

Interactive comment on “Recent trends in daily temperature extremes over southern Montenegro (1951–2010)” by D. Burić et al.

D. Burić et al.

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Dear reviewer #1 Firstly, we would like to thank you for such valuable comments which significantly improve the quality of the manuscript and thus will be taken into consideration in our revised version of the manuscript. In the following parts you may find our reply to your comments by each point:

COMMENT: There are several instances when it is mentioned that there was a 'well-known climate shift in the late 1970s'. I would like to see some justification on that, even if this is taken from relevant studies.

In Europe, a cooling period followed by a warming period starting in the mid '70s has been found (Balling et al., 1998; Klein Tank et al., 2002). Gurevich et al. (2011) found C1885

that the change in the temperatures in Israel has occurred approximately between the mid-1980s and the mid-1990s. Toreti and Desiato (2008) have noted the increase of high temperature events in Italy from the late 1970s/early 1980s with slight differences between the gradients slopes of warming trends. The first step in the analysis of the temperature time series was the identification of possible change years i.e. time epochs with trend change for every station. We will add a paragraph justifying change points.

COMMENT: A similar to my first comment applies to the explanation/justification of the trends found in this study. It would be interesting/useful to discuss what might have caused the trends identified.

We will add that several authors have associated increase in mean annual temperature with the positive phase of the North Atlantic Oscillation (NAO) since this pattern is recognized as the main mode of climate variability in the extratropical Northern Hemisphere (e.g. Hurrell, 1995; Sun et al., 2009; del Río et al., 2011).

COMMENT: Although this is the study of recent trends in daily temperature extremes it would be interesting to show a figure with the timeseries of the actual temperature (i.e. mean daily temperature) over the period of 60 years.

We completely agree that presenting timeseries with mean daily temperatures would be interesting to show, but we decided not to implement it due to volume of the paper already reached.

Minor comments: page 5182, l.3: explain ETCCD l.11: "The two separately..." page 5183, l. 1: Rodriguez-Puebla et al., 2009 l. 6: Toreti and Desiato (2008) l. 9: the definition 'tropical nights' is used here and in one more instance, but it is not explained anywhere how this is defined. page 5184, l.22: "...a version of MASHv3.02 ..." page 5185, l.13: "..Vincent and Mekis, 2006)." l.26: "...estimation...." page 5186, l.12: "...local climate effects..." l.23: Could you provide some explanation for the variance between the two studies? page 5188, l.12: Could you elaborate slightly more on Tn90p? You mention global results, so give some reference on those. Table 1: Better use 2.0,

10.0 Table 3: Mention units (degrees Celsius?) Figure 2: the legend would better be "Tm in 2003" or "Tm in year 2003".

All suggestions in minor comments are accepted and are going to be corrected.

Sun, J.Q., Wang, H.J., Yuan, W., 2009. Role of the tropical Atlantic sea surface temperature in the decadal change of the summer North Atlantic Oscillation. *Journal of Geophysical Research* 114, D20110.

del Río, S., Herrero, L., Pinto-Gomes, C., Penas, A., 2011. Spatial analysis of mean temperature trends in Spain over the period 1961–2006. *Global and Planetary Change* 78, 65–75.

Balling, R.C., Michaels, P.J., Knappenberger, P.C., 1998. Analysis of winter and summer warming rates in gridded temperature timeseries. *Climate Research* 9, 175–181.

Gurevich, G., Hadad, Y., Ofir, A., Ohayon, B., 2011. Statistical analysis of temperature changes in Israel: an application of change point detection and estimation techniques. *Global NEST Journal* 13, 215-228.

Hurrell, J.W., 1995. Decadal trends in the North-Atlantic Oscillation – regional temperatures and precipitation. *Science* 269, 676–679.

Klein Tank et al., (2002) Daily dataset of 20th-century surface air temperature and precipitation series for the European Climate Assessment. *International Journal of Climatology* 22, 1441-1453.

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