

Supporting Information for “Statistical inference shows Helheim Glacier velocity response to runoff, terminus position, and topography”

Lizz Ultee^{1,2}, Denis Felikson³, Brent Minchew¹, Leigh A. Stearns⁴, Bryan

Riel¹

¹Dept. of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA, USA

²School of Earth & Atmospheric Sciences, Georgia Institute of Technology, Atlanta, GA, USA

³NASA Goddard Space Flight Center, Greenbelt, MD, USA

⁴Department of Geology, University of Kansas, Lawrence, KS, USA

Contents of this file

1. Figure S1

Additional Supporting Information (Files uploaded separately)

1. Caption for Dataset S1

Data Set S1. Terminus position of Helheim Glacier (2002-2019) in terms of a width-averaged distance from an upstream flux gate, identified from satellite imagery. We primarily use Moderate Imaging Spectroradiometer (MODIS) imagery, but incorporate Landsat and Sentinel-2 imagery when available. Terminus positions are derived manually until 2010 (Schild & Hamilton, 2013) and using an semi-automated technique thereafter (e.g. Foga et al., 2014).

References

- Foga, S., Stearns, L. A., & van der Veen, C. (2014). Application of satellite remote sensing techniques to quantify terminus and ice mélange behavior at Helheim Glacier, East Greenland. *Marine Technology Society Journal*, 48(5), 81–91. doi: 10.4031/MTSJ.48.5.3
- Schild, K. M., & Hamilton, G. S. (2013). *Terminus position time series: Helheim and Kangerslugssuaq glaciers, Greenland*. National Science Foundation Arctic Data Center. Retrieved from [https://arcticdata.io/catalog/view/doi%3A10.18739/2FA2W93G](https://arcticdata.io/catalog/view/doi%3A10.18739%2FA2W93G) doi: 10.18739/A2W93G

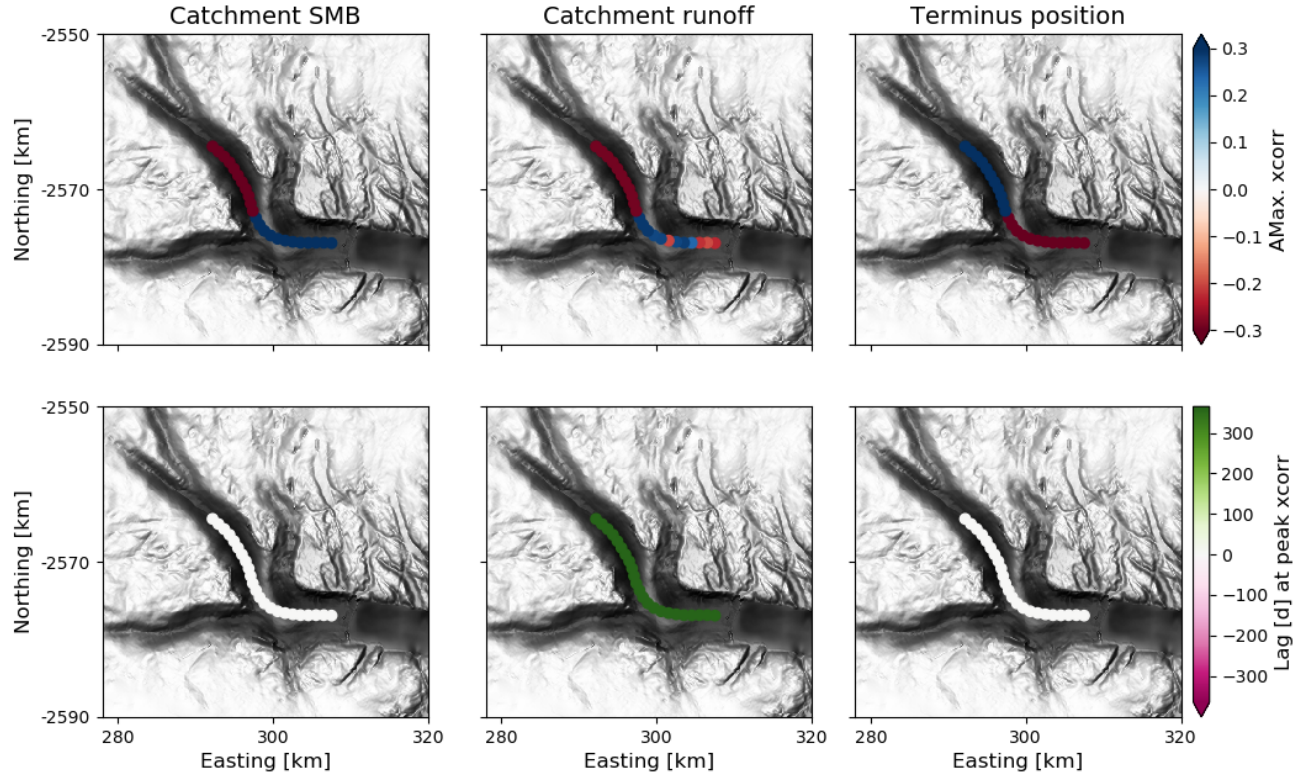


Figure S1. Cross-correlation of largest absolute value (top row) and corresponding lag (bottom row) between the long-term varying components of ice surface speed and each variable (columns). Colorbars for cross-correlation and lag used here are consistent with main text Figure 3 to allow intercomparison; however, the range of values represented here exceeds those shown on that figure.