

# Oceanic structure of the Vincennes Bay

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Antarctic Bottom Water (AABW) formation is an integral component of the global ocean circulation. Sea ice production is a key process for Dense Shelf Water (DSW; a source water of AABW) formation. The Vincennes Bay is the latest identified AABW source (Kitade et al. 2014) since after mapping of sea ice production become widely available (Tamura et al. 2008). Sea ice production in the Vincennes Bay polynya, on the other hand, is relatively moderate among the coastal polynyas found around the Antarctica. To understand DSW formation process in the Vincennes Bay, or to further explore the possibility of AABW formation at coastal region nearby the polynya with comparable sea ice production (e.g., Shackleton, Dibble), understanding background oceanic structure of the Vincennes Bay, including freshwater discharge from glaciers, should be critical.

Recently, summer hydrographic data in the Vincennes Bay became available through bio-logging technic (Roquet et al. 2014). Derived dynamic height is taking minimum in the center of the bay (fig. 1a), suggesting clockwise baroclinic gyre in the bay. Further, warm and saline water is thicker in western region and cold and dense water is thicker in western region (fig. 1b, c). These facts suggest that warm and saline Modified Circumpolar Deep Water (MCDW) enters the basin along eastern boundary and being modified by polynyas and/or glaciers to form DSW or melt water at the southern end. Then, DSW and melt water are exported along western boundary. Further details will be given in the presentation.

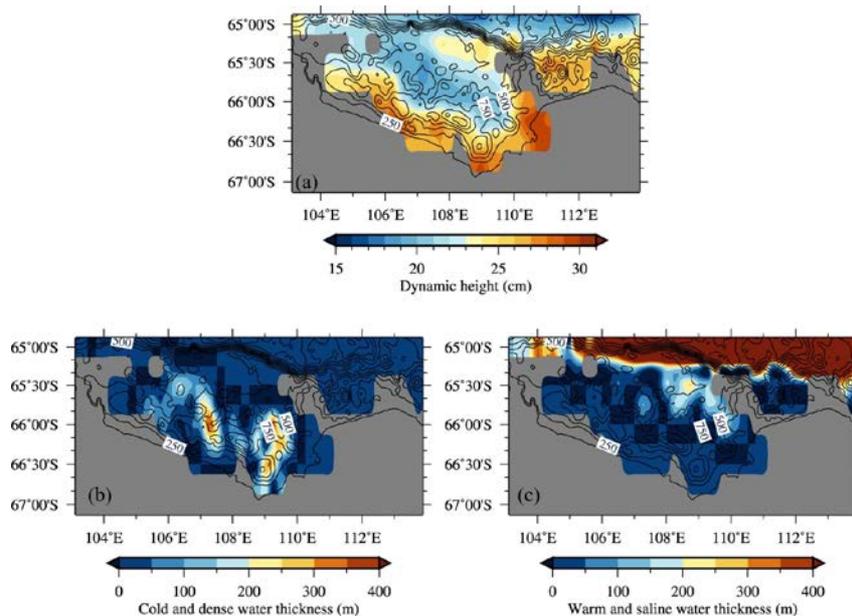


Figure 1. Dynamic height with thickness of cold and dense and warm and saline water obtained from biologging CTD data.

a) dynamic height referenced to 500 m. b) and c) thickness of cold and dense warm and salty water, which are respectively defined as water colder than  $-1.5\text{ }^{\circ}\text{C}$  and denser than  $27.75\text{ kg/m}^3$  in sigma-theta, warmer than  $-1.0\text{ }^{\circ}\text{C}$  and saline than  $34.525$  (PSS-78).

## References

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