

The Chemical Hydrography of the South China Sea West of Luzon and a Comparison with the West Philippine Sea

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ABSTRACT

The Chemical hydrography of the South China Sea west of Luzon observed in December, 1990 is reported and compared with that observed in the West Philippine Sea in October, 1990. The purpose is to understand the difference between the SCS water and its precursor, and how such change could be attained. The existence of salinity maximum and minimum in the South China Sea and the resemblance between the deep waters of the two seas reflected the influence of water intrusion from the West Philippine Sea to the South China Sea. On the other hand, distinctions in the water properties above 1500 m were found between the two seas. The subsurface water (100-600 m) of the South China Sea west of Luzon was considerably colder than that of the West Philippine Sea, and more enriched in nutrients and depleted in oxygen relative to the water of the same temperature in the western Philippine Sea. The situation was reversed in the intermediate water (600-1500 m). The salient features of our observations were supported by historical data. The chemical distinction between the two seas could be used to distinguish water masses in the interfacial zone. The much colder and nutrient-richer subsurface water and the uniformity in water properties in the South China Sea may be attributed to vertical mixing as well as upward advection, which was possibly related to rather rapid turnover of the deep water.

1. INTRODUCTION

The South China Sea (SCS) is the largest body of water in the Asiatic Mediterranean Sea. Its central part is a deep basin exceeding 4000 m in depth. The Luzon Strait between Taiwan and Luzon is the only important channel for the exchange of its deep water with the western Philippine Sea (WPS) in the open Pacific Ocean (Sverdrup *et al.*, 1942). All the other channels connecting with the surrounding oceans are either shallow or narrow.

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