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Università degli Studi di Napoli "Parthenope"

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PHYSICAL OCEANOGRAPHY

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ABSTRACT Subject :

Study of the fresh-water inflow through the eastern gate on the Ross Sea

Abstract 23/01/2023 09:32:14

The production of Antarctic Bottom Water (AABW) plays a major role in determining the strength of the Meridional Overturning Circulation and, therefore, is an important element in the ocean's contribution to global climate. AABW is formed in few areas around the Antarctic continent, especially in the Ross and Weddell Seas, with distinct thermohaline characteristics. Observations within the Southern Ocean's Pacific sector indicate a decadal trend of reduced salinity of the shelf waters which are related to the AABW modification. Specifically in the Ross Sea, CTD data and moored observations are showing changes in the thermohaline characteristics of the shelf waters, precursors of the AABW, since 1995. A freshening was observed in the western Ross Sea both at the shelf water formation area and at the Ross Sea shelf break, where the AABW is formed and cascades to fill the Pacific Ocean deep basins. Despite the negative salinity trend, a rebound in salinity has been observed for the last 5 years. The Ross Sea freshening was attributed to the inflow of waters from West Antarctica where a dramatic melting of glaciers is occurring. To determine the freshwater inflow from West Antarctica and the role of these waters in the salinity field variability, an oceanographic cruise was carried out during austral summer 2020 in the eastern sector of the Ross Sea. Additionally, a section of the same CTD grid was repeated during January 2021. Using physical data from the CTD and LADCP casts, glider deployment and drifters, we estimated water mass characteristics and dynamical features. Eventually, discrete sea water sampling for chemical analyses (nutrients, carbonate system, trace metals, persistent organic compounds) has been carried out to provide new information about the biogeochemistry of the area and origin of the water masses.

