Supplementary file to

Recent Ice sheet surface warming events over coastal Dronning Maud land, East Antarctica: Causes and Implications

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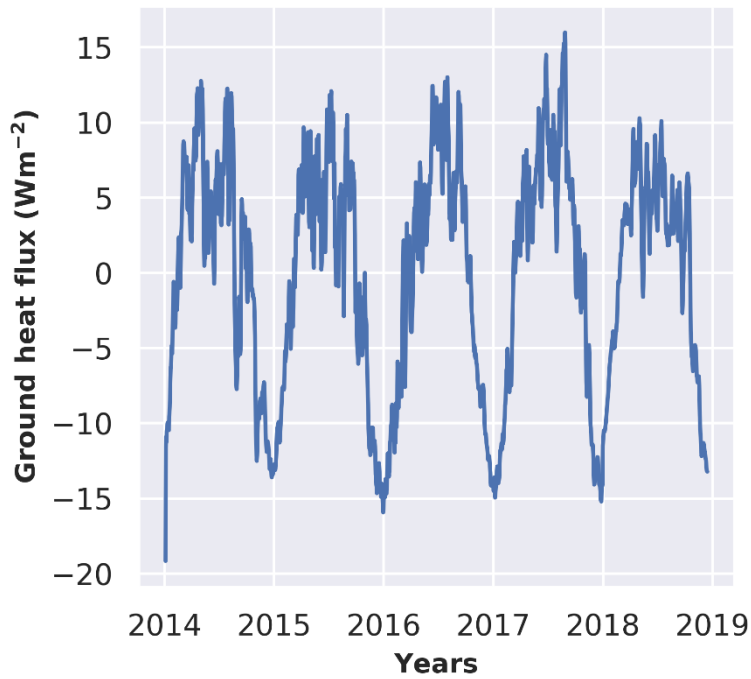
Figure 1s: Ground heat flux calculated from borehole thermistor measurements. The method is explained in Sect 2.4
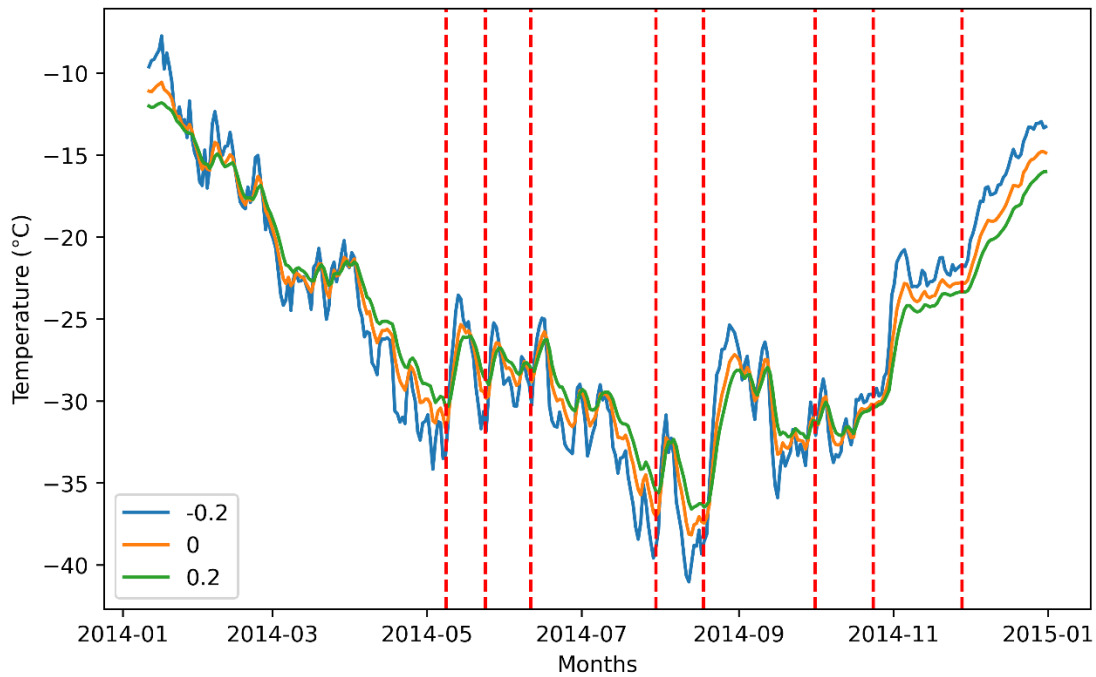
Figure 2s: The daily average time series of temperature measured at the borehole surface (after considering burial), 20 cm height (labeled as -0.2) and 20 cm depth (labeled as 0.2) for 2014. Dashed lines show the onset of ISSW events. All the 3 depths have synchronous fluctuations, but the magnitude is different.
