

Analysis of the precipitation and streamflow extremes in Northern Italy using high resolution reanalysis dataset Express-Hydro

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The characterization of the hydrometeorological extremes, both in terms of rainfall and streamflow, in a given region plays a key role in the environmental monitoring provided by the flood alert services. In last years meteorological simulations (both near real-time and historical reanalysis) were available at increasing spatial and temporal resolutions, making possible long-period hydrological reanalysis in which the meteo dataset is used as input in distributed hydrological models.

In this work, a very high resolution meteorological reanalysis dataset, namely Express-Hydro (CIMA, ISAC-CNR, GAUSS Special Project PR45DE), was employed as input in the hydrological model Continuum in order to produce long time series of streamflows in the Liguria territory, located in the Northern part of Italy. The original dataset covers the whole Europe territory in the 1979-2008 period, at 4 km of spatial resolution and 3 hours of time resolution.

Analyses in terms of comparison between the rainfall estimated by the dataset and the observations (available from the local raingauges network) were carried out, and a bias correction was also performed in order to better match the observed climatology. An extreme analysis was eventually carried on the streamflows time series obtained by the simulations, by comparing them with the results of the same hydrological model fed with the observed time series of rainfall. The results of the analysis are shown and discussed.