

Fig. S1 Total number of Vb-cyclone events occurred during Spring, Summer, Autumn and Winter and their associated trends in various simulations

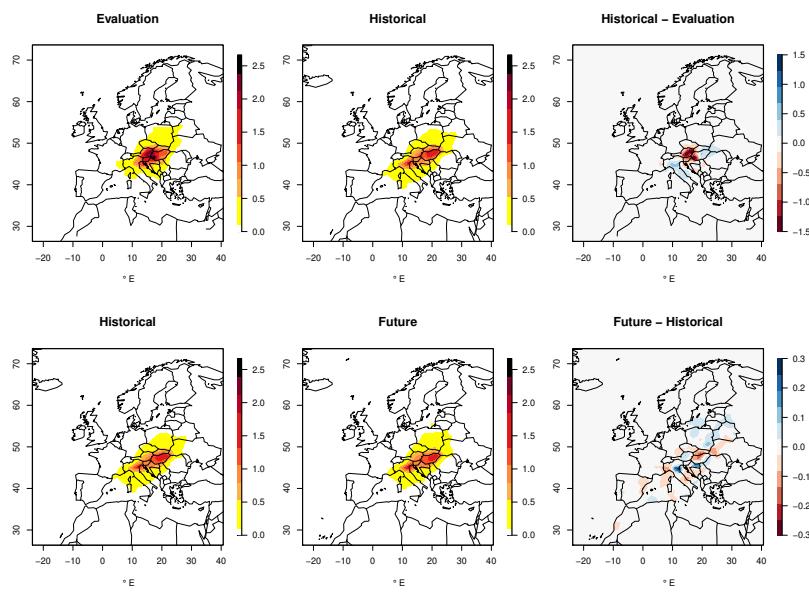


Fig. S2 Probability density field of all detected Vb-cyclone centres various simulations and their respective differences.

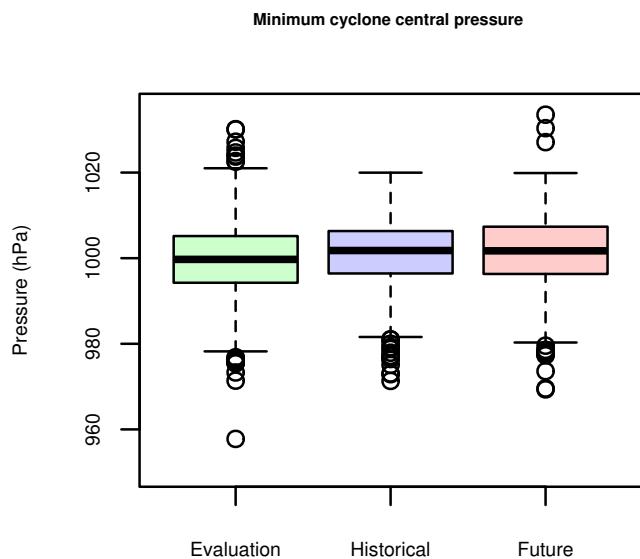


Fig. S3 Box plots representing minimum central core pressure (hPa) for all the Vb-cyclones in various simulations.

