

Formation and origin of smog

MDDEP : Manon Therrien



Smoggy day in Québec, February 02, 2005

Smog is a yellowish fog caused by a mixture of atmospheric pollutants and it consists mainly of fine particles and ozone. The latter is the product of complex photochemical reactions between nitrogen oxides (NO_x) and volatile organic compounds (VOC), which are called “precursors”. The main sources of these pollutants are motor vehicles, industrial processes and the heating of buildings.

Ground-level ozone is a harmful pollutant. It should not be confused with the naturally occurring ozone in the upper atmosphere, which protects us from the harmful rays of the sun.

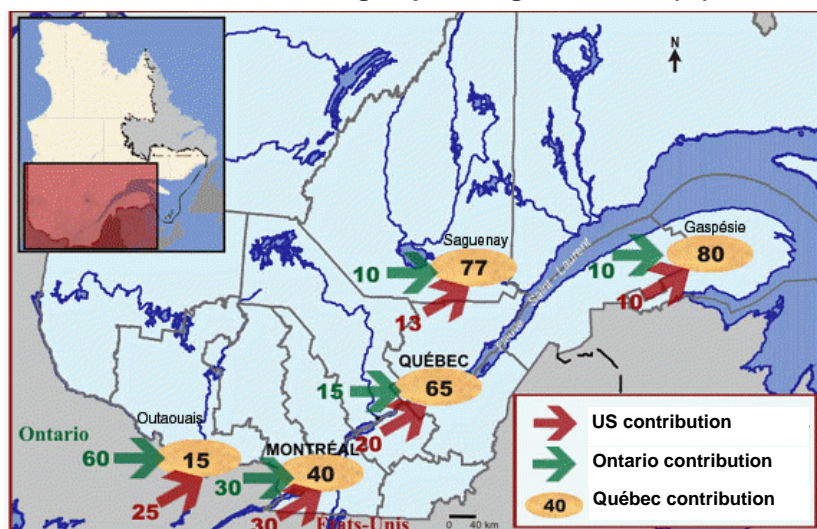
Fine particles are released directly into the air by motor vehicles, industrial processes and heating, especially wood burning, or are created in the atmosphere following the chemical reactions of precursor pollutants such as sulfur dioxide (SO₂) and nitrogen oxides (NO_x) in the air.

The greatest concentrations of ozone are observed downwind from the major urban areas, on very hot sunny afternoons between May and September when there is little wind. Strong concentrations of fine particles may occur in winter as well as in summer.

Smog-creating pollutants can originate on the other side of the border or locally. The winds bring the precursor pollutants and ozone from southern Ontario and the central US. These then combine with the contribution from urban areas in Québec.

The areas that are worst affected by cross-border smog are located in southern Québec near the border with Ontario and the US. The further away from the Great Lakes region one moves, the greater the role played by Québec emissions in the creation of smog.

Contribution to smog of polluting emissions (%)



Ministère de l'Environnement, 1996 and Canadian Council of Ministers of the Environment. 1997