



Supplement of

A 20-year satellite-reanalysis-based climatology of extreme precipitation characteristics over the Sinai Peninsula

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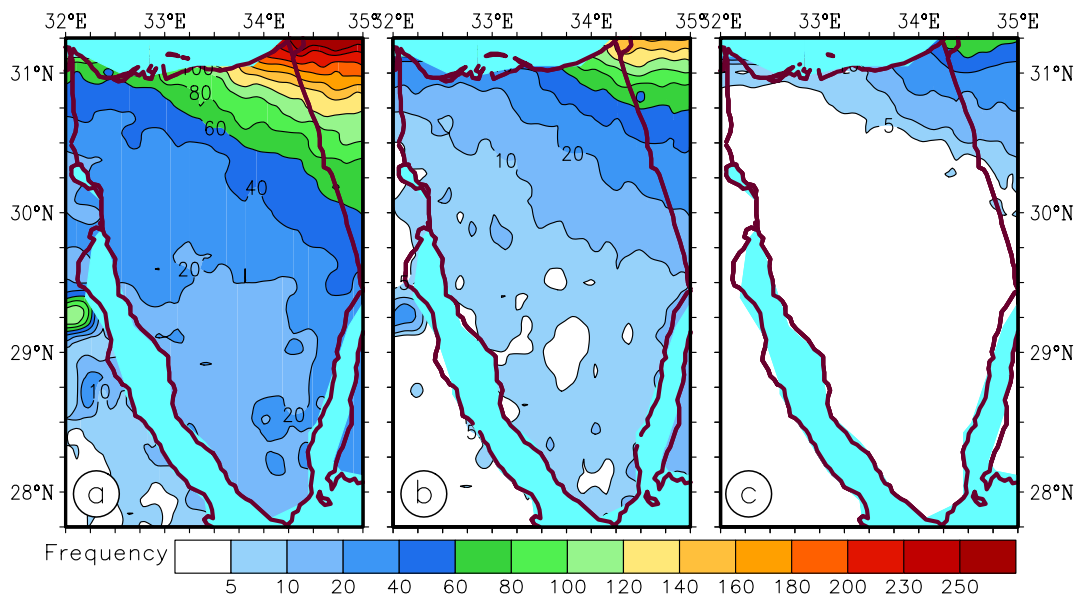


Figure S1. Frequency occurrence of the precipitation events with thresholds of a) ≥ 5 mm/day, b) ≥ 10 mm/day and c) ≥ 20 mm/day in the Sinai Peninsula for the period of 2001-2020. Units are in days.

