Table S1. Pearson correlation coefficients between the 30-year running average time series of Fig. 4.

	T850 anomalies	Cyclone frequency	Maximum cyclone-related precipitation	Maximum cyclone-related wind speed
T850 anomalies	x	-0.088	0.098	-0.224
Cyclone frequency	x	x	0.217	0.135
Maximum cyclone-related precipitation	x	x	x	0.592
Maximum cyclone-related wind speed	x	x	x	x

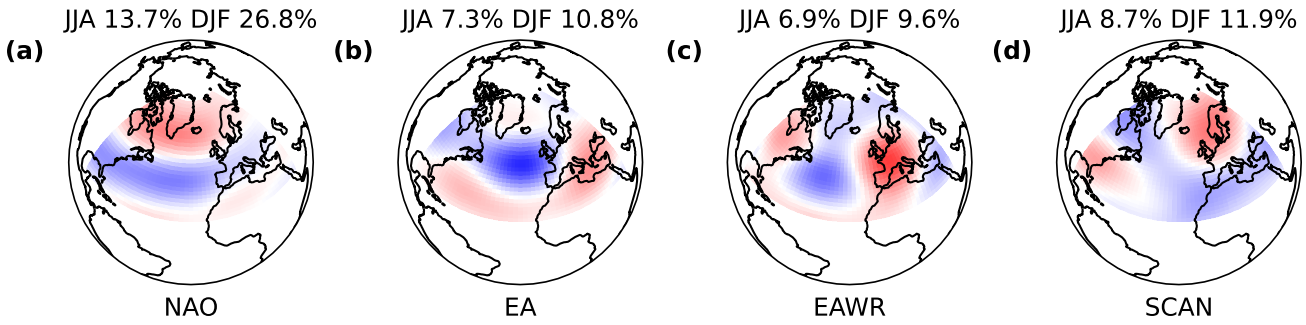

Figure S1. Shapes of EOFs that were used to compute the PCS that were correlated with cyclone frequency, cyclone-related precipitation and cyclone-related wind speed in Fig. 6 and S2. (a) is the EOF for the NAO, (b) the EA, (c) the EAWR and (d) the SCAN pattern.

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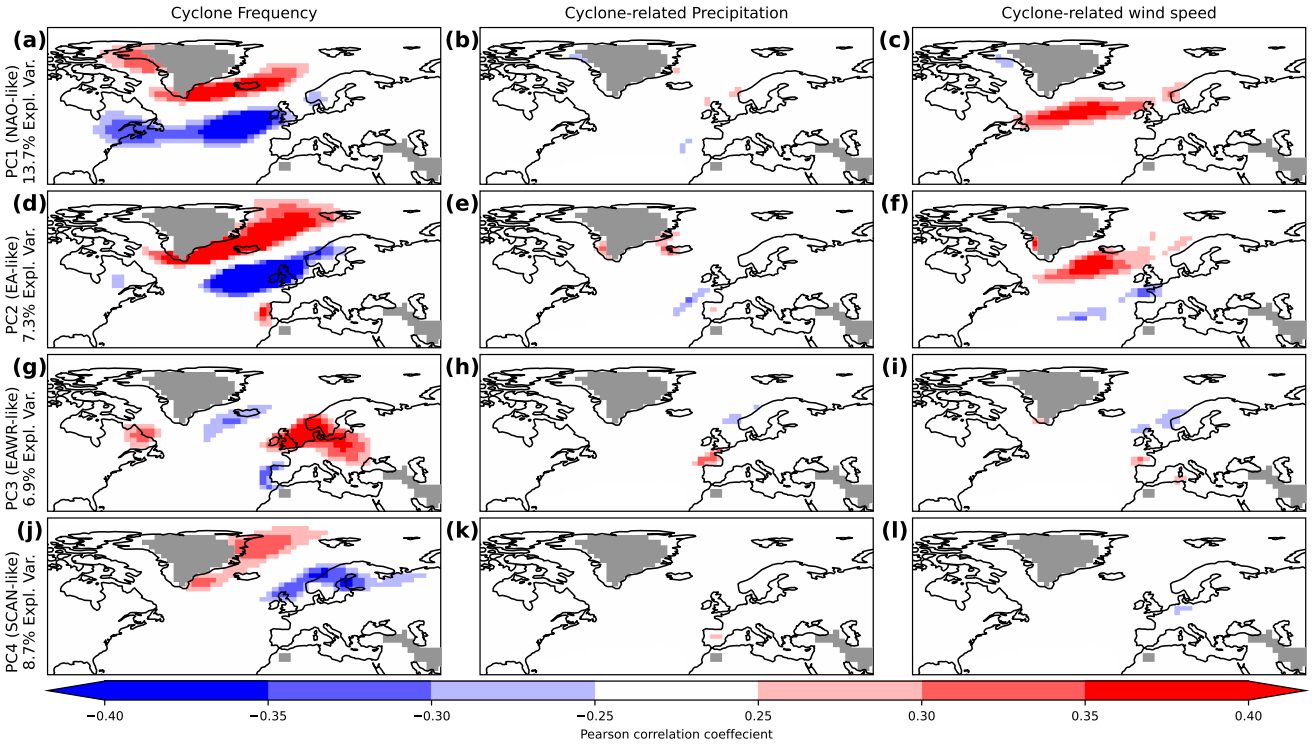

