

Inhomogeneity of Conductive Heat Fluxes Around the Tiksi Meteorological Tower

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Analysis of the separate components of surface energy budget is necessary for better understanding the surface-atmosphere heat and energy exchanges of the Arctic region, including local variability. A number of studies have presented the net atmospheric flux in Arctic regions; however, without measurement of the conductive fluxes in the underlying surface it is not possible to determine the net surface-atmosphere flux. In Tiksi, Russia, a 20 meter meteorological tower is surrounded by five flux plates and four thermistor strings from which conductive heat fluxes can be measured and derived respectively. The flux plates and thermistor strings are distributed in a variety of regimes including wet tundra, mid tundra and dry tundra soils. While all sites are close enough to the tower to assume that incoming radiative and turbulent fluxes are the same, there are significant differences in seasonal magnitude and amplitude of the conductive fluxes. The conductive heat fluxes from around the Tiksi tower are compared for one winter and one summer month. The values mapped to a 2 km x 2 km satellite image that indicates terrain distribution to estimate a representative conductive heat flux estimate for the area surrounding the tower.

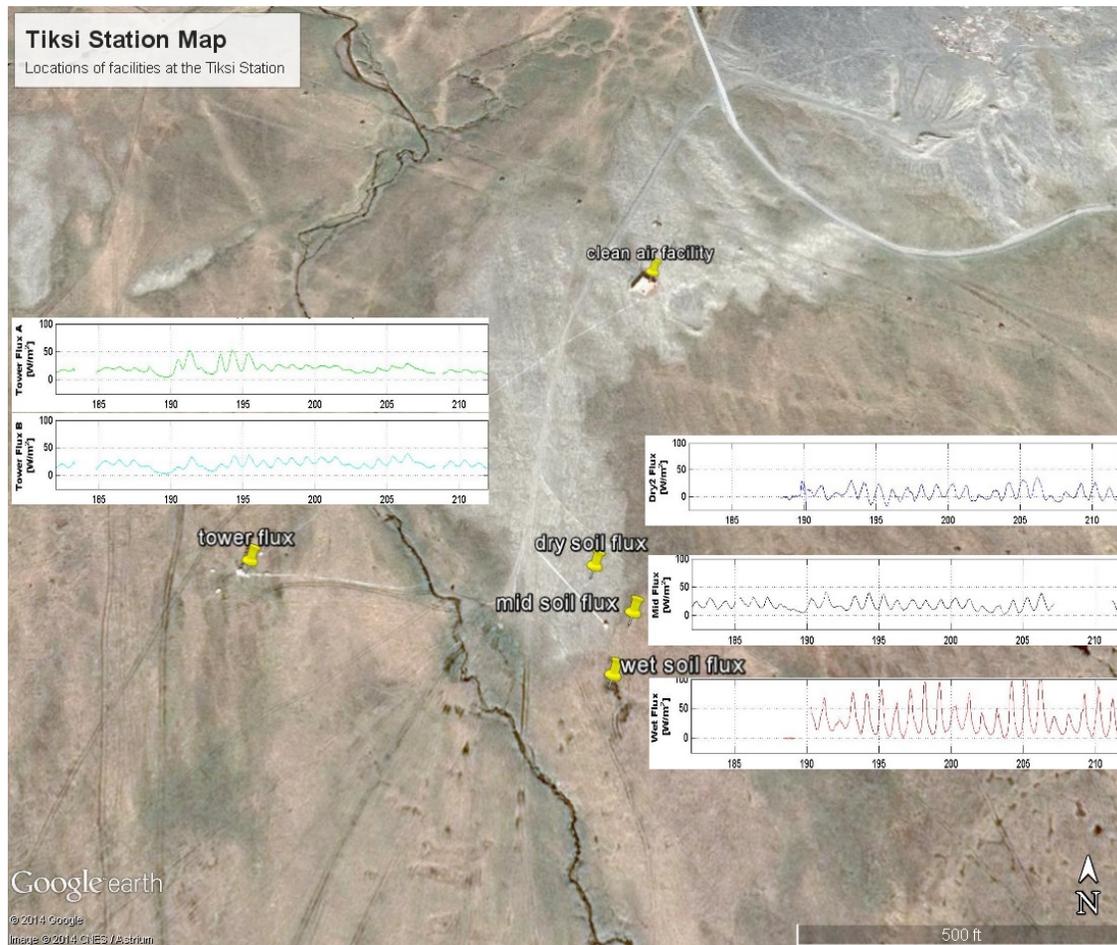


Figure 1. Satellite image of the tundra surrounding the Tiksi meteorological tower with corresponding conductive heat flux plate measurements pertaining to soil type.