S1 Additional Figures

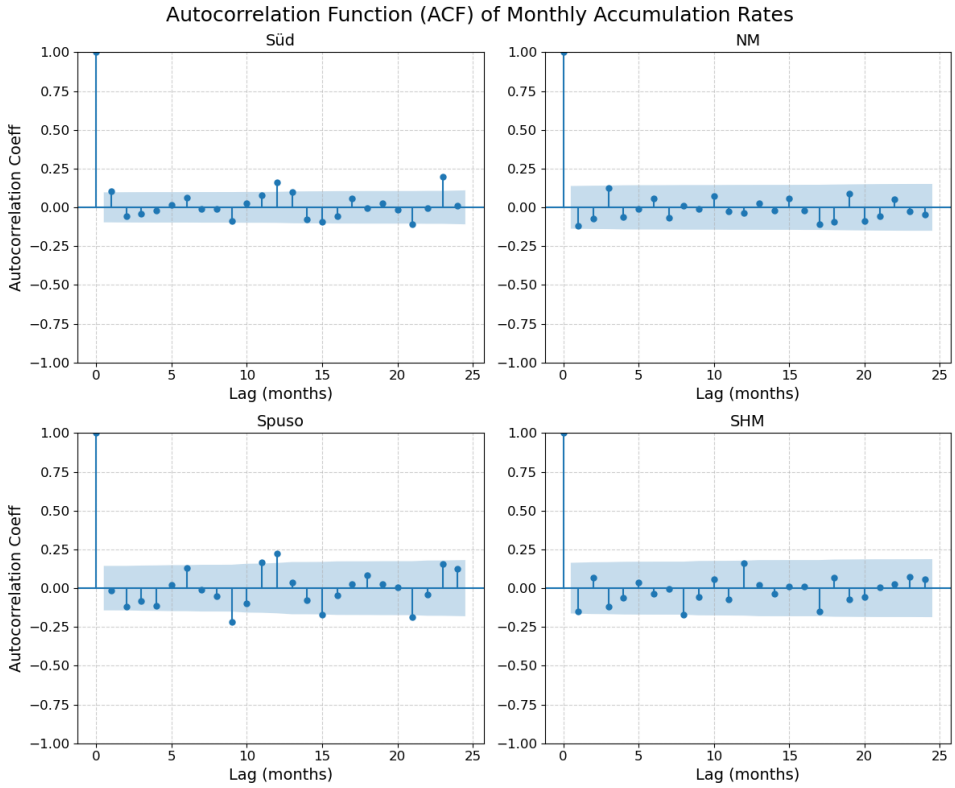

Figure S1: Autocorrelation function (ACF) of monthly snow accumulation rates at four measurement sites (Süd, NM, Spuso, SHM) over their respective full observation period

