



Analysis of cenozoic sequences and glacial features in the Victoria Land Basin (Antarctica)

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The VILMAP project is still ongoing and is included in the frame of a IPY 2007 proposal named ROSSMAP (Ross Sea Digital Geophysical and Geological Maps, Antarctica) aimed to produce a new series of digital seismo-stratigraphic and structural maps for the whole Ross Sea region. This work will represent a major revision and extension of the stratigraphic and isopach maps of the principal regional unconformities and seismic sequences in the Ross Sea made by the Ross Sea Regional Working Group of the Antarctic Offshore Acoustic Stratigraphy project (ANTOSTRAT) (Brancolini et al., 1995).

The present study is aimed in particular to map the distribution of main depositional sequences and to understand the processes that dominated during their formation from the analysis of the acoustic facies tied to the few available stratigraphic data.

The current availability of seismic data that have been acquired in the last 10 years, multichannel seismic lines (MCS) (IT88/89/90, USGS, NBP) and single channel seismic lines (SCS) (PD90), will be incorporated in the maps, and integrated with the most recently available drilling data of Cape Roberts Project.

The study of the medium resolution seismic data (PD90) provides the possibility to detect the more recent erosional surfaces and depositional records developed in the last 2 Ma in the southern portion of the Victoria Land Basin.

The post stack reprocessing of the seismic lines improves the lateral continuity of the seismo-stratigraphic events and enhances the reliability of the correspondence between the dated horizons, recognised in correspondence of the CPR wells, and the unconformities interpreted in the northern sections of the Victoria Land Basin. Targeted filters, tests of different demultiple methods, migration and, for strategic lines in the

pre-stack domain, horizontal velocity analysis along the main reflectors, is performed.

Preliminary contour maps of key horizons and /or unconformities (e.g. RSU6 and RSU5 of Brancolini et al., 1995) representing significant tectonic events and paleoenvironmental changes affecting the Victoria Land Basin (VLB) during the Cenozoic will be shown.

In addition, seismic facies maps for some areas will be shown to better define the distribution, geometries, and facies association of the glaciomarine sediments of different ages, and to achieve an understanding of glacial processes, as recorded by the seismic stratigraphy.

A preliminary qualitative analysis of the seismic records shows the location and distribution, along the coast, of grounding line zone facies in time (grounding-line fans, till deltas and delta-fan complexes), and discriminates between subglacial deposits and proximal or distal ice-shelf glaciomarine sediments.

The marine glacial sedimentary deposits of these type of coastal glaciers, and erosional features as submarine through and glaciated valley may be correlated with the onshore studied landforms and coastal terrestrial deposits, in order to better constrain the glacial paleoenvironments and dynamic processes.

An attempt is done to link the observed glacial features to the possible widespread advances and grounding of the West Antarctic Ice Sheet (WAIS) on the western Ross Sea Shelf, and/or to the expressions of more local glacial cycle of ice streams or outlet glaciers, valley glaciers, piedmont glaciers or ice tongue.

This study provides some new insight into the relationship between the dynamics and the evolution of the outlet glaciers draining from the East Antarctic Ice Sheet (EAIS) along the Victoria Land coast and the West Antarctic Ice Sheet (WAIS) ice streams.

1 Bibliography

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