**Arneth et al.(2010) and Mahowald et al. (2011)**

Describe the most important biogeochemical feedbacks in the climate system involving CO2, other long-lived greenhouse gases, reactive species and aerosols.

Are these feedbacks positive or negative? Are they well-understood? Compare their relative importance.

Are these feedbacks important for the future evolution of climate? To what extend? Have they been important in the past evolution of climate?

What are the direct and indirect effects of aerosols on climate ? What is the importance of aerosol impact on climate through biogeochemical feedbacks ? What seems to be the most important biogeochemical feedback of aerosols ? Describe the process, its role and the time scale involved.

**Fiore et al. (2012)**

What are the most important reactive species and aerosols with anthropogenic emissions and their relative impact of climate over the past decades?

What are the most important feedbacks between a warming climate and air quality?

What are the expected evolutions of surface ozone and particulate matter during the 21st century? Are these evolutions uniform over the various regions of the world?

Identify the main sources of uncertainty in these future evolutions and prioritize (and describe) the major knowledge gaps.