



Supplement of

Interannual and seasonal evolution of supraglacial drainage systems on Nivlisen Ice Shelf, East Antarctica

Jiao Chen et al.

Correspondence to: Jiao Chen (jiao.chen@durham.ac.uk)

The copyright of individual parts of the supplement might differ from the article licence.

Table S1: Sentinel-2 and Landsat-8 imagery information

Data type	Spatial Resolution	Number or Row/Path	Acquisition Date
Sentinel 2	10 m	R049_T32DNG	2017/01/26
		R049_T32DNH	
		R049_T32DPG	
		R049_T32DPH	
		R049_T32DNG	2018/01/11
		R049_T32DNH	
		R049_T32DPG	
		R049_T32DPH	
		R049_T32DNG	2019/01/31
		R049_T32DNH	
		R049_T32DPG	
		R049_T32DPH	
		R049_T32DNG	2020/01/26
		R049_T32DNH	
		R049_T32DPG	
		R049_T32DPH	
		R049_T32DNG	2021/01/20
		R049_T32DNH	
		R049_T32DPG	
		R049_T32DPH	
		R049_T32DNG	2022/01/25
		R049_T32DNH	
		R049_T32DPG	
		R049_T32DPH	
		R006_T32DNG	2023/01/27
		R006_T32DNH	
		R006_T32DPG	
		R006_T32DPH	
		R006_T32DNG	2024/01/22
		R006_T32DNH	
		R006_T32DPG	
		R006_T32DPH	
Landsat 8	30 m	110/166	2018/12/01
		110/165	2018/12/10
		110/166	2018/12/17
		109/167	2018/12/24
		110/167	2018/12/24
		109/167	2019/01/25
		110/167	2019/01/25
		110/166	2019/02/19
		110/165	2019/02/28
		110/166	2019/03/07

