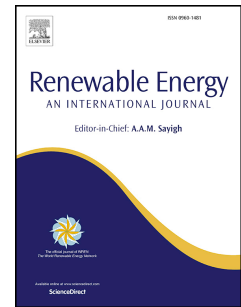


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Study of inter-correlations of solar radiation, wind speed and precipitation under the influence of El Niño Southern Oscillation (ENSO) in California

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ABSTRACT

El Niño Southern Oscillation (ENSO) is recognized as an influential climate pattern on meteorological variables such as global solar radiation (H), wind speed (V) and precipitation (P). California as one of the leading States in increasing renewable energy utilization, having established a Renewables Portfolios to meet its electricity demand from renewable energy resources. In this study, long-term 50 years datasets (1961-2010) of eight locations representing different climate conditions of California are utilized. The main objective of this work is to investigate the sensitivity of H, V and P and their variation to El Niño events (very strong and strong El Niño) and La Niña events (strong and moderate La Niña) in different regions of California. The results showed distinct impacts of El Niño and La Niña events on the magnitude and distribution of the studied meteorological variables. The impact of ENSO events on these variables are found to be geographically and seasonally dependent. Furthermore, the degree to which the variables link to ENSO depends on intensity of the events. Overall, the results suggest that ENSO is a potentially useful prognostic tool for California solar and wind energy and hydropower planning for upcoming events.

Keywords: El Niño, La Niña, Global solar radiation, Wind speed, Precipitation, Correlations.

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