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MEMORANDUM

DATE: November 4, 2022
TO: Deputy Mayor Gladziszewski
FROM: Katie Koester, Engineering and Public Works Director
SUBJECT: Gastineau Avenue Event Summary

The purpose of this memo is to provide the Assembly with a summary of the response to the Gastineau Avenue event on September 26, 2022, including context on the nature of the event and contributing factors. The memo and associated images were compiled from the field observations, notes, and narratives of Mitch McDonald, Engineering Geologist with Alaska Department of Transportation and Public Facilities, Mort Larsen with Landslide Hazards Program Manager with the Division of Geological and Geophysical Surveys, Richard Cartesen with University of Alaska and Aaron Brakel with Southeast Alaska Conservation Council. Immense gratitude for their personal and professional contributions.

Event Response

9.26.22: At 6:10PM on Monday, September 26th a channelized landslide consisting predominantly of tree debris on Gastineau Avenue damaged three homes, took out power to downtown Juneau and cut off road access. Capital City Fire and Rescue (CCFR) responded, evacuating homes in the immediate area. Engineering and Public Works Streets responded and blocked off the street. Due to poor lighting and heavy rain, site safety could not be adequately addressed that evening. CBJ did not stand up a shelter, but did provide sheltering for impacted property owners at a downtown hotel.

9.27.22: CBJ was fortunate to have the assistance of state geologists to assess the site the following morning. Together with CCFR staff and Juneau Mountain Rescue, they assessed the slide and identified several hazard trees that had to be removed upslope before crews could safely begin working in the area. CBJ contracted with Admiralty Construction to remove debris on Gastineau Ave. with oversight from CBJ Streets and Engineering to ensure the structural stability of the debris pile as pieces were removed.

9.28.22: Debris was cleared from the CBJ right-of-way and Gastineau Avenue was opened back up to traffic.



Drone footage from Pat Dryer, ADOT

Nature of the Event

Geologists have identified this event as a shallow channelized landslide that scoured down to bedrock. This slide originated at approximately 600 feet and traveled down the mountainside, leaving a roughly 30 foot wide U-shaped channel that scoured relatively shallow surface soils until water exposed the underlying bedrock channel. It is not known if the slide was initiated by a tree toppling in the high gale force winds or if water erosion initiated the event by undercutting root systems.

While the debris pile at the toe of the slope consisted of some saturated silty soil and bedrock fragments, large woody debris (alder and spruce) was the dominant feature. Out of the 15 truckloads of woody debris hauled from the area to clear Gastineau Ave., there was soil debris reported in only one of the truckloads. The water flowing through the debris pile had very low turbidity, suggesting very little soil was associated with the event. Damage to the structures (3) and vehicles (2) appears to have been caused by a single large spruce tree, 3-4 feet in diameter. Observations from Discovery Southeast date this tree to 1770.

Contributing Factors

The terrain in this area is extremely steep with a thin layer of soil and organic materials over the bedrock. This creates a shallow root system for the alder and spruce trees that dominate the slope. By September 26, 2022, Juneau had experienced just shy of twice the average September rainfall (According to the Juneau Airport weather station, average rainfall in September is 6.7 inches and rainfall on 9.26.22 had already reached 11.61 inches.). Notably, rainfall had been particularly intense over the six days preceding the event. In addition to the rainfall that contributed to this event, Juneau has been experiencing an increasing amount of heavy rainfall over the past several decades. The scatterplot below tracks the number of days per year, since 1944, where we have seen more than 1 inch of rain at the Juneau Airport. A clear upward trend is noted. A rapid shift in the direction of the wind recorded at the Mount Roberts Tram Terminal weather station could have also contributed to the event.

