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## Changes in Aerosols in an Urban Cold Climate During and Before the COVID-19 Outbreak

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Atmospheric aerosols are of significant importance in climate change and health research and are essential to consider in air quality and climate modeling. Quebec is the second-largest province in Canada by population and much of the population lives in urban areas. Limitation of public activities, public transportation as well as some suspended operations of educational institutions and many commercial establishments in Quebec while severe lockdown policy was implemented, had strong repercussions on the pollutant concentration level. By analyzing a combination of air pollutants observational data (e.g. CO, SO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>, and NO<sub>2</sub>), this study attempts to investigate the impact of lockdown due to the COVID-19 pandemic on the pollution level of the local urban environment. Since meteorology can play an important role in air quality, the variation in diverse meteorological factors (e.g. temperature, humidity, wind, pressure, and sunlight) is evaluated as well. By separating long-term trends, seasonal signals, and meteorological contributions concerning climatology, this study estimates the relative contributions of human activities to changes in particulate concentrations. We herein discuss the implications of these results on air quality and climate modeling.