



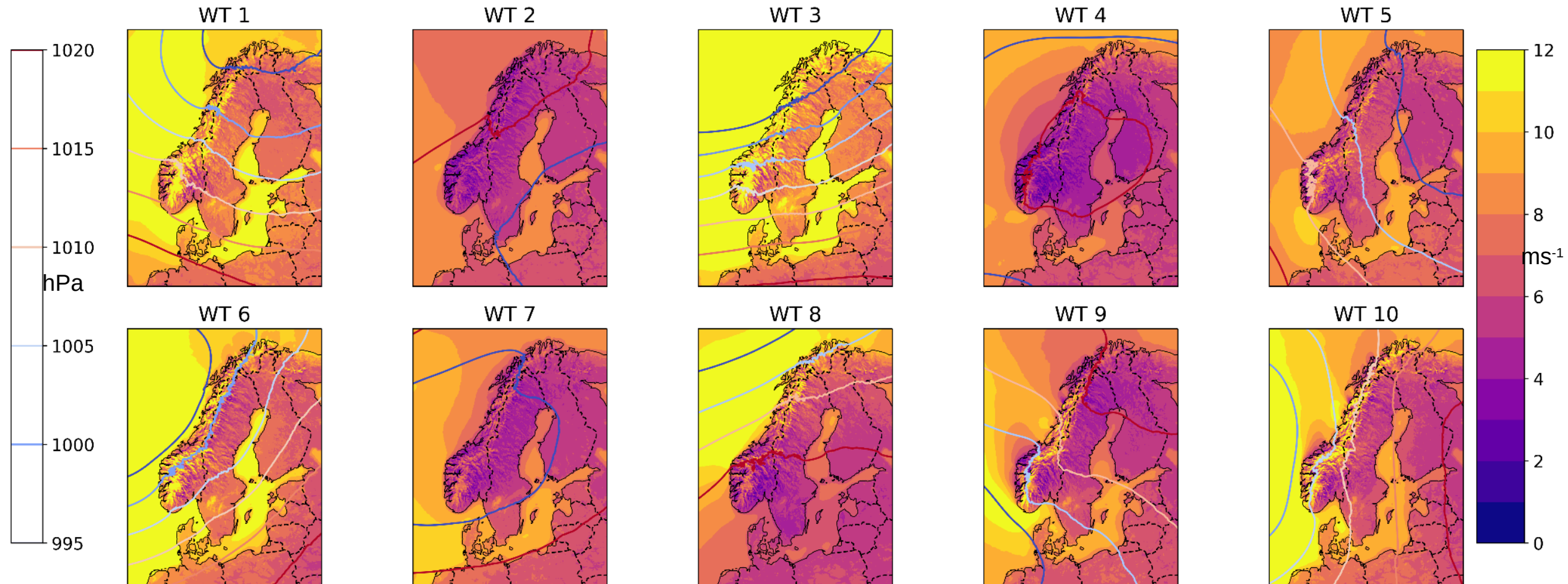
# The impact of climate change on wind conditions

