



How well do models reproduce the ocean-forced teleconnections associated with droughts and pluvials in the Middle East and Southwest Asia?

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Tropical sea surface temperatures have been shown to strongly influence the seasonal and multi-year occurrence of both droughts and very wet periods (pluvials) across Southwest Asia and parts of the Middle East. Here, we examine those ocean-forced teleconnections from three perspectives: how their influence varies within this broad region, how well their influence is captured by a range of models, and how closely their influence is linked to societal impacts. This combination of perspectives improves our understanding of these modes, especially in relation to societal impacts, and provides key information for evaluating climate projections.

The teleconnections are examined first in observational data, considering differences resulting from focusing on the western part of the region (the Mediterranean coastal Middle East) to the eastern part of the region (the Pamir mountains), and then comparing the observational results to ensemble simulations from a range of models. There are notable differences between models, with important implications for understanding the dynamics of the events and for setting confidence bounds on climate change projections in the region.

The relationship between droughts and floods in the region is also considered. The teleconnections associated with pluvials are approximately antisymmetric to those associated with droughts. Floods occur over a considerably shorter time-scale, however, and their variability is examined by analyzing changes to the frequency of floods between pluvial and drought periods, considering floods as recorded in the Dartmouth Flood Observatory and the CRED EM-DAT disaster database.