Dear Dr. Yool,

Thank you very much for your positive response to the revised manuscript and your further constructive comments. Below you will find our replies to your comments, along with their exact location in the tracked document that is uploaded together with the revised manuscript.

I have examined the new manuscript version and am generally satisfied that it addresses the issues raised by your referees. I have listed a few minor points below that would benefit from some additional clarification.

• Please include DOIs or weblinks (with access dates) to the observational datasets used in your analysis
We have included a new section in the Appendix that lists the weblinks of the observational datasets that were used to evaluate the model. We used your approach in the link you provided as a guide to structure the section. (L652-664)

• It would be useful if something of the response you gave around spin-up somehow appeared in the manuscript; for instance, quantifying the linear rate of change in annual mean nutrients, either as absolute or relative (%) numbers
We understand the necessity and as you suggest we have added absolute rates of changes to the manuscript. The following paragraph is added to the beginning of the model evaluation section (L287-291):

Prior to presenting detailed model results, we note that the model is at a steady-state after 2-years of simulation (1989 – 1990). For the years 1991 – 2010, which we have performed our analyses, the model nitrate rate of change is 0.002, 0.0031 and -0.0007 mmolN m^{-3} y^{-1} for average nitrate within 0 – 100 m, 0 – 500 m, and 0 m – bottom respectively. For the same averaging depths, the model silicate and phosphate rates of change are 0.004, 0.0055, 0.0057 mmolSi m^{-3} y^{-1} and 0.00004, 0.00016, -0.0026 mmolP m^{-3} y^{-1} respectively.

• In your original manuscript there was some confusion around WOA2013 and WOA2018; the revised manuscript clarifies this, but I note a mention of WOA2018 on line 629.
We have corrected the WOA version to 2013. We apologize for this as it should have been corrected in the revised manuscript.

Further, I did identify some issues when revisiting your manuscript in relation to the "code and data availability" section. This has changed since the previous manuscript revision, and no longer makes clear the DOI link to Zenodo, something which is not clear from the tracked changes version of the revised manuscript. Please revert this to restore direct mention of the archive.
We reverted back to an earlier version of this section. You have approved that version before. We believe this clarifies the reference to Zenodo (L668-680).

Additionally, while the description of the archive's contents is extensive in this section, its relationship with the archive at Zenodo itself is less clear. Specifically, the archive is comprised of a series of large, and anonymous, zipfile fragments, without even a README explaining the organisation. It would be more helpful to readers if the contents of the archive were organised into code, data, and scripts, such that they could be selectively downloaded. Apologies if I am misunderstanding the structure of your archive, but its current organisation is unnecessarily difficult to understand.
We updated the files in Zenodo and now the contents appear as Version 4. In total, the folder (archived) we uploaded has a 4+ GB size, and due to file size restrictions, we divided model_output

and model_experiment folders into multiple zip files. But Zenodo is able to show the contents of the folders with this version. We also included a separate README file which can be separately downloaded. It contains detailed information on the contents of each subfolders. We believe this approach gives the reader understanding of what each component contain and the ability to download them separately.

Please note that, due to working with multiple computers, there was an inconsistency in this revision, as such the figure captions in Section 5 appeared in the main text. We have deleted those, but they appear in the track changes. We have not modified anything to the text that was already approved by the referees and the editor.