Hydrology and
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Sciences

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Discussions

EGU

Interactive comment on "Recent changes and drivers of the atmospheric evaporative demand in the Canary Islands" *by* S. M. Vicente-Serrano et al.

Anonymous Referee #1

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The manuscript presents a trend analysis of the FAO-56 reference evaporation using meteorological data from 8 sites at the Canary Islands. Interestingly the results show a remarkable heterogeneity in both the drivers of ET0 and its trends, which I did not expect due to the maritime climate. The most consistent effect is the decrease in relative humidity at most sites and thus an increase of the aerodynamic component of ET0. Generally the paper is well written, the data analysis is comprehensive and well designed. The topic of observed ET0 changes and choice of the sites are relevant and well suited for publication in HESS. Although I have a some remarks I am positive that the authors can implement these and recommend minor revisions.

Comments and remarks

The trends in ET0 seem to be significant because of the low values in the beginning of

the chosen period. The results of the two sites with longer coverage show no significance. Thus the trend seems to be rather an effect of decadal scale variability. Please indicate this within the discussion of the results.

Abstract: L16 ET0 is not explained, please state here in the abstract that you estimate AED by the FAO-56 reference evaporation equation

L17-18 The sentence "The radiative component . . . did" can be removed because this is again stated in the next sentence. Also explain the meaning of the two components.

Introduction: The main research hypotheses should be clearly formulated

Section 2.1 L107-116: The homogenisation alters the original data and can effect the detection of trends. To achieve reproducibility of the results I recommend to provide an overview about data gaps, breakpoints and corrections which should be added as supplement.

Section 2.3 L160-171 I do like the simple yet illustrate way to determine the effects of single variables on the detected trend. By design this is done as a local sensitivity analysis where one variable is changed holding the others fixed. However, it is not a global sensitivity analysis and co-variation of the forcing variables is neglected. Especially for the meteorological variables used here, I suspect that the variables and eventually their trends in time do co-vary - e.g. temperature and relative humidity. Did you consider such effects and are they important to understand the long-term variability?

L195 . . . the aerodynamic component (Eq. 3).

Discussion: L303- 305 differences in ET0 trends across sites . . . "must be considered either due to random effects and uncertainty at various levels or due to microgeographic effects . . . " I think the differences of the trends and the different strength of the aerodynamic / radiative components at the sites deserve more attention in the discussion. The results are presented already in a detailed manner and these aspects should be discussed. That means is there a link of the different strength of certain

forcing variables and the magnitude of ET0 trend at a given site.

L514: in preparation

Tables: Please add a Site Metadata Table with site name, WMO-ID, LAT, LON, Height, gaps, relocation, corrections, available variables

Figure 1: Please add LAT - LON coordinates as a grid and a scale for the distance

Figure 4 and 5: The grey lines are not very informative. Please adapt the figures, using different colors or line types for the sites. It might be also useful to demean the time series for the display. In the annual panel the bold line is missing.

Fig. 5 the labels are too small to be readable

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-15, 2016.