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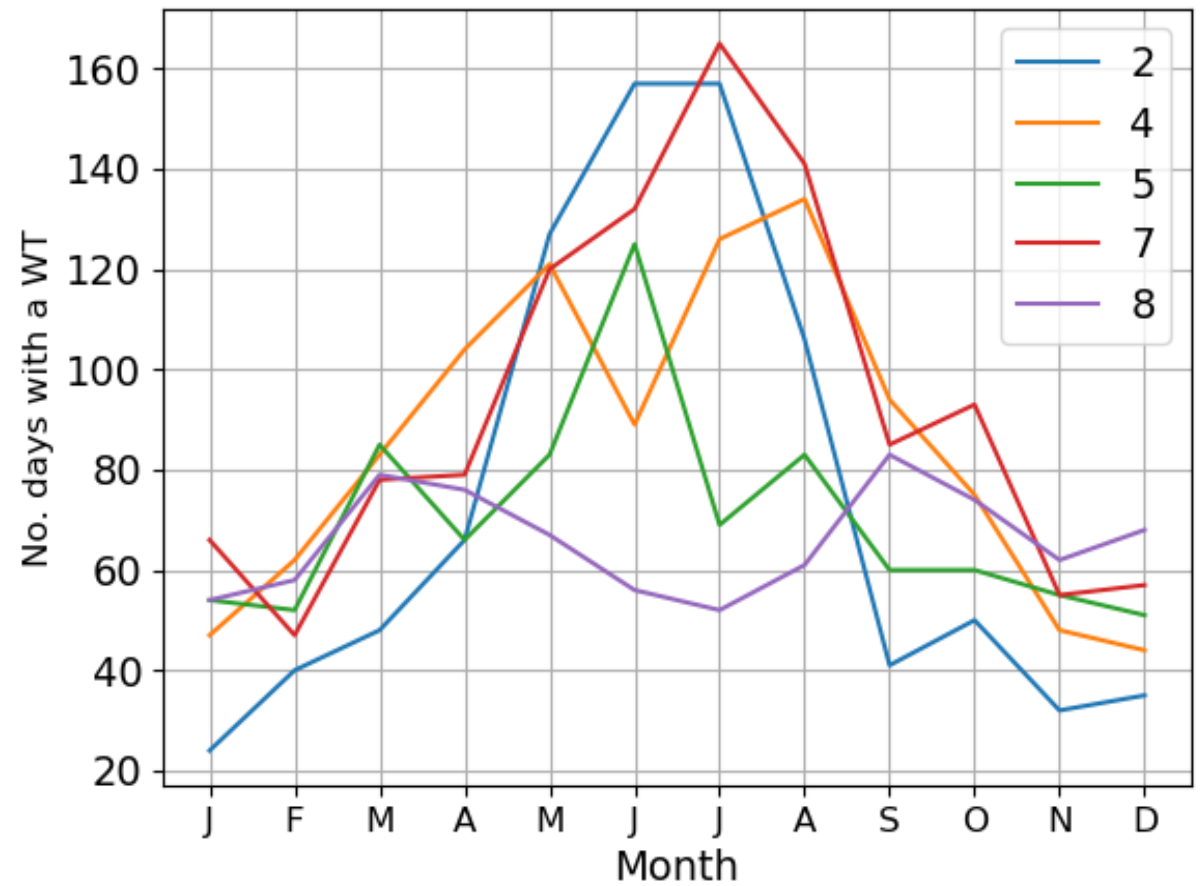
