



Distribution of model uncertainty across multiple data streams

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When confronting biogeochemical models with a diversity of observational data streams, we are faced with the problem of weighing the data streams. Without weighing or multiple blocked cost functions, model uncertainty is allocated to the sparse data streams and possible bias in processes that are strongly constraint is exported to processes that are constrained by sparse data streams only.

In this study we propose an approach that aims at making model uncertainty a factor of observations uncertainty, that is constant over all data streams. Further we propose an implementation based on Monte-Carlo Markov chain sampling combined with simulated annealing that is able to determine this variance factor. The method is exemplified both with very simple models, artificial data and with an inversion of the DALEC ecosystem carbon model against multiple observations of Howland forest.

We argue that the presented approach is able to help and maybe resolve the problem of bias export to sparse data streams.