

Biosphere-Atmosphere Interactions at large spatial scales	
Objectives	<ul style="list-style-type: none"> • Understand the main interactions that occur between the land surfaces and the overlying atmosphere. • Get knowledge on the various roles the terrestrial Biosphere play in the climate system, at both the regional, continental and global scales. • Get knowledge on the way global biosphere models are built. • Understand the various uses that are made of biosphere models at regional, continental and global scales.
Content	<p>This module is organized in essentially 3 main sections :</p> <p>1) Fundamentals about land-atmosphere interactions, ocean-atmosphere interactions, global biogeochemical cycles (carbon, methane and nitrogen). We will also touch upon the way biosphere models are built and used.</p> <p>2) A first research driven part looking at up-to-date knowledge on <i>what scientists have learned about the various roles the terrestrial biosphere plays in the climate system</i>. We will address various time scales: from days to seasons, and even look at climates of the past (i.e. paleoclimates). This part will be based on published scientific work, in peer-reviewed journals. Students will be encouraged to read those papers.</p> <p>3) A second research driven part will focus on the impacts of climate change on the terrestrial biosphere. We will explore how biosphere models are used for such studies, and discuss what scientists know. This will be based not only on up-to-date knowledge but also on discussions / debates between the students and scientists as we will target still unresolved scientific questions.</p> <p>In parallel several sessions will be dedicated to some analysis of land-atmosphere exchanges and the effects of specific land-cover changes (e.g. deforestation) on the fluxes and the atmospheric state. This will be done using excel OR R or Python depending on what students are the most familiar with.</p>

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