

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

Assaf Hochman^{1, 2, 3}, Tzvi Harpaz^{1, 2}, Hadas Saaroni², Pinhas Alpert¹

¹ Department of Geophysics, School of Geosciences, Tel-Aviv University, Tel-Aviv, Israel.

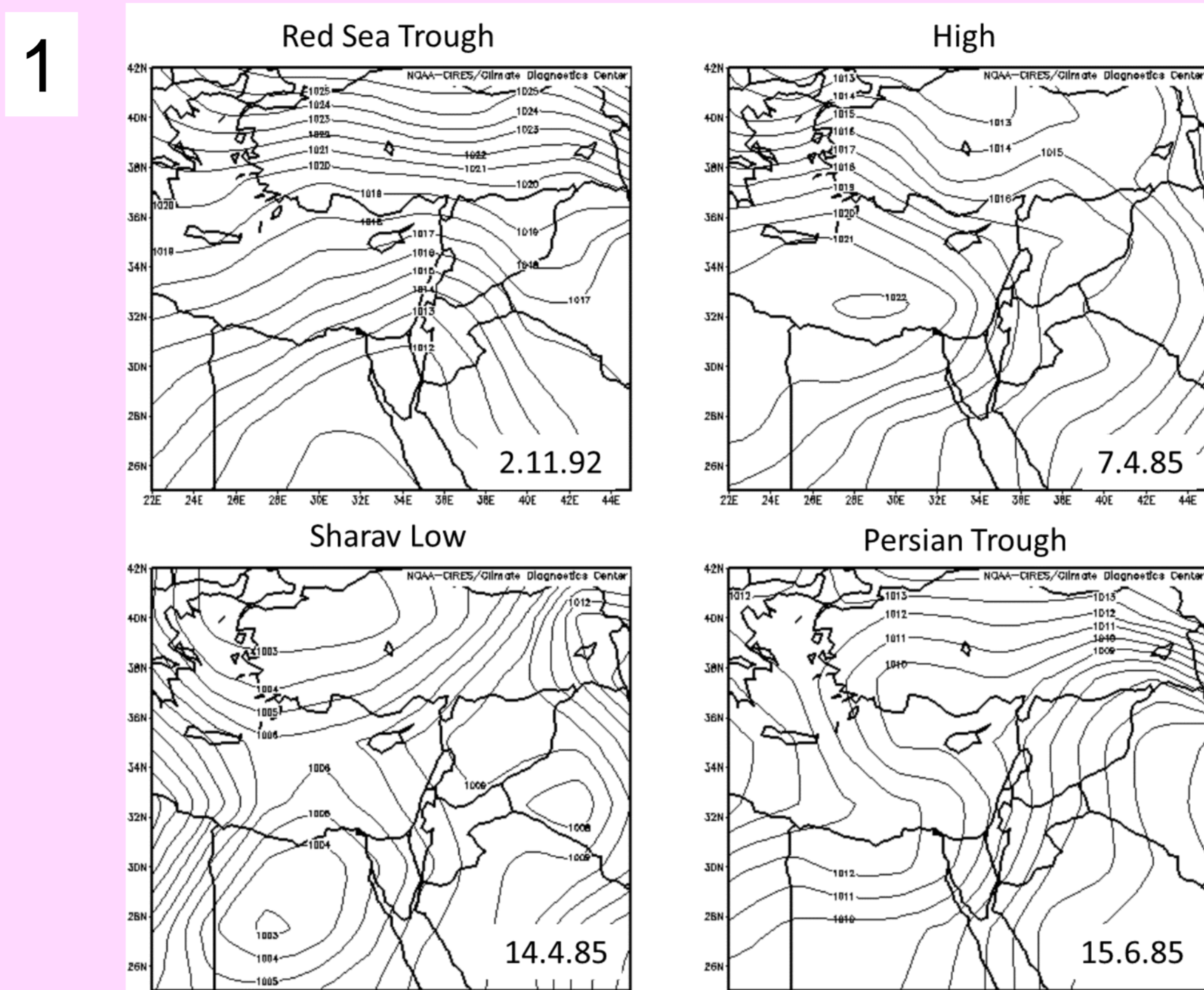
² Department of Geography and the Human Environment, School of Geosciences, Tel-Aviv University, Tel-Aviv, Israel.