Figure S2. Same as Fig. 6, but now for JJA.

Table S2. Number of overlapping EXCs that are present in two or more extremeness rankings.

	Overlap wind speed and precipitation EXCs	Overlap wind speed and compound EXCs	Overlap precipitation and compound EXCs
EXC10 CMED	0	2	5
EXC100 CMED	8	45	45
EXC1000 CMED	256	548	469
EXC10 EMED	0	3	3
EXC100 EMED	14	52	49
EXC1000 EMD	295	584	602

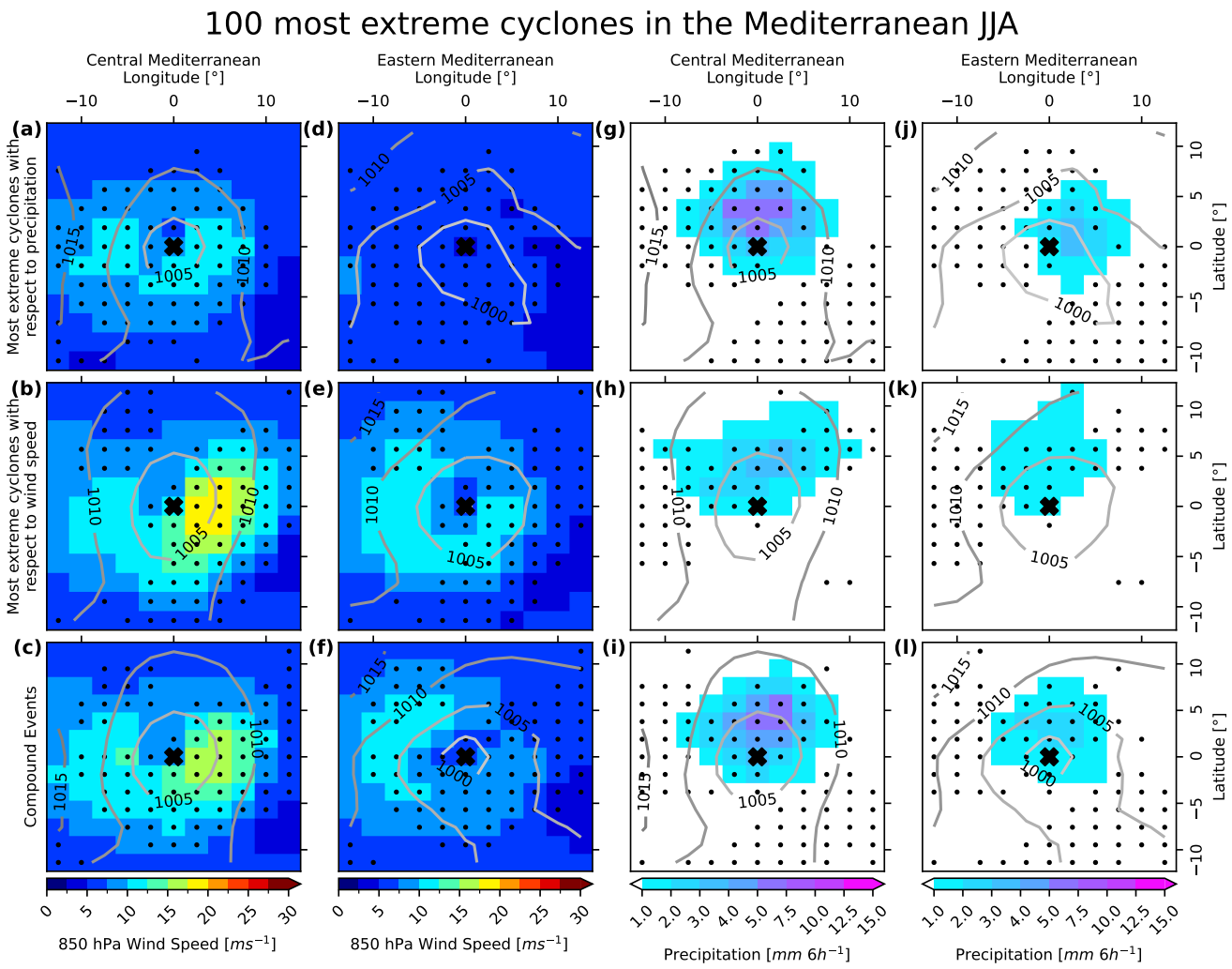

Figure S3. Same as Fig. 7, but now for JJA.

