atmosphere

MDPI

Supplementary Materials

A model-based climatology of low-level jets in the Antarctic

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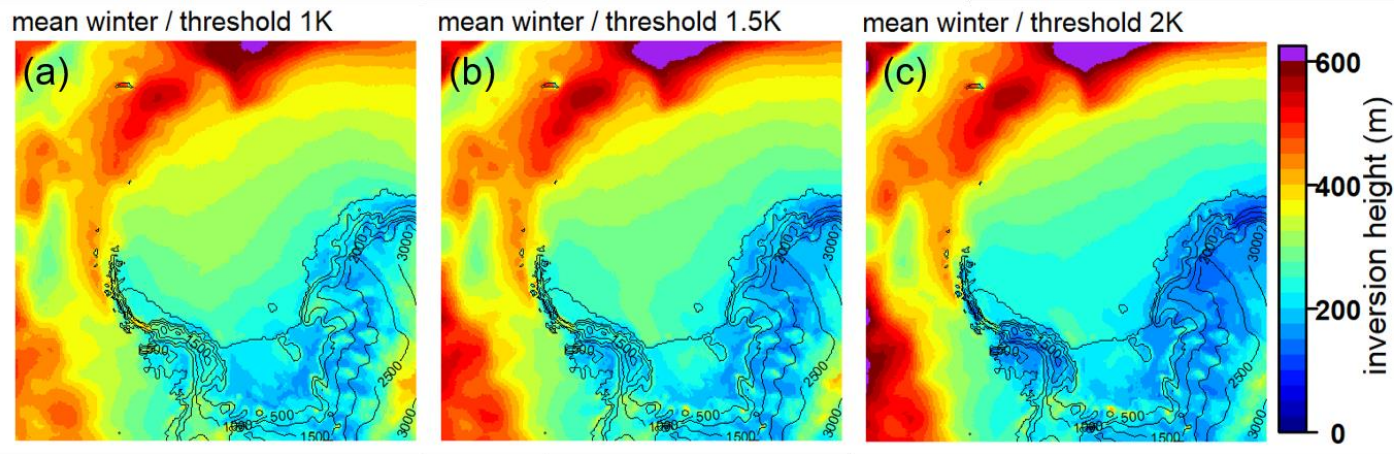

Figure S1. Mean inversion height during winter (April-Sept.) for 2002-2016 for different thresholds of the gradient of the potential temperature (1.0, 1.5 and 2.0 K/100m).

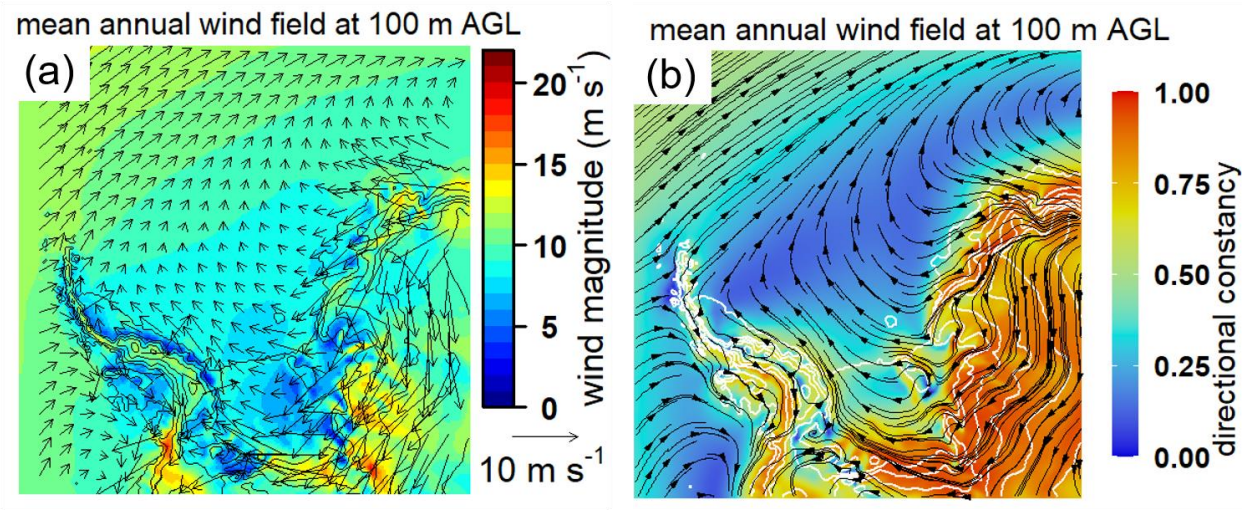

Figure S2. Mean wind field for 2002-2016 at 100 m. (a) mean wind vector (at every 10th grid point) and wind speed, (b) directional constancy with streamlines. Topography is shown as black and white isolines every 500 m in (a) and (b), respectively.

