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PHYSICAL OCEANOGRAPHY

Yuri Cotroneo

ABSTRACT Subject :

Temperature data collected in the Pacific Sector of the Southern Ocean since 1994

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Since 1994 the temperature of the Southern Ocean between New Zealand and the Ross Sea is monitored by the University of Naples Parthenope in the framework of the Italian Antarctic Programme (Programma Nazionale di Ricerche in Antartide – PNRA) with the involvement of more than 50 scientists and technicians. Temperature and salinity data in the upper 800m of the ocean are collected during each austral summer through regular XBT sampling as well as underway collection of sea surface temperature, sea surface salinity and samples. During the first 30 years of activity, several projects have been in charge of data collection. Since 2011, these activities are carried out by the Marine Observatory of the Ross Sea (MORSea) which is coordinated by the University Parthenope of Naples. Throughout the cruises, XBT T7 probes by Sippican/Lockheed Martin were used, with a vertical resolution of 65 cm and a maximum nominal depth of 760 m. Each transect was completed in approximately 6 days to provide a synoptic picture of the thermal structure of the upper Southern Ocean. A regular 20 nm spatial sampling rate was adopted across the frontal regions of the Antarctic Circumpolar Current. The corresponding data were quality controlled based on international standards and then made available on the NOAA/NCEI public repository. This long-term dataset reveals interesting aspects of the Southern Ocean and allows us to focus on peculiar aspects of the Antarctic Circumpolar Current (ACC) characteristics and its variability. Here, we present some highlights from published studies focusing on: • The long-term variability of ACC fronts • The calculation of ACC transport from XBT data • The properties of cold core eddies detaching from the ACC Future perspectives are linked to a larger exploitation of these data, but also to the new possibilities in terms of navigation offered by the I/B Laura Bassi and the associated opportunity of data collection during a longer season.