

Tracking the grounding line migration at Getz Ice Shelf using Sentinel-1 A/B

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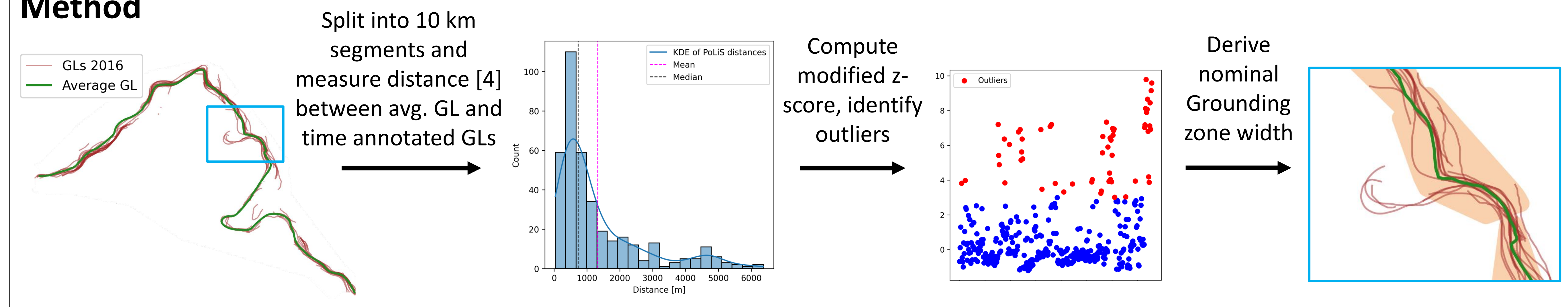


Motivation

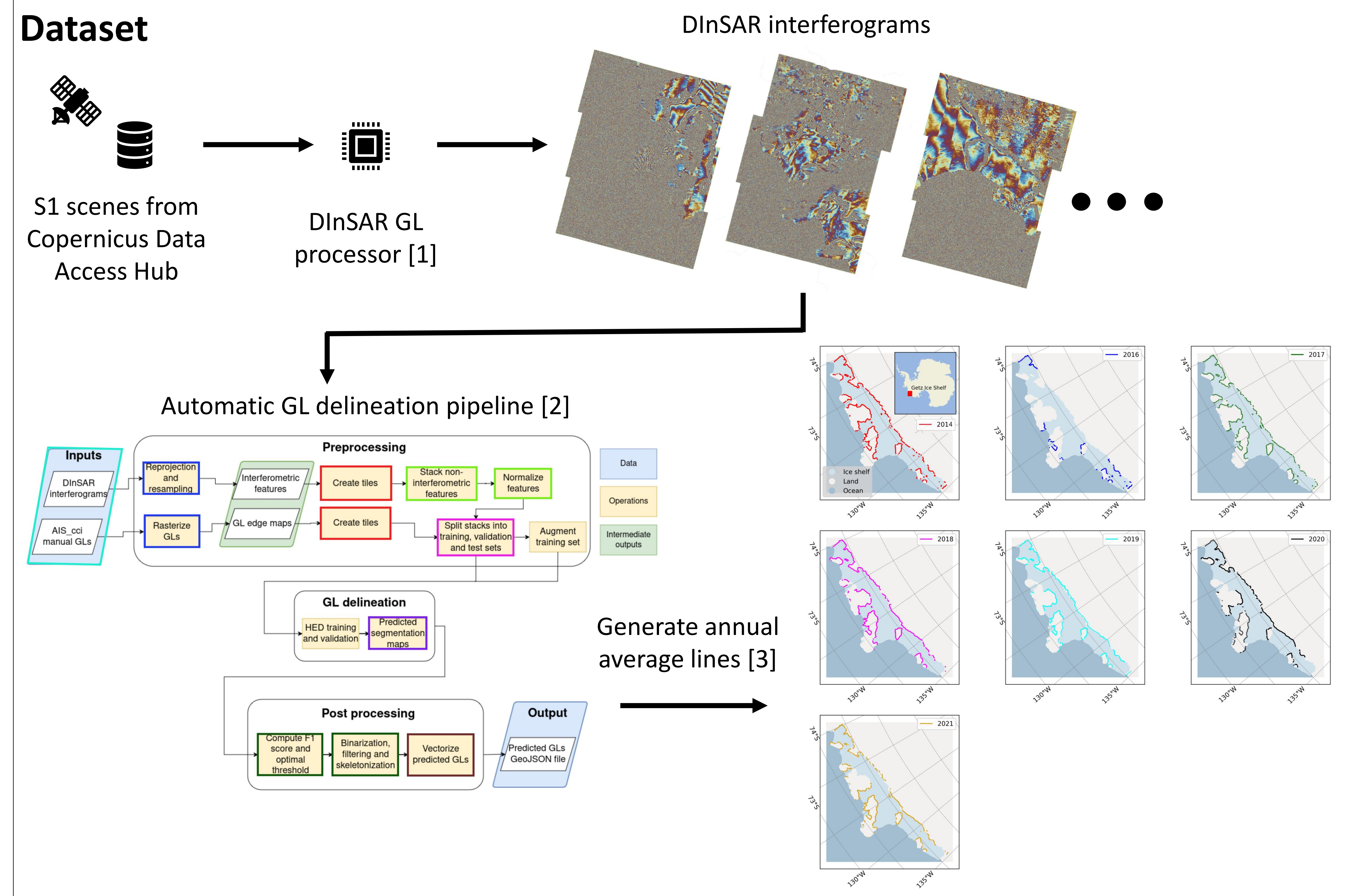
The grounding line (GL) defines the boundary of grounded ice of marine ice sheets in Greenland and Antarctica. The speed and extent of GL retreat indicate the ice sheet stability, making it essential to track and quantify their migration. Grounding lines move in response to changes in the ice sheet geometry, and they also exhibit periodic displacements due to tidal ice shelf flexure. This tidally induced motion enables the accurate and spatially dense mapping of GLs using Synthetic Aperture Radar (SAR) satellites via Differential Interferometric SAR (DInSAR).

