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Western Mediterranean marine cores show an imprint of anthropogenically enhanced CO_2 emissions in planktic Foraminifers

SVEN PALLACKS[1], RALF SCHIEBEL[2], HUBERT VONHOF[2], ERIC GALBRAITH[1,3] AND PATRIZIA ZIVERI[1,4]

[1]Institute of Environmental Science and Technology, Universitat Autònoma de Barcelona

[2]Max Planck Institute for Chemistry

[3]Department of Earth & Planetary Sciences, McGill University

[4]Catalan Institution for Research and Advanced Studies

Presenting Author: sven.pallacks@uab.cat

Increasing atmospheric CO_2 concentration during the last century is evidently altering marine environments. Specifically, marine planktic calcifying organisms interact sensitively to changes in surface water, being strongly linked to the marine carbon cycle. The study sites are in the western Mediterranean Sea, a region highly affected by both climate change and direct anthropogenic pressure. By analyzing high-resolution multicores spanning the last 200 to 1500 years BP, conclusions can be drawn on how increasing environmental changes have altered the biogeochemistry of the region, including shell chemistry of planktic foraminifera. At all sites, planktic foraminiferal species show a significant drop of carbon isotopic composition in their tests during the 20th century in comparison to pre-industrial times. The decline of foraminiferal carbonate isotopic composition reflects changes in seawater carbonate chemistry and might be due to regional alteration in marine surface productivity and upwelling mechanisms. The consistent post-industrial decline at all three stations, in species with different depth habitats might be evidence for the vertical penetration of anthropogenic CO_2 in the western Mediterranean Sea. The carbon isotope results seem to indicate that the Mediterranean Sea is particularly able to uptake anthropogenic CO_2 as suggested by previous studies.