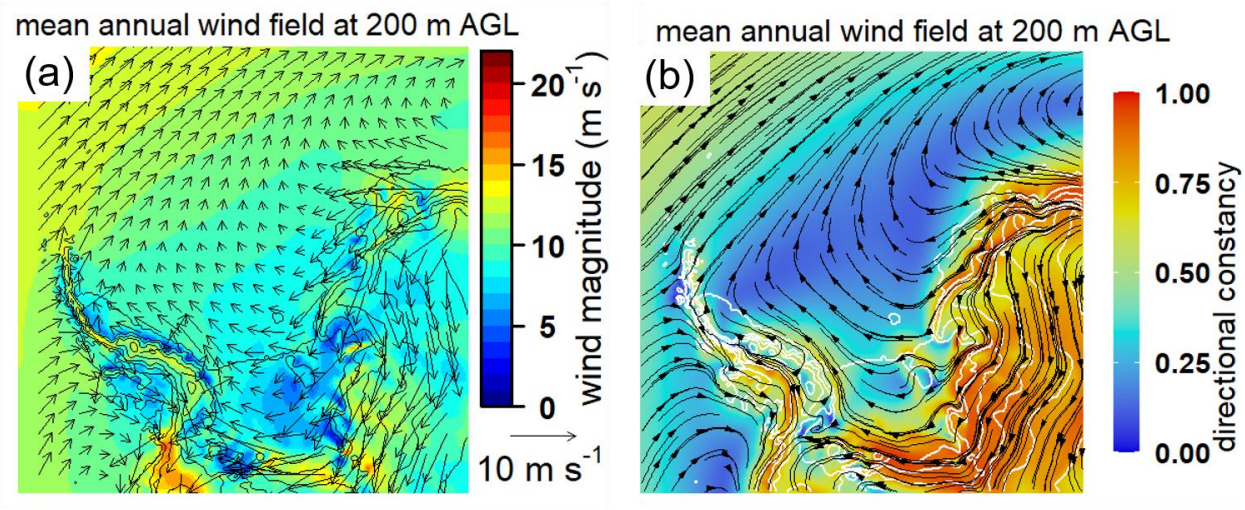

Figure S3. Mean wind field for 2002-2016 at 200 m. (a) mean wind vector (at every 10th grid point) and wind speed, (b) directional constancy with streamlines. Topography is shown as black and white isolines every 500 m in (a) and (b), respectively.

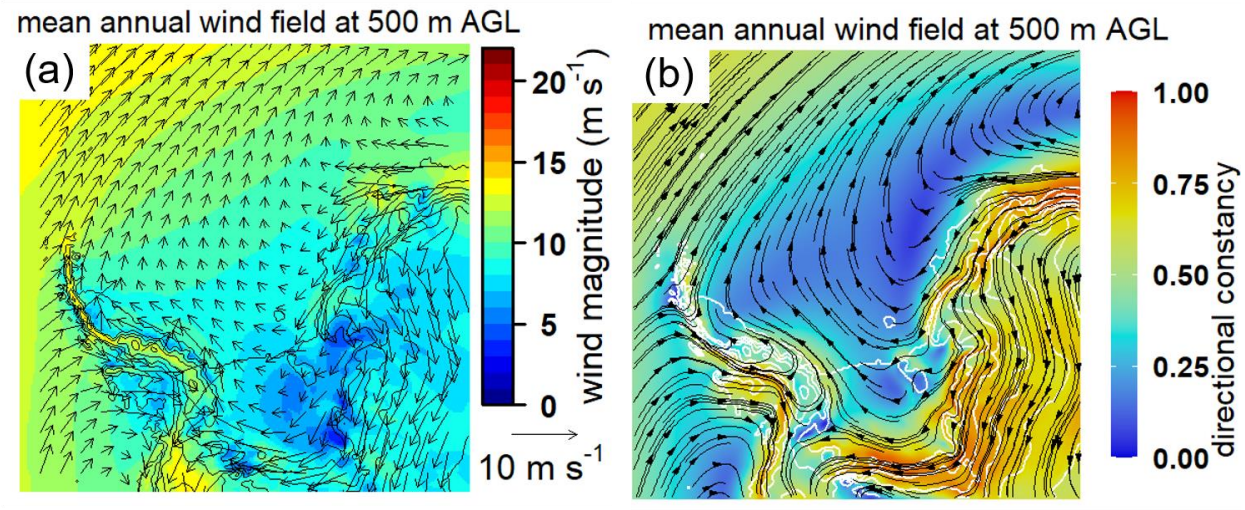

Figure S4. Mean wind field for 2002-2016 at 500 m. (a) mean wind vector (at every 10th grid point) and wind speed, (b) directional constancy with streamlines. Topography is shown as black and white isolines every 500 m in (a) and (b), respectively.

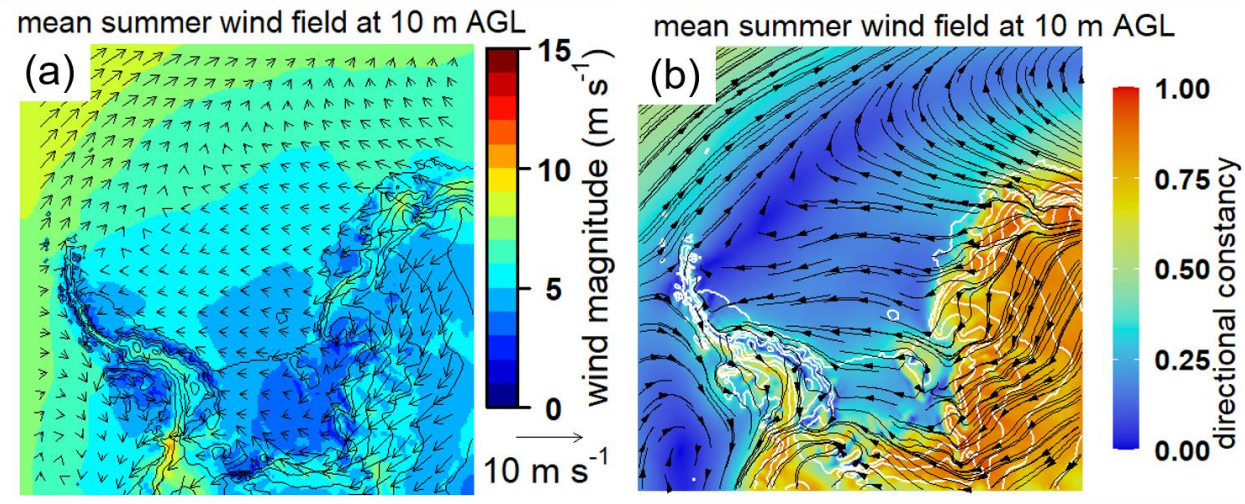

Figure S5. Mean wind field for 2002-2016 at 10 m for summer (Dec.-Jan.). (a) mean wind vector (at every 10th grid point) and wind speed, (b) directional constancy with streamlines. Topography is shown as black and white isolines every 500 m in (a) and (b), respectively.

