



Assessing biosphere feedbacks on Earth System Processes

Jennifer McElwain

Earth Institute, University College Dublin, Dublin, Ireland (Jennifer.mcelwain@ucd.ie)

The evolution and ecology of plant life has been shaped by the direct and indirect influence of plate tectonics. Climatic change and environmental upheaval associated with the emplacement of large igneous provinces have triggered biosphere level ecological change, physiological modification and pulses of both extinction and origination. This talk will investigate the influence of large scale changes in atmospheric composition on plant ecophysiology at key intervals of the Phanerozoic. Furthermore, I will assess the extent to which plant ecophysiological response can in turn feedback on earth system processes such as the global hydrological cycle and biogeochemical cycling of nitrogen and carbon. Palaeo-atmosphere simulation experiments, palaeobotanical data and recent historical (last 50 years) data-model comparison will be used to address the extent to which plant physiological responses to atmospheric CO₂ can modulate global climate change via biosphere level feedback.