



Soil thermal behaviour from the temperature soil regime in Livingston Island (South Shetlands, Maritime Antarctic)

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The Maritime Antarctic cryosphere is very sensitive to the global warming because of the mean annual air temperature near sea level is around -2°C . This situation has an important influence on the general distribution of frozen ground in this region. Since 2000, two shallow boreholes are monitoring the soil temperature regime in Livingston Island. This island is located in the South Shetlands near the northern tip of the Antarctic Peninsula at $62^{\circ}39'S$, $60^{\circ}21'W$. The soil temperature signal can be used to estimate different thermal characteristics both in the soil and in the atmosphere boundary limit layer. Based on the compiled data from these boreholes we have been able to identify at least three relevant periods at 24 h, 8-10 days and 1 year related to the local climatic conditions measured in this area. Besides, the soil thermal behaviour has been characterised by its thermal diffusivity inferred from the measured thermal regime. In this work, we present a detailed summary of our main results and use the estimated diffusivities to infer the soil thermal characteristics at different depth ranges. A correct characterization of this shallow layer is crucial for the understanding of the heat exchange between the soil and the atmosphere.