³ Porter School of Environmental Studies, School of Geosciences, Tel-Aviv University, Tel-Aviv, Israel.

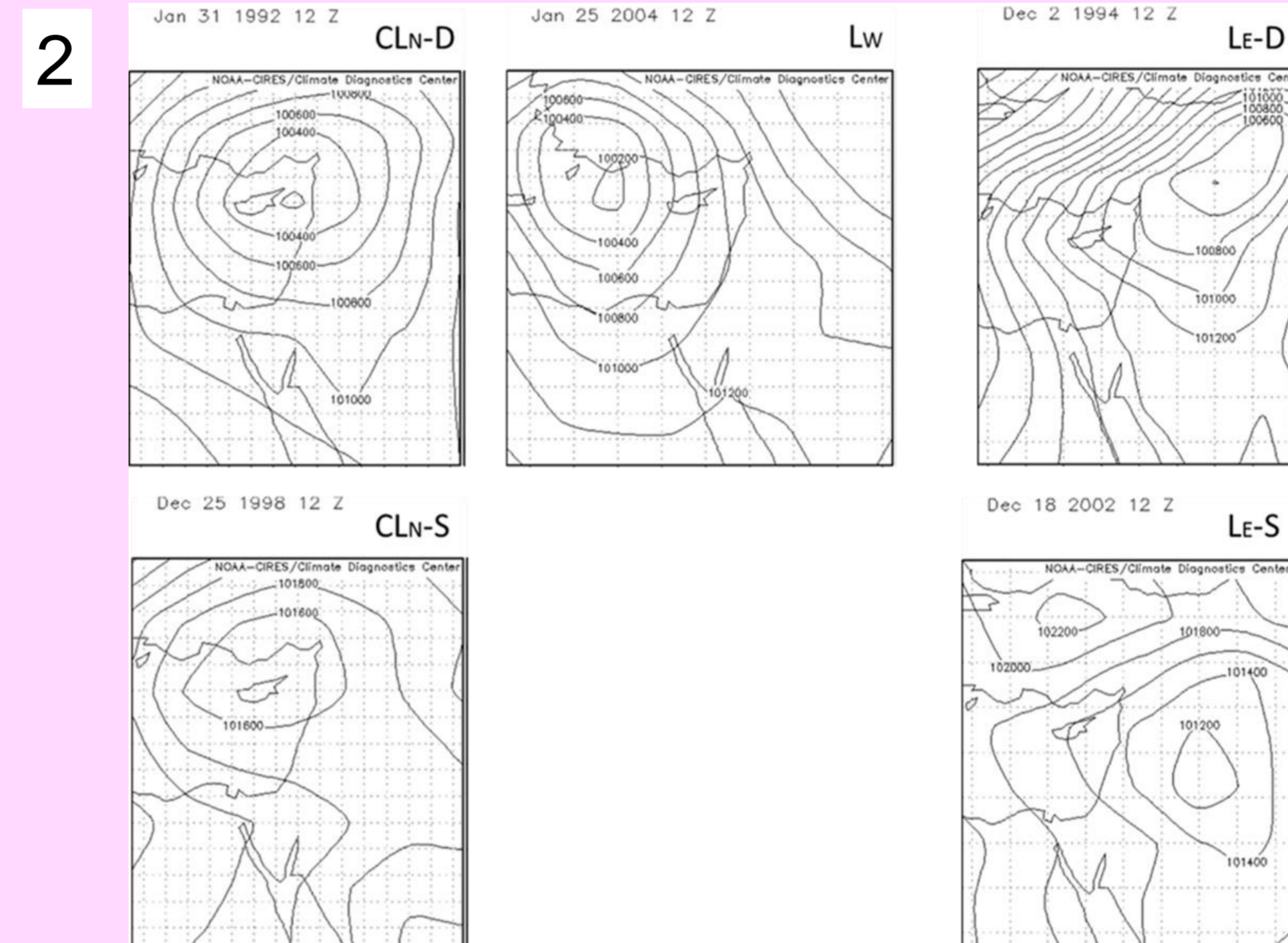
Abstract

A weather pattern classification procedure was applied to eight Global Climate Models in order to predict weather patterns occurrences in the 21st century over the Eastern Mediterranean with special focus on winter storms. A ~35% reduction in winter storms occurrence was found towards the end of the 21st century.

