



Transport of pollution from the middle latitudes into the Arctic

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A 5.5-year climatology of transport from pollution source regions in the middle latitudes to the Arctic will be presented. Transport potentials from different source regions and on different time scales will be compared using maps of the emission sensitivity and potential source contributions to Arctic air masses, as derived with the FLEX-PART particle dispersion model. The focus will be on the transport of black carbon (BC) to the Arctic as this species is highly relevant both as a pollutant and as a climate agent (radiative forcing, albedo feedback). It is shown that Europe is the main source region for Arctic BC in winter. South Asia plays a much smaller role, which is in agreement with traditional Arctic Haze studies and meteorological reasoning but in contrast to some recent studies using climate-chemistry models. Furthermore, it is shown that boreal forest fires can be the potentially dominant source of BC to the Arctic in summer in years of strong burning. A case study of BC transport to the Arctic from boreal forest fires burning in Alaska and Canada in the year 2004 will also be presented.