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Title: *Pollution from transit shipping and oil/gas extraction: Implications for future Arctic development*

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Transit shipping through the Arctic via the Northern Sea Route, along the northern coast of Scandinavia and Russia, is already occurring. In addition, Arctic oil/gas extraction is being explored due to large oil and gas reserves under the Arctic Ocean. In the future, development of these anthropogenic activities will increase emissions of air pollutants (aerosols, ozone, and their precursors) into the Arctic lower troposphere. Even at mid-latitudes, emissions from oil/gas activities and shipping have large uncertainties, making future projections of Arctic shipping emissions even more difficult. As part of the EU ACCESS project, an aircraft campaign was conducted in July 2012 to study shipping and oil/gas extraction emissions based in Andøya, Norway. The campaign focused on studying ships in transit to/from Murmansk, Russia off the coast of Norway and oil/gas platforms in the Norwegian Sea. The main focus of the campaign measurements was to investigate the role of current and future anthropogenic activities in and near the Arctic on regional air pollution and investigate potential connections to Arctic climate. To compliment the measurements, we use a regional chemical transport model, WRF-Chem, to study the regional impacts of these local anthropogenic emissions. The model simulates emissions, transport, mixing, and chemical transformation of trace gases and aerosols simultaneously with meteorology. The model is used to examine ozone and aerosol formation in fresh and aged pollution plumes.