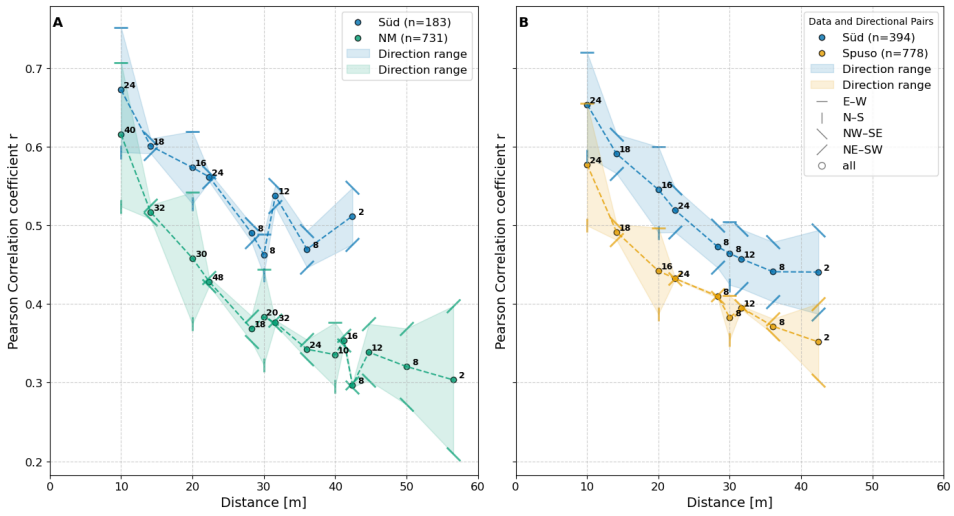

Figure S2: Variograms of correlations in snow accumulation (without resampling to the monthly time axis) between stake pairs as a function of distance for the stake farms NM (weekly measurements), Süd (biweekly to monthly measurements), and Spuso (weekly measurements). A: comparison between Süd and NM for 1995–2008. B: comparison between Süd and Spuso for 2010–2024. Markers indicate the orientation of stake pairs (e.g., − :E–W or / : NE–SW), and shaded areas represent the range between individual orientation correlation coefficients. Numbers next to data points indicate the number of stake pair combinations (n) contributing to each mean correlation coefficient. Abbreviations: N–north, S–south, W–west, E–east

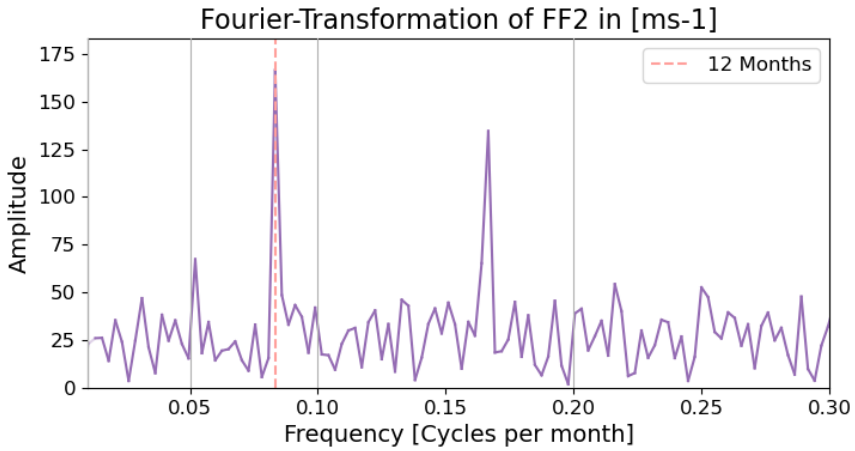

Figure S3: Fourier analysis of 2m wind speed. The dashed line marks the period with the maximum amplitude. Only periods shorter than the cut-off (1/4 of the record length, here: 96 months) were considered.

