

## **BARRY ARM LANDSLIDE INTERAGENCY INFORMATION STATEMENT**

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

Friday, 26 August 2022, 11 AM AKDT (19:00 UTC)

61°09'10" N 148°09'15" W

### **Executive Summary**

- Beginning August 23, 2022, new ground surface movement has been observed in a 0.42 square km (0.16 sq mi) portion of the Barry Arm landslide referred to as “the Kite.” The current movement is up to 50 mm (2 in) per day.
- The thickness of material that is moving is currently unknown.
- Movement in this part of the landslide is common, and the current motion is within the range of historically measured rates. However, we will continue to monitor the rate of motion, as an acceleration in the rate of movement may indicate increasing hazard.
- This ground motion does not mean that a failure will occur. However, it is notable because this portion of the landslide is right above the water.
- If this portion of the landslide fails, anyone in the immediate vicinity, including Barry Arm and Harriman Fjord, would face a life-threatening tsunami. It is NOT expected that the impacts of a failure would create significant inundation in nearby communities such as Whittier, Alaska-- though damage could be possible in harbors and marinas, along with strong and unusual currents that make navigation difficult or impossible for several hours.
- The interagency team will continue to monitor the landslide area and the water beneath it with existing instrumentation and satellite data. Tsunami warning capability is being tested, but not yet available.

### **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. Preliminary analysis suggests rates up to 50 mm (2 in) per day of localized motion in a 0.42 km<sup>2</sup> (104 acre or 0.16 mi<sup>2</sup>) area of the landslide immediately above the terminus of the Barry Glacier. This kite-shaped portion of the landslide is approximately 700 m (2300 feet or 0.4 mi) wide by 800 m (2600 feet or 0.5 mi) tall. 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, this rate of 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 the imagery is notable in that it is in a location that coincides with a large block of the landslide perched directly above the water. If the area failed rapidly, it would generate a life-threatening tsunami.

### **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. Should the portion of the landslide fail into the water, it would create a life-threatening tsunami in Barry Arm and Harriman Fiord. Significant impacts would not be expected in nearby communities, such as Whittier.

Radar data are transmitted hourly and analyzed multiple times per day. 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.

### **Current monitoring**

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.

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 currently no operational real-time warning system 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 M m<sup>3</sup> or ~650 M yd<sup>3</sup>) 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. Increased movement was documented during the rapid recession of the Barry Glacier from 2010 – 2016, with observed rates up to  $26 \pm 3$  m/yr observed from May 2010 to September 2013. Deformation rates slowed to approximately  $1.3 \pm 0.7$  m/yr 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, available at <https://dgggs.alaska.gov/hazards/barry-arm-landslide.html>.

National Tsunami Warning Center: Current tsunami alerts, 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: Information on tsunami preparedness, 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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