Geophysical Research Abstracts
Vol. 14, EGU2012-4627, 2012
EGU General Assembly 2012

Extreme Value Statistics of Downscaled Climate Projections for Turkey and Its Region

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Information about climate extremes of the future should constituted essential ingredient for any realistic impact study. This study attempts to extract such information from dynamically downscaled climate projections for Turkey and its region. Results from several AR4 global climate models (ECHAM5, CCSM and HadCM3) has been used to force at the boundaries a regional climate model (RegCM3) to obtain dynamically downscaled climate fields at a resolution of 27 km for the historical (1961-1990) reference period and the 21st Century (2000-2099). Generalized Extreme Value (GEV) distribution parameters (location, shape and scale) are estimated using a maximum likelihood approach under the assumption of non-stationarity for each model grid cell and for a number of climate variables (daily mean temperature, daily maximum temperature, daily minimum temperature, daily total precipitation, monthly mean surface runoff and snow depth). Uncertainties for GEV parameters are estimated through resampling methods. Parameters are estimated for 10-year periods both for reference and projected climates. It has been observed that GEV parameters for most climate variables show significant geographic variations, mostly due to the accentuated topography of Turkey.