

Supplementary Material

Online Resource

Using a Network of Low-Cost Particle Sensors to Assess the Impact of Ship Emissions on a Residential Community

Environmental Monitoring and Assessment

Rohan Jayaratne, Tara Kuhn, Bryce Christenson, Xiaoting Liu, Isak Zing, Riki Lamont, Matthew Dunbabin, Jill Maddox, Gavin Fisher, Lidia Morawska

Corresponding Author:

Lidia Morawska

International Laboratory for Air Quality and Health, Queensland University of Technology

Tel: (617) 3138 2616; Fax: (617) 3138 9079

Email: l.morawska@qut.edu.au

Supplementary Material

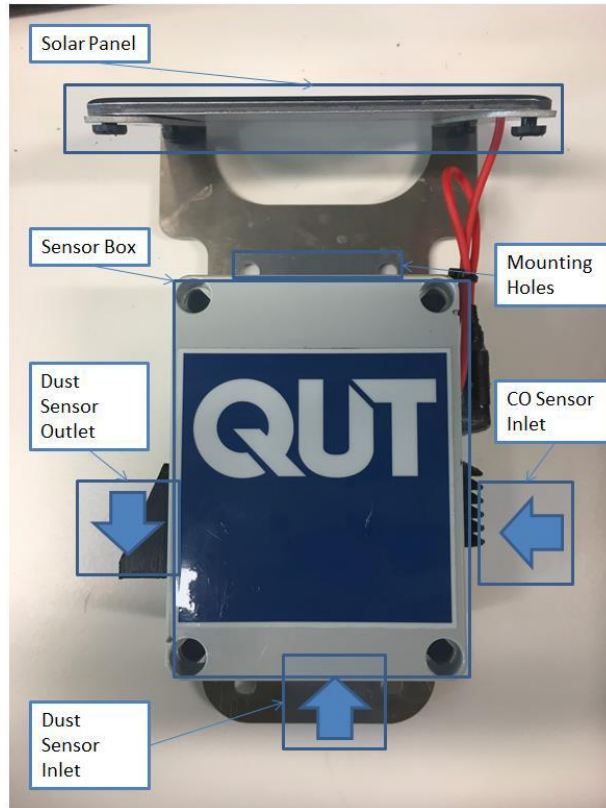


Fig S1(a) KOALA with the solar panel, with essential external parts labelled.



Fig S1(b) KOALA modified for use via the mains and USB cable.



Fig S2 An example of the real-time visualisation map of the PM_{2.5} concentrations at the seven locations in Beacon Cove that was made available on-line during the project (02/02/2019).