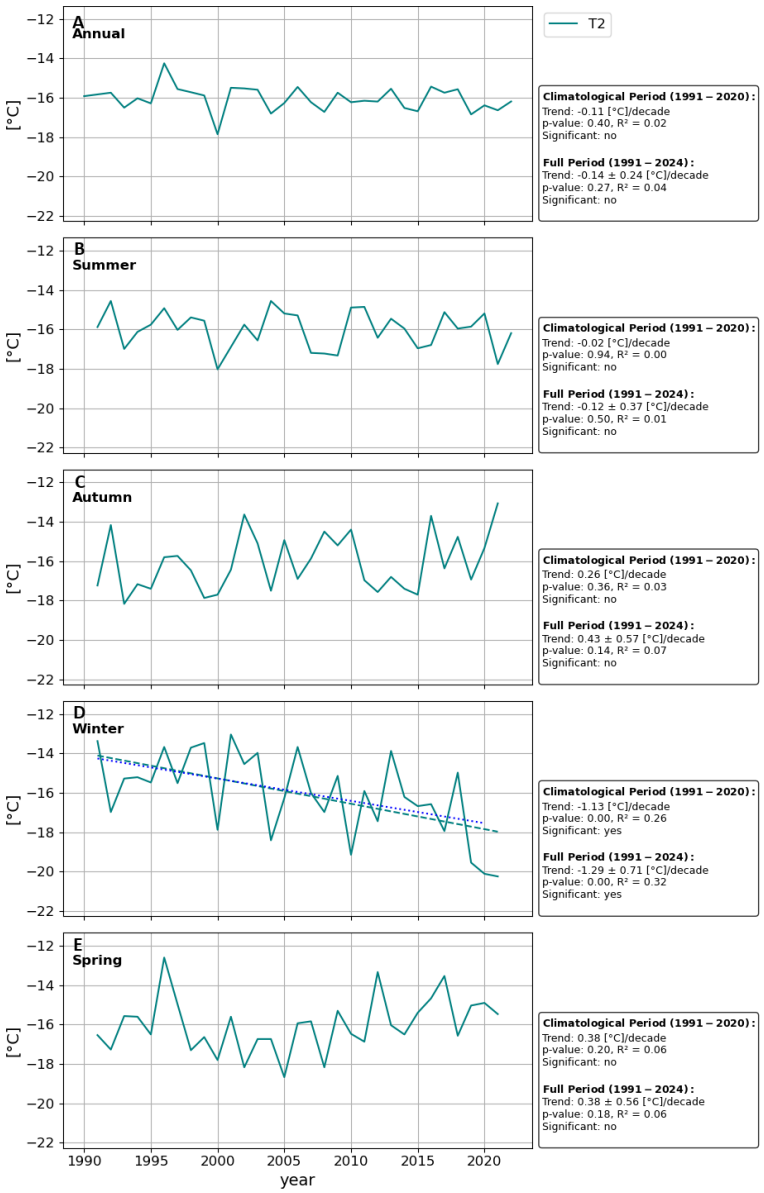

Figure S4: Time series of deseasonalized monthly mean 2 m temperature (in °C) at Neumayer (1991–2021), obtained by subtracting the mean seasonal cycle from the monthly means, shown in green. Panels represent (A) annual averages and (B–E) seasonal averages: (B) summer (DJF), (C) autumn (MAM), (D) winter (JJA), and (E) spring (SON). If a significant linear trend ($p < 0.05$) is detected in the temperature time series, it is shown as a dashed line.

