BARRY ARM LANDSLIDE INTERAGENCY INFORMATION STATEMENT

U.S. Geological Survey, Alaska Division of Geological & Geophysical Surveys, National Tsunami Warning Center, Alaska Earthquake Center

Friday, 16 September 2022, 2 PM AKDT (22:00 UTC)

61°09'10" N 148°09'15" W

Executive Summary

- The spatial extent of the area currently moving within the Barry Arm landslide has increased since initial motion was detected on August 23. Movement now includes the entirety of the "Kite," and large portions of the "Prow" and "Core."
- The U.S. Geological Survey, Alaska Division of Geological & Geophysical Surveys, and the National Tsunami Warning Center have indefinitely postponed Barry Arm fieldwork requiring water access.
- Movement in these parts of the landslide is common, but current rates of motion are at or above the range of rates that have been measured since 2020.
- The thickness of material that is moving is currently unknown.
- This ground motion does not mean that a failure will occur. However, it is notable because of the areal extent of motion, elevated rates of motion, and that the portion of the landslide experiencing movement is right above the water.
- If the part of the landside that is currently moving fails rapidly, anyone in the immediate vicinity, including Barry Arm and Harriman Fiord, would face a life-threatening tsunami. Dangerous currents and onshore impacts would be expected in Port Wells, Blackstone Bay, Cochrane Bay, Passage Canal, and in Whittier, Alaska.
- The interagency team will continue to monitor the landslide area and the water beneath it with existing instrumentation and satellite data.

Current observations

A ground-based synthetic aperture radar instrument installed on the east side of Barry Arm revealed the movement of a portion of the Barry Arm landslide beginning early in the morning on August 23, 2022. More recent data identified additional areas that are also moving. Satellite data and imagery from nearby cameras confirmed that a larger portion of the Barry Arm landslide is now moving at rates between 40 and 70 millimeters per day (1.6 to 2.7 inches per day). We are currently unable to estimate potential slide volumes as the depth of the current motion is unknown.

Based on analysis of historical topographic and satellite data for the Barry Arm landslide, movement at this part of the landslide is common. Previous studies at Barry Arm have identified ground movement at similar or much greater rates since 2008. However, the recent ground movement identified in multiple data sources is notable in that (a) it includes a much larger area than previous data, (b) the movement is at rates at least 2x greater than the last period of similar patterns of motion in 2020, and (c) it is in a location that is perched directly above the water.

Prognosis

Localized ground movement is not necessarily a precursor to partial or complete failure of the Barry Arm landslide. Continued movement at this rate, or increases in the rate of motion, would further increase the potential for failure of this portion of the landslide. If the area failed rapidly, it would generate a life-threatening tsunami in nearby waterbodies, such as Harriman Fiord, Barry Arm, College Fiord, Port Wells, Cochrane Bay, Blackstone Bay, and Passage Canal. Tsunami inundation and dangerous waves and currents would also be expected in Whittier, Alaska.

Current monitoring

U.S. Geological Survey scientists will continue to track the landslide for signs that hazard may be increasing, such as an acceleration in the rate of movement. Systematic monitoring of optical imagery and remote sensing data is conducted throughout the year. Ground-based radar observations are made multiple times per day during avalanche-free conditions (May through October). New satellite observations are available bi-monthly with favorable atmospheric conditions.

There is a local monitoring network in Barry Arm that includes two seismometers, an infrasound array, a ground-based radar, several weather stations, and four cameras. In addition, there is an infrasound array located in the town of Whittier, Alaska, approximately 50 km (31 miles) from the Barry Arm landslide. The National Tsunami Warning Center (NTWC) also operates three water level sensors in Barry Arm.

The National Tsunami Warning Center in Palmer, Alaska, is testing a developmental real-time warning system in place for the Barry Arm landslide and potential tsunami. Updates on the status of the landslide as determined by current monitoring capabilities will be provided through the Alaska Division of Geological & Geophysical Surveys Barry Arm landslide webpage and email list (linked below).

Background

The Barry Arm landslide is a large (~500 million m^3 or ~650 million yd^3) landslide located in the northwestern corner of Prince William Sound, Alaska. Rapid, catastrophic failure of the landslide could generate a life-threatening tsunami.

The existence of the landslide is evident in imagery dating back to the 1920s. Slow ground motion has been documented going back several decades. The increased movement was documented during the rapid recession of the Barry Glacier from 2010 – 2016, with maximum measured rates up to 26 ± 3 meters per year (85 ± 9 feet per year) from May 2010 to September 2013. Deformation rates slowed to approximately 1.3 ± 0.7 meters per year (4.25 ± 2.3 feet per year) in March of 2017 as the retreat of the Barry Glacier ceased.

Additional Information

Visit the following agencies for information on the Barry Arm landslide and how you can prepare for a tsunami and other emergencies.

Alaska Division of Geological & Geophysical Surveys: The most up-to-date source of information on the Barry Arm landslide, including links to partner agencies, is available at https://dggs.alaska.gov/hazards/barry-arm-landslide.html.

National Tsunami Warning Center: Information on tsunami preparedness, available at https://tsunami.gov/.

U.S. Geological Survey: Information on the Barry Arm landslide and tsunami monitoring, with links to related science and publications. https://www.usgs.gov/programs/landslide-hazards/science/barry-arm-alaska-landslide-and-tsunami-monitoring

Alaska Earthquake Center: Information on earthquake preparedness, available at https://earthquake.alaska.edu.

National Weather Service: Current tsunami alerts, available at https://www.weather.gov/safety/tsunami-alerts.

SUBSCRIBE TO BARRY ARM UPDATE MESSAGES by email: https://list.state.ak.us/mailman/listinfo/barryarm

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