

TRENDS ANALYSIS: AIR QUALITY

SUMMER 2015



What does this measure & why is it important?

This indicator tracks annual average hourly readings of fine airborne particulates (referred to as PM_{2.5}) from monitoring stations in the region. Data are acquired from the BC Ministry of Environment's [air data archive](#) and processed using Ministry of Environment guidelines.

Sources of fine particulate matter include wildfires, residential wood burning, agriculture and unpaved roads. High concentrations of PM_{2.5} can have negative effects on human health and the environment. Because the particles are small enough to enter the deepest part of human lungs, PM_{2.5} can cause respiratory problems and contribute to cardiovascular disease. Fine particulates can also impair visibility, affect the climate and damage property (BC Lung Association, 2013).

What are the trends & current conditions?

Annual average particulate matter readings were higher at two stations in 2014 as compared to 2013 (Castlegar, Nelson) and lower at two (Grand Forks, Creston). One additional station was also added at the Golden Helipad, replacing the Golden Hospital station which reported data in previous years. A comparison of average daily readings (Figure 1) shows that differences between the two years were most pronounced during the summer, when readings were generally higher in 2014, and early winter, when readings were generally lower. These differences can likely be attributed to the relatively active wildfire season experienced in 2014, and the relatively mild start to the 2014-2015 winter which would have affected the amount of smoke being produced from residential wood-burning appliances.

[Environment Canada climate data](#) shows that heating degree days in the communities included in the calculation for Figure 1 were about 7% lower for November and December 2014 as compared to the same months in 2013. The 'heating degree day' is a measure of the number of degrees Celsius that a daily mean temperature is below 18°C. It can be used to estimate heating requirements for buildings.

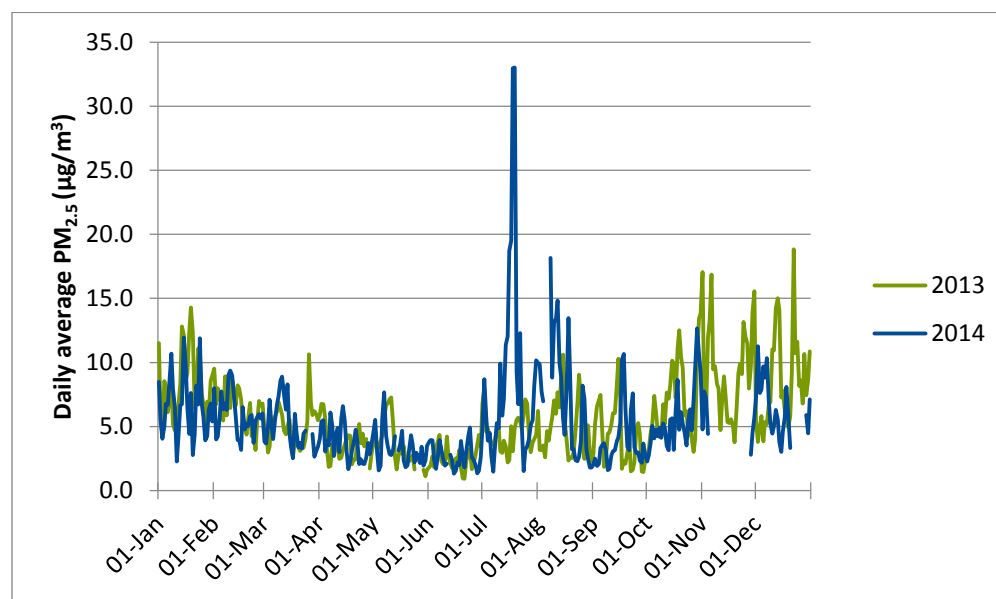


Figure 1: Daily average PM_{2.5} readings (µg/m³) in 2013 and 2014, average of Castlegar, Creston, Golden and Nelson stations

Source: BC Ministry of Environment (2015)

The Nelson station continues to record the lowest annual PM_{2.5} levels in the region, at 4.0 micrograms per cubic metre in 2014. The highest readings were once again recorded in Castlegar, though caution

should be exercised when comparing Castlegar readings to the remainder of the region. The Castlegar station uses new technology that is not yet in place at other sites. The new instruments tend to record higher PM_{2.5} levels than older instruments. All annual average values were below the provincial air quality objective of 8.0 (Figure 2).

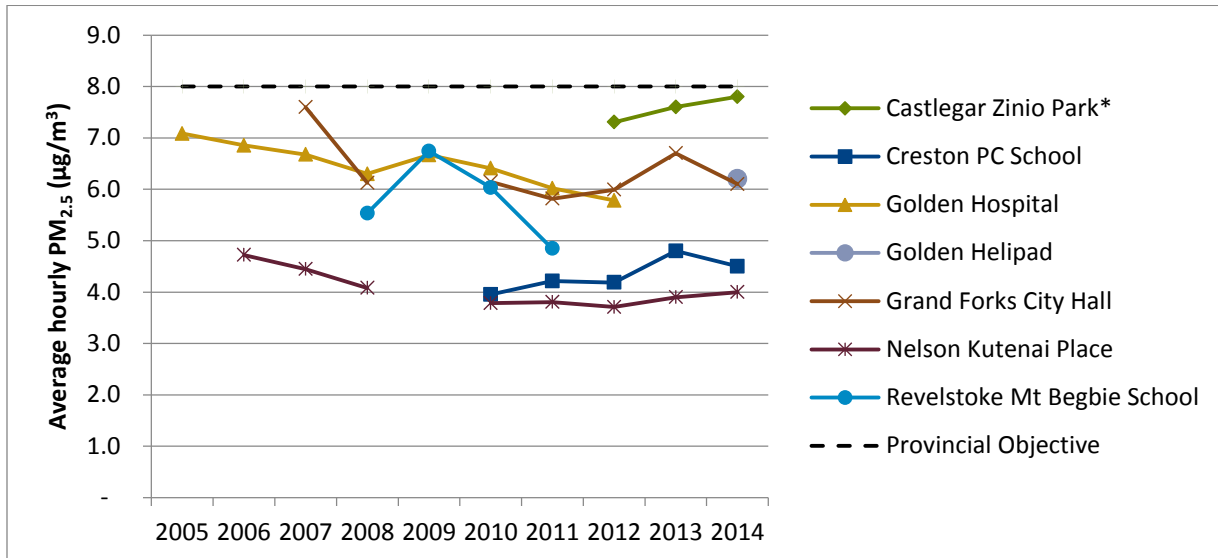


Figure 2: Annual average hourly PM_{2.5} readings (µg/m³) at monitoring stations in the region (*The Castlegar station relies on new technology that typically records higher readings than the old technology)
 Source: BC Ministry of Environment (2015).



The Columbia Basin Rural Development Institute, at Selkirk College, is a regional research centre with a mandate to support informed decision-making by Columbia Basin-Boundary communities through the provision of information, applied research and related outreach and extension support. Visit www.cbrdi.ca for more information.

References

BC Lung Association. (2013). State of the Air 2012. The Lung Association of British Columbia. Retrieved from: <http://www.bc.lung.ca/airquality/stateoftheair-report.html>

Ministry of Environment. (2015). BC Air Data Archive [Database]. Retrieved from: <http://envistaweb.env.goc.bc.ca/>