

115TH CONGRESS  
1ST SESSION

# S. 698

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

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## IN THE SENATE OF THE UNITED STATES

MARCH 22, 2017

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

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## 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.

9               (2) 3D ELEVATION DATA.—

1 (A) IN GENERAL.—The term “3D ele-  
2 vation data” means 3D, high-resolution data  
3 obtained using lidar, ifsar, or other methods  
4 over the United States (including territories).

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

8 (3) 3D ELEVATION PROGRAM.—The term “3D  
9 Elevation Program” means the 3D Elevation Pro-  
10 gram established under section 5(a).

11 (4) IFSAR.—The term “ifsar” means  
12 interferometric synthetic aperture radar.

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

17 (6) LIDAR.—The term “lidar” means light de-  
18 tection and ranging.

19 (7) SECRETARY.—The term “Secretary” means  
20 the Secretary of the Interior, acting through the Di-  
21 rector of the United States Geological Survey.

22 (8) STATE.—The term “State” means any unit  
23 of State government handling the identification,  
24 mapping, assessment, and research of landslide haz-  
25 ards or responding to landslide events, including—

1 (A) a State geological survey office;

2 (B) a State department of emergency re-  
3 sponse; and

4 (C) a State department of transportation.

5 **SEC. 3. NATIONAL LANDSLIDE HAZARDS REDUCTION PRO-**  
6 **GRAM.**

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

11 (1) to identify and understand landslide haz-  
12 ards and risks;

13 (2) to reduce losses from landslides;

14 (3) to protect communities at risk of landslide  
15 hazards; and

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

20 (b) DESCRIPTION OF PROGRAM.—

21 (1) PROGRAM ACTIVITIES.—The Secretary, in  
22 coordination with the Interagency Coordinating  
23 Committee on Landslide Hazards established by  
24 subsection (c)(1) (referred to in this section as the  
25 “Committee”) and in coordination with existing ac-

1       tivities of the United States Geological Survey and  
2       other Federal agencies, shall—

3               (A) identify, map, assess, and research  
4       landslide hazards;

5               (B) respond to landslide events; and

6               (C) in coordination with States and Indian  
7       tribes—

8                   (i) establish working groups with  
9       States 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; and

18                          (III) land use and other decision-  
19      makers.

20           (2) NATIONAL STRATEGY.—Not later than 180  
21      days after the date of enactment of this Act, and  
22      every 5 years thereafter, the Secretary, in coordina-  
23      tion with the Committee, shall develop and publish  
24      a national strategy for landslide hazards and risk re-  
25      duction in the United States, which shall include—

1 (A) goals and priorities for the program;

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

6 (C) a detailed interagency plan to carry  
7 out the national strategy, including details  
8 about the programs, projects, and budgets that  
9 will be used to implement the national strategy.

10 (3) NATIONAL LANDSLIDE HAZARDS DATA-  
11 BASE.—In carrying out the program, the Secretary,  
12 in coordination with States and Indian tribes, shall  
13 develop and maintain a publicly accessible national  
14 landslide hazard and risk inventory database to com-  
15 pile, maintain, standardize, and evaluate data re-  
16 garding—

17 (A) landslide hazards and risks nationwide;

18 (B) the nationwide impact of landslides

19 on—

20 (i) health and safety;

21 (ii) the economy and infrastructure;

22 and

23 (iii) the environment;

24 (C) landslide hazard stabilization; and

25 (D) reduction of losses from landslides.

(4) LANDSLIDE HAZARD AND RISK PREPAREDNESS FOR COMMUNITIES.—In carrying out the program, the Secretary, in coordination with the Secretary of the Army, the Secretary of Commerce, the Secretary of Homeland Security, the Secretary of Transportation, and the heads of other relevant Federal agencies, and in consultation with States and Indian tribes, shall develop and disseminate—

(A) landslide planning and risk reduction guidance, guidelines, maps, tools, and training materials to help inform State, local, and tribal governments and decisionmakers with respect to—

(i) the use and implementation of landslide hazard assessments;

(ii) the applied use of the database developed under paragraph (3);

(iii) reducing losses from landslides;

and

(iv) resources available for communities working to improve landslide hazard preparedness; and

(B) landslide preparedness curricula and training modules for—

(i) State, local, and tribal officials;

- 1 (ii) Federal, State, local, and tribal  
 2 emergency managers; and  
 3 (iii) the National Guard.

