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Supplement of

Subglacial permafrost dynamics and erosion inside subglacial channels driven by surface events in Svalbard

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1 Tables

Table S1. Pearson correlation coefficients for forecasted versus daily observed temperature and rainfall in the measurement periods 2016 and 2019.

	2016	2019
Temperature	0.985	0.986
Rainfall	0.234	0.339

2 Figures

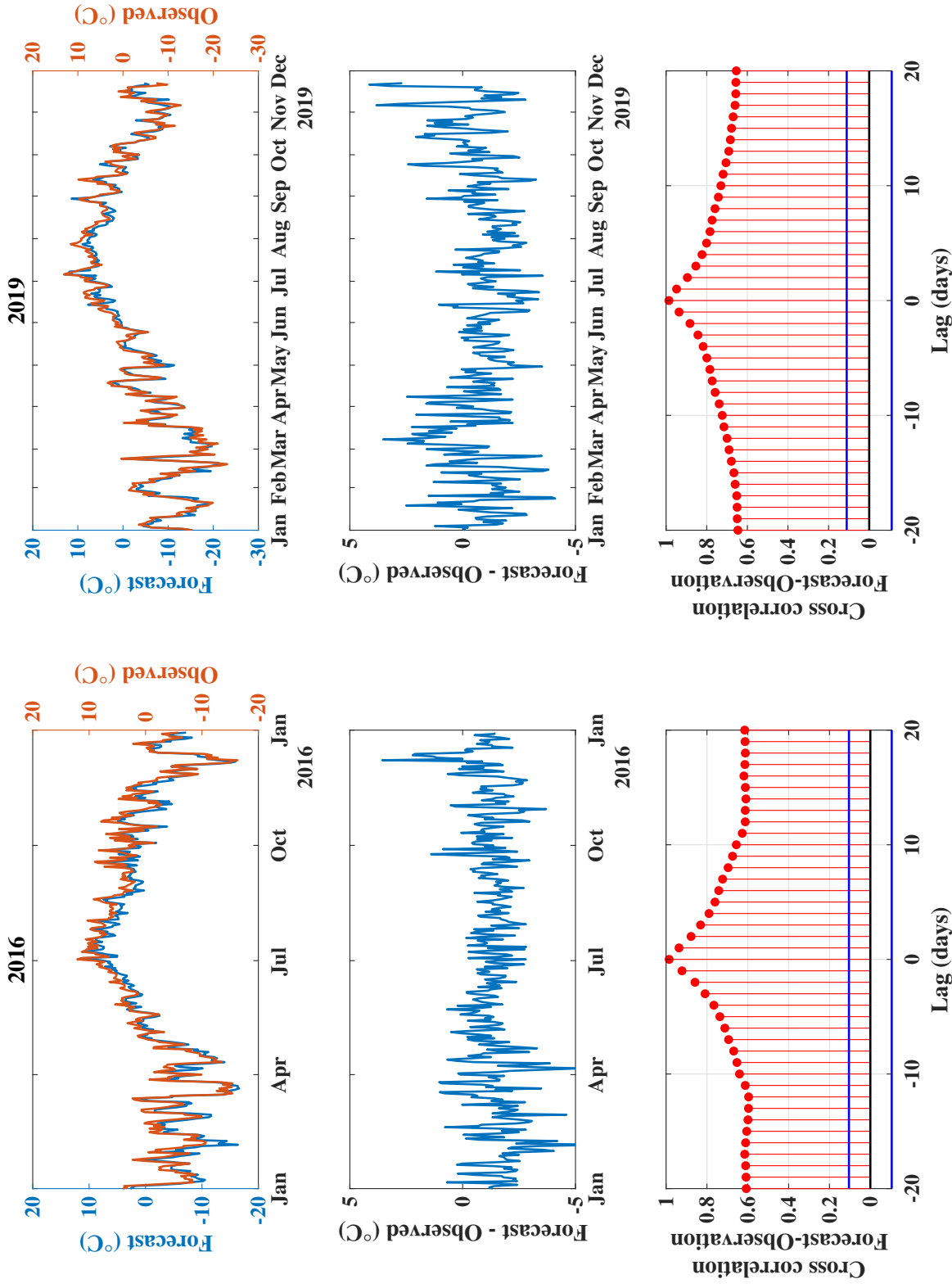


Figure S1. Forecasted versus observed daily mean 2 m air temperature at Svalbard airport for 2016 and 2019. Temperature is forecasted using the AROME-Arctic model.

