



## **Atmospheric inputs of soluble N, P and Fe to the Mediterranean Sea**

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The oligotrophic semi-closed environment of the Mediterranean Sea is characterized by anomalous high nitrogen-to-phosphorus ratio that has been tentatively attributed to the atmospheric inputs of nutrients to the sea. A 3-dimensional atmospheric chemistry transport model to evaluate the atmospheric deposition fluxes of soluble N, P and Fe to the Mediterranean Sea. The study considers both the inorganic and organic fractions of them and compares them to other external to the ocean sources of these nutrients. These deposition fluxes provide an integrated spatially complete picture of the atmospheric inputs to the Mediterranean Sea than constructed from point measurements. The estimated fluxes of soluble nutrients amount at 1.3 Tg-N y<sup>-1</sup>, 0.004 Tg-P y<sup>-1</sup> and 0.006 Tg-Fe y<sup>-1</sup>. They are much lower when anthropogenic and biomass burning emissions of the year 1850 are considered; while for future emissions N deposition hardly increases and soluble P and Fe fluxes are drastically reduced compared to current estimates. While simple calculations reveal the importance of atmospheric deposition for C fixation, use of ocean biogeochemical model is needed to investigate the importance of these atmospheric inputs to this marine ecosystem and the ocean carbon cycle.

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