Geophysical Research Abstracts
Vol. 16, EGU2014-13816, 2014
EGU General Assembly 2014

Humans as drivers of tropospheric gases and aerosol changes over the last three decades

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Over the last century, the fast growth of Earth's population led to increased needs for food and energy. The development of our society has been thus accompanied by emissions of various pollutants into the atmosphere. This has affected the quality of the air as well as climate and the ecosystems. To face dramatic environmental changes, humans have taken measures to mitigate their negative impacts on the environment. The extent to which these measures have been successful is under investigation in the present modeling study. For this purpose a global chemistry and transport model (CTM) is used to simulate atmospheric composition changes during the last 30 years (1980-2010) driven by ECMWF ERA interim meteorology and based on annual/monthly varying historical emissions of trace gases and aerosols. A second 30-year simulation rate has been performed using the same meteorology but assuming no change in the emission per human capita since 1980. The results are presented, compared to long term observations and thoroughly discussed.