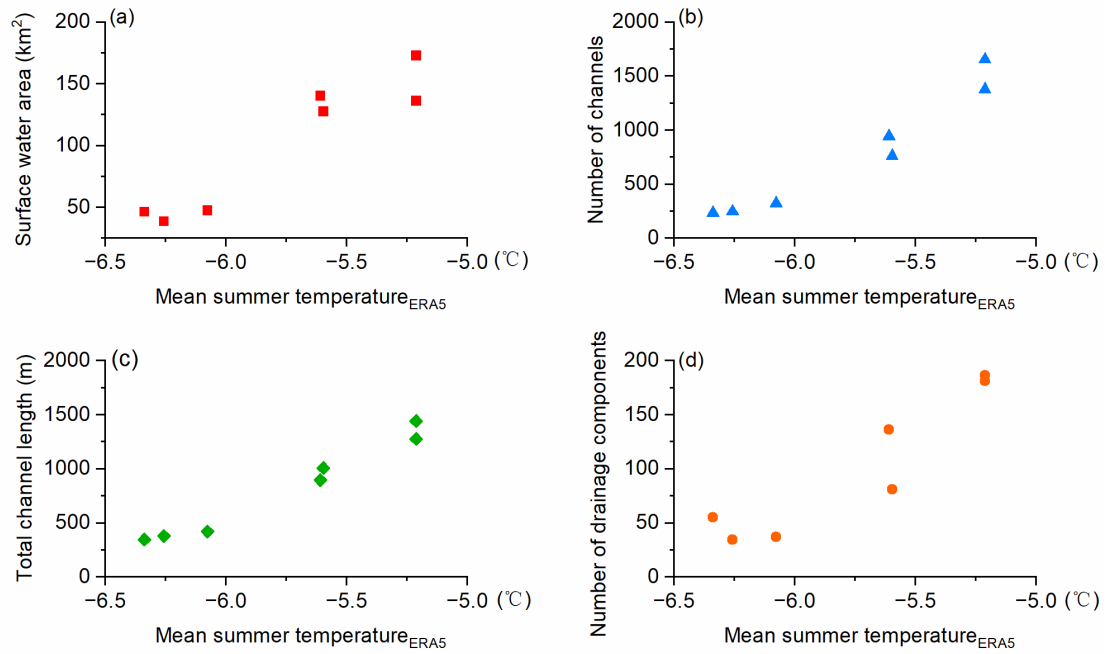
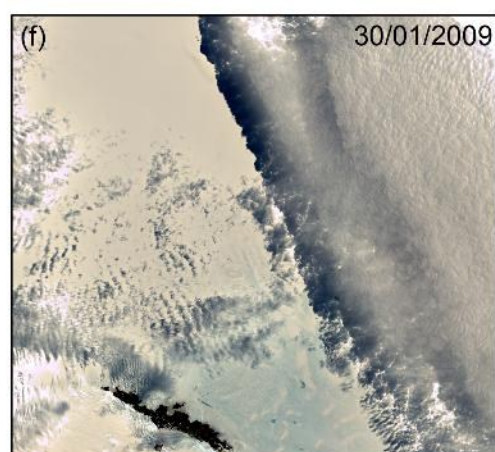
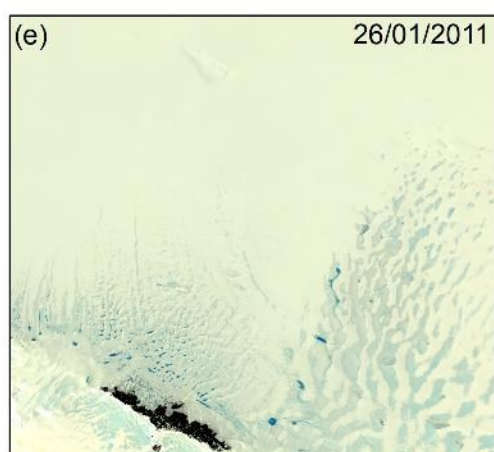
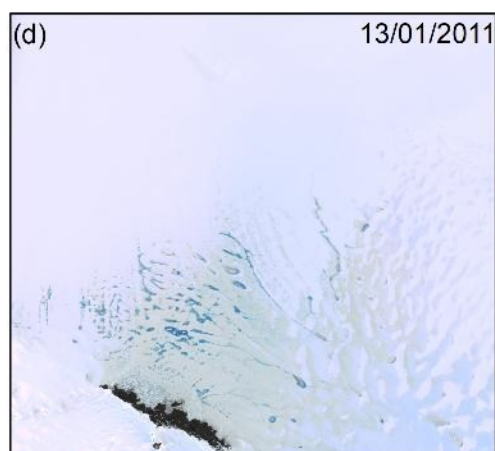
