Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00151, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00151
EGU General Assembly 2008

Near-real time maps of the air to sea CO_2 flux in the North Atlantic

M. Telszewski (1), A. Chazottes (2), U. Schuster (1), C. Moulin (2), A. J. Watson (1), D. C. E. Bakker (1)

(1) University of East Anglia, School of Environmental Sciences, Norwich, UK, (2) Laboratoire des Sciences du Climat et de l'Environnement, CEA Saclay, France, (m.telszewski@uea.ac.uk / Phone : +44 1603 591315)

To improve estimates of seasonal to interannual variability in the CO_2 air-sea flux, reliable maps of sea surface pCO_2 are necessary. Applying neural networks, we show basin-wide monthly maps of North Atlantic's surface pCO2 and air-sea fluxes for 2004 to 2006, including seasonal and annual variability.

Our dataset consists of underway measurements of sea surface $pCO_{2,}$coincided with satellite chlorophyll a concentration, NCEP/NCAR reanalysis sea surface temperature, and FOAM mixed layer depth.

Self Organizing Maps process multidimensional data with non-linear behaviour. The algorithms partition available data into "groups" (neurons) of similar characteristics. The SOM, despite its resemblance to vector quantization algorithms, has one important distinction: it applies a neighbourhood function, by which neurons nearby to the best-matching unit are updated when presented with the new datum. The end result is that neighbouring neurons have similar weight vectors. This feature enables the use of SOM for improved pattern recognition, when highly nonlinear relationships are present. Coherence of presented maps confirms methods reliability and the pCO_2 fields' RMS between 8.8 and 13.2 μatm gives certain confidence to flux estimates.