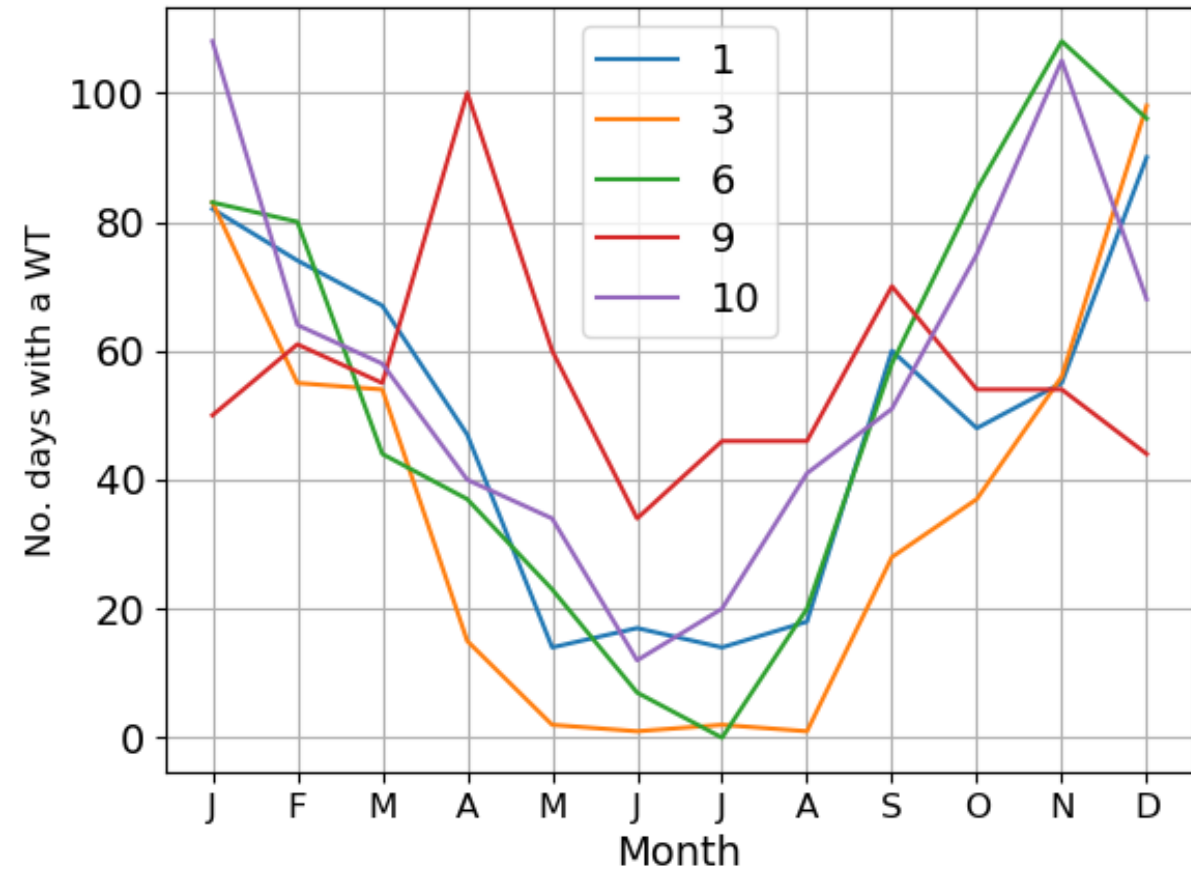
# Classification of weather types (WT)

