

Microbial activity in the sediments of Subglacial Lake Whillans

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Subglacial Lake Whillans is situated 800m below the surface of the Whillans Ice Stream (WIS), in a region of the continent that drains much of the water from below the West Antarctic Ice Sheet. Water draining below the WIS creates a system of drainage channels, lakes, and saturated sediment. The saturated sediment near the upper reaches of the WIS has been estimated to be up to a kilometer thick. These saturated sediments have been thought to contain a large reservoir of organic carbon and support viable microorganisms. We collected ~ 40 cm sediment cores during January 2013 to determine the geomicrobiological characteristics of the surface sediments. Biological incorporation of ^{14}C -acetate, ^3H -leucine and ^3H -thymidine in 4°C , dark incubations was significant in the upper 2 cm of the sediment column. Rates of ^3H -leucine and thymidine incorporation were similar to ^3H -leucine rates measured in the perennially ice-covered lakes in the Taylor Valley, Antarctica. Fixation of ^{14}C -bicarbonate only occurred 38-40cm below the surface of the cores. Our results reveal the presence of an active microbial assemblage in the sediments beneath Lake Whillans consisting of heterotrophic and chemoautotrophic organisms.

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