We have developed a statistical method to analyze DInSAR-derived GLs, allowing us to identify regions of high spatial variation and extract migration patterns from our generated time series. We present its application to the GLs of Getz Ice Shelf in Antarctica

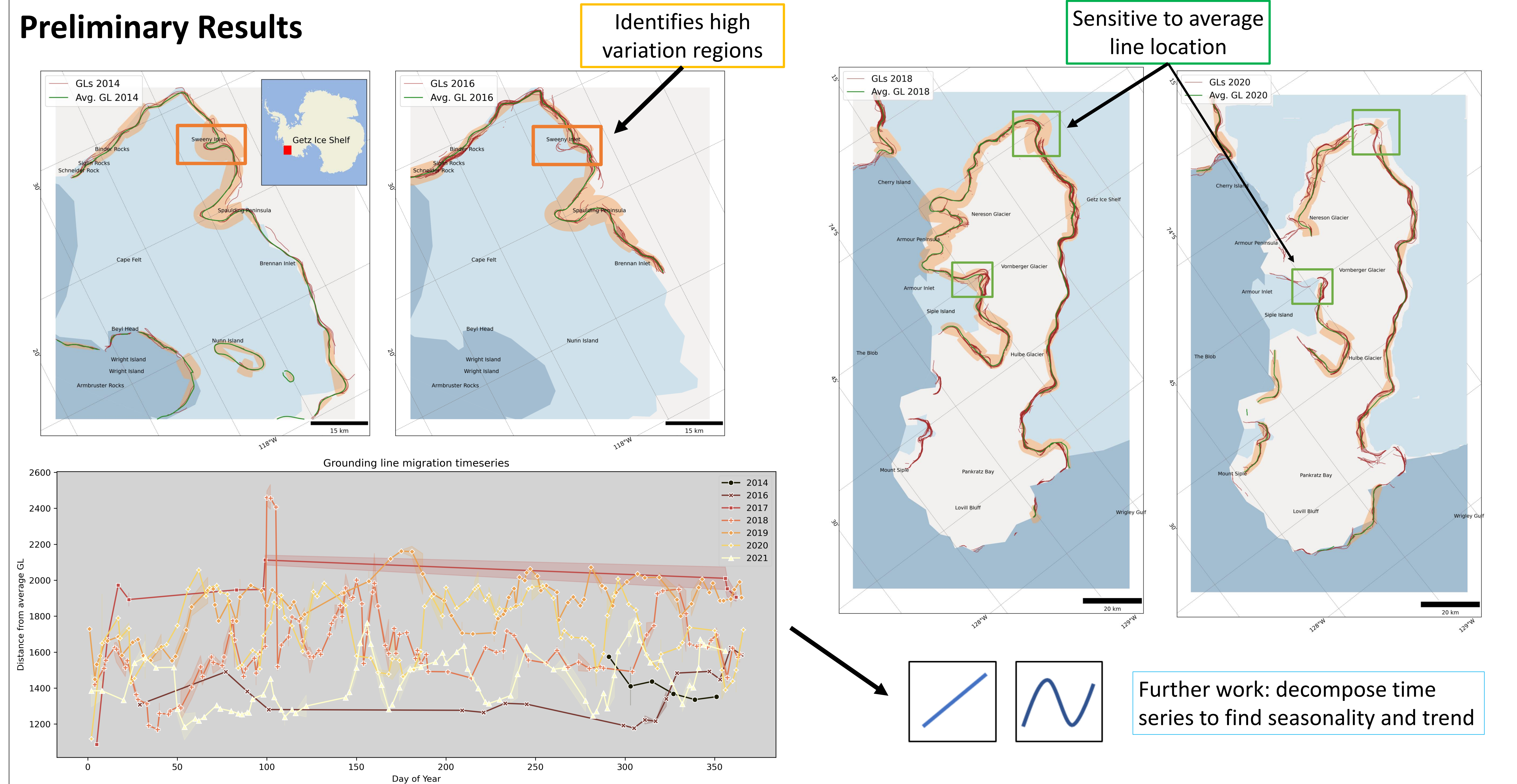
Method



Dataset



Preliminary Results



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[2] S. Ramanath Tarekere, L. Krieger, D. Floricioiu, and K. Heidler, "Deep learning based automatic grounding line delineation in DInSAR interferograms," EGU sphere, vol. 2024, pp. 1–35, 2024. <https://doi.org/10.5194/egusphere-2024-223>
[3] L. Krieger, Grounding lines averaging tool, unpublished
[4] J. Avbelj, R. Müller, and R. Bamler, "A metric for polygon comparison and building extraction evaluation". 2014 IEEE Geoscience and Remote Sensing Letters, 12(1), 170–174