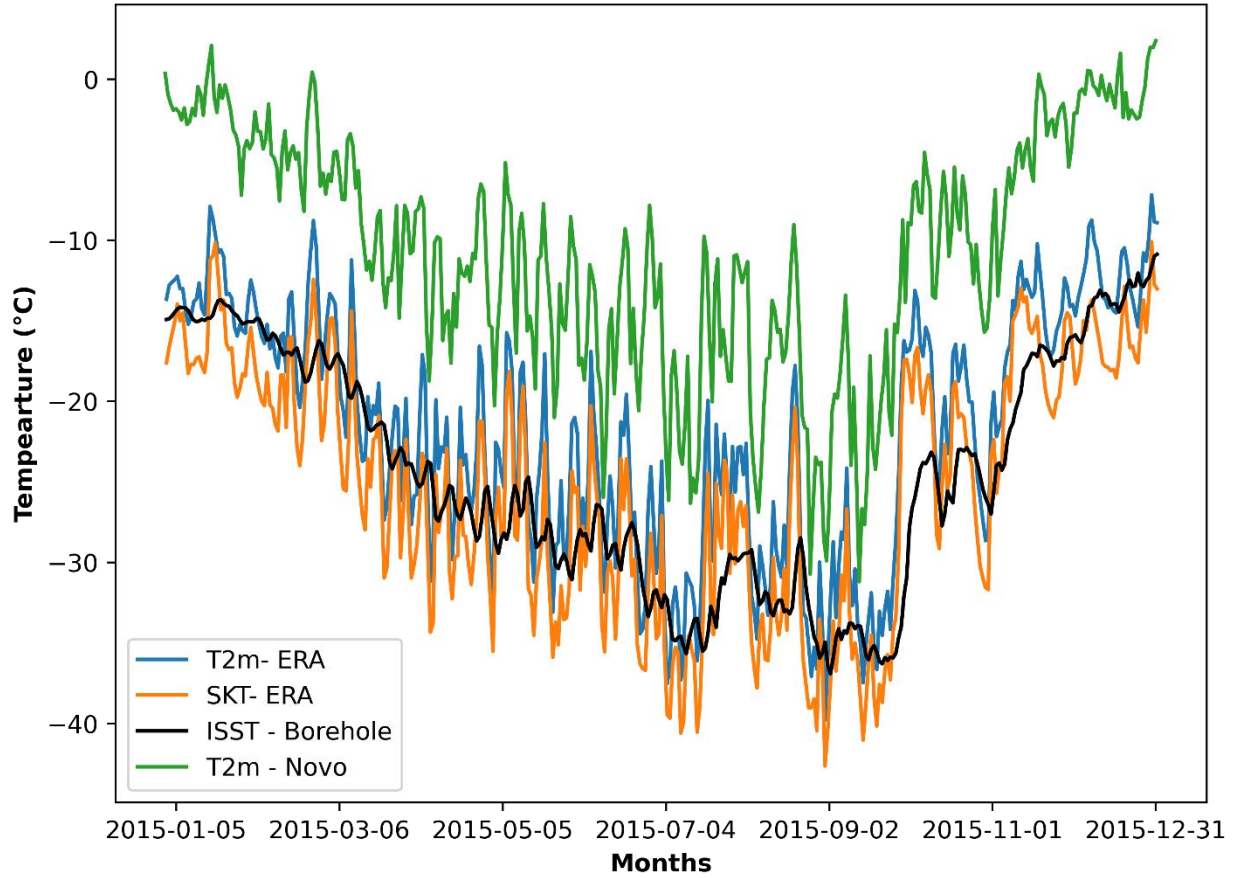
Figure 3s: The comparison of daily variability of borehole surface temperature (ISST - Borehole), 2 m temperature (T2m - ERA) and skin temperature (SKT - ERA) of ERA 5 dataset retrieved from a grid point near to borehole location and Novolazarskaya station observation of 2m air temperature (T2m - Novo) for the year 2015. The station data for Novolazarskaya is available on ftp://ftp.bas.ac.uk/src/ANTARCTIC_METEOROLOGICAL_DATA/GTS_DATA/SURFACE/ (Turner et al., 2004).
