

Supplementary Materials: Circulation Specific Precipitation Patterns Over Svalbard And Projected Future Changes

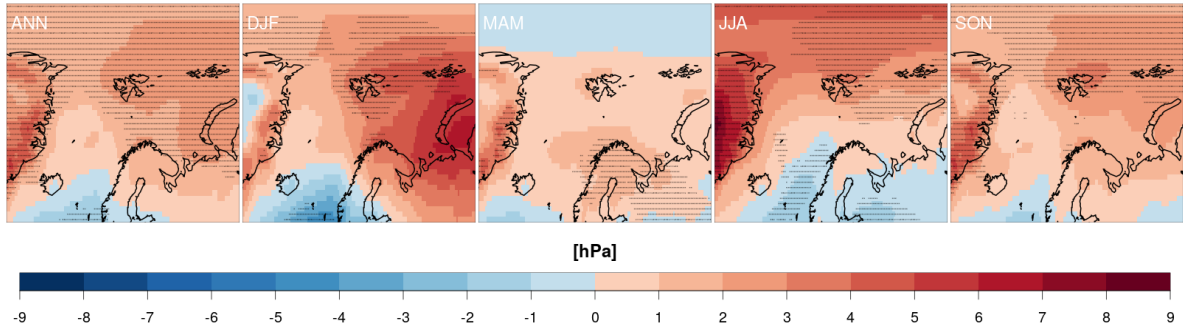


Figure S1. Annual and seasonal mean sea level pressure bias from the MPI-ESM-LR current climate (1971-2000) simulation. Statistically significant differences are marked with dots. The labels in the top left corners refer to the annual mean (ANN) or the months of the specific season of the year.

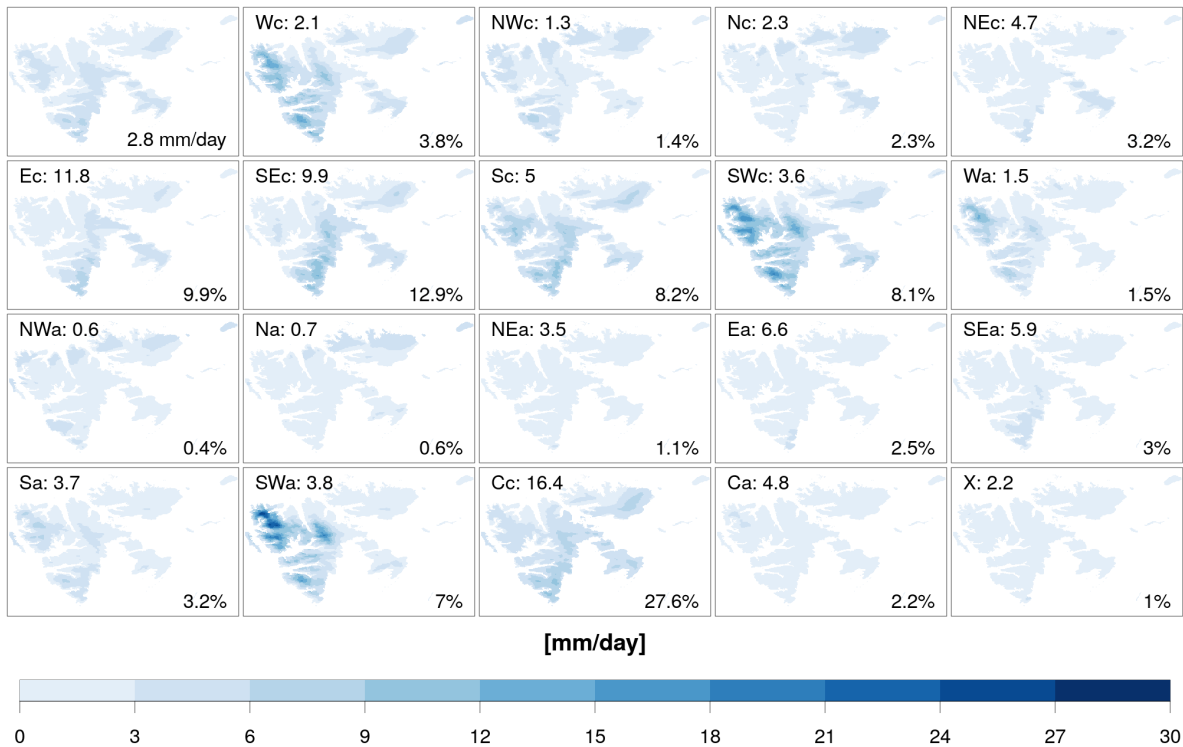


Figure S2. Mean winter precipitation (top left) from the MPI-ESM-LR driven COSMO-CLM current climate (1971-2000) simulation and its decomposition into single weather types. For the seasonal mean, the average daily precipitation over the whole land area is shown in the bottom right corner. For the different weather types, the contribution to the total precipitation is given in the bottom right corner, while the number in the top left corresponds to the number of occurrences per year

