ABSTRACT

The language of set theory can be utilized to represent the emergy involved in all processes. In this paper we use set theory in an emergy evaluation to ensure an accurate representation of the inputs to territorial systems. We consider a generic territorial system and we describe how the emergy related to every flow in these systems can be uniquely determined through the operation of the union of sets. The aim of this paper is to propose a new way to evaluate the main emergy flows entering a system using set theory, which is a general scheme applicable to every system. Because this paper represents the first step in an emergy evaluation of hierarchically – organized systems, we consider a territorial system as an example, because in it we will always have at least two levels of organization. In this regard we consider the relationships between flows to and from as well as within the system and the respective flows of one of its subsystems in the process providing a definition using the mathematics of sets both for the flows and for the relationships between the respective flows that occur at the different scales.

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