

Calendar No. 315

116TH CONGRESS
1ST SESSION

S. 529

[Report No. 116-165]

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, Mrs. FEINSTEIN, and Mr. SULLIVAN) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

DECEMBER 5, 2019

Reported by Mr. WICKER, with an amendment

[Strike out all after the enacting clause and insert the part printed in *italic*]

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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “National Landslide
3 Preparedness Act”.

4 **SEC. 2. DEFINITIONS.**

5 In this Act:

6 (1) **3D.**—The term “3D” means 3-dimensional.

7 (2) **3D ELEVATION DATA.**—

8 (A) **IN GENERAL.**—The term “3D ele-
9 vation data” means 3D, high-resolution data
10 obtained using LiDAR, IfSAR, or other meth-
11 ods over the United States (including terri-
12 tories).

13 (B) **INCLUSIONS.**—The term “3D elevation
14 data” includes terrestrial and bathymetric ele-
15 vation data.

16 (3) **3D ELEVATION PROGRAM.**—The term “3D
17 Elevation Program” means the 3D Elevation Pro-
18 gram established under section 5(a).

19 (4) **IFSAR.**—The term “IfSAR” means
20 interferometric synthetic aperture radar.

21 (5) **INDIAN TRIBE.**—The term “Indian tribe”
22 has the meaning given the term in section 4 of the
23 Indian Self-Determination and Education Assistance
24 Act (25 U.S.C. 5304).

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

1 (A) often fast-moving; and

2 (B) a hazard in watersheds downstream of
3 volcanic peaks.

4 (7) LIDAR.—The term “LiDAR” means light
5 detection and ranging.

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

9 (9) STATE.—The term “State” means—

10 (A) a State; and

11 (B) the District of Columbia.

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

17 (A) a State geological survey office;

18 (B) a State department of emergency re-
19 sponse; and

20 (C) a State department of transportation.

21 (11) TERRITORY.—The term “territory”
22 means—

23 (A) the Commonwealth of Puerto Rico;

24 (B) Guam;

25 (C) American Samoa;

- 1 (D) the Commonwealth of the Northern
 2 Mariana Islands;
 3 (E) the Federated States of Micronesia;
 4 (F) the Republic of the Marshall Islands;
 5 (G) the Republic of Palau; and
 6 (H) the United States Virgin Islands.

7 **SEC. 3. NATIONAL LANDSLIDE HAZARDS REDUCTION PRO-**
 8 **GRAM.**

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

13 (1) to identify and understand landslide haz-
 14 ards and risks;

15 (2) to reduce losses from landslides;

16 (3) to protect communities at risk of landslide
 17 hazards; and

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

22 (b) **DESCRIPTION OF PROGRAM.**—

23 (1) **PROGRAM ACTIVITIES.**—The Secretary, in
 24 coordination with the Interagency Coordinating
 25 Committee on Landslide Hazards established by

1 subsection (c)(1) (referred to in this section as the
2 “Committee”) and in coordination with existing ac-
3 tivities of the United States Geological Survey and
4 other Federal agencies, shall—

5 (A) identify, map, assess, and research
6 landslide hazards;

7 (B) respond to landslide events; and

8 (C) in coordination with State offices,
9 units of local government, territories, and In-
10 dian tribes—

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

17 (ii) develop and implement landslide
18 hazard guidelines for—

19 (I) geologists;

20 (II) geological and geotechnical
21 engineers;

22 (III) emergency management
23 personnel; and

24 (IV) land use and other decision-
25 makers.

1 (2) NATIONAL STRATEGY.—Not later than 1
2 year after the date of enactment of this Act, and
3 every 5 years thereafter, the Secretary, in coordina-
4 tion with the Committee, shall develop and publish
5 a national strategy for landslide hazards, risk reduc-
6 tion, and response in the United States (including
7 territories), which shall include—

8 (A) goals and priorities for the program;

9 (B) priorities for data acquisition, re-
10 search, communications, and risk management
11 on landslides and landslide hazards across rel-
12 evant Federal agencies; and

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

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

1 maintain, standardize, and evaluate data regard-
 2 ing—

3 (A) landslide hazards and risks;

4 (B) the impact of landslides on—

5 (i) health and safety;

6 (ii) the economy and infrastructure;

7 and

8 (iii) the environment;

9 (C) landslide hazard stabilization; and

10 (D) reduction of losses from landslides.

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

20 (A) landslide planning and risk reduction
 21 guidance, guidelines, maps, tools, and training
 22 materials to help inform State, territorial, local,
 23 and Tribal governments and decisionmakers
 24 with respect to—

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

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

5 (iii) reducing losses from landslides;
6 and

7 (iv) resources available for commu-
8 nities working to improve landslide hazard
9 preparedness; and

10 (B) landslide preparedness curricula and
11 training modules for—

12 (i) State, territorial, local, and Tribal
13 officials;

14 (ii) Federal, State, territorial, local,
15 and Tribal emergency managers; and

16 (iii) the National Guard.

