

116TH CONGRESS
1ST SESSION

S. 529

To establish a national program to identify and reduce losses from landslide hazards, to establish a national 3D Elevation Program, and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 14, 2019

Ms. CANTWELL (for herself, Ms. MURKOWSKI, Mr. GARDNER, Mr. WYDEN, and Mrs. FEINSTEIN) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To establish a national program to identify and reduce losses from landslide hazards, to establish a national 3D Elevation Program, 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 Landslide
5 Preparedness Act”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

8 (1) 3D.—The term “3D” means 3-dimensional.

1 (2) 3D ELEVATION DATA.—

2 (A) IN GENERAL.—The term “3D ele-
3 vation data” means 3D, high-resolution data
4 obtained using LiDAR, IfSAR, or other meth-
5 ods over the United States (including terri-
6 tories).

7 (B) INCLUSIONS.—The term “3D elevation
8 data” includes terrestrial and bathymetric ele-
9 vation data.

10 (3) 3D ELEVATION PROGRAM.—The term “3D
11 Elevation Program” means the 3D Elevation Pro-
12 gram established under section 5(a).

13 (4) IfSAR.—The term “IfSAR” means
14 interferometric synthetic aperture radar.

15 (5) INDIAN TRIBE.—The term “Indian tribe”
16 has the meaning given the term in section 4 of the
17 Indian Self-Determination and Education Assistance
18 Act (25 U.S.C. 5304).

19 (6) LAHAR.—The term “lahar” means a large
20 debris flow of mostly volcanic material that is—

21 (A) often fast-moving; and

22 (B) a hazard in watersheds downstream of
23 volcanic peaks.

24 (7) LiDAR.—The term “LiDAR” means light
25 detection and ranging.

1 (8) SECRETARY.—The term “Secretary” means
2 the Secretary of the Interior, acting through the Di-
3 rector of the United States Geological Survey.

4 (9) STATE.—The term “State” means—

5 (A) a State; and

6 (B) the District of Columbia.

7 (10) STATE OFFICE.—The term “State office”
8 means any unit of State government that handles
9 the identification, mapping, assessment, and re-
10 search of landslide hazards or responding to land-
11 slide events, including—

12 (A) a State geological survey office;

13 (B) a State department of emergency re-
14 sponse; and

15 (C) a State department of transportation.

16 (11) TERRITORY.—The term “territory”
17 means—

18 (A) the Commonwealth of Puerto Rico;

19 (B) Guam;

20 (C) American Samoa;

21 (D) the Commonwealth of the Northern
22 Mariana Islands;

23 (E) the Federated States of Micronesia;

24 (F) the Republic of the Marshall Islands;

25 (G) the Republic of Palau; and

1 (H) the United States Virgin Islands.

2 **SEC. 3. NATIONAL LANDSLIDE HAZARDS REDUCTION PRO-**
3 **GRAM.**

4 (a) ESTABLISHMENT.—The Secretary shall establish
5 a program, to be known as the “National Landslide Haz-
6 ards Reduction Program” (referred to in this section as
7 the “program”)—

8 (1) to identify and understand landslide haz-
9 ards and risks;

10 (2) to reduce losses from landslides;

11 (3) to protect communities at risk of landslide
12 hazards; and

13 (4) to help improve communication and emer-
14 gency preparedness, including by coordinating with
15 communities and entities responsible for infrastruc-
16 ture that are at risk of landslide hazards.

17 (b) DESCRIPTION OF PROGRAM.—

18 (1) PROGRAM ACTIVITIES.—The Secretary, in
19 coordination with the Interagency Coordinating
20 Committee on Landslide Hazards established by
21 subsection (c)(1) (referred to in this section as the
22 “Committee”) and in coordination with existing ac-
23 tivities of the United States Geological Survey and
24 other Federal agencies, shall—

1 (A) identify, map, assess, and research
2 landslide hazards;

3 (B) respond to landslide events; and

4 (C) in coordination with State offices,
5 units of local government, territories, and In-
6 dian tribes—

7 (i) establish working groups with
8 State offices, units of local government,
9 territories, and Indian tribes to identify re-
10 gional and local priorities for researching,
11 identifying, mapping, and assessing land-
12 slide hazards; and

13 (ii) develop and implement landslide
14 hazard guidelines for—

15 (I) geologists;

16 (II) geological and geotechnical
17 engineers;

18 (III) emergency management
19 personnel; and

20 (IV) land use and other decision-
21 makers.

