

Interactive comment on “A protocol for the intercomparison of marine fishery and ecosystem models: Fish-MIP v1.0” by Derek P. Tittensor et al.

Anonymous Referee #1

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General comments:

This work develops a model inter-comparison protocol for fisheries and ecosystem models forced by similar climate scenarios. Achieving this is important in order to better understand and evaluate predictions coming from these models, and difficult due to the diversity of model structures, scales, inputs, and outputs. This intercomparison protocol is novel; comparing these diverse model types has not been attempted before. However, it builds upon the existing coupled and ocean model inter-comparison projects (CMIP and OMIP), and is part of the Inter-Sectoral Impact Model Intercomparison Project, a broader effort. The manuscript is well-written, well-referenced, and clear, with a descriptive title and abstract.

This work represents a substantial advance in modelling science. In concept, both the

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development of the protocol and the subsequent intercomparisons will facilitate standardization and improvements to multiple types of ecosystem and fisheries models, as well as allow ensembles of these models to be assembled in a systematic way. This will happen even as the protocol is improved, as noted below in specific comments. While this is the first version of the protocol and comparative results are not presented, one interesting result of employing the protocol is the limited number of earth system models (ESMs) available to force the models after screening for availability, quality control, future response, and model drift. This alone indicates a need for improvement of ESM outputs and potentially fosters two-way communication between modeling research groups.

The two outstanding issues with the manuscript are the validity of the assumption of comparable fishery production using the current protocol, and reproducibility of the protocol as written for individual models. These are already recognized but could be addressed further with minor revisions.

Specific comments:

The methods and assumptions are clearly outlined and mostly valid. The impact of fishing may be difficult to see in projections with the current protocol, however, due to the decision to either hold constant 2005 fishing levels or have no fishing. Comparing 2005 fishing in a lightly fished system with 2005 fishing in a heavily fished system will be difficult; fishery productivity under these circumstances is not comparable. This is clearly a placeholder to get the project up and running, and the authors acknowledge that it is not ideal. I understand how difficult it is to predict future fishing and also how difficult it is to estimate things like dynamic sustainable yield or other target reference points, but I think it is essential to develop protocols for this to have better model inter-comparisons in the future. Perhaps the authors could outline in more detail how this might be addressed in future protocols (e.g. how might the future fishing scenarios referenced on p 14, line 14 be made spatially explicit in a standardized way?).

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Precisely reproducing the protocol for an individual model may be difficult, because in this first round there seems to be much leeway given to individual modeling groups to “optimize” inputs from forcing models, rather than use standardized inputs. While it makes sense to allow flexibility given the wide range of ecosystem and fisheries models included and the diversity of their inputs, different modeling groups working with the same model framework may make different decisions under the current flexible protocol. The authors note that some standardization will be imposed in updated versions of the protocol. Perhaps additional examples of standardizations of the protocol could be given (one regarding diazotrophs is given on p 11, lines 21-24), or some method for standardizing decision making of modeling groups regarding forcing inputs could be outlined to ensure that similar “optimizations” would be made across groups under the current protocol.

Technical corrections: Define CMIP5 and CMIP6 in abstract P 7, line 18, should this say “Ecospace, the spatial-temporal model run in Ecosim. . .”

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