REFEREE COMMENTS

on the discussion paper under review for the journal Natural Hazards and Earth System Science (NHESS), doi:10.5194/nhessd-1-4963-2013.

<u>Title:</u> "Development of an operational modelling system for urban heat islands: an application to Athens, Greece"

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General comments

1. Scientific Significance: Good (2)
    The manuscript represent a real contribution to the understanding of natural hazards and their consequences by applying MOS approach – WRF output (2km resolution) is downscaled to specific measuring stations (urban and rural) by applying proper Artificial Neural Network (ANN) model.

2. Scientific Quality: Good (2)
    The scientific approach is valid and the applied method leads to good results. The testing period is short to some extent, but results are rather good. They are discussed in an appropriate and balanced way. The referred papers are numerous enough and are in line with the topic of the paper. The title and the abstract properly reflect the contents of the paper.

3. Presentation Quality: Good (2)
    The scientific data, results, discussions and conclusions are presented in a clear and well-structured way. The text is illustrated with 8 figures and 5 tables. According to the referee's knowledge the technical and English languages are good.

Specific comments

    P4969, L8-16: The paragraph describes the procedure of incorporating CORINE LU data in WRF. First, this data is remapped to the IGBP 30" database and this data is remapped to the model grid. Isn't it more natural to correct already mapped IGBP data to the model grid?

    Section 3.2: Describes the use of the ANN approach for downscaling WRF output. May be different ANN models would be constructed for Urban and Rural conditions. In this line, the space averaging used in presenting the comparison of ANN model output with the measured data probably masks the U-R diversions. It is confirmed by Fig.7 (average diurnal variations of temperatures) - in rural conditions the measured and calculated temperatures almost coincide.

    Section 5.1: It is interesting to compare not only temperatures themselves but also the U-R temperature differences.

Technical corrections
    <u>a. Text:</u>
- P4965, L19: The abbreviation (SVF) is used nowhere in the text
- P4975, L25: Eq.(3) is referred instead of Eq.(4).
- P4976, L3: Must be 21C<DI<=24C.
- P4976, L9: Eq.(4) is referred instead of Eq.(5).

- P4976, L10: Eqs. (4) and (5) must be referred, instead.
- P4578, L12: "near-air temperature"? May be "near-surface air temperature"

b. Tables and figures
- Table 2: The presented values ought to be checked again. For instance, roughness length for "High intensity residential" LU class is probably 1.08m and the albedo for "Low intensity residential" - 0.09.
- Table 3: The ID of "Ano Liosia" station must be 2.
- Fig. 8: StDev is not defined and commented in the text

c. Referencing
- P4965, L7: (Houghton et al., 2001) is referred in the text but is missing in the Reference
- P4965, L16: Double citing of (Christen and Vogt, 2004) in one and the same sentence
- P4966, L13: The cited (Giannaros et al., 2013) does not exist in the reference (may be 2012)
- P4980, L19: (Hoashell and Johnson, 2001) is present in the reference but is missing in the text
- P4982, L24: (Taha, 2008b) is present in the reference but is missing in the text