4 (5) FLASH FLOOD AND DEBRIS FLOW EARLY  
 5 WARNING SYSTEM.—In carrying out the program,  
 6 the Secretary, in coordination with the Secretary of  
 7 Commerce, shall expand the early warning system  
 8 for flash floods and debris flow by—

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

12 (B) developing procedures with State,  
 13 local, and tribal governments to monitor  
 14 stormwater drainage in areas with high flash  
 15 flood and debris flow risk; and

16 (C) identifying high-risk debris flow areas,  
 17 such as recently burned land and potential  
 18 lahar hazard areas.

19 (6) EMERGENCY RESPONSE ACTIVITIES.—In  
 20 carrying out the program, the Secretary, in coordi-  
 21 nation with the Secretary of Commerce, the Sec-  
 22 retary of Homeland Security, the heads of other rel-  
 23 evant Federal agencies, States, and Indian tribes,  
 24 shall establish emergency response procedures for  
 25 the rapid deployment of Federal scientists, equip-

1       ment, and services to areas impacted by a significant  
2       landslide event—

3               (A) to support emergency response efforts  
4               and improve the safety of emergency respond-  
5               ers;

6               (B) to improve data collection; and

7               (C) to conduct research to advance the un-  
8               derstanding of the causes, impacts, and reduc-  
9               tion of landslide hazards and risks.

10       (c) INTERAGENCY COORDINATING COMMITTEE ON  
11       LANDSLIDE HAZARDS.—

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

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

18               (A) The Secretary, who shall serve as  
19       Chairperson of the Committee.

20               (B) The Secretary of the Army.

21               (C) The Secretary of Commerce.

22               (D) The Secretary of Homeland Security.

23               (E) The Secretary of Transportation.

24               (F) The Director of the National Science  
25       Foundation.

1 (G) The Director of the Office of Science  
2 and Technology Policy.

3 (H) The Director of the Office of Manage-  
4 ment and Budget.

5 (3) MEETINGS.—The Committee shall meet at  
6 the call of the Chairperson.

7 (4) PURPOSE AND DUTIES.—The Committee  
8 shall—

9 (A) advise and oversee the program;

10 (B) facilitate communication and coordina-  
11 tion across Federal agencies in the planning,  
12 management, budgeting, and execution of land-  
13 slide activities; and

14 (C) support the development and execution  
15 of the national strategy under subsection (b)(2),  
16 including by—

17 (i) supporting the development of na-  
18 tional goals and priorities for the national  
19 strategy;

20 (ii) articulating Federal agency roles,  
21 responsibilities, and resources for carrying  
22 out the national strategy; and

23 (iii) overseeing the implementation of  
24 the national strategy.

25 (d) ADVISORY COMMITTEE.—

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

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

7                   (A) of whom none may be an individual de-  
8                   scribed in any of subparagraphs (A) through  
9                   (F) of section 7342(a)(1) of title 5, United  
10                  States Code; and

11                  (B) who shall be representatives of—

12                          (i) States, including State geological  
13                          organizations;

14                          (ii) Indian tribes, including tribal geo-  
15                          logical organizations;

16                          (iii) research institutions and institu-  
17                          tions of higher education that are quali-  
18                          fied—

19                                  (I) to provide advice regarding  
20                                  landslide hazard and risk reduction;  
21                                  and

22                                  (II) to represent related sci-  
23                                  entific, architectural, engineering, and  
24                                  planning disciplines;

- 1 (iv) industry standards development  
2 organizations; and  
3 (v) State, local, and tribal emergency  
4 management agencies.

