

Every Model-Data Mismatch Has A Silver Lining

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Success, for many paleoclimate studies featuring model-data inter-comparison, is finding strong agreement between proxy reconstructions and climate or Earth-system models. Most commonly, model results are used to bolster proxy interpretation or proxy interpretations used to validate model performance. Although model-data agreement is certainly reassuring that the proxies and models are behaving ‘well’, agreement offers little opportunity for deepening our understanding. It is arguably when models and proxies disagree that the greatest insight into the proxy limitations, model shortcomings, or the Earth system itself, is gained.

In this talk, we present examples of model-data disagreement and less conventional model-data inter-comparison approaches. We show how models can provide insight into proxies (themselves simplified empirical models) and how model-data mismatches can be effectively exploited to refine proxy interpretation. We furthermore quantify the number and distribution of proxy data points required to rigorously assess whether climate models and proxy climate reconstructions are in agreement.