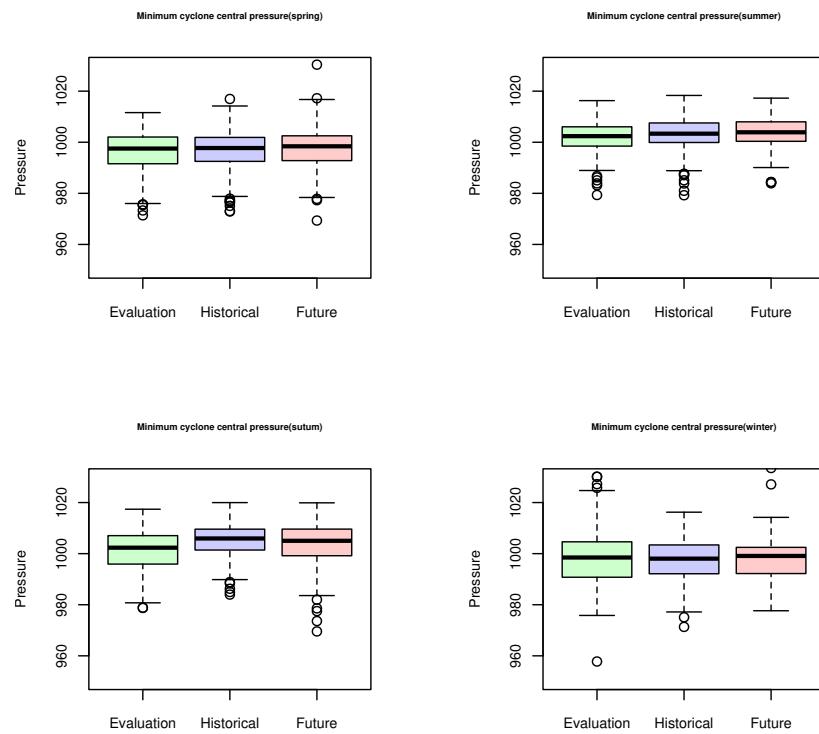


Fig. S4 Minimum central core pressure for all the Vb-cyclone detected tracks in Spring, Summer, Autumn and Winter seasons as simulated in various simulations.

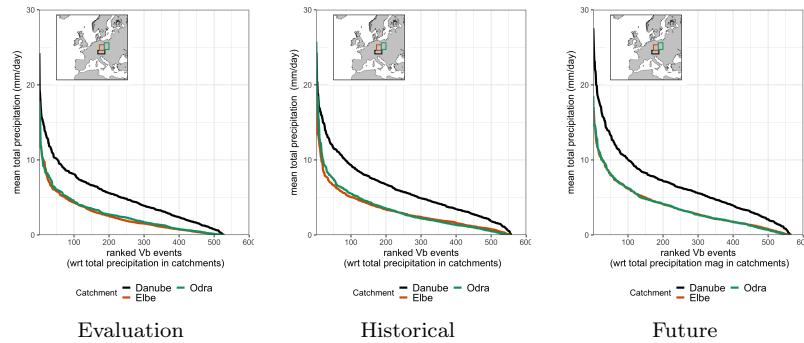


Fig. S5 Ranked total absolute Vb-cyclone precipitation amounts over the Danube, Elbe, and Odra catchments in (a) Evaluation (b) Historical (c) Future simulations.

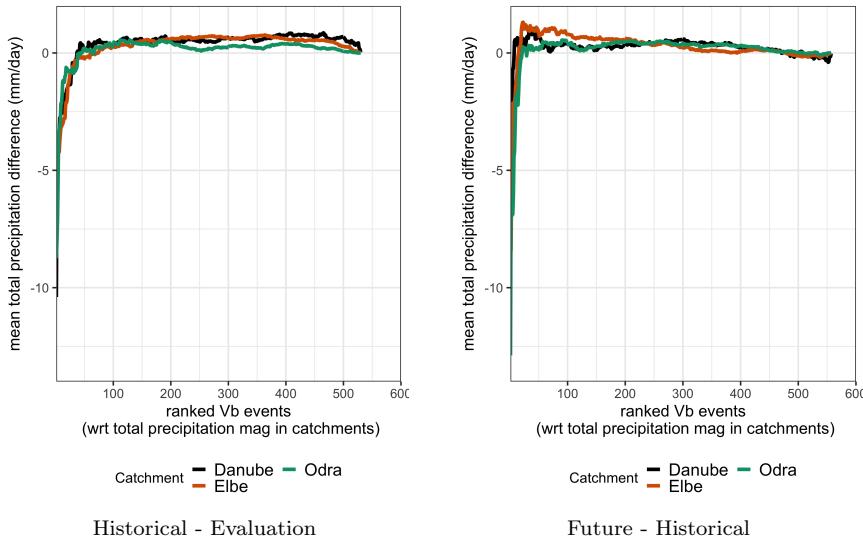


Fig. S6 Difference between the total absolute precipitation amounts in the Danube, Elbe, and Odra catchment (a) Historical - Evaluation (b) Future - Historical

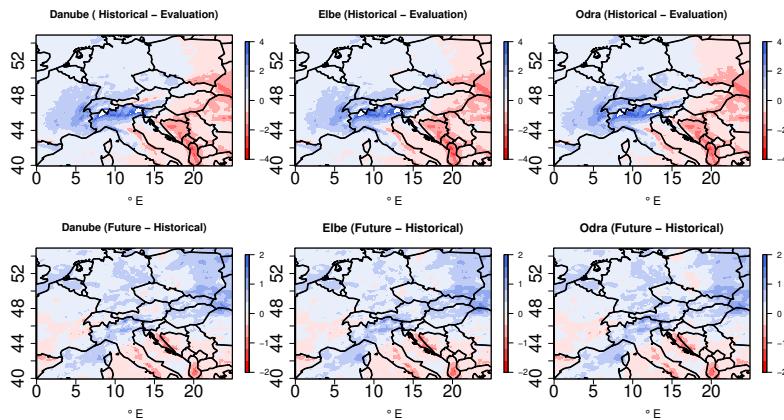


Fig. S7 Difference in the total absolute precipitation amounts (mm/day) between the historical and evaluation (upper panel), Future and historical (lower panel) for all the catchments