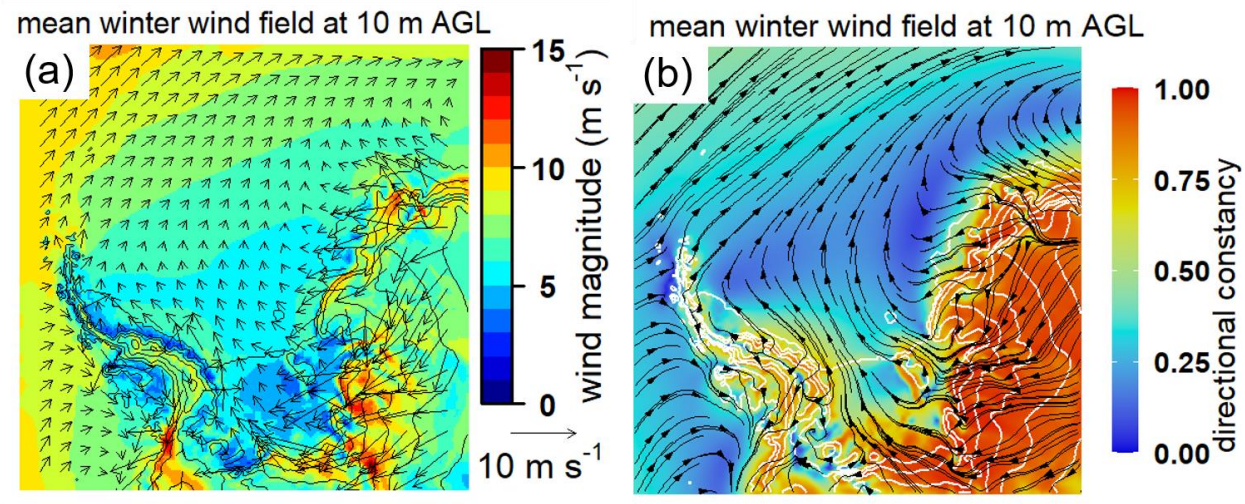

Figure S6. Mean wind field for 2002-2016 at 10 m for winter (Apr.-Sept.). (a) mean wind vector (at every 10th grid point) and wind speed, (b) directional constancy with streamlines. Topography is shown as black and white isolines every 500 m in (a) and (b), respectively.

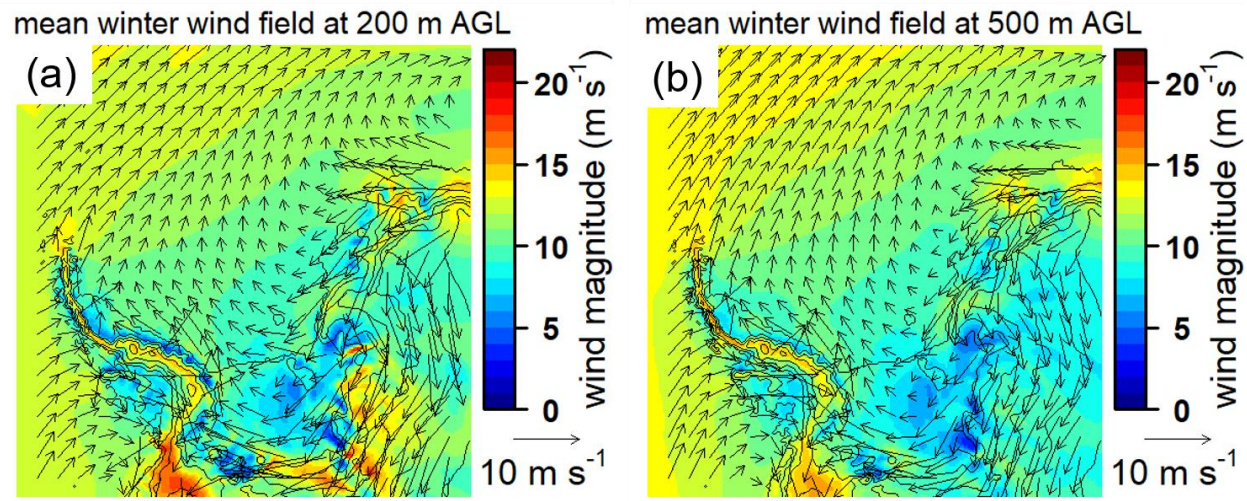

Figure S7. Mean wind field for 2002-2016 for winter (Apr.-Sept.) Mean wind vector (at every 10th grid point) and wind speed at at 200 m (a) and 500 m (b). Topography is shown as black isolines every 500 m.

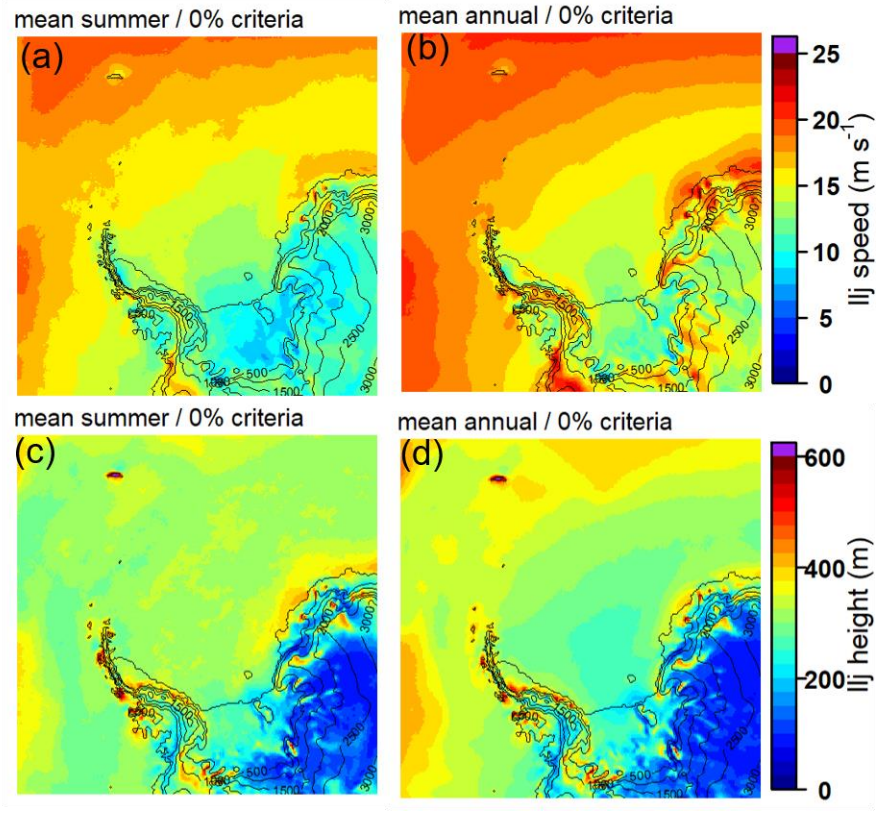

Figure S8. Mean LLJ wind speed for summer (a) and the whole year (b), and LLJ height for summer (c) and the whole year (d).

