

Interactive comment on “A numerical model study of the main factors contributing to hypoxia and its sub-seasonal to interannual variability off the Changjiang Estuary” by Haiyan Zhang et al.

Anonymous Referee #1

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The paper describes a new configuration of a regional coupled ocean-circulation biogeochemical model. The focus is on simulating the variability of oxygen. The main point of the paper is the description of the simulated interplay of biogeochemical processes, oceanic circulation and air-sea gas exchange which results in a variability of pelagic oxygen concentrations.

I see two routes the paper could go from there to be of interest to the wider audience addressed by Biogeosciences:

(1) Highlight one (or more) process which you have identified in your model and which have not been thought about in the past (in the literature). (I guess my main point here

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is that your "new" science is not easy to recognize. A good example is your abstract where the reader is left wondering which of the processes have been "discovered" by the authors.)

(2) Convince the reader that your model simulation is a realistic copy of reality.

In its present form, I got the impression that the manuscript apparently has chosen route (2). The problem I have with this is: the only observations presented that give an impression of the model's fidelity are the oxygen data in Fig. 2. It is not very much data and the fit is not very good either. The overall correlation is 0.76 so your model explains less than 60% of the variance (of which a considerable fraction may be associated to the seasonal cycle meaning that the correlation in each subpanel of Fig. 2 is probably much less.) For comparison: global models are well above 0.8 for nutrients (e.g. Laufkoetter et al. 2015 their Fig. 1) and even for oxygen (e.g. Matear & Lenton 2014 their Fig. 1).

In order to give the reader a chance to put your model results into perspective I suggest that you extend you model evaluation section - preferably with in-situ measurements of nutrients, temperature and salinity (and/or sea surface temperature, chlorophyll, sea surface height estimated from space).

References: Laufkoetter et al. 2015 doi: 10.5194/bg-12-6955-2015

Matear & Lenton 2014 doi:10.5194/bg-11-3965-2014

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