Geophysical Research Abstracts
Vol. 15, EGU2013-7708, 2013
EGU General Assembly 2013

How to weigh multiple data streams?

Thomas Wutzler
MPI-BGC Jena, Biogeochemical integration, Jena, Germany (twutz@bgc-jena.mpg.de)

When confronting biogeochemical models with a diversity of observational data streams we are faced with the problem of weighing the data streams. In a pure statistical approach, the leverage of streams with many observations may outweigh the influence of data streams with sparse observations. Therefore, often a subjective weighing of the data streams is applied to allow for a more balanced effect of the data streams. This however, compromises the inferred uncertainty and distribution of model parameters.

In this study we suggest another approach, where data streams are not weighed, but where different parameters of the biogeochemical model are constrained by different data streams. We present an inversion framework that is able to account for the different cost functions at the same time by a Metropolis within Gibbs sampling scheme. The method is exemplified with very simple model and artificial data and with an inversion of the DALEC ecosystem carbon model against multiple observations of Howland forest. We discuss effects of model errors and how the presented approach can help to detect model structural errors. The aim of the talk, however, is not to present ready solutions but rather to stimulate and advance the general discussion on how to deal with multiple data stream that differing in magnitude in their number of observations.