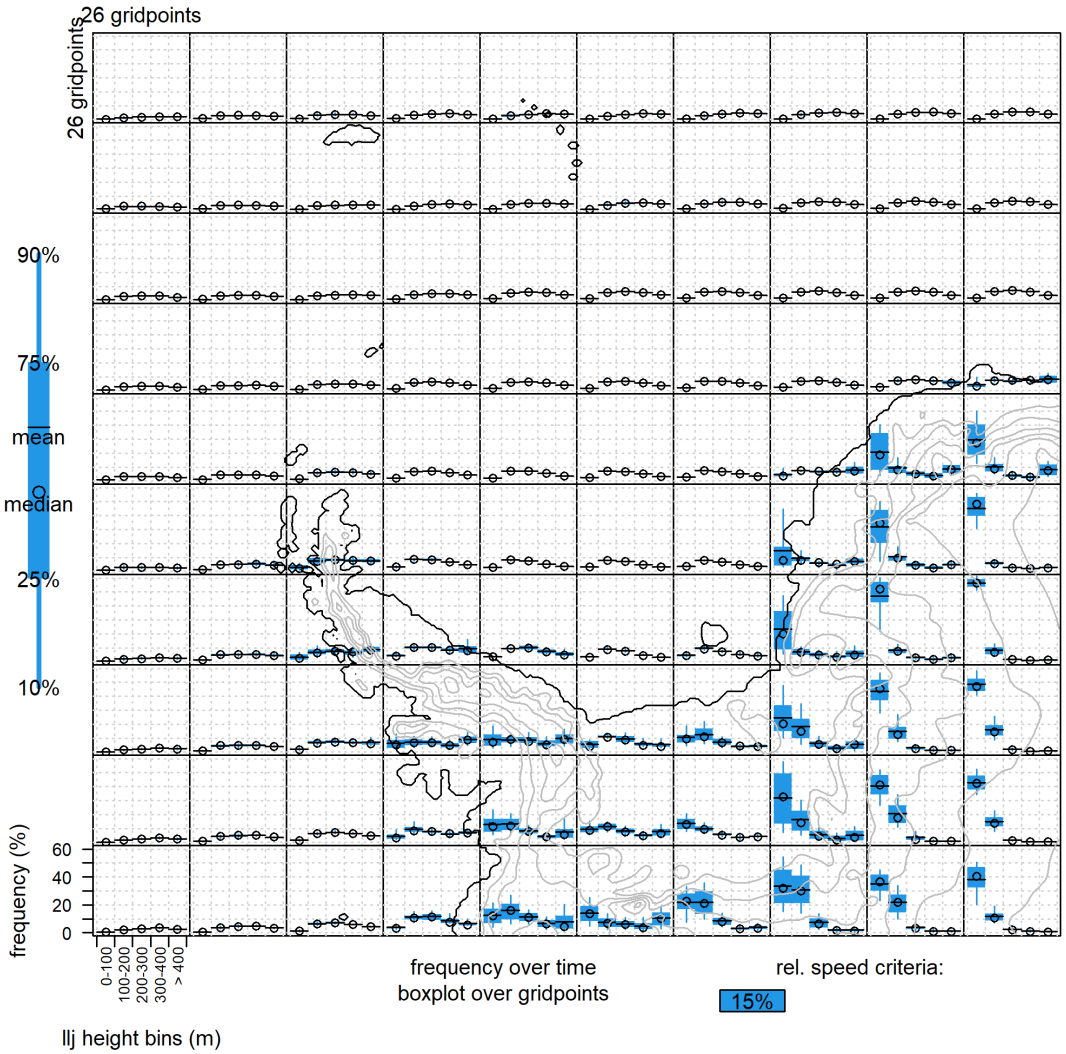

Figure S9. Distribution of LLJ wind speed the whole year for different regions (boxes with 26x26 grid points). The box-whisker plots show the mean, median and percentiles within the grid box.