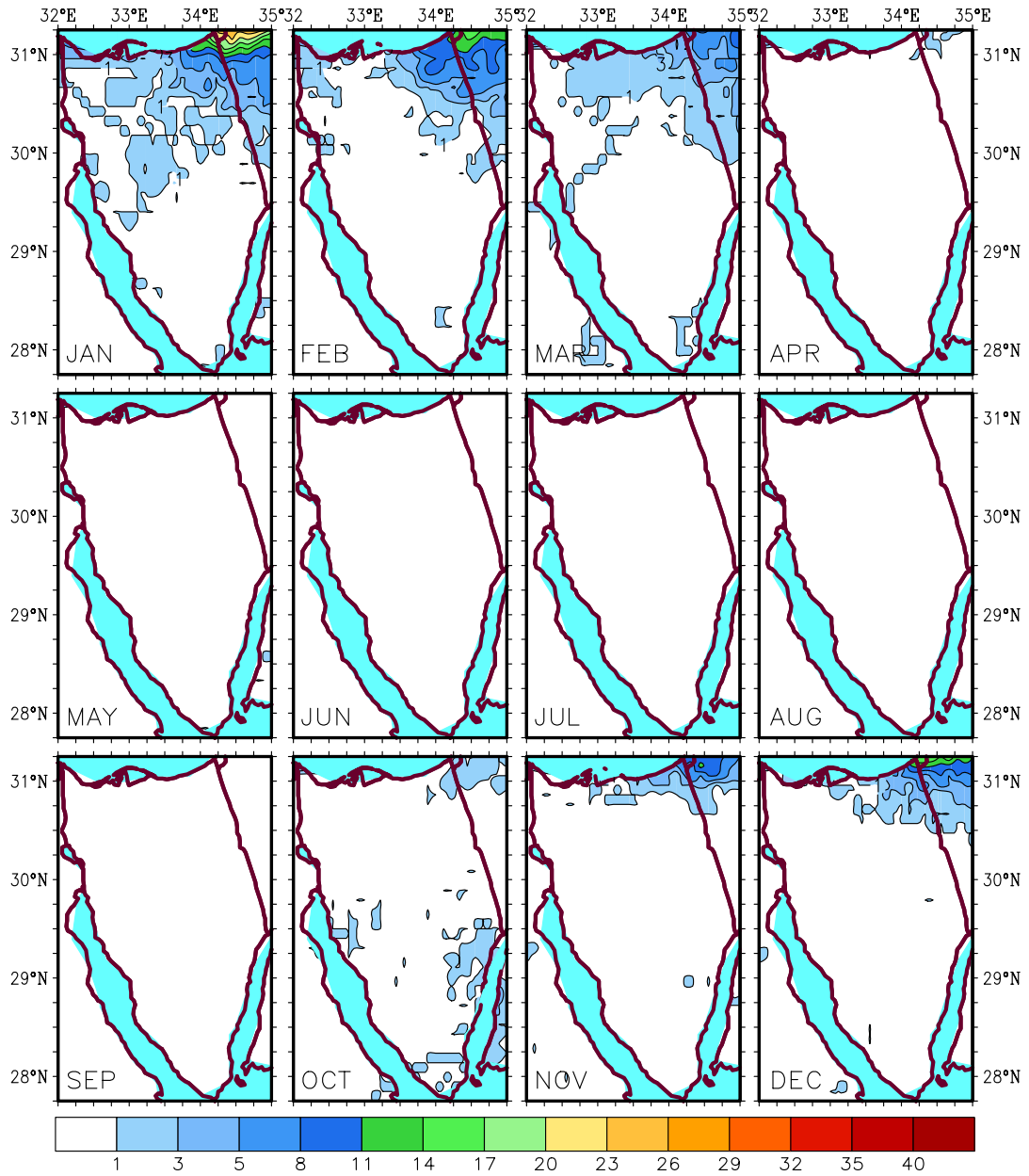


Figure S2. Frequency occurrence of the monthly precipitation climatology events with a threshold of ≥ 20 mm/day for the period of 2001-2020 (7305 days) over the Sinai Peninsula. Units are frequency in days.

