

Sourdough Rock Glacier Active Seismic Experiment 2021

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Experiment Name: Sourdough Glacier Seismic Work August 2021

Purpose:

The purpose of this active seismic data collection is to detect the debris-ice interface and possibly the bed of a debris-covered glacier through refraction and reflection surveys. The location of the experiment is on the Sourdough rock glacier near the town of McCarthy, Alaska. The results will be used to evaluate active-source seismology as an exploration tool in this kind of environment.

Layout & Execution:

Two survey lines were used in this experiment. Two Geometrics Geode 24-channel seismographs were connected to create sub-arrays of 48 40Hz receivers for both survey lines. Line 1 runs approximately East-West and has 144 receiver stations with receiver spacing of 0.5m. This line used a simulated roll-along survey design in which the first sub-array of 48 receivers was laid out, the source shot through the first 24 receivers, the first group of 24 receivers was then picked up and reconnected to the end of the line to create a new 48-channel sub-array. Line 2 runs approximately North-South and has 48 receiver locations with receiver spacing of 0.3m. A 16-lb sledgehammer and a standard geologists' rock hammer were used as sources. For more details on source and receiver locations within specific sub-arrays refer to SOURL1_SRC_LOG.txt and SOURL2_SRC_LOG.txt files included with submission. For receiver coordinates refer to file SourdoughLinesReceiverCoordinates.csv. A map of the survey locations on the glacier has also been included for context (SourdoughSeismicMap.png).