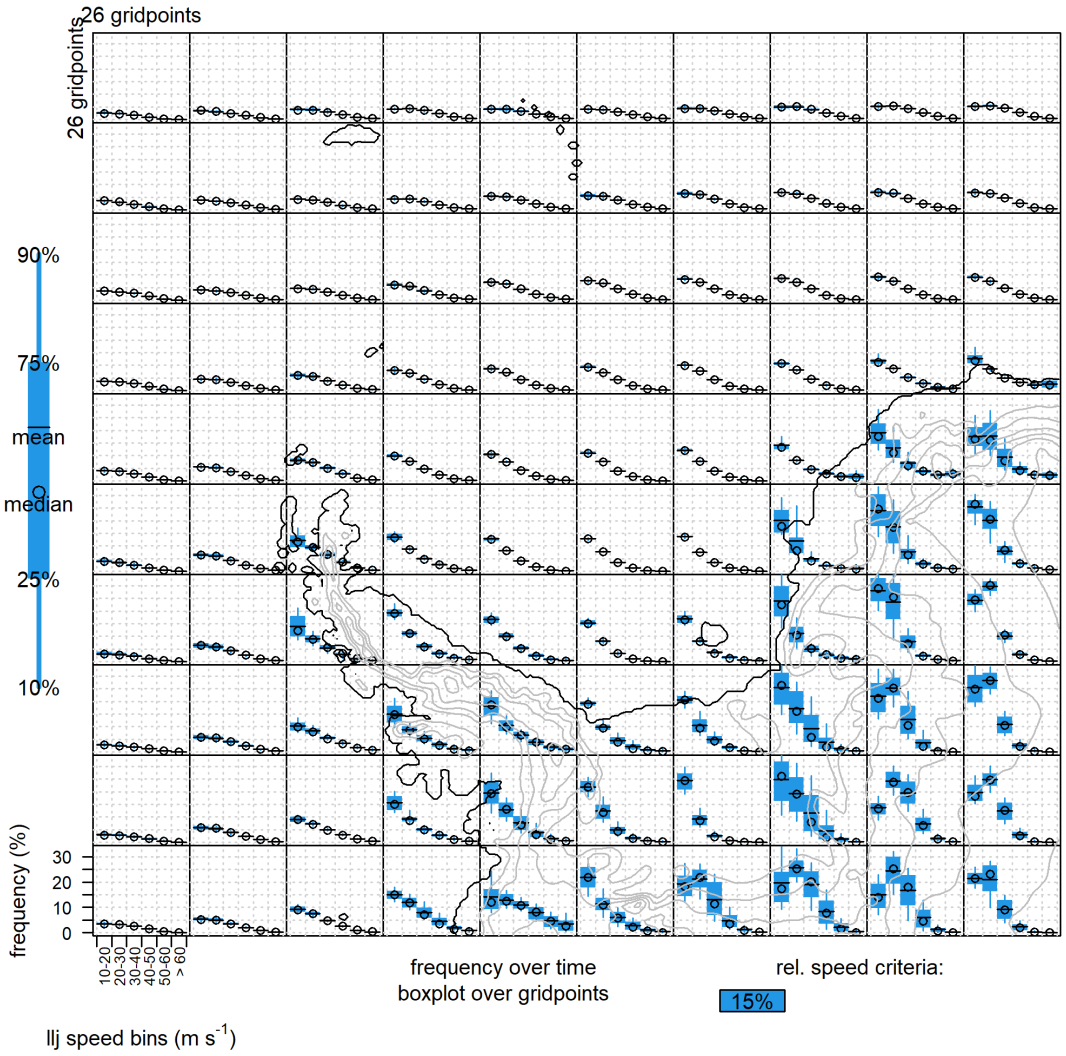

Figure S10. Distribution of LLJ wind height the whole year for different regions (boxes with 26x26 grid points). The box-whisker plots show the mean, median and percentiles within the grid box.

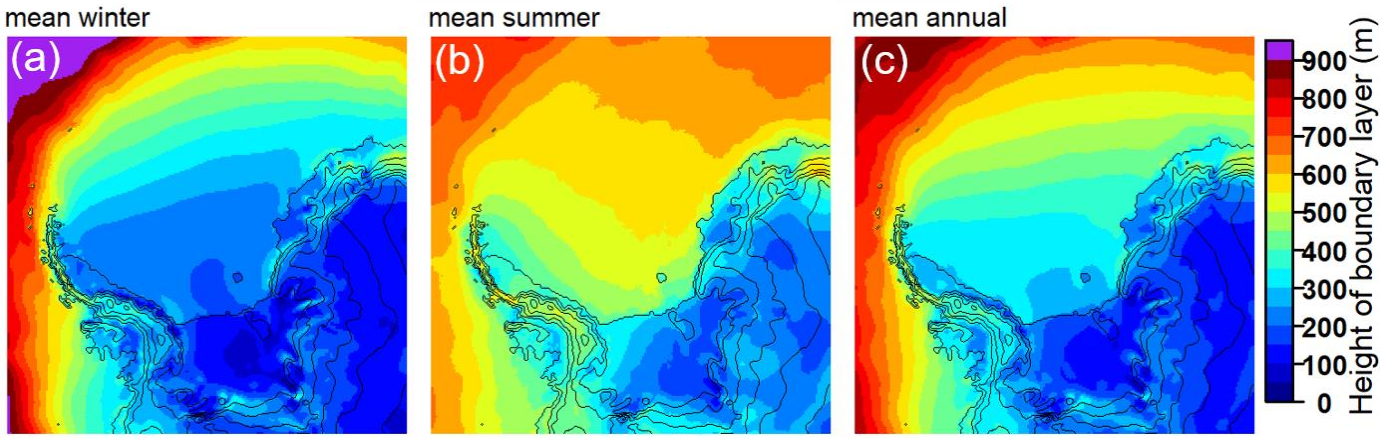

Figure S11. Height of the boundary layer as computed by CCLM for (a) winter, (b) summer and (c) the whole year 2002-2016.

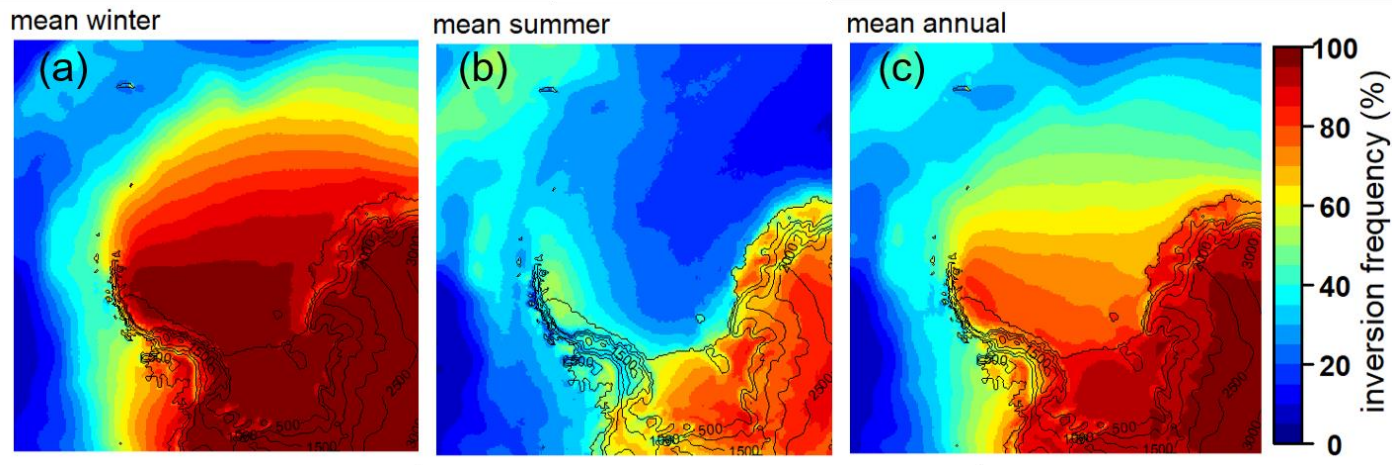

Figure S12. Inversion frequency for (a) winter, (b) summer and (c) the whole year 2002-2016.

