



## **Lead isotope ratios and trace metal concentrations in coastal and remote marine aerosols**

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The atmosphere is recognised as an important source of trace metals to Oceans. The atmospheric deposition of trace metals was investigated by studying aerosols collected during cruises from the UK to the Falkland Islands and from South Africa to Australia. Air mass back trajectories suggested most of the aerosol samples had spent several days over the ocean prior to collection. The highest metal concentrations were observed in aerosols close to South Africa, Australia and major cities in South America, although these concentrations were lower than had been reported previously in the literature. Lead concentrations were elevated above crustal sources in the samples although in contrast to previous studies no clear north - south gradient was observed in the concentrations of the trace metals in the aerosols. Similar dry deposition fluxes were calculated to the North Atlantic, South Atlantic and southern Indian Oceans for the trace metals studied, with the exception of Ba, which had a strong crustal influence and was highest in the North Atlantic.

Stable lead isotope measurements (206, 207 and 208) were also carried out on aerosol samples using a multi collector- inductively coupled plasma- mass spectrometer to assist in source apportionment. While distinctions between Pb isotope ratios were not as well defined as in previous studies, clear differences were noted in the isotope ratios collected on either side of the Indian Ocean with Australian lead ore dominating over much of the eastern and mid southern Indian Ocean. Samples collected over the western Indian Ocean and Atlantic Ocean under South African influence had lead isotopes quite different to those seen in South African cities in the past and are closer in ratio to the coal signature of the region.