www.ehinz.ac.nz

Environmental Health Indicators For New Zealand

EHI #27

December 2012

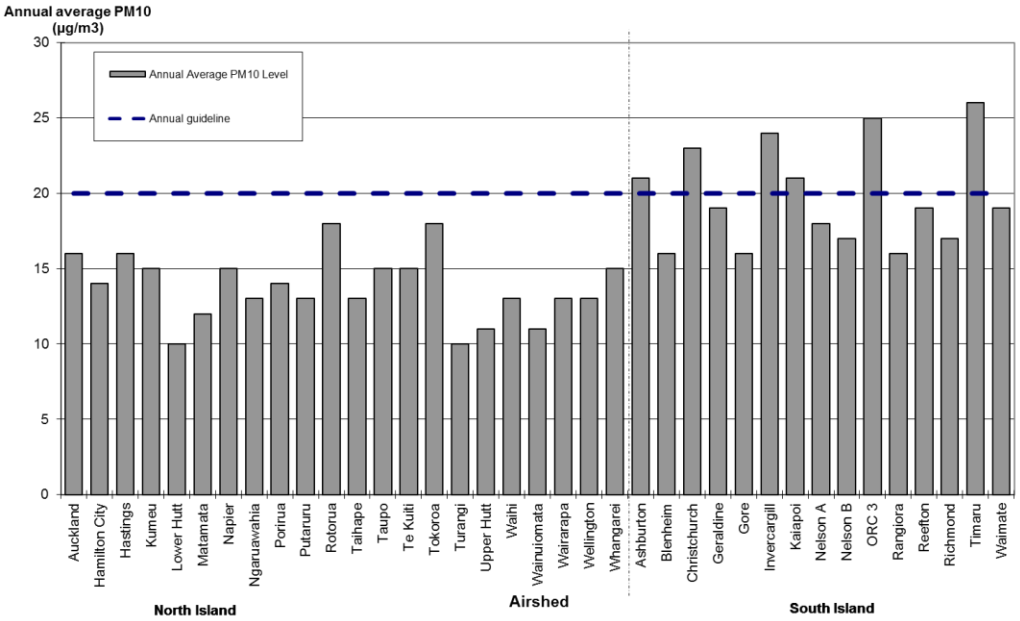
CONTACT:

Helene Marsters
t.h.marsters@massey.ac.nz

PARTICULATE MATTER (PM_{10}) – ANNUAL AVERAGE

Particulate matter with a diameter of less than 10 micrometres (PM_{10}) can penetrate far into the human lung., and short-term and long-term exposures to PM_{10} have predominantly been associated with the exacerbation of respiratory and cardiovascular conditions (WHO 2006a). Most poor air quality in New Zealand is caused by high winter levels of PM_{10} from coal and wood used in home heating (Ministry for the Environment 2010a). Additionally Auckland also experiences high levels of PM_{10} from road transport (Ministry for the Environment 2007). Particulates are also produced from atmospheric reactions of other compounds such as SO2 and nitrogen oxides (Cromar et al 2004), as well as natural sources such as dust, pollen, ash, sea salt and soil particles (Fisher et al 2007). The following update from the EHI monitoring project presents data on the annual average PM_{10} levels recorded in 2011 at 37 of the monitored airsheds in New Zealand. The average annual concentration of PM_{10} allowed under the ambient air quality guidelines is 20 $\mu g/m^3$, exceedance of which is used as an indication of long-term exposure levels.

FIGURE 1: ANNUAL AVERAGE PM_{10}, LEVELS IN AIRSHEDS, 2011



Note: The broken line represents the maximum number of exceedance days (one day per year) allowed under the National Environmental Standards for Air Quality which is consistent with the WHO guidelines. *Source: Ministry for the Environment (2012)*

Annual Average- Current situation

Figure 1 presents the average annual PM_{10} levels in 2011 for 37 of the 43 monitored airsheds that were able to monitor an annual average for PM_{10}. The annual guideline level of 20 $\mu g/m^3$ was not exceeded in any North Island Airsheds and exceeded in 6 airsheds in the South Island Timaru (26 $\mu g/m^3$), Otago 3 (25 $\mu g/m^3$), Invercargill (24 $\mu g/m^3$), Christchurch (23 $\mu g/m^3$), Ashburton and Kaiapoi (both 21 $\mu g/m^3$), amounting to 1 less airshed than in 2010 and 3 less than in 2009.

References

• WHO. 2006a. *Air Quality Guidelines Global Update 2005: Particulate matter, ozone, nitrogen dioxide and sulfur dioxide*. Geneva: World Health Organization.

• Ministry for the Environment. 2012. *Environmental Report Card October 2012– Air Quality (Particulate Matter – PM10).* Wellington: Ministry for the Environment.

•Cromar N, Cameron S, Fallowfield H (eds). 2004. *Environmental Health in Australia and New Zealand*. Melbourne: Oxford University Press.

• Fisher G, Kjellström T, Kingham S, et al. 2007. *Health and Air Pollution in New Zealand (HAPiNZ): Main report*. Auckland: Health Research Council of New Zealand, Ministry for the Environment, Ministry of Transport.