22 (2) NATIONAL STRATEGY.—Not later than 1
23 year after the date of enactment of this Act, and
24 every 5 years thereafter, the Secretary, in coordina-
25 tion with the Committee, shall develop and publish

1 a national strategy for landslide hazards, risk reduc-
2 tion, and response in the United States (including
3 territories), which shall include—

4 (A) goals and priorities for the program;

5 (B) priorities for data acquisition, re-
6 search, communications, and risk management
7 on landslides and landslide hazards across rel-
8 evant Federal agencies; and

9 (C) a detailed interagency plan, which shall
10 take into consideration national disaster pre-
11 paredness, response, and recovery frameworks,
12 to carry out the national strategy, including de-
13 tails about the programs, projects, and budgets
14 that will be used to implement the national
15 strategy.

16 (3) NATIONAL LANDSLIDE HAZARDS DATA-
17 BASE.—In carrying out the program, the Secretary,
18 in coordination with State offices, units of local gov-
19 ernment, territories, and Indian tribes, shall develop
20 and maintain a publicly accessible national landslide
21 hazard and risk inventory database to compile,
22 maintain, standardize, and evaluate data regard-
23 ing—

24 (A) landslide hazards and risks;

25 (B) the impact of landslides on—

- 1 (i) health and safety;
2 (ii) the economy and infrastructure;
3 and
4 (iii) the environment;
5 (C) landslide hazard stabilization; and
6 (D) reduction of losses from landslides.

7 (4) LANDSLIDE HAZARD AND RISK PREPARED-
8 NESS FOR COMMUNITIES.—In carrying out the pro-
9 gram, the Secretary, in coordination with the Sec-
10 retary of the Army, the Secretary of Commerce, the
11 Secretary of Homeland Security, the Secretary of
12 Transportation, and the heads of other relevant Fed-
13 eral agencies, and in consultation with State offices,
14 units of local government, territories, and Indian
15 tribes, shall develop and disseminate—

16 (A) landslide planning and risk reduction
17 guidance, guidelines, maps, tools, and training
18 materials to help inform State, territorial, local,
19 and Tribal governments and decisionmakers
20 with respect to—

- 21 (i) the use and implementation of
22 landslide hazard assessments;
23 (ii) the applied use of the database
24 developed under paragraph (3);

1 (iii) reducing losses from landslides;

2 and

3 (iv) resources available for commu-
4 nities working to improve landslide hazard
5 preparedness; and

6 (B) landslide preparedness curricula and
7 training modules for—

8 (i) State, territorial, local, and Tribal
9 officials;

10 (ii) Federal, State, territorial, local,
11 and Tribal emergency managers; and

12 (iii) the National Guard.

13 (5) DEBRIS FLOW EARLY WARNING SYSTEM.—

14 In carrying out the program, the Secretary, in co-
15 ordination with the Secretary of Commerce and the
16 Secretary of Homeland Security, shall expand the
17 early warning system for debris flow by—

18 (A) expanding the early warning system
19 for post-wildfire debris flow to include recently
20 burned areas across the western United States;

21 (B) developing procedures with State, ter-
22 ritorial, local, and Tribal governments to mon-
23 itor stormwater drainage in areas with high de-
24bris flow risk; and

1 (C) identifying high-risk debris flow areas,
2 such as recently burned land and potential
3 lahar hazard areas.

4 (6) EMERGENCY RESPONSE ACTIVITIES.—In
5 carrying out the program, the Secretary, in coordi-
6 nation with the Secretary of Commerce, the Sec-
7 retary of Homeland Security, the heads of other rel-
8 evant Federal agencies, States offices, units of local
9 government, territories, and Indian tribes, shall es-
10 tablish and support emergency response procedures
11 for the rapid deployment of Federal scientists,
12 equipment, and services to areas impacted by a sig-
13 nificant landslide event—

14 (A) to support emergency response efforts
15 and improve the safety of emergency respond-
16 ers;

17 (B) to improve data collection; and

18 (C) to conduct research to advance the un-
19 derstanding of the causes, impacts, and reduc-
20 tion of landslide hazards and risks.

