



Aerosol water soluble organic nitrogen and carbon over the remote Atlantic Ocean

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Nitrogen is a limiting or co-limiting nutrient in large parts of the world's oceans particularly in oligotrophic regions such as gyres. In the open ocean there are two pathways by which new nutrient nitrogen can enter the oligotrophic system: biological nitrogen fixation and atmospheric deposition. Aerosol matter contributes to the latter route via dry and wet deposition, therefore it is important to understand and quantify the nitrogen containing material in aerosols and establish its major sources. Until recently, the organic nitrogen component of aerosol nitrogen was largely ignored, however, it is now known to contribute between 25-30 % of total water soluble nitrogen in aerosols, globally. This organic nitrogen is known to be chemically complex, shows high spatial and temporal variability and a large proportion of it has been shown to be bioavailable. It is important that this material is further quantified and characterised (including its carbon component) to determine its biogeochemical impact. Data gathered from fine and coarse mode aerosol samples collected on three Atlantic cruises (AMT21, AMT22 and ANT26-4) will be presented. Bulk and water soluble organic carbon and nitrogen data will be shown alongside major ion and inorganic nitrogen data. Potential sources of organic nitrogen and carbon material will be evaluated using a combination of inter-component correlations with known tracers and air-parcel back trajectories, allowing estimates of the anthropogenic impact on nutrient deposition to the remote Atlantic Ocean to be made.