Each map shows composite averages for 1998-2018 based on the 3-km reanalysis-driven HCLIM simulation for the respective circulation type of the mean sea level pressure pattern (isolines, unit hPa) and 100-meter wind speed (colours).



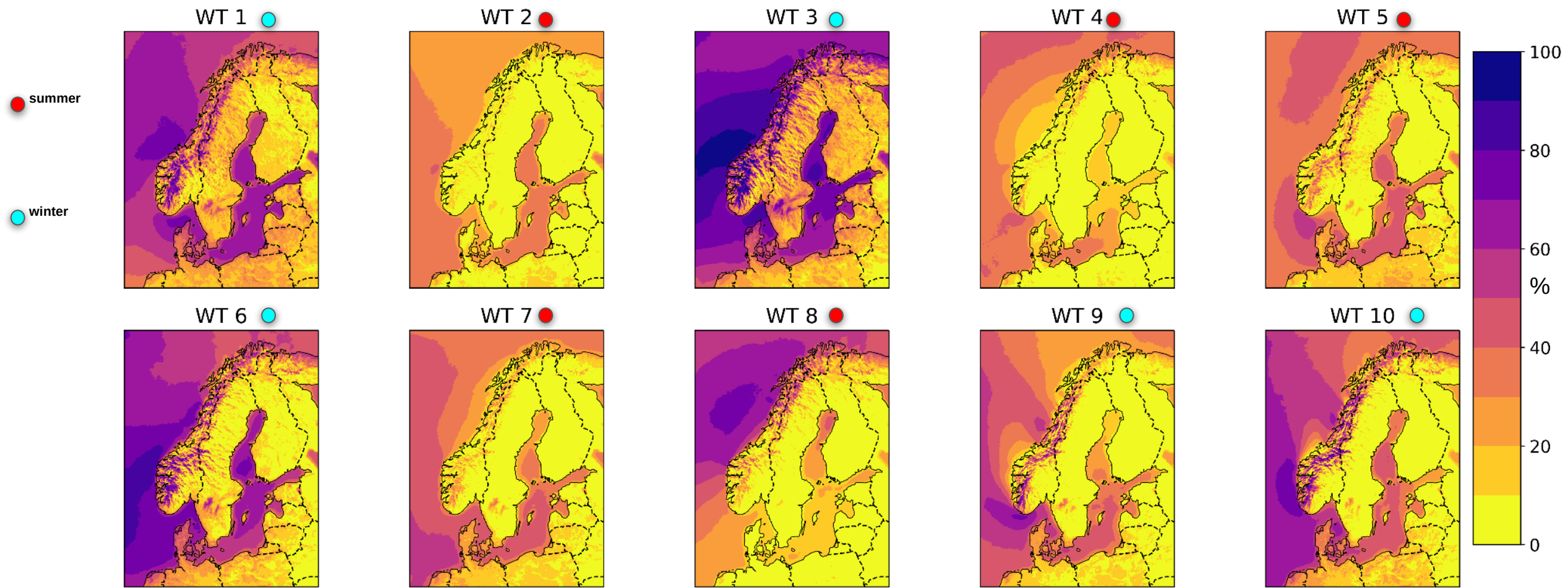
# Seasonality of weather types

Frequency of the ten circulation types for each month for 1998-2018.



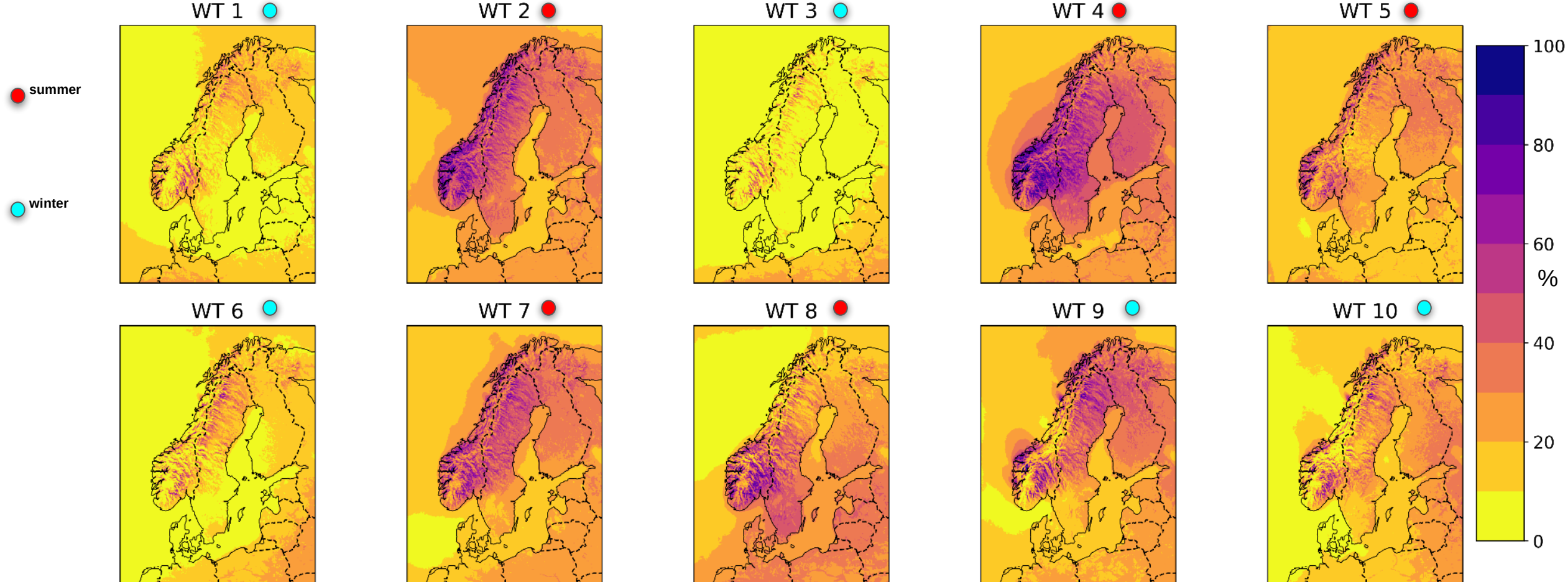
# Percentage of days with calm conditions (> 10 m/s as a daily mean) for each circulation type (WT1-10) in 1998-2018