21 (c) INTERAGENCY COORDINATING COMMITTEE ON
22 LANDSLIDE HAZARDS.—

23 (1) IN GENERAL.—There is established a com-
24 mittee, to be known as the “Interagency Coordi-
25 nating Committee on Landslide Hazards”.

1 (2) MEMBERSHIP.—The Committee shall be
2 composed of the following members (or their des-
3 ignees):

4 (A) The Secretary, who shall serve as
5 Chairperson of the Committee.

6 (B) The Secretary of Agriculture.

7 (C) The Secretary of the Army.

8 (D) The Secretary of Commerce.

9 (E) The Secretary of Homeland Security.

10 (F) The Secretary of Transportation.

11 (G) The Director of the National Science
12 Foundation.

13 (H) The Director of the Office of Science
14 and Technology Policy.

15 (I) The Director of the Office of Manage-
16 ment and Budget.

17 (3) MEETINGS.—The Committee shall meet at
18 the call of the Chairperson.

19 (4) PURPOSE AND DUTIES.—The Committee
20 shall—

21 (A) advise and oversee the program;

22 (B) facilitate communication and coordina-
23 tion across Federal agencies in the planning,
24 management, budgeting, and execution of land-
25 slide activities; and

1 (C) support the development and execution
2 of the national strategy under subsection (b)(2),
3 including by—

4 (i) supporting the development of na-
5 tional goals and priorities for the national
6 strategy;

7 (ii) articulating Federal agency roles,
8 responsibilities, and resources for carrying
9 out the national strategy; and

10 (iii) overseeing the implementation of
11 the national strategy.

12 (d) ADVISORY COMMITTEE.—

13 (1) IN GENERAL.—The Secretary shall establish
14 an advisory committee, to be known as the “Advi-
15 sory Committee on Landslides” (referred to in this
16 subsection as the “Advisory Committee”).

17 (2) MEMBERSHIP.—The Advisory Committee
18 shall be composed of not fewer than 11 members—

19 (A) of whom none may be an individual de-
20 scribed in any of subparagraphs (A) through
21 (F) of section 7342(a)(1) of title 5, United
22 States Code; and

23 (B) who shall be representatives of—

24 (i) States, including State geological
25 organizations;

1 (ii) territories, including territorial ge-
2 ological organizations;

3 (iii) Indian tribes, including Tribal ge-
4 ological organizations;

5 (iv) research institutions and institu-
6 tions of higher education that are quali-
7 fied—

8 (I) to provide advice regarding
9 landslide hazard and risk reduction;
10 and

11 (II) to represent related sci-
12 entific, architectural, engineering, and
13 planning disciplines;

14 (v) industry standards development
15 organizations; and

16 (vi) State, territorial, local, and Tribal
17 emergency management agencies.

18 (3) RECOMMENDATIONS.—

19 (A) IN GENERAL.—The Advisory Com-
20 mittee shall submit to the Committee rec-
21 ommendations for the implementation of the
22 program, including recommendations regard-
23 ing—

24 (i) landslide hazard and risk reduction
25 and planning;

- 1 (ii) tools for communities;
2 (iii) research; and
3 (iv) such other topics as the Advisory
4 Committee determines appropriate.

5 (B) CONSIDERATION.—The Secretary and
6 the agency heads described in subparagraphs
7 (B) through (I) of subsection (c)(2) shall take
8 into consideration any recommendation of the
9 Advisory Committee submitted under subpara-
10 graph (A).

11 (e) GRANT PROGRAMS.—

12 (1) COOPERATIVE LANDSLIDE HAZARD MAP-
13 PING AND ASSESSMENT PROGRAM.—

14 (A) IN GENERAL.—Subject to appropria-
15 tions, the Secretary may—

16 (i) provide grants, on a competitive
17 basis, to State, territorial, local, and Tribal
18 governments to research, map, assess, and
19 collect data on landslide hazards within the
20 jurisdictions of those governments; and

21 (ii) accept and use funds received
22 from other Federal and non-Federal part-
23 ners to advance the purposes of the pro-
24 gram.

