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Active layer and permafrost thermal regime in the vicinity of the Bulgarian Antarctic Station (Livingston Island, Antarctic). First results for 2006-2008.

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The Antarctic Peninsula region has experienced in the last 50 years a warming trend of 2.5ºC in the mean annual air temperature. This region is located near the latitudinal limit of permafrost, and the way it is reacting to this warming trend is still poorly known. The focus of this research is to study the thermal regime of the active layer and permafrost in Hurd Peninsula (Livingston Island), as well as the influence of climate factors on its spatial distribution and temporal variability.

In 2006 an active layer monitoring site according to the CALM protocol was installed in the vicinity of the Bulgarian Antarctic Base (Livingston Island, Antarctic). The site consists on a 50x50m grid and it's located approximately at 140m a.s.l in a flat interfluve. Measurements of the ground and air temperatures and the monitoring of snow thickness were collected at 4-hour intervals.

In 2007 a network of permafrost monitoring boreholes began to be installed in Livingston Island (Maritime Antarctic). The first borehole is placed in the CALM site at 136m a.s.l with a depth of 5m. A second borehole is located south from the base at 147m a.s.l with a depth of 4m. Inside of each borehole was placed a chain of loggers measuring temperature at 4-hour intervals.

The ground temperature data for two years in the proximity of the Bulgarian Antarctic Station allows to evaluate the relationship of air temperatures, snow thickness and the thermal regimes of the ground. The data shows a high interanual variation of the snow cover and its consequences on the ground thermal regime.

Borehole data supports that the monitoring sites are located near the lower boundary of continuous permafrost in bedrock and that this area is privileged for the studying how the atmospheric warming trend will influence permafrost degradation, as well as the landscape dynamics.