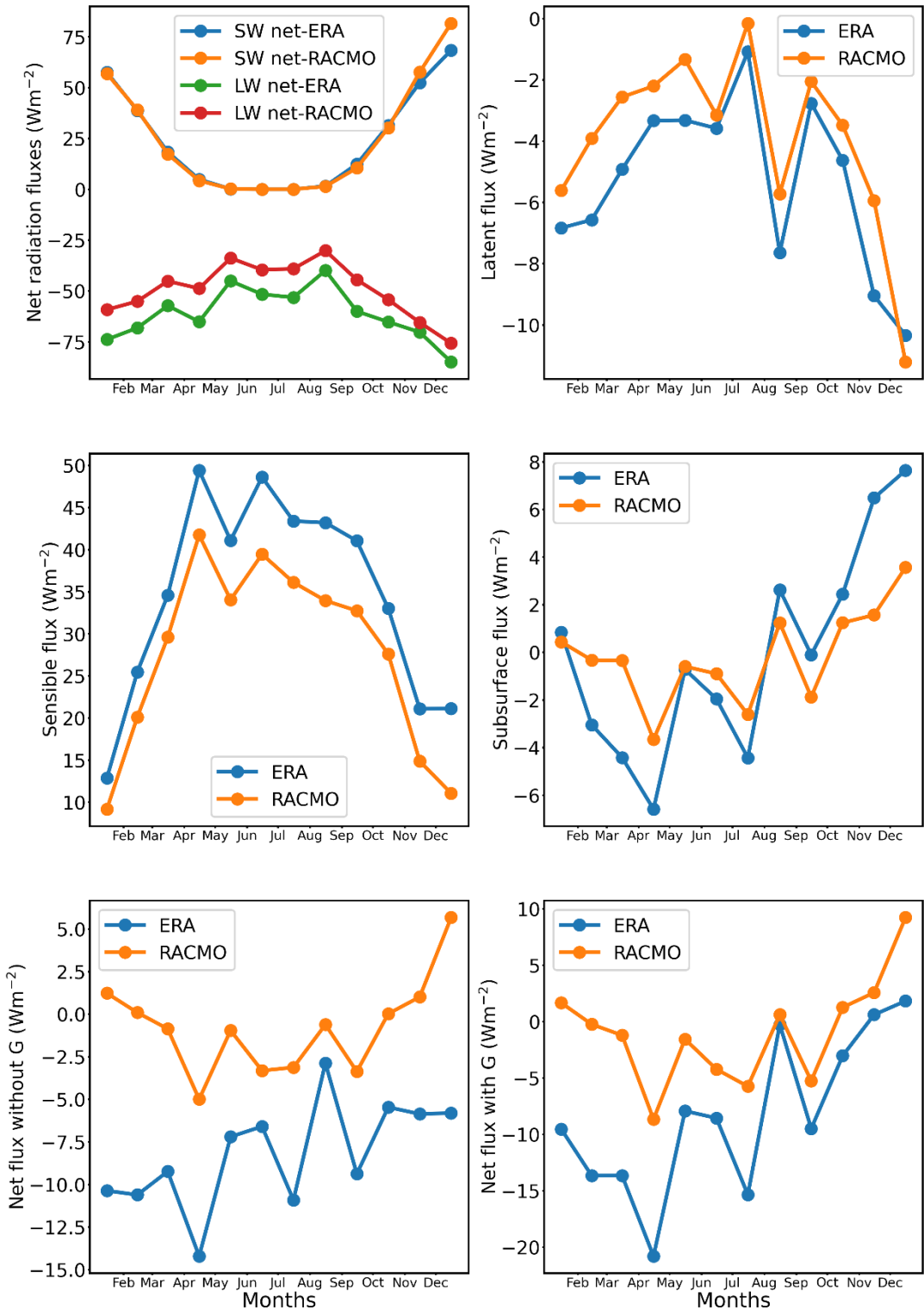
Figure 4s: The comparison of monthly timeseries of Surface Energy Balance parameters (Net longwave (LW net), Net Shortwave (SW net), latent heat flux (LHF), sensible heat flux (SHF), subsurface heat flux (G), net heat flux without G = SWnet+LWnet+SHF+LHF and net heat flux with G = SWnet+LWnet+SHF+LHF+G) from ERA 5 and RACMO data retrieved for a location near to borehole for the year 2015. Subsurface flux for ERA5 is calculated from borehole thermistor

measurements. The beginning of each month is labelled in x axis and the dots represent monthly averaged values of each month. The RACMO model output is available on (DOI 10.5281/zenodo.7760490, (van Wessem et al., 2023)).
