



Localization of source regions of odd nitrogen through a receptor climatology of trajectories for the region of Western Siberia

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Air parcel trajectories arriving at Tall Mast (60°26' n.lat., 89°24'e.lon.) in the Western Siberia are calculated for a period from March – December 2007 using three-dimensional trajectories basing on NCAR/NCEP final analysis data. Model output along with the observed surface concentrations of O₃, NO and NO₂ are analyzed to describe the long-range and regional transport climatology by examining the distribution of back trajectory end points over a latitude-longitude grid as a function of measured concentrations at the monitoring site. Statistically significant regions of the most important NO_x sources in the West-Central Siberia have been identified along with seasonal variation of the primary transport paths of anthropogenic pollutants in the region. The results are found to be in a good agreement with the previous data on surface O₃ and NO_x concentrations measured during TROICA campaigns for the last decade along the Trans-Siberian Railroad. The seasonal variability of the measured species along with the sensitivity of the regional boundary layer photochemistry to the primary emission sources in the region are investigated basing on the developed source-receptor model, as well as numerical calculations with WRF-ARW hydrodynamical model and CMAQ chemical transport model.

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