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Permafrost distribution in marine terraces and glacier margins in the Byers Peninsula (Livingston Island, Antarctica)

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Geophysical surveying has been proven to be an effective method to unveil the distribution of permafrost conditions in polar environments. In the South Shetland Islands permafrost is considered to be marginal to discontinuous until elevations of 20-40 m asl changing to continuous at higher altitudes.

However, there is no specific data about the distribution of permafrost in the recently deglaciated areas in the Byers Peninsula (Livingston Island, Antarctica), the largest ice-free area in the South Shetland Islands. With the purpose of better understanding the existence or inexistence of permanent frozen conditions in this area, we have conducted a field season focusing on the geophysical surveying along two transects: from the coast to the highest marine terraces and from the glacier to the central plateau.

The snowy conditions during the cold season in 2014 in the Byers Peninsula have conditioned a late melting of snow, which must be taken into account when interpreting the data related to frozen conditions inferred from the geophysical surveying. The results provide insights about the time required for permafrost to form in the lowest areas of the peninsula, as well as the possible existence of permafrost near the glacier front which may be indicative of the thermal properties of the base of the glacier (cold-warm).

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