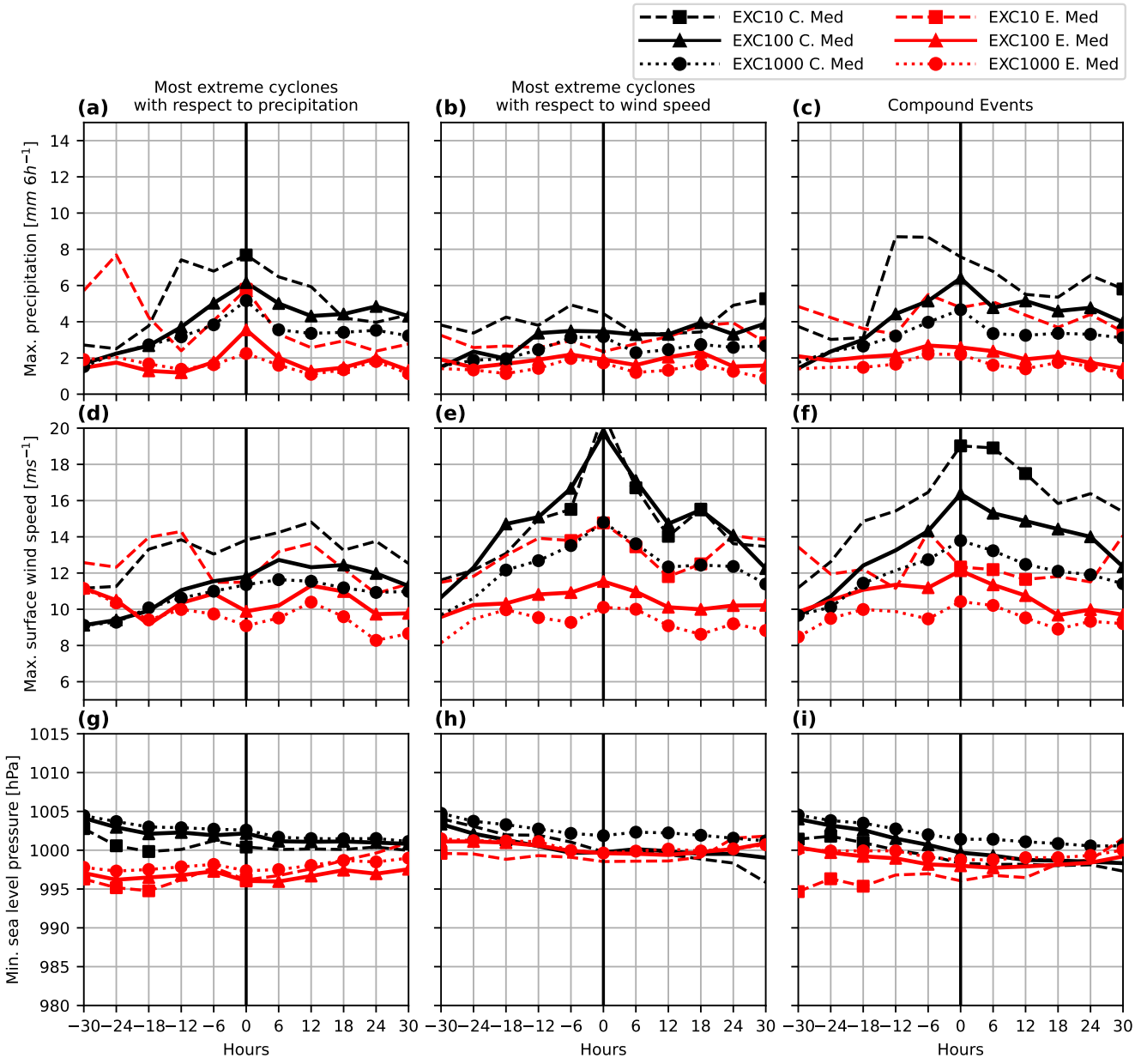

Figure S4. Same as Fig. 8, but now for JJA.

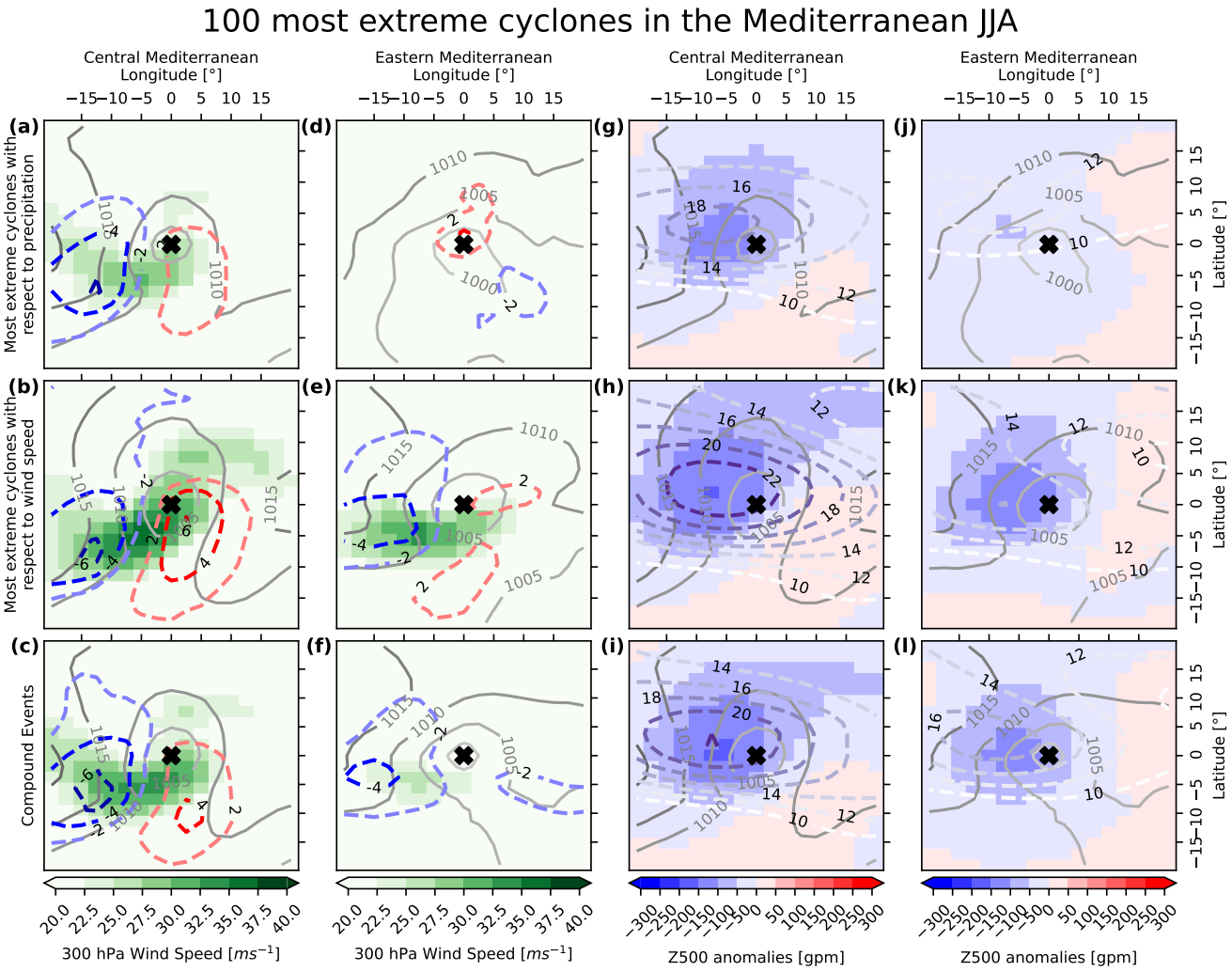

Figure S5. Same as Fig. 9, but now for JJA. Please note that the colorbar for the 300 hPa wind speed is different here compared to Fig. 9.

