Urban Heat Island Arctic Research Campaign (UHIARC) dataset

Pavel Konstantinov, Lomonosov Moscow State University (MSU)

Mikhail Varentsov, Lomonosov Moscow State University (MSU)

Alexander Baklanov, World Meteorological Organization (WMO)

Igor Ezau, Nansen Environmental & Remote Sensing Centre (NERSC)

E-mail: kostadini@mail.ru

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DS on micro-climatic features and Urban Heat Island Intensity in cities of Arctic region

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Absence of a dense meteorological network impedes development of urban climatology in the northern polar region where the global warming is rapid and amplified. High quality and density urban temperature datasets are required to monitor thawing processes in urban soils, properly assess and project trends in urban comfort and air quality as well as to estimate impacts of climatic extremes. This dataset presents data of Urban Heat Island Arctic Research Campaign (UHIARC) observational network, which has been deployed in several medium-sized cities (Salekhard, Vorkuta, Nadym, and Novy Urengoy) of the Eurasian Arctic region in winter 2016-2017. The network comprises an array of air temperature loggers (iButton) and one automatic weather station Davis Pro in each of these four cities. The UHIARC observations revealed strong positive temperature anomalies in all four cities. These temperature anomalies, which are known as urban heat islands (UHIs), have mean wintertime intensities of 0.7K to 1.4K. Typical extreme intensities of 7.1K were observed during cold anticyclonic weather conditions. Such a strong mediation of the cold temperature spells by the UHI might induce considerable socio-economic and environmental impact in the cities. The UHIARC data are available for the period from February 2nd to March 15th of 2017 in the .csv format after registration on the server. Current dataset includes temperature measurement data of pairs of stations (urban and rural) for three cities (Vorkuta, Salekhard and Nadym) based on observations of urban AWSs and rural WMO stations.

The data from the iButton TLs are provided on request as well as the data for other periods (including the latest observations) for the listed cities and also for Apatity (Murmansk region, Russia).

The data are free exclusively for academic purposes, in case of publishing scientific results of processing of initial UHIARC info, the reference to the dataset and the source are mandatory.

References:

Pavel Konstantinov, Mikhail Varentsov, and Igor Esau. A high density urban temperature network deployed in several cities of Eurasian Arctic. Environmental Research Letters, 13(7), 2018. https://doi.org/10.1088/1748-9326/aacb84