17 (5) DEBRIS FLOW EARLY WARNING SYSTEM.—

18 In carrying out the program, the Secretary, in co-
19 ordination with the Secretary of Commerce and the
20 Secretary of Homeland Security, shall expand the
21 early warning system for debris flow by—

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

1 (B) developing procedures with State, ter-
2 ritorial, local, and Tribal governments to mon-
3 itor stormwater drainage in areas with high de-
4 bris flow risk; and

5 (C) identifying high-risk debris flow areas,
6 such as recently burned land and potential
7 lahar hazard areas.

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

18 (A) to support emergency response efforts
19 and improve the safety of emergency respond-
20 ers;

21 (B) to improve data collection; and

22 (C) to conduct research to advance the un-
23 derstanding of the causes, impacts, and reduc-
24 tion of landslide hazards and risks.

1 (c) INTERAGENCY COORDINATING COMMITTEE ON
2 LANDSLIDE HAZARDS.—

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

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

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

11 (B) The Secretary of Agriculture.

12 (C) The Secretary of the Army.

13 (D) The Secretary of Commerce.

14 (E) The Secretary of Homeland Security.

15 (F) The Secretary of Transportation.

16 (G) The Director of the National Science
17 Foundation.

18 (H) The Director of the Office of Science
19 and Technology Policy.

20 (I) The Director of the Office of Manage-
21 ment and Budget.

22 (3) MEETINGS.—The Committee shall meet at
23 the call of the Chairperson.

24 (4) PURPOSE AND DUTIES.—The Committee
25 shall—

1 (A) advise and oversee the program;

2 (B) facilitate communication and coordina-
3 tion across Federal agencies in the planning,
4 management, budgeting, and execution of land-
5 slide activities; and

6 (C) support the development and execution
7 of the national strategy under subsection (b)(2);
8 including by—

9 (i) supporting the development of na-
10 tional goals and priorities for the national
11 strategy;

12 (ii) articulating Federal agency roles,
13 responsibilities, and resources for carrying
14 out the national strategy; and

15 (iii) overseeing the implementation of
16 the national strategy.

17 (d) ADVISORY COMMITTEE.—

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

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

24 (A) of whom none may be an individual de-
25 scribed in any of subparagraphs (A) through

1 ~~(F)~~ of section 7342(a)(1) of title 5, United
2 States Code; and

3 ~~(B)~~ who shall be representatives of—

4 (i) States, including State geological
5 organizations;

6 (ii) territories, including territorial ge-
7 ological organizations;

8 (iii) Indian tribes, including Tribal ge-
9 ological organizations;

10 (iv) research institutions and institu-
11 tions of higher education that are quali-
12 fied—

13 (I) to provide advice regarding
14 landslide hazard and risk reduction;
15 and

16 (II) to represent related sci-
17 entific, architectural, engineering, and
18 planning disciplines;

19 (v) industry standards development
20 organizations; and

21 (vi) State, territorial, local, and Tribal
22 emergency management agencies.

23 ~~(3)~~ RECOMMENDATIONS.—

24 (A) IN GENERAL.—The Advisory Com-
25 mittee shall submit to the Committee rec-

1 ommendations for the implementation of the
 2 program, including recommendations regard-
 3 ing—

4 (i) landslide hazard and risk reduction
 5 and planning;

6 (ii) tools for communities;

7 (iii) research; and

8 (iv) such other topics as the Advisory
 9 Committee determines appropriate.

10 ~~(B) CONSIDERATION.~~—The Secretary and
 11 the agency heads described in subparagraphs
 12 ~~(B)~~ through ~~(I)~~ of subsection ~~(c)(2)~~ shall take
 13 into consideration any recommendation of the
 14 Advisory Committee submitted under subpara-
 15 graph ~~(A)~~.

16 ~~(e) GRANT PROGRAMS.~~—

17 ~~(1) COOPERATIVE LANDSLIDE HAZARD MAP-~~
 18 ~~PING AND ASSESSMENT PROGRAM.~~—

19 ~~(A) IN GENERAL.~~—Subject to appropria-
 20 tions, the Secretary may—

21 (i) provide grants, on a competitive
 22 basis, to State, territorial, local, and Tribal
 23 governments to research, map, assess, and
 24 collect data on landslide hazards within the
 25 jurisdictions of those governments; and

1 (ii) accept and use funds received
2 from other Federal and non-Federal part-
3 ners to advance the purposes of the pro-
4 gram.

5 (B) PRIORITY.—

6 (i) IN GENERAL.—The Secretary shall
7 consult annually with the Committee,
8 States, units of local government, terri-
9 tories, and Indian tribes to establish prior-
10 ities for the grant program under this
11 paragraph.