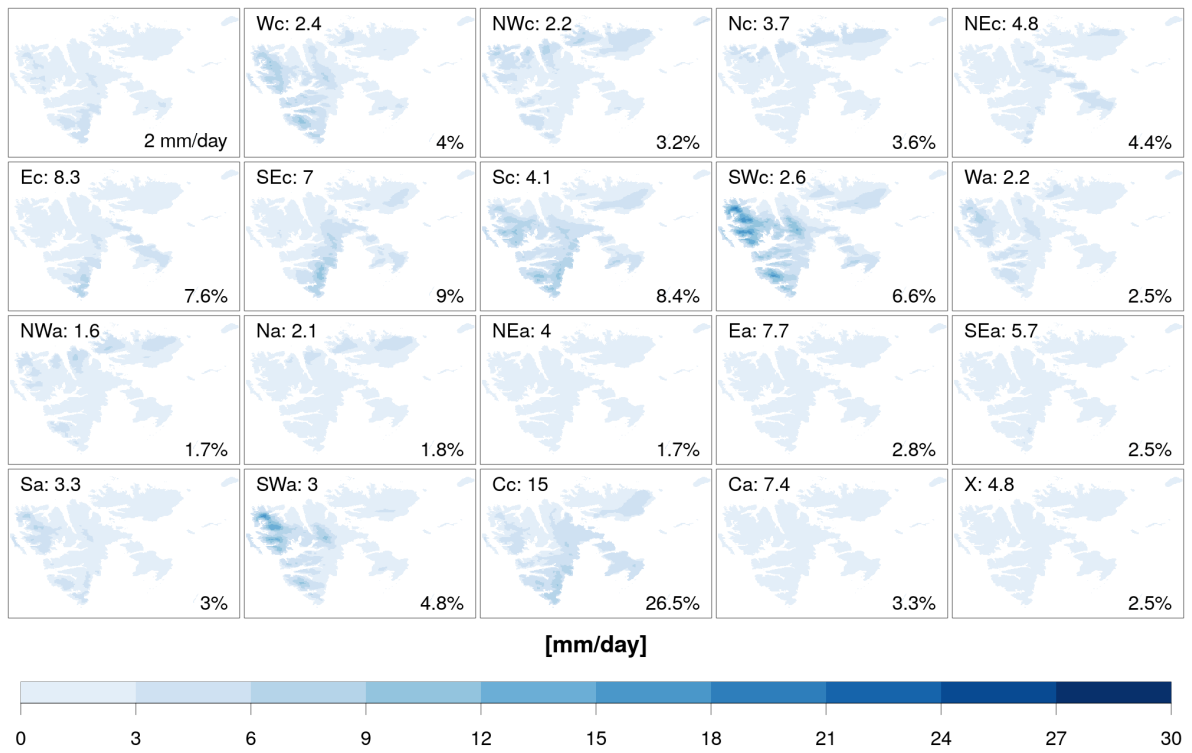


Figure S3. As for Figure S2, but for spring.

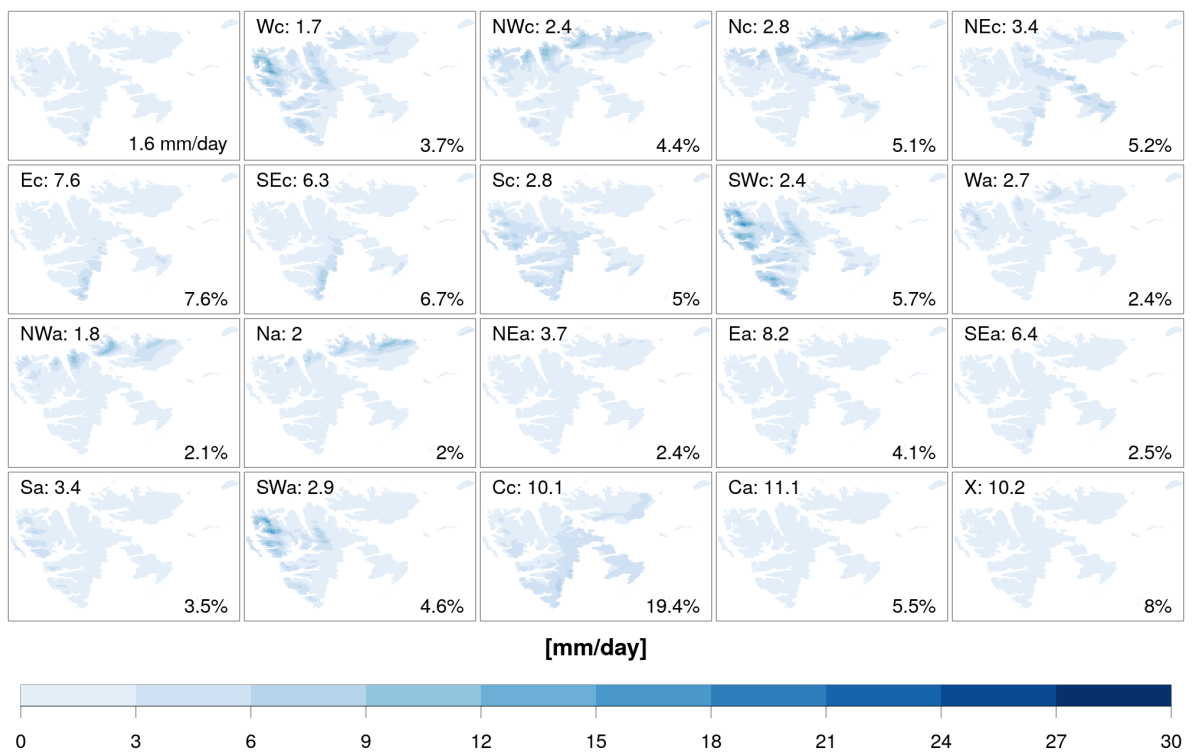


Figure S4. As for Figure S2, but for summer.

