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# Subglacial Lake Whillans: A Shallow Active Reservoir Beneath a West Antarctic Ice Stream

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Active subglacial lakes concentrate the distribution of water beneath ice sheets in both space and time. Here we report on ground-based geophysical observations from Subglacial Lake Whillans (SLW), which lies beneath Whillans Ice Stream in West Antarctica. Seismic and surface observations from SLW, reveal that this active lake forms a persistent, albeit fluctuating, reservoir beneath the ice stream. Imaging and phase observations from active-source seismic data show that SLW, which was in a low-stand state when surveyed, is a perpetually shallow feature with a water column of less than 8 m depth imaged along 5 km of the 45 km profiled. This water column presents a suitable drill site at S 84.240°, W 153.694°. The water column is located within the lake's hydropotential low, which is independently determined using densely spaced radar and GPS observations. The water column also lies within the region of maximum observed ICESat elevation range. Elsewhere, the majority of the bed appears wet with water thicknesses below the imaging resolution of our data (< 5 m). The surface expression of the active lake, previously revealed by ICESat elevation data and image differencing, generally corresponds to the seismic estimate of water extent, with notable exceptions occurring at the upstream and downstream ends of the lake. These exceptions indicate that SLW: (1) grounds, or has negligible water, in places at low-stands (2) has disconnected or transient active and inactive portions, or, (3) is a system in transition.