

Exposure history of pre-LGM glacial drifts in Terra Nova Bay: field work and first results from the XX and XXI Italian Antarctic expeditions

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The history of the East Antarctic Ice Sheet is one of the key issues in paleoclimate research. The expansion of the ice sheet at its margin is directly related to variation in ice thickness, and this expansion is recorded by glacial deposits and glacial erosional features. When these geomorphological features are dated, the chronology of the ice volume variation can be reconstructed.

This study focuses on Terra Nova Bay region (in northern Victoria Land) where a complex and unique glacial system is developed between Priestley Glacier (South), Rennik Glacier (West) and Ross Sea (East and North). This glacial system is completely independent from the East Antarctic Ice Sheet (Baroni et al. 2005) and it is not fed by the East Antarctic Ice Sheet but by local glaciers. Dating of erratic boulders and glacially eroded surfaces using terrestrial cosmogenic nuclides (¹⁰Be, ²¹Ne and ²⁶Al), will enable the study of the investigated glacial system dynamics, the establishment of its glacial history and chronology, and the correlation of glacial advances with those in the Transantarctic Mountains.

In the first phase of this study, 17 samples from erratic boulder from Terra Nova Bay region were processed for surface exposure dating. Accelerator mass spectrometry measurements of ¹⁰Be/⁹Be and ²⁶Al/²⁷Al were performed at the ETH/PSI tandem facility in Zurich. ¹⁰Be measurements of the samples were successfully completed, and ²⁶Al measurements are still to be completed. The ²¹Ne/²⁰Ne and the ²²Ne/²⁰Ne were measured with a 90° sector field static noble gas mass spectrometer at ETH Zurich. According to the results from the first phase, the sampling strategy of the second phase is developed. Following this strategy, 42 samples from Terra Nova Bay region were collected and 20 of these samples are still to be prepared for ¹⁰Be, ²¹Ne and ²⁶Al

measurements. A detailed interpretation with a multiple nuclide approach will be done after gathering the results from the mass spectrometer measurements.

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