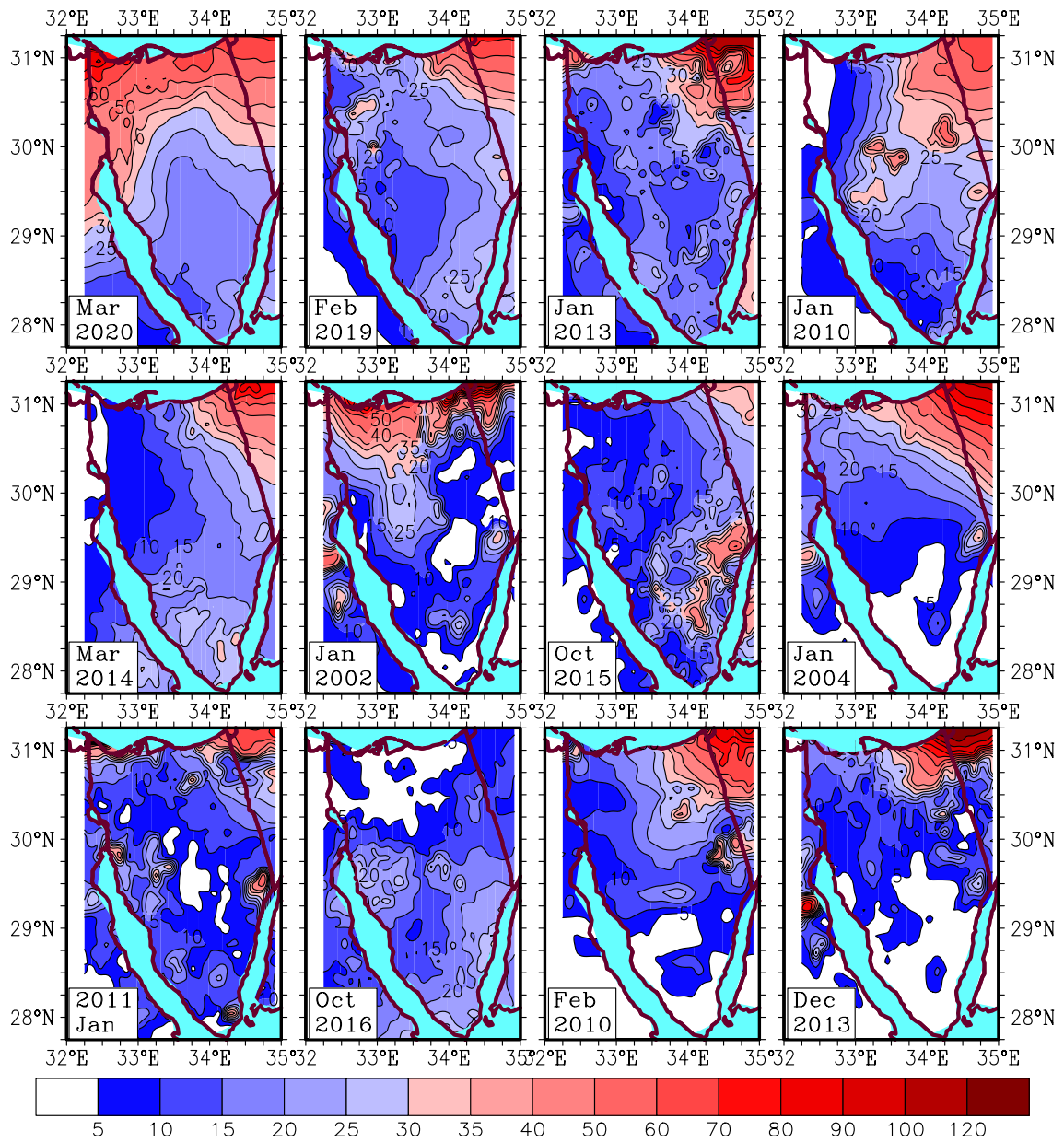


Figure S3. The twelve wettest months (out of 240 months) in the Sinai Peninsula for the period of 2001-2020. The panels are ranked in order from top-left to bottom-right. Units are in mm.