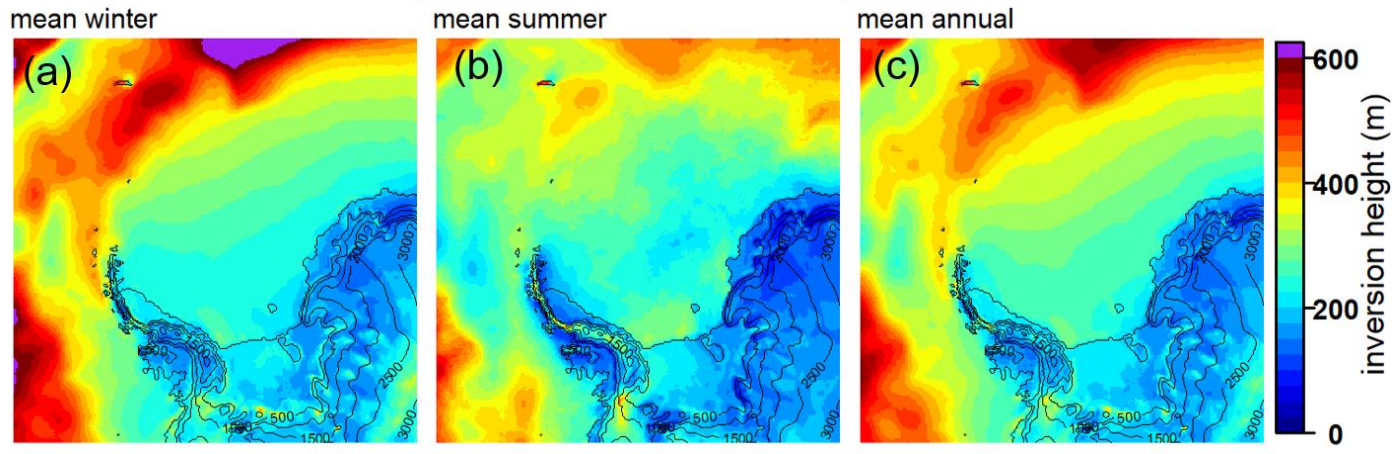

Figure S13. Inversion height for (a) winter, (b) summer and (c) the whole year 2002-2016.

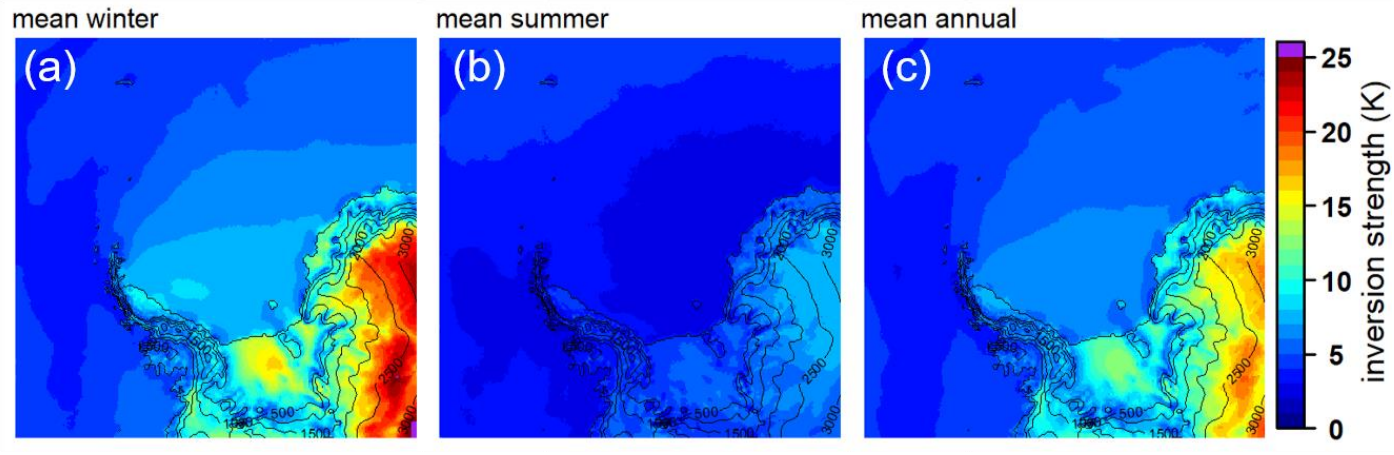

Figure S14. Inversion strength for (a) winter, (b) summer and (c) the whole year 2002-2016.

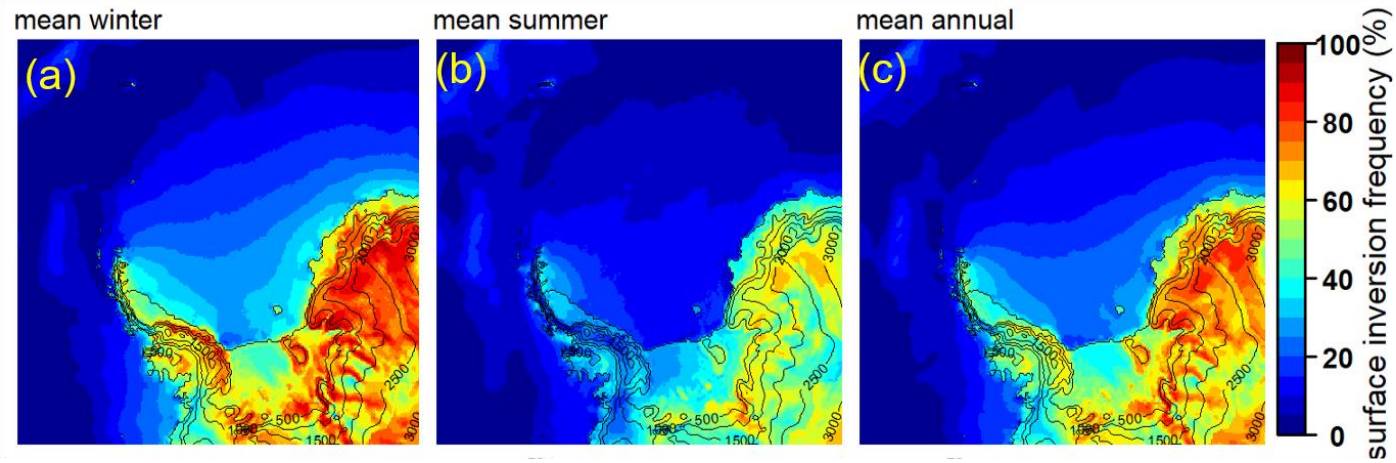

Figure S15. Frequency of surface inversions for (a) winter, (b) summer and (c) the whole year 2002-2016.

