

Biogeochemical cycles and global change (MET6480)

Instructor: Dr. Christopher Holmes
 Time: Spring 2017, TuTh 2-3:15
 Location: Love 307

This course examines the changing composition and chemistry of the atmosphere, ocean, and land on human time scales. Our goal is to understand biogeochemical cycles that drive anthropogenic global change or are affected by it. Special emphasis will be placed on greenhouse gases, nutrients, and pollutants that move between all of the Earth surface reservoirs. These include the cycles of CO₂, methane, nitrogen, and mercury, among others. The approach will be to understand major fluxes and processes (physical, chemical, and biological) and how these processes are represented in models, such as global climate models. Coursework will include discussion of primary literature, construction of box models, and numerical analysis of coupled biogeochemical systems. These exercises will include analytical (pencil and paper) treatments and some numerical programming (Python or Matlab).

The course is designed to be accessible to graduate students in any area of EOAS.

For MET graduate students, this course is a physical meteorology elective.

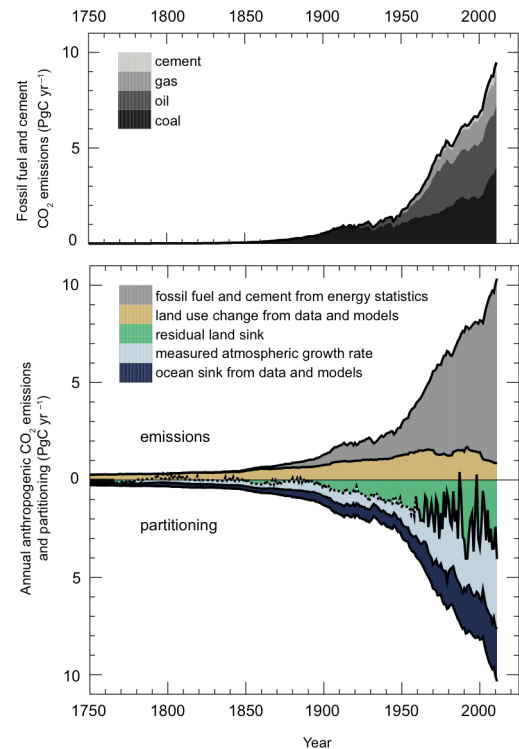


Figure: Anthropogenic CO₂ emissions and their partitioning among the atmosphere, land, and ocean.

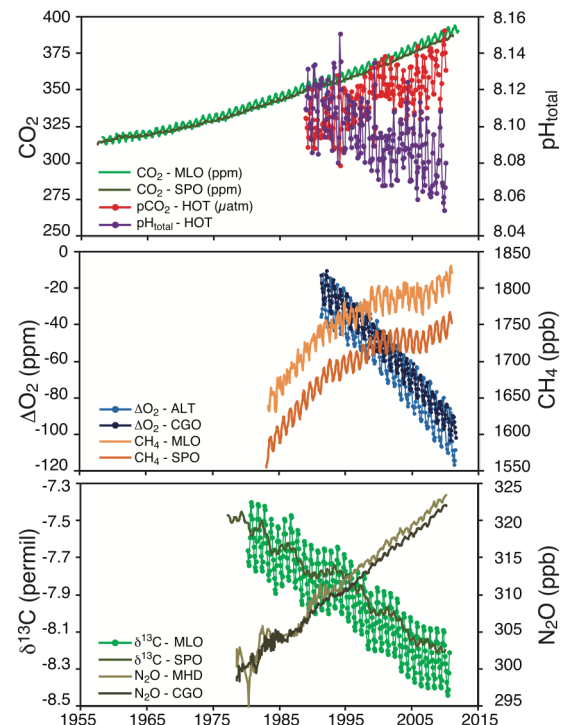


Figure: Changing concentrations of greenhouse gases, atmospheric O₂, CO₂ isotopes, and ocean pH.