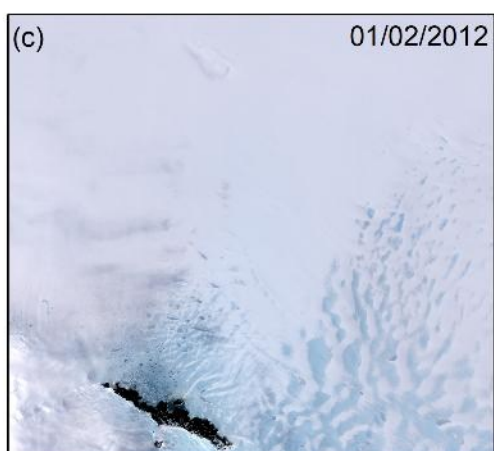
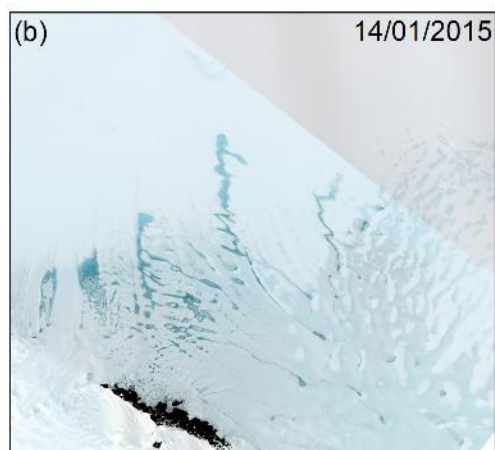
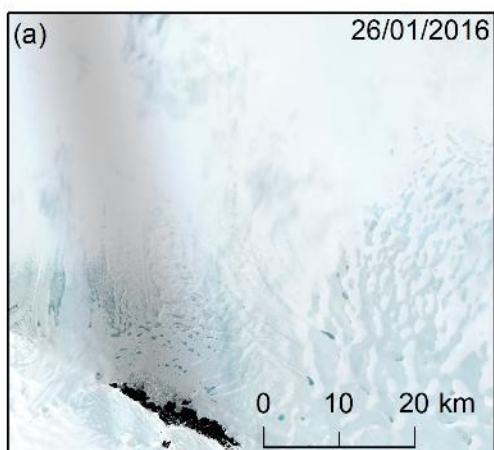
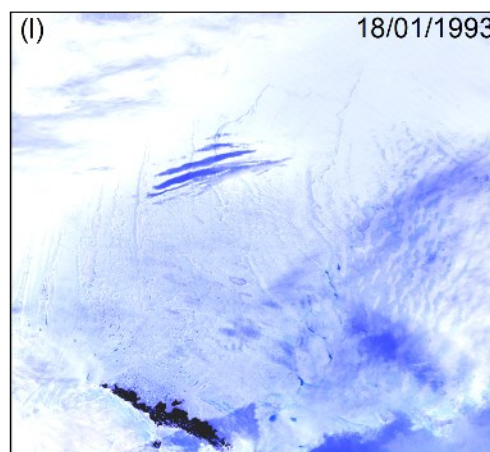
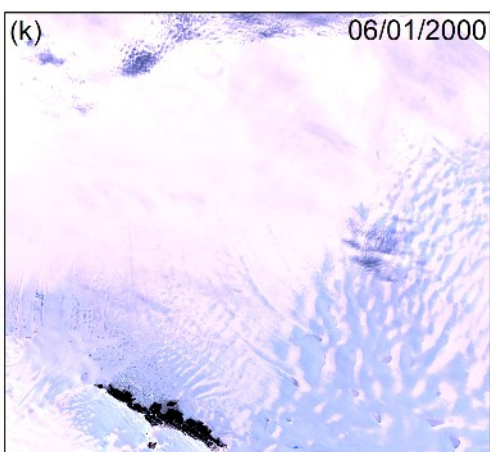
