



## UNDERSTANDING PRESENT AND PAST INTERACTIONS BETWEEN PERMAFROST AND CLIMATE IN THE MARITIME ANTARCTICA. THE HOLOANTAR PROJECT (PÓSTER)

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HOLOANTAR is a multidisciplinary project funded by the Fundação para a Ciência e a Tecnologia of Portugal for conducting research activities in the Maritime Antarctic between 2012 and 2015. Following former projects focused on permafrost topics (PERMANTAR, PERMANTAR-2), HOLOANTAR project will focus on the South Shetland Islands. Up to 16 researchers from different international institutions (Portugal, Spain, Brazil and Uruguay) will participate in the HOLOANTAR project.

The project is led by the Institute of Geography and Spatial Planning - Centre for Geographical Studies of the University of Lisbon through the research group Antarctic Environments and Climate Change Research Group (ANTECC). Results of HOLOANTAR project will contribute to the understanding of the landscape evolution and climate changes in the South Shetlands Islands (SSI) following Holocene environmental evolution in Byers Peninsula (Livingston, Antarctica, the largest ice-free area in the SSI).

The SSI are located in the northwestern tip of the Antarctic Peninsula, one of the Earth's regions that have experienced a stronger warming signal during the second half of the 20th century. In the ice-free areas of this archipelago islands the terrestrial ecosystem is supported by permafrost, one of the key components of the cryosphere as recently defined by the World Climate Research Programme, though its reaction to climate change is still poorly known. HOLOANTAR is based on two main hypotheses:

- a) A multi-proxy analysis of lake sediments will allow reconstructing the palaeoecological evolution in the Maritime Antarctic and the role played in it by permafrost and active layer dynamics,
- b) The detection of activity rates, spatial patterns and geographical controls of contemporary key-geomorphic processes and permafrost distribution, will allow defining their limiting climatic conditions that will be used to interpret the sedimentary record.



The main purpose of HOLOANTAR is to reconstruct the Holocene environmental evolution and climate variability in Byers by executing five main tasks: (1) Geomorphological mapping, (2) Monitoring of geomorphological processes and permafrost regime/distribution, (3) Sedimentological field work, (4) Laboratory analyses, and (5) Palaeoenvironmental reconstruction based on all the data.

By comparison with present-day geomorphological processes, we shall derive the role played by permafrost and active layer dynamics in the last millennia controlling the environmental evolution in the area. Results will be published in international journals and widely spread in conferences. Several outreach activities will be conducted in order to collaborate in making aware the people of the uniqueness and the necessity to preserve and protect the Antarctic environment.