Geoscientific
Model Development
Discussions

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comment

Interactive comment on "Modular System for Shelves and Coasts (MOSSCO v1.0) — a flexible and multi-component framework for coupled coastal ocean ecosystem modelling" *by* Carsten Lemmen et al.

Carsten Lemmen et al.

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We thank the Anonymous Reviewer for their comments and provide a point-by-point response below.

1   GMD standards

The papers is well structured and clear but, in my view, it doesn't fit GMD standards for publication. In particular, the manuscript doesn't include scientific results or evaluation of the model software—at least quantitative evaluation of the modelling performance.

We disagree. This manuscript meets the standards layed down for a *Model description paper* as outlined in the GMD manuscript types specification (https://www.geoscientific-model-development.net/about/manuscript_types.html). In particular, we "describe model components and modules, as well as frameworks and utility tools used to build practical modelling systems, such as coupling frameworks or other software toolboxes with a geoscientific application". The purpose of this manuscript is *not* a model evaluation.

2   No namelists / Sequential vs. concurrent mode

It doesn't provide namelists or coupling procedures to support statement of modularity. [. . .] examples—if detailed—might help the reader to understand how the various modules works together in sequential or parallel modes.

The coupling mode is discussed in our subsection "Scheduling in a coupled system", and the coupling procedure is explained in textual form as well as in Figure 2. We will add in a revised version coupling namelists to exemplify the different coupling modes and add a section with a technical example of how the models work together (see below).

3   Reliance on published software

I do have concerns about the added value of this manuscript since most of the examples of the MOSSCO software have been detailed in independent papers and have been submitted elsewhere. It mainly relies on former published softwares.

It is the purpose of the MOSSCO framework to make published software interoperable; thus it is desirable to rely on formerly published software. The added value is in interoperability; indeed, we added and described for all of the published software new coupling layers (BMI and CMI).

4   No modeling details

Most of the examples provide in the current manuscript relies on submitted papers or to be submitted papers without further details. [. . .] Without those examples, it is unclear in which case or scientific questions coupled modular shelves- to-ocean models are required.

The focus of our manuscript is the coupling concept and technical implementation, it is not its application. The applications of the framework are detailed in separate manuscripts; these deal with the science within and between the coupled scientific models and contain evaluation of the scientific models.

The Southern North Sea (manuscripts submitted) examples of application are not critical for the purpose of this manuscript; they are showcases of scope and applicability of the model framework presented. While the two manuscripts referred to have not been published, we can provide this material confidentially on request. We will consider to expand the 1D application (section 4.1) to include more details on the coupling (now

contained in the proceedings article by Hofmeister 2014 et al.) of the "Helgoland station" example, as this example shows most clearly the soil–pelagic coupling and the modularization process.

Thanks for this very important remark that it remained unclear when coupled modular systems are required. We argue that they are not *required* for any single application at all, one can always choose to hardwire all coupled subsystems into a monolithic code. Instead, modular models provide better potential for re-use, intercomparison, and model exchange, and thus further the advancement of a coastal geoscientific community science. We will better clarify this early on in a revised version.

Finally, we thank the reviewer for specific comments, which will all be addressed.

Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2017-138, 2017.