

Information theory in ecological system modelling

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Abstract

If a conserved entity like carbon, nitrogen, water, or energy moves through a network of pools/boxes, we call such mass-balanced systems compartmental. Their flow of material can be described by a system of ordinary differential equations. Because such natural systems are dissipative, classical entropy measures like topological and metrical entropy vanish and cannot serve as complexity measure. Interpreting the deterministic system for bulk material as a stochastic Markov chain for a single particle, we invite Shannon information theory to compartmental systems to, for instance, tackle the problem of equifinality during model selection by the maximum entropy principle.

In my talk I will describe my way into the still rather unexplored realm of information theory in ecological modelling by means of compartmental systems as Markov chains. Additionally, I will give an overview of potential future research questions at the interface of information theory and ecological modelling in a more general setting.

References/Recommended reading

Later