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# 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 paleoclimatic research. The expansion of the ice sheet at its margin is directly related to a variation in ice thickness, and 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 (northern Victoria Land), which lies along the western margin of the Ross Sea and extends from Drygalsky Ice Tongue in the South to Cape Washington in the North. On its inland flank, lie the north-south orientated Transantarctic Mountains which limit the region to the east.

In the coastal area, different glacial drifts have been recognized at different altitudes by geomorphological and glacial geological surveys, but evidences to separate these are ambiguous. A rounded glacial erosion morphology is preserved at the highest elevation and it is attributed to one or several old glaciations that covered the whole coastal area. The high- elevated coastal belt has remained ice free ever since.

A valuable tool for numerically dating relict landforms and glacial deposits is at hand

with surface exposure dating using in situ produced cosmogenic isotopes. With a "multiple" nuclide approach, it is possible to identify erosion rates which yield valuable information about weathering conditions and, possibly, burial ages (which in this context mean burial beneath a cold based ice sheet).

Samples from erratic boulders and erosional surfaces from key sites in the Terra Nova Bay region were processed for surface exposure dating. Accelerator mass spectrometry measurements of $^{10}$Be/$^{9}$Be ratios were performed at the ETH/PSI tandem facility in Zurich and the $^{21}$Ne/$^{20}$Ne and the $^{22}$Ne/$^{20}$Ne ratios were measured with a 90˚ sector field static noble gas mass spectrometer at ETH Zurich. Following the initial results, sampling strategy for the second phase has been developed with the aim to differentiate several glacial events from the eroded bedrock on the mountain top to the lower drifts close to the sea. A detailed interpretation with a multiple nuclide approach will be done after gathering the results from the mass spectrometer analyses.