



Nutrient and trace metals atmospheric deposition in the western Mediterranean: source apportionment

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Mediterranean Sea is a typical LNLC region particularly well adapted to assess the role of ocean–atmosphere exchanges. Throughout the summer stratification period when diffusion through the thermocline is low, atmospheric inputs become the main external source of nutrients to the surface open waters of the MS, mostly by wet deposition in the western basin. Here, we show a 3-yr time continuous series of nutrient (N, P) and trace metals (Cr, Cu, Fe, P, V, Zn) total deposition fluxes in Corsica. Between March 2008 and May 2011, a monitoring station was operated with a weekly sampling time step at Galeria (42.44°N; 8.65°E) on the western coast of Corsica in the framework of the projects DUNE (a Dust Experiment in a Low Nutrient Low Chlorophyll Ecosystem) and then ChArMEx (the Chemistry-Aerosols Mediterranean Experiment).

Monthly fluxes were measured to assess the temporal variability of the measured elements over the Western Mediterranean. Nutrients deposition presented a clear seasonal pattern which was different for each studied nutrients, emphasizing a difference of sources for the nutrients. The results show no dust event larger than 0.68 g m⁻² so that the maximum yearly flux was among the lowest ever observed in Corsica (1.7 g m⁻² y⁻¹). One dust deposition event could contribute up to 30% of yearly deposition fluxes of nutrient and trace metals, confirming the high temporal variability of atmospheric deposition. However a source apportionment work via statistical methods shows that the yearly deposition fluxes of considered nutrient and trace metals were dominated by anthropogenic sources, except for Fe.

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