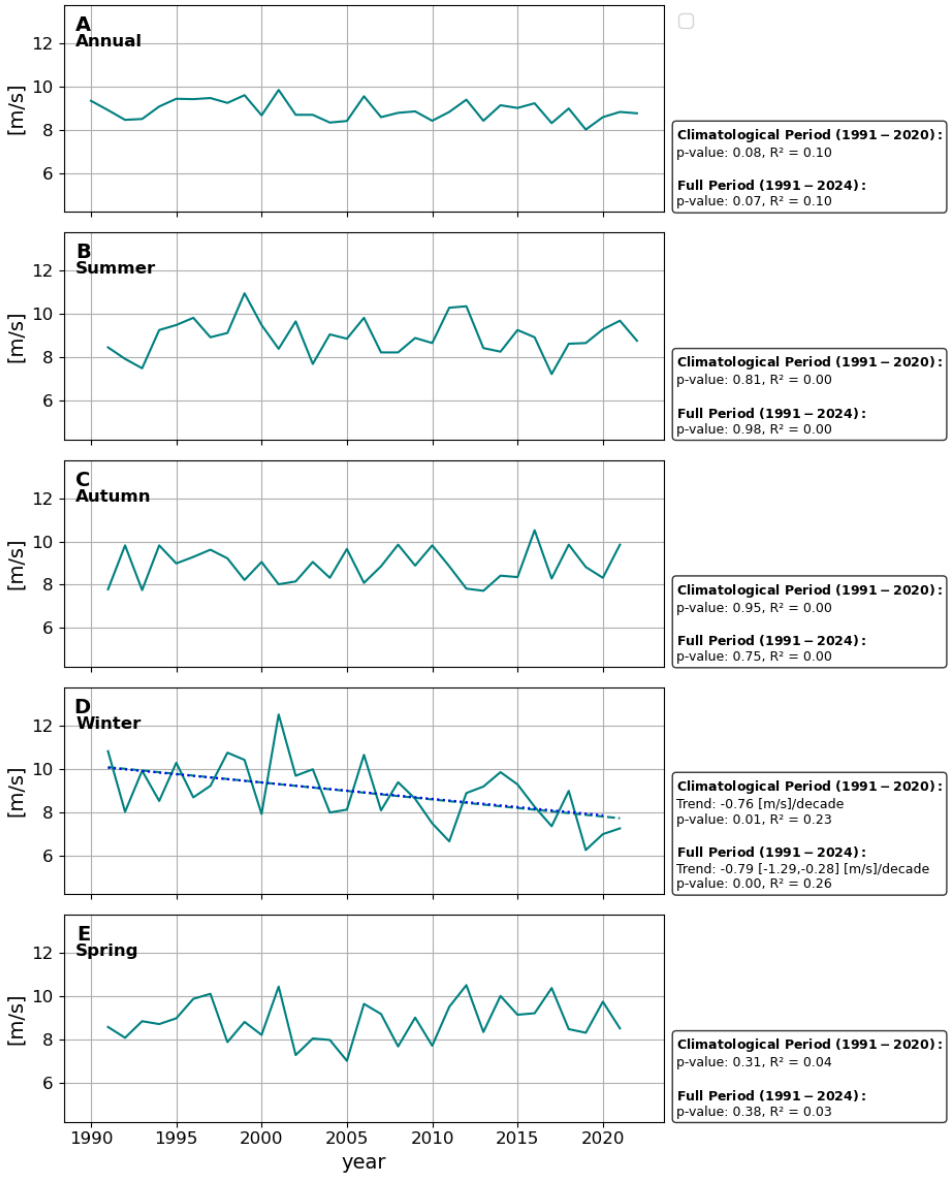

Figure S5: Time series of deseasonalized monthly mean 10 m wind speed (in m s^{-1}) at Neumayer (1991–2021), obtained by subtracting the mean seasonal cycle from the monthly means, shown in green. Panels represent (A) annual averages and (B–E) seasonal averages: (B) summer (DJF), (C) autumn (MAM), (D) winter (JJA), and (E) spring (SON). If a significant linear trend ($p < 0.05$) is detected in the 33-year wind speed time series, it is shown as a dashed line.

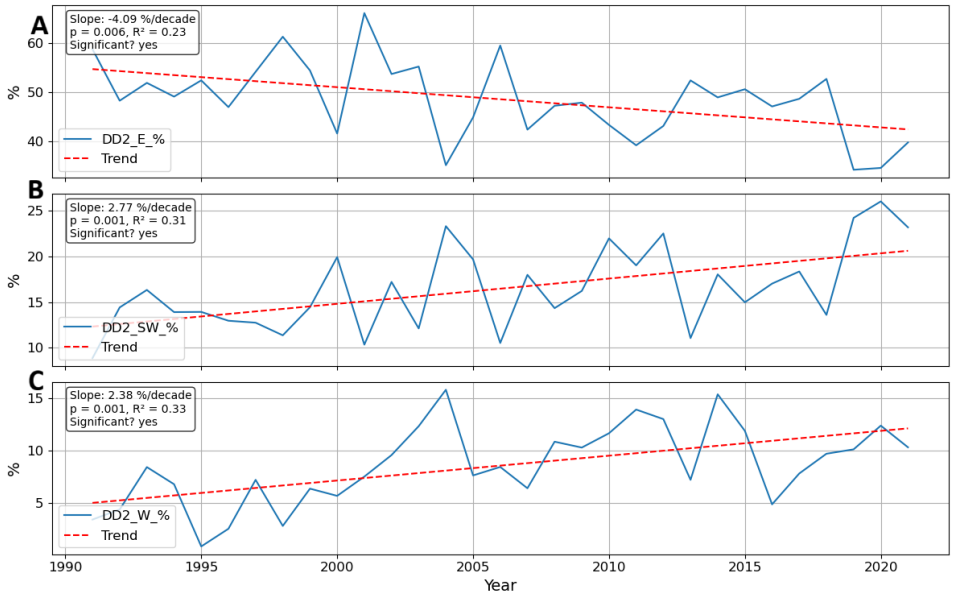

Figure S6: Relative frequency of 2 m wind directions for easterlies (A), southwesterlies (B), and westerlies (C), expressed as the percentage of hours per month during which the respective wind direction occurred. Shown are winter months only.