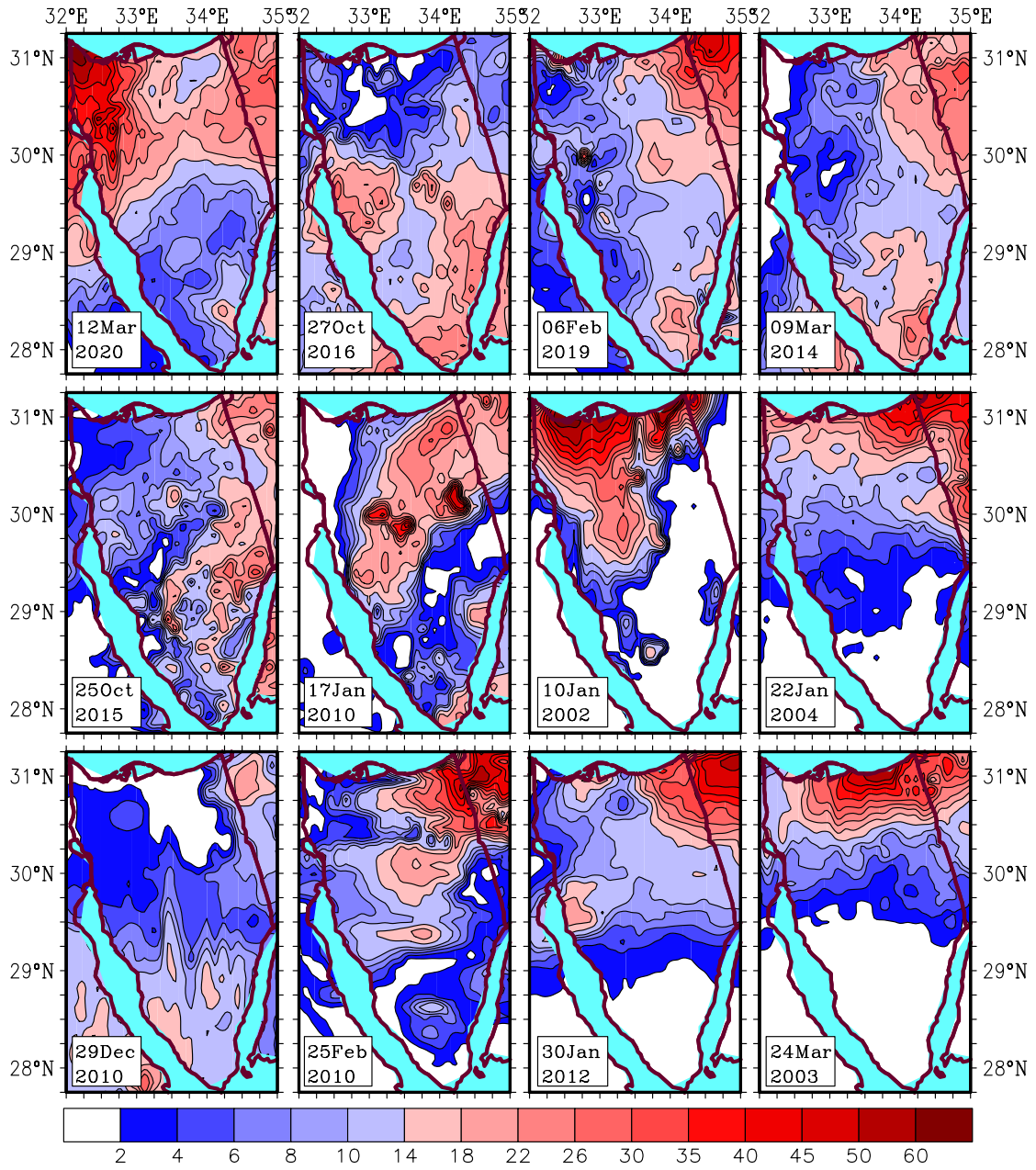


Figure S4. Same as Fig. S3, but for the twelve wettest days (out of 7305 days).

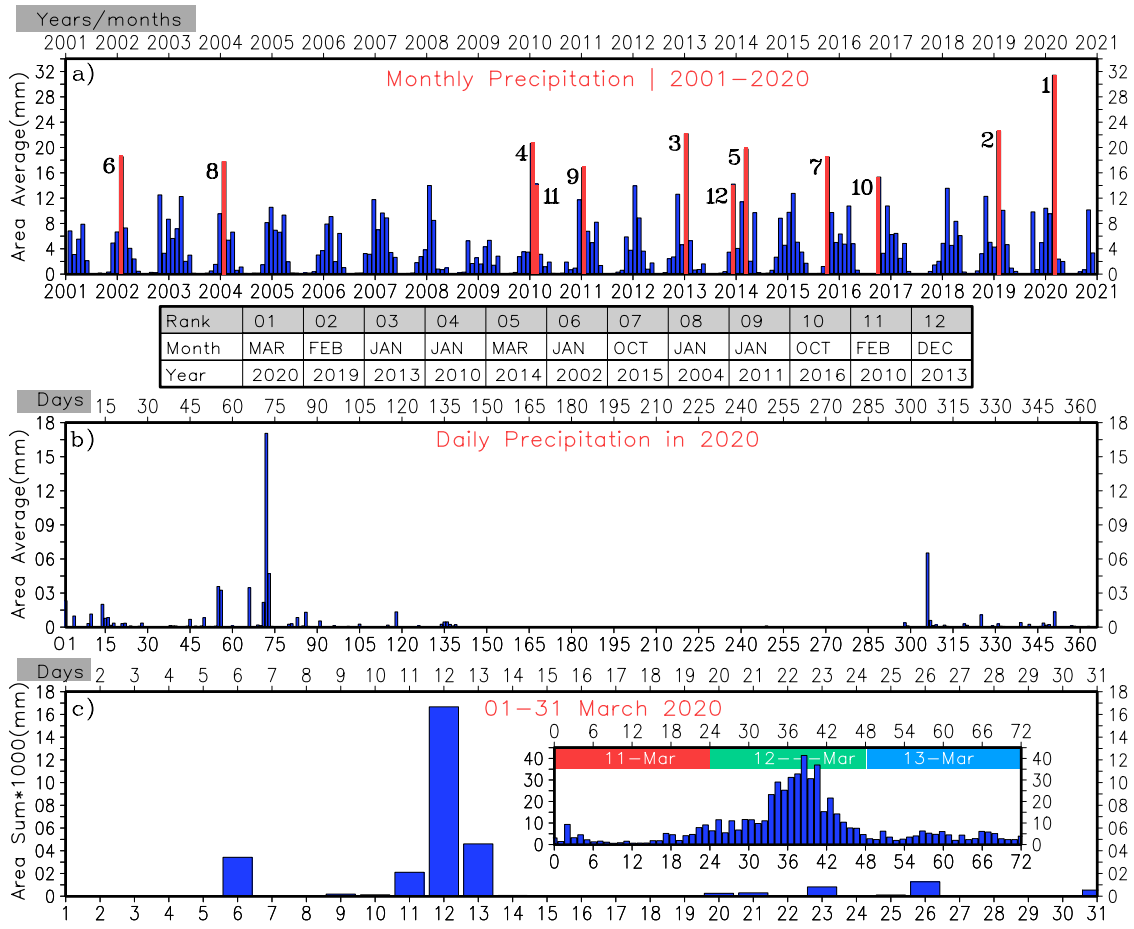


Figure S5. The regional averaged precipitation amounts over the of Sinai Peninsula: a) areal averaged monthly precipitation timeseries for the climatology period of 2001-2020 (240 months), and the table ranks 12 months/years with the highest rainfall received over the past two decades; b) daily precipitation timeseries in 2020; c) daily precipitation of the period 1-31 March 2020, and the subplot indicates the rainfall event of 11-13 March in hourly interval.

