

***Interactive comment on “A framework for assessing hydrological regime sensitivity to climate change in a convective rainfall environment: a case study of two medium-sized eastern Mediterranean catchments, Israel” by N. Peleg et al.***

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Review: Peleg et al hess-2014-322

All in all, a very interesting and well-presented paper, which describes an appropriate methodology for determining the response of small arid catchments in Israel to possible changes in climate. The technique of selecting synoptic systems which drive the

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rainfall is appropriate and the method of downscaling GCM outputs via the link between reanalysis output and local radar rainfall records is intelligently done. I liked the application of the weather generator, but had to read the authors' paper before I could understand how it was done – a few paragraphs giving more detail of that technique would improve the paper in my mind. There are a few places where I recommend minor modifications to the text, which are detailed below, however there is one section that the authors should consider rewriting – the Discussion and Conclusions because, in my opinion, there is too much new discussion material presented in this section. I found that it detracted from the clean results offered in the body of the text. I recommend that the authors consider resiting the newly referenced material, found in this section, in appropriate earlier parts of the paper to set the stage for their methodology.

I recommend acceptance of the paper for publication after moderate review.

Geoff Pegram

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In detail, some suggestions and questions, my suggested changes in UPPER CASE:

10554, 15: (range of 2-23%) - is that outer range or interquartile range or other?

10558, 3-4: the hydrologic regime to MODELLED climate change. 25: show the location and range of Shacham–Mekorot radar?

10561, 5: whose cell tracking algorithm is used – it reads like Mike Dixon's TITAN? 22: it would be instructive and interesting to see a couple of quantile-quantile plots

10562, 1: It was found that THE FOLLOWING ARE LIKELY:

10563, 22: the locations of the hydrometric stations are not shown on Figure 1 – assumedly, they are at the outlets of the catchments? Also, could the rain gauge locations be marked, or is the figure already too busy?

10566, 4: Referring to Figure 6, the three boxes illustrating the limits of the means and

stdvs is a neat and informative idea

Fig 1: presumably, the small blue cross in each of the upper right images locates the catchments

Fig 3: “Panels (a) and (b) present observed (from hydrometric stations) vs. calculated . . .” this is confusing as the labelling is not standard - should be reversed: calculated (ordinate) vs observed (abscissa)

Fig 4: If one believes in linear streamflow responses, then an event starts and ends at the same flow level, e.g. the major one on this figure starting at 18.5 days and ending at 29.7. It seems to me to be odd to split the hydrograph at day 21 where the flow is near the peak and the volume of the blue rainfall preceding that day is greater than the grey.

Fig 5: Regression lines through the 3 sets would help visualisation - I had to work quite hard to see the comparisons without lines which I inserted and positioned by eye

Fig 6: [Caption edited]: The standard deviation of the annual rainfall of each 30 year ensemble SELECTED FROM THE 300-YEAR SIMULATIONS (black . . . . show the extent [REMOVE "of change"] of annual rainfall . . . . Tananim catchments COMBINED.

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