13       wildland fires on communities, buildings, and  
14       other infrastructure;

15           (B) carry out research on the generation of  
16       firebrands from wildland fires and on methods  
17       and materials to prevent or reduce firebrand ig-  
18       nition of communities, buildings, and other in-  
19       frastructure;

20           (C) carry out research on novel materials,  
21       systems, structures, and construction designs to  
22       harden structures, parcels, and communities to  
23       the impact of wildland fires;

1 (D) carry out research on the impact of  
2 environmental factors on wildland fire behavior,  
3 including wind, terrain, and moisture; and

4 (E) support the development of perform-  
5 ance-based tools to mitigate the impact of  
6 wildland fires, and work with appropriate  
7 groups to promote the use of such tools, includ-  
8 ing through model building codes and fire  
9 codes, standard test methods, voluntary con-  
10 sensus standards, and construction and retrofit  
11 best practices.

12 (2) WILDLAND-URBAN INTERFACE FIRE POST-  
13 INVESTIGATIONS.—The Director of the National In-  
14 stitute of Standards and Technology shall—

15 (A) coordinate Federal post-wildland fire  
16 investigations of fires at the wildland-urban  
17 interface; and

18 (B) develop methodologies to characterize  
19 the impact of wildland fires on communities and  
20 the impact of changes in building and fire  
21 codes, including methodologies—

22 (i) for collecting, inventorying, and  
23 analyzing information on the performance  
24 of communities, buildings, and other infra-  
25 structure in wildland fires; and

1 (ii) for improved collection of perti-  
2 nent information from different sources,  
3 including first responders, the design and  
4 construction industry, insurance compa-  
5 nies, and building officials.

6 (b) NATIONAL SCIENCE FOUNDATION.—As a part of  
7 the Program, the Director of the National Science Foun-  
8 dation shall support—

9 (1) research to improve the understanding and  
10 prediction of wildland fire risks, including the condi-  
11 tions that increase the likelihood of a wildland fire,  
12 the behavior of wildland fires, and their impacts on  
13 buildings, communities, infrastructure, ecosystems  
14 and living systems;

15 (2) development and improvement of tools and  
16 technologies, including databases and computational  
17 models, to enable and accelerate the understanding  
18 and prediction of wildland fires and their impacts;

19 (3) development of research infrastructure, as  
20 appropriate, to enable and accelerate the under-  
21 standing and prediction of wildland fires and their  
22 impacts, including upgrades or additions to the Na-  
23 tional Hazards Engineering Research Infrastructure;

24 (4) research to improve the understanding of—

1 (A) the response to wildland fire risk mes-  
2 sages by individuals, communities, and policy-  
3 makers;

4 (B) economic and other factors influencing  
5 the implementation and adoption of wildland  
6 fire risk reduction measures by individuals,  
7 communities, and policymakers; and

8 (C) decision making and emergency re-  
9 sponse to wildland fires;

10 (5) undergraduate and graduate research op-  
11 portunities and graduate and postdoctoral fellow-  
12 ships and traineeships in fields of study relevant to  
13 wildland fires and their impacts; and

14 (6) research to improve the understanding of  
15 the impacts of climate change and climate variability  
16 on wildland fires, including wildland fire risk, fre-  
17 quency, and severity, and wildland fire prediction,  
18 mitigation, and resilience strategies.

19 (c) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-  
20 ISTRATION.—

21 (1) IN GENERAL.—The Administrator of the  
22 National Oceanic and Atmospheric Administration  
23 (in this subsection referred to as the “Adminis-  
24 trator”) shall conduct research, observations, mod-  
25 eling, forecasting, prediction, and historical analysis

1 of wildland fires to improve understanding of  
2 wildland fires, and associated fire weather and  
3 smoke, for the protection of life and property and  
4 for the enhancement of the national economy.

5 (2) WEATHER FORECASTING AND DECISION  
6 SUPPORT FOR WILDLAND FIRES.—The Adminis-  
7 trator shall—

8 (A) develop and provide accurate, timely,  
9 and effective warnings and forecasts of wildland  
10 fires and fire weather events that endanger life  
11 and property. Such warnings may include red  
12 flag warnings, operational fire weather alerts,  
13 and any other warnings or alerts the Adminis-  
14 trator deems appropriate;

15 (B) provide stakeholders and the public  
16 with impact-based decision support services,  
17 seasonal climate predictions, air quality prod-  
18 ucts, and smoke forecasts; and

19 (C) provide on-site weather forecasts, sea-  
20 sonal climate predictions, and other decision  
21 support to wildland fire incident command  
22 posts.

