

EGU25-6653, updated on 10 Nov 2025

<https://doi.org/10.5194/egusphere-egu25-6653>

EGU General Assembly 2025

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



Using the VLIZ ICOS station measurements and discrete samples to assess the carbonate chemistry trends (since 2017) and carbon neutrality of the Belgian part of the North Sea

Coraline Leseurre, Hannelore Theetaert, Michiel T'Jampens, Tom Van Engeland, Silke Verbrugge, and Thanos Gkritzalis

Flanders Marine Institute, VLIZ, Oostende, Belgium (coraline.leseurre@vliz.be)

Better understanding of the carbon dynamics in coastal areas is essential to develop metrics to evaluate the efficiency of policies regarding carbon neutrality (i.e. whether the coastal environment, more specifically the Belgian part of the North Sea, acts as a source or sink of carbon to the atmosphere). Over the last 8 years data has been collected from discrete samples (pH, DIC, TA) and data produced by the ICOS coastal stations BE-SOOP-Simon Stevin and the BE-FOS-Thornton Buoy (seawater CO₂ concentration). These data are an invaluable source to identify how the carbonate chemistry and air-sea carbon fluxes can be used to determine whether the coastal environment acts as a source or sink of CO₂ and assess the acidification state. More specifically, we will present the temporal evolution of pH, DIC, TA, seawater CO₂ concentration and air-sea CO₂ fluxes from the gathered data. The data show the expected seasonality of carbon dynamics and the link with biogeochemical processes (e.g. phytoplankton blooms) but also trends in the capacity of these areas to absorb or release CO₂. Furthermore, the results show a pH stability of these coastal waters, uncorrelated with the increase in DIC. This suggests the influence of biogeochemical processes, such as riverine inputs, nutrient dynamics, and the organic matter remineralisation within the coastal zone. This work will also investigate whether it is feasible to connect such information directly or indirectly to policies relevant to carbon neutrality.