Impact of sea-salt emission strength on anthropogenic aerosol forcing

June 10, 2020

Some characteristics of the simulations These simulations have been done

- with CAM5.3-Oslo
- on the 0.9°x1.25° grid
- using nudged meteorlogy (horizontal wind and surface pressure)
- CMIP6 emissions (2012–2014)
- 3-year long simulations (2012–2014)
- 1850 pre-industrial conditions for the reference state.

The sea-salt emissions were using an emission strenght which is proportional with $\sim U^{3.41}$. DMS emissions were using the Lana-climatology for the upper-ocean DMS concentration.

Results The figure shows how the anthropogenic aerosol ERF is affected by the strength of the natural emissions of dust, isoprene/monoterpenes, marince primary organic matter, sea-salt and DMS. It indicates that doubling the sea-salt emission strength has a reasonably small impact on the anthropogenic ERF.

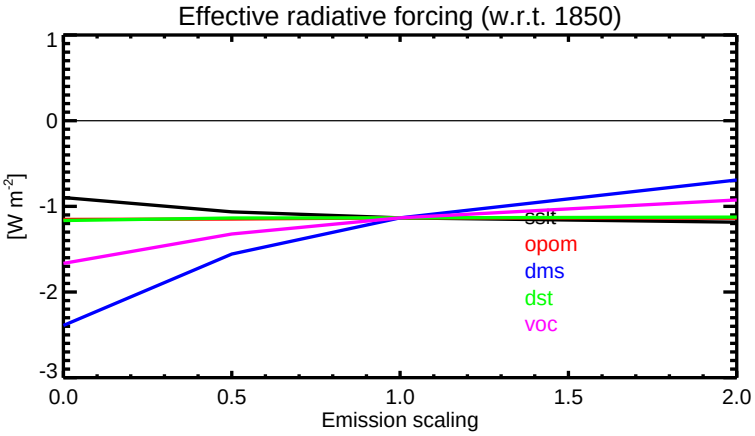

Figure : Impact of natural emission strength on anthropogenic aerosol ERF.

The table shows the same information as the figure : it indicates that when sea-salt emissions are doubled, the anthropogenic ERF changes from -1.135 $\mathrm{W\,m^{-2}}$ to -1.184 ,$\mathrm{m^{-2}}$, i.e., a change of -0.049 $\mathrm{W\,m^{-2}}$.

Table : Impact of natural emission strength on anthropogenic.

		Emission scaling			
		×0	×0.5	×1	×2
Sea-salt	[$\mathrm{W\,m^{-2}}$]	-0.898	-1.064	-1.135	-1.184
OPOM	[$\mathrm{W\,m^{-2}}$]	-1.153	-1.148	-1.135	-1.139
DMS	[$\mathrm{W\,m^{-2}}$]	-2.391	-1.557	-1.135	-0.692
Dust	[$\mathrm{W\,m^{-2}}$]	-1.166	-1.136	-1.135	-1.125
VOCs	[$\mathrm{W\,m^{-2}}$]	-1.666	-1.323	-1.135	-0.925