Days with more than 10 m/s in mean wind speed are favorable for wind power generation, and these can be attributed to particular weather types



# Percentage of days with calm conditions (< 4.5 m/s as a daily mean) for each circulation type (WT1-10) in 1998-2018

The number of days with low wind speed is highly dependent on the circulation type, being clearly more present during summer

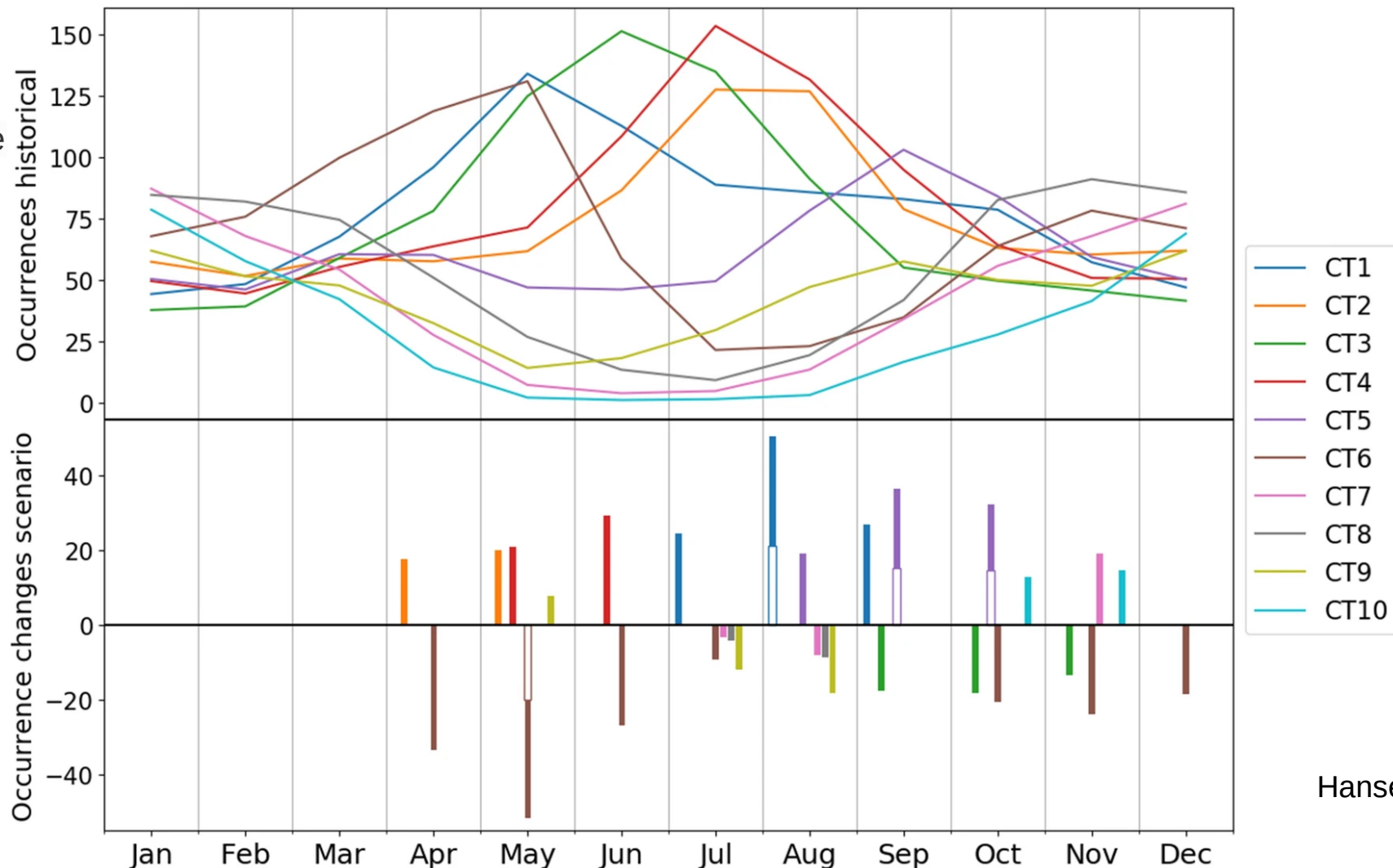


# Changes in WT occurrences in future climate

No significant changes in WT occurrences by the middle of the 21st Century, especially during winter

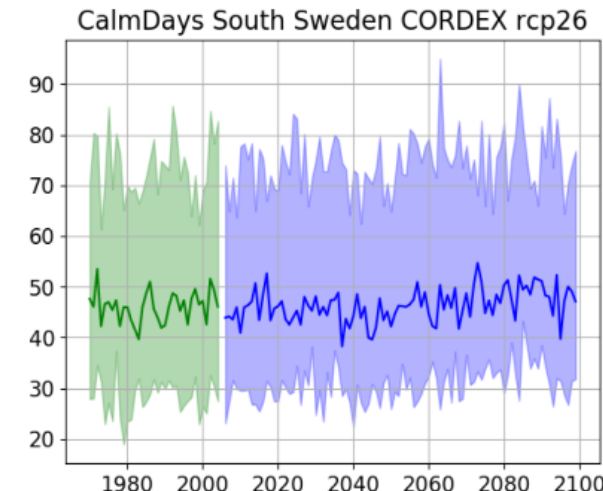
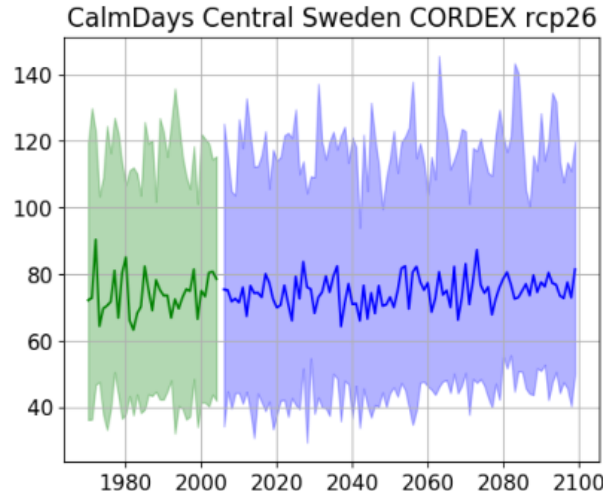
