

GC31B-1182: Impacts of urban and industrial development on Arctic land surface temperature in Lower Yenisei River Region.

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Urbanization and industrial development have significant impacts on arctic climate that in turn controls settlement patterns and socio-economic processes. In this study we have analyzed the anthropogenic influences on regional land surface temperature of Lower Yenisei River Region of the Russia Arctic. The study area covers two consecutive Landsat scenes and includes three major cities: Norilsk, Igarka and Dudingka. Norilsk industrial region is the largest producer of nickel and palladium in the world, and Igarka and Dudingka are important ports for shipping. We constructed a spatio-temporal interpolated temperature model by including 1km MODIS LST, field-measured climate, Modern Era Retrospective-analysis for Research and Applications (MERRA), DEM, Landsat NDVI and Landsat Land Cover. Those fore-mentioned spatial data have various resolution and coverage in both time and space. We analyzed their relationships and created a monthly spatio-temporal interpolated surface temperature model at 1km resolution from 1980 to 2010. The temperature model then was used to examine the characteristic seasonal LST signatures, related to several representative assemblages of Arctic urban and industrial infrastructure in order to quantify anthropogenic influence on regional surface temperature.