

Research to Legislation: Finding a Pathway after the 2014 Oso, Washington Landslide



Briefing on the GEER Scientific Investigation of the March 2014 Oso (S.R. 530) Landslide

Prepared by Joseph Wartman* (23 February 2015)
H. R. Berg Assoc. Professor of Civil and Env. Engineering, Univ. of Washington
Co-Leader, GEER Oso Landslide Investigation Team

Significance and Impacts: The 22 March 2014 Oso (S.R. 530) Landslide (Fig. 1) claimed 43 lives, making it the deadliest landslide disaster in the history of the continental United States. A recent accounting by the State of Washington found that the direct costs of the landslide exceed \$120 million.

Landslide History: Geologic evidence indicates that large landslides have occurred across much of the North Fork Stillaguamish River Valley. These landslides, with ages ranging from hundreds to thousands of years, appear to be similar to the 2014 Oso Landslide (Fig. 2). Indeed, the Oso Landslide was a reactivation of one of these older landslides. There is strong evidence that a landslide that is even larger than the Oso slide occurred immediately to the west of the Oso Landslide. This landslide similarly ran out across the river valley. Multiple episodes of movement of the Oso landslide have been described in studies dating back to the 1950s. These studies show that size of the landslide gradually increased until 2008, when a major 300-foot movement occurred at the site, followed by the catastrophic event of March 2014.

Initiation of the 2014 Oso Landslide: It is highly probable that a heavy 3-week rainfall that preceded the event played a significant role in triggering the landslide. Beyond the rainfall trigger itself, there are other factors that are likely to have contributed to destabilization of the landslide mass. These include: (i) alteration of the local groundwater regime due to previous landsliding at the site, and (ii) weakening of the landslide mass due to natural geologic processes. Detailed consideration of land use practices (most notably, timber harvesting) was beyond the scope of our investigation; however, it is known that most of the large landslides in the North Fork Stillaguamish River Valley pre-date logging. Given the size and depth of the landslide, if timber harvest practices did influence on the landslide, it was through modification of the groundwater recharge regime rather than by any shallow-depth loss of root mass reinforcement.

Landslide Risk Assessment, Management, and Communication: Studies conducted in the decades preceding the Oso Landslide clearly indicated a high landslide hazard at the site. However, these studies were primarily focused on the impacts of landslides to the river versus the impacts to people or property. In addition, it does not appear that there was any publicly communicated understanding that the debris from a landslide could run-out as much as ~1 mile, as it did in the 2014 event. Our assessment of the risk for fatalities due to landslides in this portion of the valley indicates that it is comparable to risks from flooding in some areas in the United States, but relatively high compared to guidelines for landslides in other developed countries. Currently there are no national or state guidelines in the United States concerning levels of risk due to natural landslides that warrant action.

The complete GEER Oso Landslide Investigation report is available online at:
http://www.geerassociation.org/GEER_Post%20E%20Reports/Oso_WA_2014/index.html
Financial support for this investigation was provided by the National Science Foundation

* Contact information: e-mail: wartman@uw.edu, office telephone: 206-685-4806

Public Law 116-323 116th Congress

An Act

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

Jan. 5, 2021
[H.R. 8810]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

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

National
Landslide
Preparedness
Act,
43 USC 3101
note.

H.R.2250 - National Landslide Preparedness Act Reauthorization Act of 2025

119th Congress (2025-2028) | [Get alerts](#)

BILL Hide Overview X

Sponsor: [Rep. DelBene, Suzan K. \(D-WA-1\)](#) (Introduced 03/21/2025)

Committees: House - Science, Space, and Technology; Natural Resources

Committee Meetings: 06/25/25 10:00AM 05/20/25 2:00PM

Committee Reports: [H. Rept. 119-431](#)

Latest Action: House - 01/08/2026 Reported (Amended) by the Committee on Natural Resources. [H. Rept. 119-431, Part 1. \(All Actions\)](#)

Tracker: [Introduced](#) [Passed House](#) [Passed Senate](#) [To President](#) [Become Law](#)



The Seattle Times

The New York Times



Reducing Landslide Risk

Recommendations for Implementation of the National Landslide Hazard Reduction Program: A National Approach to Strengthen Avoidance, Preparedness, and Response



Prepared by the Advisory Committee on Landslides

April 2026

Joe Wartman, Director, RAPID Facility; University of Washington