Introduction

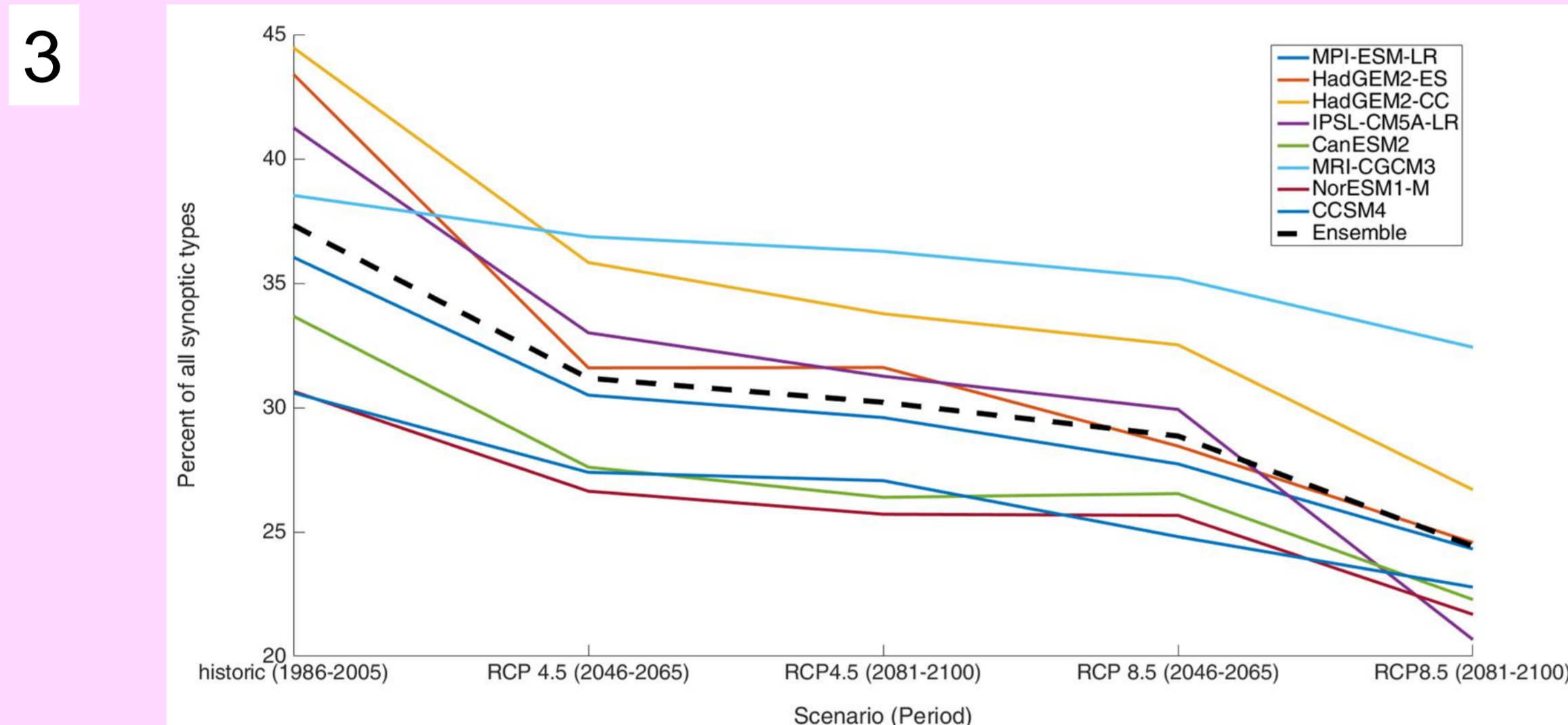


Examples of the prevailing weather patterns over the Eastern Mediterranean

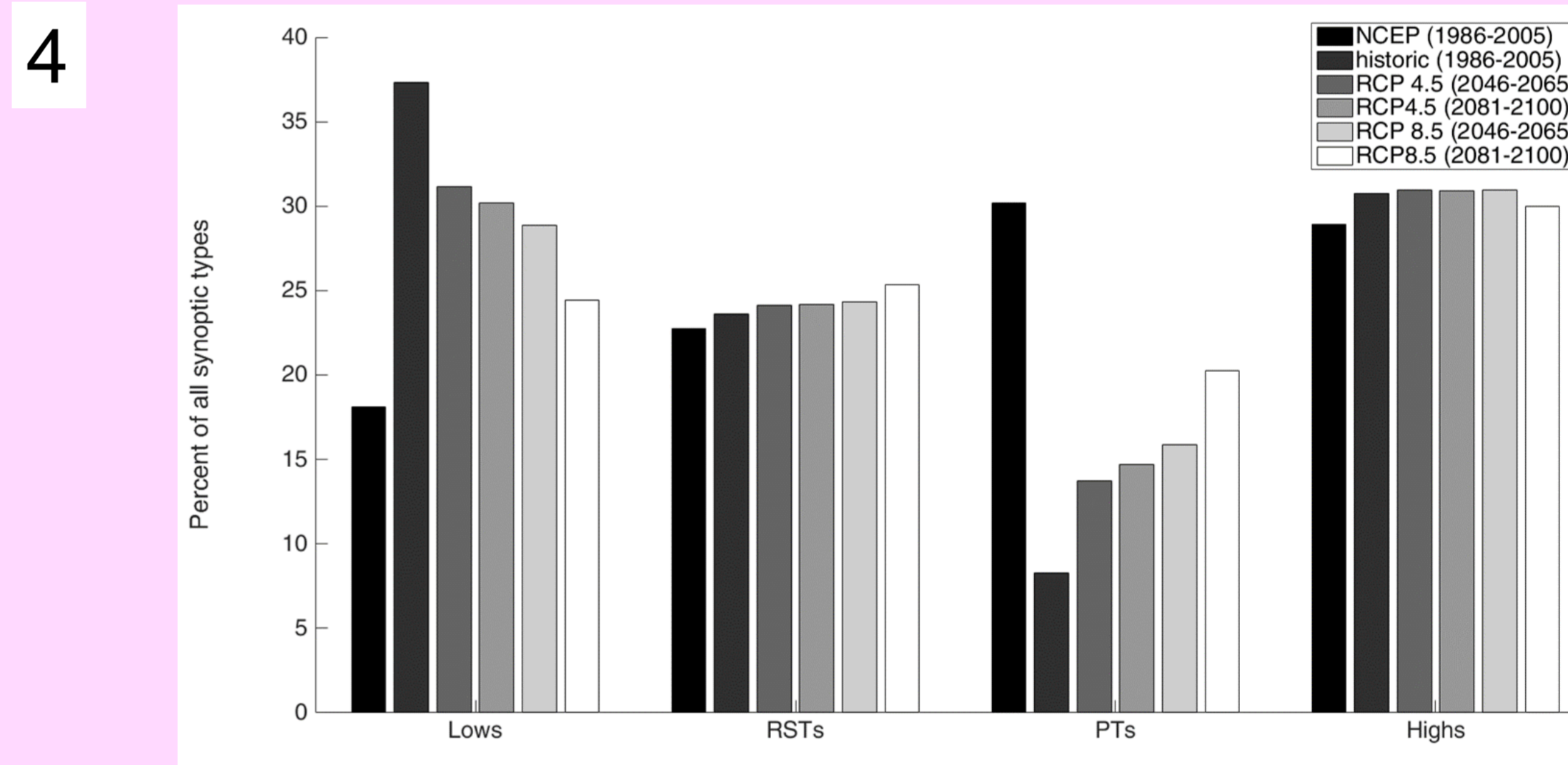


Examples of winter storms over the Eastern Mediterranean

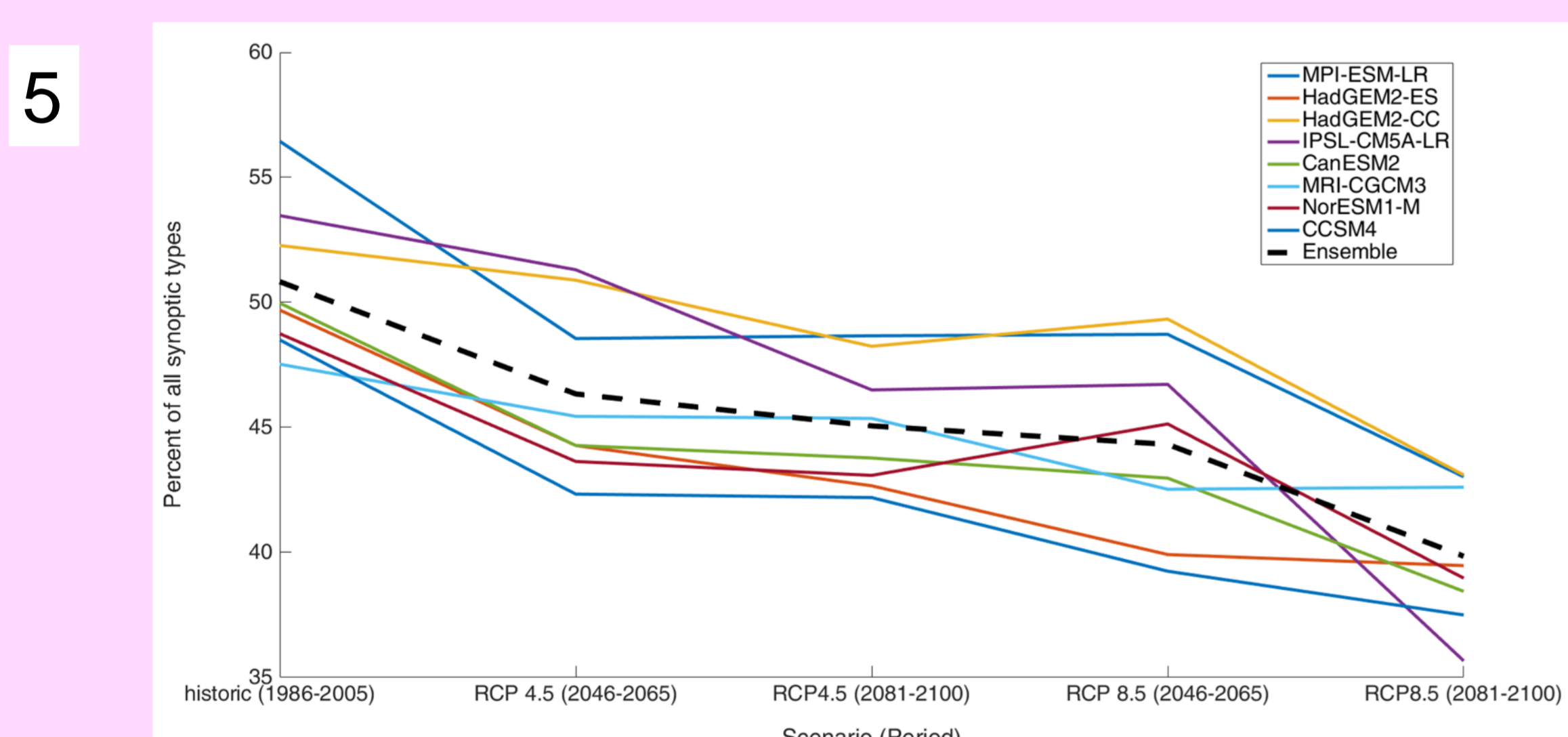
Results



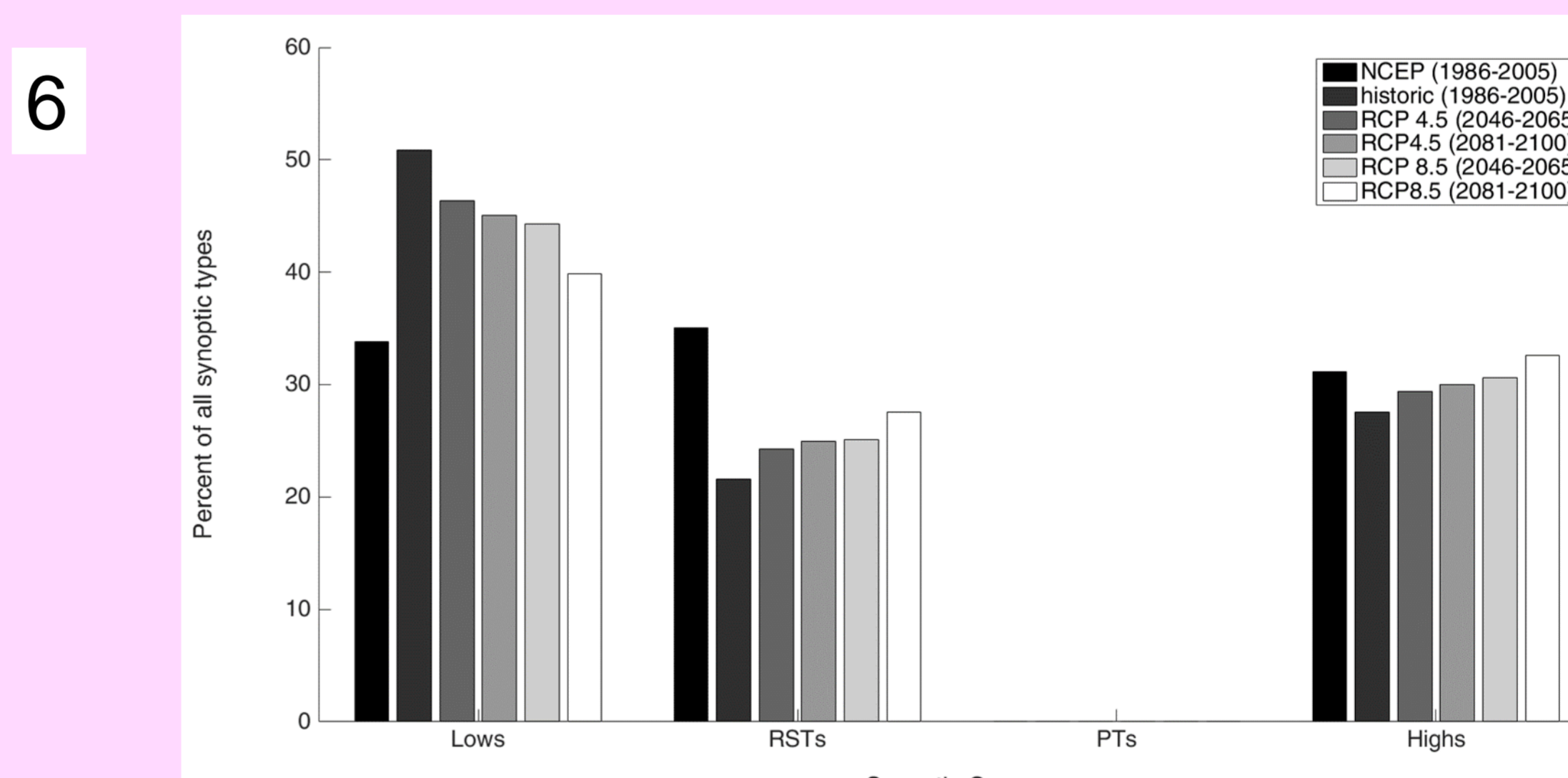
The annual predicted occurrence of winter storms in the 21st century over the Eastern Mediterranean.



The annual predicted occurrence of weather patterns in the 21st century over the Eastern Mediterranean (Lows-winter storms, RST-Red Sea Troughs, PT-Persian Troughs, H – Highs).



The winter predicted occurrence of storms in the 21st century over the Eastern Mediterranean.



The winter predicted occurrence of weather patterns in the 21st century over the Eastern Mediterranean (Lows-winter storms, RST-Red Sea Troughs, PT-Persian Troughs, H – Highs).

Conclusions

A significant reduction in winter storms occurrence was found towards the end of the 21st century. The reduction in winter storms frequencies are accompanied by an increase in the frequencies of Red Sea Troughs, Persian Troughs and Highs, which are mostly warm and dry weather patterns. The predicted changes in the occurrences of various weather patterns will lead to a more accurate forecast of climatic hazards.

Reference: Hochman A, Harpaz T, Saaroni H, Alpert P. 2017. Synoptic classification in 21st century CMIP5 predictions over the Eastern Mediterranean with focus on cyclones. *International Journal of Climatology*. DOI: 10.1002/joc.5260