Seasonal and interannual variations in the nutrient concentrations in the Bungo Channel, Japan

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The Bungo Channel is a channel connecting the Seto Inland Sea and the Pacific Ocean. The hydrographic condition in the Bungo Channel has been suggested to be strongly influenced by the intrusion of oceanic water from the Pacific Ocean. In this study, we focus on the spatial and temporal variations of the nutrients in the Bungo channel. We used field data of three nutrient elements (nitrate, phosphate and silicate), water temperature and salinity collected by the Ehime Research Institute of Agriculture, Forestry and Fisheries from 1991 to 2005 with an interval of one month. The nutrient concentrations were highest over the continental shelf slope in the southern area of the Bungo Channel during all seasons, and the interannual variations were also highest in the same area. In summer, water mass with relatively high concentration of nutrients was widely spread in the bottom layer of the channel. The nutrient concentrations in the middle and bottom layers in summer also showed large interannual variations. The large interannual variations of nutrient concentration from the shelf slope to the bottom layer of the channel are likely also associated with the bottom intrusion of oceanic water into the channel.

Keywords: Seto Inland Sea, field observations, nutrients, bottom intrusion