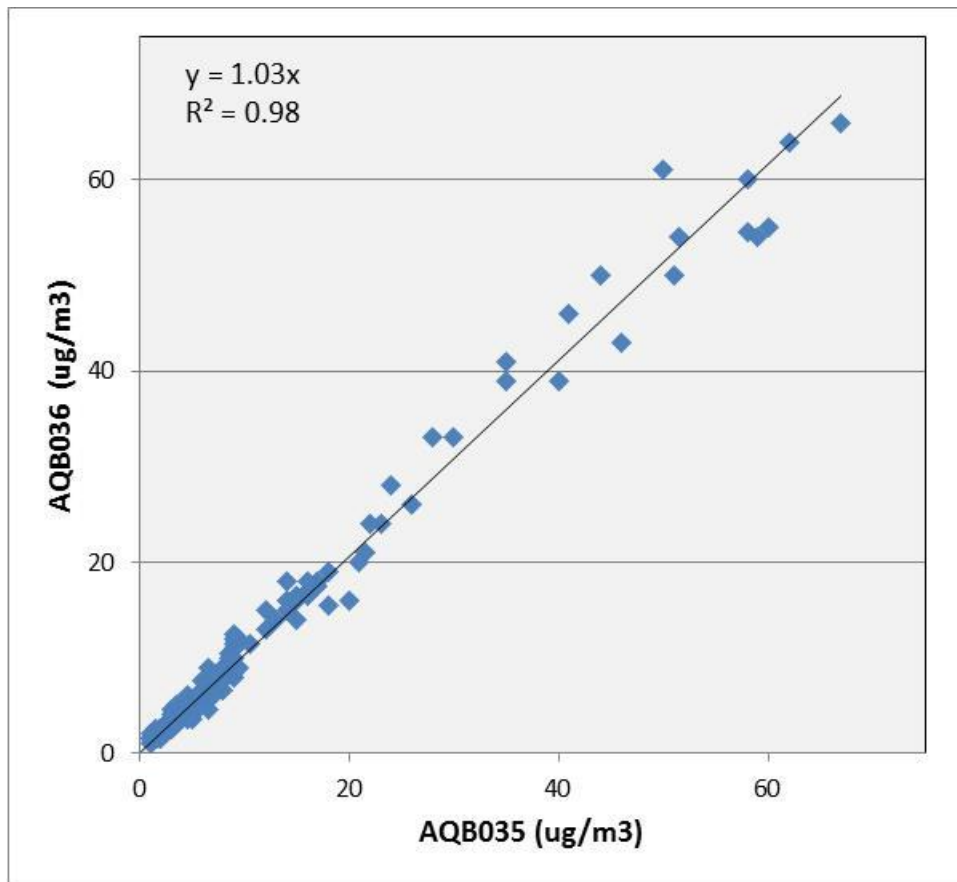


Fig S3 Hourly average PM_{2.5} concentrations of AQB36 vs AQB35 at the EPA, Air Quality Monitoring Station at Footscray.

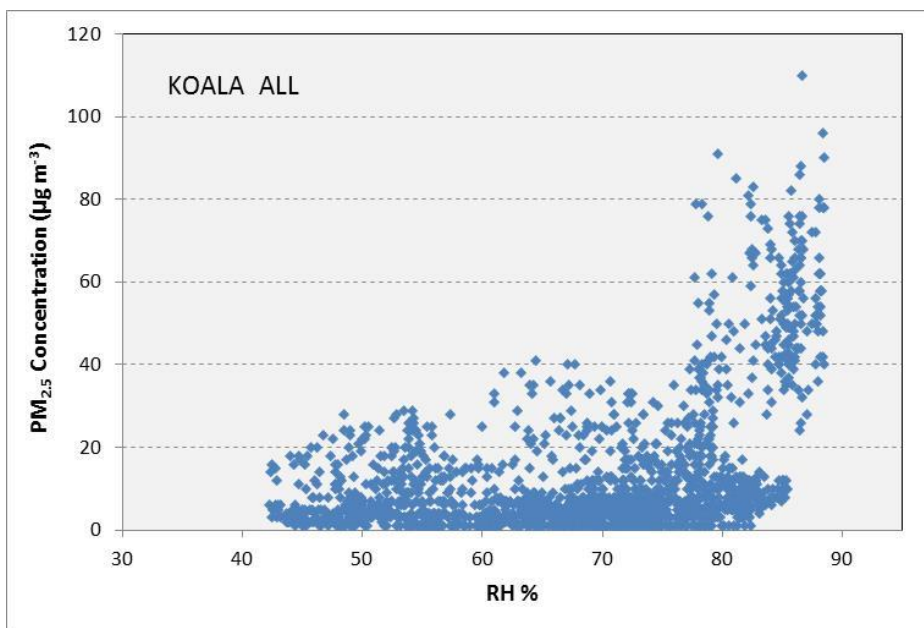


Fig S4 PM_{2.5} concentrations of AQB35 against the relative humidity.

