

**WORLD OCEAN ATLAS 2005 INDICATES OCCURRENCE OF WINTER CONVECTION AT OPEN OCEAN
POLYNYA IN THE EASTERN PART OF OKHOTSK SEA**

MAKOTO KASHIWAI

Faculty of Bio-Industry, Tokyo University of Agriculture, 196 Yasaka, Abashiri 099-2493, Japan
m3kashiw@bioindustry.nodai.ac.jp

The January σ_θ sections of the middle of the Okhotsk Sea produced from World Ocean Atlas 2005 (WOA05) data indicate existence of pycnostad (water mass having vertically homogeneous density structure) in the eastern half of central part of the Okhotsk Sea, which corresponds to the open ocean polynya in the maximum sea ice season. The depth range of pycnostad exceeds 400m in the TINRO Basin, and the potential density ranges $26.2 - 26.7 \sigma_\theta$, which correspond to that of water just above the Okhotsk Sea Mode Water ($26.7-27.0 \sigma_\theta$). The vertical distributions of temperature and salinity of pycnostad are not vertically homogeneous but compensating between changes of temperature and salinity, as clearly shown in T-S diagram parallel to isopycnals. This specific temperature and salinity profile is common to that of documented deep convection sites; the Gulf of Lion, and the Labrador Sea. However, the winter convection at open ocean polynya in the Okhotsk Sea has been believed to occur in the upper 100-150m and not to penetrate under the temperature minimum. The Pycnostad has considerable extent and could have considerable contribution to the water mass formation. Under global warming trend, the open ocean polynya in the east part of Okhotsk Sea is expected to increase. Thus, the effect of winter convection at this open ocean polynya can become important process along with progress of global warming, and thus, should be focused in future studies.