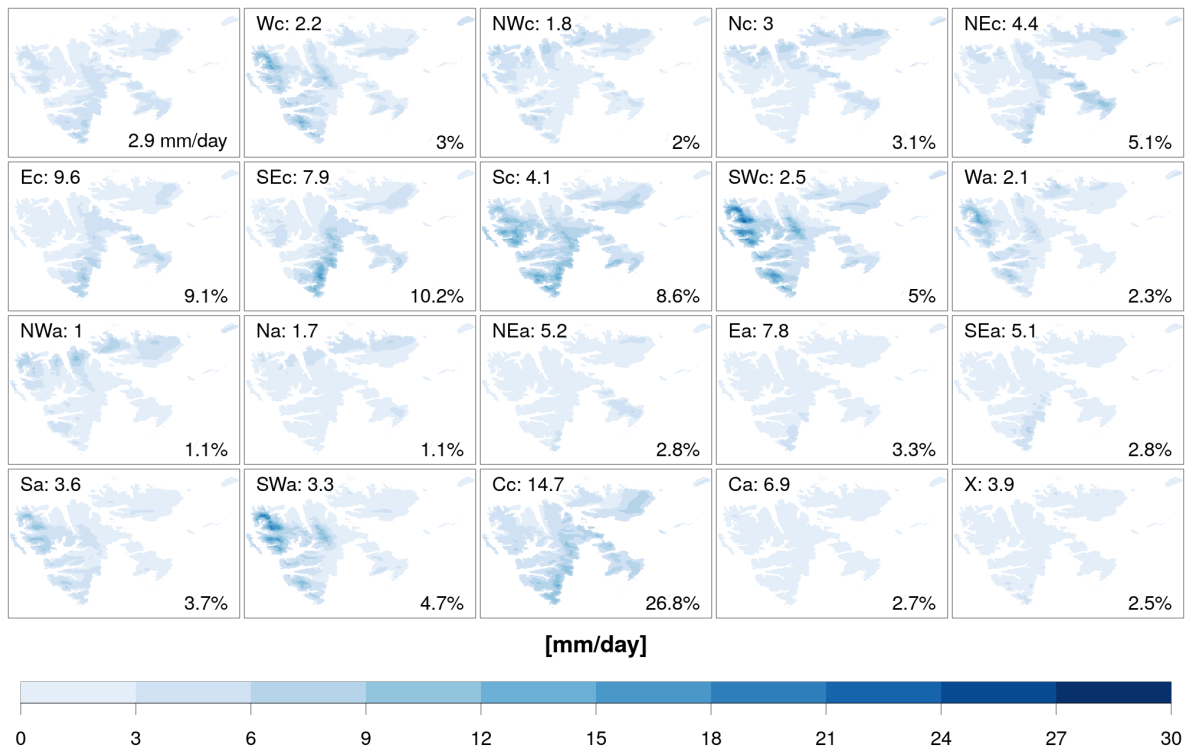


Figure S5. As for Figure S2, but for autumn.

