

Supplementary material

Assessment of Morphology Changes of the End Moraine of the Werenskiöld Glacier (SW Spitsbergen) Using Active and Passive Remote Sensing Techniques

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Supplementary tables & figures:

- **Table S1:** Photogrammetry parameters.
- **Table S2:** InSAR processing methods and parameters.
- **Figure S1:** Baseline plot of interferograms generated and selected for dataset.
- **Figure S2:** Location of the pictures and measurements.
- **Figure S3:** Location of photogrammetry control points.

Table S1. Photogrammetry parameters.

Dataset/year	Camera type	Picture format	Axis tilt [°]	Film type	Flight altitude [m]
1936	Zeiss 18/18f c = 210 mm	18 x 18 cm	-30	Agfa Aeropan MF 11	2700
1960	Wild RC-8 c = 153 mm	23 x 23 cm	≥1	Kodak Aerochrome IR	8000
1990	Wild RC-20 c = 152 mm	23 x 23 cm	≥1	Kodak Aerochrome IR	8200
2011	Vexcel UltraCam Xp c = 100 mm	23 x 15 cm	≥1	CCD RGBIr	7400

Table S2. InSAR processing methods and parameters.

SAR mode/geometry/polarization	InSAR processing method	Multi-looking factor/ground resolution	Maximum spatial and temporal base-lines	Number of selected/unselected interferograms	Observation period (first-last selected scenes)	Number of selected scenes	Coherence filter
Interferometric Wide Swath (IWS) Ascending HH	Small Base-line Subset	8x2 40 x 40 m	150 m 24 d	14 11	2.08.2015 - 05.01.2016	14	0.45 in >50% interferograms

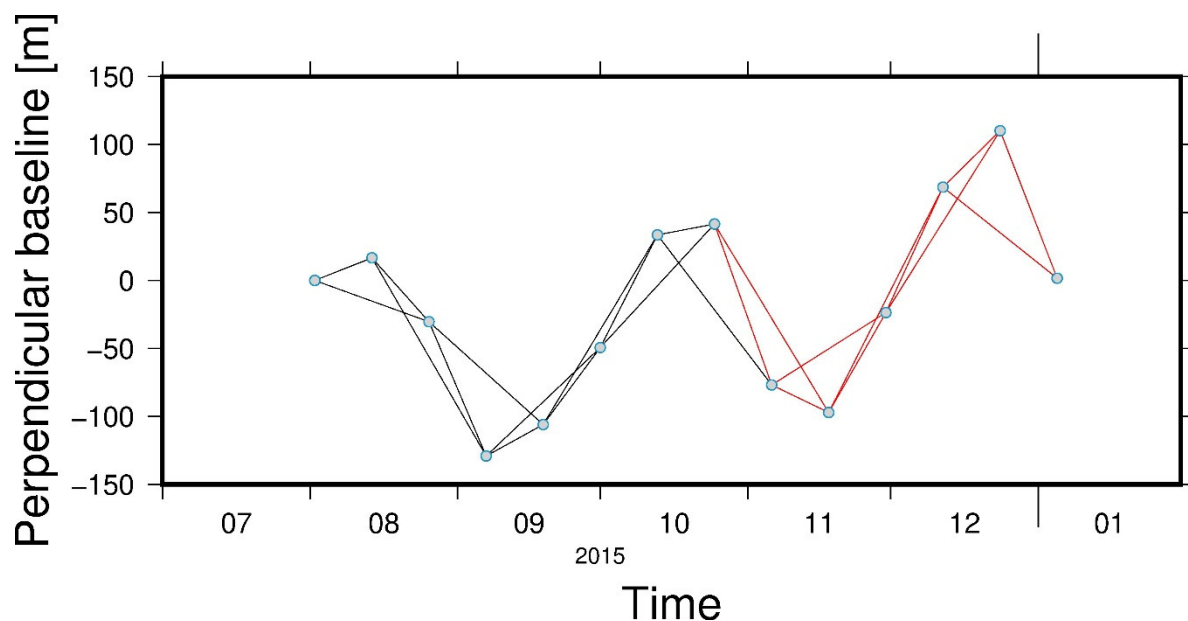


Figure S1. InSAR baseline plot for Sentinel-1A of 2015, multi-year stacking showing the ascending scenes (dots) and the interferograms (lines) generated using 24 days of maximum temporal baseline. The reference (master) image used at the co-registration step is 2015-08-02. The scenes and interferograms selected for multi-year stacking are indicated in black. Discarded interferograms are indicated in red. Details about processing parameters are described in Section 2 and Table S1.

