

Using state space models to understand trait evolution in fossil lineages

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Resumen:

Linear state space models provide a useful framework for investigating phenotypic evolution in fossil lineages in a wide variety of models including Brownian motion, Ornstein-Uhlenbeck processes, and models that incorporate potentially explanatory environmental covariates. A state space framework also provides access to residuals for the predicted and observed values at each time point as well as improved numerical stability. We illustrate the value of the state space approach by re-analyzing a classic dataset of diatom evolution in Yellowstone Lake. We find that number of spines is best explained by adaptation to changing solar insolation as an exogenous environmental covariate.

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