Could closing a sea passage between Russia and the US stabilize the Atlantic current? Exploring a radical intervention

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With the Seward Peninsula (Alaska) to the east and Chukotsky-Poluostrov (Siberia) to the west, the US and Russia are separated by only about 80 kilometers by the Bering Strait. Credit: NASA/GSFC/JPL, MISR team

A dam in the Bering Strait could potentially help stabilize the Atlantic Meridional Overturning Circulation (AMOC), according to research by Ph.D. candidate Jelle Soons from Utrecht University. Using climate models, he investigated how closing the strait between Alaska and Siberia would affect the current.

In some scenarios, the AMOC remains more stable, although uncertainties are large and it is unclear whether such an intervention would work in practice. The study was published in *Science Advances*.

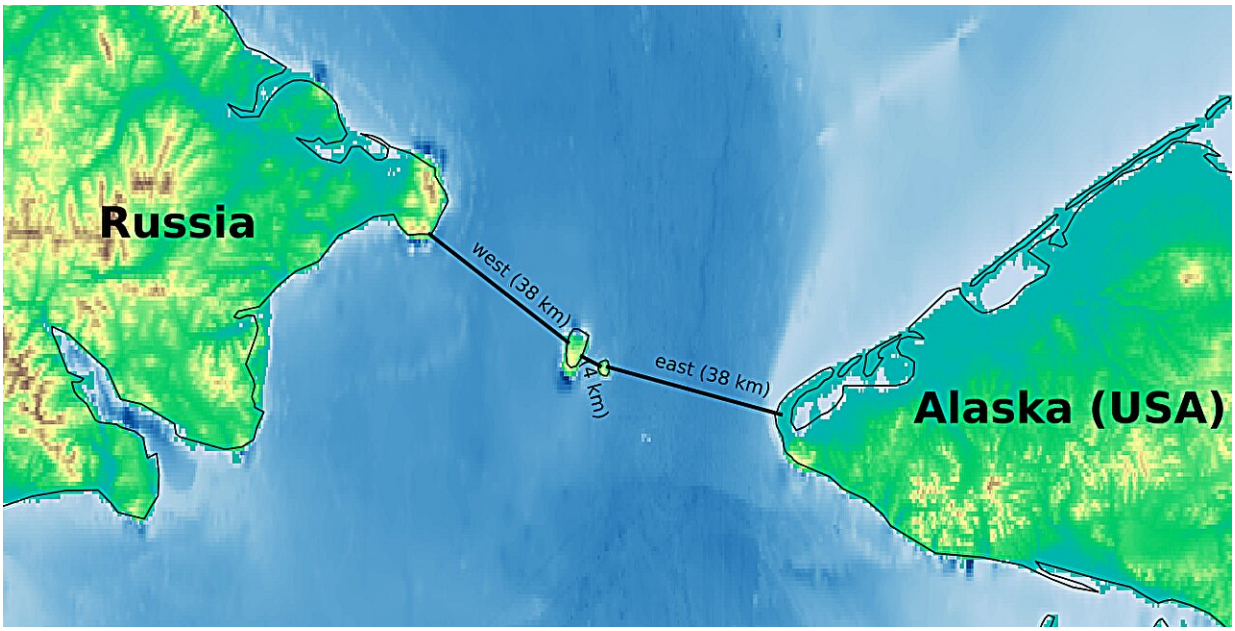
In the 1960s, Soviet engineer Petr Mikhailovich Borisov came up with a plan to melt Arctic sea ice. According to him, this would be beneficial: larger parts of Russia could be used for agriculture and settlement. It would also make the Sahara greener and create a milder global climate.

He proposed that building a dam in the Bering Strait could influence the exchange between cold Arctic water and warmer water from the Pacific Ocean. This, in turn, would allow warmer water to flow toward the Arctic, causing much of the sea ice to disappear.

No sources

"The scientific paper describing Borisov's plans was published in a Russian journal at the time," says Jelle Soons, Ph.D. researcher at the Institute for Marine and Atmospheric Research Utrecht. "But he didn't cite a single source to support his conclusions," he adds with a laugh.

According to Soons, the physics behind the idea does not really hold up. Still, Borisov's plans show that the idea of deliberately altering the climate is not new.



The proposed Bering Strait Dam consists of three separate parts: a part between the Russian mainland and the island of Big Diomede (38 km), a part between Big Diomede and Little Diomede (4 km), and an eastern part between Little Diomede and Alaska (38 km). Credit: Utrecht University

Large scale ocean current

Soons wondered whether a dam in the Bering Strait could help prevent the AMOC, a large ocean circulation system, from slowing down or collapsing.

Earlier research suggests that this circulation was stronger during the Pliocene, between 5 and 2 million years ago. At that time, sea levels were lower and the Bering Strait was closed, meaning North America and Asia were still connected. This raised a question: what would happen if that connection were closed again today?

What is the AMOC?

The AMOC is a large system of ocean currents in the Atlantic Ocean. Warm, salty water flows northward at the surface, cools, and sinks in the North Atlantic, before returning southward at depth. This system plays an important role in transporting heat around the globe. Changes in temperature and salinity, for example due to melting ice sheets, can disrupt this circulation.

Climate models

To investigate the potential effects of a dam in the Bering Strait, Soons used climate models. He simulated different initial states of the ocean, since no model perfectly represents reality.

In some of these scenarios, closing the Bering Strait helps stabilize the AMOC, even as CO_2 levels in the atmosphere increase. In others, the opposite happens and the circulation becomes more vulnerable. "This study is a proof of concept," says Soons. "We've shown that there are scenarios in which such a dam could work. But we don't yet know how realistic those scenarios are."

Timing also turns out to be crucial. If the intervention is implemented early enough, it may support the circulation. But if the AMOC has already weakened, the effect could reverse.

Ecological consequences

Even if building a dam between North America and Russia were theoretically possible, it is far from certain that it could be realized. The Bering Strait is about 80 kilometers wide and located in a remote area with little infrastructure. "The location is a major challenge. There are

no roads leading there."

On top of that, the ecological consequences would likely be significant. The strait is an important migration route for marine mammals, and changes in currents and salinity would affect entire ecosystems.

Geoengineering

Closing a sea passage to influence the climate is an example of geoengineering: large, deliberate interventions in the climate system aimed at producing a desired effect. Other examples include injecting particles into the atmosphere to reflect sunlight, or capturing CO_2 on a large scale.

Geoengineering often raises concerns, especially at this scale. Who would decide to close a sea passage between Russia and the United States? And who would bear the consequences if ecosystems are disrupted?

There is also a broader concern: that technological fixes like this could distract from the root of the problem: greenhouse gas emissions. If a "backup plan" seems to exist, the pressure to reduce emissions might weaken.

Soons does not see geoengineering as an alternative to climate policy, but rather as a last resort. "It's a bit like weight-loss surgery. It's better to lose weight, but if that doesn't work, you might consider an intervention."

More information: Jelle Soons et al, The effects of a constructed closure of the Bering Strait on AMOC tipping behavior, *Science Advances* (2026). DOI: 10.1126/sciadv.aeb7887