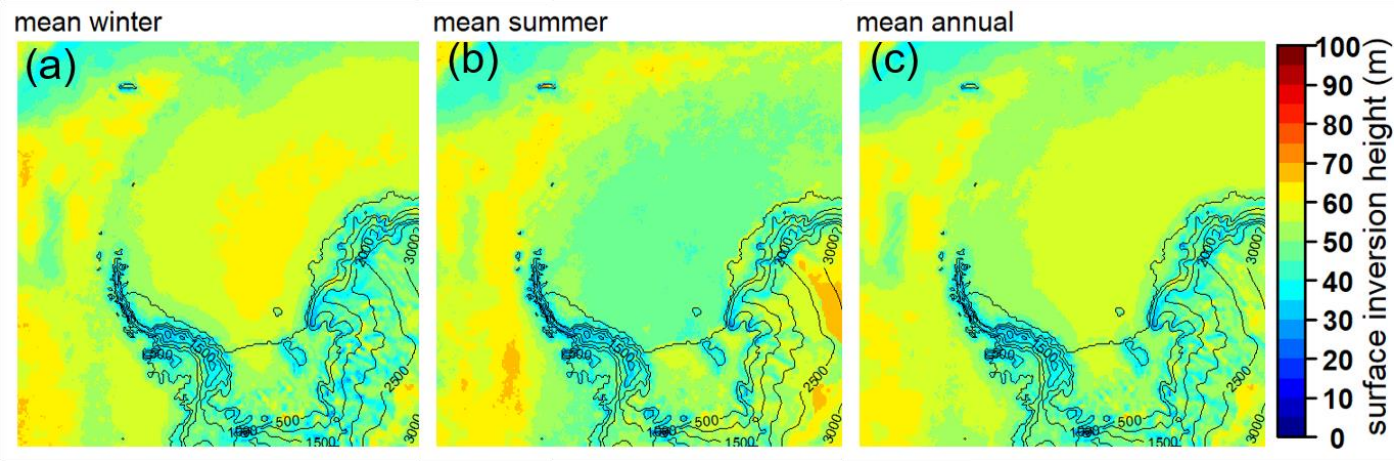

Figure S16. Height of surface inversions for (a) winter, (b) summer and (c) the whole year 2002-2016.

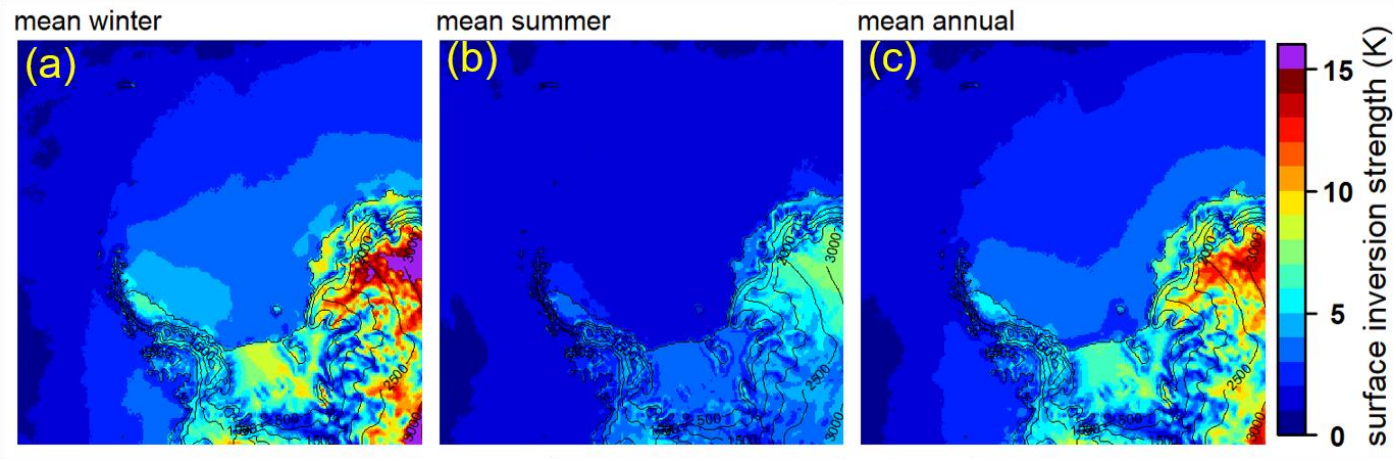

Figure S17. Strength of surface inversions for (a) winter, (b) summer and (c) the whole year 2002-2016.