23 (3) WILDLAND FIRE INCIDENT RESEARCH  
24 DATABASE.—The Administrator, in collaboration  
25 with Program agencies and relevant stakeholders,

1 shall develop a publicly accessible Fire Incident Re-  
2 search Database to support the archiving, steward-  
3 ship, and understanding of historical wildland fire  
4 and fire weather data, and to advance wildland fire  
5 science. In developing the database, NOAA shall col-  
6 laborate with Program agencies and stakeholders  
7 to—

8 (A) develop data standards to enhance  
9 interoperability of diverse wildland fire data and  
10 improve usability of data for a diverse range of  
11 stakeholders; and

12 (B) solicit data from other Program agen-  
13 cies and from relevant stakeholders.

14 (4) WILDLAND FIRE AND FIRE WEATHER SUR-  
15 VEILLANCE AND OBSERVATIONS.—The Adminis-  
16 trator, in coordination with Administrator of the Na-  
17 tional Aeronautics and Space Administration, shall

18 (A) leverage existing observations, tech-  
19 nologies and assets and develop new tech-  
20 nologies to sustain and enhance environmental  
21 observations used for wildland fire prediction  
22 and detection, fire weather and smoke fore-  
23 casting and monitoring, and post-wildland fire  
24 recovery, with a focus on—

1 (i) collecting data for pre-ignition  
2 analysis, such as drought, fuel conditions,  
3 and soil moisture, that will help predict se-  
4 vere wildland fire conditions on subsea-  
5 sonal to decadal timescales;

6 (ii) supporting identification and clas-  
7 sification of fire environments to determine  
8 vulnerability to wildland fires and rapid  
9 wildland fire growth;

10 (iii) detecting, observing, and moni-  
11 toring wildland fires and smoke;

12 (iv) supporting research on the inter-  
13 action of weather and wildland fire behav-  
14 ior; and

15 (v) supporting post-fire assessments  
16 conducted by Program agencies; and

17 (B) prioritize the ability to detect wildfire  
18 and smoke in its requirements for its current  
19 and future operational space-based assessments  
20 and commercial data purchases.

21 (5) FIRE WEATHER TESTBED.—In collaboration  
22 with Program agencies, the Administrator shall es-  
23 tablish a Fire Weather Testbed to evaluate physical  
24 and social science, technology, and other research to

1 develop fire weather products and services for imple-  
2 mentation by relevant stakeholders.

3 (6) WILDLAND FIRE AND FIRE WEATHER RE-  
4 SEARCH AND DEVELOPMENT.—The Administrator  
5 shall support a wildland fire and smoke research and  
6 development program with the goals of—

7 (A) improving the understanding, pre-  
8 diction, detection, forecasting, monitoring, and  
9 assessments of wildland fires and associated fire  
10 weather and smoke;

11 (B) developing products and services to  
12 meet stakeholder needs;

13 (C) transitioning physical and social  
14 science research into operations;

15 (D) improving modeling and technology,  
16 including coupled fire-atmosphere fire behavior  
17 modeling; and

18 (E) better understanding of links between  
19 fire weather events and subseasonal-to-climate  
20 impacts.

21 (7) EXTRAMURAL RESEARCH.—The Adminis-  
22 trator shall collaborate with and support the non-  
23 Federal wildland fire research community, which in-  
24 cludes institutions of higher education, private enti-  
25 ties, nongovernmental organizations, and other rel-



1       evant stakeholders, by making funds available  
2       through competitive grants, contracts, and coopera-  
3       tive agreements.

4               (8) HIGH PERFORMANCE COMPUTING.—The  
5       Administrator shall acquire high performance com-  
6       puting technologies and supercomputing technologies  
7       to conduct research and development activities, sup-  
8       port research to operations under this section, and  
9       host operational fire and smoke forecast models.

