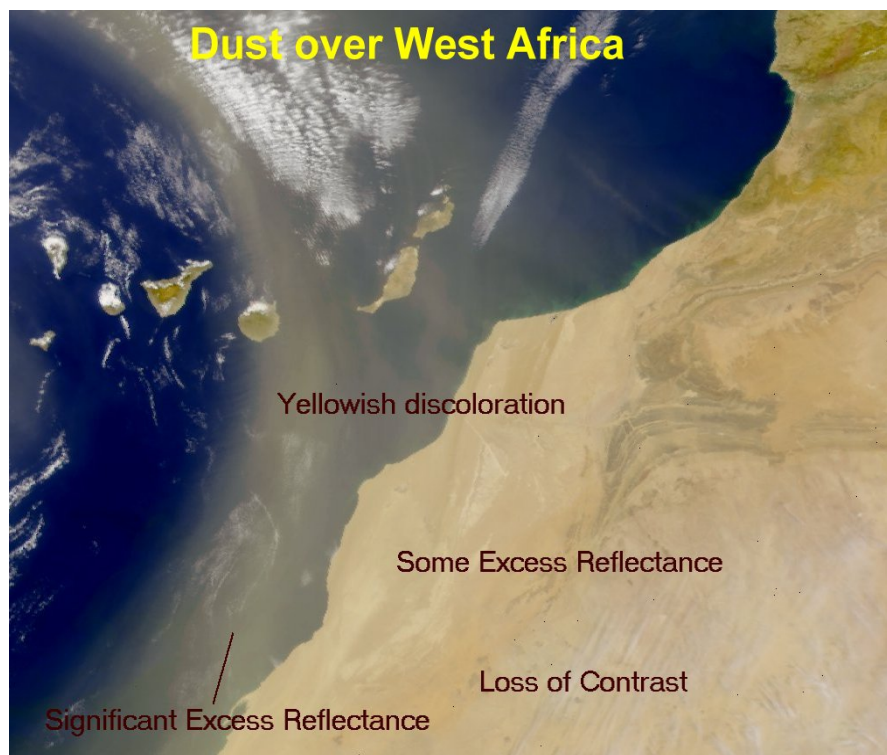


Figure 1. Radiative forcings since 1850 due to changes in GHGs, aerosols (including indirect effects; e.g., “forced cloud changes”), land use, solar activity, and volcanoes. From Hansen, J.E.; Sato, M. Trends of Measured Climate Forcing Agents; *Proc. Nat. Ac. Sci.* 2001, 98, 14,478-14,483.

Note – this figure is a little simpler and may be better for the webcast. I also like the uncertainty bars...

The AR4 plot (next slide) is nice as well, but a little busier? Generally, it looks like the forcing levels are similar.

RADIATIVE EFFECT OF AEROSOL PARTICLES



Note: Figure from Rudy Husar.

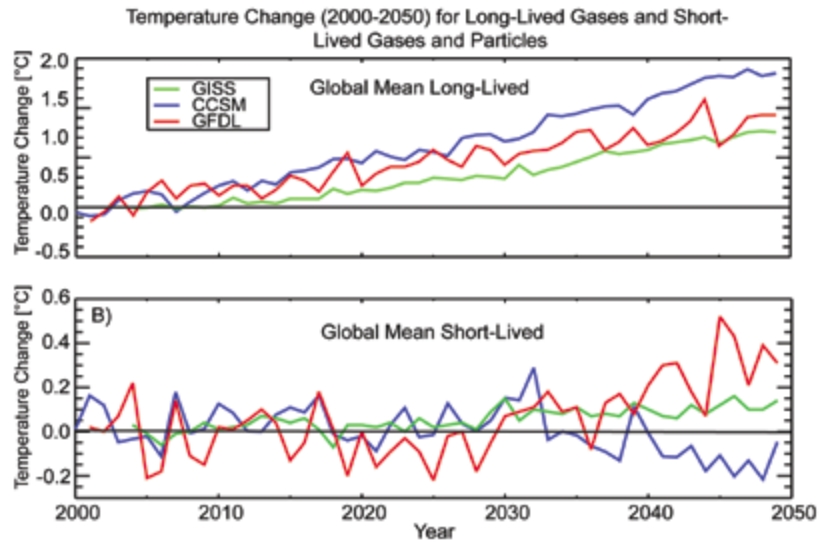


Figure 3.5 Global mean annual average temperature change ($^{\circ}\text{C}$) in the simulations with time-varying long-lived (top) and short-lived (bottom) gases and aerosols. Results are three-member ensemble means for GFDL and GISS and single-member simulations for CCSM. Results for the short-lived gases and aerosols are obtained by subtraction of the (long-lived) calculations from the (short + long-lived) calculations. From Shindell, D.T., H. Levy II, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, 2008: Climate Change From Short-Lived Emissions Due to Human Activities in Climate Projections Based on Emissions Scenarios for Long-Lived and Short-Lived Radiatively Active Gases and Aerosols. H. Levy II, D.T. Shindell, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, (eds.). A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research, Washington, D.C.

