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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Geo-hydrological hazard and urban development in the Mediterranean area: an example from Genoa City (Italy)" *by* F. Faccini et al.

Anonymous Referee #2

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General Comments

The article deals with a goal of great current interest, such as the evolution of the floods and their possible relation to urban development. The historical research about the land uses evolution and the urban development is well detailed. The authors analyse several episodes of catastrophic floods and also the evolution of the territory. However, the article is based on some hypotheses which are not sufficiently proven, it presents problems of structure and ends with conclusions that are not well supported.

It should be necessary to improve all the meteorological explanations. From a climatic

point of view, it is necessary to tell with test of significance you have used and which level of significance the results have (95%?). The linear regression is not good enough to obtain a significative trend. You cannot deduce any trend by comparing only two or three events. To speak about trends requires working with series.

Section 3 mixes different results (that are not clear if they are obtained by the authors or by another people) with some previous research, data and some sentences like lines 9-11 page 2457 that do not includes any specific or new information. Please, modify the structure of the paper and show clearly which are the new contributions, results, data, methodology,. . .

I would recommend you to read some papers about flood trends, like Hall et al (2014) or the HESSD special issue on European floods (2014).

Specific comments p. 2452, l. 9-10: The statement "A troubling trend since the beginning of the new century, is the recurrence of such events with greater frequency than in the past" is not well supported by the results of the paper and cannot be included here. p. 2452, l. 11: Like in my previous comment, the sentence "seem to have a rainfall intensity basically greater. . ." is not well supported and cannot be included here. p. 2452, l. 22-23: Authors compare the population in the 19th century with the peak in the 1970s. Does it mean that the population has not increased in Genoa after 1970?. In line 22 you say "tool a peak"; I suppose it is "took" p. 2453, l. 14-18: too long sentence. On the other hand you use the expression of supercells here and in other parts of the paper, referring to a precipitation system that could be a multicellular or a mesoscale convective system or convection embedded in stratiform precipitation. The word "supercell" implies a thunderstorm structure with a rotational movement inside it. Please, avoid the use of supercell and substitute it for the specific one for each event or amore general like a convective structure. p. 2453 l. 5: October and November 2014? It is not clear p. 2454, l. 23-27: Leiro is written different in Figure 1than in the text; the Branega catchment is not in Figure 1. p. 2455, l. 21-23: Pay attention, the Genoa cyclone does not move to the Po Valley. In some occasions the cold air that

arrives to the Mediterranean through the Po valley helps to the Genoa cyclogenesis. There are a great number of references dealing with the Genoa cyclones that could help you to understand better the phenomena, like the works of Andrea Buzzi, Agustin Jansà, or those developed in the MEDEX project. Please, improve your explanation. p. 2456, l. 1-5: the major parts of the references you cite in the text are not from SCI papers and do not justify your explanations; for instance Sacchini is a reference about planes not about weather regimes. Air masses contrast is not necessarily responsible of triggering thunderstorms. They can help to increase the thermodynamic instability but they do not trigger convection. Remember, avoid the use of the word "supercell" p. 2457, l. 17-18: Tell how you calculate the SAI index p. 2457, l. 22-30- p.2458, l. 1-8: Improve all the trend analysis with a more robust methodology. p. 2458, l. 9. Which maps do you use? p. 2459, l. 1-9. Why do you only explain 6 events? You cannot justify the meteorological characterization of 5 of the six events produced after 1970 with references from 1970 and 1971. Have you analysed these events? If not, you should mention specific references for any event. p. 2461, l. 18. Do you have radar imagery to justify "very narrow supercells storm"? Thre are other possibilities p. 2458, l. 15, l. 22-23. By the comparison of some specific events you cannot conclude any trend in rainfall intensity. On the other hand you compare hourly intensities from different events, but, how long has been sustained these intensities? For instance, in Figure 4 (please, indicate a) and b)), you compare intensities near 40 mm/h sustained 10 hours, it is to say, 400 mm, that would imply that all the events would overpassed this quantity, but some of them do not arrive to 400 mm. These intensities have all of them recorded in the Genoa raingauge? When start the hourly series? p. 2462, l. 1-5. How are you sure that there are not any event previously to 1970 with a major intensity? p. 2462, l. 9. Figure 5 does not present any trend p.2467, l.1-10. From the analysis of 10 events is not possible to conclude any trend that could be due to climate change. Data and information about flash floods are not systematic since 1800 and the potential increase could be due to a heterogeneous database (we have lesser information for the 19th century than for the 20th century). On the other hand the last IPCC

report of WGII (2014) and the SREX report about climatic extremes from IPCC (2012) do not conclude that there is "an increase of precipitation rate with the average temperatures confirmed by data of other worldwide recording stations". On the contrary, as you try to demonstrate, some changes could be mainly due to changes in vulnerability, exposure or uses of soil. p.2467, l.15-20. Avoid the use of the term supercell; translate "nell'alluvione" p.2467, l.27. Change the damages in liras to euros.

References Hall, J., B. Arheimer, M. Borga, R. Brázdil, P. Claps, A. Kiss, T. R. Kjeldsen, J. KriaučiÅńnienÄŮ, Z. W. Kundzewicz, M. Lang, M. C. Llasat, N. Macdonald, N. McIntyre, L. Mediero, B. Merz, R. Merz, P. Molnar, A. Montanari, C. Neuhold, J. Parajka, R. A. P. Perdigão, L. Plavcová1, M. Rogger, J. L. Salinas, E. Sauquet, C. Schär, J. Szolgay, A. Viglione and G. Blöschl, 2014: Understanding Flood Regime Changes in Europe: A state of the art assessment. Hydrol. Earth Syst. Sci., 18, 2735-2772, 2013, www.hydrol-earth-syst-sci.net/18/2735/2014/ doi:10.5194/hess-18-2735-2014

HESSD special issue "Floods and their changes in historical times - a European perspective" Eds. A. Kiss, R. Brázdil and G. Blöschl, 2014

IPCC: Managing the risks of extreme events and disasters to advance climate change adaption (SREX), Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, 582 pp., 2012.

IPCC: Climate Change 2013: The Physical Science Basis, in: Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, 1535 pp., 2013.

Jansà, A.: A general view about Mediterranean meteorology: cyclones and hazardous weather, In Proceedings of the INM/WMO International Symposium on Cyclones and HazardousWeather in the Mediterranean, Instituto Nacional de Meteorología and Universitat de les Illes Balears, Palma de Mallorca, 33–42, 1997

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 2451, 2015.