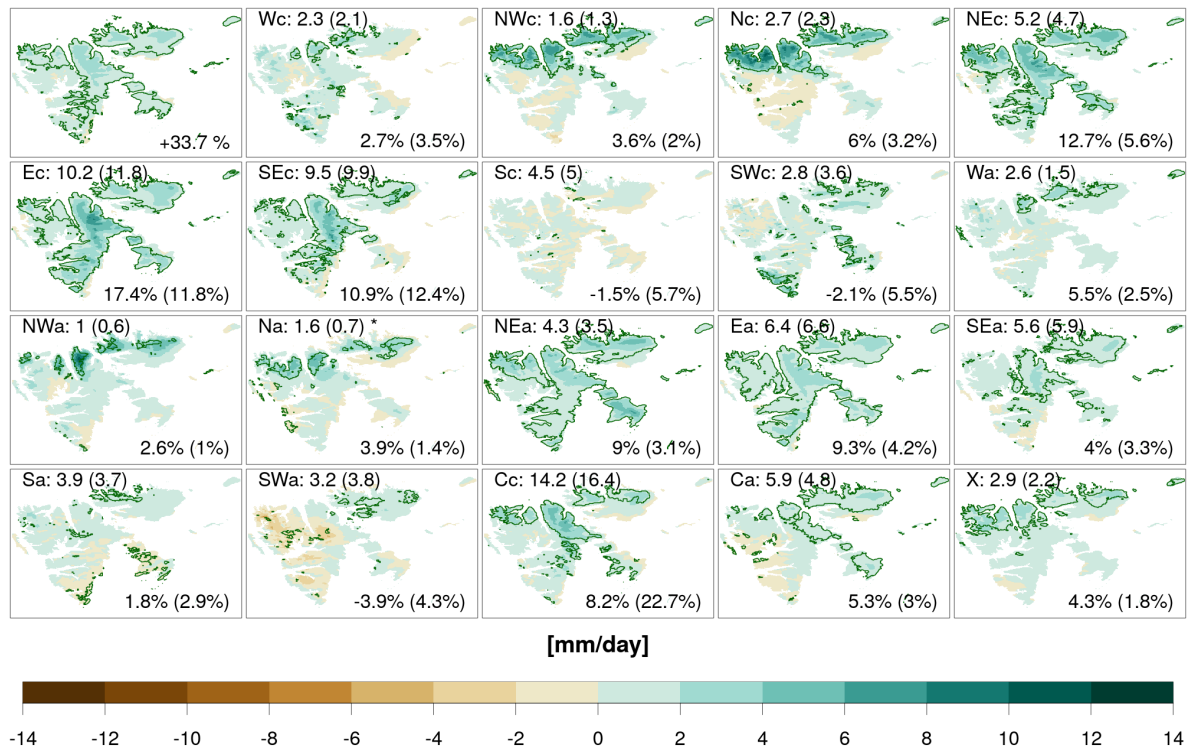


Figure S6. Mean winter precipitation change (top left) and its decomposition into single weather types. Statistically significant changes are outlined. For the seasonal mean, the number in the bottom right corner gives the mean increase. For the weather types, the numbers give the contributions to the change and the contribution to the future mean precipitation (in parentheses), respectively. In the top left corner, the frequencies for the future and current climate (in parentheses) are given. Statistically significant changes in the frequencies are denoted by a star.

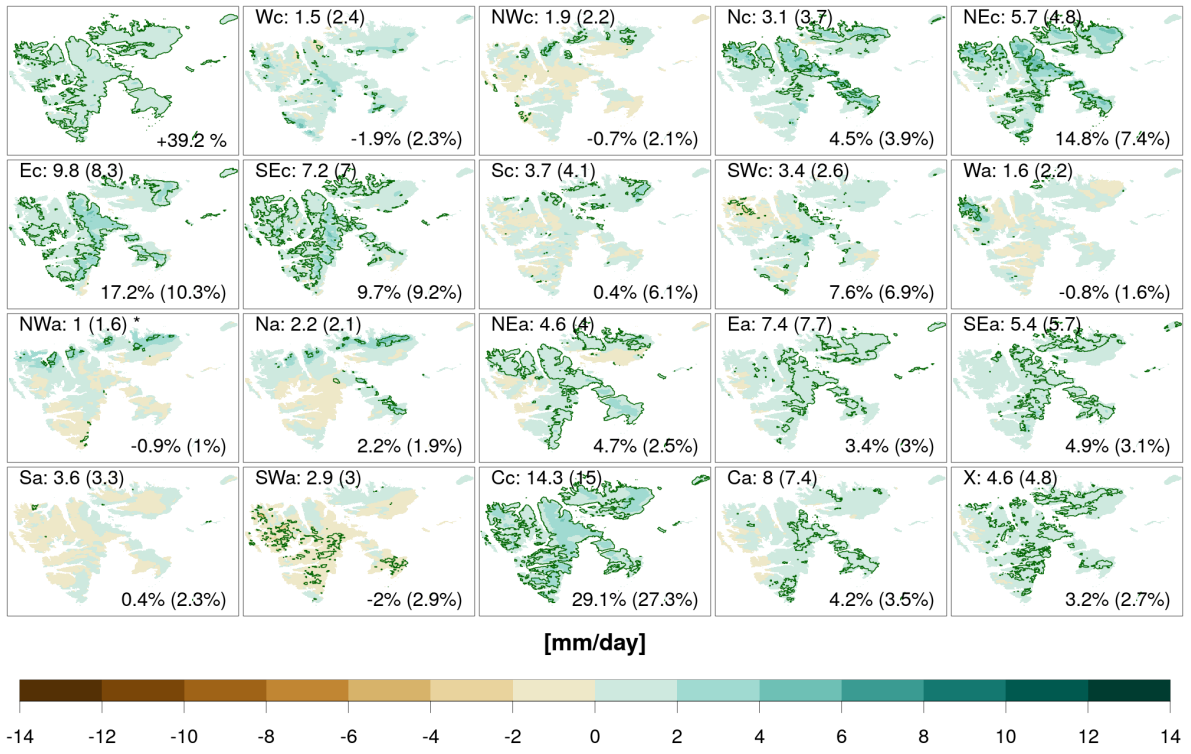


Figure S7. As for Figure S6, but for spring.