12 (ii) FUNDING PRIORITIZATION.—In
13 providing grants under this paragraph, the
14 Secretary shall give priority to projects—

15 (I) that will achieve the greatest
16 landslide hazard and risk reduction;

17 (II) that reflect the goals and
18 priorities of the national strategy es-
19 tablished under subsection (b)(2)(A);

20 (III) not less than 50 percent of
21 the total cost of which is matched by
22 non-Federal sources; and

23 (IV) that include acquisition of
24 enhanced elevation data consistent
25 with the 3D Elevation Program.

1 (2) NATIONAL LANDSLIDE RESEARCH
2 GRANTS.—

3 (A) IN GENERAL.—To advance the goals
4 and priorities of the national strategy estab-
5 lished under subsection (b)(2)(A), subject to ap-
6 propriations, the Director of the National
7 Science Foundation (referred to in this para-
8 graph as the “Director”) may provide grants to
9 eligible entities for landslide research, including
10 research on—

11 (i) the causes, mechanisms, triggers,
12 hydrology, and geology of landslides;

13 (ii) ways to reduce landslide hazards
14 and risks to minimize loss of life and prop-
15 erty, including landslide hazard and risk
16 communication, perception, decision-
17 making, tools, and technologies; and

18 (iii) other goals and priorities of the
19 national strategy established under sub-
20 section (b)(2)(A).

21 (B) ELIGIBLE ENTITIES.—The Director
22 shall determine whether an entity is eligible to
23 receive a grant under this paragraph.

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

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

3 (ii) consider grant applications sub-
4 mitted by eligible entities that have devel-
5 oped the application in partnership with 1
6 or more State geological surveys.

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

10 (1) the goals and accomplishments of the Sec-
11 retary and the agency heads described in subpara-
12 graphs (B) through (I) of subsection (e)(2) in ear-
13 rying out the national strategy developed under sub-
14 section (b)(2), expressed—

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

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

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

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

1 (4) the grants provided under this section dur-
2 ing the preceding 2 calendar years, 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 (including territories) during the pre-
9 ceding 2 calendar years—

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

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

16 (C) a description of the effectiveness of
17 any warning and risk communication, including
18 the dissemination of warnings by State, terri-
19 torial, local, and Tribal partners in the affected
20 area;

21 (D) recommendations to improve risk iden-
22 tification, reduction, and communication to
23 landowners and units of local government;

1 ~~(E)~~ recommendations to improve landslide
2 hazard preparedness and emergency response
3 activities under this section; and

4 ~~(F)~~ such other findings as the Secretary
5 determines appropriate.

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

9 ~~(1)~~ \$25,000,000 each fiscal year shall be made
10 available to the United States Geological Survey;
11 and

12 ~~(2)~~ \$1,000,000 each fiscal year shall be made
13 available to the National Oceanic and Atmospheric
14 Administration.

15 **SEC. 4. GROUND SUBSIDENCE.**

16 As the Secretary determines to be appropriate and
17 subject to appropriations, the Secretary, through existing
18 programs, shall advance the identification, mapping, re-
19 search, and monitoring of subsidence and groundwater re-
20 source accounting, particularly in areas affected by
21 drought.

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

23 ~~(a) ESTABLISHMENT OF 3D ELEVATION PRO-~~
24 GRAM.—

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

4 (A) to provide 3D elevation data coverage
5 for the United States;

6 (B) to coordinate and facilitate the collec-
7 tion, dissemination, and use of 3D elevation
8 data among Federal departments and agencies
9 and non-Federal entities;

10 (C) to produce standard, publicly acces-
11 sible 3D elevation data products for the United
12 States; and

13 (D) to promote the collection, dissemina-
14 tion, and use of 3D elevation data among Fed-
15 eral, State, local, and Tribal governments, com-
16 munities, institutions of higher education, and
17 the private sector through—

18 (i) cooperative agreements;

19 (ii) the development and maintenance
20 of spatial data infrastructure to provide
21 quality control and deliver to the public 3D
22 elevation data products;

23 (iii) in coordination with the 3D Ele-
24 vation Federal Interagency Coordinating
25 Committee established under subsection

1 (b), States, and industry and standards
2 bodies, the development of standards and
3 guidelines for 3D elevation data acquisition
4 to increase accessibility to 3D elevation
5 data in a standard, easy-to-use format; and

6 (iv) the identification, assessment, and
7 adoption of emerging technologies to im-
8 prove the accuracy and efficiency of the
9 3D Elevation Program.

10 (2) MANAGEMENT.—

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

13 (i) to ensure efficiency with respect to
14 related activities of the Department of the
15 Interior and other participating Federal
16 departments and agencies; and

17 (ii) to meet the needs of Department
18 of the Interior programs, stakeholders, and
19 the public.