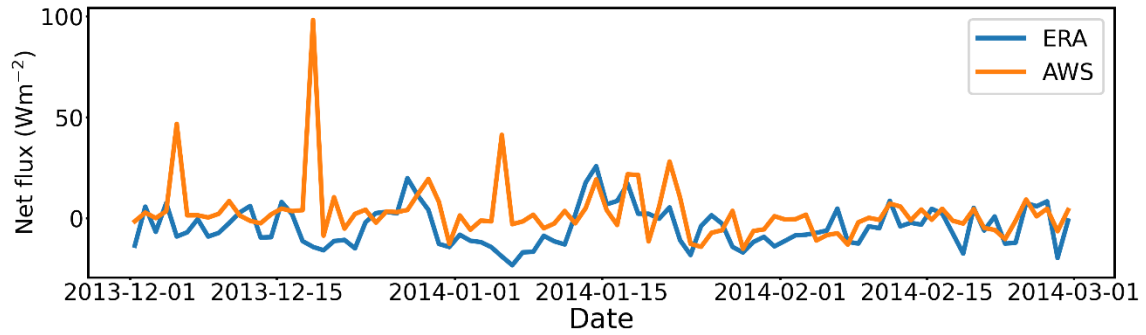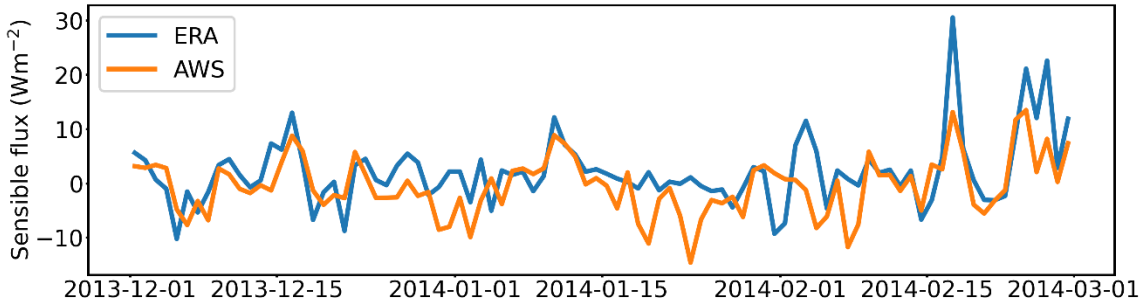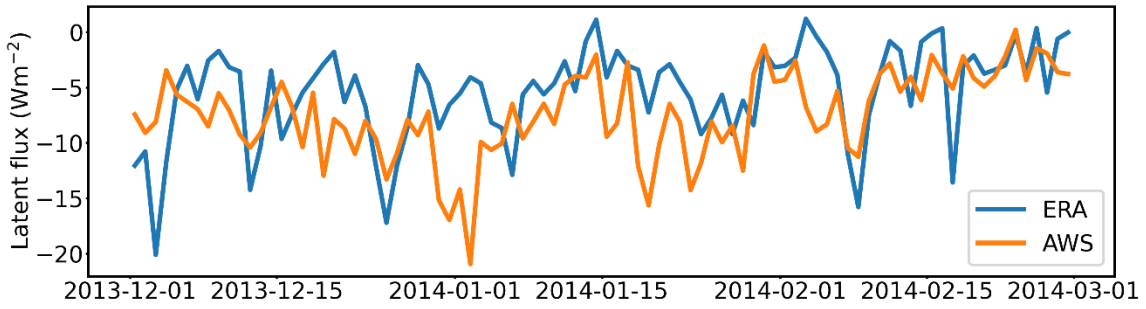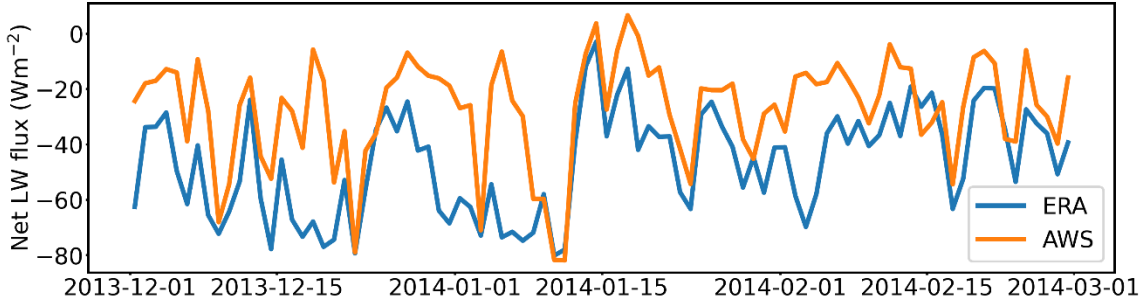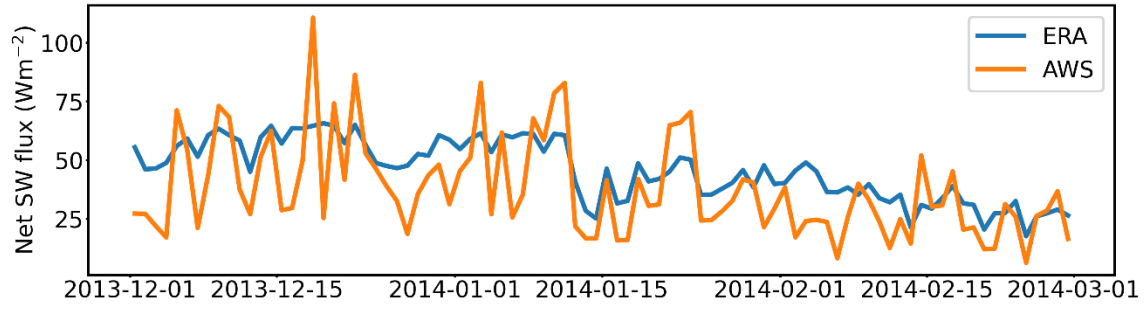
Figure 5s: The comparison of daily average time series of Surface Energy Balance parameters of an AWS situated in Larsen C Ice Shelf and and ERA 5 from a nearby grid point for the summer of 2013. The panels are in order from top Net longwave (LW net), Net Shortwave (SW net), latent heat flux (LHF), sensible heat flux (SHF) and