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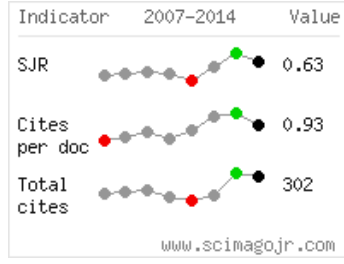
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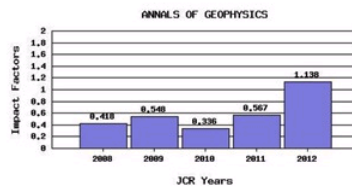
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Mediterranean precipitation and its relationship with sea level pressure patterns

R. Thompson, D. N. Green

Abstract

The relationship between Mediterranean precipitation and North Atlantic and European sea level pressure fields has been studied using statistical techniques to investigate the variability within the data. A principal component analysis shows the major winter precipitation variability is described by a see-saw fluctuation between the Western and Eastern Mediterranean. The pressure-precipitation relationships indicate that a highly variable, pressure region situated to the south of Britain dominates this major precipitation pattern. The large-scale pressure fields which facilitate the precipitation patterns have been isolated using a canonical correlation analysis. Although the well-known major pressure centres of action in the North Atlantic are important, pressure changes in the east are found to also control the transport of moisture across the Mediterranean to a large degree, as the presence of a large high over Kazakhstan causes meridional flow and impedes the passage of moisture across the Mediterranean. The pressure-precipitation relationships are found to be very consistent over multi-decadal, seasonal, monthly and daily time-scales with trajectory analysis confirming many of the features of the average seasonal pressure charts. This steadiness and regularity indicates that the Mediterranean precipitation teleconnection is a robust phenomenon that is affected by large-scale pressure changes to both the east and west.

Keywords

Mediterranean; precipitation; principal component; canonical correlation; trajectory

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