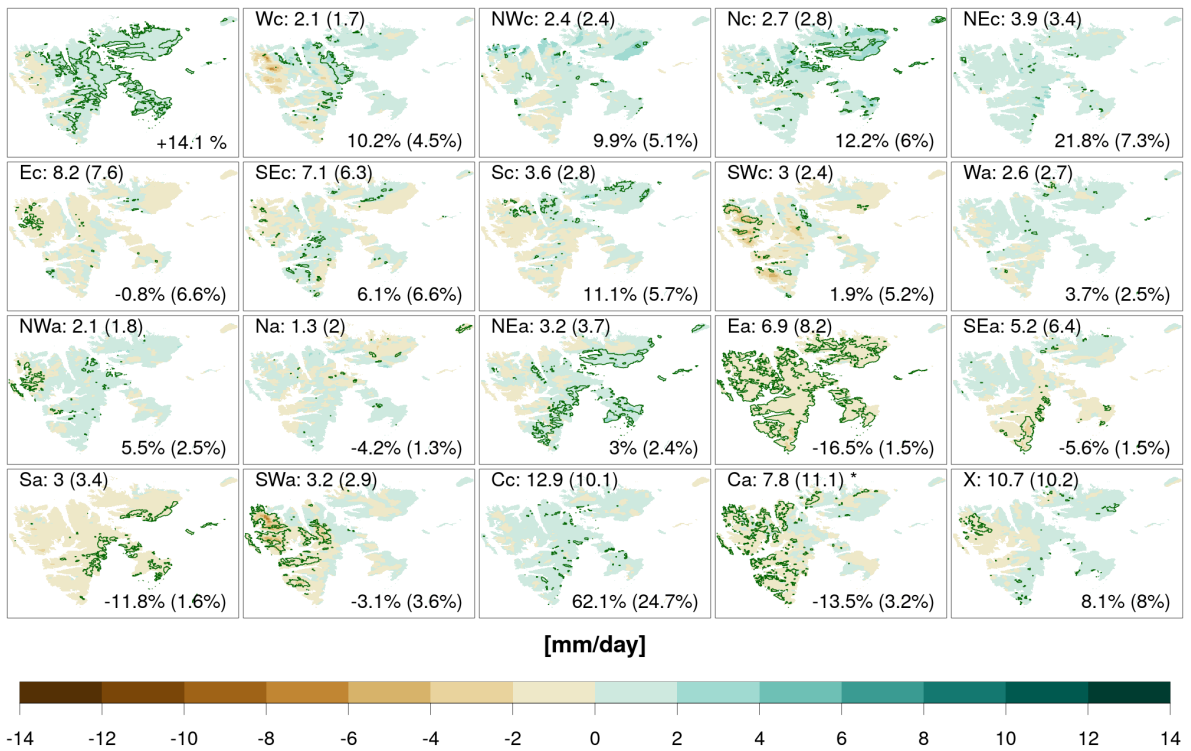


Figure S8. As for Figure S6, but for summer.

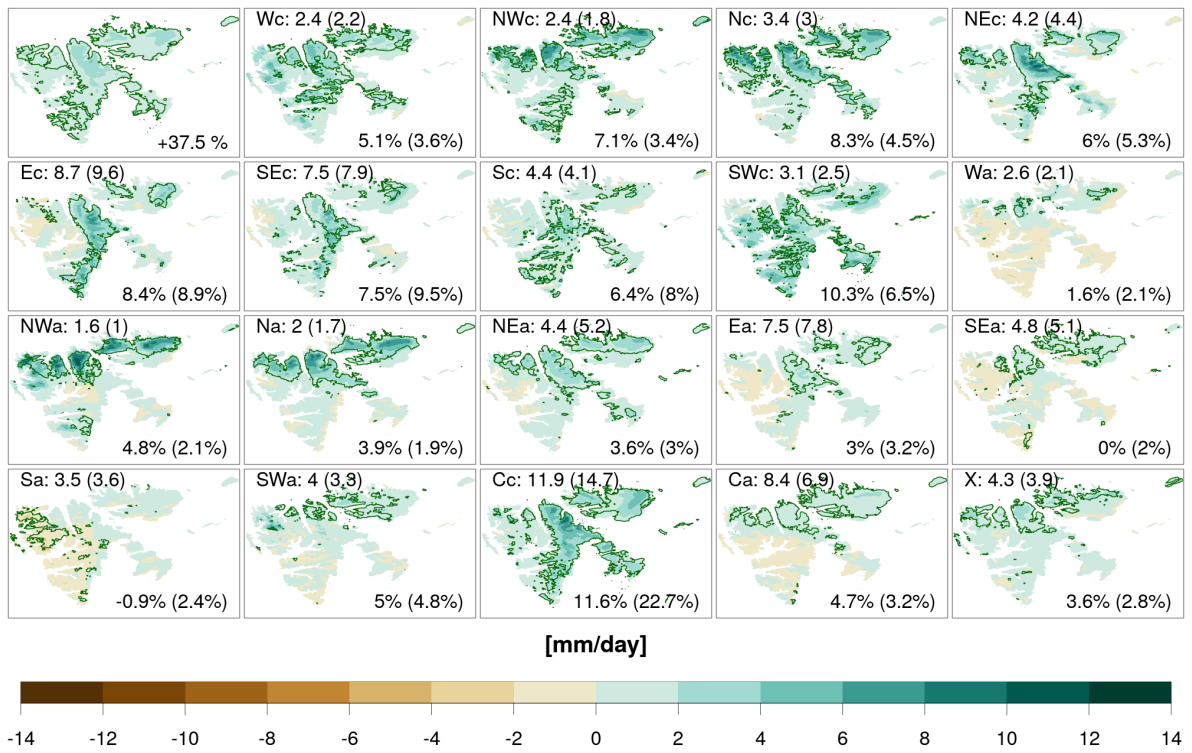


Figure S9. As for Figure S6, but for autumn.