5 (3) RECOMMENDATIONS.—

6 (A) IN GENERAL.—The Advisory Com-  
7 mittee shall submit to the Committee rec-  
8 ommendations for the implementation of the  
9 program, including recommendations regard-  
10 ing—

11 (i) landslide hazard and risk reduction  
12 and planning;

13 (ii) tools for communities;

14 (iii) research; and

15 (iv) such other topics as the Advisory  
16 Committee determines appropriate.

17 (B) CONSIDERATION.—The Secretary and  
18 the agency heads described in subparagraphs  
19 (A) through (H) of subsection (c)(2) shall take  
20 into consideration any recommendation of the  
21 Advisory Committee submitted under subpara-  
22 graph (A).

23 (e) GRANT PROGRAMS.—

24 (1) COOPERATIVE LANDSLIDE HAZARD MAP-  
25 PING AND ASSESSMENT PROGRAM.—

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

3 (i) provide grants, on a competitive  
4 basis, to State, local, and tribal govern-  
5 ments to research, map, assess, and collect  
6 data on landslide hazards within the juris-  
7 dictions of those governments; and

8 (ii) accept and use funds received  
9 from other Federal and non-Federal part-  
10 ners to advance the purposes of the pro-  
11 gram.

12 (B) PRIORITY.—

13 (i) IN GENERAL.—The Secretary shall  
14 consult annually with the Committee,  
15 States, and Indian tribes to establish prior-  
16 ities for the grant program under this  
17 paragraph.

18 (ii) FUNDING PRIORITIZATION.—In  
19 providing grants under this paragraph, the  
20 Secretary shall give priority to projects  
21 that—

22 (I) will achieve the greatest land-  
23 slide hazard and risk reduction;

1 (II) reflect the goals and prior-  
 2 ities of the national strategy estab-  
 3 lished under subsection (b)(2)(A);

4 (III) would receive not more than  
 5 50 percent of the total cost of the  
 6 project from non-Federal sources; and

7 (IV) include acquisition of en-  
 8 hanced elevation data consistent with  
 9 the 3D Elevation Program.

10 (2) NATIONAL LANDSLIDE RESEARCH  
 11 GRANTS.—In providing grants for landslide research  
 12 and development, the Director of the National  
 13 Science Foundation, in consultation with the Sec-  
 14 retary and the Committee, shall ensure that the  
 15 grants are provided on a competitive basis to State,  
 16 local, and tribal governments, institutions of higher  
 17 education, and nongovernmental entities to advance  
 18 the goals and priorities of the national strategy es-  
 19 tablished under subsection (b)(2)(A), including for  
 20 research and development on—

21 (A) the causes, mechanisms, triggers, hy-  
 22 drology, and geology of landslides;

23 (B) ways to reduce landslide hazards and  
 24 risks to minimize loss of life and property, in-  
 25 cluding landslide hazard and risk communica-

1           tion, perception, decisionmaking, tools, and  
2           technologies; and

3           (C) other goals and priorities of the na-  
4           tional strategy established under subsection  
5           (b)(2)(A).

6           (f) ANNUAL REPORT.—The Secretary shall submit to  
7 Congress an annual report, including a description of, with  
8 respect to the preceding calendar year—

9           (1) the goals and accomplishments of the Sec-  
10          retary and the agency heads described in subpara-  
11          graphs (A) through (H) of subsection (c)(2) in car-  
12          rying out the national strategy developed under sub-  
13          section (b)(2), expressed—

14               (A) by agency, program, and budgetary re-  
15               source; and

16               (B) by the goals and priorities of the na-  
17               tional strategy established under subsection  
18               (b)(2)(A);

19           (2) the results of the activities of the Com-  
20          mittee under this section;

21           (3) the extent to which any recommendations of  
22          the Advisory Committee under subsection (d)(3)(A)  
23          have been implemented;

1           (4) the grants provided under this section dur-  
2       ing that preceding calendar year, including a de-  
3       scription of—

4                   (A) each activity carried out using such a  
5       grant; and

6                   (B) the results of those activities; and

7       (5) for each significant landslide event in the  
8       United States during that preceding calendar year—

9                   (A) a description of the landslide event and  
10       the implications of the event on communities,  
11       including life and property;

12                   (B) recommendations on how the identi-  
13       fication of the landslide risk could have been  
14       improved prior to the event;

15                   (C) a description of the effectiveness of  
16       any warning and risk communication, including  
17       the dissemination of warnings by State, local,  
18       and tribal partners in the affected area;

19                   (D) recommendations to improve risk iden-  
20       tification, reduction, and communication to  
21       landowners and local governments;

22                   (E) recommendations to improve landslide  
23       hazard preparedness and emergency response  
24       activities under this section; and

1 (F) such other findings as the Secretary  
2 determines appropriate.

