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New survey of Arctic's mineral riches could stoke international strife

- Region could contain 30% of the world's gas reserves
- Fears that study will raise tensions in region

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The battle for the [Arctic's](#) hidden mineral riches is likely to intensify after a survey revealing the [energy](#) reserves present beneath the ice.

A map of potential [oil](#) and [gas](#) reserves in the region, published today in *Science*, shows that about 30% of the world's unexploited gas and 13% of oil lie under the seas around the north pole. Billions of barrels of oil and trillions of cubic feet of gas lie within the Arctic circle, where, until now, permanent ice has prevented drilling.

The report is likely to further stoke international competition for mineral, tourism and shipping rights in the region. Exploration and drilling for oil and gas have become easier as climate change forces the ice to retreat, and all countries with borders inside the Arctic circle are fighting to claim their share. "For better or worse, limited exploration prospects in the rest of the world combined with technological advances make the Arctic increasingly attractive for development," said Paul Berkman of the Scott polar research institute at the University of Cambridge, who specialises in the politics of the Arctic.

Russia filed its claim with the UN in 2001 but it is being contested by Canada, Denmark, Norway and the US. In 2007, Russian sailors used a submarine to plant a flag on the sea bed beneath the north pole in an area also claimed by Denmark, thanks to its sovereignty of Greenland. Earlier this month, Russia said it would be prepared to use military force to protect its claims in the Arctic.

The map in *Science* pulls together partial assessments of the region carried out by many different countries and puts the information in the public domain for the first time. It shows that most of the oil is likely to be found under shallow water and there is probably about 90bn barrels in total. For comparison, at the end of 2007, the world's proven oil reserves stood at 1,238bn barrels and annual consumption was about 30bn barrels.

Donald Gautier of the US Geological Survey, who led a team of researchers to produce the map, said the amounts were relatively small compared with the rest of the world's total fossil fuel production. "I think one should be cautious in jumping to the conclusion that it immediately extends world production by three years," he said. "There's nothing we see in the Arctic which suggests the pre-eminence of the oil resources of the Gulf states would be shifted."

For natural gas, the picture is different. "Gas is heavily concentrated in Russian territory and they're already the world's largest producer of gas," said Gautier. "These findings suggest that future pre-eminence of Russian strategic control of gas resources is likely to be extended."

The researchers said while their map was an accurate estimate of the potential geological resource in the Arctic, they had not considered the practical or economic case for whether the oil or gas would be recoverable.

Berkman, who will speak on the political challenge of the Arctic at a meeting at the Royal Society in London next week, said energy resources happened to be at the top of international considerations at present but additional commercial prospects would soon arise.

"Shipping is an important resource and potential for more efficient and economic access through the Arctic would have a tremendous economic implication for trade normally," he said. "The potential for fisheries would also have significant implications." The biggest challenge for governments, he said, was the potential for discord.

"They need to envision strategies to defuse international tensions. At the moment, there are a lot of assertions going on by different nations about their interests."

One way to face the problem, he said, was to focus on common interests in the region, such as environmental protection and peace. But Berkman was concerned that no forum for international dialogue had been developed.

The US team produced the map by gathering data from geological surveys carried out by scientists from Germany, Canada, Denmark and Norway.

By mapping sedimentary rocks, which are the type most consistent with finding oil and gas, and comparing these rocks with proven fossil fuel deposits around the world, the researchers were able to calculate an assessment for the resources in the Arctic.

Gautier said the map was only an early estimate for the minerals around the north pole. "What we have done is gone into an unknown world and done our best to bring to bear the best geological information we can."

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