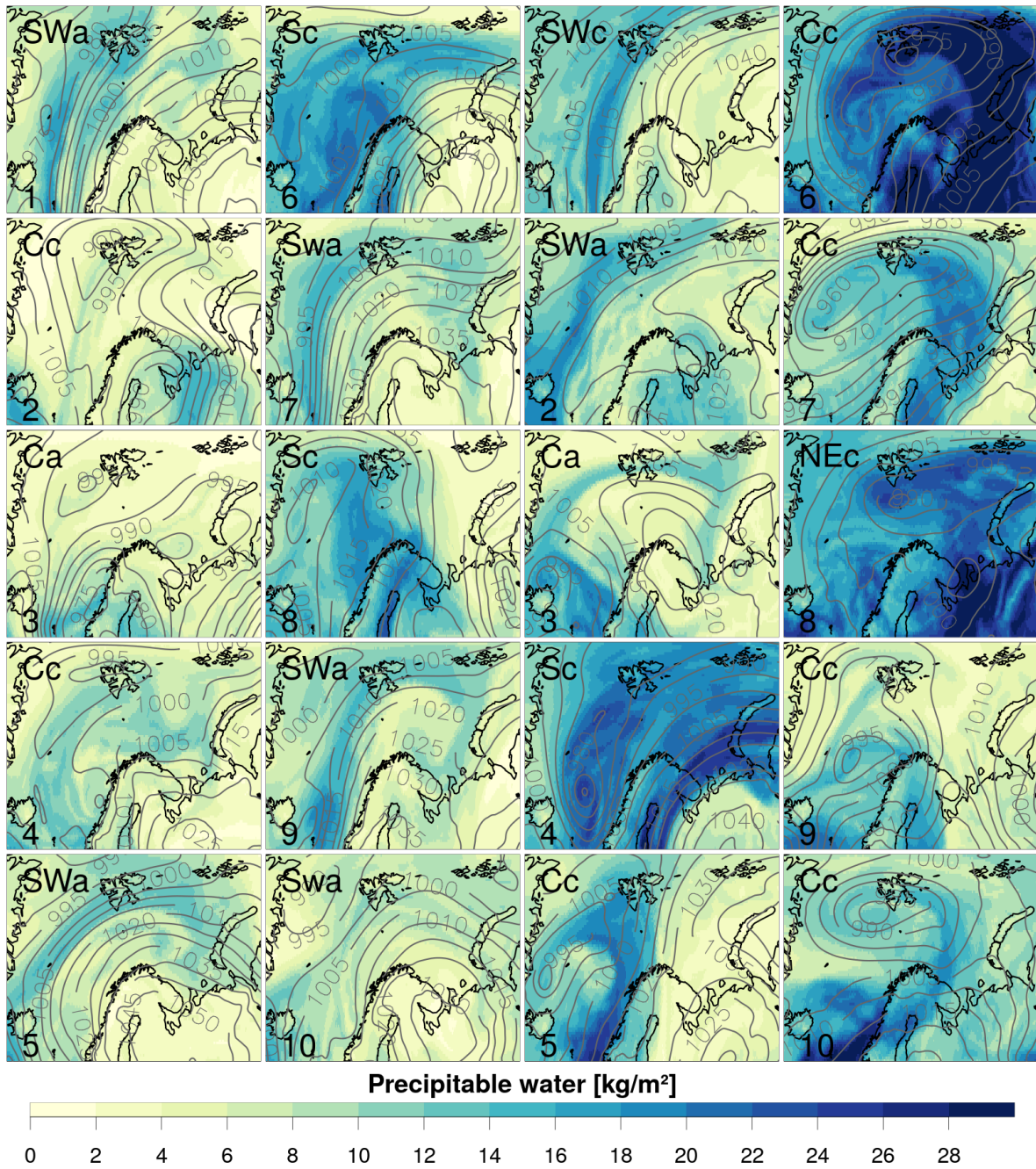


Figure S10. Precipitable water (colours) and sea level pressure (contours) for the top ten precipitation events in the current (first and second column) and future (third and fourth column) climate simulation. The rank of the event is given in the bottom left corner, the corresponding weather type in the top left corner.

