

## **Investigating Canada's deadliest volcanic eruption and mitigating future hazards**

Tseax volcano is a small cinder cone in NW British Columbia and the site of a 32 km long lava flow constituting one of the youngest volcanic eruptions in Canada (mid-1700s). The eruption caused ~ 2000 fatalities among the Nisga'a First Nations living nearby and is Canada's second worst natural disaster. The rich oral history of the Nisga'a First Nation describes the lava flow event and suggests that the fatalities may have been the result of "poison smoke". Other scenarios have also been suggested, which motivates the aim of this project: to investigate the nature of the Tseax eruption from a multidisciplinary approach in an attempt to offer possible explanations for Canada's second worst natural disaster. A volcanic hazard map for the area will be produced to mitigate against possible future eruptive activity.

This project will investigate the eruption by collecting high resolution 3D topographic data (using a microUAV and ground-based LiDAR/photogrammetry) along with ground-based geological mapping of Tseax volcano, the lava flow and surrounding volcanic field. Samples of volcanic ash, scoria, lava and soil will be collected across the area for geochemical and petrophysical analyses in order to investigate primary volatile contents (*via* melt inclusions) and total volume and composition of gas released, lava rheological properties and whether any carbonised soil horizons are present. These data will facilitate evaluation of other possible volcanic hazards associated with the eruption such as the release of dense, gravity-driven CO<sub>2</sub> flows or whether the lava flow triggered a forest fire that led to the fatalities. The morphological, mapping and petrophysical data will be incorporated into thermomechanical flow models (e.g., VolcFlow) to estimate the emplacement rates while also facilitating development of a volcanic hazard map for the area.