

The Lebanese Sea: a source or a sink of CO₂ to the atmosphere?

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Lebanon is witnessing, since the last twenty years, a huge growth of the industrial and transportation sector, which resulted in an excessive emission of CO₂ and other pollutants in the atmosphere as well as in the sea. A study of the carbonates system, and CO₂ air-sea fluxes, will allow us to determine whether Lebanese waters act as a source or sink of CO₂ compared to the atmosphere in the context of a current biogeochemical change in the Lebanese sea that is not yet well studied.

The purpose of this study is to quantify the carbonate system and the air-sea fluxes of CO₂ in the Lebanese sea. The samples of this project are collected monthly from January 2016 until May 2019 from two stations located in Batroun a coastal one (B1) from which we sample only from the surface (0 m) and the other (B2) located 5 Km offshore from which samples are taken from different depths (0, 20, 40, 60 and 80 m).

The measurement of physical parameters is conducted in-situ while the chemical and biological parameters are analyzed in the laboratory. The CO₂ air-sea fluxes were estimated to evaluate if Lebanese waters play the role of source or sink compared to the atmosphere.

Our most relevant results show a decreasing temporal trend in pH, a sign of Lebanese waters acidification. An increasing temporal trend in total alkalinity is obtained because of the high power of resistance to acidification for Lebanese marine waters. As for the fluxes a very significant seasonality is detected with mostly positive vibes which shows us that Lebanese waters act actually as a source of CO₂ to the atmosphere.