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Discussions

Interactive comment on "Constraining parameters in state-of-the-art marine pelagic ecosystem models – is it actually feasible with typical observations of standing stocks?" *by* U. Löptien and H. Dietze

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General comments

In my view, the manuscript at hand by Loeptien & Dietze is well-written and provides valuable new insights. Since I am suggesting only textual changes, I recommend publication after minor revisions. In my opinion, the key insight is that many parameters in marine ecosystem models are very difficult to constrain due to strong correlations between the different parameters. For example, a too high phytoplankton maximum

growth rate can be 'compensated' by a too high half saturation constant and/or a too high mortality. The authors summarize this in a clear fashion in the Discussion section. However, I believe that this important finding also deserves to be emphasized in the Abstract as well as in the Summary and conclusions section.

Specific comments

Although the findings are, in my view, highly significant as they stand, I think that addressing the following issues could enhance the significance of the manuscript even further:

1) I am missing a clear strategy to better constrain the plankton growth parameters (or MM constants, as the authors call them). Should we rely on laboratory measurements of growth rates and half saturation constants? Or are those too ill-constrained as well? Should the focus be on measuring primary production rates? And if so, which method do the authors consider the most appropriate?

2) An interesting finding is that it is much more difficult to constrain parameter values, if correlated 'reddish' noise is applied than if uncorrelated white noise is used. Do the authors have an idea why this is the case? The authors suggest a relation with the finding by Friedrichs (2001) that systematic biases are more detrimental than white noise (p.250, l.9-11). How are these findings related, given that a constant bias is not the same as correlated noise?

Technical corrections

"an AR(3)-processes ($E_t, t=1,...,n$) by" -> "an AR(3)-process ($E_t, t=1,...,n$)" (p.239, l.22)
"estimation way more than" -> "estimation much more strongly than" (p.250, l.9/10)
"rates systematical biases" -> "rates systematic biases" (p.250, l.10/11)

Interactive comment on Ocean Sci. Discuss., 12, 227, 2015.