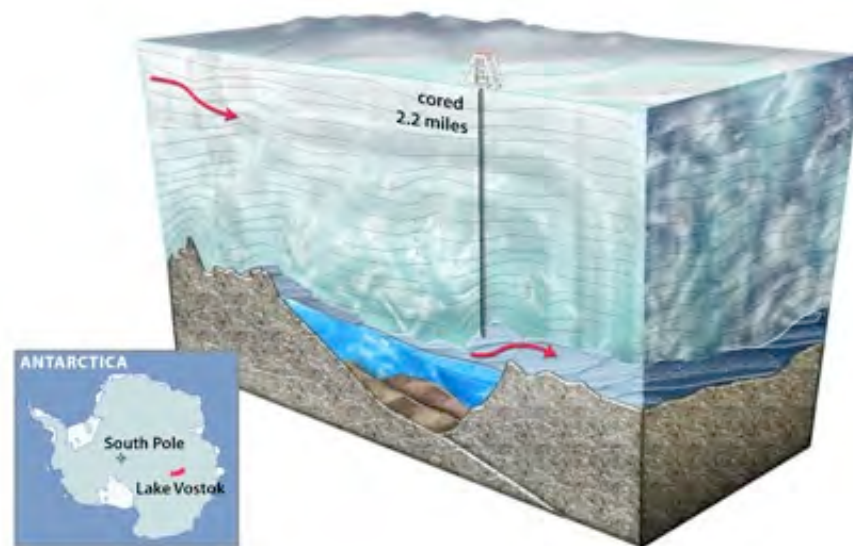


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Mysterious Lakes Under Antarctica May Be Threatened

Russia Poised to Penetrate Huge Subglacial Lake

By LEE DYE
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Sometime within the next few months, a Russian device may dip into a place where no man has been before. It won't be on another planet, or even the dark side of the moon. It will be on this planet, in one of Earth's most austere regions, in a place that has not been disturbed in millions of years.

A Russian drilling rig has penetrated through more than two miles of Antarctic ice and is within about 70 meters of a huge subglacial lake that may harbor microbial colonies that are unlike anything ever seen on Earth. It's an exciting time for some scientists, and a matter of concern to others.

Lake Vostok is a huge body of fresh water, about the size of Lake Ontario, that is part of a recently discovered network of at least 150 lakes

beneath Antarctica's massive ice sheets. The immense pressure of the ice keeps the water in a liquid form. The lakes are fed by subglacial rivers that pump water throughout an astonishing aquatic system, at least a couple of miles below the top of the ice field.

The rivers and lakes are now thought to play a key role in regulating the flow of Antarctica's ice sheets toward the ocean.

"The water under the ice sheets is what lubricates the glaciers and controls their movement toward the ocean," said oceanographer Mahlon "Chuck" Kennicutt II of Texas A&M University in College Station.

Kennicutt is involved in several international programs to explore Antarctica, which, for more than 50 years, has been a model of international cooperation.

A team of scientists reported earlier this year that ice above some of the subglacial lakes was moving at a significant pace, at least a couple of meters a day.

"It's really ripping along," Helen Fricker, of the Scripps Institution of Oceanography in San Diego, said at the time.

The problem is that no one knows enough about those giant subsurface aquifers - which seem to be key players in the movement of the ice - to really evaluate their potential impact on Antarctica's contribution to sea level rise, due to global warming.

In the wake of the recent intergovernmental panel on climate change, "One of the most compelling things is, we really don't understand what the response of the Antarctic ice sheets will be to global warming," Kennicutt said in an interview.

"About 90 percent of the world's fresh water is tied up in these ice sheets, so it's a major unknown. How will these ice sheets react to the warming that's been predicted?"

And how will any major climate change impact the lakes and rivers beneath the ice, the system's "lubricant"?

The National Aeronautics and Space Administration has confirmed that photos from space show a significant link between the flow of ice and the movement of water through some of the subglacial rivers and lakes. That

has added to concerns that Antarctica, which, so far, has been an underachiever in the climate change picture, might change more rapidly than had been expected. That's certainly been the case in the Arctic.

Of course, it's unlikely that a single Russian drilling rig is going to precipitate a sudden melting or movement of Antarctica's massive ice fields into the sea, thus inundating most of the planet's coastal regions, but many polar scientists believe the time has come to move forward cautiously.

As for the Russians, they say they have fulfilled the requirements under the international treaty that governs Antarctica, and they are confident their project will do no harm, so there's nothing anyone can do to stop them.

"At the end of the day, it's really a national decision by the Russians over whether they go forward," Kennicutt said.

Scientists are far less worried about triggering an avalanche of disastrous climate changes in Antarctica, than they are about contaminating an environment that is priceless to a number of fields. NASA is particularly concerned, because the frozen South Pole is considered one of the best areas to practice looking for life in places that are different from the conditions that most of us consider habitable.

Scientists have found life virtually everywhere they've looked on this planet, and some expect to find life in the pure, untouched freshwater lakes and rivers beneath the ice on Antarctica. Any attempt to penetrate Lake Vostok, some scientists say, could introduce contaminants that would jeopardize that effort.

It's safe to say no one expects to find living dinosaurs down there. But most likely, tiny organisms that have adapted to a unique environment, will have made their home there. But they could be very vulnerable to any kind of disturbance.

That danger is present in all efforts to explore unknown places, but much has been learned through space exploration, and the threat could be lessened considerably today. Of course, we left a lot of junk on the moon, so it may be difficult to point a finger at someone else.

Kennicutt, for one, argues that Lake Vostok, by far the largest of the subglacial lakes, should be explored when the time is right. But he doesn't think it's the right place to start.

"There's a lot of alternative, less sensitive, places to test the technology," he said.

It could be done in any number of frozen lakes, answering a number of questions. Could penetration cause hydro-fracturing of the well hole, leading to something like an uncontrolled oil well blowout? The Russian drilling rig wasn't designed to penetrate a virgin lake and leave no contamination. Diesel fuel and Freon are used to maintain the well, so is it possible to penetrate the lake and not also contaminate it?

The Russians have said they can do it safely, and they have complied with the governing treaty, which has no enforcement provisions.

"The Russians have made this the centerpiece of their Antarctic program," Kennicutt said. "This is really now a matter of national pride."

They weren't the first to get to the moon. They seem determined to be the first to penetrate Lake Vostok, which blankets about 5,400 square miles directly beneath their research station. It's got to be a very juicy plumb.

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