Geophysical Research Abstracts, Vol. 9, 00692, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00692

DOC concentrations variability in the seashore zone of the Gdansk Bay, Baltic Sea

K. Kulinski, J. Pempkowiak
Institute of Oceanology PAS, PO Box 197, Sopot, Poland, kroll@iopan.gda.pl

Coastal seas play a key role in the global carbon cycle, corresponding with approximately 20% of global CO_2 uptake by the world ocean and constituting only 7% of their surface. This is due to a very efficient biophysical pump, propelled mostly by the phytoplankton blooms, which transform CO_2 into organic matter. In the same time shelf seas constitute transition zone between rivers, carrying terrestrial organic matter to the deep ocean, where its significant part is exported. On the European shelf the Baltic Sea seems to be particularly important as regards preliminary stages of the transport path.

The Baltic, together with the transition zone of the Danish Straits and the Kattegat, form a unique system through which transport of organic matter takes place from the land to the deep Atlantic Ocean.

As part of an ongoing experiment, each week in the spring and summer 2006, surface sea water samples were collected, 150 m from the seashore of Sopot, Gdansk Bay, Southern Baltic. Additionally, once a month, water samples from the mouth of the Vistula River were collected, as the Vistula constitutes important source of the organic matter for the Gdansk Bay with its 1070 $m^3\ s^{-1}$ of the water runoff.

Results indicate distinct, weekly oscillations of DOC concentrations (in the range from 4,22+/-0.06 mg/l to 5,48+/-0.05 mg/l) that are higher than those expected from DOC vs. salinity gradient. The oscillations are tentatively attributed both to phytoplankton activity- a hypothesis substantiated by the active chlorophyll a concentrations, and to the Vistula River water contribution, marked as salinity decrease. Plots of DOC concentrations vs. active chlorophyll a concentrations and salinity were calculated and their linear regression correlation coefficients of about 43 % and 35 % respectively, were observed. However the mean DOC concentrations for spring and summer are

equal to 4,64 mg/l and 4,80 mg/l respectively, while the mean concentrations for the Vistula River water equal 6,25 mg/l and 7,95 mg/l respectively.