Geophysical Research Abstracts, Vol. 7, 01953, 2005
SRef-ID: 1607-7962/gra/EGU05-A-01953

Enhanced open ocean storage of CO2 from shelf sea pumping

H. Thomas (1), Y. Bozec (2), K. Elkalay (2), H.J.W. deBaar (2)

(1) Canada Research Chair, Dalhousie University, Department of Oceanography, Halifax, Canada; (2) Royal Netherlands Institute for Sea Research, Department of Marine Chemistry and Geology, 't Horntje, Texel, The Netherlands (helmuth.thomas@dal.ca)

Seasonal field observations show that the North Sea, a northern European shelf sea, is highly efficient in pumping CO2 from the atmosphere to the North Atlantic Ocean. The bottom topography controlled stratification separates production and respiration processes in the North Sea, causing a CO2 increase in the subsurface layer, which is ultimately exported to the North Atlantic Ocean. The carbon budget of the North Sea is dominated by the exchange with the North Atlantic Ocean, while the net carbon flows are dominated by the carbon inputs from rivers, the Baltic Sea and the atmosphere. The North Sea acts as a sink for organic carbon and thus can be characterised as a heterotrophic system. Globally extrapolated, the net uptake of CO2 by coastal and marginal seas would be approximately 20% of the world ocean's uptake of anthropogenic CO2 thus enhancing significantly the open ocean CO2 storage.