3 **SEC. 4. GROUND SUBSIDENCE.**

4 As the Secretary determines to be appropriate and  
5 subject to appropriations, the Secretary, through existing  
6 programs, shall advance the identification, mapping, re-  
7 search, and monitoring of subsidence and groundwater re-  
8 source accounting, particularly in areas affected by  
9 drought.

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

11 (a) ESTABLISHMENT OF 3D ELEVATION PRO-  
12 GRAM.—

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

16 (A) to provide 3D elevation data coverage  
17 for the United States;

18 (B) to coordinate and facilitate the collec-  
19 tion, dissemination, and use of 3D elevation  
20 data among Federal departments and agencies  
21 and non-Federal entities;

22 (C) to produce standard, publicly acces-  
23 sible 3D elevation data products for the United  
24 States; and

1 (D) to promote the collection, dissemina-  
2 tion, and use of 3D elevation data among Fed-  
3 eral, State, local, and tribal governments, com-  
4 munities, institutions of higher education, and  
5 the private sector through—

6 (i) cooperative agreements;

7 (ii) the development and maintenance  
8 of spatial data infrastructure to provide  
9 quality control and deliver to the public 3D  
10 elevation data products;

11 (iii) the development of standards and  
12 guidelines for 3D elevation data acquisition  
13 to increase accessibility to 3D elevation  
14 data in a standard, easy-to-use format; and

15 (iv) the identification, assessment, and  
16 adoption of emerging technologies to im-  
17 prove the accuracy and efficiency of the  
18 3D Elevation Program.

19 (2) MANAGEMENT.—

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

22 (i) to ensure efficiency with respect to  
23 related activities of the Department of the  
24 Interior and other participating Federal  
25 departments and agencies; and

1 (ii) to meet the needs of Department  
2 of the Interior programs, stakeholders, and  
3 the public.

4 (B) OTHER FEDERAL DEPARTMENTS AND  
5 AGENCIES.—The head of each Federal depart-  
6 ment and agency involved in the acquisition,  
7 production, distribution, or application of 3D  
8 elevation data shall—

9 (i) coordinate with the 3D Elevation  
10 Federal Interagency Coordinating Com-  
11 mittee established under subsection (b) to  
12 acquire additional, enhanced 3D elevation  
13 data;

14 (ii) submit to the Secretary a descrip-  
15 tion of priority areas of interest for 3D ele-  
16 vation data collection for use in providing  
17 grants and cooperative agreements under  
18 subsection (d);

19 (iii) implement policies and procedures  
20 for data acquisition and sharing that are  
21 consistent with standards and guidelines  
22 developed under the 3D Elevation Pro-  
23 gram;

24 (iv) participate in, and share the re-  
25 sults and benefits of, the 3D Elevation

1                   Program, in accordance with standards  
 2                   and guidelines developed under the 3D  
 3                   Elevation Program; and

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

6                   (I) meets 3D Elevation Program  
 7                   standards; and

8                   (II) is included in the national  
 9                   holdings of those data.

10       (b) 3D ELEVATION FEDERAL INTERAGENCY CO-  
 11       ORDINATING COMMITTEE.—

12               (1) ESTABLISHMENT.—The Secretary, in co-  
 13       ordination with the Secretary of Commerce, shall es-  
 14       tablish an interagency coordinating committee, to be  
 15       known as the “3D Elevation Federal Interagency  
 16       Coordinating Committee” (referred to in this sub-  
 17       section as the “Committee”), to better coordinate  
 18       3D elevation data management across the Federal  
 19       Government.

