

Joint analysis of the seasonal and spatial variability of carbon dioxide, methane and nitrous oxide in the Scheldt estuary.

CHASSE G¹, MIDDELBURG JJ², DELILLE B¹, CHAMPENOIS W¹, COMMARIEU MV¹ AND BORGES AV¹

¹*University of Liège, Belgium*

²*Netherlands Institute of Ecology (NIOO-KNAW), The Netherlands*

Since January 2009, we have carried out monthly surveys in the Scheldt estuary to measure the partial pressure of carbon dioxide (pCO₂), methane (CH₄) and nitrous oxide (N₂O). Measurements of pCO₂ were carried out underway with an equilibrator coupled to an infra-red gas analyser, while the concentration of CH₄ and N₂O were carried out with a gas chromatograph on discrete samples. The dynamic range of seasonal changes and horizontal spatial gradients of these three green house gases (GHGs) are one to two orders of magnitude higher than in the open ocean. The drivers of the seasonal and spatial gradients of these GHGs are discussed, among which primary production (in the tidal river and the marine zone), nitrification (in the oligohaline zone), etc...

¹ Chemical Oceanography Unit, Institut de Physique (B5), B-4000, Belgium.

² Netherlands Institute of Ecology (NIOO-KNAW) Centre for Estuarine and Marine Ecology, Postbus 140, 4400 AC Yerseke, The Netherlands.