

Spatial and temporal trends in atmospheric carbon monoxide across Canada

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We document spatial and temporal trends in carbon monoxide across Canada, based on observations from the MOPITT instrument since the start of the 21st Century. There is significant variability in overall total column CO between provinces and territories, based largely on proximity and exposure to major polluting urban areas, within both Canada and the USA. This is supported by analysis of air-parcel back-trajectories from the HYSPLIT model. All areas experience a decline in total column CO over the time period considered, although not to the same extent; provinces whose dominant source of CO is from upstream areas are experiencing the slowest rate of decline. This decline is evident in all seasons except the summer, which we speculate is due to the dominance of forest fires on atmospheric CO loadings at this time of the year, especially given a background of reduced CO emissions from urban sources. Finally, we outline atmospheric conditions that favour extremely high/low total column CO anomalies (with respect to long-term mean values) for the different Canadian provinces.