

The role of upwelling systems for air-sea exchange in marginal seas

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Coastal processes in atmosphere and sea are highly integrated, coastally introduced circulation systems have the potential of strongly influencing air-sea exchange as well as physical and biogeochemical processes. We use in-situ data from a coastal tower, several coastal moorings for understanding of the processes and remote sensing data for spatially distributed data. Sea surface $p\text{CO}_2$ and air-sea CO_2 flux are determined using satellite data in self-organising map methodology (Parard et al., 2015). The $p\text{CO}_2$ on a monthly basis is strongly depending on the SST, chlorophyll and CDOM products. When integrating over monthly timescales highly frequent upwelling events are not included and this strongly biases budget estimates. It is shown that upwelling events influences biogeochemistry of the water, air-sea exchange as well as partly the response of atmospheric conditions (due to the lowering of the SST). We study the Baltic Sea in northern Europe, the results indicate a strong impact on the role of the Baltic Sea as a sink/source of carbon, but might also be relevant for other coastal/marginal seas.