10              (9) INCIDENT METEOROLOGIST WORKFORCE AS-  
11       SESSMENT.—Not later than 6 months after the date  
12       of enactment of this Act, the Administrator shall  
13       submit to the Committee on Science, Space, and  
14       Technology in the House, and the Committee on  
15       Commerce, Science, and Transportation in the Sen-  
16       ate the results of an assessment of National Weath-  
17       er Service workforce and training needs for Incident  
18       Meteorologists for wildland fires and other extreme  
19       events and the potential need for more such Incident  
20       Meteorologists. Such assessment shall take into con-  
21       sideration information technology support, logistical  
22       and administrative operations, future climate condi-  
23       tions, and feedback from relevant stakeholders.

1 (d) FEDERAL EMERGENCY MANAGEMENT AGEN-  
2 CY.—The Administrator of the Federal Emergency Man-  
3 agement Agency shall—

4 (1) support—

5 (A) the development of risk assessment  
6 tools and effective mitigation techniques for  
7 wildland fires;

8 (B) wildland fire-related data collection  
9 and analysis;

10 (C) public outreach and information dis-  
11 semination related to wildland fires and  
12 wildland fire risk; and

13 (D) promotion of the adoption of wildland  
14 fire preparedness and risk reduction measures,  
15 including for households, businesses, and com-  
16 munities;

17 (2) work closely with standards development or-  
18 ganizations and building code organizations, in con-  
19 junction with the National Institute of Standards  
20 and Technology, to promote the implementation of  
21 research results and promote better buildings and  
22 retrofit practices within the design and construction  
23 industry, including architects, engineers, contractors,  
24 builders, and inspectors; and

1           (3) acting through the United States Fire Ad-  
2       ministration—

3           (A) help translate new information and re-  
4       search findings into best practices to improve  
5       the training of firefighters in wildland fire fire-  
6       fighting; and

7           (B) conduct outreach and information dis-  
8       semination to fire departments regarding best  
9       practices for wildland fire firefighting and  
10      training in wildland fire firefighting.

11      (e) NATIONAL AERONAUTICS AND SPACE ADMINIS-  
12     TRATION.—The responsibilities of the Administrator of  
13     the National Aeronautics and Space Administration (in  
14     this subsection referred to as the “Administrator”) with  
15     respect to the Program are as follows:

16           (1) IN GENERAL.—The Administrator shall,  
17     with respect to the Program—

18           (A) support relevant basic and applied sci-  
19       entific research and modeling;

20           (B) ensure the use in the Program of all  
21       relevant National Aeronautics and Space Ad-  
22       ministration Earth observations data for max-  
23       imum utility;

24           (C) explore and apply novel tools and tech-  
25       nologies in the activities of the Program;

1 (D) support the translation of research to  
2 operations, including to Program agencies and  
3 relevant stakeholders; and

4 (E) facilitate the communication of  
5 wildland fire research, knowledge, and tools to  
6 relevant stakeholders.

7 (2) WILDLAND FIRE RESEARCH AND APPLICA-  
8 TIONS.—The Administrator shall support basic and  
9 applied wildland fire research and modeling activi-  
10 ties, including competitively-selected research, to—

11 (A) improve the understanding and pre-  
12 diction of fire environments, wildland fires, as-  
13 sociated smoke, and their impacts;

14 (B) improve the understanding of the im-  
15 pacts of climate change and variability on  
16 wildland fire risk, frequency, and severity;

17 (C) characterize the pre-fire phase and  
18 fire-inducing conditions, such as soil moisture  
19 and vegetative fuel availability;

20 (D) characterize the active fire phase, such  
21 as fire and smoke plume mapping, fire behavior  
22 and spread modeling, and domestic and global  
23 fire activity;

24 (E) characterize the post-fire phase, such  
25 as landscape changes, air quality, erosion, land-

1 slides, and impacts on carbon distributions in  
2 forest biomass;

3 (F) contribute to advancing predictive  
4 wildland fire models;

5 (G) address other relevant investigations  
6 and measurements prioritized by the National  
7 Academies of Sciences, Engineering, and Medi-  
8 cine Decadal Survey on Earth Science and Ap-  
9 plications from Space;

10 (H) improve the translation of research  
11 knowledge into actionable information;

12 (I) develop research and data products, in-  
13 cluding maps, decision-support information, and  
14 tools, and support related training as appro-  
15 priate and practicable;

16 (J) collaborate with other Program agen-  
17 cies and relevant stakeholders, as appropriate,  
18 on joint research and development projects, in-  
19 cluding research grant solicitations and field  
20 campaigns; and

21 (K) transition research advances to oper-  
22 ations, including to Program agencies and rel-  
23 evant stakeholders, as practicable.

