



To: To Whom it May Concern  
From: The City of Valdez  
RE: Slope Hazard Mapping, Identification & Monitoring  
Date: February 3, 2025

The City of Valdez recognizes the high-angle slopes that surround its developed community, one road in-out travel corridor, the many rivers and streams, and the subaerial (above ground) and submarine slopes bordering Port Valdez, Valdez Glacier Lake, and Robe Lake represent a risk for potentially damaging and deadly avalanches and landslides that may also contribute to flooding and tsunamis.

During the 1964 Great Alaska Earthquake (a 9.2 magnitude quake that lasted five minutes and killed dozens in Valdez and others across Alaska),<sup>1</sup> a huge sloped section of submarine coastline failed causing a tsunami that was responsible for many deaths. The sloped landmass consisted of unconsolidated glacial sediment deposition. The entire City of Valdez was moved four miles to the northwest by the Army Corps of Engineers as a result. In 2000, large avalanches released behind Valdez High School and an adjacent residential street, as well as at the "Duck Flats" of the Richardson Highway, causing damage which resulted in a grant through the Hazard Mitigation Grants Program to move twelve residential homes to safer locations.<sup>2</sup> Additionally, the City of Valdez experienced what was dubbed "Damalanche 2014"<sup>3</sup> a massive snow avalanche that buried the Richardson Highway (the only ingress/egress road to Valdez) and damned the Lowe River upstream from residential neighborhoods. It took two weeks to clear the highway. Over the last decade, numerous subaerial landslides<sup>4</sup> have occurred in similar communities around the state resulting in property damage and tragic loss of life. Small-scale landslides and avalanches occur in and around Valdez routinely. Permafrost melt, glacier retreat, and a changing environment are all contributing factors to slope instability in Valdez and throughout the state.

Owing to these avalanche and landslide hazards, the City of Valdez educates the public, incorporates the hazards in the city's Hazard Mitigation, Emergency Operations, and Comprehensive Plans, conducts related disaster exercises<sup>5</sup>, and engages in numerous local, state, and federal scientific partnerships. One such partnership is with the United States Geological Survey (USGS) and the Alaska Division of Geological and Geophysical Surveys (DGGs). With a contingency of National and Alaska USGS representatives, the City of Valdez Emergency Manager recently presented in December of 2024 at the American Geophysical Union's annual conference in Washington D.C. Presentations were made highlighting examples of slope instability in Alaska and the need for local jurisdictions to create partnerships with state and federal agencies to address the problem. The city has also partnered with DGGs in the creation and promotion of the "Alaska Landslide Reporter"<sup>6</sup> app which provides a platform for the public to document and report precursors and failures of unstable slopes for further evaluation

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<sup>1</sup> <https://earthquake.usgs.gov/earthquakes/events/alaska1964/>;

<sup>2</sup> <https://adaptalaska.org/case-study/cordova-valdez-and-avalanche-hazard-mitigation/>

<sup>3</sup> <https://dot.alaska.gov/highways/richardson/damalanche.shtml>

<sup>4</sup> <https://www.adn.com/alaska-news/2024/08/26/timeline-a-decade-of-deadly-and-destructive-alaska-landslides/>

<sup>5</sup> <https://www.youtube.com/watch?v=J2VH7IRbTXo>

<sup>6</sup> <https://dggg.alaska.gov/hazards/landslide-reporter.html>



by scientists to assess risk. And the city is nearing completion with these, and additional partners, on a nine-minute educational video for public release that informs on slope instability.

Most importantly, the city is coordinating with USGS and DGGs to create a landslide and avalanche monitoring program in the Valdez area. As part of this effort, the city was recently awarded a 70/30 matching grant<sup>7</sup> with the National Oceanic and Atmospheric Administration for a new hydrographic survey of Port Valdez (summer of 2025). The city is also engaged in acquiring a new hydrographic survey of the Valdez Glacier Lake and is working with USGS and DGGs on contemporary acquisition of LiDAR in the Valdez Area and ice-penetrating radar for the entire length of the Valdez Glacier. Ice-penetrating radar will aid in understanding risks associated with potentially debuttressed slopes, as the glacier continues to retreat. Using this and other data, USGS and DGGs are preparing to build new geological maps for the Valdez area to identify slopes susceptible to avalanche and landslide hazards. It is for this purpose that the City of Valdez writes this letter of support as USGS and DGGs seek internal and outside funding, grants, and equipment to support this specific mapping effort and greater monitoring project.

These new geological maps for the Valdez area are just the first step in the city's partnership to create a slope monitoring program. As hazard areas and zones are identified within the mapping project, next steps will be to deploy instrumentation and/or other methods of monitoring to better understand risks associated with specific hazard locations. Furthermore, it is the intention, and current efforts, of the City of Valdez to leverage the city's partnership with USGS and DGGs, as well as other partnering agencies, to create a comprehensive monitoring program for the entire city limits of Valdez and nearby Richardson Highway corridor. This monitoring program will establish a framework for scheduled acquisition of updated data, based on identified needs. It will also incorporate thresholds for catalysts such as earthquake magnitudes and saturation limits during persistent atmospheric rivers or precipitation months that would trigger additional data collection in targeted areas to detect hazardous changes.

Creating a comprehensive monitoring program will aid in moving from a limited susceptibility-only approach to one that involves probabilistic analysis and engages in proactivity to discover slope-related hazards, before they become disasters. This area-wide probabilistic approach is a novel project for today and may become a model for other communities around the state and in other regions of the world. To this end, the City of Valdez supports the efforts of USGS and DGGs in helping to build this program.



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<sup>7</sup> <https://nauticalcharts.noaa.gov/updates/noaa-announces-plans-to-survey-port-valdez-and-solicits-proposals-for-2026-funding-opportunity/>