25 (B) PRIORITY.—

1 (i) IN GENERAL.—The Secretary shall
 2 consult annually with the Committee,
 3 States, units of local government, terri-
 4 tories, and Indian tribes to establish prior-
 5 ities for the grant program under this
 6 paragraph.

7 (ii) FUNDING PRIORITIZATION.—In
 8 providing grants under this paragraph, the
 9 Secretary shall give priority to projects—

10 (I) that will achieve the greatest
 11 landslide hazard and risk reduction;

12 (II) that reflect the goals and
 13 priorities of the national strategy es-
 14 tablished under subsection (b)(2)(A);

15 (III) not less than 50 percent of
 16 the total cost of which is matched by
 17 non-Federal sources; and

18 (IV) that include acquisition of
 19 enhanced elevation data consistent
 20 with the 3D Elevation Program.

21 (2) NATIONAL LANDSLIDE RESEARCH
 22 GRANTS.—

23 (A) IN GENERAL.—To advance the goals
 24 and priorities of the national strategy estab-
 25 lished under subsection (b)(2)(A), subject to ap-

1 propriations, the Director of the National
2 Science Foundation (referred to in this para-
3 graph as the “Director”) may provide grants to
4 eligible entities for landslide research, including
5 research on—

6 (i) the causes, mechanisms, triggers,
7 hydrology, and geology of landslides;

8 (ii) ways to reduce landslide hazards
9 and risks to minimize loss of life and prop-
10 erty, including landslide hazard and risk
11 communication, perception, decision-
12 making, tools, and technologies; and

13 (iii) other goals and priorities of the
14 national strategy established under sub-
15 section (b)(2)(A).

16 (B) ELIGIBLE ENTITIES.—The Director
17 shall determine whether an entity is eligible to
18 receive a grant under this paragraph.

19 (C) REQUIREMENTS.—In providing grants
20 under this paragraph, the Director shall—

21 (i) ensure that the grants are pro-
22 vided on a competitive basis; and

23 (ii) consider grant applications sub-
24 mitted by eligible entities that have devel-

1 oped the application in partnership with 1
2 or more State geological surveys.

3 (f) BIENNIAL REPORT.—The Secretary shall submit
4 to Congress a biennial report, including a description of,
5 with respect to the preceding 2 calendar years—

6 (1) the goals and accomplishments of the Sec-
7 retary and the agency heads described in subpara-
8 graphs (B) through (I) of subsection (c)(2) in car-
9 rying out the national strategy developed under sub-
10 section (b)(2), expressed—

11 (A) by agency, program, and budgetary re-
12 source; and

13 (B) by the goals and priorities of the na-
14 tional strategy established under subsection
15 (b)(2)(A);

16 (2) the results of the activities of the Com-
17 mittee under this section;

18 (3) the extent to which any recommendations of
19 the Advisory Committee under subsection (d)(3)(A)
20 have been implemented;

21 (4) the grants provided under this section dur-
22 ing the preceding 2 calendar years, including a de-
23 scription of—

24 (A) each activity carried out using such a
25 grant; and

1 (B) the results of those activities; and

2 (5) for each significant landslide event in the
3 United States (including territories) during the pre-
4 ceding 2 calendar years—

5 (A) a description of the landslide event and
6 the implications of the event on communities,
7 including life and property;

8 (B) recommendations on how the identi-
9 fication of the landslide risk could have been
10 improved prior to the event;

11 (C) a description of the effectiveness of
12 any warning and risk communication, including
13 the dissemination of warnings by State, terri-
14 torial, local, and Tribal partners in the affected
15 area;

16 (D) recommendations to improve risk iden-
17 tification, reduction, and communication to
18 landowners and units of local government;

19 (E) recommendations to improve landslide
20 hazard preparedness and emergency response
21 activities under this section; and

22 (F) such other findings as the Secretary
23 determines appropriate.

1 (g) FUNDING.—There is authorized to be appro-
2 priated to carry out this section \$37,000,000 for each of
3 fiscal years 2020 through 2023, of which—

4 (1) \$25,000,000 each fiscal year shall be made
5 available to the United States Geological Survey;
6 and

7 (2) \$1,000,000 each fiscal year shall be made
8 available to the National Oceanic and Atmospheric
9 Administration.

