

Climate Impacts of Near Term Forcers: Insights from Multi-Model CMIP6 Analysis

1. Near Term Climate Forcers

NTCFs are chemically and physically reactive compounds with atmospheric lifetimes shorter than a decade.

NTCFs' **brief atmospheric lifetime**, heterogeneous composition and distribution derives in global and regional climatic effects that are not yet fully understood.

In this work, we focus on anthropogenic nonmethane NTCFs, namely: aerosols, tropospheric ozone and their precursors.



Global aerosol optical depth evolution in the historical CMIP6 experiment

2. Methodology

We isolate the NTCFs signal on climate in the period 1950-2014 through a multi-model analysis of simulations from the AerChemMIP - CMIP6 initiative (Collins et al., 2017).

Experiment	Description
historical	historical forcings
hist-piNTCF	historical forcings but NTCF emissions fixed to 1850 values

Model requirements:

- interactive tropospheric aerosols and chemistry
- at least 3 members to filter model internal variability

BCC-ESM1 MRI-ESM2-0 UKESM1-0-LL EC-Earth3-AerChem

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From 1950 to 2014, aerosols drive the NTCFs signal: • a general cooling with **stronger AA until 1980** • a southward displacement of the ITCZ of 0.6° an increase of Labrador Sea convection by 38%

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We will use a similar multi-model framework future projections within the comparing AerChemMIP initiative that isolate these species.

3. Main Effects on Climate

impacts of future NTCFs emissions on the AMOC.

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