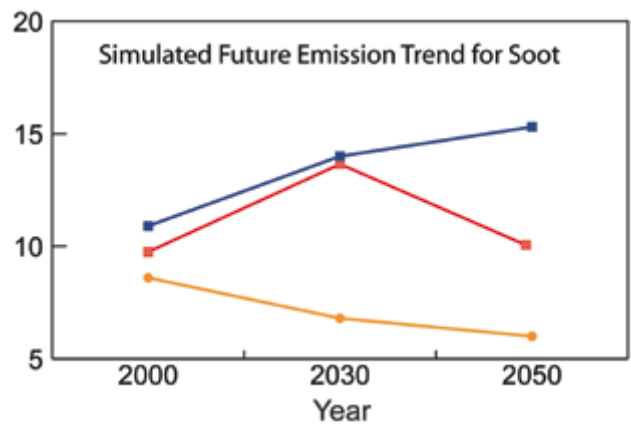


Figure ES.3 The three plausible but very different emissions trends projected for black carbon particles (soot). Each of the three groups in this study used a different trend. The units are million metric tons of carbon per year. From Levy II, H., D.T. Shindell, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, 2008: Executive Summary in Climate Projections Based on Emissions Scenarios for Long-Lived and Short-Lived Radiatively Active Gases and Aerosols. H. Levy II, D.T. Shindell, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, (eds.). A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research, Washington, D.C.

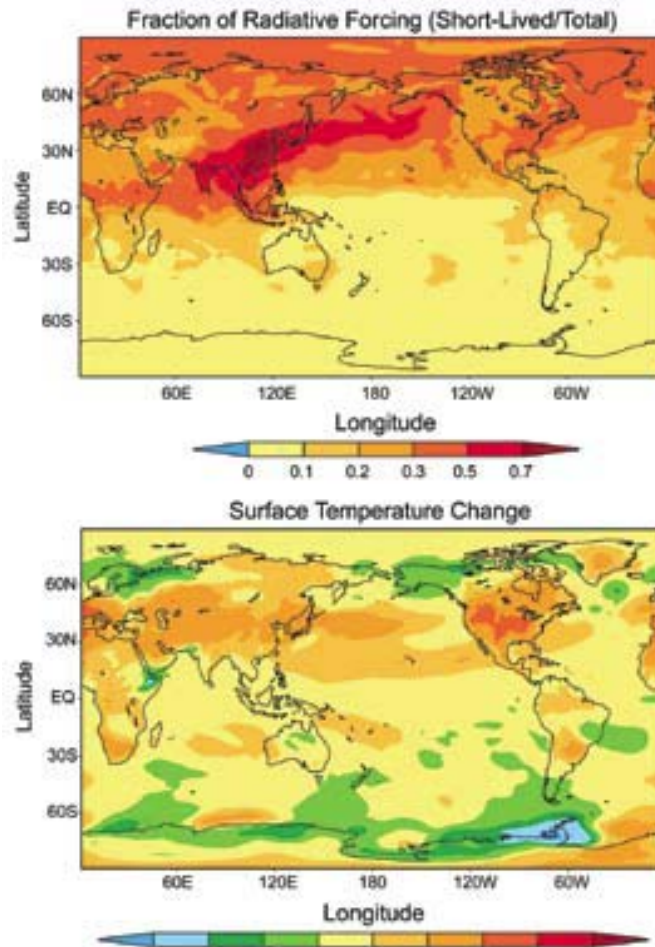


Figure ES.2 The fraction of summertime (June-August) radiative forcing* due to changing levels of short-lived gases and particles and the resulting summertime surface temperature change (degrees Centigrade) for year 2100. From Levy II, H., D.T. Shindell, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, 2008: Executive Summary in Climate Projections Based on Emissions Scenarios for Long-Lived and Short-Lived Radiatively Active Gases and Aerosols. H. Levy II, D.T. Shindell, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, (eds.). A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research, Washington, D.C.