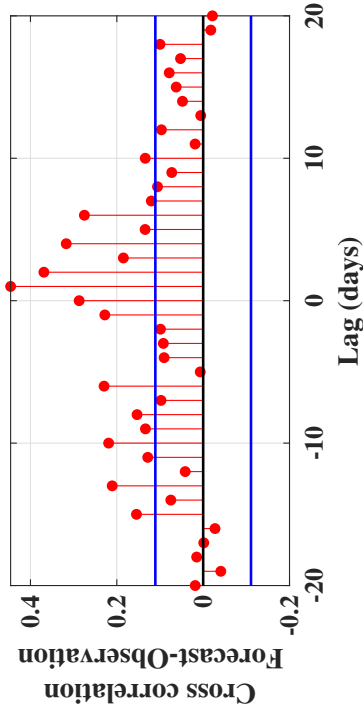
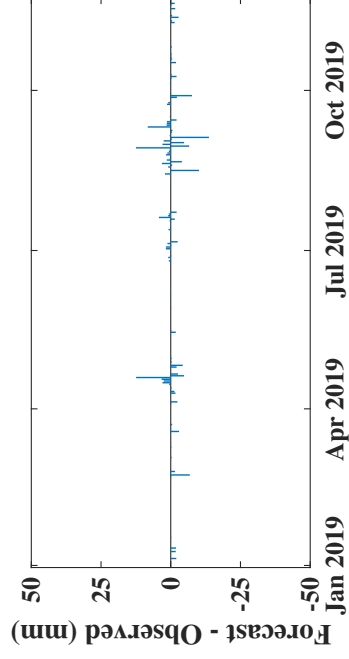
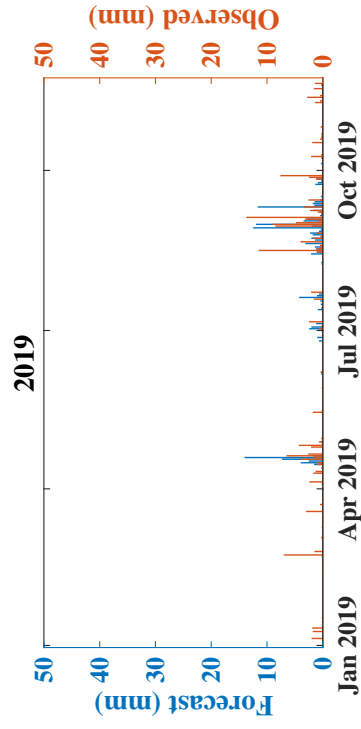
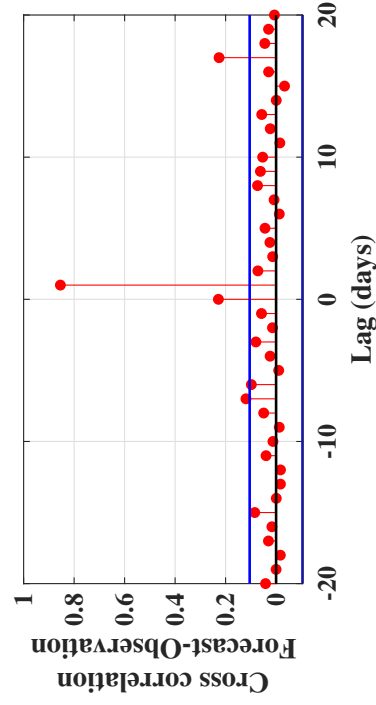
