



Time series of the partial pressure of carbon dioxide (2001-2004) and preliminary inorganic carbon budget in the Scheldt plume (Belgian coastal waters)

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A four-year time series (2001-2004) of the partial pressure of CO₂ (pCO₂) and air-sea CO₂ fluxes is reported in the Scheldt estuarine plume. This system is oversaturated in CO₂ with respect to the atmosphere, except during the spring phytoplanktonic bloom, and acts as a net source of CO₂ to the atmosphere of 0.7 mol C m⁻² yr⁻¹ that represents 7 to 27% of the inner Scheldt estuary CO₂ emission. Results also highlight that a high spatial and temporal coverage of the surface pCO₂ in coastal ecosystems is crucial for reliable estimations of air-sea CO₂ fluxes. The seasonal variations of pCO₂ seem to be more dominated by biological activities (photosynthesis/respiration) than by temperature change. Based on a preliminary dissolved inorganic carbon input/output budget, the annual emission of CO₂ towards the atmosphere seems to be largely due to the outgassing of the inputs of CO₂ from the inner Scheldt estuary, rather than due to organic carbon degradation.