



Link between rainfall-based weather patterns classification over British-Columbia and El Niño Southern Oscillations

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Classifications of atmospheric weather patterns (WP) are widely used for the description of the climate of a given region and are employed for many applications, such as weather forecasting, downscaling of Global Circulation Models outputs and reconstruction of past climates. WP classifications were recently used to improve the statistical characterization of heavy rainfall occurrences. In this context, bottom-up approaches, combining spatial distribution of heavy rainfall observations and geopotential height fields have been used to define WP classifications relevant for heavy rainfall statistical analysis (Garavaglia et al., 2010). The definition of weather patterns at the synoptic scale creates an interesting variable which could be used as a link between the global scale of climate signals and local scale of precipitation station measurements.

We introduce here a new WP classification centred on British-Columbia costal region (Canada) and based on a bottom up approach. We show that it is useful for the statistical characterization of British Columbia heavy rainfall. Interestingly, the frequency of occurrence of the different WP has been identified as dependent on El Niño Southern Oscillations (ENSO). This significant link can be used to discriminate different extreme rainfall distributions for “El Niño” and “La Niña” years, showing the ability of the WP approach to take into account climate variability and opening interesting perspectives for the analysis of extreme rainfall distribution in non-stationary context.

References:

Garavaglia, F., J. Gailhard, E. Paquet, M. Lang, R. Garçon, and P. Bernardara. 2010. “Introducing a rainfall compound distribution model based on weather patterns sub-sampling.” *Hydrology and Earth System Sciences* 14 (6) : 951-964. doi:10.5194/hess-14-951-2010.