

Relationships between air and surface temperature for reconstruction of climate change from borehole temperature

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Inversions in temperature-depth profiles due to surface warming are found in subsurface thermal regime, and reconstructions of the climate change using subsurface temperature have been made in many areas over the world. This is attributed to the recent global warming, urbanization, and land cover change. However the temperature reconstructed from subsurface temperature

profiles is not air temperature but surface temperature. In order to evaluate the relationship between air temperature and surface temperature, long term analyses of annual air temperature, soil temperature at the surface, 10cm, 50 cm, 1m and 5m have been done. Increases in air and surface temperature were found in the cities due to urbanization. The difference between surface temperature and air temperature decreases with the latitude in Japan. The difference between surface and air temperature increased from 1930's to 1940's.