



Supplement of

InSAR-derived seasonal subsidence reflects spatial soil moisture patterns in Arctic lowland permafrost regions

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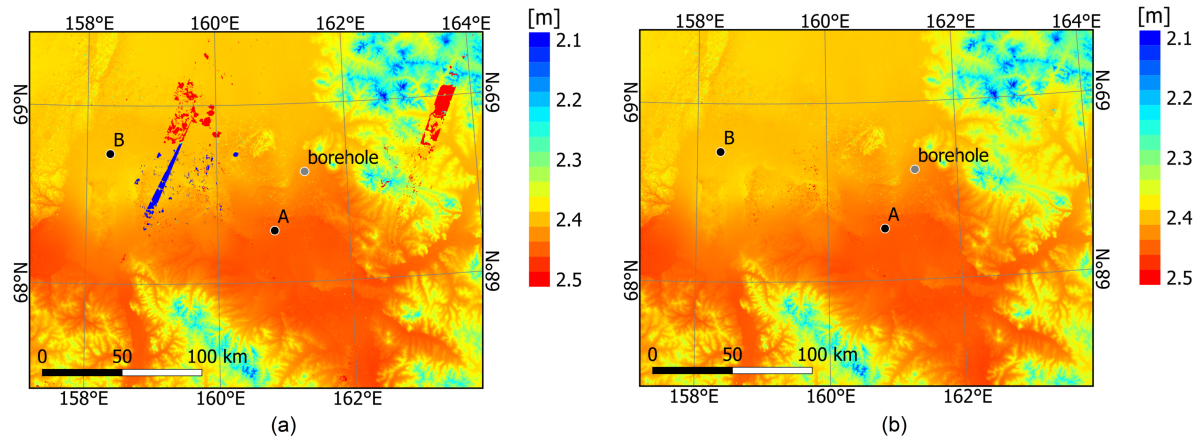


Figure S 1. GACOS tropospheric delay map (Yu et al., 2018) for the Chersky region (10.08.2017). (a) artefacts stemming from ASTER DEM, (b) applied artefact correction

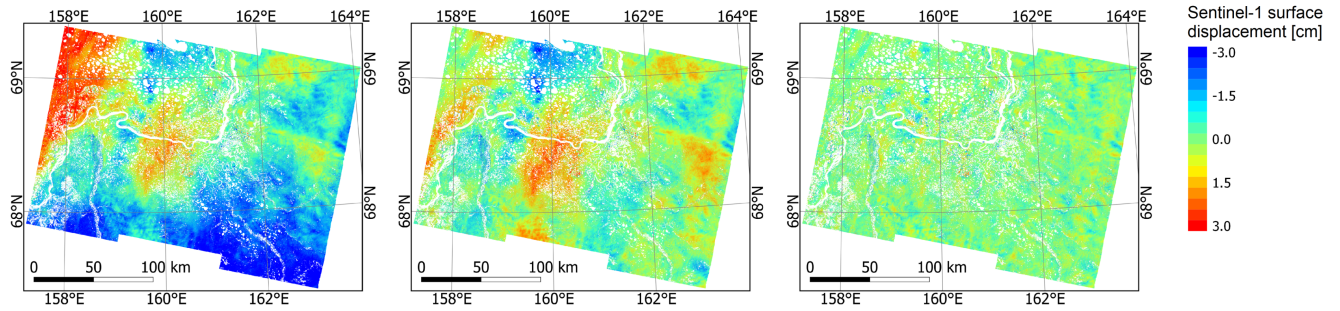


Figure S 2. Comparison of spatial filter radius size for the Chersky region (maps of interferometric phase expressed as displacement for 23.06.2017 - 05.07.2017). Left: no filter, middle: filter radius about 60km, right filter radius about 6km

Table S 1. Acquisition dates of the Sentinel-1 images per study region used in this study.

