

Detailed Monitoring of Nutrient Supply through Tidal Front in Seto Inland Sea, Japan

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The tidal front, which is a transition zone between the stratified area and the area vertically mixed by tidal currents, probably supplies a moderately high concentration of nutrients from the vertically mixed area to the subsurface layer of the stratified area. Thus, knowledge of these dynamics is essential to manage the coastal environment because tidal fronts are important for primary production of the stratified area. In this study, we conducted a spatio-temporal field survey from April to November 2009 to quantify and assess the nutrient supply from the narrow strait (Hoyo Strait) to the stratified area (Iyo-Nada) in Seto Inland Sea, Japan. Concomitantly, we conducted a fixed-point observation to measure the short-term fluctuation of the nutrients in the Sada Peninsula (i.e., vertically mixed area) almost everyday in 2009.

The tidal front was observed between the vertical mixed area (Hoyo Strait) and the stratified area (Iyo Nada) during a six months period (from April to October), defined as the stratified period. An analysis using the TS diagram indicated an intrusion of the mixed water (Hoyo Strait) into the middle layer (10 ~ 30 m depth) of the stratified water (Iyo-Nada). Chlorophyll *a* (Chl-*a*) maximum was observed within the tidal front area on the middle layer. In the Hoyo Strait, vertical mean concentration of NO₃+NO₂-N increased from 2.2 μmol L⁻¹ on April to 4.3 μmol L⁻¹ in August. Subsequently, a clear correlation was observed between the vertical mean concentration of NO₃+NO₂-N in the Hoyo Strait and the mean standing stocks of Chl-*a* in the middle layer of Iyo-Nada during the stratified period ($r^2 = 0.836$, $n = 8$, $p < 0.01$). Thus, the nutrient supply from the Hoyo Strait seems to be an important nutrient sources for the primary production of Iyo-Nada. The results of the short-term fluctuation of the nutrients in Sada Peninsula will be reported in the presentation.

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