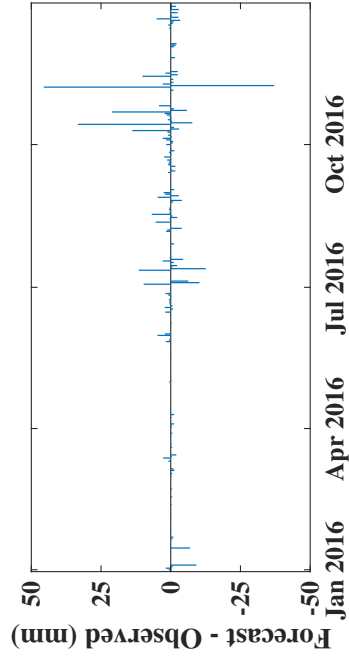
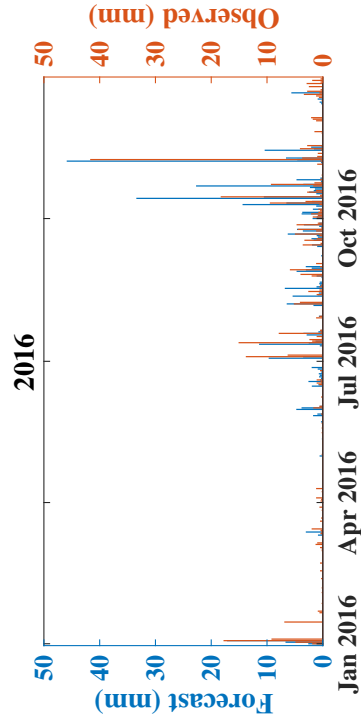
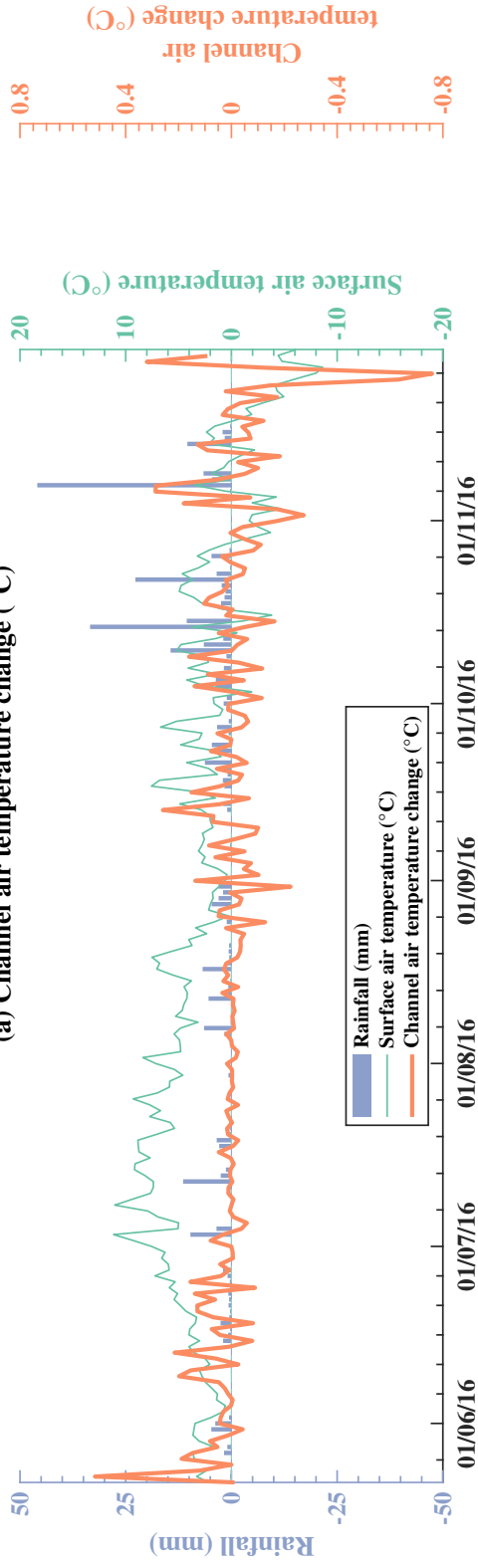


