Geophysical Research Abstracts
Vol. 21, EGU2019-17605, 2019
EGU General Assembly 2019

Satellite-driven preliminary estimates of Total Alkalinity in the Mediterranean basin

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ESA SMOS satellite [1] has been providing Sea Surface Salinity (SSS) measurements, for the first time from space, since November 2009. Until recently, inherent algorithm limitations or external interferences hampered a reliable provision of satellite SSS data in semi-enclosed basin such as the Mediterranean. This has however been overcome through different strategies in the processing chain and data filtering approach which allowed a consistent SSS data stream in the Mediterranean Sea [2, 3]. This recent capability has been in turn used to infer the spatial and temporal distribution of Total Alkalinity (TA - a crucial parameter of the marine carbonate system) in this basin, exploiting some direct relationships existing between salinity and Alkalinity.
Preliminary results [4] focused on the differences existing in several parameterizations [e.g, 5] relating these two variables, and how they vary over one-year timeframe. This is now been expanded over a larger timeframe to assess quantitatively the seasonal to interannual variability of the TA estimates.
Moreover, to verify the consistency and accuracy of the derived products, these data are being properly validated against a proper ensemble of in-situ, climatology and model outputs within the Mediterranean basin. An error propagation exercise is also being planned to assess how uncertainties in the satellite data would translate into the final products accuracy.
The resulting preliminary estimates of Alkalinity in the Mediterranean Sea will be linked to the overall carbonate system in the broader context of Ocean Acidification assessment and marine carbon cycle.

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