

## What Monitoring Networks Measure

Monitoring networks measure the changing chemistry of the atmosphere. Environment Canada is responsible for operating virtually all of the federal government's operational air quality monitoring programs - one exception is the Canadian Radiological Monitoring Network operated by Health Canada.

Although it is convenient to talk about specific air quality issues like acid rain, smog, or hazardous air pollutants such as heavy metals or persistent organic pollutants (POPS), once the pollutants are in the atmosphere they become part of a complex, weather-dependent chemical process resulting in a "chemical soup".

As our scientific understanding of these processes matures, we see that an integrated, or more unified approach to measuring and modelling these issues can further our understanding of the interrelationships and interactions affecting multiple air quality issues.

Following this approach, two major categories of pollutants can be identified; Combustion Products; and Commercial Substances.

Combustion Products include sulphur species associated with coal burning (sulphur dioxide gas and sulphate particles), nitrogen species emitted primarily from transportation sources (nitrogen oxides, nitrate particles and a large assortment of complex nitrate particles and gases), dioxins and furans largely from incomplete combustion in waste incinerators and from steel production, mercury from base metal smelting, coal burning and incineration, polyaromatic hydrocarbons (PAHs) from fuel combustion and greenhouse gases resulting from combustion of fossil fuels, which lead to global warming.

Commercial Substances include pesticides and persistent organic pollutants (notably the "dirty dozen" identified for global monitoring by the UN-ECE), PCBs (polychlorinated biphenyls) used in old power transformers and capacitors, and flame retardants or PBDEs (polybrominated diphenyl ethers), among a long list of substances that accumulate in fatty tissue and have been found in human breast milk.

In some cases naturally occurring compounds can be the deciding factor that promotes or limits chemical reactions. This can be significant in the cases of ground level ozone and particulate matter, which are influenced by the presence of volatile organic compounds (VOCs). It becomes essential in the design of control programs to identify whether these VOCs are naturally occurring or of human origin.

What aren't routinely measured are species that require research-grade instruments and analysis. This is sometimes addressed through the organization

of highly collaborative “field-studies”, such as Pacific 2001 that took place in the Vancouver area recently. Scientists and support staff from federal and provincial governments and academia focus all their talent and technology on a specific issue for a relatively short period of intensive measurements.

These field programs and the resulting data bases become the foundation of scientific papers, model evaluations, and improved measurement methods - often for decades into the future.

Source: [Environment Canada](#)

<<[http://www.ec.gc.ca/cleanair-airpur/What\\_is\\_Monitored-WSBA9AC7FB-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/What_is_Monitored-WSBA9AC7FB-1_En.htm)>>