

Geo-hydrological hazard and urban development in the Mediterranean area: an example from Genoa City (Italy)

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General remarks:

The authors presents the evaluation of flood events in the city of Genua (Italy) and focus on precipitation extremes, synoptic of the events and the relation of the consequences of the flood to growing urbanization in the target area. The scope of the paper is time relevant, since “Flood change” in cities is one of the goals of the new IAHS decade “Panta Rhei” (Montanari et al. 2013). A pity that the authors do not put their research within this framework.

Furthermore, such a study is a typical example of “forensic hydrology”, a fashionable term that received quite some attention recently

(<http://www.naturwissenschaften.ch/service/events/35762-forensic-hydrology>).

The introduction is not written as one would expect from a scientific paper. No citation is given to any previous study.

Section 5 is quite interesting, but we do not learn much about the authors evaluate the maps.

There is large literature on comparing categorical information that could have been used (e.g. Hargrove et al., 2006 or Hagen-Zanker, 2009).

I am of the opinion, that this manuscript do not really contribute to increase knowledge in the field of natural hazards research. It is a well realized documentation but I miss methodological novelty and sound embedding in current research on the topic. This document need major modifications prior to be considered for publication.

Best regards

Massimiliano Zappa

WSL, 27.5.2015

Issues to be addressed (Page(s) – Line(s)):

P 2452: I guess the authors forgot to summarize the findings in the abstract. So far the abstracts reads such as a conference abstract where the authors submit in the hope to have something to show some months later at the conference. This is maybe acceptable as a conference contribution, but should be at least adapted in case of manuscripts considered for publication.

P 2453-2454: The Introduction do not contain any single reference to previous work on such topics. There are several studies focussing on analysis of flood events both in hydrology (e.g. Blöschl et al., 2013) and meteorology (e.g. Gram et al., 2013). Some indications are given in Section 3. Too late! Thus I urge the authors to combine section 3 with the Introduction, an so come closer to the form of a scientific manuscript. Please also expand the review of past floods to areas other than your region.

P 2457: Figure 3 is presented with a very small description on the adopted methodology. Which alternative methods could have been considered? How about homogeneization of the data used (e.g. Begert et al., 2005)?

2457 – L21: “The annual average temperature shows a clear growth according to recent climate variations”. Please add references!

P 2459-2462: I see no science in this section 4. This is a valuable communication for local authorities

P2462 – L5: I don't see any trends in Figure 5. Do you mean “time series” or “characteristics”. I understand, that the word trend could be used in this sense, but due to its more specific meaning in statistics (e.g. your Figure 3), I think is more appropriate to use another term here.

Minor comments:

Abstract: Include the declaration of the country (“Italy”) somewhere.

P 2459, L 5 : Concerning table 4 you could discuss your methodology of documenting events with the one presented in Hilker et al. (2009).

References:

- Begert M, Schlegel T, Kirchhofer W (2005): Homogeneous temperature and precipitation series of Switzerland from 1864 to 2000. *Int. J. Climatol.* 25: 65-80.
- Blöschl, G., Nester, T., Komma, J., Parajka, J., and Perdigão, R. A. P.: The June 2013 flood in the Upper Danube Basin, and comparisons with the 2002, 1954 and 1899 floods, *Hydrol. Earth Syst. Sci.*, 17, 5197-5212, doi:10.5194/hess-17-5197-2013, 2013.
- Grams, C. M., Binder, H., Pfahl, S., Piaget, N., and Wernli, H.: Atmospheric processes triggering the Central European floods in June 2013, *Nat. Hazards Earth Syst. Sci. Discuss.*, 2, 427-458, doi:10.5194/nhessd-2-427-2014, 2014.
- Hagen-Zanker, A., 2009. An improved Fuzzy Kappa statistic that accounts for spatial autocorrelation. *Int. J. Geogr. Inf. Sci.* 23, 61–73. DOI: 10.1080/13658810802570317.
- Hargrove, W.W., Hoffman, F.M., Hessburg, P.F., 2006. Mapcurves: a quantitative method for comparing categorical maps. *J. Geograph. Syst* 8, 187–208. DOI: 10.1007/s10109-006-0025-x.
- Hilker, N., Badoux, A., and Hegg, C.: The Swiss flood and landslide damage database 1972–2007, *Nat. Hazards Earth Syst. Sci.*, 9, 913-925, doi:10.5194/nhess-9-913-2009, 2009.
- Montanari, A., Young, G., Savenije, H.H.G., Hughes, D., Wagener, T., Ren, L.L., Koutsoyiannis, D., Cudennec, C., Toth, E., Grimaldi, S., Blöschl, G., Sivapalan, M., Beven, K., Gupta, H., Hipsey, M., Schaeffli, B., Arheimer, B., Boegh, E., Schymanski, S.J., Di Baldassarre, G., Yu, B., Hubert, P., Huang, Y., Schumann, A., Post, D., Srinivasan, V., Harman, C., Thompson, S., Rogger, M., Viglione, A., McMillan, H., Characklis, G., Pang, Z., and Belyaev, V., 2013. “Panta Rhei—Everything Flows”: Change in hydrology and society—The IAHS Scientific Decade 2013–2022. *Hydrological Sciences Journal*. 58 (6) 1256–1275.