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Heatwave risks in urban area – a case study for Arad municipality in Romania

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Robust signs of climate change, especially in temperature-related climate behaviour, are already present. Heatwave frequency, intensity and persitance are changing under climate change conditions and so are the exposure to them and associated risks. Urban areas have additional thermal-related vulnerabilities due to effects of urban heat island on large populations concentrated in a human-transformed space. The goal of our study is to use climate and socio-economic data to assess changes in heatwave risks for the urban area of Arad municipality in Romania. Arad municipality is in the top ten towns in Romania with largest contribution to gross domestic product (GDP), covering of 253 km2 and with a population of 169327. Arad is representative for towns situated over plane areas and the results of our study can be translated for other Romanian towns as well.

For our purpose we used remote sense and climate data with health, demography and land use information to develop a climate change risk assessment for heatwaves. We used skin temperature from Modis products (2000-2010), air temperature from Arad weather station (1961-2010), Corine land cover and demographic information from 2004 census. Results from regional climate models obtained from FP6 ENSEMBLES project are used for future projection of air temperature in 21st century. Our analysis builds on the EU Council conclusions on "Further Developing Risk Assessment for Disaster Management within the European Union" adopted in March 2011 that aims for a common approach and harmonisation on the prevention of natural and man-made disasters setting out an overall disaster prevention framework.