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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "On the drought in the Balearic Islands during the hydrological year 2015–2016" *by* Climent Ramis et al.

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General comments:

I agree with referee #1 on the importance of the subject and the convenience of the publication of this work.

It is also clear the need to use empirical formulas to calculate evapo-transpiration rates, due to the lack of direct measurements. In this sense, the Hargreaves method is much used when the variables observed at a site are limited. However, the airports are observatories with a more complete range of observations, and therefore more complex alternatives, such as the Penman-Monteith method, could have been used. Unfortunately, radiation is measured only at the Palma airport and, while a comparison on ET

values computed with Penman-Monteith and Hargreaves formulas would assess the validity of the latter within the studied climatic area, that effort could give birth to a new article by itself.

More debatable is, as referee #1 also points out, the use of both Thornthwaite monthly hydrological balances and daily balances with the Hargreaves estimates. Thornthwaite approach has been extensively used in the past when dealing with monthly series, and can still be used for comparison purposes, especially on monthly climatic averages. However, it has been reported that Thornthwaite method under-estimates ETP in arid climates, but if more realistic empirical formulas are used (Guijarro, 1986, cited by the authors), monthly hydrological balances following Thornthwaite result in soils being completely dry all year round in extensive zones of the Balearic islands, which is also unrealistic. Therefore, climatic balances should be derived by applying daily balances to the reference period and then computing the monthly values, or at least the Thornthwaite method should also be applied to the 2015-16 year to assess the impact of using these different approaches.

Specific comments:

115: "These are the longest homogeneous climatic series without gaps..." Has their homogeneity been assessed? I would remove ' homogeneous' otherwise.

With respect to comments on lines 132-136 and 155-156 a reference could be added to the sentence in line 156: "do not respond to the same circulation patterns, as previously reported by Guijarro (2002 and 2003)" GUIJARRO JA (2002): Tendencias de la precipitación en el litoral mediterráneo español. In Guijarro et al. (Eds.), El agua y el clima, Asociación Española de Climatología, A-3:237-246, ISBN 84-7632-757-9. GUIJARRO JA (2003): El flujo geostrófico superficial en el Mediterráneo Balear durante el periodo 1948-2002. Rev. climatol., 3:45-59.

The statement in lines 137-138 is debatable. Different regimes can be seen in different parts of Mallorca (Sumner et al., 1995). SUMNER G., GUIJARRO J.A., RAMIS

C. (1995): The impact of surface circulation on significant daily rainfall patterns over Mallorca. International Journal of Climatology, 15:673-696.

Technical corrections:

131: ‘end’ → ‘and’

254: “to which the local vegetation was subjected to.” Too many ‘to’s? Remove the last one?

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