Geophysical Research Abstracts
Vol. 17, EGU2015-4562, 2015
EGU General Assembly 2015

Stratification of the oceans: a global survey since the ARGO era

Christophe MAES
LPO/IRD, physical oceanography, Plouzane, France (christophe.maes@ird.fr)

Of the many physical ocean processes contributing to the present climate changes, little attention has been paid to the large-scale contributions of stratification changes in the water column. Over the top part of the oceans, the rich variability in the vertical shapes and forms that the stratification structure can assume through variation in the atmospheric forcing results in a differential effect in terms of the temperature and salinity fields. Rather than focusing on the classical halocline vs thermocline definitions, the present study takes into account the respective thermal and saline dependencies in the Brunt-Vaisala frequency (N2) in order to isolate the specific role of the salinity stratification in the layers including the main permanent pycnocline. We evaluated observed estimates of long-term patterns and compare these to the corresponding thermal changes. Along the water column, the role of salinity is differentiated through its stabilizing or destabilizing effect on stratification. Beyond its role at the base of the mixed layer, the stabilizing effect of salinity as depicted by the ocean salinity stratification has been shown to be seasonally important above the main pycnocline in the tropical oceans. At the opposite, the destabilizing effect seems to be important in the subtropics where compensations with temperature have been previously observed. How these patterns are consistent with estimates of long-term water cycle amplification will be discussed.