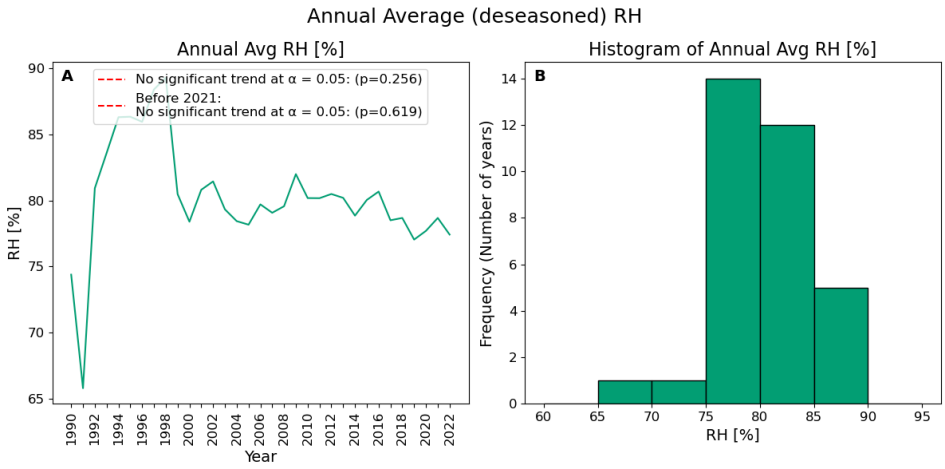

Figure S7: A: Deseasonalized annual mean relative humidity (RH), obtained by subtracting the mean seasonal cycle from the monthly means, in %. B: Histogram of deseasonalized annual mean relative humidity.

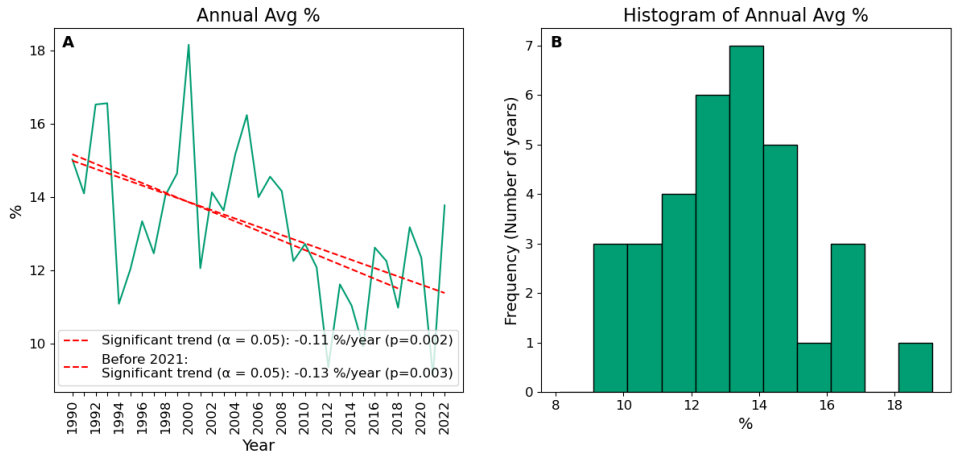

Figure S8: A: Deseasonalized annual mean percentage of southerly wind direction, obtained by subtracting the mean seasonal cycle from the monthly means, in %. B: Histogram of deseasonalized annual mean percentage of southerly wind direction.

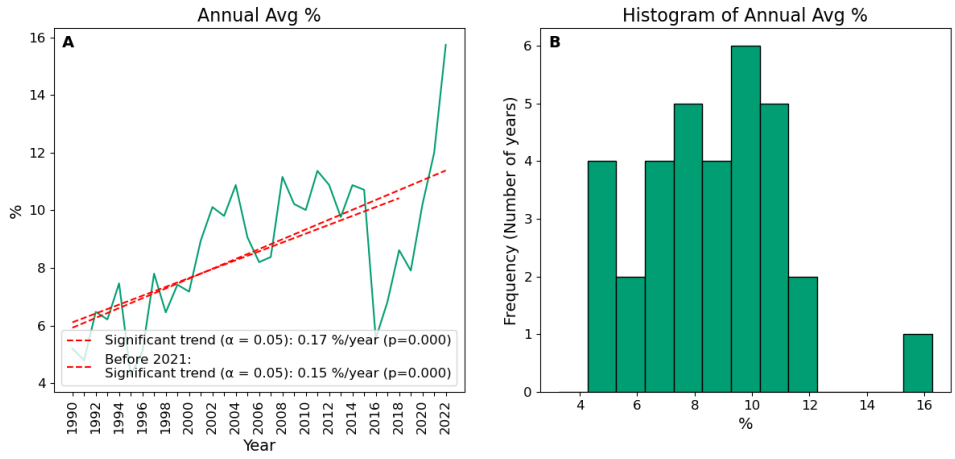

Figure S9: A: Deseasonalized annual mean percentage of westerly wind direction, obtained by subtracting the mean seasonal cycle from the monthly means, in %. B: Histogram of deseasonalized annual mean percentage of westerly wind direction.