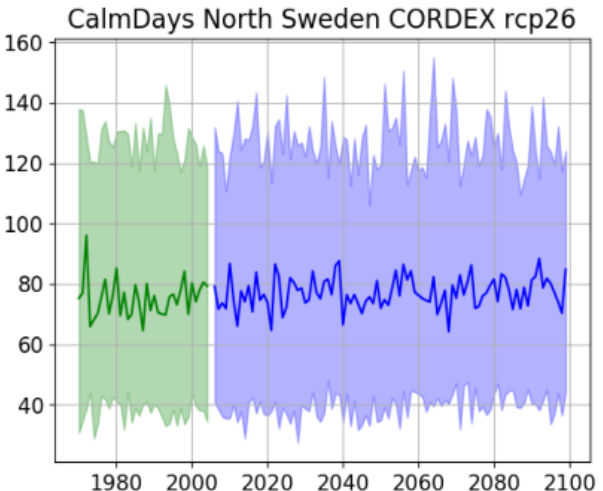
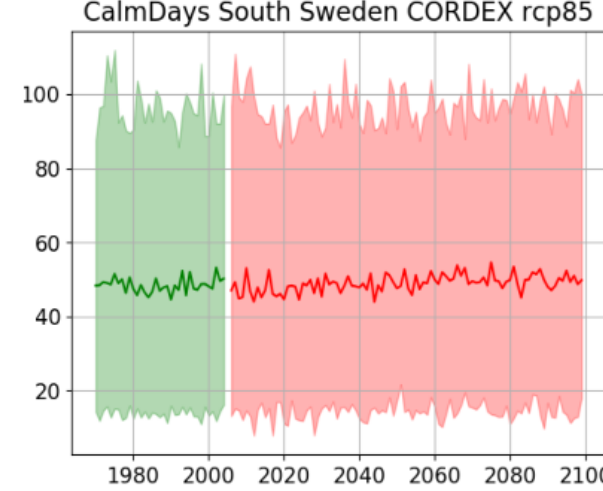
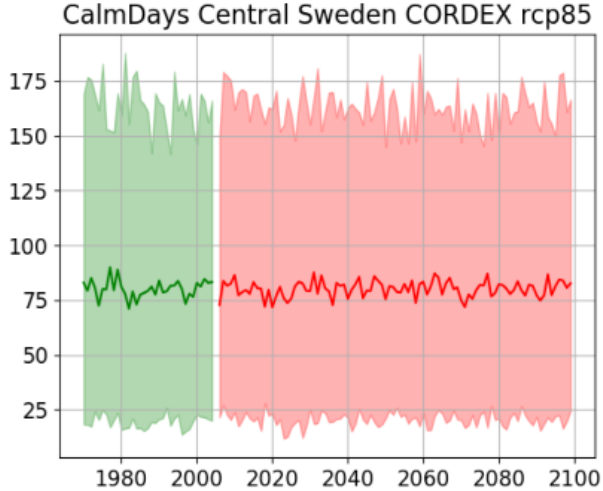
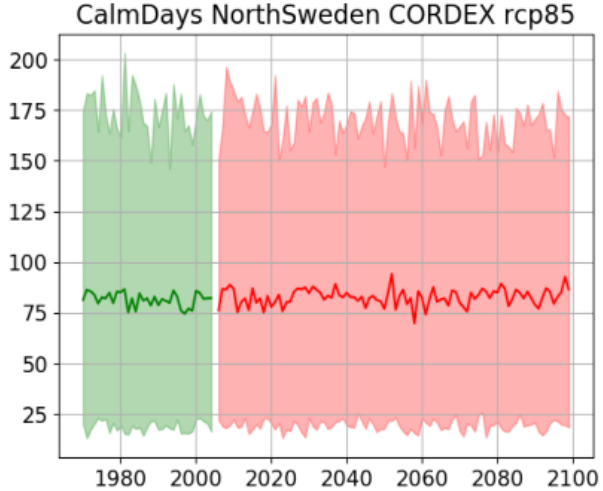
Number of occurrences of each WT in each month. Shown is the EC-Earth large ensemble mean from 20 years of the historical simulation (1995–2014).