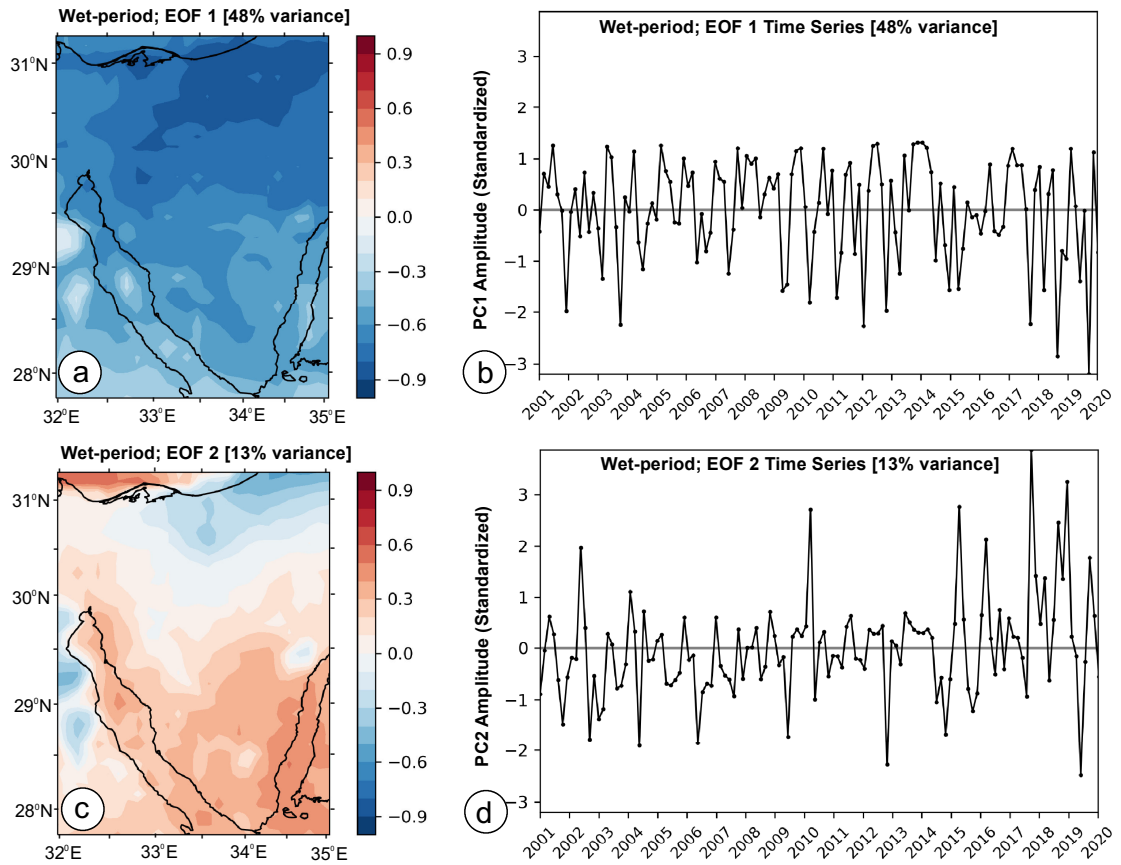


Figure S6. The two leading EOF spatial patterns (a and c) and the associated timeseries (b and d) of the monthly mean precipitation dataset (wet-period: October-March, 120 months) for the climatology period of 2001-2020 in the Sinai Peninsula. The values of EOFs (a and c) are expressed as correlation coefficients.

