Geophysical Research Abstracts, Vol. 7, 09330, 2005
SRef-ID: 1607-7962/gra/EGU05-A-09330

Community metabolism in three contrasting coastal ecosystems

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Anthropogenic activities in the coastal zone often result in large increases in nutrient concentrations and changes in community metabolism and ecosystem function. The central question to the project EUROTROPH was to identify the response of ecosystem metabolism to different eutrophication levels in three widely contrasting European coastal ecosystems. The study sites were investigated during two seasons and were: the Scheldt estuary (turbid and eutrophied), Randersfjord (low turbidity and nutrient-managed estuary) and the Bay of Palma (meso- to oligotrophic and abundance of seagrass beds). Overall, the main drivers of planktonic gross and net primary production are irradiance and the concentration of nitrate whereas temperature, concentration of nitrate and dissolved organic carbon are the main drivers of planktonic community respiration and bacterial production. The effect of temperature declined in importance for the later two processes in the highly eutrophied site. All sites were heterotrophic, except the Bay of Palma in winter, and sources of CO2 to the atmosphere, except Randersfjord and the Bay of Palma in winter. The behavior of benthic community metabolism and eutrophication in European estuaries will be discussed.

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