## INTERANNUAL VARIABILITY OF $CO_2$ PARAMETERS AT THE ESTOC SITE

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Time-series approach is the best procedure to detect long term trends and changes against the background of the interannual variability of biogeochemical processes and hydrodynamics. Since 1995, hydrography properties, $fCO_2$, $pH_T$ and $A_T$ have been measured in surface waters on monthly cruises at the European Station for Time Series in the Ocean at the Canary Islands, ESTOC, located in the Northeast Atlantic subtropical gyre (González-Dávila et al., 2003). With over ten years of oceanographic data, seasonal and interannual trends of $pCO_2$ and pH have been evaluated. This area is acting as a minor sink of $CO_2$, with an average ingassing value of 51 ± 36 mmol $CO_2$ $m^{-2}$ $yr^{-1}$ (Santana-Casiano et al., 2007) controlled by the dominant Trade Winds blowing from May to August.

After removing seasonality variability, $fCO_{2sw}$ increases at a rate of 1.57±0.3 uatm $yr^{-1}$ and total inorganic carbon ($NC_T$) increases at a rate of 0.9±0.2 umol $kg^{-1}$ $yr^{-1}$, while $pH_{T25}$ decreases at a rate of 0.0017±0.0003 and total alkalinity decreases at a rate of 0.79±0.14 umol $kg^{-1}$ $yr^{-1}$ following the same trend presented by the salinity.

Hydrographic and biogeochemical anomalies induce a significant variability in the inorganic carbon fluxes at ESTOC produced by variations in the winter mixed-layer depth that have been linked to large-scale climate variability indexes. This variability reflects fluctuations relating to NAO showing a closer correlation with a 3-year NAO delay.

References

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