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

23               (A) The Secretary, who shall serve as  
 24       Chairperson of the Committee.

25               (B) The Secretary of Agriculture.

1 (C) The Secretary of Commerce.

2 (D) The Secretary of Homeland Security.

3 (E) The Director of the National Science  
4 Foundation.

5 (F) The Director of the Office of Science  
6 and Technology Policy.

7 (G) The Director of the Office of Manage-  
8 ment and Budget.

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

11 (3) COORDINATION.—The Committee shall co-  
12 ordinate, as appropriate, with the existing activities  
13 of—

14 (A) the 3D Elevation Program Executive  
15 Forum;

16 (B) the Alaska Mapping Executive Com-  
17 mittee;

18 (C) the 3D Elevation Working Group; and

19 (D) the 3D National Elevation Sub-  
20 committee.

21 (4) MEETINGS.—The Committee shall meet at  
22 the call of the Chairperson.

23 (5) DUTIES.—The Committee shall—

1 (A) oversee the planning, management,  
2 and coordination of the 3D Elevation Program;  
3 and

4 (B) develop, by not later than 1 year after  
5 the date of enactment of this Act, and update  
6 periodically thereafter—

7 (i) a strategic plan that establishes  
8 goals and priorities for activities carried  
9 out under the 3D Elevation Program; and

10 (ii) a detailed management plan to  
11 implement the strategic plan.

12 (c) SUBCOMMITTEE OF NATIONAL GEOSPATIAL AD-  
13 VISORY COMMITTEE.—

14 (1) ESTABLISHMENT.—

15 (A) IN GENERAL.—The Secretary shall es-  
16 tablish, within the National Geospatial Advisory  
17 Committee, a subcommittee (referred to in this  
18 subsection as the “Subcommittee”).

19 (B) MEMBERSHIP.—The Subcommittee  
20 shall—

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

24 (ii) include representatives of—

- 1 (I) research and academic insti-
- 2 tutions;
- 3 (II) industry standards develop-
- 4 ment organizations;
- 5 (III) units of State and local gov-
- 6 ernment; and
- 7 (IV) the private sector.

8 (2) DUTIES.—

9 (A) ASSESSMENT.—The Subcommittee  
10 shall conduct an assessment of—

11 (i) trends and developments in—

12 (I) the collection, dissemination,  
13 and use of 3D elevation data; and

14 (II) science and technology relat-  
15 ing to 3D elevation data;

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

19 (iii) the need to revise or reorganize  
20 the 3D Elevation Program; and

21 (iv) the management, coordination,  
22 implementation, and activities of the 3D  
23 Elevation Program.

24 (B) REPORT.—Not later than 1 year after  
25 the date of enactment of this Act, and not less

1 frequently than once every 2 years thereafter,  
2 the Subcommittee shall submit to the Secretary  
3 and the 3D Elevation Federal Interagency Co-  
4 ordinating Committee established under sub-  
5 section (b) a report that includes—

6 (i) the findings of the assessment  
7 under subparagraph (A); and

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

10 (d) GRANTS AND COOPERATIVE AGREEMENTS.—

11 (1) IN GENERAL.—The Secretary may make  
12 grants and enter into cooperative agreements with  
13 other Federal departments and agencies, units of  
14 tribal, State, or local government, institutions of  
15 higher education, nonprofit research institutions, or  
16 other organizations to facilitate the improvement of  
17 nationwide coverage of 3D elevation data.

18 (2) APPLICATIONS.—To be eligible to receive a  
19 grant or enter into a cooperative agreement under  
20 this subsection, an entity described in paragraph (1)  
21 shall submit to the Secretary an application at such  
22 time, in such manner, and containing such informa-  
23 tion as the Secretary may require.

24 (3) TERMS AND CONDITIONS.—A grant or coop-  
25 erative agreement under this subsection shall be sub-

1       ject to such terms and conditions as the Secretary  
2       determines to be appropriate, including making data  
3       publically available and interoperable with other  
4       Federal datasets.

○