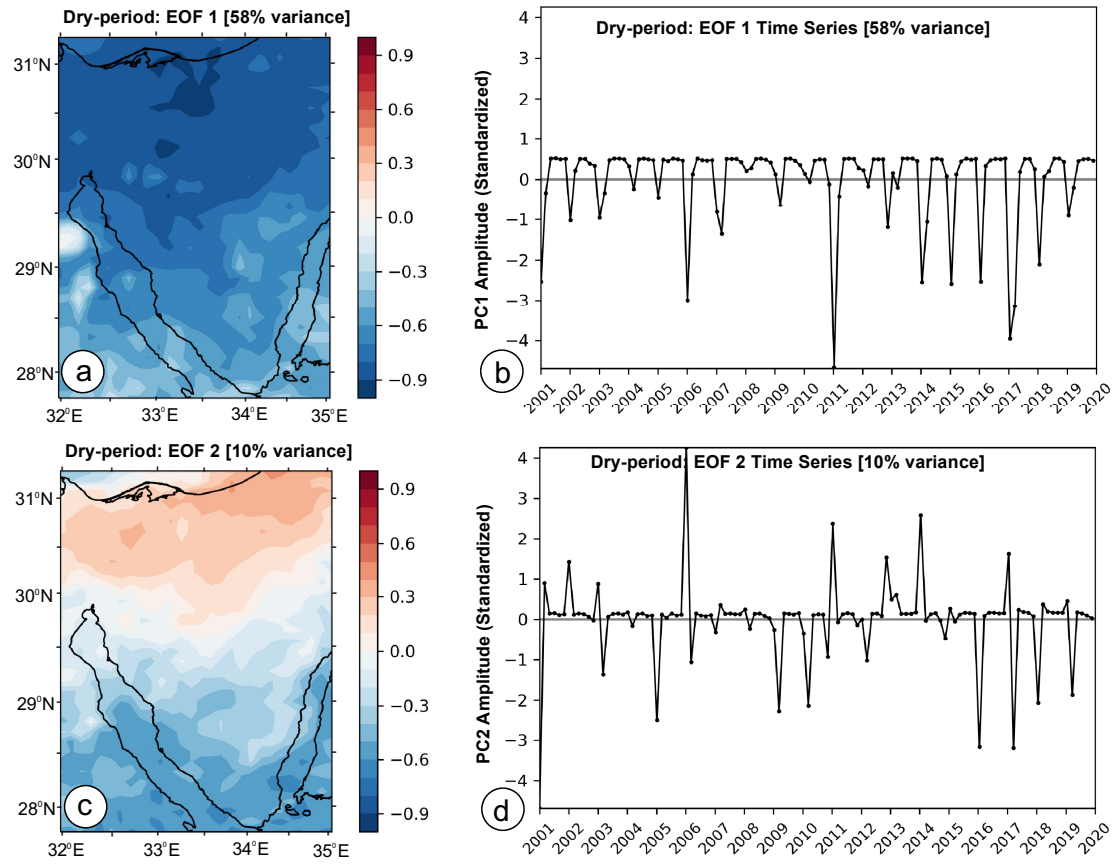


Figure S7. Same as Fig. S6, but for the dry-period (April-September).

