

1.030 Airborne Particles in the Urban-Marine Environment .

Early Career Scientist

Presenting Author:

Doreena Dominick, University of Wollongong, dd824@uowmail.edu.au

Co-Authors:

Stephen Wilson, University of Wollongong

Clare Paton-Walsh, University of Wollongong

Élise-Andrée Guérette, University of Wollongong

Ruhi Humphries, CSIRO Ocean and Atmospheric flagship

Melita Keyword, CSIRO Ocean and Atmospheric flagship

Abstract:

Atmospheric particles were measured in the seaside city of Wollongong, Australia, during an intensive field campaign known as MUMBA (Measurement of Urban, Marine and Biogenic Air) between 21st Dec 2012 and 15th Feb 2013. A scanning mobility particle sizer (SMPS) and eSampler were operated to measure number particle size distributions ranging from 14 nm to 660 nm in diameter and particle mass (PM_{2.5}) respectively. Principal component analysis has been applied on the SMPS dataset and revealed three different factors (Large, Medium and Small). The three factors are ranging from 14 nm to 478 nm in diameter and describe 85% of the dataset cumulative variance. All three particle factors and particle mass increased steadily in the morning with a distinct peak observed between 7:00 and 8:00 (Australian Eastern Daylight Saving Time), related to a combination of dispersion of accumulated particles overnight and local traffic. North-westerly winds carry biogenic emissions from the Illawarra escarpment conservation area. Anthropogenic emissions from the central business district and the steel works are identifiable in southerly winds. Total particle concentrations appear to be strongly influenced by the prevailing easterly to north easterly sea breezes that carry pollutants from sources in and around Sydney.