Research News

Atlantic Ocean circulation may get a jump-start from the other side of the world

New insights into Atlantic's main circulation system

Atlantic Ocean circulation may be jump-started by the Indian Ocean.

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A key question for climate scientists in recent years has been whether the Atlantic Ocean's main circulation system is slowing down, a development that could have dramatic consequences for Europe and other parts of the Atlantic rim. But a new study suggests help may be on the way from an unexpected source -- the Indian Ocean.

The new study, by Shineng Hu of the Scripps Institution of Oceanography at the University of California San Diego and Alexey Fedorov of Yale University (/cgi-bin/good-bye?https://news.yale.edu/2019/09/16/atlantic-ocean-may-get-jump-start-other-side-world), appears in the journal *Nature Climate Change* (/cgi-bin/good-bye?https://www.nature.com/articles/s41558-019-0566-x#Ack1).

Atlantic meridional overturning circulation, or AMOC, is one of the planet's largest water circulation systems. It operates like a liquid escalator, delivering warm water to the North Atlantic via an upper limb and sending colder water south via a deeper limb.

Although AMOC has been stable for thousands of years, data from the past 15 years, as well as computer model projections, have given scientists cause for concern.

The researchers said their modeling indicates a series of cascading effects that stretch from the Indian Ocean all way to the Atlantic. As the Indian Ocean warms faster, it generates additional precipitation. This, in turn, draws more air from other parts of the world, including the Atlantic, to the Indian Ocean.

With so much precipitation in the Indian Ocean, there will be less precipitation in the Atlantic Ocean, the researchers said. Less precipitation will lead to higher salinity in the waters of the tropical portion of the Atlantic -- because there won't be as much rainwater to dilute it. This saltier water in the Atlantic, as it comes north via AMOC, will get cold much quicker than usual and sink faster. That would act as a jump-start for AMOC, intensifying circulation.

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