Chersky	Inuvik	Yamal	Tazovsky
		07/07/2016 19/07/2016 12/08/2016 24/08/2016 05/09/2016 17/09/2016 05/10/2016	
23/06/2017 05/07/2017 17/07/2017 29/07/2017 10/08/2017 22/08/2017 03/09/2017		14/06/2017 26/06/2017 08/07/2017 20/07/2017 01/08/2017 25/08/2017 06/09/2017 18/09/2017	
12/07/2018 24/07/2018 05/08/2018 17/08/2018 29/08/2018 10/09/2018 22/09/2018	30/06/2018 12/07/2018 24/07/2018 05/08/2018	21/06/2018 03/07/2018 15/07/2018 08/08/2018 20/08/2018 01/09/2018 07/10/2018	
19/07/2019 31/07/2019 12/08/2019 24/08/2019 05/09/2019 17/09/2019	13/06/2019 25/06/2019 07/07/2019 19/07/2019 31/07/2019 12/08/2019 24/08/2019 05/09/2019 17/09/2019		10/06/2019 22/06/2019 04/07/2019 16/07/2019 28/07/2019 02/09/2019 14/09/2019
19/06/2020 01/07/2020 13/07/2020 25/07/2020 06/08/2020 18/08/2020 30/08/2020 11/09/2020 23/09/2020	26/05/2020 07/06/2020 19/06/2020 01/07/2020 13/07/2020 25/07/2020 06/08/2020 18/08/2020 30/08/2020 11/09/2020 23/09/2020		23/05/2020 04/06/2020 16/06/2020 28/06/2020 10/07/2020 15/08/2020 08/09/2020 20/09/2020
14/06/2021 26/06/2021 08/07/2021 20/07/2021 01/08/2021 13/08/2021 25/08/2021	21/05/2021 14/06/2021 26/06/2021 08/07/2021 20/07/2021 01/08/2021 13/08/2021 25/08/2021 06/09/2021 18/09/2021	24/05/2021 05/06/2021 17/06/2021 29/06/2021 11/07/2021 23/07/2021 04/08/2021 09/09/2021 21/09/2021	
	28/05/2022 09/06/2022 21/06/2022 03/07/2022 15/07/2022 08/08/2022 20/08/2022 01/09/2022 13/09/2022		
	23/05/2023 04/06/2023 16/06/2023 28/06/2023 10/07/2023 22/07/2023 15/08/2023 08/09/2023 20/09/2023		

Table S 2. Sentinel-1 paths and frames per study region used in this study (see Table S 1)

	Chersky	Inuvik	Yamal	Tazovsky
Path	31	108	64	151
Frame	363	221	358	366

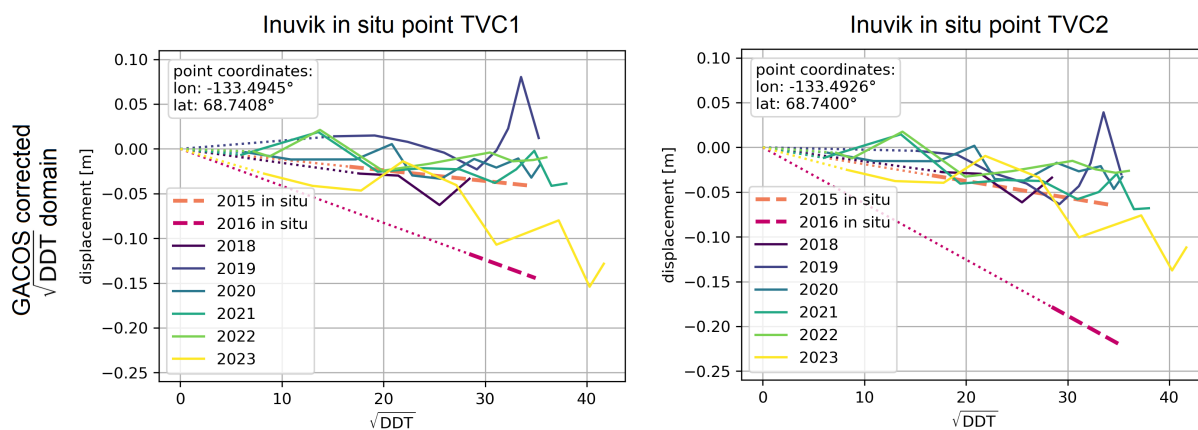


Figure S 3. Displacements by the square root of degree day of thaw (\sqrt{DDT}) of two sample points with in situ subsidence measurements for the years 2015 and 2016 near the Trail Valley Creek (TVC) research station (Inuvik region). The early thaw data gap in the InSAR time series was accounted for by extrapolation (approach following Bartsch et al. (2019), dotted lines correspond to linearly extrapolation part of the time series). For comparisons to results in the DDT domain see Figure A4.

References

- Bartsch, A., Leibman, M., Strozzi, T., Khomutov, A., Widhalm, B., Babkina, E., Mullanurov, D., Ermokhina, K., Kroisleitner, C., and Bergstedt, H.: Seasonal Progression of Ground Displacement Identified with Satellite Radar Interferometry and the Impact of Unusually Warm Conditions on Permafrost at the Yamal Peninsula in 2016, *Remote Sensing*, 11, <https://doi.org/10.3390/rs11161865>, 2019.
- 5 Yu, C., Li, Z., Penna, N. T., and Crippa, P.: Generic Atmospheric Correction Model for Interferometric Synthetic Aperture Radar Observations, *Journal of Geophysical Research: Solid Earth*, 123, 9202–9222, <https://doi.org/https://doi.org/10.1029/2017JB015305>, 2018.