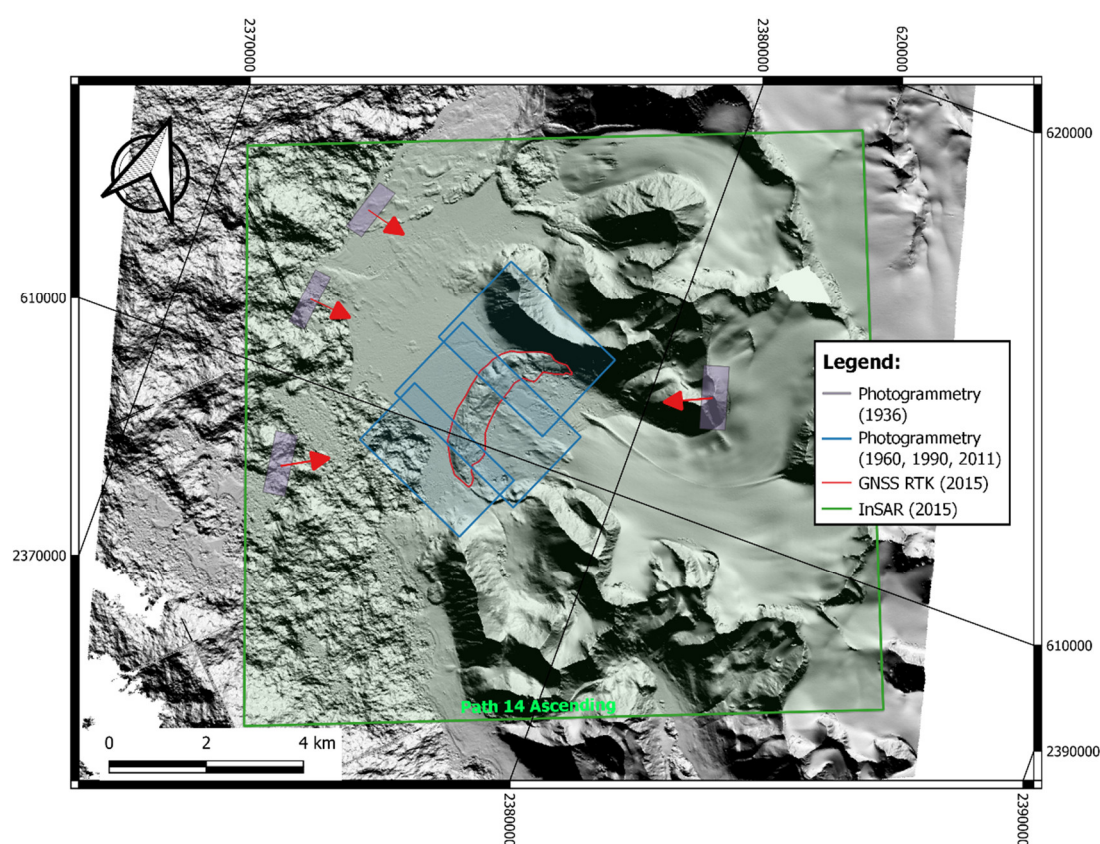


Figure S2. Location of the processed area of Sentinel 1A Tracks 14 in green color box, indicative location of photogrammetry picture in violet color box with red arrow for axis direction, and blue color box. GNSS RTK measurements in red polygon. In background, Digital Elevation Model (DEM) from ArcticDEM <https://www.pgc.umn.edu/data/arcticdem/>. Reference system WGS 84/ UPS North (EPSG:32661).

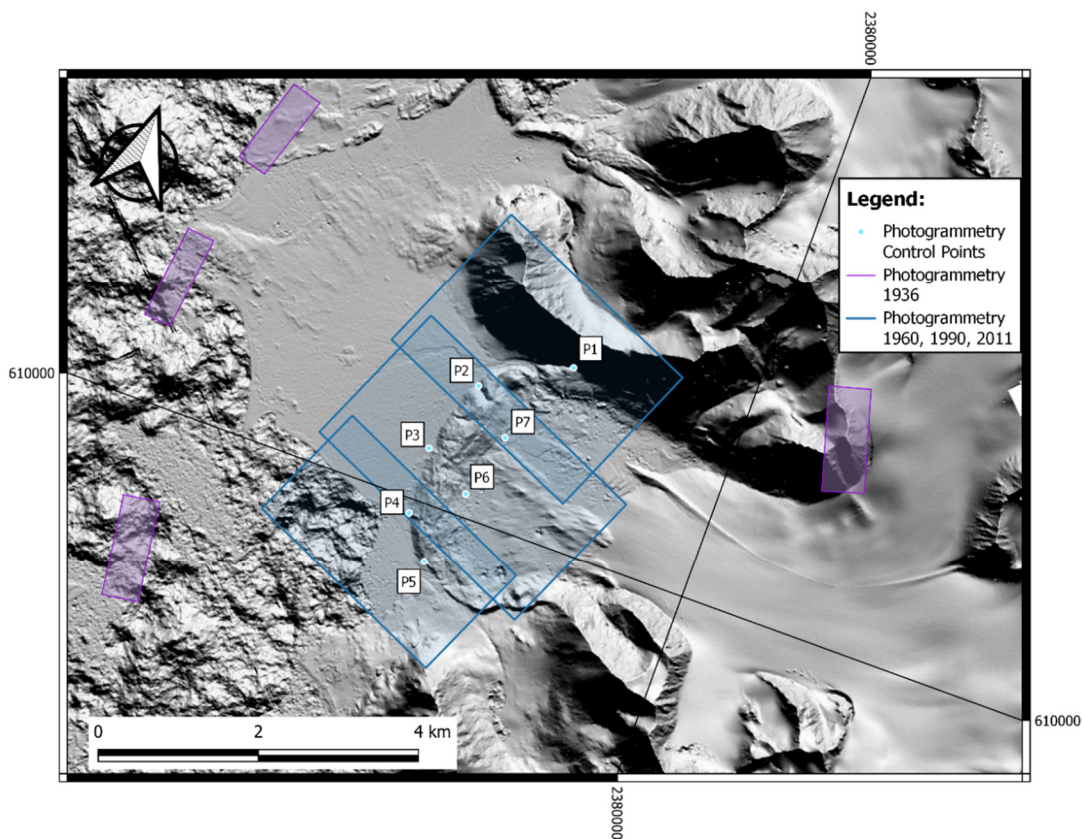


Figure S3. Location of photogrammetry control points (blue dots). Indicative location of photogrammetry picture (violet and blue). In background, Digital Elevation Model (DEM) from ArcticDEM <https://www.pgc.umn.edu/data/arcticdem/>. Reference system WGS 84/ UPS North (EPSG:32661).