20 (B) OTHER FEDERAL DEPARTMENTS AND
21 AGENCIES.—The head of each Federal depart-
22 ment and agency involved in the acquisition,
23 production, distribution, or application of 3D
24 elevation data shall—

1 (i) coordinate with the 3D Elevation
2 Federal Interagency Coordinating Com-
3 mittee established under subsection (b) to
4 acquire additional, enhanced 3D elevation
5 data;

6 (ii) submit to the Secretary a descrip-
7 tion of priority areas of interest for 3D ele-
8 vation data collection for use in providing
9 grants and cooperative agreements under
10 subsection (d);

11 (iii) implement policies and procedures
12 for data acquisition and sharing that are
13 consistent with standards and guidelines
14 developed under the 3D Elevation Pro-
15 gram;

16 (iv) participate in, and share the re-
17 sults and benefits of, the 3D Elevation
18 Program, in accordance with standards
19 and guidelines developed under the 3D
20 Elevation Program; and

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

23 (I) meets 3D Elevation Program
24 standards; and

1 (H) is included in the national
2 holdings of those data.

3 (b) ~~3D ELEVATION FEDERAL INTERAGENCY CO-~~
4 ~~ORDINATING COMMITTEE.—~~

5 (1) ~~ESTABLISHMENT.—~~The Secretary, in co-
6 ordination with the Secretary of Commerce and the
7 Secretary of Homeland Security, shall establish an
8 interagency coordinating committee, to be known as
9 the “~~3D Elevation Federal Interagency Coordinating~~
10 ~~Committee~~” (referred to in this subsection as the
11 “~~Committee~~”), to better coordinate 3D elevation
12 data management across the Federal Government.

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

16 (A) The Secretary, who shall serve as
17 Chairperson of the Committee.

18 (B) The Secretary of Agriculture.

19 (C) The Secretary of Commerce.

20 (D) The Secretary of Homeland Security.

21 (E) The Director of the National Science
22 Foundation.

23 (F) The Director of the Office of Science
24 and Technology Policy.

1 (G) The Director of the Office of Manage-
2 ment and Budget.

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

5 (3) COORDINATION.—The Committee shall co-
6 ordinate, as appropriate, with the existing activities
7 of—

8 (A) the 3D Elevation Program Executive
9 Forum;

10 (B) the Alaska Mapping Executive Com-
11 mittee;

12 (C) the 3D Elevation Working Group;

13 (D) the 3D National Elevation Sub-
14 committee; and

15 (E) State offices.

16 (4) MEETINGS.—The Committee shall meet at
17 the call of the Chairperson.

18 (5) DUTIES.—The Committee shall—

19 (A) oversee the planning, management,
20 and coordination of the 3D Elevation Program;
21 and

22 (B) develop, by not later than 1 year after
23 the date of enactment of this Act, and update
24 periodically thereafter—

- 1 (i) a strategic plan that establishes
2 goals and priorities for activities carried
3 out under the 3D Elevation Program; and
4 (ii) a detailed management plan to
5 implement the strategic plan.

6 (c) ~~SUBCOMMITTEE OF NATIONAL GEOSPATIAL AD-~~
7 ~~VISORY COMMITTEE.—~~

8 (1) ~~ESTABLISHMENT.—~~

9 (A) ~~IN GENERAL.—~~The Secretary shall es-
10 tablish, within the National Geospatial Advisory
11 Committee, a subcommittee (referred to in this
12 subsection as the “Subcommittee”).

13 (B) ~~MEMBERSHIP.—~~The Subcommittee
14 shall—

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

18 (ii) include representatives of—

19 (I) research and academic insti-
20 tutions;

21 (II) industry standards develop-
22 ment organizations;

23 (III) units of State and local gov-
24 ernment; and

25 (IV) the private sector.

1 (2) DUTIES.—

2 (A) ASSESSMENT.—The Subcommittee
3 shall conduct an assessment of—

4 (i) trends and developments in—

5 (I) the collection, dissemination,
6 and use of 3D elevation data; and

7 (II) science and technology relat-
8 ing to 3D elevation data;

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

12 (iii) the need to revise or reorganize
13 the 3D Elevation Program; and

14 (iv) the management, coordination,
15 implementation, and activities of the 3D
16 Elevation Program.

17 (B) REPORT.—Not later than 1 year after
18 the date of enactment of this Act, and every 2
19 years thereafter, the Subcommittee shall submit
20 to the Secretary and the 3D Elevation Federal
21 Interagency Coordinating Committee estab-
22 lished under subsection (b) a report that in-
23 cludes—

24 (i) the findings of the assessment
25 under subparagraph (A); and

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

3 (d) GRANTS AND COOPERATIVE AGREEMENTS.—

4 (1) IN GENERAL.—The Secretary may make
5 grants and enter into cooperative agreements with
6 other Federal departments and agencies, units of
7 State, local, or Tribal government, institutions of
8 higher education, nonprofit research institutions, or
9 other organizations to facilitate the improvement of
10 nationwide coverage of 3D elevation data.

11 (2) APPLICATIONS.—To be eligible to receive a
12 grant or enter into a cooperative agreement under
13 this subsection, an entity described in paragraph (1)
14 shall submit to the Secretary an application at such
15 time, in such manner, and containing such informa-
16 tion as the Secretary may require.

