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Ecological Complexity

Volume 1, Issue 4, December 2004, Pages 267-280

Review

Application of thermodynamic principles in ecology

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<https://doi.org/10.1016/j.ecocom.2004.07.001>

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Abstract

Current developments in ecosystem theory to understand ecological complexity, particularly those incorporating and applying thermodynamic principles, are making it possible to integrate various ecosystem approaches into a consistent theoretical framework. The time, therefore, seems right to apply this theory to explain observations published in the ecological literature that typically lack linkages to ecological theory or other rule-based explanations. This paper presents the foundations of that theory of ecological complexity in eight observational principles and summarizes the results from a review of a number of papers using thermodynamic principles to explain ecological observations. The theory will continue to evolve and be modified as more test cases are made, however, here explanations of some published ecological observations are presented to illustrate how the ecosystem theory is applied.

Keywords

Ecological modeling; Ecological theory; Ecological thermodynamics; Ecosystems

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