Benthic contributions to Adriatic and Mediterranean biogeochemical cycles

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The 3D biogeochemical BFM-OGSTM implementation currently exploited operationally in the Copernicus Marine Environment Monitoring Services Mediterranean Sea Monitoring and Forecasting Centre (CMEMS-Med-MFC; Lazzari et al., 2010) has been complemented with a benthic component. The approach followed that of (Capet et al 2016) and involved a vertically integrated benthic module accounting for the effect of environmental bottom conditions on diagenetic rates (aerobic mineralization, denitrification, nitrification) through transfer functions as well as the effect of waves and bottom currents on sediment deposition and resuspension. A balanced climatological year is simulated for various values of the resuspension parameters, using specifically calibrated transfer functions for the Adriatic Sea and generic formulations for the rest of the Mediterranean basin. The results serves the mapping of distinct provinces of the Adriatic Sea based on the benthic contributions biogeochemical budgets and the seasonal variability of benthic-pelagic fluxes. The differences with the non-benthic reference simulation are highlighted in details regarding the Adriatic, and more generally for the entire Mediterranean Sea.

Lazzari, P., Teruzzi, A., Salon, S., Campagna, S., Calonaci, C., Colella, S., Tonani, M., Crise, A. (2010). Pre-operational short-term forecasts for Mediterranean Sea biogeochemistry. Ocean Science, 6(1), 25-39.

Capet, A., Meysman, F. J., Akoumianaki, I., Soetaert, K., & Grégoire, M. (2016). Integrating sediment biogeochemistry into 3D oceanic models: A study of benthic-pelagic coupling in the Black Sea. Ocean Modelling, 101, 83-100.