net heat flux. The AWS data for fluxes used here is available on https://doi.org/10.1594/PANGAEA.910471, (Jakobs et al., 2020)
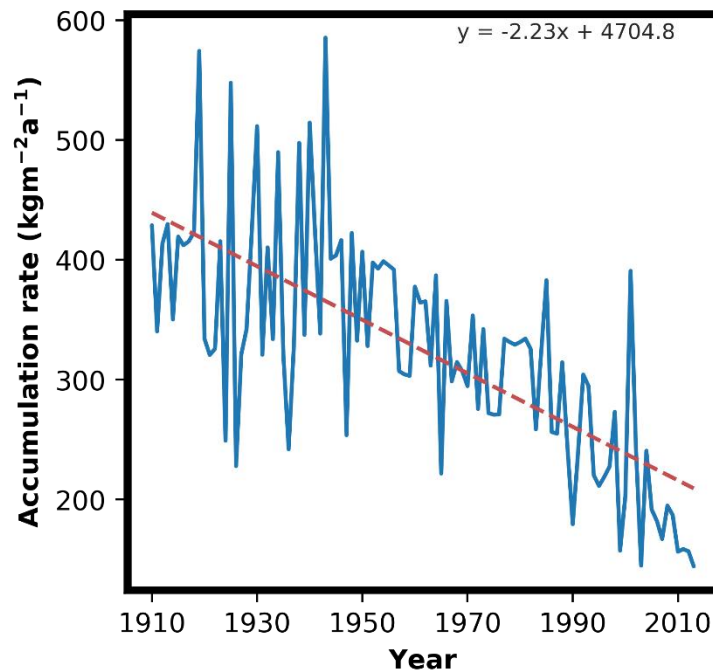
Figure 6s: Reconstructed accumulation rate from density measurements of IND33 core for 1910-2013 (Ejaz et al., 2021). The red line indicates the trend line for the period and the trend line equation is shown in the upper right corner. The line has a slope of -2.23 and an intercept of 4704.8.

References

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