



Multidisciplinary studies of the dust storm that affected Sydney in September 2009

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A major dust storm transgressed over southeastern Australia in September 2009 and continued as far as northern Queensland [to the north], New Zealand and New Caledonia [to the east].

We analysed samples of the dust for organic compounds, its microbiological composition, pollen, trace and rare earth elements as well as Sr and Nd isotopes. Grain size analysis was also performed on some of the samples. We also obtained information on the meteorological conditions that led to the large dust plume and its pathway.

Our geochemical fingerprinting allowed us to determine the origin of the dust, and this was confirmed by meteorological observations and satellite imagery.

As the pathway of the dust plume went over the city of Canberra, located to the southwest of Sydney, we were able to collect samples of dust that fell with rain, and the surprise was that the geochemical composition of the dust varied with time [and dust fall], identifying that as the dust plume transgressed over the landscape, it picked up additional material that was compositionally different from its point of origin.

We also compared our data with those obtained from another major dust event that affected Canberra in October 2002, and a number of important differences are noted, particularly with respect of the microbiological composition of the dust, and its chemical composition.

Collaborators on this project are: Chris Munday and Gwen Allison [microbiology]: Research School of Biology, ANU; Jochen Brocks and Janet Hope [organic chemistry] and Marc Norman [inorganic geochemistry]: Research School of Earth Sciences, ANU; Tadhg O'Loingsigh and Nigel Tapper [meteorology, satellite imagery] and Sander van der Kaars [palynology]: Geography and Environmental Science, Monash University; and J.-B. Stuut [grain size analysis], NIOZ.