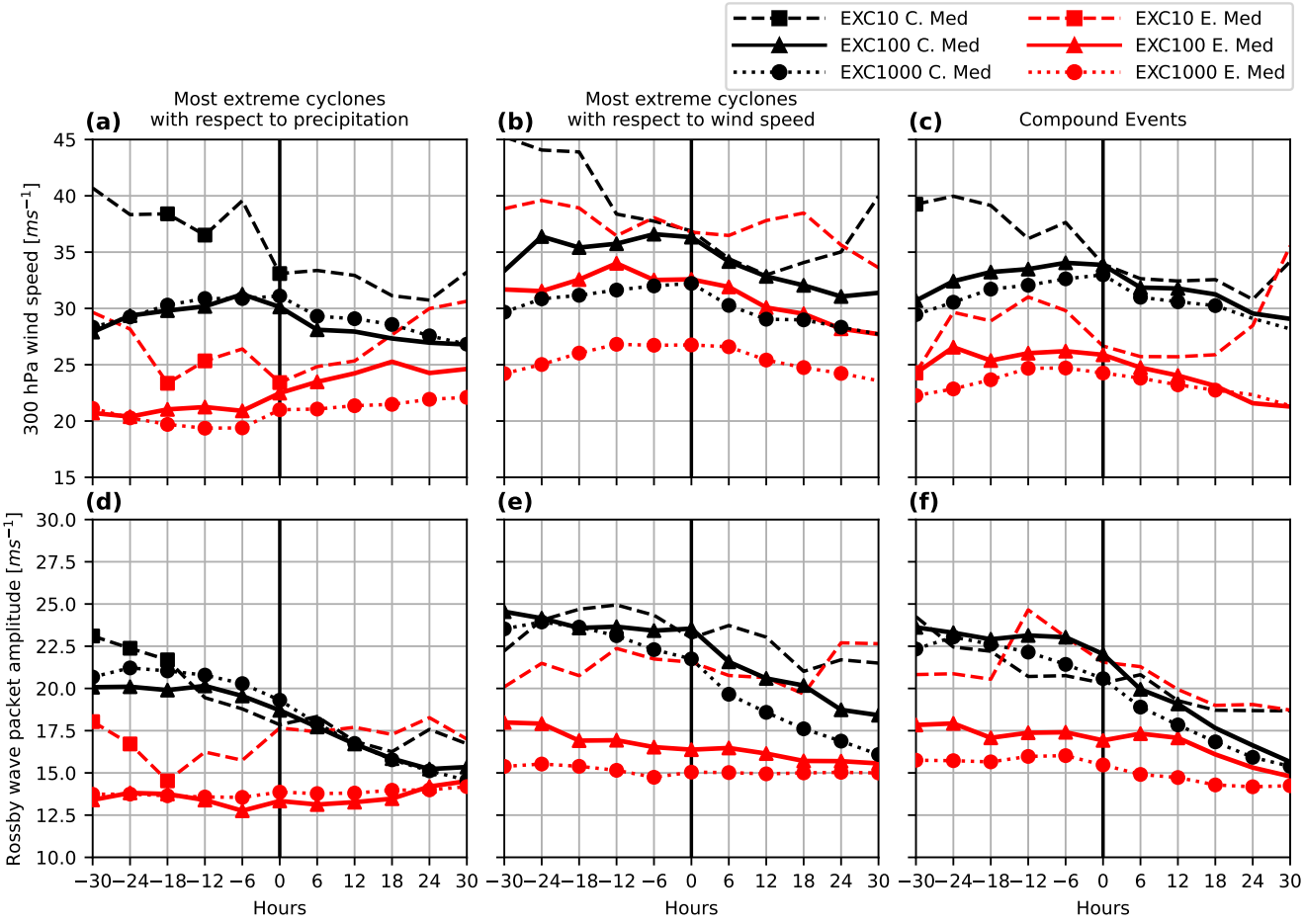

Figure S6. Same as Fig. 10, but now for JJA.