

# The ecological entropy: towards an entropic reading of ecological matters



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The entropy concept is inherently rooted in thermodynamics and information theory.

Since organisms and ecosystems are “thermodynamic machines” able to increase and maintain a high complexity (i.e. information) in spite of the universal tendency of increasing entropy (the “arrow of time”), the entropy concept has been often considered as a “magic bullet”, i.e. a conceptual tool able to interpret natural processes within the general framework provided by physical laws.

An increasing number of attempts to create an ecological theory based on entropy-based functions has been put forward in the last decades. At the same time, several information theory-based measures have been proposed as biodiversity indices.

My speech is intended to describe the fundamentals of the entropic approach and to illustrate the potential of some derivative instruments in ecological case studies, which include processes of ecological succession and eutrophication, as well as the analysis of biodiversity on spatial and temporal scales.

Phytoplankton Bloom in the Barents Sea. August 31, 2010  
Photograph by NASA image courtesy Norman Kuring, NASA Ocean Color Group