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Title Creation of Pan-Arctic network for investigation of urban climate and urban air quality (based on results of UHIARC in Eastern

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Theme -Theme 2: Observing in Support of Adaptation and Mitigation

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Poster title (brief) Creation of Pan-Arctic network for investigation of urban climate and urban air quality (based on results of UHIARC in Eastern and Western Arctic)

Abstract - text box

Wide number of dangerous consequences of global climate change is connected with high latitudes: permafrost melting, growing of urban heat island magnitude etc. These problems are quite intensive especially in urban areas. First assumption about microclimate of polar cities in Eastern Arctic was based on the UHIARC (Urban Heat Island Arctic Research Campaign) seasonal-scale experimental meteorological observations in the five cities: Apatity in Kola peninsula, Vorkuta in the north-east of the European Russia (Komi republic) and Nadym, Novy Urengoy and Salekhard in located in the north of Western Siberia. All of them have quite similar population (from 50 to 115 thousands inhabitants) and building features.

The already existing UHIARC network was expanded in the cities of Apatity (Kola Peninsula) and Nadym (Western Siberia) by the low-cost recorders of temperature inversions in the surface layer at heights of 1.5 and 3 meters, respectively. With the help of these complexes, it is supposed to obtain a reliable climatology of surface inversions in city core area and outside the city for the winter period, when episodes of high concentrations of atmospheric pollutants are most frequent. In 2019-2020 winter season new measurements of PM_{2.5} concentrations in pedestrian level (0-2m) were established in two cities of Eastern Arctic (Apatity and Nadym). Until the end of 2020 we plan to organize simultaneous measurements of ground-level inversions intensity in Fairbanks (USA) and Tromsø (Norway). In 2020-21 such network can be enlarged on Reykjavik (Iceland).

Thus, in 2020 is planned to establish in 2020 Pan-Arctic network for investigation of urban climate and urban air quality for the first time in meteorological history. That will allow for the first time to obtain a unique set of scientific data in Arctic region that can be useful for both scientists and decision-makers.

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