

## Study on bottom intrusion in the Bungo Channel observed by mooring ADCP data

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Bottom cold water with high nutrient intrudes into Bungo Channel from shelf sloop during summer and autumn, which is called as the Bottom Intrusion (BI). Frequency of occurrence of the BI has been reported using multi-layer water temperature monitoring data, while generation mechanism of BI is still poorly understood. Since high resolution numerical models are developed recently, BI in the models have been analyzed. However, we do not know that the BI in the models are real phenomena of BI or not because we do not have few time-series data in the center of the Bungo Channel, especially current data. Kaneda et al. (2002) reported variation in bottom current in the central part of Bungo Channel associated with BI. However, their observed period was only 15 days and a current data at 100m depth. In the present study, we report the analyzed result of mooring ADCP and water temperature and salinity data at a central part of the Bungo Channel for 3.5 months. In addition, we also report variation in nutrient concentration related to BI.

We moored ADCP and water temperature and salinity meter at Shibiko-Se of water depth of 100m and at Kanbe-Se of water depth of 90m in order to observe current variation related to BI. Period of mooring is from July 7 to October 17 in 2016 at Shibiko-Se but until July 27 at Kanbe-Se. We observed 11 times BI at Shibiko-Se for 3.5 months. Average temperature drop due to BI was 1.46°C. Although previous studies have reported that BI occurred mainly during neap tide, our observe BIs do not always occur during neap tide. Bottom current velocity during BI show northward current for every BI event and its averaged velocity was 8.7 cm/s. The averaged velocity corresponds to that reported by Kaneda et al. (2002). Progressive vector analysis is applied to investigate origin of cold water mass observed at Shibiko-Se. The result showed that origin of cold water mass is about 22 km south from Shibiko-Se. CTD data demonstrated that cold water mass observed at shibiko-Se exists there. This fact suggests that BI is advection of cold water mass from south. On the other hand, when bottom temperature increase after the BI, we cannot observe southward current. Previous studies suggested that disappearance of BI was retreat of cold water mass to the south but our data did not show the retreat of cold water. CTD data shows the reason of increase of bottom water temperature as developing of bottom mixing layer. However, phase between developing of bottom mixing layer and increase of bottom temperature sometimes differs. Anomaly current velocity at Shibiko-Se from long-period variation showed southward when bottom temperature increased. This fact imply that there is a interfered mechanism of BI.

Keywords: Bottom intrusion, Bungo Channel, Mooring observation