Multiscale Modeling of Land-Atmosphere Interactions in CESM

Scott Denning (scott.denning@colostate.edu) - Colorado State University (PI).

Interactions between the vegetated land and the atmosphere occur at spatial scales that are orders of magnitude too small to resolve in global climate models. Unfortunately some of these processes are not linear, meaning that the response to the average forcing can be dramatically different than the average response to the forcing. Common examples are the saturation of the photosynthetic light response or the threshold for drought stress in response to changes in root zone soil moisture. Traditional land surface parameterization uses several coexisting “tiles” to represent heterogeneous vegetation and soils, but all tiles in a given climate model grid cell share the same precipitation, radiation, humidity, etc.