



## **North Atlantic surface pCO<sub>2</sub> estimated from ARGO float data**

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A novel method for mapping North Atlantic surface pCO<sub>2</sub> on a nearly basinwide scale is presented and analyzed using an eddy-resolving model. VOS-line coverage of the year 2005 is simulated and the synthetic observations of SST and SSS form a training data set for a self-organizing neural network that is subsequently applied to simulated year-2005 ARGO float data. The punctual pCO<sub>2</sub> estimates at the float positions are extrapolated using objective mapping. For ARGO float coverage of the year 2005, the resulting pCO<sub>2</sub> maps cover 70% of the considered area (15°S to 65°N) with an RMS-error of 15.9 ppm and allow for a calculation of an annual cycle of pCO<sub>2</sub> and CO<sub>2</sub>-fluxes. Compared to remote sensing based estimates that suffer from large regional gaps in optical satellite data coverage, the RMS-error in reproducing the annual cycle of pCO<sub>2</sub> can be reduced by 42 % when the more evenly distributed ARGO float based data are used.