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FOCA: FIOod and Catchment Atlas for 631 gauged watersheds in Italy

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H10-01 FOCA: FLOod and Catchment Atlas for 631 gauged watersheds in Italy

 Tuesday, 23 January 2024

 19:00 - 19:05

 Venue 3, Earth Covering (Online Only)

Abstract

In recent years, several national databases of geomorphoclimatic watershed attributes have been built, such as the CAMELS datasets developed for Switzerland, France, Germany, the United Kingdom, the United States, Australia, Chile, and Brazil (now integrated into Caravan) and LamaH-CE. With the aim of covering the whole Italy, in this work we present FOCA (Italian FLOod and Catchment Atlas), the first systematic collection of data on Italian basins for which historical time series of peak flows and/or maximum daily flows are available. The hydrological data, relating to 631 gauged sections, are derived from the "Catalogo delle Piene dei Corsi d'acqua Italiani" (Claps et al., 2020), but FOCA integrates the hydrometric information with a comprehensive set of more than 100 descriptors related to geomorphology, soil and land cover, NDVI, climate and, not so common, extreme precipitation. These descriptors were calculated using sources that meet the following three criteria: a) national spatial coverage; b) absence of regional or local distortions; c) adequacy of spatial resolution. For each variable, the best available dataset was selected, prioritizing local information and relying on global data only in a few cases. The availability of basin boundaries will allow users to assess other descriptors using their own models or other datasets.

One of the strengths of FOCA, compared to several other available national datasets, is the inclusion of a rich set of geomorphological descriptors, computed with the *r.basin* algorithm of GRASS GIS and subsequently quality-controlled. The second relevant aspect is the inclusion of extreme rainfall characteristics calculated using station data rather than reanalysis data, an approach often used in the development of CAMELS datasets. In this case, the Improved Italian - Rainfall Extreme Dataset or I2-RED (Mazzoglio et al., 2020) has been used as a starting point.

The availability of this data set allows us to present the peculiarities of the hydrology of Italy, a mountainous country with great part of the population subjected to flooding from small basins in both a Mediterranean and sub-Alpine climate.

With this first nationwide data collection, it will now be possible to undertake a wide range of basin-scale hydrological applications in Italy, with a focus on extreme value studies.

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