Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05617, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05617
EGU General Assembly 2008
© Author(s) 2008

Statistical downscaling techniques and the spatial coherence of daily rainfall variations: a case study over Chaudiere watershed in Quebec

A. I. **Bokoye (**1, 2), Y. Dibiké(1), P.Gachon(1), L. Lefauvre (1,2) and B. Casati (2)

(1) Environment Canada, Montreal, Canada

(2) Ouranos Consortium on Regional Climatology and Adaptation to Climate Change, Montreal, Canada

Email: Bokoye.Amadou@Ouranos.ca Phone: 1-514-282-64-64

An accurate simulation of rainfall at local scale and at high temporal resolution is needed for many climate change impact studies. The statistical downscaling (SD) techniques are often used to perform this simulation taking into account their relative simplicity. One performance criterion associated to SD rainfall simulation is the spatial-temporal coherence of the precipitation field. The present work assesses the spatial coherence of daily rainfall data from observation (9 climatic stations distributed over Chaudiere watershed with records from 1961-2000) and simulations from various SD techniques. CGCM3 and HadCM3 climatic models were considered for large scale predictors necessary for the SD. In a first step, the SD outputs characteristics are evaluated in particular in terms of percentage of explained variance. In a second step, intersite correlations and principal component analysis (PCA) are used to determine the considered SD techniques efficiency to reproduce the different precipitation patterns. The links between these patterns and physical processes associated to the rainfall are discussed on a seasonal basis with an emphasis on the differences between winter and summer. Some approaches in particular synoptic weather typing classification are explored in order to recover the spatial-temporal coherence of SD daily rainfall. In fact, the absence of this coherence constitutes a limit of SD and affects also climate impact models output like hydrologic streamflow.