Figure S2. Forecasted versus observed daily rainfall at Svalbard airport for 2016 and 2019. Rainfall is forecasted using the AROME-Arctic model.

(a) Channel air temperature change (°C)



(b) 1.05 m sediment temperature change (°C)

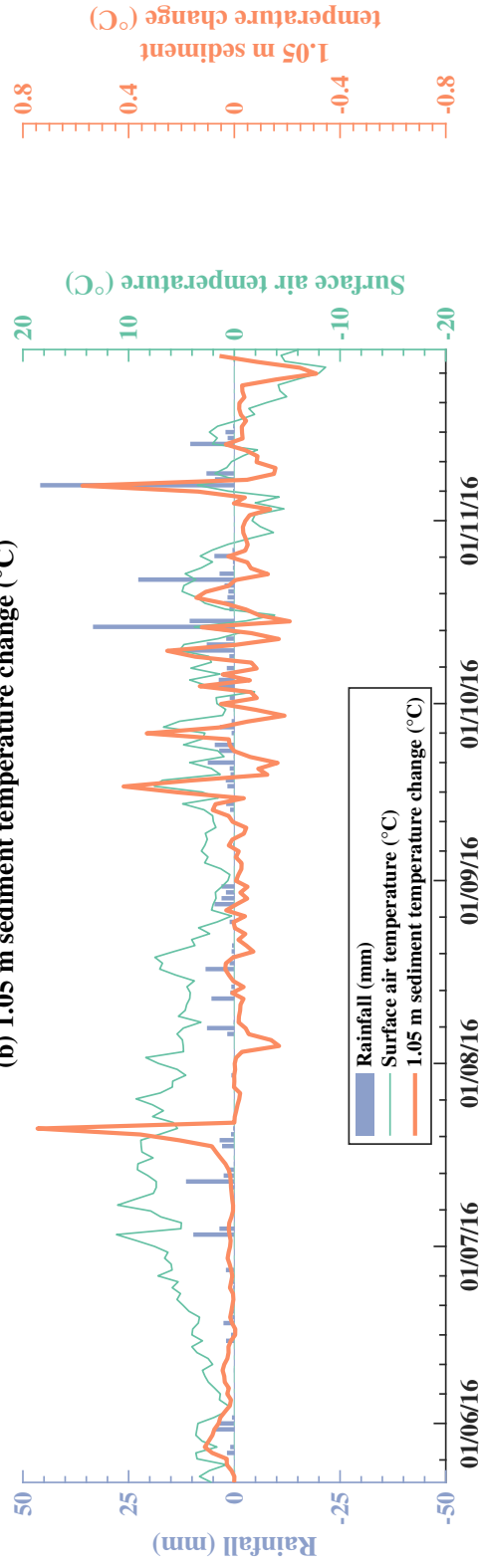


Figure S3. Daily subglacial temperature changes compared to modelled weather conditions at Larsbreen in 2016. a) Time series of subglacial channel air temperature change, modelled surface air temperatures and modelled rainfall. b) Time series of subglacial sediment temperature change, modelled surface air temperature and modelled rainfall.