24 (3) WILDLAND FIRE DATA SYSTEMS AND COM-  
25 PUTATIONAL TOOLS.—

1 (A) IN GENERAL.—The Administrator  
2 shall—

3 (i) identify, from the National Aero-  
4 nautics and Space Administration’s Earth  
5 science data systems, data, including com-  
6 bined data products, that can contribute to  
7 improving the understanding, monitoring,  
8 prediction, and mitigation of wildland fires  
9 and their impacts, including data related  
10 to fire weather, plume dynamics, smoke  
11 and fire behavior, impacts of climate  
12 change and variability, land and property  
13 burned, wildlife and ecosystem destruction,  
14 among other areas;

15 (ii) prioritize the dissemination of  
16 data identified under this subparagraph to  
17 the widest extent practicable to support  
18 relevant research and operational stake-  
19 holders;

20 (iii) consider opportunities to support  
21 the Program under section 2 and the Pro-  
22 gram activities under section 3 when plan-  
23 ning and developing Earth observation sat-  
24 ellites, instruments, and airborne measure-  
25 ment platforms;

1 (iv) identify opportunities, in collabo-  
2 ration with Program agencies and relevant  
3 stakeholders, as practicable and appro-  
4 priate, to acquire additional airborne and  
5 space-based data and observations that  
6 may enhance or supplement the under-  
7 standing, monitoring, prediction, and miti-  
8 gation of wildland fire risks, and the rel-  
9 evant Program activities under section 3;  
10 and

11 (v) lead, in collaboration with Pro-  
12 gram agencies, the development of a  
13 Wildland Fire Risk Reduction Scientific  
14 Data Collaboration Environment for the  
15 purposes of accelerating the understanding  
16 and prediction of wildland fires and to fa-  
17 cilitate communications and outreach on  
18 wildland fire data, science, and risk to Pro-  
19 gram agencies and relevant stakeholders.

20 (B) DATA COLLABORATION ENVIRONMENT  
21 SPECIFICATIONS.—The Wildland Fire Risk Re-  
22 duction Scientific Data Collaboration Environ-  
23 ment under clause (v) of subparagraph (A)  
24 shall be—

(i) a publicly available means of accessing Program agencies' wildland fire risk scientific data related to active wildland fires; and

(ii) comprised of observations, available real-time and near-real-time measurements, derived science and data products, such as risk and spread maps, and other relevant decision support and information tools.

(4) NOVEL TOOLS FOR ACTIVE WILDLAND FIRE MONITORING AND RISK MITIGATION.—The Administrator, in collaboration with other Program agencies and relevant stakeholders shall apply novel tools and technologies to support active wildland fire research, monitoring, mitigation, and risk reduction, as practicable and appropriate. In particular, the Administrator shall:

(A) Establish a program to develop and demonstrate a unified concept of operations for the safe and effective deployment of diverse air capabilities in active wildland fire monitoring, mitigation, and risk reduction. The objectives of the Program shall be to—



1 (i) develop a wildland fire airspace op-  
2 erations system accounting for piloted air-  
3 craft, uncrewed aerial systems, and other  
4 new and emerging capabilities such as au-  
5 tonomous and high-altitude assets;

6 (ii) develop an interoperable commu-  
7 nications strategy to support such system;

8 (iii) develop a roadmap for the on-  
9 ramping of new technologies, capabilities,  
10 or entities into such system;

11 (iv) identify additional development,  
12 testing, and demonstration that would be  
13 required to expand the scale of operations  
14 of such system;

15 (v) identify actions that would be re-  
16 quired to transition the program into ongo-  
17 ing, operational use; and

18 (vi) identify other objectives for such  
19 system, as deemed appropriate by the Ad-  
20 ministrator.

