

On turnover measures of species communities

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Abstract: Ecological communities vary through time (and space). Measures of alpha diversity, for example species richness or Shannon diversity are widely used to capture spatial and temporal differences. However, beta diversity, a concept first introduced by Robert Whittaker, tracks shifts in species composition, and can be a more informative metric of community change. Here, we introduce a new statistical framework for many of the commonly used measures of beta diversity including those based on both presence/absence and abundance data. Using simulations and analyses of community time series we show how our framework illuminates the relationship between familiar metrics, enables the user to develop appropriate null models, and aids the interpretation of analyses of community change.