

Spatial and temporal variations of dust elemental composition in Patagonia

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South America is suspected to be the major source of atmospheric dust input into Southern Ocean. The chemical composition and properties of dust from this region are poorly documented. During four field campaigns, we collected about 130 soil samples from Patagonia and central Argentina and lichens from the South part of Patagonia. Initial dust samples were prepared from each soil using a laboratory dust generation device - SyGAVib. An aerosol sampling station installed at Rio Gallegos (Argentina, South Patagonia, 51°38'S; 69°14'W) provides continuously samples on a weekly basis from December 2011. Elemental composition of soils, aerosols collected at Rio Gallegos and laboratory generated aerosols were measured by X-Ray Fluorescence, ICP-AES and ICP-MS, and lichens' elemental composition by ICP-AES. Solubility experiments were performed on several laboratory generated aerosol samples.

Elemental composition analysis shows visible differences between soil and soil-derived dust. No clear correlation was found with geological variation mode. Lichens' chemical composition can bring additional information on the local dust emission. Chemical maps of soil and generated aerosol are finally proposed, covering most of dry regions of Patagonia and central Argentina.

Results of aerosol samples from Rio Gallegos reveal a seasonal pattern with much lower dust content in winter than in summer. However, sea salt aerosol is also observed at this station and exhibits smaller seasonal variations.

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