

Biodiversity Measures Revisited

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Abstract. A few commonly used biodiversity measures such as the biodiversity index, the Kullback information measure and exergy are considered in order to check their capability to trace (and, potentially, to predict) negative changes in the community structure. We apply these measures to a model community of three competitive species and show that, in spite of the fact that all the species exhibit dynamically similar behavior, their contribution to the corresponding changes in the biodiversity measures is remarkably asymmetrical. While for two species the changes in their population sizes are strongly correlated/associated with the changes in the biodiversity measures, the information about the third species is virtually lost. In order to loosen the deterministic feedbacks between the species, we then include environmental noise and show that the results stay essentially the same.

Keywords: biodiversity, biodiversity index, competition, extinction, entropy, exergy