

Changes of Antarctic Bottom Water off the Wilks Land coast of the Australia-Antarctic Basin

*Taiyo Kobayashi¹

1. Japan Agency for Marine-Earth Science and Technology

Changes of Antarctic Bottom Water (AABW) off the Wilks Land coast (near 115°E) of the Australia-Antarctic Basin were examined mainly with historical hydrographic datasets and recent observations of research vessels and deep floats. From climatological views, AABW (denser than $\gamma^n = 28.30$) has decreased its thickness since around 1970 by the rate of about 15 m yr⁻¹ at the “hypothetical” station of 60°S 115°E. The freshening of AABW began before 1960 in the region and it was accelerated in time. These climatological features are fairly consistent with those that had been reported on the AABW changes in the other regions in the Australia-Antarctic Basin.

After around 2010, however, the changes in AABW seemed to have modulated from these climatological trends. The thickness of AABW was kept at almost the same level until around 2015, and then it has decreased rapidly (by about 50-100 m yr⁻¹). The isothermal salinity decreased rapidly by more than -1.0×10^{-3} yr⁻¹ for the period of 2010-2015, and then the freshening seemed to be halted.

The recent modulations of the AABW changes off the Wilks Land coast are similar to the recent changes in AABW off the Adélie/George V Land coast (around 140°E) (Kobayashi, 2018) at many points. Meanwhile they have several differences; the former modulations probably began about 4 years later of the latter occurrences, and the former changes were more gradual than the latter. These features would suggest that the recent modulations of the AABW changes off the Wilks Land coast were derived from the arrival of the modified AABW from the east and ultimately attributed to the collapse of Mertz Glacier Tongue in February 2010.

Keywords: AABW, Deep Argo