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Dust deposition fluxes and particle size of Saharan dust across the Atlantic Ocean, from 2012 - 2014

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Every year, an estimated 140 million tons of Saharan dust are deposited in the Atlantic Ocean, which can have several direct and indirect effects on global and regional climate. For example, dust can scatter and absorb incoming and reflected solar radiation, transport nutrients and pathogens, and act as mineral ballast particles in the ocean. This influences global radiation budgets and carbon export to the deep ocean, which in turn relate to the particle size of the dust.

In order to constrain the relations between atmospheric dust and climate, subsurface sediment traps were moored at five stations along a transect across the Atlantic Ocean at 12˚N, at 1200m and 3500m water depth. These sampled from October 2012 to April 2016.

For the first time, dust particle fluxes and particle size of two years of sampling (October 2012 – October 2014) will be presented here. The data show seasonal variations, with finer-grained dust particles during winter and spring, and coarser-grained dust during summer and fall, and seasonality of the dust flux. Also a fining trend of the grain sizes of the dust particles from source (Africa) to sink (Caribbean) is observed, in combination with a downwind decrease in dust deposition. In addition, we observed “giant” dust particles (>100 μm) at distances up to 4400 km from the African coast. This is much larger than previously assumed and applied in climate models. The dust deposition data is unique for validation of regional or global dust models.

Some of the data that will be presented here has been recently published in van der Does et al. (2016); Atmospheric Chemistry and Physics 16, doi: 10.5194/acp-16-13697-2016.
See also: www.nioz.nl/dust