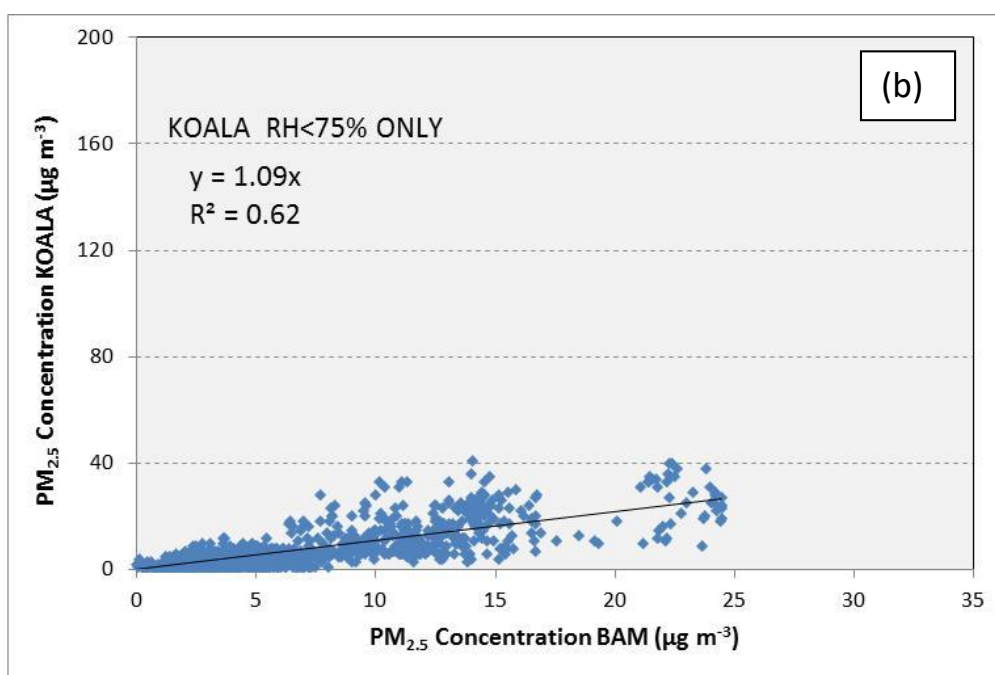
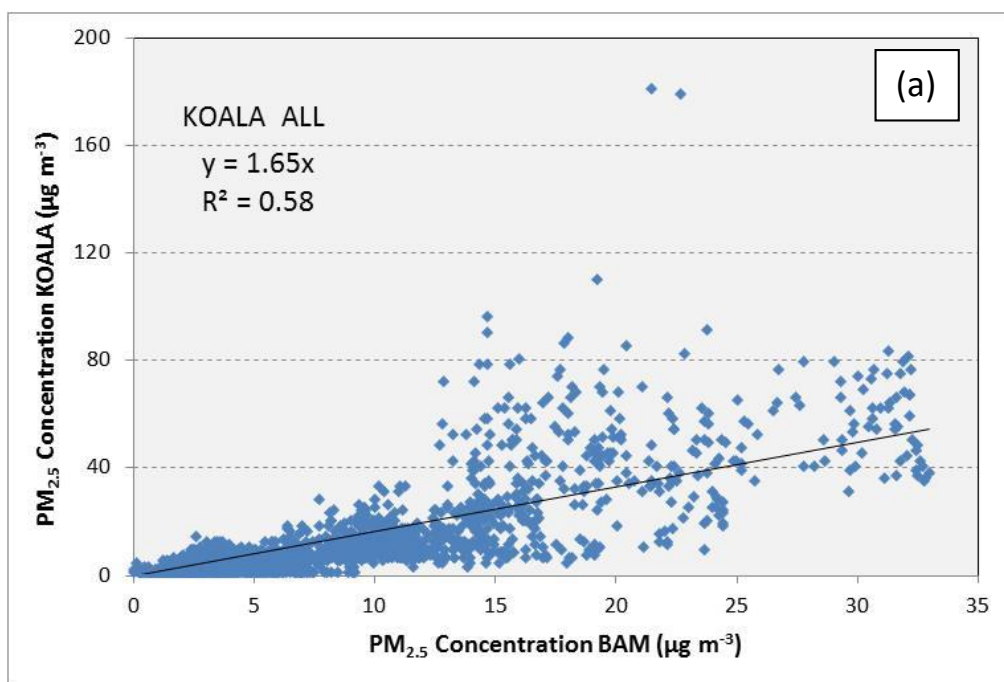


Fig S5 $PM_{2.5}$ concentrations of AQB35 against the BAM (a) at all values of RH and (b) when the RH was less than 75% only. The sample sizes, slopes and standard errors of the slopes in (a) and (b) are (2016, 1.65, 0.035) and (1377, 1.09, 0.024), respectively. The slopes of the two lines are significantly different at a confidence level of 95% ($P < 0.05$).

