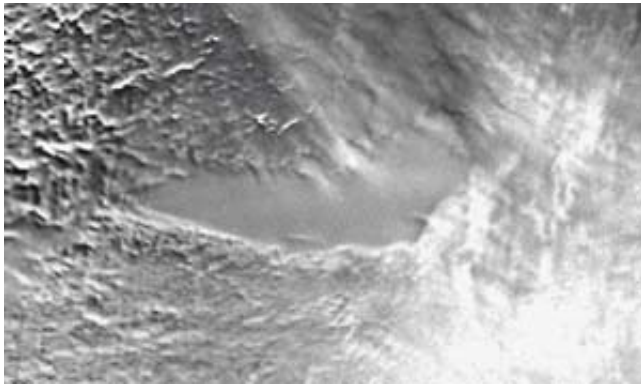


Russians hope to reach Lake Vostok for the first time soon

10 January 2011, by Lin Edwards



RADARSAT image of Lake Vostok. Image: NASA.

(PhysOrg.com) -- Lake Vostok, an untouched lake in Antarctica, is soon to be reached for the first time. Russian scientists are drilling down to the oxygen-rich lake, which is buried beneath a sheet of ice almost four kilometers thick, and extract water samples for analysis.

Lake Vostok is approximately 250 kilometers long and up to 50 kilometers wide (around the size of Lake Ontario in North America), and is up to 800 meters deep. It is isolated from all the other 145 or so subglacial lakes in [Antarctica](#). The lake has been sealed off from the rest of the world by the ice sheet for at least 14 million years.

Earlier plans to [drill](#) into the lake were squashed by the Antarctic Treaty Secretariat (ATS) because of concerns the lake might become contaminated. A team of astrobiologists from [NASA](#) concluded in 2003 that such an exploration could be dangerous and lead to contamination because the high oxygen and nitrogen content of the lake would cause the water to "fizz up" like a shaken soda can. Now, the ATS has approved the environmental evaluation for the new attempt by scientists from the Arctic and Antarctic Research Institute (AARI) in St. Petersburg.

AARI spokesman Valery Lukin, Director of the Russian Antarctic Expedition (RAE), said they have invented a way of sampling the lake without the risk of contamination. When the drill reaches the lake, the water pressure will "push the working body and drilling fluid upwards in the borehole," where it will freeze. The researchers will then return during the next Antarctic summer to remove the frozen water for analysis.



Panoramic photo of Vostok Station showing the layout of the camp. Credit: Todd Sowers LDEO, Columbia University, Palisades, New York.

Lake Vostok is supersaturated with oxygen, with levels estimated to be around 50 times greater than an average freshwater lake. Lukin said the researchers hope to find live organisms in the lake, particularly in the mineralized water near the bottom. If life does exist there, the organisms would be "extremophiles," with many adaptations to allow them to survive. If life is found in the lake, this would have implications for the possibilities of life on Jupiter's moon Europa or Saturn's satellite Enceladus, both of which have a similar environment.

The Russian team are unsure when their drill will break through because the exact depth of the ice/water boundary is not known, but hope they will reach the water later this month and before the current Antarctic summer season ends. Their borehole is currently 3650 meters deep, which is estimated to be approximately 100 meters above the lake surface. The next stages will use a mechanical drill and kerosene freon to get down to 3725 meters, and a new thermal drill head with a clean silicon-oil fluid to drill the rest of the way. The thermal drill head will be fitted with a camera. They are able to drill around four meters a day.

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APA citation: Russians hope to reach Lake Vostok for the first time soon (2011, January 10) retrieved 2 March 2021 from <https://phys.org/news/2011-01-russians-lake-vostok.html>

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