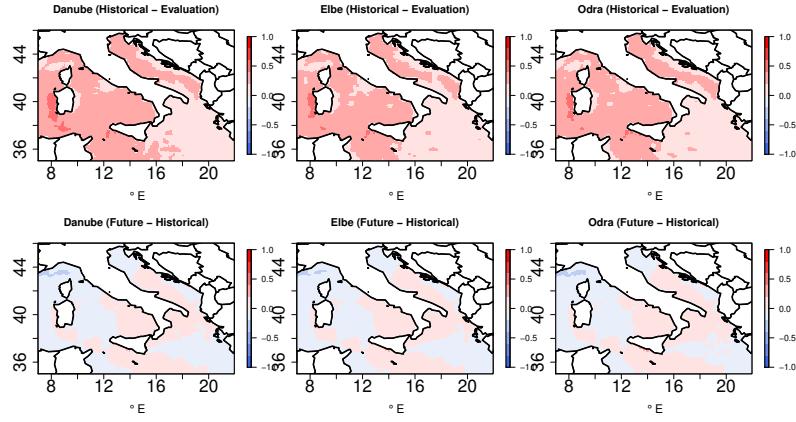


Fig. S8 Difference in the sea surface temperatures mean anomalies between historical and evaluation (upper panel), future and historical (lower panel) corresponding to Vb-cyclone precipitation over all the catchments.

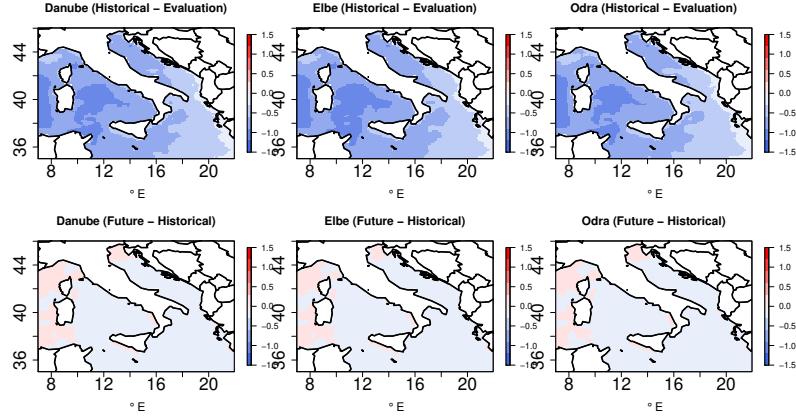


Fig. S9 Difference in the evaporation (mm/day) mean anomalies between historical and evaluation (upper panel), future and historical (lower panel) corresponding to Vb-cyclone precipitation over all the catchments.

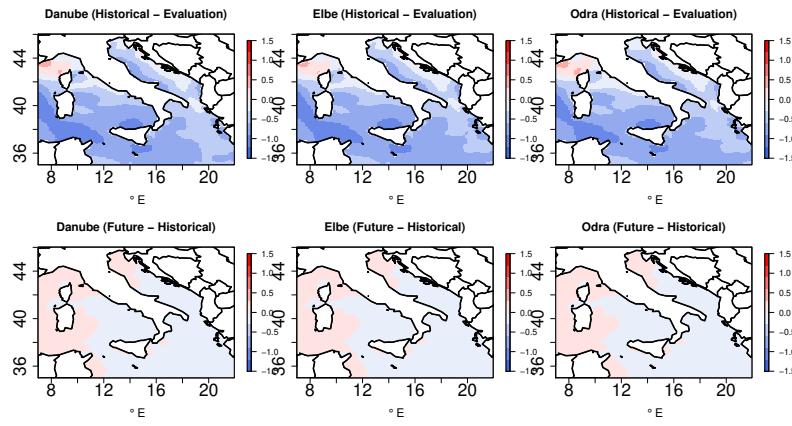


Fig. S10 Difference in the wind speed (m/s) mean anomalies between historical and evaluation (upper panel), future and historical (lower panel) corresponding to Vb-cyclone precipitation over all the catchments.

