Is nutrients dynamic affected by ocean acidification? Results from two mesocosms experiments in the Mediterranean Sea (FP7 MedseA Project)

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Ocean acidification is the term used to describe the decrease in seawater pH due to ocean's absorption of anthropogenic carbon dioxide (CO2) from the atmosphere. This represents an additional anthropogenic pressure for Mediterranean Sea ecosystems that already suffer from increasing sea surface temperatures, increasing urbanization of the littoral zone, overfishing. One of the goals of the European FP7 project MedseA (Mediterranean Sea Acidification in a changing climate) is to study the impact of ocean acidification on Mediterranean Sea ecosystems by the mean of experiments conducted in large pelagic mesocosms. A first experiment took place in Summer 2012 in the oligotrophic waters of the bay of Calvi (Stareso; Corsica). A second experiment took place in Feb-March 2013 in the bay of Villefranche (French Riviera) under pre-bloom conditions. For both experiments, 9 mesocosms were deployed among which three served as controls and six were acidified following a gradient from 450 to 1,250 μatm. By using analytical methods adapted to the nanomolar level, the evolution of nutrients (nitrate, phosphate, dissolved iron) concentrations and bioavailability (speciation between organic and inorganic forms) was followed. Since the organic nutrients pool likely represents a significant fraction in the euphotic zone and thus a potential source for marine microorganisms, the quantification of such partitioning and its link with bioavailability is particularly important in the context of ocean acidification. Results (NO_3^-, PO_4^-, [inorganic/organic], DFe) from both experiments will be presented.