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## **The influence of plant physiology on vegetation and climate**

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The physical properties of the land surface depend strongly on “hard-wired” features of vascular plants, especially the linkages between photosynthetic physiology and vascular system hydraulics (through stomatal function) and nutrient availability (through requirements for macromolecular synthesis). The influence of ambient atmospheric carbon dioxide concentration on plant physiology, and thereby on interspecies competition and ultimately vegetation structure and dynamics, can be understood in this theoretical framework. The influence of carbon dioxide concentration is far more important than has generally been recognized in interpreting climate change from palaeovegetation data. The use of inverse modelling techniques represents a new paradigm in palaeoclimate reconstruction which can take account of plant physiological constraints due to changing carbon dioxide concentration, the influence of latitude, and much else. Less explored is the feedback of CO<sub>2</sub>-induced changes in vegetation structure on the climate itself, a subject for Earth System Models (ESMs). But this development calls for more explicit representation of plant physiological processes in the land surface physics components of ESMs.