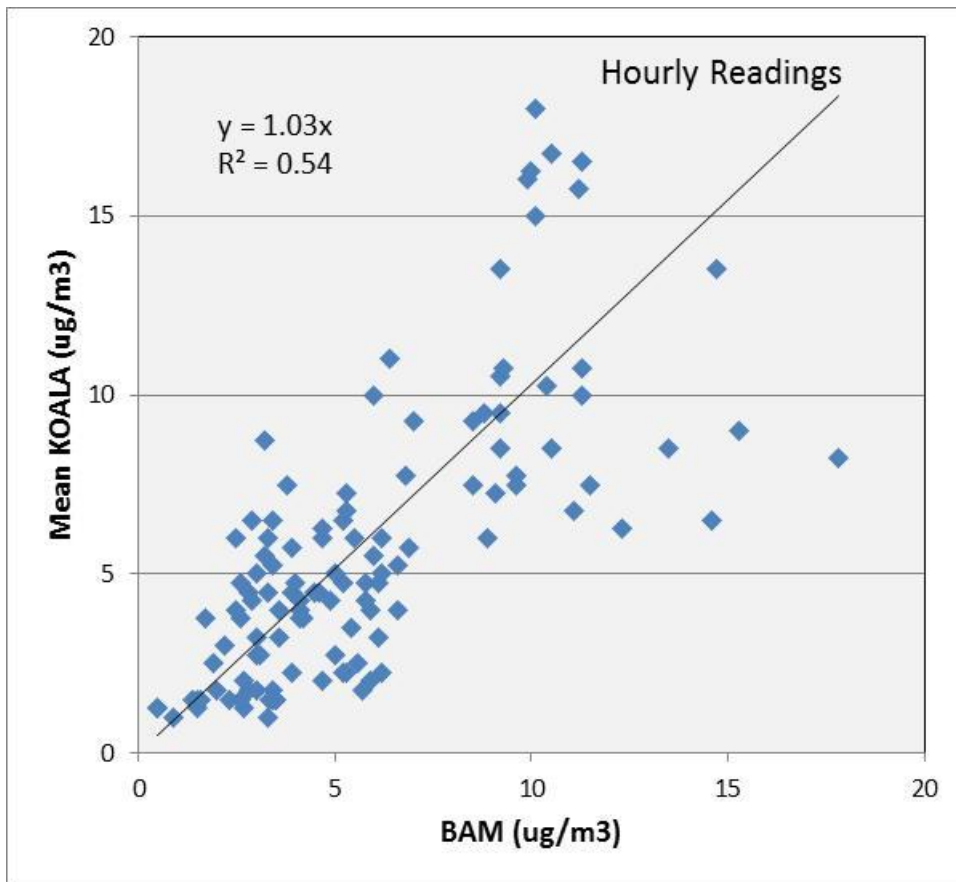


Fig S6(a) Mean hourly $\text{PM}_{2.5}$ concentrations of AQB36 and AQB35, against the EPA standard instrument, BAM. $\text{RH} < 75\%$.

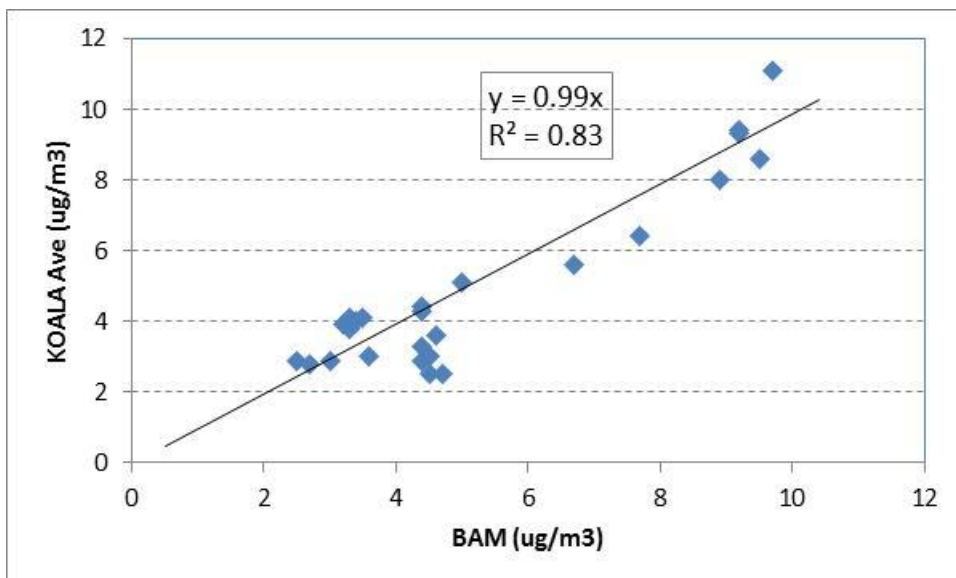


Fig S6(b) Mean 24-hour $\text{PM}_{2.5}$ concentrations of AQB36 and AQB35, against the EPA standard instrument, BAM. $\text{RH} < 75\%$.



Fig S7 Means of the 5-min PM_{2.5} concentrations with the wind direction from the S-quadrant (red) and all other directions (green) at the seven locations.

