

Analysis of the variability of the main physical parameters in the Ross Sea and evaluation of the effects on bottom water production

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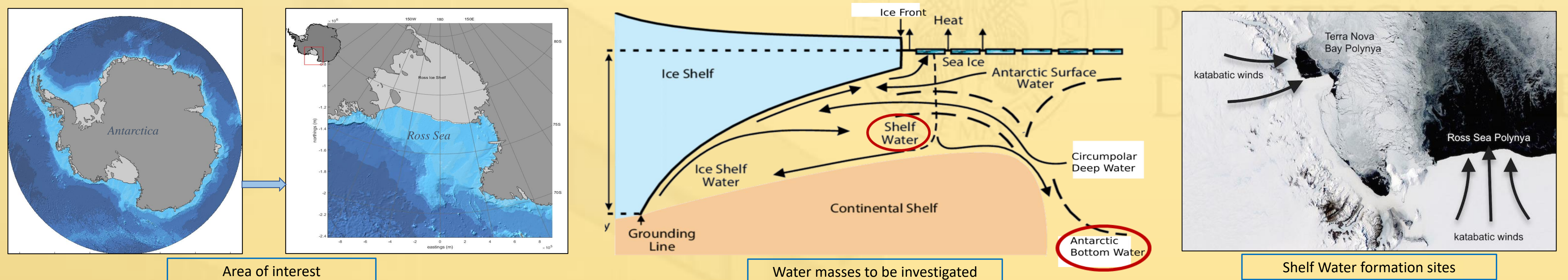
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INTRODUCTION

The Ross Sea (Antarctica) is one of the most important areas in regulating the global climate: here, in fact, around 25% of the Antarctic Bottom Water (AABW) is formed, the coldest and the densest water mass of the world that occupies the bottom layer of the world ocean (Purkey et al., 2013). AABW plays a significant role in the Meridional Overturning Circulation (MOC) and in the ventilation of the deep layers of the ocean. AABW is formed starting from the mixing of the Circumpolar Deep Water (CDW) with the High Salinity Shelf Water (HSSW), which originates in the Ross Sea polynya areas thanks to the action of katabatic winds, atmospheric cooling and brine rejection during the sea ice formation (Jacobs et al., 1985, Budillon et al., 2000). These Shelf Waters (SW) are precursors of AABW, since they represent a key element in its formation (Jacobs and Comiso, 1989). Changes in SW properties have consequences on AABW, and its modifications could affect the entire global thermohaline circulation. For this reason, it is necessary to study the variability of the physical properties of these water masses in the Ross Sea, especially in their formation areas (Terra Nova Bay and Ross Ice Shelf polynyas), in order to understand the contribution of SW to the AABW production.

Keywords: Ross Sea, Shelf Waters, Antarctic Bottom Water, physical oceanography.



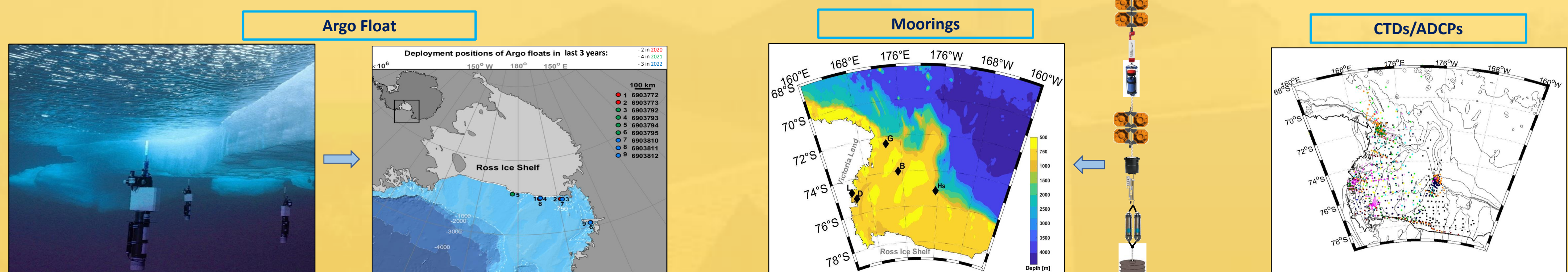
AIM OF THE RESEARCH

Analysis of the variability of Shelf waters (SW)

Characterization of Shelf Waters and their spatio-temporal variability

Through the analysis of oceanographic data from:

Study of the salt budget and salinity variability and distribution



EXPECTED RESULTS

- Description of Shelf Waters (SW) physical characteristics
- Analysis of the variability of SW physical properties
- Study of the salt budget of Ross Sea water masses
- Analysis of the variability of the SW salinity field
- Study of the effects on AABW formation and production

