



Abstract

Seton Lake is a freshwater fiord located in southwestern British Columbia, roughly 4 km west of Lillooet and 250 km north-northeast of Vancouver. Located in the Coast Mountains, it is an alpine lake about 22 km long and roughly 1-1.5 km wide. It is separated from nearby Anderson Lake, located to the west, by a large prehistoric rock avalanche deposit of Seton Portage. The lake stands at about 243 m above sea level and is up to about 150 m deep (BC gov., 1953). Water level is controlled by a hydroelectric dam (i.e., Seton dam) located at the eastern end of the lake. Here, the lake drains east into Seton Canal, a 5 km diversion of the flow of the Seton River, which begins at the Seton dam. The Seton Canal pushes water to the Seton Powerhouse, a hydroelectric generating station at the Fraser River, just south of the community of Sekw'e'l and confluence of the Seton River, which drains into the Fraser River at Lillooet. Seton Portage, Shaalth, South Shaalth, Tal'ah (Shalth), Sekw'e'l was (Cayosh Creek), and T'it'et (Lillooet) are communities that surround the lake.

Surrounded by mountainous terrain, the lake is flanked at mid-slope by glacial and colluvial sediments deposited during the last glacial and deglacial periods (Clague, 1989; Jakob, 2018). The bedrock consists mainly of mafic to ultramafic volcanic rocks with minor carbonate and argillite from the Carboniferous to Middle Jurassic periods (Journey and Monger, 1994).

As part of the Public Safety Geoscience Program at the Geological Survey of Canada (Natural Resources Canada), our goal is to provide baseline geoscience information to nearby communities, stakeholders and decision-makers. Our objective was to see what kind of sediments were deposited and specifically if we could identify underwater landslide deposits. Thus, we surveyed the lake using a Pingr SP8 sub bottom profiler made by Knudsen Engineering Ltd., with dual 3.5 / 200 kHz transducers mounted to a small boat (see photo). This instrument transmits sound energy down through the water column that reflects off the lake bottom surface and underlying sediment layers. At the lake surface, the reflected sound energy is received by the profiler, recorded on a laptop computer, and integrated with GPS data. These data are processed to generate a two-dimensional image (or profile) showing the character of the lake bottom and underlying sediments along the route that the boat passed over. Our survey in 2022 recorded 98 profiles along Seton Lake.

References:
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