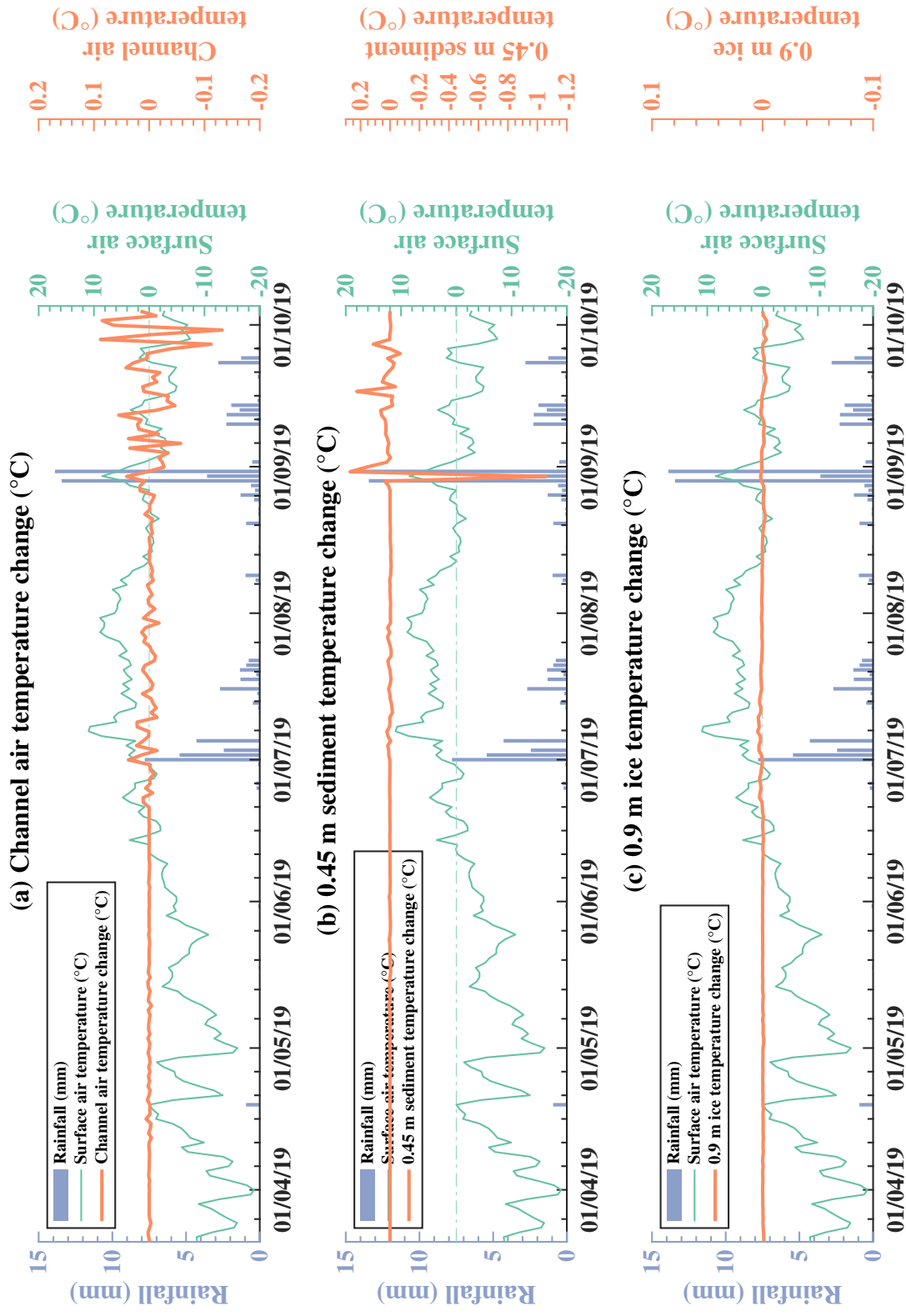


Figure S4. Daily subglacial temperature changes compared to modelled weather conditions at Tellbreen 'Subglacial 1' in 2019. a) Time series of subglacial channel air temperature change, modelled surface air temperatures and modelled rainfall. b) Time series of subglacial sediment temperature change, modelled surface air temperature and modelled rainfall. c) Time series of subglacial ice temperature change, modelled surface air temperature and modelled rainfall.