21 (B) Develop and demonstrate affordable  
22 and deployable sensing technologies, in con-  
23 sultation with other Program agencies and rel-  
24 evant stakeholders, to improve the monitoring  
25 of fire fuel and active wildland fires, wildland

1 fire behavior models and forecast, mapping ef-  
2 forts, and the prediction and mitigation of  
3 wildland fires and their impacts. The Adminis-  
4 trator shall—

5 (i) test and demonstrate technologies  
6 such as infrared, microwave, and active  
7 sensors suitable for deployment on space-  
8 craft, aircraft, and uncrewed aerial sys-  
9 tems, as appropriate and practicable;

10 (ii) develop and demonstrate afford-  
11 able and deployable sensing technologies  
12 that can be transitioned to operations for  
13 collection of near-real-time localized meas-  
14 urements;

15 (iii) identify opportunities and actions  
16 required, in collaboration with Program  
17 agencies and relevant stakeholders, to  
18 transition relevant technologies, tech-  
19 niques, and data to science operations,  
20 upon successful demonstration of the feasi-  
21 bility and scientific utility of the sensors  
22 and data;

23 (iv) transition demonstrated tech-  
24 nologies, techniques, and data into ongo-

ing, operational use, including to Program agencies and relevant stakeholders; and

(v) prioritize and facilitate, to the greatest extent practicable, the dissemination of these science data to operations, including to Program agencies and relevant stakeholders.

(f) ENVIRONMENTAL PROTECTION AGENCY.—The Administrator of the Environmental Protection Agency shall support environmental research and development activities to—

(1) improve the understanding of—

(A) wildland fire and smoke impacts on communities, and on water and outdoor and indoor air quality;

(B) wildland fire smoke plume characteristics, chemical transformation, and transport;

(C) wildland fire and smoke impacts to contaminant containment and remediation;

(D) the contribution of wildland fire emissions to climate forcing emissions;

(E) differences between the impacts of prescribed fires compared to other wildland fires on communities and air and water quality; and

1 (F) climate change and variability on  
2 wildland fires and smoke plumes, including on  
3 smoke exposure;

4 (2) develop and improve tools, sensors, and  
5 technologies including databases and computational  
6 models, to accelerate the understanding, monitoring,  
7 and prediction of wildland fires and smoke exposure;

8 (3) better integrate observational data into  
9 wildland fire and smoke characterization models to  
10 improve modeling at finer temporal and spatial reso-  
11 lution; and

12 (4) improve communication of wildland fire and  
13 smoke risk reduction strategies to the public in co-  
14 ordination with relevant stakeholders and other Fed-  
15 eral agencies.

16 (g) DEPARTMENT OF ENERGY.—The Secretary of  
17 Energy shall carry out activities to research and develop  
18 tools, techniques, and technologies for—

19 (1) withstanding and addressing the current  
20 and projected impact of wildland fires on energy sec-  
21 tor infrastructure;

22 (2) providing real-time or near-time awareness  
23 of the risks posed by wildland fires to the operation  
24 of energy infrastructure in affected and potentially  
25 affected areas;

1           (3) early detection of malfunctioning electrical  
2           equipment on the transmission and distribution grid,  
3           including detection of spark ignition causing  
4           wildland fires;

5           (4) assisting with the planning, safe execution  
6           of, and safe and timely restoration of power after  
7           emergency power shut offs following wildland fires  
8           started by grid infrastructure;

9           (5) improving electric grid and energy sector  
10          safety and resilience in the event of multiple simul-  
11          taneous or co-located weather or climate events lead-  
12          ing to extreme conditions, such as extreme wind,  
13          wildland fires, extreme cold, and extreme heat;

14          (6) coordinating data across relevant entities to  
15          promote resilience and wildland fire prevention in  
16          the planning, design, construction, operation, and  
17          maintenance of transmission infrastructure; and

18          (7) considering optimal building energy effi-  
19          ciency practices, as practicable, in wildland fire re-  
20          search.

21 **SEC. 7. BUDGET ACTIVITIES.**

22          The Director of the National Institute of Standards  
23          and Technology, the Director of the National Science  
24          Foundation, the Administrator of the National Oceanic  
25          and Atmospheric Administration, the Director of the Fed-

1 eral Emergency Management Agency, the Administrator  
2 of the National Aeronautics and Space Administration,  
3 the Administrator of the Environmental Protection Agen-  
4 cy, and the Secretary of Energy shall each include in the  
5 annual budget request to Congress of each respective  
6 agency a description of the projected activities of such  
7 agency under the Program for the fiscal year covered by  
8 the budget request and an estimate of the amount such  
9 agency plans to spend on such activities for the relevant  
10 fiscal year.

