G. Brancolini

Istituto Nazionale di Oceanografia e di Geofisica Sperimentale

SEISMIC FACIES AND GLACIAL HISTORY OF THE ANTARCTIC MARGINS

Multichannel seismics from four area around Antarctica (Pacific Margin of the Antarctic Peninsula, Ross Sea, Offshore of the Wilkes Land and Pridz Bay) show similar features, interpreted as a record of the long term evolution of the Antarctic criosphere.

In all the area the continental shelf and margin are characterized by well developed prograding wedges with eroded topset and steep foreset. These units are interpreted as till delta, deposited during multiple advances and retreat of the ice sheet on the continental shelf (sequences type IA from Cooper et al., 1991; Larter and Barker, 1989). Prograding wedges usually overly more regular, sub-parallel aggrading sequences, interpreted as pre-glacial deposits (sequences type IIA).

On the continental rise three major post-rift depositional stages are recognized (Rebesco et al., 1996; Donda et al., in press).

The oldest one (stage C; Fig. 1) is characterized by sub-parallel, low amplitude and very regular reflectors. It is usually interpreted as distal turbiditic or hemipelagic deposits (Escutia et al., 2000).

The intermediate (stage B) is characterized by discontinuous to very irregular geometries, associated to complex channel-levee systems and/or sediment drifts deposits.

The uppermost stage (stage A) is characterized by draping geometries: bedforms and drifts, still develop, but the overall trend is the attenuation of the pre-existing morphologies.

Seismic correlations between shelf and rise are not totally clear, but in all the examined area prograding wedges (type IA sequences) on the shelf are correlated to stage A and to the uppermost portion of stage B, while the aggrading sequences (type IIA) are correlated to stages C and the lower portion of stage B.

This mean that large portions of the channel levee systems and drifts on the rise pre-dates the formation of the prograding wedges on the shelf.

According to the model we propose, stage B represent a major growth of the Antarctic ice sheet. During this stage the ice sheet was temperate or sub-polar, the continental shelf was not overdeepened by ice stream erosion and important volume of sediment were transported and dispersed on the shelf and rise. Stage A testify the evolution of the ice sheet from sub-polar to polar, with consequent ceasing of melt water formation and decreasing of the sediment supply to the margin. This model is also supported by ODP 188 in Pridz bay, that recorded a noticeable reduction in the sedimentation rates throughout the Cenozoic and a thick Pliocene sequence of unsorted debries flows that built up the continental slope.
**REFERENCES**


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**Fig. 1** - Development stages of the mound system on the Wilkes Land rise: Stage C: pre-mound, stage B: channel levee system, stage A: attenuation phase.