5th International Conference on Polar & Alpine Microbiology, Big Sky, MT, USA, 2013

Microbial activity in the sediments of Subglacial Lake Whillans

Alexander Michaud, Trista Vick-Majors, and John Priscu, Land Resources and Environmental Science Department, Montana State University, Bozeman, MT, 59717
Mark Skidmore, Earth Sciences, Montana State University, Bozeman, MT, 59717
Andy Mitchell, Geography and Earth Sciences, Aberystwyth University, Aberystwyth, UK

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, ^{3}H-leucine and ^{3}H-thymidine in 4^{o}C, dark incubations was significant in the upper 2 cm of the sediment column. Rates of ^{3}H-leucine and thymidine incorporation were similar to ^{3}H-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.

Funding: NSF-OPP 0838933