



Glaciomarine sedimentation and landforms in Admiralty Bay, South Shetland Islands, Antarctica

Fabio Magrani, Arthur Ayres Neto, and Rosemary Vieira
LAPSA - Univerisidade Federal Fluminense (Brazil)

This work consists on the integration and interpretation of high-resolution seismic profiles, geological sampling and multibeam bathymetry in order to analyze and understand the evolution of the deglaciation of Admiralty Bay, South Shetland Islands, Antarctica, since the Last Glacial Maximum (LGM).

Data were obtained from three expeditions to Antarctica between 2009 and 2013, totaling 500 km of seismic lines and five geological cores. The characterization of the bottom geology was performed by analyzing the echocharacters and the sedimentary thickness of the glaciomarine deposits. Its correlation with the collected samples provided interpretation of the depositional paleoenvironments, allowing the reconstruction and evolution of the glaciers since the LGM and the recognition of glaciomarine processes. Multibeam bathymetry also provided records of submarine landforms related to glacial events and changes in positions of glaciers in the region.

In this way, we ought to answer the question: which glaciomarine records are present in Admiralty Bay that can broaden our understanding of the evolution of its deglaciation during the advances and retreats of glaciers that once dominated the fjord, and its sedimentary processes?

Four different echocharacters have been identified. Echoes I and II show good resolution and are characterized by continuous and sharp echoes with sub-parallel reflections and the presence of glaciomarine muds. Very prolonged echoes and absence of sub-parallel reflectors characterizes Echoes III and IV. Eco III is associated with the shallower portions of the bay, with little sediment thickness, sandier content and presence of ice rafted debris. Eco IV is associated with morainical banks and grounding zones.

Seabed landform features show that the region experienced major glacial advance, with subsequent rapid retreat of the glaciers in the deeper parts of the fjord, followed by slower retreat, with the presence of several recessional moraines in the shallower portions. Moreover, submarine channels identified in the records indicate the contribution of meltwater sedimentation in the fjord. The presence of morainical banks up to 640 m water depth shows possible grounding of glaciers at this position during the LGM.