17 (3) TERMS AND CONDITIONS.—A grant or coop-
18 erative agreement under this subsection shall be sub-
19 ject to such terms and conditions as the Secretary
20 determines to be appropriate, including making data
21 publically available and interoperable with other
22 Federal datasets.

23 (e) AUTHORIZATION OF APPROPRIATIONS.—There is
24 authorized to be appropriated to carry out this section
25 \$20,000,000 for each of fiscal years 2020 through 2023.

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 3 *paredness Act”.*

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13 identification, mapping, assessment, and research of
14 landslide hazards or responding to landslide events,
15 including—

16 (A) a State geological survey office;

17 (B) a State department of emergency re-
18 sponse; and

19 (C) a State department of transportation.

20 (11) *TERRITORY*.—The term “*territory*”
21 means—

22 (A) the Commonwealth of Puerto Rico;

23 (B) Guam;

24 (C) American Samoa;

1 (D) *the Commonwealth of the Northern*
2 *Mariana Islands;*

3 (E) *the Federated States of Micronesia;*

4 (F) *the Republic of the Marshall Islands;*

5 (G) *the Republic of Palau; and*

6 (H) *the United States Virgin Islands.*

7 **SEC. 3. NATIONAL LANDSLIDE HAZARDS REDUCTION PRO-**
8 **GRAM.**

9 (a) *ESTABLISHMENT.*—*The Secretary shall establish a*
10 *program, to be known as the “National Landslide Hazards*
11 *Reduction Program” (referred to in this section as the “pro-*
12 *gram”)*—

13 (1) *to identify and understand landslide hazards*
14 *and risks;*

15 (2) *to reduce losses from landslides;*

16 (3) *to protect communities at risk of landslide*
17 *hazards; and*

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

22 (b) *DESCRIPTION OF PROGRAM.*—

23 (1) *PROGRAM ACTIVITIES.*—*The Secretary, in co-*
24 *ordination with the Interagency Coordinating Com-*
25 *mittee on Landslide Hazards established by subsection*

1 (c)(1) (referred to in this section as the “Committee”)
2 and in coordination with existing activities of the
3 United States Geological Survey and other Federal
4 agencies, shall—

5 (A) identify, map, assess, and research
6 landslide hazards;

7 (B) respond to landslide events; and

8 (C) in coordination with State offices, units
9 of local government, territories, and Indian
10 tribes—

11 (i) establish working groups with State
12 offices, units of local government, territories,
13 and Indian tribes to identify regional and
14 local priorities for researching, identifying,
15 mapping, and assessing landslide hazards;
16 and

17 (ii) develop and implement landslide
18 hazard guidelines for—

19 (I) geologists;

20 (II) geological and geotechnical
21 engineers;

22 (III) emergency management per-
23 sonnel; and

24 (IV) land use and other decision-
25 makers.

1 (2) *NATIONAL STRATEGY.*—Not later than 1 year
2 after the date of enactment of this Act, and every 5
3 years thereafter, the Secretary, in coordination with
4 the Committee, shall develop and publish a national
5 strategy for landslide hazards, risk reduction, and re-
6 sponse in the United States (including territories),
7 which shall include—

8 (A) goals and priorities for the program;

9 (B) priorities for data acquisition, research,
10 communications, and risk management on land-
11 slides and landslide hazards across relevant Fed-
12 eral agencies; and

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

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

- 1 (A) landslide hazards and risks;
- 2 (B) the impact of landslides on—
- 3 (i) health and safety;
- 4 (ii) the economy and infrastructure;
- 5 and
- 6 (iii) the environment;
- 7 (C) landslide hazard stabilization; and
- 8 (D) reduction of losses from landslides.

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

- 18 (A) *landslide planning and risk reduction*
 19 *guidance, guidelines, maps, tools, and training*
 20 *materials to help inform State, territorial, local,*
 21 *and Tribal governments and decisionmakers*
 22 *with respect to—*
- 23 (i) *the use and implementation of*
 24 *landslide hazard assessments;*

1 (ii) the applied use of the database de-
2 veloped under paragraph (3);

3 (iii) reducing losses from landslides;
4 and

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

8 (B) landslide preparedness curricula and
9 training modules for—

10 (i) State, territorial, local, and Tribal
11 officials;

12 (ii) Federal, State, territorial, local,
13 and Tribal emergency managers; and

14 (iii) the National Guard.

