

# Antarctica's Whillans Ice Plain ice flows are highly variable

6 May 2014

The Whillans Ice Plain (WIP) is a roughly 20,000-square-kilometer (772-square-mile) region of the West Antarctic Ice Sheet that acts as a massive conveyor, driving glacier ice into the Ross Ice Shelf. As the climate changes, knowing how large bodies of ice like the WIP behave will be important to assessing sea level rise.

Provided by American Geophysical Union

Since measurements first began in 1963, researchers have found that the ice flows in the WIP have been slowing down. Based on what were initially decadal observations, researchers calculated that the slowdown was occurring at a constant rate.

Starting in 2007, Beem et al. began collecting annual measurements on the WIP. The authors find that rather than undergoing a steady deceleration, ice flow rates fluctuate on interannual timescales. The ice flow rate is controlled by a range of resistive stresses, such as side drag, basal drag, and other factors, but previous research, combined with the current findings, suggests that changes in basal drag are responsible for the WIP's interannual variability.

What would cause this increase in basal drag? Water loss from the surface beneath the ice—caused by water freezing to the glacier's underside, or by subglacial streams being diverted along a new path, the authors speculate. Both mechanisms are supported by existing research. The authors note that changes to ice flow at WIP are linked to changes in internal glacier dynamics rather than to climate variability.

**More information:** Variable deceleration of Whillans Ice Stream, West Antarctica, *Journal of Geophysical Research: Earth Surface*, DOI: [10.1002/2013JF002958](https://doi.org/10.1002/2013JF002958), 2014. <http://onlinelibrary.wiley.com/doi/10.1002/2013JF002958/abstract>

APA citation: Antarctica's Whillans Ice Plain ice flows are highly variable (2014, May 6) retrieved 25 June 2019 from <https://phys.org/news/2014-05-antarctica-whillans-ice-plain-highly.html>

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