Geophysical Research Abstracts,
Vol. 11, EGU2009-1272-1, 2009
EGU General Assembly 2009

Results of the thermal state of permafrost and active layer in Livingston an Deception island (conclusions at the end of the PERMAMODEL-PERMANTAR IPY projects)

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The Antarctic Peninsula (AP) is one of the regions in the World with a very strong atmospheric warming trend: + 2.5ºC in Mean Annual Air Temperatures (MAAT) over the last 50 years. The Maritime Antarctic Islands, where Livingston (62º39'S, 60º21'W) and Deception (62º43'S, 60º57'W) Islands are located, have significant proportions of ice-free terrain underlain by permafrost. These islands, located close to the MAAT isotherm of -2ºC, have a very high sensitivity of the permafrost to climate variability. The measurement of soil temperature and maximum active layer depth are very useful techniques to quantify changes in the atmosphere-ground heat exchange, and therefore, for studying permafrost evolution (aggradation or degradation).
Since 2000, regular thermal active-layer monitoring is performed by means of shallow boreholes on both islands. In the last 3 years, and recently in the course of the International Polar Year (IPY) activities, three international projects PERMAMODEL (Spain), PERMANTAR and PERMADRILL(Portugal) with the collaboration of Switzerland and Bulgaria research institutions, are focusing on installing a long term network of boreholes (shallow and medium depth) for monitoring the thermal state of permafrost and the active layer in Livingston and Deception Islands.
During the last Antarctic campaign 2007-08 two boreholes (25 m and 15 m) were drilled on Sofia mount (275 masl) on Livingston Island. In the 2008-2009 Antarctic campaign new drilling is planned in collaboration with a Russian team in order to complete the monitoring network in Deception Island.
In this contribution, we present the most important results and conclusions obtained in the different monitoring sites, and the preliminary information about the recent drilling campaign on Deception Island.