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Synoptic classification in 21st Century CMIP5 predictions over the Eastern Mediterranean with focus on cyclones

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The Mediterranean has been recognized as a 'hot spot', currently influenced by climate change, and predicted to be strongly affected in the future by significant warming and drying. This trend is expected to be expressed in changes in the occurrence and intensity of Mediterranean cyclones, in general, and of East Mediterranean (EM), i.e. Cyprus Lows (CL), in particular, as well as in the occurrence of all other synoptic systems dominating the region.
Here, we have modified the semi-objective synoptic classification (Alpert et al., 2004) to investigate future changes in the occurrence of EM synoptic types, with an emphasis on CLs. The modified classification was applied to eight CMIP5 models for the present (1986-2005), mid-21st century (2046-2065) and end of the century (2081-2100) periods, for both RCP4.5 and RCP8.5 scenarios.
The modified classification captured the synoptic type frequencies for the present period well, and particularly excelled in capturing that of the CLs. For the future period, a ∼35% reduction in CL occurrence is found towards the end of the 21st century (RCP8.5). The reductions in the frequencies of CLs are accompanied by an increase in the frequencies of Red Sea Troughs in winter. The predicted changes in the occurrence of various synoptic types in general and of CLs, in particular, will lead to a more accurate forecast of local potential climatic hazards.

Citation
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Reference
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