



Paleobathymetric Reconstruction of Ross Sea: seismic data processing and regional reflectors mapping

Elisabetta Olivo (1), Laura De Santis (1), Nigel Wardell (1), Riccardo Geletti (1), Martina Busetti (1), Chiara Sauli (1), Andrea Bergamasco (2), Florence Colleoni (3), Walter Vanzella (4), Christopher Sorlien (5), Doug Wilson (5), Robert De Conto (6), Ross Powell (7), Phil Bart (8), and Bruce Luyendyk (5)

(1) OGS - Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Trieste, Italia, (2) CNR-ISMAR Istituto di Scienze del Mare, Venezia, Italia, (3) CMCC-Centro Euro-Mediterraneo sui Cambiamenti Climatici, Bologna, Italia, (4) Gance Vision Technologies - SISSA, Trieste, Italia, (5) University of California, Santa Barbara, (6) University of Massachusetts, Amherst, (7) Northern Illinois University, (8) Louisiana State University

PURPOSE:

New maps of some major unconformities of the Ross Sea have been reconstructed, by using seismic data grids, combined with the acoustic velocities from previous works, from new and reprocessed seismic profiles.

This work is carried out with the support of PNRA and in the frame of the bilateral Italy-USA project GLAISS (Global Sea Level Rise & Antarctic Ice Sheet Stability predictions), funded by the Ministry of Foreign Affairs. Paleobathymetric maps of 30, 14 and 4 million years ago, three 'key moments' for the glacial history of the Antarctic Ice Sheet, coinciding with global climatic changes. The paleobathymetric maps will then be used for numeric simulations focused on the width and thickness of the Ross Sea Ice Sheet.

PRELIMINARY RESULTS:

The first step was to create TWT maps of three main unconformity (RSU6, RSU4, and RSU2) of Ross Sea, revisiting and updating the ANTOSTRAT maps, through the interpretation of sedimentary bodies and erosional features, used to infer active or old processes along the slope, we identified the main seismic unconformities. We used the HIS Kingdom academic license. The different groups contribution was on the analysis of the Eastern Ross Sea continental slope and rise (OGS), of the Central Basin (KOPRI) of the western and central Ross Sea (Univ. of Santa Barbara and OGS), where new drill sites and seismic profiles were collected after the publication of the ANTOSTRAT maps. Then we joined our interpretation with previous interpretations.

We examined previous processing of several seismic lines and all the old acoustic velocity analysis. In addition we reprocessed some lines in order to have a higher data coverage. Then, combining the TWT maps of the unconformity with the old and new speed data we created new depth maps of the study area.

The new depth maps will then be used for reconstructing the paleobathymetry of the Ross Sea by applying backstripping technique.