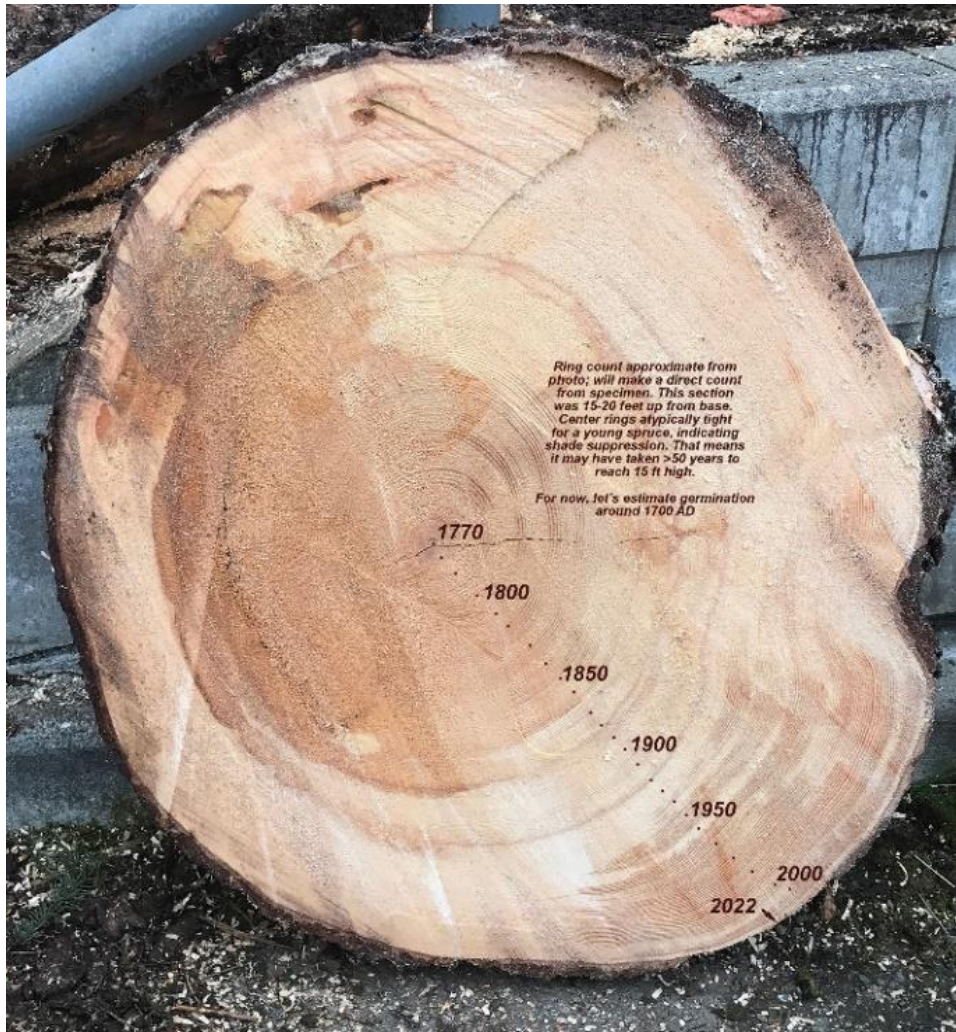
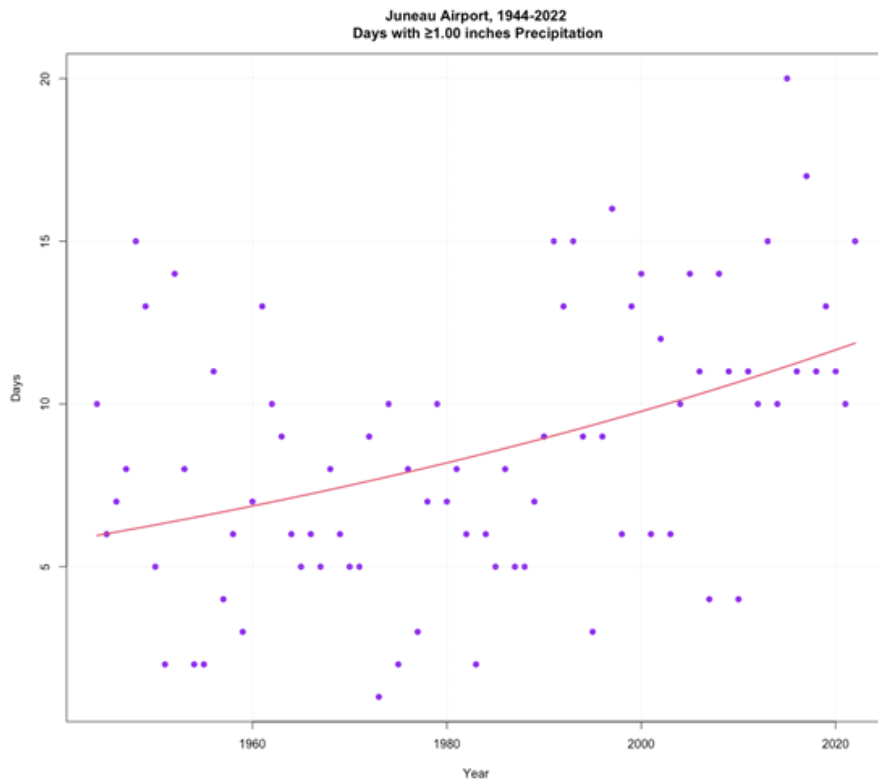
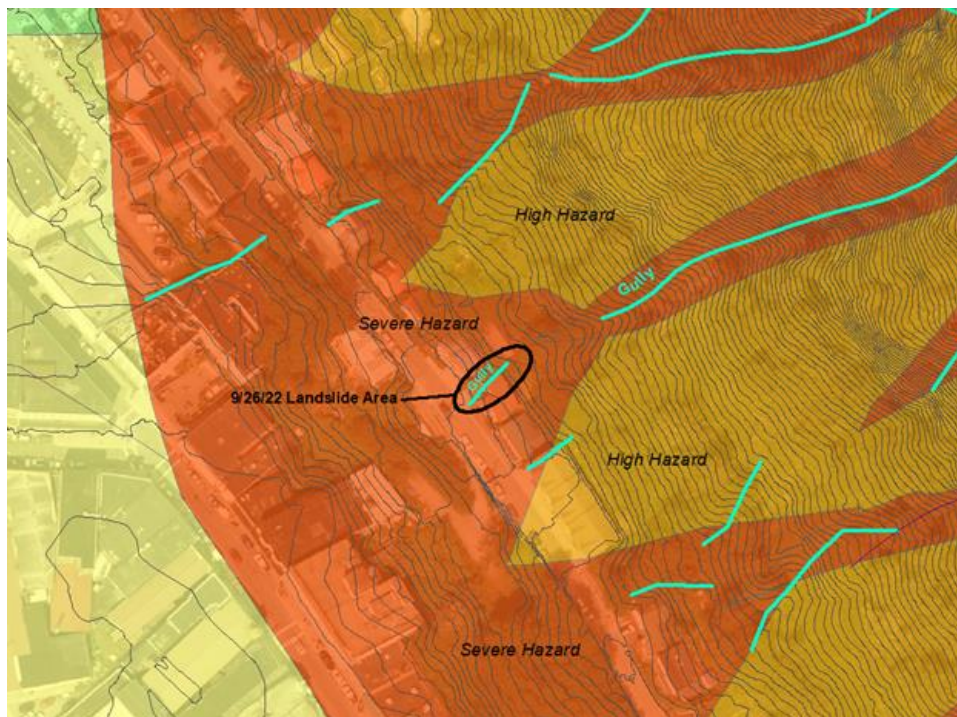


Photo Credit: Richard Carstensen, University of Alaska and Discovery Southeast and Aaron Brakel, Southeast Alaska Conservation Council



Graphic and data credit: Juneau National Weather Service, NOAA



Graphic from Community Development Department