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Analysis of the impacts of EC-Earth Global Circulation Model in the RCP45 climate change scenario on maximum daily streamflow quantiles at global scale

Francesco Silvestro (1), Lorenzo Campo (1), Roberto Rudari (1), Christian Herold (2), Silvia De Angeli (3), Simone Gabellani (1), Mirko D'Andrea (1), and Denisa Rodila (3)

(1) CIMA Research Foundation, Savona, Italy (lorenzo.campo@cimafoundation.org), (2) UNEP, DEWA/GRID-Geneva, Chemin des Anémones 11, Châtelaine, Swiss, (3) WRR Programme, UME School, IUSS-Pavia, Italy

Climate changes can have an impact on various components of hydrological cycle. From a risk assessment point of view it is certainly interesting understanding how extreme streamflow values can change as a consequence of climate variability. In order to do this the outputs of a climate model (EC-EARTH) that accounts for a standard climate scenario were used to feed a hydrological model and to generate 140 years (1960-2100) of continuous streamflow simulations in a large number of stations that cover all the world. These time series were then post-processed in order to evaluate how annual daily maximum streamflow quantiles change because of climate scenarios.
The analysis highlights that in many cases there is an increment or a decrease of the quantiles for fixed return periods, but only in a reduced number of situations these variation lay out of the confidence intervals of the quantiles estimated in current climate. The analysis was carried out on over 5000 stations distributed in all continents and spanned the period 1960-2100 according to the climate scenario RCP45.