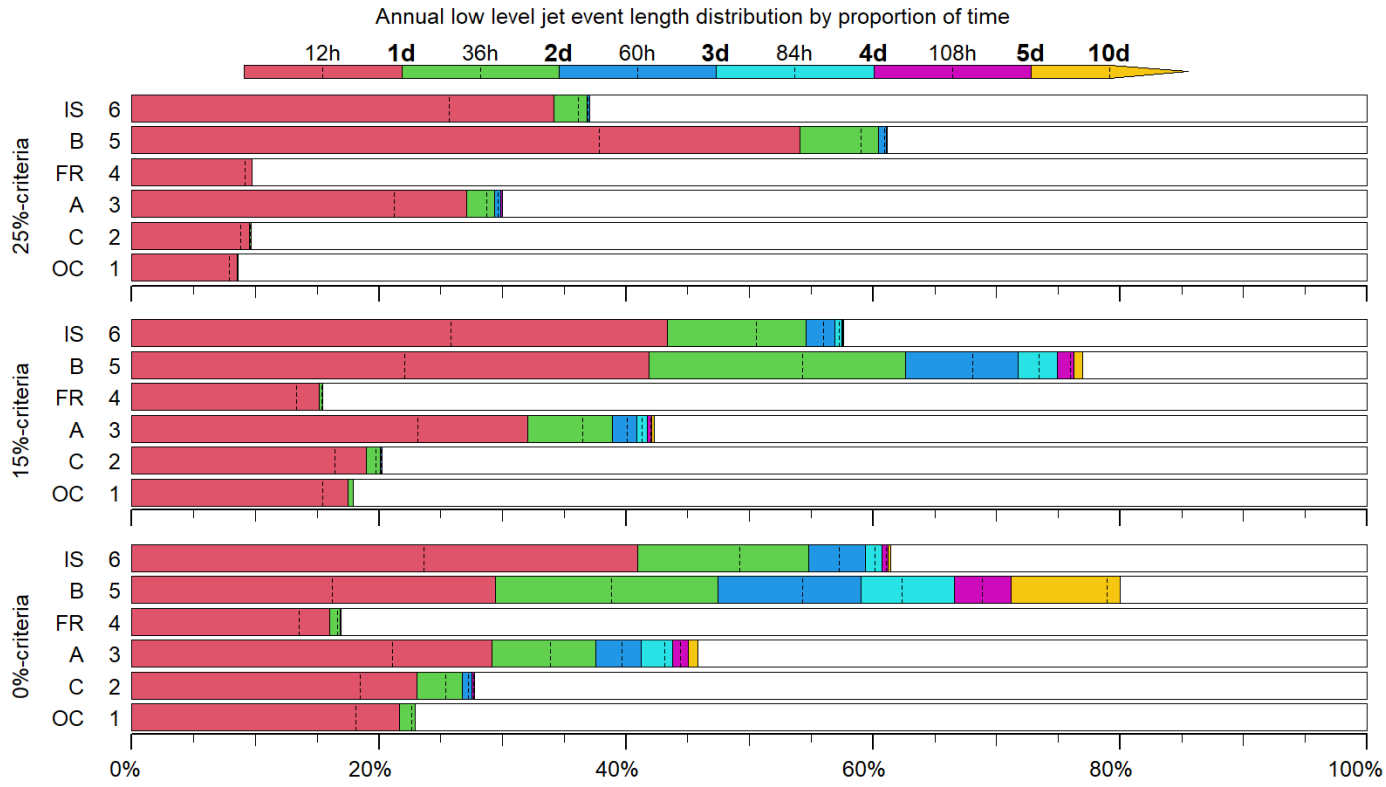

Figure S18. Distribution for the length of LLJ events (fraction of time of the respective LLJs events) for 0%, 15% and 25% relative criteria for the whole year 2002-2016 for the points 1-6 shown in Fig.1. Point 1 is located over the ocean (OC), points 2-4 are located in cross-sections A-C, point 5 is located over the central FRIS (FR) and point 6 is located over the ice sheet (IS). The colored bars represent the relative frequencies in 24h bins, the value for 12 hours is marked by a line inside the 24h bin. For the last bin (yellow) the line marks 10 days.

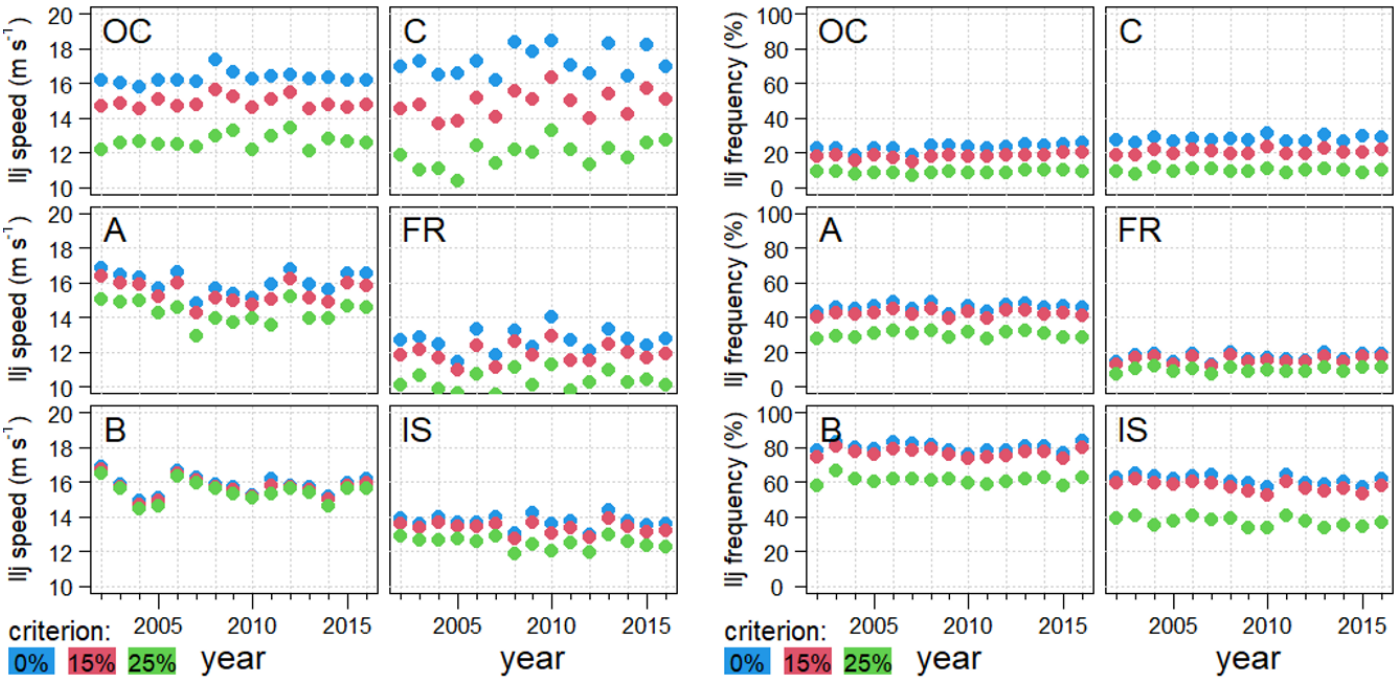

Figure S19. Time series of LLJ speed and frequency for annual means for 0%, 15% and 25% relative criteria for the points 1-6 shown in Fig.1.