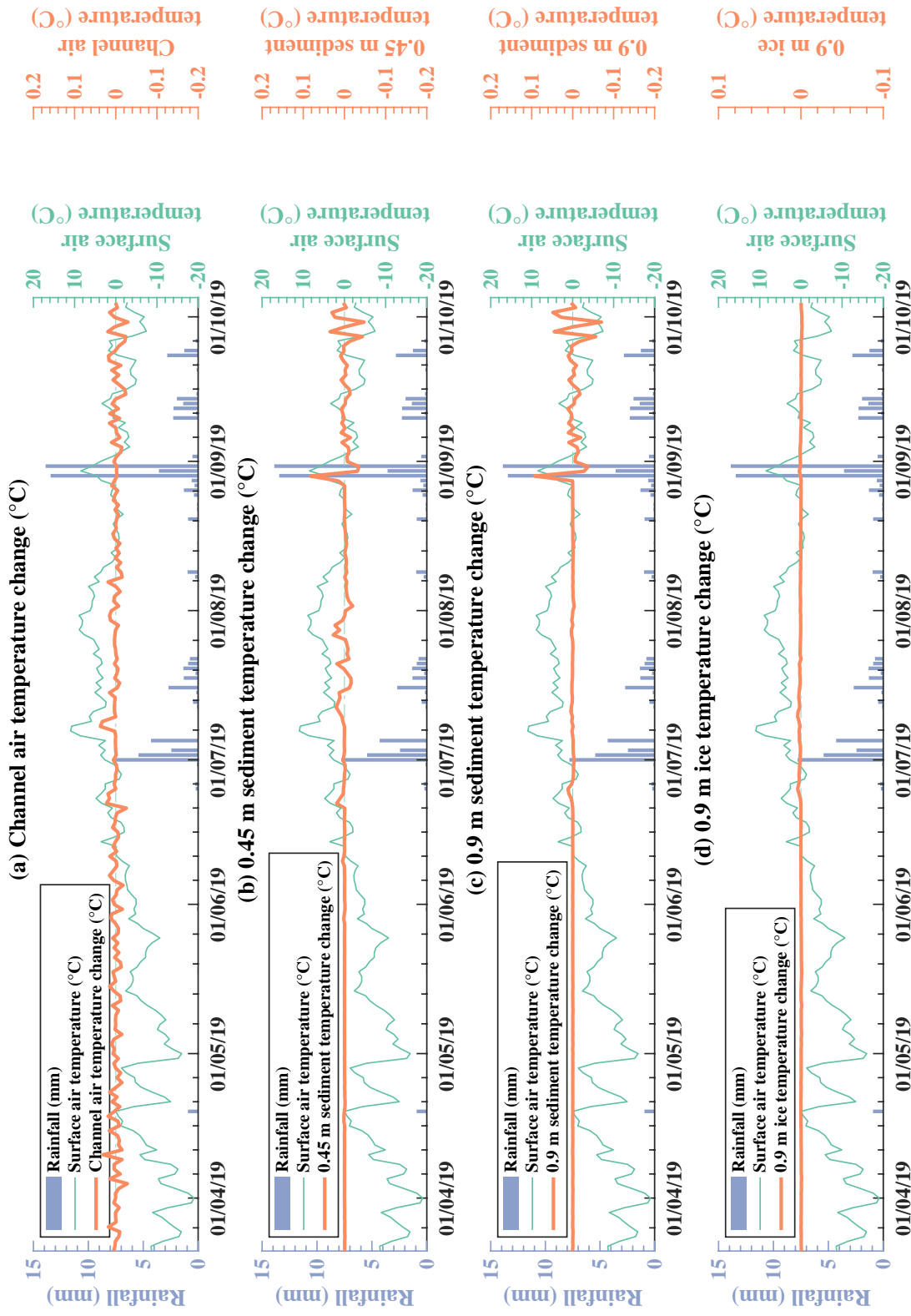


Figure S5. Daily subglacial temperature changes compared to modelled weather conditions at Tellbreen 'Subglacial 2' in 2019. a) Time series of subglacial channel air temperature change, modelled surface air temperatures and modelled rainfall. b) Time series of subglacial 0.45 m sediment temperature change, modelled surface air temperature and modelled rainfall. c) Time series of subglacial 0.9 m sediment temperature change, modelled surface air temperature and modelled rainfall. d) Time series of subglacial ice temperature change, modelled surface air temperature and modelled rainfall.

