Geophysical Research Abstracts
Vol. 15, EGU2013-4979, 2013
EGU General Assembly 2013

Decadal changes in the Red Sea Deep Water properties

Turki Alraddadi, Neil Wells, and Loic Jullion
United Kingdom (t.alraddadi@noc.soton.ac.uk)

Long term variability of the Red Sea deep water (RSDW) properties was investigated using hydrographic data stretching back to the beginning of 19^{th} century. The analysis of the potential temperature and salinity indicate that there is a signal of cooling and freshening trends between 1950 to 2011 in the RSDW by an average of 35.5 x10^{-4} $\pm$ 5.6x10^{-4} ^{o}C yr^{-1} and 13.8x10^{-4} $\pm$ 2.8x10^{-4} psu yr^{-1} respectively. Both trends of cooling and freshening are statistically significant with a confidence level of more than 95%. This cooling and freshening trend is consistent with net heat losses trend in the three source regions for the deep water formation of the Red Sea by an average of -1.12 $\pm$ 0.49 Wm^{-2}, -1.75 $\pm$ 0.49 Wm^{-2} and -1.58 $\pm$ 0.47 Wm^{-2} for the northern part of the Red Sea, and the Gulfs of Suez and Aqaba respectively. The results suggest that the potential temperature and salinity has decreased between 1950 and 2011 by as much as 0.12 ^{o}C and 0.13 psu respectively.

These changes in the potential temperature and salinity in the RSDW are consistent throughout the Red Sea basin (subdivided to 2^{o} grid) for the last three decades (1977-2011).