



## Abstract View

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## The Basin Waters of the Bransfield Strait

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### ABSTRACT

Hydrographic data were obtained within the Bransfield Strait and adjacent waters during February and March 1975 by R/V *Conrad* and R/V *Melville* as part of FDRAKE 75. Within the Strait the circumpolar Deep Water is either missing or its influence is weak. The salinity maximum, oxygen minimum and silicate maximum present in the upper layers of the Strait attenuate toward the east, demonstrating the eastward decrease of Bellingshausen Sea influence. The Strait contains three basins separated from one another by sills less than 1500 m deep and from adjacent ocean areas by depth near or less than 500 m, except for a channel to the northeast of slightly over 1100 m depth. The deep and bottom waters of these basins, with depths to nearly 2600 m, are significantly colder, less saline, higher in oxygen and lower in nutrient concentrations than the deep exterior water adjacent to the Strait. These characteristics confirm Clowes' (1934) contention that the waters of these basins are renewed by local convection. Supportive evidence for post-bomb renewal is provided by tritium measurements from the easternmost basin of the Strait. Bottom (2566 m) tritium values are essentially the same as surface values, which are greater than expected for subsurface water which has not recently been in contact with the surface waters. Comparison of  $T$ - $S$  relations suggests that one mixing component of near-surface water in the convective renewal of Bransfield bottom water is the same as that involved in Weddell Sea bottom water formation. The FDRAKE data set shows that the character of the deep and bottom waters is different within each of the three major basins, suggesting significant spatial (or temporal) variability of the convective events occurring in the Strait. Water mass distributions of the southern Drake Passage and the Weddell Sea are apparently not influenced by outflow of Bransfield basin water. Likewise, there seems to be no direct outflow of deep or bottom waters from the Bransfield basins into the Weddell-Scotia confluence Zone.

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