10 **SEC. 4. GROUND SUBSIDENCE.**

11 As the Secretary determines to be appropriate and
12 subject to appropriations, the Secretary, through existing
13 programs, shall advance the identification, mapping, re-
14 search, and monitoring of subsidence and groundwater re-
15 source accounting, particularly in areas affected by
16 drought.

17 **SEC. 5. 3D ELEVATION PROGRAM.**

18 (a) ESTABLISHMENT OF 3D ELEVATION PRO-
19 GRAM.—

20 (1) IN GENERAL.—The Secretary shall establish
21 a program, to be known as the “3D Elevation Pro-
22 gram”—

23 (A) to provide 3D elevation data coverage
24 for the United States;

1 (B) to coordinate and facilitate the collec-
2 tion, dissemination, and use of 3D elevation
3 data among Federal departments and agencies
4 and non-Federal entities;

5 (C) to produce standard, publicly acces-
6 sible 3D elevation data products for the United
7 States; and

8 (D) to promote the collection, dissemina-
9 tion, and use of 3D elevation data among Fed-
10 eral, State, local, and Tribal governments, com-
11 munities, institutions of higher education, and
12 the private sector through—

13 (i) cooperative agreements;

14 (ii) the development and maintenance
15 of spatial data infrastructure to provide
16 quality control and deliver to the public 3D
17 elevation data products;

18 (iii) in coordination with the 3D Ele-
19 vation Federal Interagency Coordinating
20 Committee established under subsection
21 (b), States, and industry and standards
22 bodies, the development of standards and
23 guidelines for 3D elevation data acquisition
24 to increase accessibility to 3D elevation
25 data in a standard, easy-to-use format; and

1 (iv) the identification, assessment, and
2 adoption of emerging technologies to im-
3 prove the accuracy and efficiency of the
4 3D Elevation Program.

5 (2) MANAGEMENT.—

6 (A) IN GENERAL.—The Secretary shall
7 manage the 3D Elevation Program—

8 (i) to ensure efficiency with respect to
9 related activities of the Department of the
10 Interior and other participating Federal
11 departments and agencies; and

12 (ii) to meet the needs of Department
13 of the Interior programs, stakeholders, and
14 the public.

15 (B) OTHER FEDERAL DEPARTMENTS AND
16 AGENCIES.—The head of each Federal depart-
17 ment and agency involved in the acquisition,
18 production, distribution, or application of 3D
19 elevation data shall—

20 (i) coordinate with the 3D Elevation
21 Federal Interagency Coordinating Com-
22 mittee established under subsection (b) to
23 acquire additional, enhanced 3D elevation
24 data;

1 (ii) submit to the Secretary a descrip-
2 tion of priority areas of interest for 3D ele-
3 vation data collection for use in providing
4 grants and cooperative agreements under
5 subsection (d);

6 (iii) implement policies and procedures
7 for data acquisition and sharing that are
8 consistent with standards and guidelines
9 developed under the 3D Elevation Pro-
10 gram;

11 (iv) participate in, and share the re-
12 sults and benefits of, the 3D Elevation
13 Program, in accordance with standards
14 and guidelines developed under the 3D
15 Elevation Program; and

16 (v) ensure that any 3D elevation data
17 acquired with Federal grant funding—

18 (I) meets 3D Elevation Program
19 standards; and

20 (II) is included in the national
21 holdings of those data.

22 (b) 3D ELEVATION FEDERAL INTERAGENCY CO-
23 ORDINATING COMMITTEE.—

24 (1) ESTABLISHMENT.—The Secretary, in co-
25 ordination with the Secretary of Commerce and the

1 Secretary of Homeland Security, shall establish an
2 interagency coordinating committee, to be known as
3 the “3D Elevation Federal Interagency Coordinating
4 Committee” (referred to in this subsection as the
5 “Committee”), to better coordinate 3D elevation
6 data management across the Federal Government.

7 (2) MEMBERSHIP.—The Committee shall be
8 composed of the following members (or their des-
9 ignees):

10 (A) The Secretary, who shall serve as
11 Chairperson of the Committee.

12 (B) The Secretary of Agriculture.

13 (C) The Secretary of Commerce.

14 (D) The Secretary of Homeland Security.

