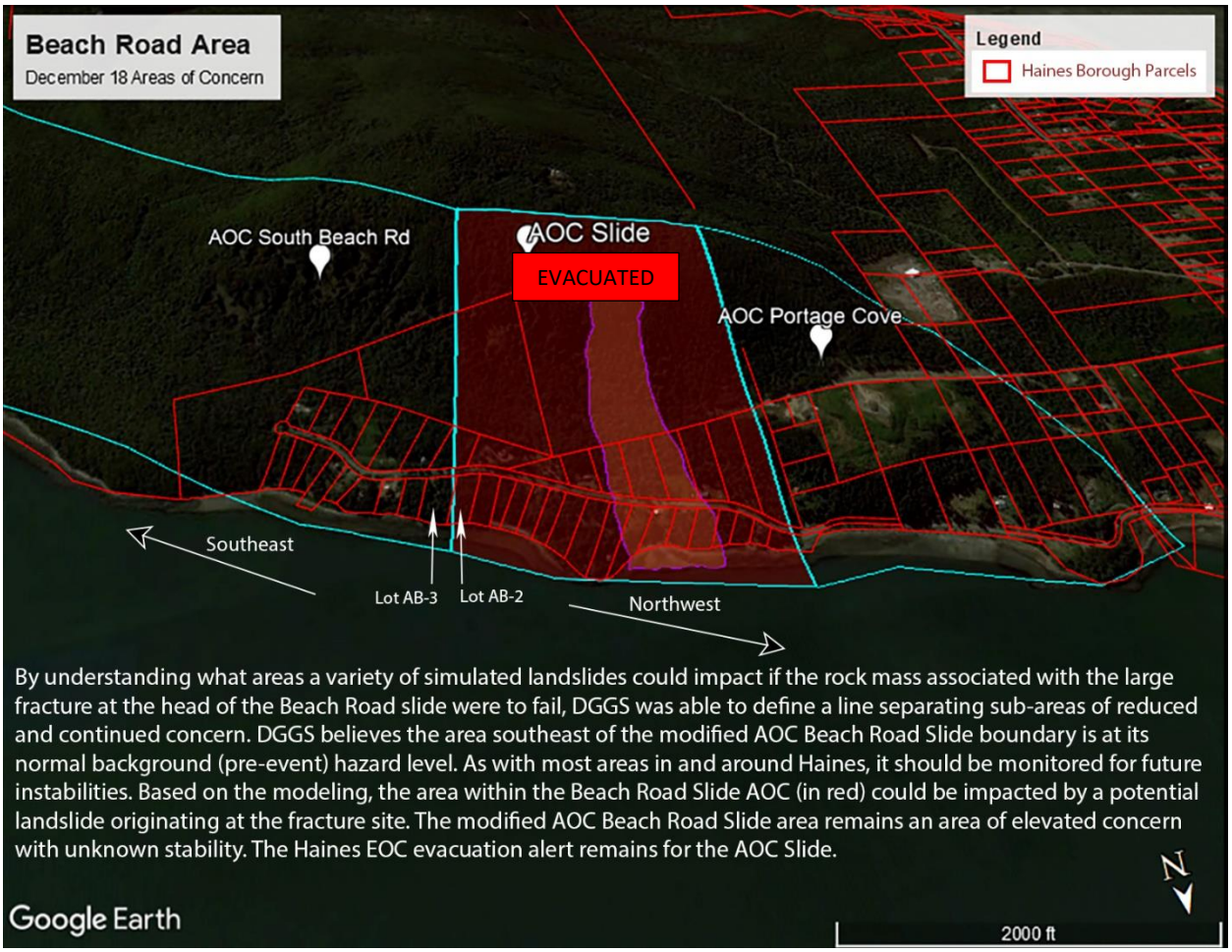
Beach Road Geologic Mass Wasting Event and Landslide Modeling

Alaska Division of Geological & Geophysical Survey (DGGS) geoscientists conducted a series of landslide simulations of potential failure of a fractured rock mass associated with the large crack at the head of the Beach Road slide to help refine the Beach Road area of concern (AOC). DGGS consulted with landslide experts at the U.S. Geological Survey (USGS) Landslide Hazards Program to explore how to best simulate potential landslide runouts with the limited data currently available, and they agreed that the LaharZ and RAMMS models would give reasonable, geologically plausible estimates. Landslide computer models rely on a variety of input parameters that typically include volume and geometry of the material that fails, soil and rock geotechnical properties, moisture content (degree of saturation), and topography, among others. DGGS has detailed topographic data from the recently conducted lidar surveys, but the remaining parameters had to be estimated based on scientific judgment. DGGS ran multiple simulations with both models using variations of parameters in an attempt to capture the range of geologically plausible possible outcomes.

By understanding what areas a variety of simulated landslides could impact if the rock mass associated with the large fracture at the head of the Beach Road slide were to fail, DGGS was able to define a line separating sub-areas of reduced and continued concern. DGGS believes the area southeast of the modified AOC Beach Road Slide boundary is at its normal background (pre-event) hazard level. As with most areas in and around Haines, it should be monitored for future instabilities. Based on the modeling, the area within the AOC Beach Road Slide (in red) could be impacted by a potential landslide originating at the fracture site. The modified AOC Beach Road Slide area remains an area of elevated concern with an unknown degree of instability.

The Haines EOC evacuation alert remains for the AOC Beach Road Slide area and may remain for months while specialty geotechnical assessment is conducted. Because DGGS does not have the data or expertise to evaluate the stability of the fractured rock mass, one must consider freeze/thaw activity, heavy rain, snow load, seismicity, high winds shaking trees, and other factors as potentially capable of triggering a new slide with no advance warning. A focused assessment by geotechnical experts is needed to fully evaluate the stability of the rock mass and understand the risk going forward.



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