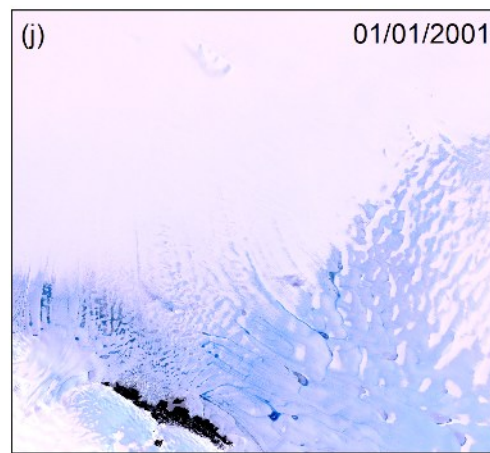
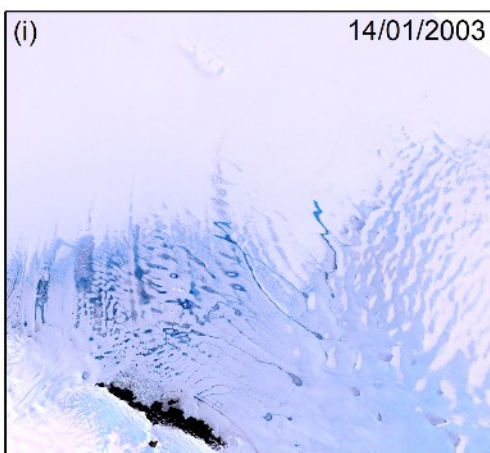
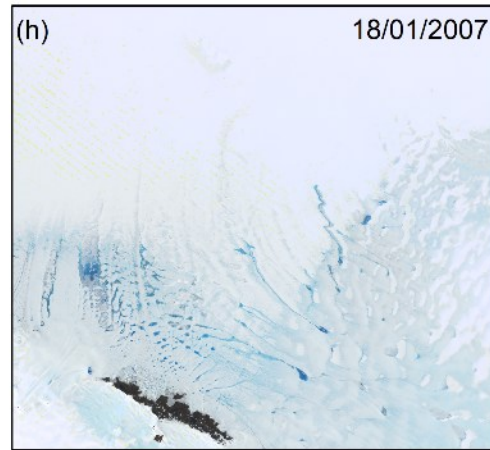
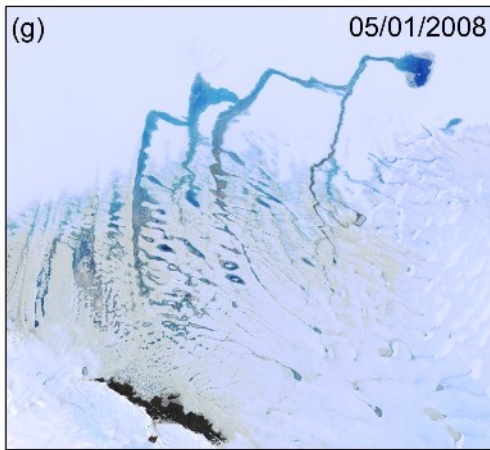


