



## **Evidence of glacial melt water input in the Western Ross Sea (Antarctica) water masses**

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Ice shelves are believed to control the glacial stability and the Antarctic Ice Sheet balance, thus their melting is a critical issue. In this context, the intrusion of the warm Circumpolar Deep Water (CDW) onto the Antarctic shelf area is one of the recognized drivers of ice shelf melting. In the Ross Sea, the CDW enters preferably on the western sector, where the local glaciers are potentially exposed to this warm intrusion. Moreover, the water masses of the Ross Sea experienced significant changes in the thermohaline characteristics, which could affect as well the ice shelf melting rates. The evaluation of the glacial melt water inputs in the western Ross Sea is one of the goals of CELEBeR (CDW Effects on glacial mELting and on Bulk of Fe in the Western Ross sea) project.

To this purpose, CELEBeR carried out ship measurements during a cruise in the austral summer 2016-17, as part of the Italian National Program of Research in Antarctica (PNRA – Programma Nazionale di Ricerca in Antartide).

Physical and chemical properties (dissolved oxygen,  $H_2^{18}O/H_2^{16}O$  ratio, nutrients) data were collected in 33 stations sampled in Terra Nova Bay polynya and near the Drygalski, Aviator and Mariner glaciers (Ross Sea, Antarctica). In particular, the relative abundance of  $^{16}O$  and  $^{18}O$  isotopes allowed us to distinguish glacial from sea ice melting at the surface and to evaluate basal melting. Moreover the vertical profile of current field and turbulence were obtained respectively by means of a Lowered Acoustic Doppler Current Profiler (LADCP) and a turbulence probe which were deployed together with the CTD.

Sources of waters with temperature below the surface freezing point have been detected in the intermediate layers of the waters column close to the Terra Nova Bay coast and in the area bounded by Aviator and Mariner glaciers. Preliminary results suggest the significant role of the local water masses in controlling the floating glaciers by governing the basal melting processes.