Editor: Thank you for your response. There are still a few issues that I think need to be dealt with.

Reply: You are right, we are using a lot of grey litterateur. We have located the 'grey' literature that we cite and evaluated in each case if it is possible to use peer-review literature instead. It seems though, that especially for the datasets and models from before journals where available where one could publish such descriptions it is hard to avoid citing reports. We also made sure that this literature is available online.

Editor: While my concern was more to do with the use of grey literature to support statements that attracted the attention of referees, I appreciate the efforts to which the authors have gone here to address this.

On a particular point that might be helpful, I would suggest that the authors consider uploading the Skogen and Søiland user's guide as supplementary material if possible. This follows the suggestion made in the abstract of GMD's 2013 editorial:

http://www.geoscientific-model-development.net/gmd_journal_white_paper.pdf

Reply: The thesis is not very specific about the detail of the adjustments over the first three years and mostly describe the drift of nutrients, therefore we have …

Editor: If I am reading this correctly, this analysis has focused on the drift of basin-averaged nutrients. If the basin is large enough, or the input / output fluxes small enough, this sort of drift is always going to be small in size. I believe that the referee was more concerned with the behaviour at smaller scales, for instance for particular water columns. At such scales, there could be large interannual drifts as the model redistributes its currency around its domain even if the total inventory of the same currency shows almost no change. In such a case, it would be difficult to judge the model as being at "steady state".

That said, in a spatially-resolved model such as this one, driven under observationally-derived forcing for a relatively small number of years, it is not straightforward to establish "steady state". However, it should still be possible to show how basin-scale properties (or perhaps those in the sub-regions studied in this manuscript) vary with time. I'm thinking here of primary production, plankton biomasses, surface / deep nutrient concentrations. Time-series plots showing how these integrated or averaged properties "level off" over a few years should give an idea of how close to "steady state" the model is. It should also reassure readers that sufficient time has been allowed for the model to reach a semi-repeating annual cycle in these major properties in the sub-regions of interest.

Reply: "Quadratic, rather than linear, mortality in the phytoplankton was one of the changes that had little effect on the error statistics …"

Editor: Your Figure R4 may show the reason for this – the parameterisations of the functional forms used means that the shape of the response curve is not significantly different for the range of zooplankton concentrations studied. I've found this in some of my own work (e.g. Yool et al., GMD, 2011), and I would expect it to be a feature of many models. If you include Figure R4 in the manuscript (as supplementary material?), you could modify your text to draw attention to this lack of strong difference in functional response for reasonable values.

Reply: "The zooplankton mortality is the closure term in the model, but contrary to other studies (e.g Steele and Henderson, 1992) perturbations of the functional form of the mortality in N04 had little effect on the results"

Editor: See my previous remark. If you include Figure R4, this response can be strengthened somewhat.

Pg. 15: Change this text "We have shown that the model reproduces a reasonable annual cycle, but one persistent challenge the initiation time of the spring bloom is later than the observations" to "We have shown that the model reproduces a reasonable annual cycle, but the initiation time of the spring bloom is consistently later than the observations"

Pg. 16: Change this text "(the early seeding of the spring bloom by phytoplankton that was mixed down during winter: Backhaus et al., 1999)" to "(the early seeding of the spring bloom by phytoplankton entrained from the shallow seafloor by winter convection; Backhaus et al., 1999)"

Figure 10: The second panel of this figure is fairly impenetrable. It looks to me like the months of January, March and November could be removed without impacting the figure at all. It might also be an idea to retain the colour scheme from the first panel, and show the months of May, July and September as dotted, dashed and solid lines.