The radiative forcing by aerosols remains a very uncertain quantity, which prevents an unambiguous estimate of the climate sensitivity from the observational record of surface temperature. In this talk we will revisit the radiative forcing by black carbon aerosols and explain why it has been overestimated in some recent studies. A new statistical analysis will also be presented that helps us to deconvolute natural from anthropogenic factors in variations of the global mean surface temperature. While the current observational record remains problematic to estimate climate sensitivity, we show why and by how much climate sensitivity is expected to be better constrained from observations by 2030.