HIARC: Anthropogenic Heat Islands in the Arctic: Windows to the Future of the Regional Climates, Ecosystems, and Societies

Call: Arctic Observing and Research for Sustainability
Type of Project: Type 3 - Research Grant
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Sponsored by: RCN, RFBR, NSF

The project Anthropogenic Heat Islands in the Arctic – Windows to the Future of the Regional Climates, Ecosystems and Societies (HIARC) will investigate an interesting, arguably important but still largely overlooked phenomenon of ecosystem and societal adaptation to warmer micro-climates, which have been created by the anthropogenic heat pollution in the arctic urbanized areas over the last 30 – 40 years. Even on the background of the amplified arctic warming, this heat pollution has created urban heat islands where temperatures are by one-two degrees higher than in the surrounding areas. These effects are found even in small settlements like Barrow, Alaska with 5000 inhabitants. It has been overlooked that the heat pollution exists long enough for local ecosystems to adapt to the warmer micro-climates. This adaptation opens windows of opportunity to resolve at least some critical debates about the climate change impact and feedbacks between vegetation, waters, permafrost and climate. HIARC ambitions are to combine high-resolution meteorological observations, satellite, modelling data with societal data, economical output and qualitative narratives of the ongoing changes and threats coming from the cultural perspectives. HIARC should improve our understanding of the environmental impact of the heat pollution and urbanization, as well as they will help to produce more accurate and more policy relevant projects of the arctic changes on the adaptation time scales up to 2050 and beyond. The HIARC impact is determined by its focus on the living, technological and cultural environment of 85% of the total arctic population of 4 million people. Up to 92% of them are migrants from southern territories, attracted by jobs. HIARC addresses the problem of broader impact of the arctic urbanization looking at: adaptation of bio-medical responses among migrants; urban dynamics, socio-cultural development and conflicts; feedbacks between environmental and climate changes over the longer historical perspective.