

Estimation of the past ground surface temperature change from borehole temperature data in Bangkok

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An effect of temperature change at the earth's surface propagates into the underground and disturbs the underground temperature structure that is determined by the thermal conductivity distribution and heat flow from the deep. Analyzing disturbances in the underground temperature structure carefully, the past ground surface temperature (GST) change closely related to the past climate change can be reconstructed (i.e. Goto et al., 2005).

In order to infer the past climate change, we measured temperature profiles in boreholes in Bangkok and reconstructed GST history during the last several hundred years. Some of the temperature profiles seem to be influenced by groundwater flows. We examined how possible variations in thermal conductivity of the formations can affect the reconstructed GST history. We also evaluated the minimum depth of temperature measurement necessary for reliable GST reconstruction. These analyses will give important criteria for selection of boreholes and determination of temperature measurement depths in this project.

Reference:

Goto S., Hamamoto H., Yamano M. (2005): Climatic and environmental changes at southeastern coast of Lake Biwa over past 3000 years, inferred from borehole temperature profiles, *Phys. Earth Planet. Int.* Vol.152, 314-325.