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# Eastern Venezuela coastal upwelling in context of regional weather and climate variability

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## Abstract

Regional factors modulating eastern Venezuela coastal upwelling emerge from this observational study. Trade winds of 3-9 m/s are a persistent feature of the shelf zone, and drive offshore Ekman transport and pumping, cooling SST by 1-3°C especially in spring. Wavelet spectral analysis of SST anomalies (11°N, 65°W) show significant intra-seasonal (9, ~45, ~100 days) and inter-annual oscillations (~3, 9 years). A case study upwelling event of 3-5 May 2014 is distinguished by a low level wind jet on the shelf edge. An ocean eddy propagated westward along the shelf, initially suppressing then enhancing offshore transport. Venezuela SST variability reflects atmospheric control by the North Atlantic anticyclone and associated trade wind-driven shelf water transport and regional evaporation. Eastern Venezuela coastal upwelling involves an atmospheric meridional overturning circulation that affects the frequency of Caribbean hurricanes.

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