

## ***Interactive comment on “Impact of the dry day definition on Mediterranean extreme dry spells analysis” by Pauline Rivoire et al.***

### **Anonymous Referee #2**

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This work describes a new methodology for the analysis and definition of dry spells in the Mediterranean, based on a time-varying threshold instead of a fixed precipitation threshold. Despite trends and drought return periods are not modified by the use of one diagnostic or the other, the new one is able to estimate dry spell duration in a more accurate way.

The methodology is well described and robust, supported by a fair number of references, and results are consistent with previous literature but also highlight the new findings.

A few improvements (pointed out as major revisions, they are in fact small majors) are needed before this work could undergo publication on NHESS:

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1) it is not clear why the authors choose to use  $ET_0$  instead of potential evapotranspiration (line 114). In addition, many references are provided for the  $ET_0$  definition, but the equation is needed (line 150) to understand all the components that are part of the calculation. It is not clear (line 150-151) what the meaning of setting wind speed at 2 m/s would be.

2) why is a dry day defined when  $\langle P - ET_0 = 0 \rangle$ , and not when  $\langle P - ET_0 \leq 0 \rangle$  ? In this respect, authors are also required to better describe how AED can be considered a measure of this quantity.

These two points need a deeper discussion. On the top of these, a few minor corrections would be appreciated.

a) line 115: what is an evaporation pan?

b) line 227: please designate the acronyms for the two threshold here, and rephrase lines 227-229 (figure 3 is also involved in this part, not only figure 2).

c) line 244: figure 4 shows the high variability of the  $ET_0/SDII$  index during the summer months: a description of this feature is required.

d) line 296-300: authors say "ET<sub>0</sub> in summer is not high enough to exceed the daily precipitation". This statement is not supported by figure 8, then it needs rephrasing. Rather, what is noticeable is that  $ET_0$  variability is much lower than that of daily precipitation.

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