Significant 20-year occurrence changes from the historical towards the middle (2041–2060; unfilled bars) and the end (2081–2100; filled bars, starting at zero) of the twenty-first century in the SSP585 scenario

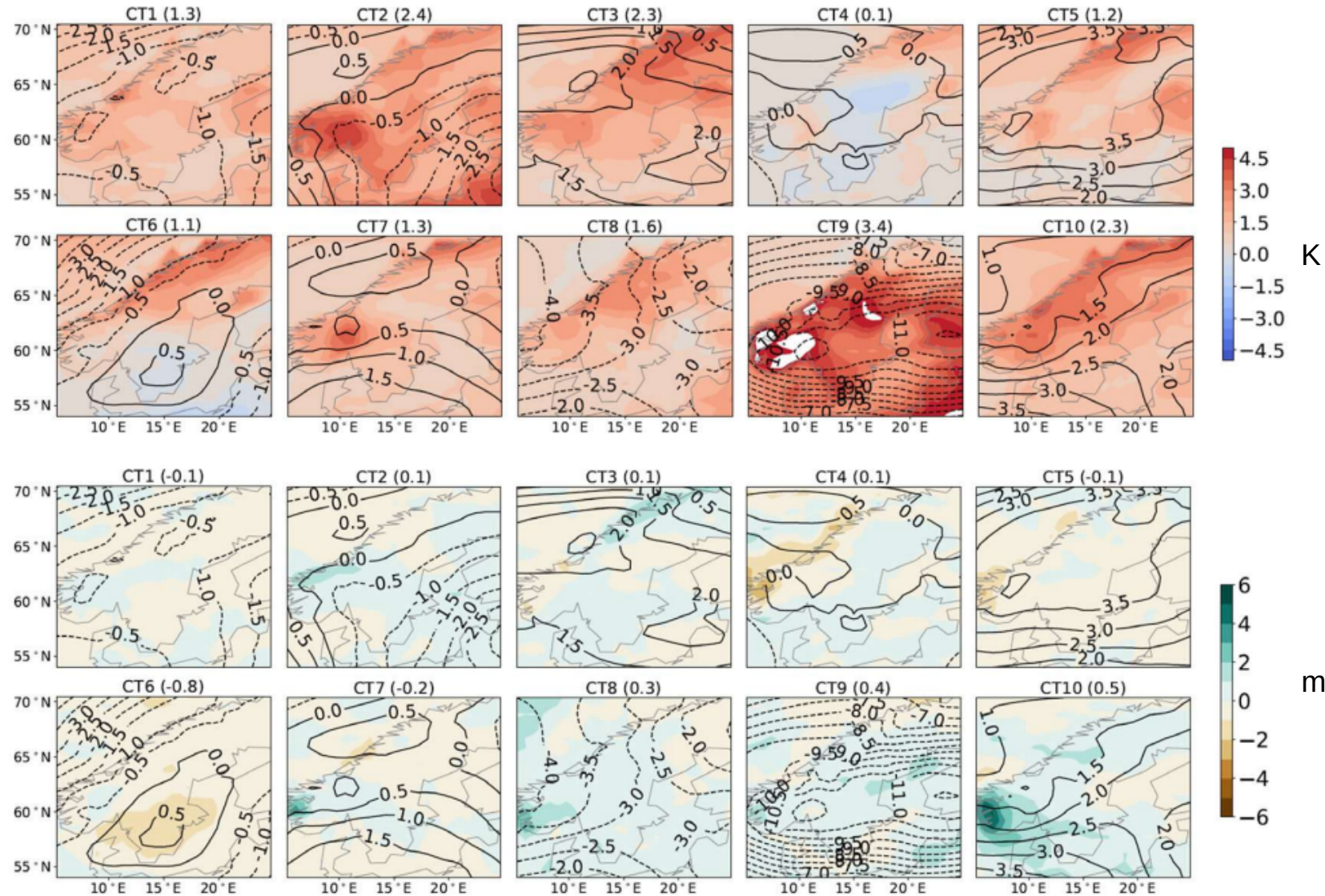


# Calm days (<4.5m/s) from a set of regional climate models at 12 km resolution

Variability dominates over the change, since no trends are found in any of the scenarios



# Observed changes in every WT in circulation, temperature and precipitation (for January 1991-2020 compared to 1961-1990)





## Summary

- Weather types help us to understand the atmospheric conditions producing windy and calm conditions and their seasonality.
- No significant changes are found on the number of occurrences of weather type, particularly no changes during the winter season. No significant changes are found for summer.
- Although no significant changes in WT are projected, changes in temperature and precipitation (and other variables) are expected associated to every WT.
- Regional climate models with relatively high resolution (12 km) show no significant changes on the number of days with calm conditions.

A close-up photograph of a rocky crevice. The rocks are grey and covered with patches of bright yellow lichen. A small, dark pool of water is visible in the center of the crevice. The word "Tack!" is written in large, white, sans-serif font across the middle of the image.

**Tack!**