

Review of Manuscript

'FOCA: a new quality-controlled database of floods and catchment descriptors in Italy'

By P. Claps et al.

Dear Editor,

I have reviewed the aforementioned work. My conclusions and comments are as follows:

1. Scope

The article is within the scope of ESSD.

2. Summary

In their paper, the authors describe the FOCA data set for Italy, the first nationwide data set of extreme values at 631 river gauges (annual maximum peak discharge and average daily annual maximum discharge) plus attributes of the related basins related to geomorphology, climatology, extreme rainfall, land cover and soil properties.

In the introduction, the authors describe the importance of large-scale, long-term, multi-criteria hydrological data sets and give an overview on recent activities on global, European, and Italian scale. In the same and the following section, the authors explain how the here-introduced data set builds on previous work of (parts of) the authors, and how it goes beyond them, which is mainly in terms of adding to the existing hydrological data climatological, geomorphological, soil and land use attributes. In the following sections, the authors describe in detail the new data set, and how the data were derived and quality-checked, structured by i) geomorphological attributes (section 3), and ii) soil, vegetation, climate, and hydrological data (section 4). In the final section 5, the authors summarize the rationale for compiling the data set, point out how the data set moves beyond previously existing ones, and point to some specialties of the data set.

3. Evaluation

The paper provides a well-structured, self-contained description of the FOCA data set. The authors both show how the data set builds on existing data sets and also how it goes beyond them. Overall, the data set provides real value to the community and the paper deserves publication. The data sources, rationale for data selection, data checks and transformations are clearly described and valid.

A few technical details that require some more attention:

Data set range

I think the wide range of catchment sizes and elevation zones covered by FOCA is a valuable and relevant feature, but it is mentioned explicitly only in the conclusion. I recommend mentioning this already in the abstract.

Catchments near the sea shore

Fig. 2 (and others) reveal that no catchments with gauges close to the sea shore are included in the data set (grey "rim" along the coast). Why is this so, and does this provide a bias to the data set? Please add an explanation to the text at the appropriate place.

Uncertainty estimates

For many applications of the FOCA data set, it will be important to have an (at least rough) estimate of the data uncertainty. For most of the data, the authors provide a clear account of data quality checks, but uncertainty estimates are lacking. This will be especially important for the data derived from observed time series (discharge, precipitation, air temperature), as here related uncertainties are highest. E.g. for the extreme rainfall data, parts of the reporting on uncertainty can be based on the variance of the variogram used for spatial interpolation (lines 362 pp), or for discharge data uncertainty of the water level recordings plus the uncertainty of the rating curve can be used.

Line 433: Figure 4 → Figure 10.

Line 460: Took → take

Data set on Zenodo

I checked the FOCA dataset as published on <https://doi.org/10.5281/zenodo.8060737>. It contains all the data discussed in the article, the files structure and the formatting of the data is reasonable, understandable and serves the purpose. The file "FOCA_Supporting_Information.pdf" provides a short and concise overview on the data, with one exception: The row raster maps (section 1.5 in the .pdf) just lists the raster maps, but does not provide an explanation of the maps. Please add.

Overall, I think the manuscript is worthy of publication after the above-mentioned **minor revisions** have been done.

Yours sincerely,

Uwe Ehret