Geophysical Research Abstracts,
Vol. 11, EGU2009-10791, 2009
EGU General Assembly 2009

Carbonate chemistry responds more strongly to eutrophication than ocean acidification in the coastal zone

A.V. Borges (1) and N. Gypens (2)

(1) Chemical Oceanography Unit, University of Liège, Liège, Belgium (alberto.borges@ulg.ac.be, +32-(0)4-3663367), (2) Laboratoire d'Ecologie des Systèmes Aquatiques, Université Libre de Bruxelles, Bruxelles, Belgium

The accumulation of anthropogenic CO2 in the ocean has altered carbonate chemistry in surface waters since pre-industrial times and is expected to continue to do so in the coming centuries. Changes in carbonate chemistry can modify biological activity in marine environments, namely the rates and fates of primary production and calcification. These modifications can in turn lead to feed-backs on increasing atmospheric CO2. Here, we show using a numerical model (RIVERSTRAHLER-MIRO-CO2) that, in highly productive near-shore coastal marine environments, such as the Belgian Coastal Zone, the effect of eutrophication on carbon cycling can counter the effect of ocean acidification on the carbonate chemistry of surface waters (pH, [CO2], saturation state of calcite and aragonite). We also show that changes in river nutrient delivery due to management regulation policies can transiently lead to stronger changes in carbonate chemistry than ocean acidification.