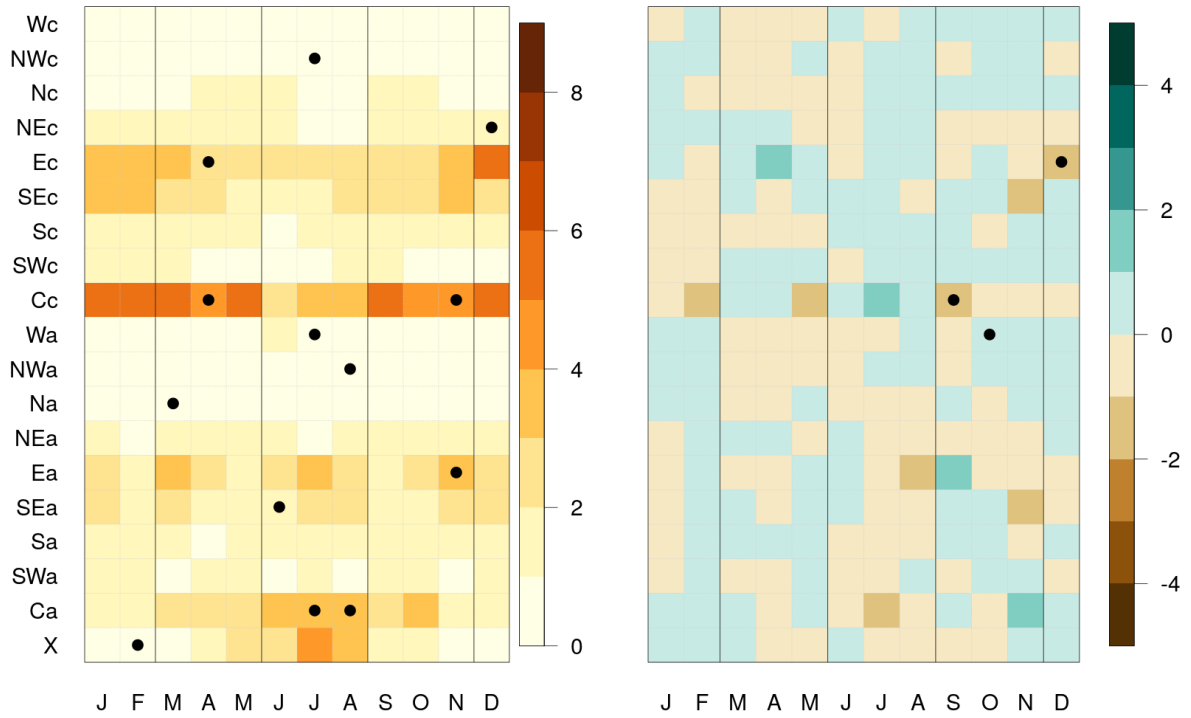


Figure S11. Mean monthly occurrence of weather types in the MPI-ESM-LR current climate simulation (1971-2000, left) and projected changes (2071-2100, right). The dots mark statistically significant differences to ERA-Interim (**left**) and changes (**right**), respectively.

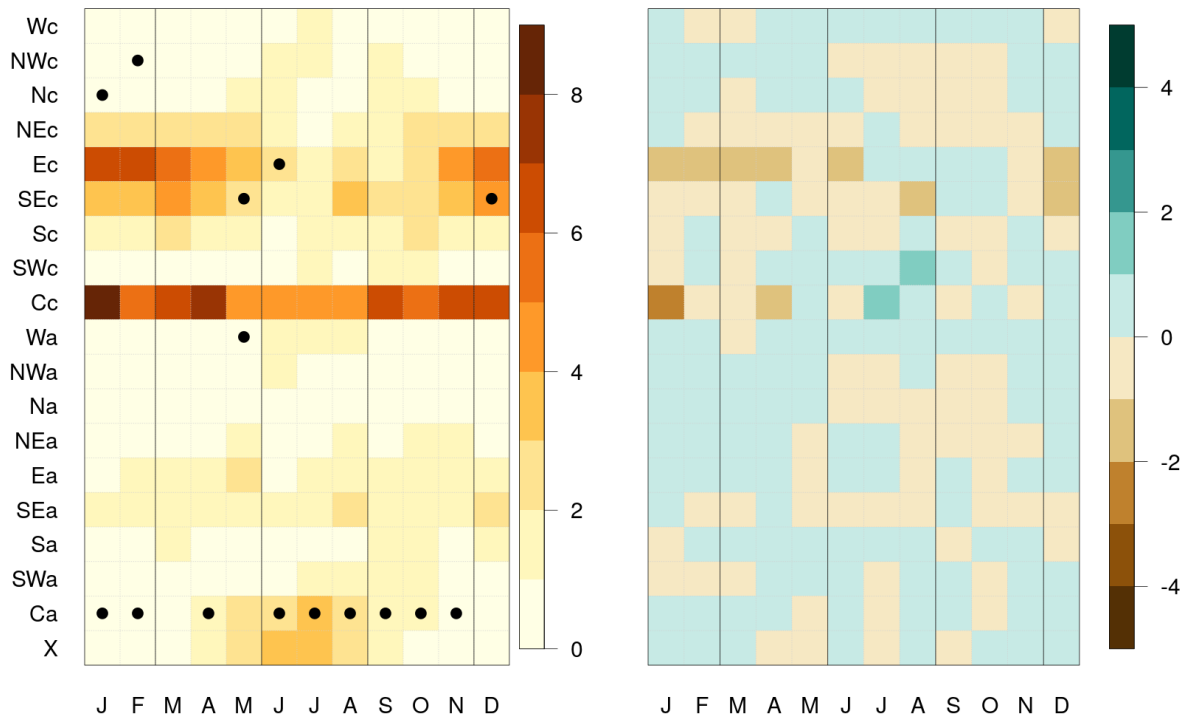


Figure S12. As for Figure S11, but for the CanESM2 model.

