

# Scientists cautious over Russia's Antarctic lake drilling

February 6 2012, by Richard Ingham and Christine Courcol

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Prince Albert II of Monaco (3rd L) poses with the scientists of the Russia's research station Vostok near the Southern Pole of Inaccessibility and the South Geomagnetic Pole, in 2009. Experts on Monday raised questions over the scientific benefit and environmental impact of Russia's feat in drilling into a virgin lake under Antarctica's icesheet.

Experts on Monday raised questions over the scientific benefit and environmental impact of Russia's feat in [drilling into a virgin lake under Antarctica's icesheet](#).

Kerosene, which the Russians used as [antifreeze](#) to prevent the [borehole](#) from closing up in the extremely cold depths of the icesheet, was a potential contamination risk for samples and for the pristine lake itself, they said.

Professor Martin Siegert, head of the school of geosciences at the University of Edinburgh, said these concerns marred "a milestone... a major achievement" by Russia in drilling through to Lake Vostok.

But, he added in a phone interview, "It's very difficult for them to convince (others) that their experiment is going to be clean, when you have essentially two miles (3.5 kilometres) of kerosene to cross before you get to the lake surface."

The lake, lying at a depth of 3,768 metres (12,246 feet), has lain untouched for possibly a million years, he said.

Sub-glacial lakes are [extreme environments](#). The hope is that samples will show whether [microbial life](#) could exist in water suspected to lie beneath the frozen surface of Mars, the Saturnian moon of [Enceladus](#) and Jupiter's satellite, Europa.

But Siegert cautioned that only recovering water from the top of the [Lake Vostok](#) would give no indication about the "[water column](#)," meaning the enormous depth of the lake.

Nor would it say anything about the sediment on its bottom, which could hold vital clues.

And kerosene contamination could skew the samples, he feared. In the last stretch of drilling, the Russians used a more environmentally-friendly antifreeze, freon.

"I don't think there's going to be widespread contamination of the lake. But it's difficult for them to convince that the experiment is going to be clean -- and not just clean, but ultra-sterile -- with the current technique they are using."

Jean Jouzel, a scientist at France's Atomic Energy Commission (CEA), said he had "reservations" about the Vostok project and dismissed claims from Russia that the breakthrough would give insights into climate change through ancient bubbles of carbon dioxide (CO<sub>2</sub>) stored in the ice.

Deep coring of Antarctic ice has already provided historical data on stored CO<sub>2</sub>.

"From a technological point of view, the drilling is a genuine feat. But from the scientific point of view I don't think it will lead to big discoveries," he said.

"It could cause pollution, which the Russians think would be temporary and minor, but this argument has still to be proved," he said.

Jouzel said French experts had previously taken part in the drilling at Vostok with the Russians.

However, they and the Russians decided to put the project on hold, in the early days of the last decade, out of pollution concerns when the drill bit was just 120 metres (390 feet) from the lake ceiling.

Scientists working in Antarctic have to declare their projects to an international panel, comprising national academies, called the Scientific Committee for Antarctic Research (SCAR).

However, it is up to national authorities to give the go-ahead, Jouzel said.

Pointing to what he said was its sense of competition with Britain, Russia gave the OK to complete the drilling.

"It is a very clear case of national prestige," said Jouzel.

"National prestige thus becomes more important than the interest of the (scientific) community, which is to preserve this lake until non-polluting technology emerges," he said. "It's regrettable."

Siegert said he would shortly lead a team to drill into another subglacial lake in Antarctica called [Lake Ellsworth](#), using a different technique called hot-water drilling.

Under this, water heated to 90 degrees Celsius (194 degrees Fahrenheit) is used to melt ice, whose water is then filtered and heated in turn, thus acting as a drill.

It means that access is kept as clean as possible in the arduous working conditions of Antarctica, although once the hole is opened, scientists only have a day or so to recover samples before it freezes over, Siegert said.

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Citation: Scientists cautious over Russia's Antarctic lake drilling (2012, February 6) retrieved 19 April 2024 from <https://phys.org/news/2012-02-scientists-cautious-russia-antarctic-lake.html>

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