

Impact of El Niño Southern Oscillation (ENSO) on Hydrometeorology Variability at Valle del Cauca State, Colombia, Using Canonical Correlation Analysis

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Abstract. The linear teleconnections between the ENSO phenomenon and Valle del Cauca State, Colombia (Colombia) monthly inter annual and seasonal hydro meteorology were studied. Two multivariate statistical techniques were used: Empirical orthogonal functions (EOFS) and the canonical correlation analysis (CCA). The ENSO effect is higher on flows than on precipitation. It was concluded that during the March-April-May (MAM) and September-October-November (SON) periods the ENSO association and effect on regional hydrometeorology is lower; while, in December-January-February (DJF) and June-July-August (JJA), the effect is higher. The inclusion of principal components of macroclimatic variables such as variables predictors for the precipitation and flows improved the prediction, indicating that they contribute with additional information. The flow models showed good fit and they can be used for prediction. Likewise, the multivariate EOFS and CCA methods proved to be valuable tools in the study of climate variability so as to understand the relationships between ENSO phenomenon with the regional hydro-meteorological regime.

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