

AMENDMENT NO. \_\_\_\_\_ Calendar No. \_\_\_\_\_

Purpose: To improve soil moisture and precipitation monitoring.

**IN THE SENATE OF THE UNITED STATES—115th Cong., 2d Sess.**

**S.** \_\_\_\_\_

To provide for the reform and continuation of agricultural and other programs of the Department of Agriculture through fiscal year 2023, and for other purposes.

Referred to the Committee on \_\_\_\_\_ and ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENT intended to be proposed by Mr. THUNE

Viz:

1 At the end of subtitle E of title XII, insert the following:  
2

3 **SEC. 125 \_\_\_\_ . IMPROVED SOIL MOISTURE AND PRECIPITATION MONITORING.**  
4

5 (a) IMPROVED SOIL MOISTURE MONITORING.—

6 (1) IN GENERAL.—Not later than 1 year after  
7 the date of enactment of this Act, the Secretary  
8 shall develop and implement a strategy to improve  
9 the accuracy of the United States Drought Monitor  
10 through increased geographic resolution of rural in-  
11 situ soil moisture profile observation or other soil

1 moisture profile measuring devices, as the Secretary  
2 considers appropriate.

3 (2) IMPLEMENTATION.—

4 (A) IN GENERAL.—In implementing the  
5 strategy required by paragraph (1), the Sec-  
6 retary shall prioritize adding soil moisture pro-  
7 file stations in States described in subpara-  
8 graph (B) so that the number of drought moni-  
9 toring stations is increased to an average of 1  
10 soil moisture profile station per 1,250 square  
11 miles in each State described in subparagraph  
12 (B) or by 50 stations in each State described in  
13 subparagraph (B), whichever is less.

14 (B) STATES DESCRIBED.—A State de-  
15 scribed in this paragraph is a State that has ex-  
16 perienced D3 (extreme drought) or D4 (excep-  
17 tional drought) (as defined by the United  
18 States Drought Monitor) within any 6 months  
19 during the period beginning on January 1,  
20 2016, and ending on the date of the enactment  
21 of this Act.

22 (3) COORDINATION.—In carrying out this sub-  
23 section, the Secretary may coordinate with other  
24 Federal agencies, State and local governments, and

1 non-Federal entities that collaborate with the United  
2 States Drought Monitor.

3 (4) COST-EFFECTIVENESS.—In carrying out  
4 this subsection, the Secretary shall consider cost-ef-  
5 fective solutions to maximize the efficiency and accu-  
6 racy of the United States Drought Monitor.

7 (5) AUTHORIZATION OF APPROPRIATIONS.—  
8 There is authorized to be appropriated to the Sec-  
9 retary \$5,000,000 for each of fiscal years 2019  
10 through 2024 to carry out this subsection.

11 (b) STANDARDS FOR INTEGRATING CITIZEN SCIENCE  
12 INTO DROUGHT MODELS.—

13 (1) IN GENERAL.—Not later than 1 year after  
14 the date of enactment of this Act, the Secretary  
15 shall—

16 (A) develop a set of standards for integra-  
17 tion of data derived from citizen science (as de-  
18 fined in the Crowdsourcing and Citizen Science  
19 Act (15 U.S.C. 3724)) into the United States  
20 Drought Monitor models, including data relat-  
21 ing to—

22 (i) location and spacing of monitoring  
23 stations;

24 (ii) data quality standards;

4

1 (iii) incorporation of data from com-  
2 mercially available weather stations;

3 (iv) standardized procedures for au-  
4 tonomous integration of data;

5 (v) streamlining of data entry meth-  
6 ods; and

7 (vi) reasonable metadata fields; and

8 (B) develop a set of consistent standards  
9 for soil moisture data collection based on equip-  
10 ment that is readily available, including stand-  
11 ards relating to—

12 (i) acceptable error ranges;

13 (ii) sensor installation procedures;

14 (iii) manufacturers of soil moisture  
15 probes;

16 (iv) calibration methodology;

17 (v) metadata fields; and

18 (vi) soil descriptions.

19 (2) INCLUSION OF DATA FROM COOPERATIVE  
20 OBSERVER PROGRAM.—For purposes of paragraph  
21 (1)(A), data derived from citizen science includes  
22 data from the Cooperative Observer Program of the  
23 National Weather Service.

1       (c) REQUIREMENT FOR ELEMENTS OF DEPARTMENT  
2 OF AGRICULTURE TO USE THE SAME MONITORING  
3 DATA.—

4           (1) IN GENERAL.—To be consistent with assist-  
5       ance provided under the livestock forage disaster  
6       program established under section 1501(c) of the  
7       Agricultural Act of 2014 (7 U.S.C. 9081(c)) and a  
8       policy or plan of insurance established under the  
9       Federal Crop Insurance Act (7 U.S.C. 1501 et seq.)  
10      for producers of livestock commodities the source of  
11      feedstock of which is pasture, rangeland, and forage,  
12      and the annual establishment of grazing rates, as  
13      applicable, on Forest Service grasslands and other  
14      applicable land, the Secretary shall use the United  
15      States Drought Monitor, in-situ soil moisture profile  
16      monitoring stations described in subsection (a), data  
17      from the Cooperative Observer Program described in  
18      subsection (b)(2), and any other applicable data to  
19      determine and establish grazing loss assistance and  
20      grazing rates, as applicable.

21           (2) COORDINATION.—In carrying out this sub-  
22      section, the Secretary may coordinate with—

23           (A) other Federal agencies, State and local  
24      governments, and non-Federal entities that col-

1           laborate with the United States Drought Mon-  
2           itor; and

3                   (B) other Federal and non-Federal entities  
4           involved in collecting data on precipitation and  
5           soil monitoring.

6           (3) COST-EFFECTIVENESS.—In carrying out  
7           this subsection, the Secretary shall consider cost-ef-  
8           fective solutions to maximize the efficiency and accu-  
9           racy of the data utilized to determine eligibility for  
10          assistance under the programs specified in para-  
11          graph (1).