

**Variation characteristics of water masses by
advection of Tsushima Warm Current in
southern part of the East Sea
in June, 1996.**

Chung Il Lee and Kyu Dae Cho

Research center for Ocean Industrial Development, Pukyong National Univ.,
Pusan 608-737, Korea
Dept. of Oceanography, Pukyong National Univ., Pusan 608-737, Korea

I . Introduction

Tsushima Warm Current(TWC) entering into the East Sea through the Korean Strait flows northeastward and during this travel it shows complicated movement like meandering and eddy. It is considered that these variations of TWC are important causes making water masses unstable and also have influence on biological and chemical properties of water masses. Lee and Cho(2000) suggested that meandering of TWC in adjacent waters of Noto peninsula has much influence on fluctuation of current structure. Entering of TWC, high- temperature and high-salinity water, into the East Sea may lead to change of physical and chemical properties of water masses

II . Data and methods

II-1. Data

This study used data obtained from a CREAMS cruise in the southern part of the East Sea from June 10th to June 20th in 1996. Temperature(°C), salinity(psu) and dissolved oxygen(DO,*ml/l*) were measured by CTD observation and salinity and DO were corrected through laboratory experiments.

II-2. Methods

To investigate oceanic condition of the East Sea in June, the researchers drew up horizontal distribution of mean temperature and its standard deviation at a depth

of 100m and vertical distribution of temperature, salinity, sigma-t and DO. To investigate variations of stability level, Brunt- Väisälä (B-V) frequency ($N^2(\text{sec}^{-1})$) was calculated by using following numerical formula (Knauss, 1997);

$$N^2 = gE = g \left(\frac{1}{\rho} \frac{\delta \rho}{\delta z} - \frac{g}{c^2} \right)$$

Geostrophic current, without tidal currents, were calculated to discover the characteristics of the current fields by fluctuations of TWC.

III. Results

Water mass of core type was found at a depth shallower than 200m. This water mass is considered as TWC and is confirmed by higher salinity than 34.6psu. TWC existed both over continental shelf in coastal waters of Japan and offshore. One of them was formed by branch of TWC flowing along the coastal waters of Japan and another was formed under meandering of TWC branch, that is, by EKWC's southward advection in process of meandering. In the distribution of B-V frequency, depth with deeper than 200m and where high-temperature and high-salinity water were advected was known as unstable. Geostrophic current flowing northeastward was strong relatively at a depth which TWC flows along the coastal waters of Japan. In offshore position of the geostrophic current flowing southward matched well with that of high-salinity water above 34.6psu. This means that high-salinity water found in offshore is from meandering of EKWC, branch of TWC and its branch is different from that of TWC flowing along the coastal waters of Japan.

IV. References

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