Geophysical Research Abstracts
Vol. 14, EGU2012-5691, 2012
EGU General Assembly 2012

An estimate of anthropogenic carbon into the north east Atlantic between Scotland and Iceland

V. M.C. Rerolle, M. Esposito, S. E Hartman, D. J. Hydes, and E. P. Achterberg

University of Southampton, National Oceanography Centre, Southampton, Southampton SO14 3ZH, United Kingdom (Victoire.Rerolle@noc.soton.ac.uk)

The uptake of anthropogenic CO_2 by the oceans since the industrial revolution is considered to have considerably buffered atmospheric CO_2 increases and thereby slow global climate change. However, the CO_2 uptake is reducing the ocean's capacity to absorb future atmospheric CO_2 which may lead to more pronounced climate forcings.

We investigated the accumulation of anthropogenic carbon in the Atlantic Ocean on a section between Scotland and Iceland, as part of the UK climate monitoring strategy. This part of the North Atlantic represents an important carbon sink and hence plays a key role in moderating the climate. Repeat sampling on this section known as the "Extended Ellet Line -EEL" has be carried out on three recent cruises in 2009, 2010 and 2011 for work on the carbonate system.

The most detailed dissolved inorganic carbon and alkalinity measurements from RRS *Discovery* cruise D365 in 2011 are used to determine the distribution of anthropogenic carbon along the EEL section. Two different approaches are used to estimate the anthropogenic carbon concentration: a back calculation technique (ΔC^*) and the extended multiple linear regression method with data from the CARINA dataset. The aim is to describe the anthropogenic carbon distribution for the region by comparing the two methods of calculation approaches and relate it to the water masses. The impacts of large-scale atmospheric forcings such as the North Atlantic Oscillation and the Atlantic Multidecadal Variability on the carbon uptake rate are also considered.