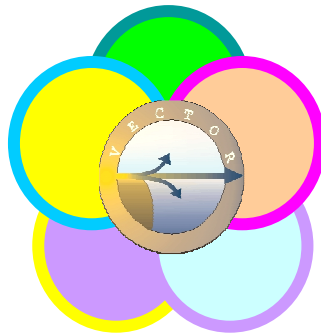


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New observations of CO₂ – induced acidification in the northern Adriatic Sea.

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In the Mediterranean area the North Adriatic is one of the most suitable sites for studying the response of marine pH to increased atmospheric CO₂ levels because of its shallow depth and being exposed to strong cold winds during winter.

During VECTOR VECSES 1 cruise (15 to 19 February 2008), pH and total alkalinity (A_T) were measured over the North Adriatic basin. These data were compared with that collected during ASCOP 2 cruise (30 April to 8 May 1983), 25 years before.

During ASCOP 2 cruise pH was determined at 25 °C using a potentiometric method in NBS scale (pH_{NBS}) while during VECSES 1 cruise it was measured by the spectrophotometric method (precision ± 0.003) and the results expressed on “total scale” at 25°C (pH_T).

To allow a comparison the pH_{NBS} values were converted into the total scale and the reliability of the conversion was checked. Comparable North Adriatic dense water bodies were identified according to T, S and AOU data from both the datasets and the carbonate system parameters were compared.

Results at 25°C showed an acidification of -0.063 pH_T units from 1983 and 2008 and a decrease in carbonate ion concentration (-19.6 μmol kg⁻¹), whereas total alkalinity (+ 74 μmol kg⁻¹), dissolved inorganic carbon (+ 110 μmol kg⁻¹) and CO₂ (+ 108 μ atm) exhibited a net increase over the same period.

The drivers of these changes were analyzed and the increase in atmospheric CO₂ concentration was identified as the main forcing that determined the acidification observed. It would correspond to an acidification rate of -0.0025 pH units/year, that is of the same order of magnitude of the rate measured in other oceanic regions.

This study, even if it was based on the comparison of only two datasets spanning 25 years is the first published work (Luchetta et al., Chem. and Ecol., 2010, vol. 26, 1-17) assessing the ocean acidification process in the Mediterranean region and one of the few based on the analysis of experimental data.