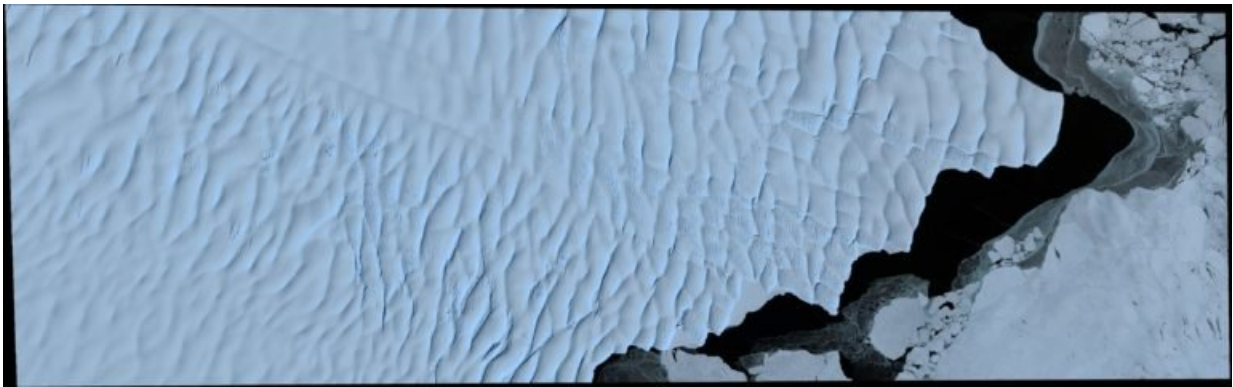


Glaciers in East Antarctica also 'imperiled' by climate change, researchers find

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In this WorldView-2 satellite image of Totten Glacier's front – acquired on Oct. 11, 2015 – ice flows from left to right. The heavily crevassed surface of the floating part of Totten is visible on the left, with larger undulations in topography associated with bottom crevasses. The dark area in front of the glacier is open water, and on the right is thin and pack sea ice. Credit: DigitalGlobe Inc.

A team of scientists from the University of California, Irvine has found evidence of significant mass loss in East Antarctica's Totten and Moscow University glaciers, which, if they fully collapsed, could add 5 meters (16.4 feet) to the global sea level.

In a paper published this week in the American Geophysical Union journal *Geophysical Research Letters*, the glaciologists estimate that between April 2002 and September 2016, the two glaciers lost about

18.5 billion tons of ice per year—equivalent to 0.7 millimeters (0.03 inches) of [global sea level](#) rise over the analyzed time period.

UCI's researchers discovered this by applying a locally optimized technique to data from NASA's Gravity Recovery & Climate Experiment satellite mission, combined with mass balance approximations from regional atmospheric climate models and ice discharge measurements by NASA's Operation IceBridge and Measures projects.

"For this research, we used an improved methodology with GRACE data to retrieve the mass loss in an area undergoing rapid change," said lead author Yara Mohajerani, a graduate student in UCI's Department of Earth System Science. "By overlaying these data with independent measurements, we improve our confidence in the results and the conclusion that Totten and Moscow University are imperiled."

Making up roughly two-thirds of the Antarctic continent, East Antarctica has been viewed by polar researchers as less threatened by climate change than the volatile ice sheets in West Antarctica and the Antarctic Peninsula.

"Both of these glaciers are vulnerable to the intrusion of warm ocean water and hold considerable potential for [sea level rise](#)," said co-author Eric Rignot, Donald Bren Professor and chair of Earth system science at UCI. "This work highlights that East Antarctic glaciers are as important to our future as those in the continent's western regions."

According to co-author Isabella Velicogna, professor of Earth system science, it's challenging to study the Totten and Moscow University [glaciers](#) because the signal of change is much weaker than that of their counterparts in the west.

"In this remote part of the world, the data from GRACE and other satellite missions are critical for us to understand the glacier evolution," she said.

More information: Mass Loss of Totten and Moscow University Glaciers, East Antarctica, Using Regionally Optimized GRACE Mascons, *Geophysical Research Letters* (2018).

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Provided by University of California, Irvine

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