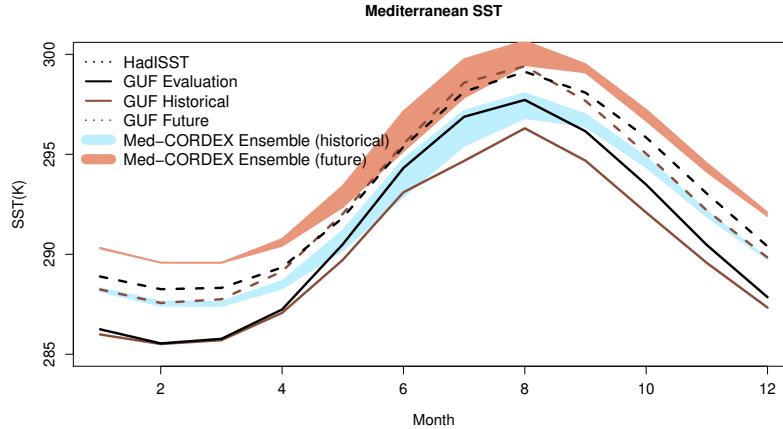


Fig. S11 Annual cycle of the averaged Mediterranean SST (K) as observed by HadISST observational data set and for various simulations.

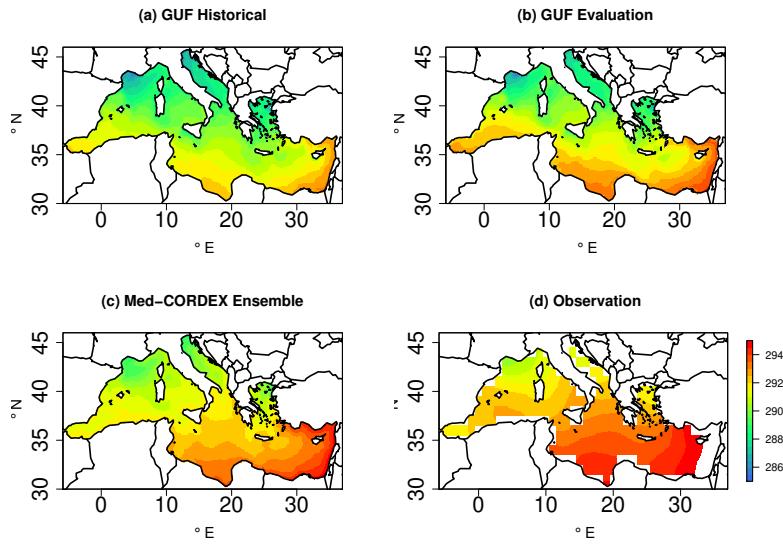


Fig. S12 The averaged Mediterranean sea surface temperatures (K) for the period 1951-2005 as simulated in (a) GUF historical (b) GUF evaluation (c) Med-CORDEX ensemble (d) Observations (HadISST).

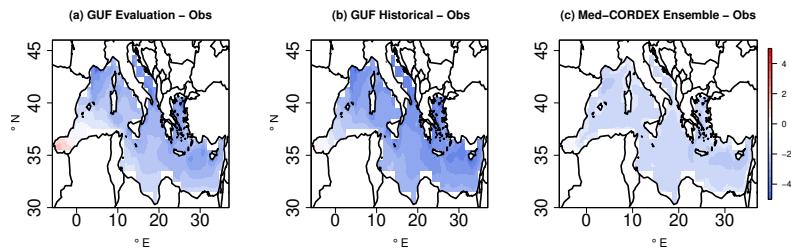


Fig. S13 Bias of the Mediterranean averaged sea surface temperatures (K) with respect to the observations (HadISST) for the period 1951-2005. (a) GUF evaluation - observation (b) GUF historical - observation (c) Med-CORDEX ensemble - observation.

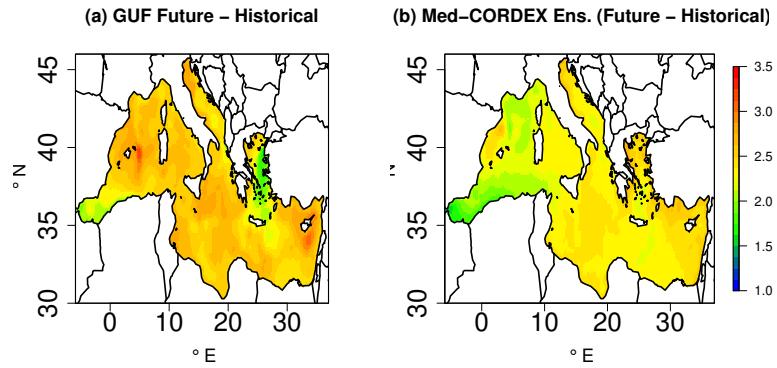


Fig. S14 The Mediterranean sea surface temperature change (K) in the future compared to the historical period for RCP 8.5 scenario in (a) GUF simulation (b) Med-CORDEX ensemble