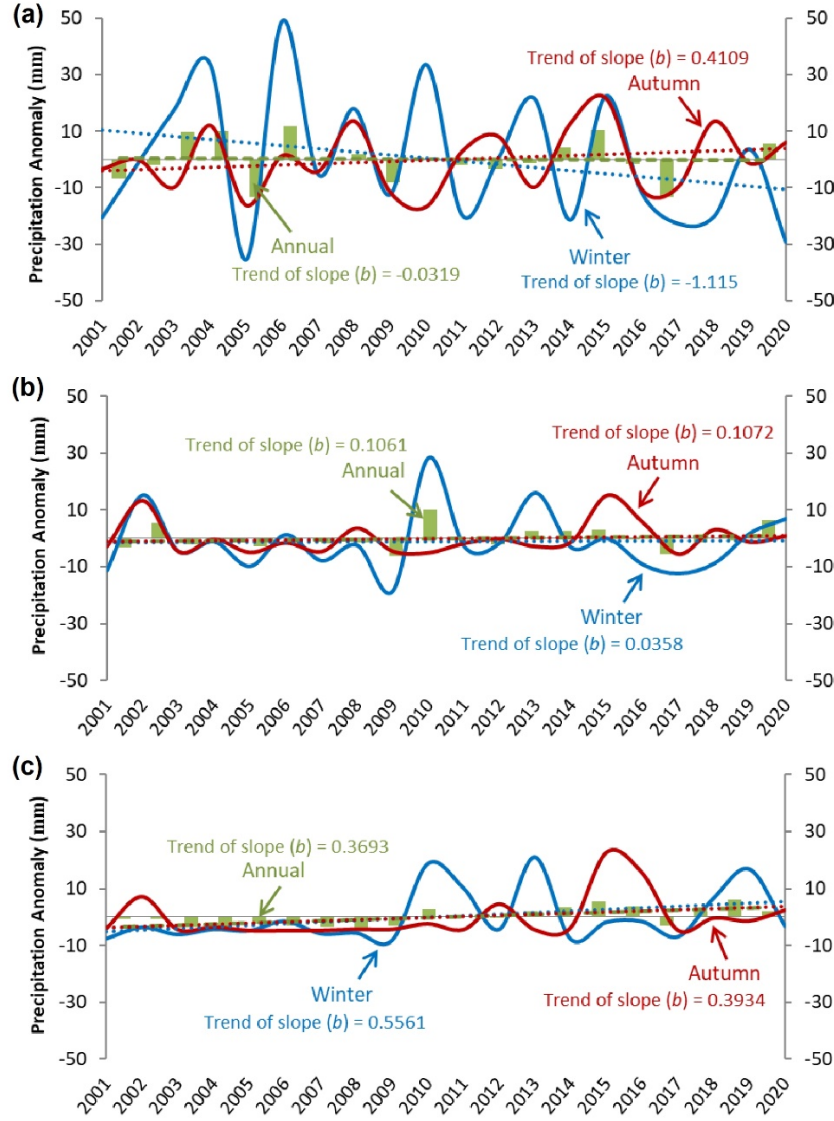


Figure S8. Annual and seasonal changes in the total precipitation (mm) for three selected sites in (a) north, (b) middle and (c) south of the Sinai Peninsula during 2001-2020. For the locations of the sites, see Fig. 1 in the manuscript. In the panels, winter (DJF) is given in blue, autumn (SON) is given in red, and annual in green color.

Table S1. The 95% and 99% bootstrapped confidence interval (CI) for the Mean and Median values of the original dataset (mean seasonal and annual for 20-years: 2001-2020) for the selected sites across the Sinai (anomaly-based analysis in Fig. S8), see Fig. 1 for the locations. For this analysis, 300 bootstrapped samples were generated each with a sample size of $n=10$.

	North-site			Middle-site			South-site		
	Winter	Autumn	Annual	Winter	Autumn	Annual	Winter	Autumn	Annual
<i>Average precipitation (mm)</i>	68.6	18.5	28.4	22	6.1	9.3	9.1	4.8	5.1
95% bootstrapped CI for Mean value of original dataset	79.8	24	31.9	30.8	9.1	11.2	14.3	9.4	6.9
99% bootstrapped CI for Mean value of original dataset	85.5	26	33.4	35.4	10.3	12	16.2	10.8	7.3
95% bootstrapped CI for Median value of original dataset	88.3	26.1	31.4	23.9	7.5	10.5	11.7	5.3	7.5
99% bootstrapped CI for Median value of original dataset	90.4	29.1	36.1	29.1	9.7	12	17.5	8.2	8.3

