



Atmospheric and oceanic variability related to dry regimes in Canada

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This study documents and assesses the atmospheric and oceanic variability associated with growing season (May to August) droughts over the Canadian Prairies. For comparison, extreme wet seasons or pluvials are also examined. Using the Palmer Z-Index as a drought indicator, extreme dry and wet seasons are firstly identified for the period 1950 to 2007. Inter-relationships among several atmospheric parameters including large to synoptic-scale circulation patterns, low-level moisture transport, moisture convergence, precipitable water content, and cyclone frequency are then assessed during extreme drought and pluvial periods. In addition, links to the previous winter's global sea-surface temperature (SST) patterns are identified using the multivariate technique of singular value decomposition.

These circulation patterns over western North America and their associated moisture transport anomalies into the Prairies show some linkages to previous winter SST patterns both globally, and in the Pacific Ocean where the SSTs are similar to those associated with inter-annual El Niño/Southern Oscillation (ENSO) events and ENSO-like inter-decadal North Pacific variability.