Figure S1: Scatter plots showing the relationships between ERA5 mean summer temperature and key metrics of supraglacial drainage components. The plots are included to show the distribution of the annual observations and to assess whether the strongest correlations are dominated by individual years. The year 2022 is not shown because no visible surface water or mapped channels were identified, and it was therefore treated separately as a no-visible-water year and not included in the correlation analysis. Correlations were therefore calculated for the seven years with mapped drainage components.





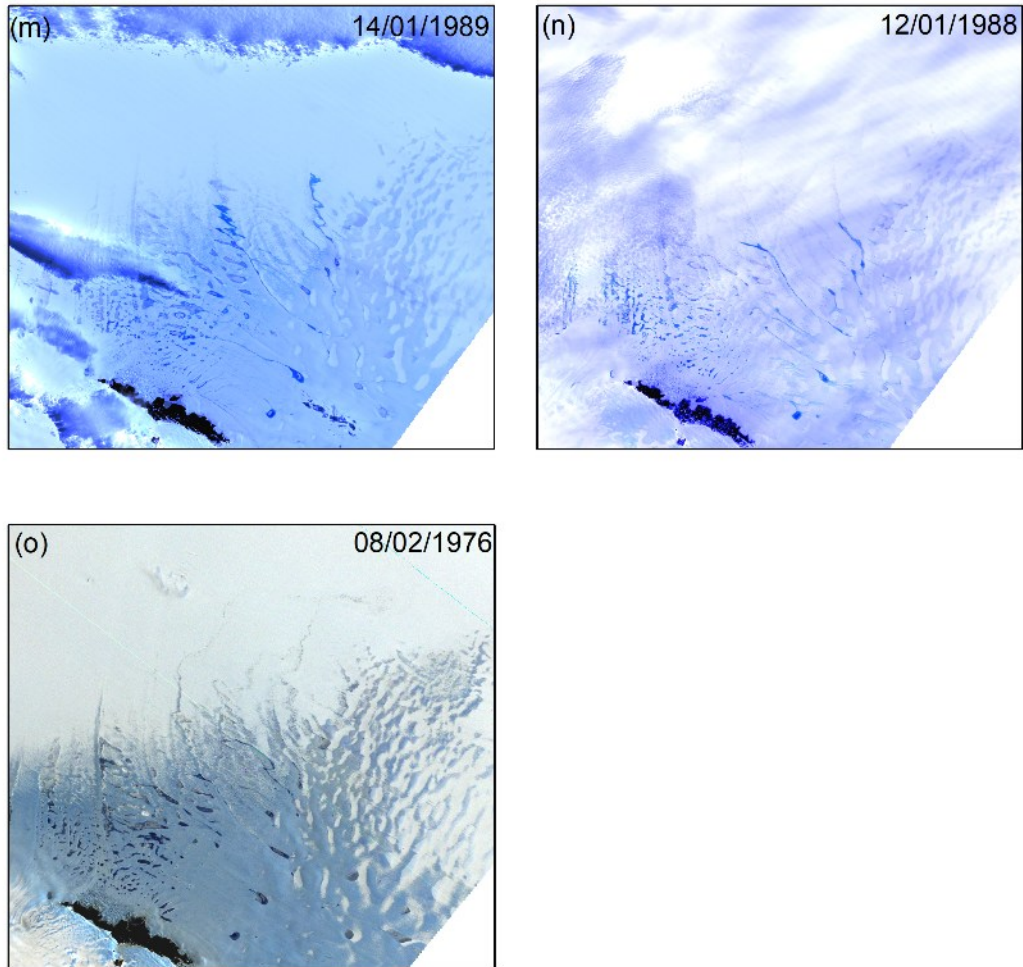


Figure S2: Qualitative historical Landsat check of January surface-water and drainage patterns on Nivlisen Ice Shelf prior to the Sentinel-2 study period. Each panel shows the same spatial extent using Landsat imagery from a single January or early-February scene. The figure is intended to provide historical context for whether drainage patterns similar to those observed in 2019 and 2020 occurred in earlier years, rather than to provide a sensor-consistent quantitative time series.

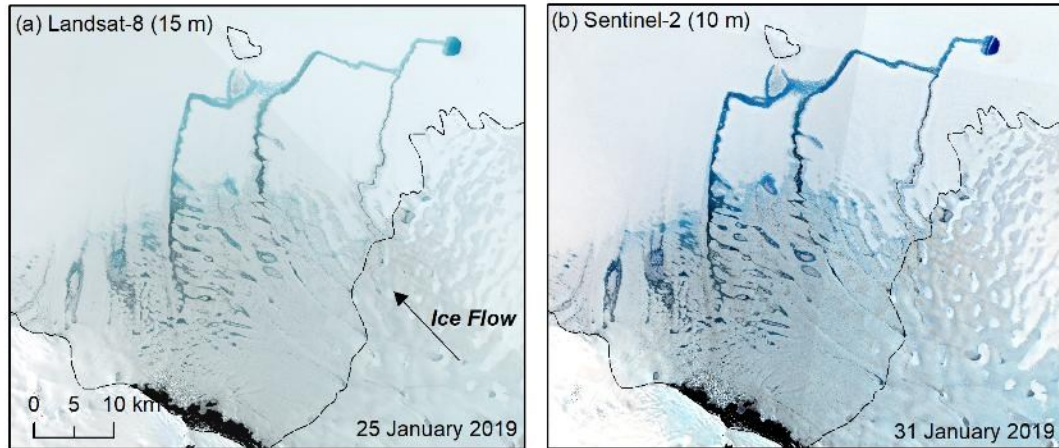


Figure S3: Comparison between (a) Landsat-8 pan-sharpened imagery acquired on 25 January 2019 and (b) Sentinel-2 imagery acquired on 31 January 2019 over Nivlisen Ice Shelf. The dash lines represent the grounding line from Mouginot et al. (2017). The comparison illustrates that the broad drainage system is visible in both datasets, while narrower and lower-contrast channel features are more clearly resolved in the Sentinel-2 image. Because the images were acquired six days apart during the melt season, the comparison is qualitative and is not used for metric-based inter-sensor correction.