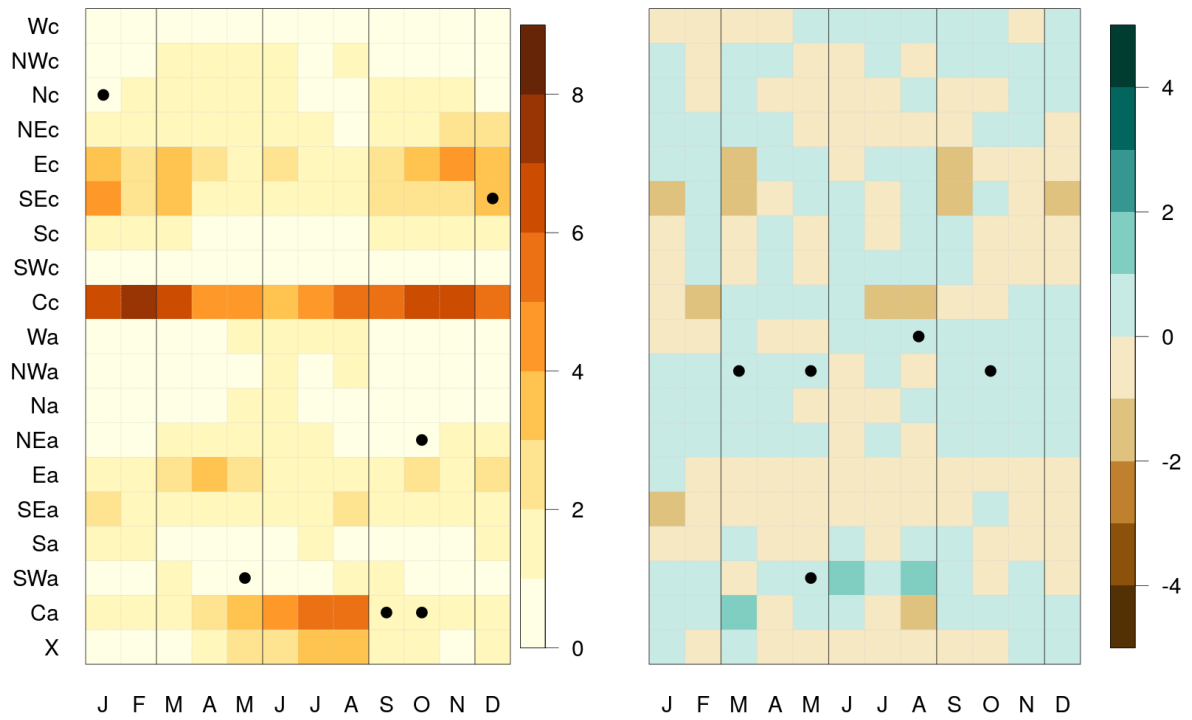


Figure S13. As for Figure S11, but for the NorESM1-M model.

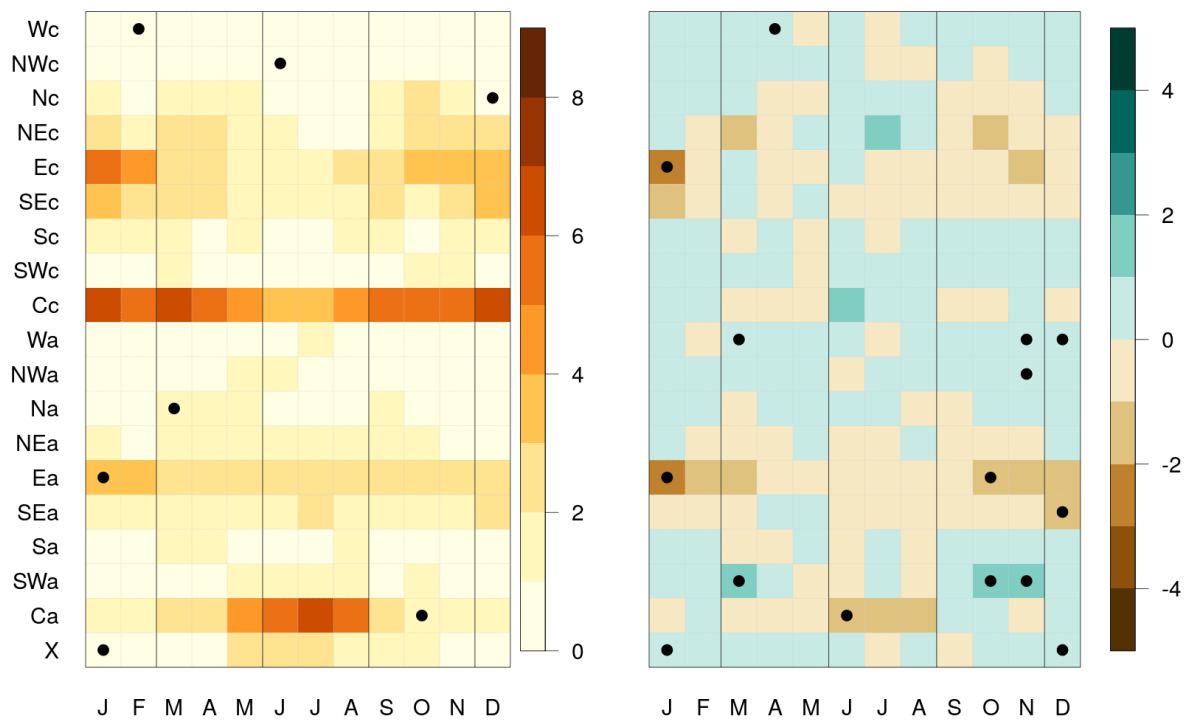


Figure S14. As for Figure S11, but for the EC-Earth model.