15 (E) The Director of the National Science
16 Foundation.

17 (F) The Director of the Office of Science
18 and Technology Policy.

19 (G) The Director of the Office of Manage-
20 ment and Budget.

21 (H) The head of any other Federal depart-
22 ment or agency, at the request of the Secretary.

23 (3) COORDINATION.—The Committee shall co-
24 ordinate, as appropriate, with the existing activities
25 of—

1 (A) the 3D Elevation Program Executive
2 Forum;

3 (B) the Alaska Mapping Executive Com-
4 mittee;

5 (C) the 3D Elevation Working Group;

6 (D) the 3D National Elevation Sub-
7 committee; and

8 (E) State offices.

9 (4) MEETINGS.—The Committee shall meet at
10 the call of the Chairperson.

11 (5) DUTIES.—The Committee shall—

12 (A) oversee the planning, management,
13 and coordination of the 3D Elevation Program;
14 and

15 (B) develop, by not later than 1 year after
16 the date of enactment of this Act, and update
17 periodically thereafter—

18 (i) a strategic plan that establishes
19 goals and priorities for activities carried
20 out under the 3D Elevation Program; and

21 (ii) a detailed management plan to
22 implement the strategic plan.

23 (c) SUBCOMMITTEE OF NATIONAL GEOSPATIAL AD-
24 VISORY COMMITTEE.—

25 (1) ESTABLISHMENT.—

1 (A) IN GENERAL.—The Secretary shall es-
2 tablish, within the National Geospatial Advisory
3 Committee, a subcommittee (referred to in this
4 subsection as the “Subcommittee”).

5 (B) MEMBERSHIP.—The Subcommittee
6 shall—

7 (i) consist of not fewer than 11 mem-
8 bers, of whom none may be a Federal offi-
9 cer or employee; and

10 (ii) include representatives of—

11 (I) research and academic insti-
12 tutions;

13 (II) industry standards develop-
14 ment organizations;

15 (III) units of State and local gov-
16 ernment; and

17 (IV) the private sector.

18 (2) DUTIES.—

19 (A) ASSESSMENT.—The Subcommittee
20 shall conduct an assessment of—

21 (i) trends and developments in—

22 (I) the collection, dissemination,
23 and use of 3D elevation data; and

24 (II) science and technology relat-
25 ing to 3D elevation data;

1 (ii) the effectiveness of the 3D Ele-
2 vation Program in carrying out the activi-
3 ties described in subsection (a)(1);

4 (iii) the need to revise or reorganize
5 the 3D Elevation Program; and

6 (iv) the management, coordination,
7 implementation, and activities of the 3D
8 Elevation Program.

9 (B) REPORT.—Not later than 1 year after
10 the date of enactment of this Act, and every 2
11 years thereafter, the Subcommittee shall submit
12 to the Secretary and the 3D Elevation Federal
13 Interagency Coordinating Committee estab-
14 lished under subsection (b) a report that in-
15 cludes—

16 (i) the findings of the assessment
17 under subparagraph (A); and

18 (ii) recommendations of the Sub-
19 committee based on those findings, if any.

20 (d) GRANTS AND COOPERATIVE AGREEMENTS.—

21 (1) IN GENERAL.—The Secretary may make
22 grants and enter into cooperative agreements with
23 other Federal departments and agencies, units of
24 State, local, or Tribal government, institutions of
25 higher education, nonprofit research institutions, or

1 other organizations to facilitate the improvement of
2 nationwide coverage of 3D elevation data.

3 (2) APPLICATIONS.—To be eligible to receive a
4 grant or enter into a cooperative agreement under
5 this subsection, an entity described in paragraph (1)
6 shall submit to the Secretary an application at such
7 time, in such manner, and containing such informa-
8 tion as the Secretary may require.

9 (3) TERMS AND CONDITIONS.—A grant or coop-
10 erative agreement under this subsection shall be sub-
11 ject to such terms and conditions as the Secretary
12 determines to be appropriate, including making data
13 publically available and interoperable with other
14 Federal datasets.

15 (e) AUTHORIZATION OF APPROPRIATIONS.—There is
16 authorized to be appropriated to carry out this section
17 \$20,000,000 for each of fiscal years 2020 through 2023.

○