15 (5) *DEBRIS FLOW EARLY WARNING SYSTEM.*—In
16 carrying out the program, the Secretary, in coordina-
17 tion with the Secretary of Commerce and the Sec-
18 retary of Homeland Security, shall expand the early
19 warning system for debris flow by—

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

23 (B) developing procedures with State, terri-
24 torial, local, and Tribal governments to monitor

1 *stormwater drainage in areas with high debris*
2 *flow risk; and*

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

6 (6) *EMERGENCY RESPONSE ACTIVITIES.—In car-*
7 *rying out the program, the Secretary, in coordination*
8 *with the Secretary of Commerce, the Secretary of*
9 *Homeland Security, the heads of other relevant Fed-*
10 *eral agencies, States offices, units of local government,*
11 *territories, and Indian tribes, shall establish and sup-*
12 *port emergency response procedures for the rapid de-*
13 *ployment of Federal scientists, equipment, and serv-*
14 *ices to areas impacted by a significant landslide*
15 *event—*

16 *(A) to support emergency response efforts*
17 *and improve the safety of emergency responders;*

18 *(B) to improve data collection; and*

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

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

1 (1) *IN GENERAL.*—*There is established a com-*
2 *mittee, to be known as the “Interagency Coordinating*
3 *Committee on Landslide Hazards”.*

4 (2) *MEMBERSHIP.*—*The Committee shall be com-*
5 *posed of the following members (or their designees):*

6 (A) *The Secretary, who shall serve as Chair-*
7 *person of the Committee.*

8 (B) *The Secretary of Agriculture.*

9 (C) *The Secretary of the Army.*

10 (D) *The Secretary of Commerce.*

11 (E) *The Secretary of Homeland Security.*

12 (F) *The Secretary of Transportation.*

13 (G) *The Director of the National Science*
14 *Foundation.*

15 (H) *The Director of the Office of Science*
16 *and Technology Policy.*

17 (I) *The Director of the Office of Manage-*
18 *ment and Budget.*

19 (3) *MEETINGS.*—*The Committee shall meet at*
20 *the call of the Chairperson.*

21 (4) *PURPOSE AND DUTIES.*—*The Committee*
22 *shall—*

23 (A) *advise and oversee the program;*

24 (B) *facilitate communication and coordina-*
25 *tion across Federal agencies in the planning,*

1 management, budgeting, and execution of land-
2 slide activities; and

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

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

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

12 (iii) overseeing the implementation of
13 the national strategy.

14 (d) *ADVISORY COMMITTEE.*—

15 (1) *IN GENERAL.*—The Secretary shall establish
16 an advisory committee, to be known as the “Advisory
17 Committee on Landslides” (referred to in this sub-
18 section as the “Advisory Committee”).

19 (2) *MEMBERSHIP.*—The Advisory Committee
20 shall be composed of not fewer than 11 members—

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

25 (B) who shall be representatives of—

1 (i) States, including State geological
2 organizations;

3 (ii) territories, including territorial ge-
4 ological organizations;

5 (iii) Indian tribes, including Tribal
6 geological organizations;

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

10 (I) to provide advice regarding
11 landslide hazard and risk reduction;
12 and

13 (II) to represent related scientific,
14 architectural, engineering, and plan-
15 ning disciplines;

16 (v) industry standards development or-
17 ganizations; and

18 (vi) State, territorial, local, and Tribal
19 emergency management agencies.

20 (3) *RECOMMENDATIONS.*—

21 (A) *IN GENERAL.*—*The Advisory Committee*
22 *shall submit to the Committee recommendations*
23 *for the implementation of the program, including*
24 *recommendations regarding—*

1 (i) landslide hazard and risk reduction
2 and planning;
3 (ii) tools for communities;
4 (iii) research; and
5 (iv) such other topics as the Advisory
6 Committee determines appropriate.

7 (B) CONSIDERATION.—The Secretary and
8 the agency heads described in subparagraphs (B)
9 through (I) of subsection (c)(2) shall take into
10 consideration any recommendation of the Advi-
11 sory Committee submitted under subparagraph
12 (A).

13 (e) GRANT PROGRAMS.—

14 (1) COOPERATIVE LANDSLIDE HAZARD MAPPING
15 AND ASSESSMENT PROGRAM.—

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

18 (i) provide grants, on a competitive
19 basis, to State, territorial, local, and Tribal
20 governments to research, map, assess, and
21 collect data on landslide hazards within the
22 jurisdictions of those governments; and
23 (ii) accept and use funds received from
24 other Federal and non-Federal partners to
25 advance the purposes of the program.

1 (B) *PRIORITY.*—

2 (i) *IN GENERAL.*—*The Secretary shall*
3 *consult annually with the Committee,*
4 *States, units of local government, territories,*
5 *and Indian tribes to establish priorities for*
6 *the grant program under this 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 pri-*
13 *orities of the national strategy estab-*
14 *lished 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 (C) *REQUIREMENT.*—*If the Secretary elects*
22 *to provide grants under subparagraph (A)(i), the*
23 *Secretary shall publish on a publicly available*
24 *website a description of—*

25 (i) *the grants; and*

1 (ii) the findings made from those
2 grants.

