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# Maximum Entropy Production and biospheric feedbacks in the climate system

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Most climate system processes are irreversible and produce entropy, no matter whether these are physical, chemical, or biological in their nature. The proposed principle of Maximum Entropy Production (MEP) states that sufficiently complex, dissipative systems adapt steady states that maximize the rate of entropy production under given constraints. Because of its general nature, MEP could provide important insights about the organization of the biosphere and how it interacts with climate system processes. In order to apply MEP to the biosphere and its feedbacks, we need to identify the dissipative nature of the affected climate system processes and take into account the flexible and interactive nature of the constraints that are imposed by the surroundings on biotic activity. I give three examples of MEP in the terrestrial biosphere and discuss the consequences for the associated feedbacks: (a) the role of stomatal conductance of terrestrial vegetation, (b) the impacts of land use change and (c) pattern formation in vegetation of semiarid regions. I close with a discussion of the broader implications and possible applications of MEP to the biosphere and its evolution.