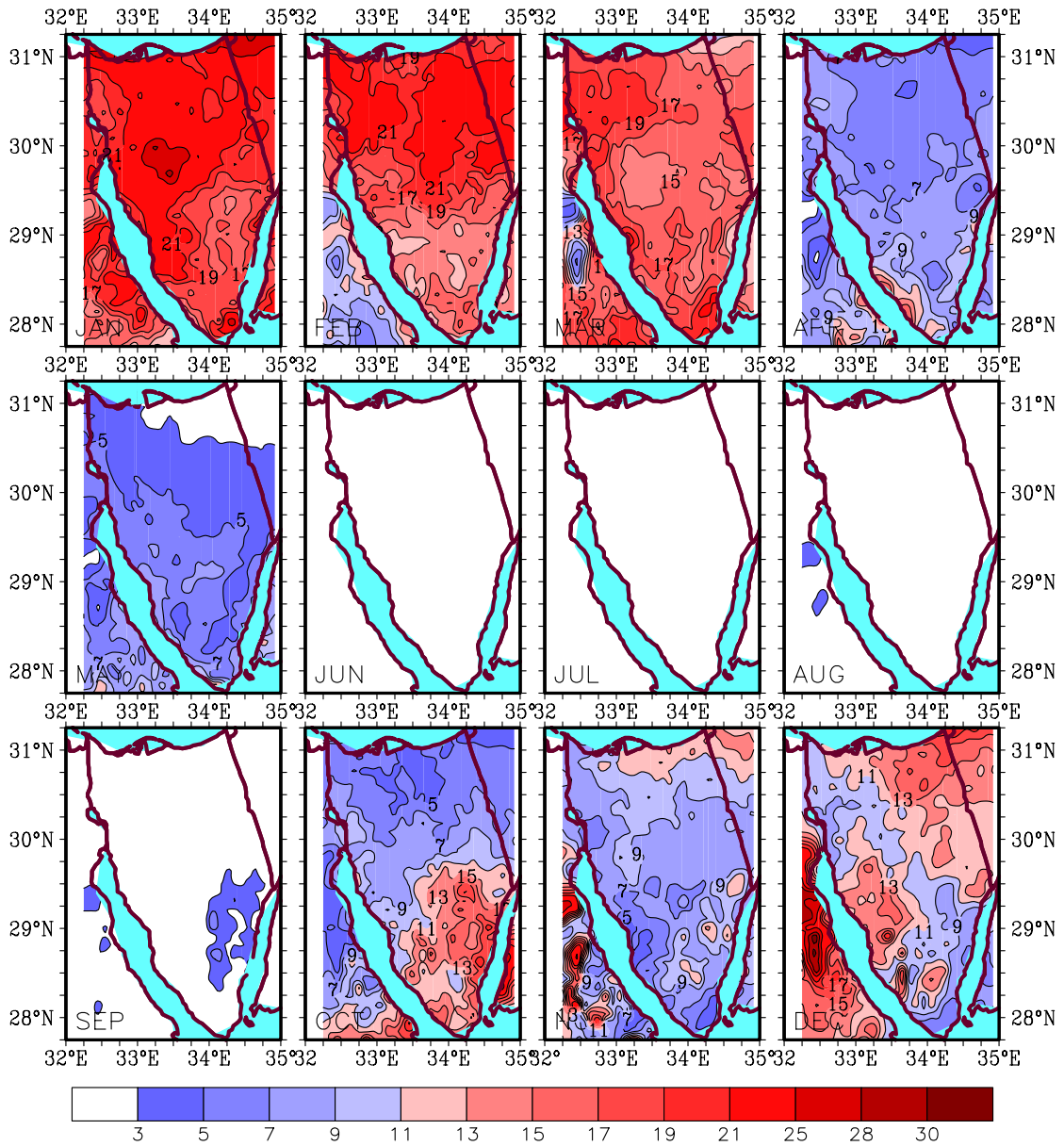


Figure S9. Monthly precipitation regime: the ratios of monthly sum precipitation to the annual total precipitation (%) in the Sinai Peninsula for the period of 2001-2020. Units are in percentage.

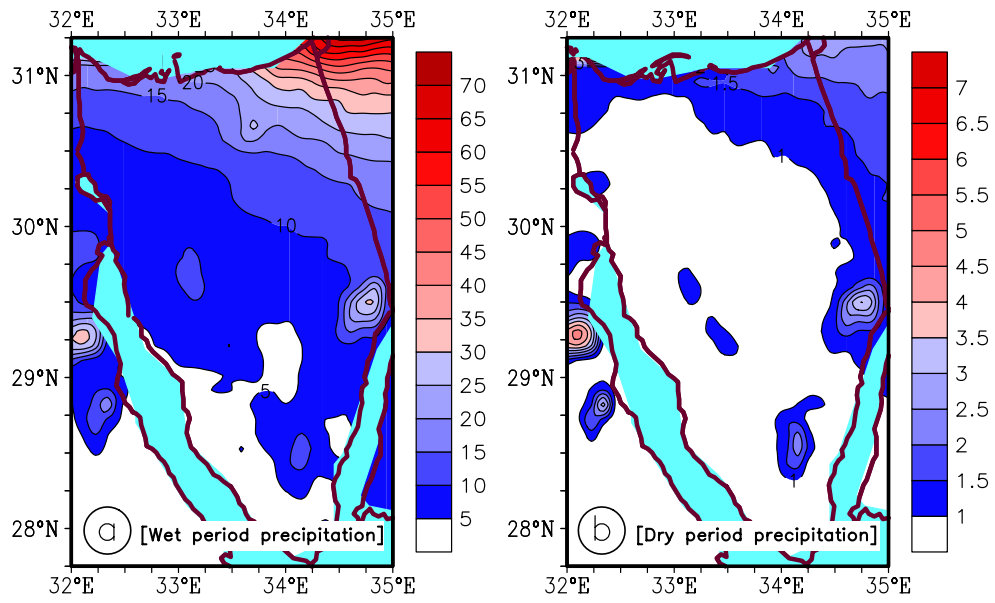


Figure S10. Mean monthly precipitation for: (a) wet period from October to March, and (b) dry period from April to September in the Sinai Peninsula for the period of 2001-2020. Units are in mm/month.