

**ESTIMATE ORGANIC CARBON EXPORT DURING INTENSE DOWNSLOPE OVERFLOW EVENT**

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Within the framework of the Italian Program for Antarctic Research (PNRA) several cruises were carried out on the continental shelf-break in the Ross sea. This area is characterized by intense shelf - slope interactions, strong mixing processes between ambient water (Circumpolar Deep Water, CDW) and the Ross Sea Shelf Water mainly High Salinity Shelf Water (HSSW). HSSW is a young water formed in Terra Nova Bay area, flowing from Drigalsky basin along Victoria land up to continental shelf break near Cape Adare.

The gravity cascade of the energetic plumes of shelf water seems to be the most important process to form the Antarctic Bottom Waters that, after mixing and entrainment processes, ventilate the deep Pacific ocean. The export of dense shelf water is of crucial importance not only for the physical behaviour of the basin but also for carbon export from the continental shelf seas into the abyssal layers.

The study estimates the export of dissolved organic carbon (DOC) and evaluates, in particular, DOC transformation during mixing processes due to the bacterial activities. The hydrolytic activity of bacterial enzymes provides important indications of the organic matter quality and can be considered as a proxy to describe the variations in biochemical composition of DOC.