3 (2) NATIONAL LANDSLIDE RESEARCH GRANTS.—

4 (A) IN GENERAL.—To advance the goals
5 and priorities of the national strategy established
6 under subsection (b)(2)(A), subject to appropri-
7 ations, the Director of the National Science Foun-
8 dation (referred to in this paragraph as the “Di-
9 rector”) may provide grants to eligible entities
10 for landslide research, including research on—

11 (i) the causes, mechanisms, triggers,
12 hydrology, and geology of landslides;

13 (ii) ways to reduce landslide hazards
14 and risks to minimize loss of life and prop-
15 erty, including landslide hazard and risk
16 communication, perception, decisionmaking,
17 tools, and technologies; and

18 (iii) other goals and priorities of the
19 national strategy established under sub-
20 section (b)(2)(A).

21 (B) ELIGIBLE ENTITIES.—The Director
22 shall determine whether an entity is eligible to
23 receive a grant under this paragraph.

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

1 (i) ensure that the grants are provided
2 on a competitive basis;

3 (ii) consider grant applications sub-
4 mitted by eligible entities that have devel-
5 oped the application in partnership with 1
6 or more State geological surveys; and

7 (iii) publish on a publicly available
8 website a description of—

9 (I) the grants; and

10 (II) the findings made from those
11 grants.

12 (f) *BIENNIAL REPORT.*—Through calendar year 2030,
13 the Secretary shall submit to Congress a biennial report,
14 including a description of, with respect to the 2-calendar-
15 year period preceding the date of the report—

16 (1) the goals and accomplishments of the Com-
17 mittee in carrying out the national strategy developed
18 under subsection (b)(2);

19 (2) the results of the activities of the Committee
20 under this section; and

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

24 (g) *SIGNIFICANT EVENTS.*—Not later than 1 year after
25 a significant landslide event in the United States (includ-

1 *ing territories) occurs, the Secretary shall publish on a pub-*
2 *licly available website—*

3 *(1) a description of the landslide event and the*
4 *implications of the event on communities, including*
5 *life and property;*

6 *(2) recommendations on how the identification of*
7 *the landslide risk could have been improved prior to*
8 *the event;*

9 *(3) a description of the effectiveness of any warn-*
10 *ing and risk communication, including the dissemi-*
11 *nation of warnings by State, territorial, local, and*
12 *Tribal partners in the affected area;*

13 *(4) recommendations to improve risk identifica-*
14 *tion, reduction, and communication to landowners*
15 *and units of local government;*

16 *(5) recommendations to improve landslide haz-*
17 *ard preparedness and emergency response activities*
18 *under this section; and*

19 *(6) such other findings as the Secretary deter-*
20 *mines appropriate.*

21 *(h) FUNDING.—There is authorized to be appropriated*
22 *to carry out this section \$37,000,000 for each of fiscal years*
23 *2020 through 2023, of which—*

24 *(1) \$25,000,000 each fiscal year shall be made*
25 *available to the United States Geological Survey;*

1 (2) \$11,000,000 each fiscal year shall be made
2 available to the National Science Foundation; and

3 (3) \$1,000,000 each fiscal year shall be made
4 available to the National Oceanic and Atmospheric
5 Administration.

6 **SEC. 4. GROUND SUBSIDENCE.**

7 As the Secretary determines to be appropriate and sub-
8 ject to appropriations, the Secretary, through existing pro-
9 grams, shall advance the identification, mapping, research,
10 and monitoring of subsidence and groundwater resource ac-
11 counting, particularly in areas affected by drought.

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

13 (a) *ESTABLISHMENT OF 3D ELEVATION PROGRAM.*—

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

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

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

23 (C) to produce standard, publicly accessible
24 3D elevation data products for the United States;
25 and

1 (D) to promote the collection, dissemination,
2 and use of 3D elevation data among Federal,
3 State, local, and Tribal governments, commu-
4 nities, institutions of higher education, and the
5 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) in coordination with the 3D Ele-
12 vation Federal Interagency Coordinating
13 Committee established under subsection (b),
14 States, and industry and standards bodies,
15 the development of standards and guidelines
16 for 3D elevation data acquisition to in-
17 crease accessibility to 3D elevation data in
18 a standard, easy-to-use format; and

19 (iv) the identification, assessment, and
20 adoption of emerging technologies to im-
21 prove the accuracy and efficiency of the 3D
22 Elevation Program.

23 (2) *MANAGEMENT.*—

24 (A) *IN GENERAL.*—The Secretary shall
25 manage the 3D Elevation Program—

1 (i) to ensure efficiency with respect to
2 related activities of the Department of the
3 Interior and other participating Federal de-
4 partments and agencies; and

5 (ii) to meet the needs of Department of
6 the Interior programs, stakeholders, and the
7 public.