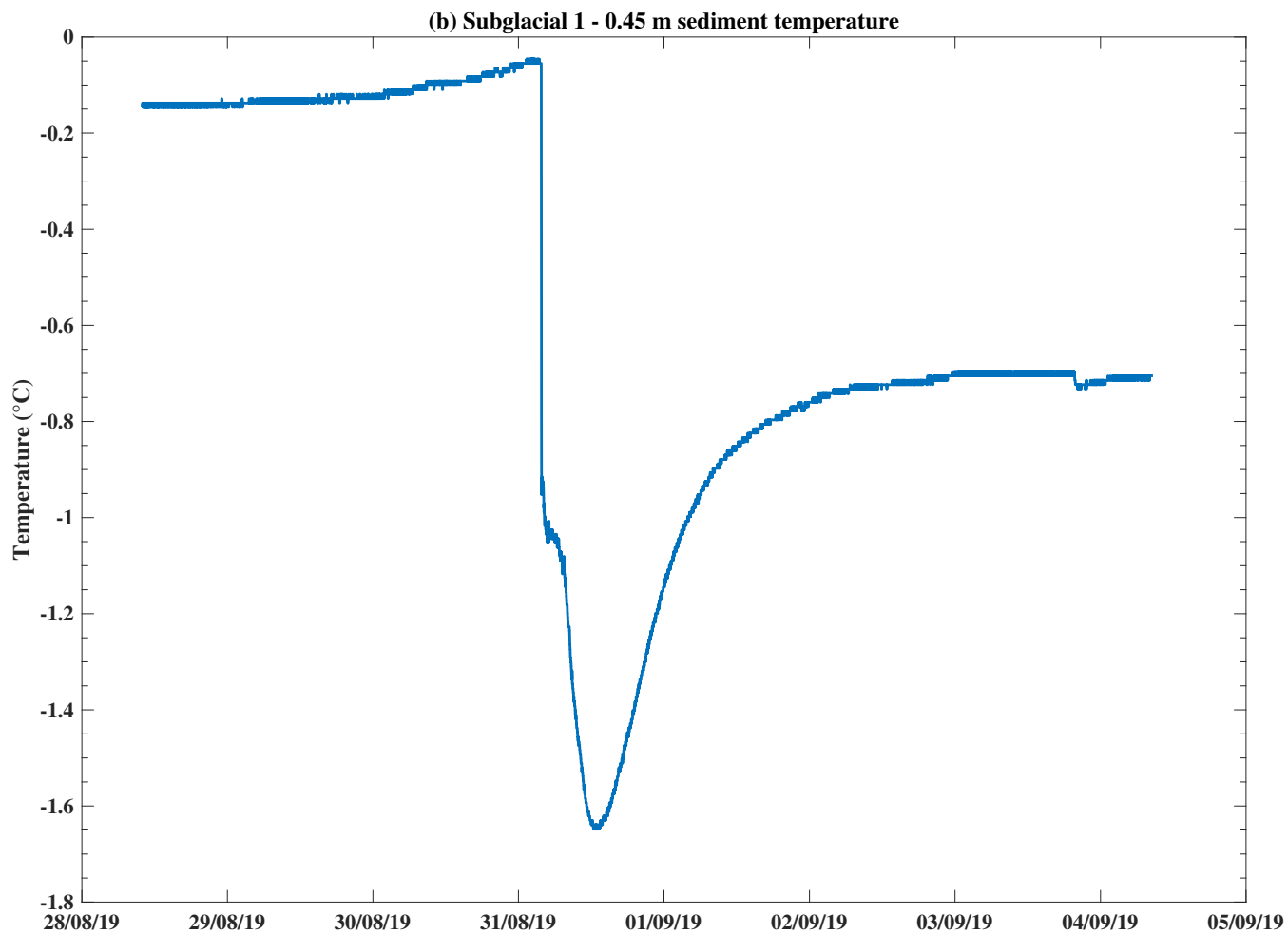


Figure S6. Excerpt of the 0.45 m sediment temperature at logger 'Subglacial 1' at Tellbreen in 2019. Temperature is shown in one minute resolution between 28.09.2019 and 05.09.2019.