Interactive comment on “Severe summer heat waves over Georgia: trends, patterns and driving forces” by I. Keggenhoff et al.

Anonymous Referee #1

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Review of ‘Severe summer heat waves over Georgia: trends, patterns and driving forces’ by Keggenhoff et al.

Recommendation: Major revisions

This study examines heat waves over Georgia. It applies statistical methods to examine trends in heat waves and their driving factors. It finds that the most severe heat waves occurred during the last 20 years. This is an interesting study and should be considered for publication after my comments have been addressed.

Comments:

1) Trends are identified using the Mann-Kendall test. This test does not take into account the autocorrelation structure of observed temperature time series as shown by C855


Franzke, C., 2012: Nonlinear trends, long-range dependence and climate noise properties of surface air temperature. J. Climate, 25, 4172-4183. DOI: http://dx.doi.org/10.1175/JCLI-D-11-00293.1


I recommend to use the modified Mann-Kendall test which takes into account also the effects of autocorrelation by


2) The study uses various overlapping periods (1961-1990, 1981-2010, 1961-2010). For a trend analysis it might be better to use non-overlapping periods.

3) I suggest to use a lagged CCA (e.g. Perlwitz, J., & Graf, H. F. (1995). The statistical connection between tropospheric and stratospheric circulation of the Northern Hemisphere in winter. Journal of Climate, 8(10), 2281-2295.) in order to examine the impact of SST since SSTs could lead the heat waves.
4) How do you define meso-scale circulation patterns? Do you perform some kind of spatial filtering? Or do you just mean the nearby circulation?

Interactive comment on Earth Syst. Dynam. Discuss., 6, 2273, 2015.