

## Descending water at the Antarctic marginal ice zone and its contribution to the Intermediate Water using an ice-ocean model

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The descending water at the marginal ice zone (MIZ) and its contribution to the Antarctic Intermediate Water (AAIW) are examined. The main concern in this study is given to the Ekman convergence at the MIZ (ECMIZ) produced by the difference between air-ice drag and air-water drag. A coupled ice-ocean model is used to show the strength and distribution of ECMIZ and to indicate its potential effects on formation of the AAIW. The ECMIZ occurs only in the Atlantic and Pacific sectors from July to October with ice melt. The interannual variability regarding the Southern Annular Mode (SAM) is also examined. The volume transport of surface water input at the MIZ in 2000 with the low SAM index is about two-thirds of that in 2001 with the high SAM index. To confirm the observed CFC-11 extent under MIZ, artificial tracer experiments are carried out. The results show good agreement with the observed CFC-11. Furthermore, they also show surface water injected into the AAIW in both the Atlantic and Pacific sectors, especially with a large amount in the Atlantic AAIW, which is colder and fresher than in the Pacific. The surface water of low salinity from ice melt plays a key role before sinking to the intermediate depth. A potential importance of the surface water input at the MIZ is suggested for formation and property of the denser AAIW, especially in the Atlantic Ocean.