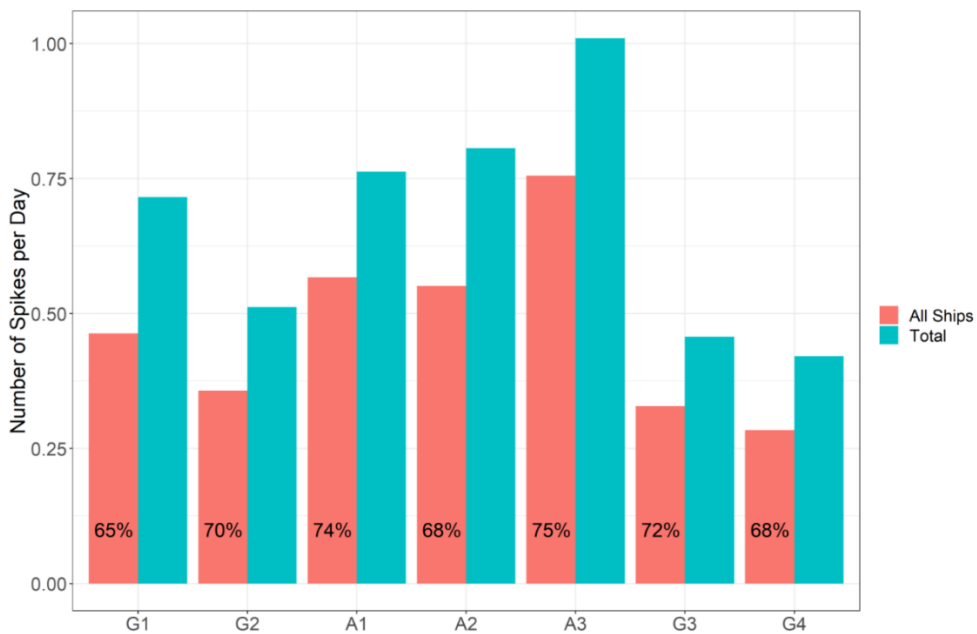


Fig S8 Mean number of ship-related 5-minute data spikes per day and their percentages in terms of all spikes observed per day at each of the seven locations.

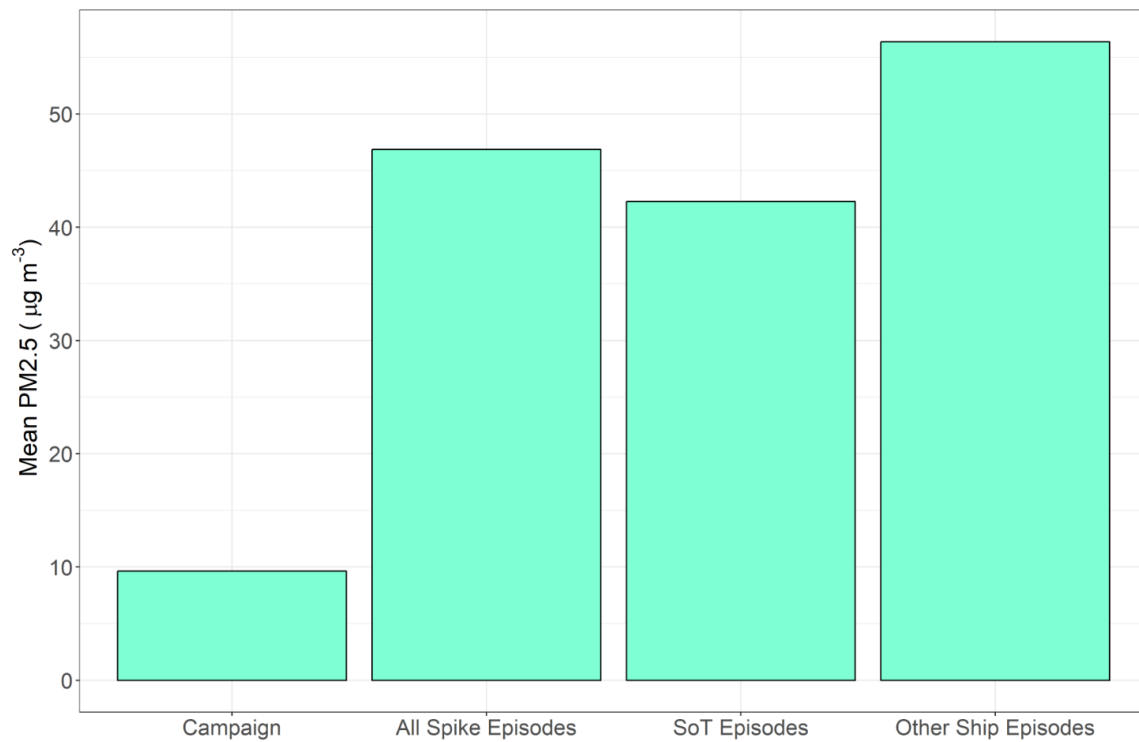


Fig S9 Histograms showing the mean PM_{2.5} concentrations during the entire monitoring period with that during the spike episodes pertaining to all, SoT and other ships.