11 **SEC. 8. DEFINITIONS.**

12 In this Act:

13 (1) DIRECTOR.—The term “Director” means  
14 the Director of the Office of Science and Technology  
15 Policy.

16 (2) PROGRAM.—The term “Program” means  
17 the Program established under section 2.

18 (3) PROGRAM AGENCIES.—The term “Program  
19 agencies” means any Federal agency with respon-  
20 sibilities under the Program.

21 (4) STAKEHOLDERS.—The term “stakeholders”  
22 means any public or private organization engaged in  
23 addressing wildland fires, associated smoke, and  
24 their impacts, and shall include relevant Federal  
25 agencies, States, territories, Tribes, State and local

1 governments, businesses, not-for-profit organiza-  
 2 tions, including national standards and building code  
 3 organizations, firefighting departments and organi-  
 4 zations, academia, and other users of wildland fire  
 5 data products.

6 (5) WILDLAND FIRE.—The term “wildland  
 7 fire” means any non-structure fire that occurs in  
 8 vegetation or natural fuels and includes wildfires  
 9 and prescribed fires.

10 (6) WILDLAND-URBAN INTERFACE.—The term  
 11 “Wildland-Urban Interface” has the meaning given  
 12 such term in section 4(11) of the Federal Fire Pre-  
 13 vention and Control Act of 1974 (15 U.S.C.  
 14 2203(11)).

15 (7) FIRE ENVIRONMENT.—The term “fire envi-  
 16 ronment” means surrounding conditions, influences,  
 17 and modifying forces of topography, fuel, and weath-  
 18 er that determine fire behavior.

19 **SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

20 (a) NATIONAL INSTITUTE OF STANDARDS AND  
 21 TECHNOLOGY.—There are authorized to be appropriated  
 22 to the National Institute of Standards and Technology for  
 23 carrying out this Act—

24 (1) \$35,800,000 for fiscal year 2022;

25 (2) \$36,100,000 for fiscal year 2023;

1 (3) \$36,400,000 for fiscal year 2024;

2 (4) \$36,700,000 for fiscal year 2025; and

3 (5) \$37,100,000 for fiscal year 2026.

4 (b) NATIONAL SCIENCE FOUNDATION.—There are  
5 authorized to be appropriated to the National Science  
6 Foundation for carrying out this Act—

7 (1) \$50,000,000 for fiscal year 2022;

8 (2) \$53,000,000 for fiscal year 2023;

9 (3) \$56,200,000 for fiscal year 2024;

10 (4) \$59,600,000 for fiscal year 2025; and

11 (5) \$63,100,000 for fiscal year 2026.

12 (c) NATIONAL OCEANIC AND ATMOSPHERIC ADMIN-  
13 ISTRATION.—There are authorized to be appropriated to  
14 the National Oceanic and Atmospheric Administration for  
15 carrying out this Act—

16 (1) \$200,000,000 for fiscal year 2022;

17 (2) \$215,000,000 for fiscal year 2023;

18 (3) \$220,000,000 for fiscal year 2024;

19 (4) \$230,000,000 for fiscal year 2025; and

20 (5) \$250,000,000 for fiscal year 2026.

21 (d) NATIONAL AERONAUTICS AND SPACE ADMINIS-  
22 TRATION.—There are authorized to be appropriated to the  
23 National Aeronautics and Space Administration for car-  
24 rying out this Act—

25 (1) \$95,000,000 for fiscal year 2022;



- 1           (2) \$100,000,000 for fiscal year 2023;
- 2           (3) \$110,000,000 for fiscal year 2024;
- 3           (4) \$110,000,000 for fiscal year 2025; and
- 4           (5) \$110,000,000 for fiscal year 2026.

5           (e) ENVIRONMENTAL PROTECTION AGENCY.—There  
6 are authorized to be appropriated to the Environmental  
7 Protection Agency for carrying out this Act—

- 8           (1) \$11,000,000 for fiscal year 2022;
- 9           (2) \$11,700,000 for fiscal year 2023;
- 10          (3) \$12,400,000 for fiscal year 2024;
- 11          (4) \$13,100,000 for fiscal year 2025; and
- 12          (5) \$13,900,000 for fiscal year 2026.

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