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

13 (i) coordinate with the 3D Elevation
14 Federal Interagency Coordinating Com-
15 mittee established under subsection (b) to
16 acquire additional, enhanced 3D elevation
17 data;

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

23 (iii) implement policies and procedures
24 for data acquisition and sharing that are

1 *consistent with standards and guidelines de-*
2 *veloped under the 3D Elevation Program;*

3 *(iv) participate in, and share the re-*
4 *sults and benefits of, the 3D Elevation Pro-*
5 *gram, in accordance with standards and*
6 *guidelines developed under the 3D Elevation*
7 *Program; and*

8 *(v) ensure that any 3D elevation data*
9 *acquired with Federal grant funding—*

10 *(I) meets 3D Elevation Program*
11 *standards; and*

12 *(II) is included in the national*
13 *holdings of those data.*

14 ***(b) 3D ELEVATION FEDERAL INTERAGENCY COORDI-***
15 ***NATING COMMITTEE.—***

16 ***(1) ESTABLISHMENT.—****The Secretary, in coordi-*
17 *nation with the Secretary of Commerce and the Sec-*
18 *retary of Homeland Security, shall establish an inter-*
19 *agency coordinating committee, to be known as the*
20 *“3D Elevation Federal Interagency Coordinating*
21 *Committee” (referred to in this subsection as the*
22 *“Committee”), to better coordinate 3D elevation data*
23 *management across the Federal Government.*

24 ***(2) MEMBERSHIP.—****The Committee shall be com-*
25 *posed of the following members (or their designees):*

1 (A) *The Secretary, who shall serve as Chair-*
2 *person of the Committee.*

3 (B) *The Secretary of Agriculture.*

4 (C) *The Secretary of Commerce.*

5 (D) *The Secretary of Homeland Security.*

6 (E) *The Director of the National Science*
7 *Foundation.*

8 (F) *The Director of the Office of Science*
9 *and Technology Policy.*

10 (G) *The Director of the Office of Manage-*
11 *ment and Budget.*

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

14 (3) *COORDINATION.—The Committee shall co-*
15 *ordinate, as appropriate, with the existing activities*
16 *of—*

17 (A) *the 3D Elevation Program Executive*
18 *Forum;*

19 (B) *the Alaska Mapping Executive Com-*
20 *mittee;*

21 (C) *the 3D Elevation Working Group;*

22 (D) *the 3D National Elevation Sub-*
23 *committee; and*

24 (E) *State offices.*

1 (4) *MEETINGS.*—*The Committee shall meet at*
2 *the call of the Chairperson.*

3 (5) *DUTIES.*—*The Committee shall—*

4 (A) *oversee the planning, management, and*
5 *coordination of the 3D Elevation Program; and*

6 (B) *develop, by not later than 1 year after*
7 *the date of enactment of this Act, and update pe-*
8 *riodically thereafter—*

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

12 (ii) *a detailed management plan to*
13 *implement the strategic plan.*

14 (c) *SUBCOMMITTEE OF NATIONAL GEOSPATIAL ADVI-*
15 *SORY COMMITTEE.*—

16 (1) *ESTABLISHMENT.*—

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

21 (B) *MEMBERSHIP.*—*The Subcommittee*
22 *shall—*

23 (i) *consist of not fewer than 11 mem-*
24 *bers, of whom none may be a Federal officer*
25 *or employee; and*

- 1 (ii) include representatives of—
2 (I) research and academic institu-
3 tions;
4 (II) industry standards develop-
5 ment organizations;
6 (III) units of State and local gov-
7 ernment; and
8 (IV) the private sector.

9 (2) *DUTIES.*—

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

- 12 (i) trends and developments in—
13 (I) the collection, dissemination,
14 and use of 3D elevation data; and
15 (II) science and technology relat-
16 ing to 3D elevation data;
17 (ii) the effectiveness of the 3D Ele-
18 vation Program in carrying out the activi-
19 ties described in subsection (a)(1);
20 (iii) the need to revise or reorganize
21 the 3D Elevation Program; and
22 (iv) the management, coordination,
23 implementation, and activities of the 3D
24 Elevation Program.

1 (B) *REPORT.*—Not later than 1 year after
2 the date of enactment of this Act, and every 2
3 years thereafter, the Subcommittee shall submit
4 to the Secretary and the 3D Elevation Federal
5 Interagency Coordinating Committee established
6 under subsection (b) a report that includes—

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

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

11 (d) *GRANTS AND COOPERATIVE AGREEMENTS.*—

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

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

1 (3) *TERMS AND CONDITIONS.*—*A grant or coop-*
2 *erative agreement under this subsection shall be sub-*
3 *ject to such terms and conditions as the Secretary de-*
4 *termines to be appropriate, including making data*
5 *publically available and interoperable with other Fed-*
6 *eral datasets.*

7 (e) *AUTHORIZATION OF APPROPRIATIONS.*—*There is*
8 *authorized to be appropriated to carry out this section*
9 *\$20,000,000 for each of fiscal years 2020 through 2023.*

Calendar No. 315

116TH CONGRESS
1ST Session

S. 529

[Report No. 116-165]

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.

DECEMBER 5, 2019

Reported with an amendment