



## **Direct impact of urbanization on the subsurface temperature field**

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This poster presents results of 3D modeling of the subsurface temperature field affected by the urbanization of originally forested area on the campus of Geological survey of Finland (GTK) in Otaniemi (Espoo). The stepwise urbanization of the area between the years 1956 and 2004 demonstrated by sequence of aerial photos allowed to define time change of boundary conditions on the surface. The repeated temperature logs from the unique borehole situated directly in the basement of GTK together with long-term air surface temperature series from nearby meteorological station were used to decompose the observed transient component of the subsurface temperature into the part affected by construction of new buildings and other anthropogenic structures in surroundings of the borehole and into the part affected by the ground surface temperature warming due to the surface air temperature rise. The effect of the built surface anthropogenic structures is detectable down to the depth of 150 m and the share of the anthropogenic signal on the non-stationary component of the observed subsurface temperature amounts to 90% at the depth of 50 m. and 80% at the depth of 100 m. Warming rate observed at the depth of 50 m between the years 1990 - 2004 (0.07 °C/year) is four times higher than modeled response to climatic warming on the Earth surface.