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Interactive comment on "EwE-F 1.0: an implementation of Ecopath with Ecosim in Fortran 95/2003 for coupling" *by* E. Akoglu et al.

Anonymous Referee #1

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This paper is primarily an evaluation of a method of achieving end to end modelling of marine ecosystems using Ecopath and Ecosim written in FORTRAN and a biogeochemical model. As such it should be accepted, it provides a generally clear exposition of a conceptually simple way of linking models, a series of test of reproducibility and a worked example of the method being discussed. However, the paper is over glib in places (particularly about the results) and overstates the value of the FOTRAN method compared to others whilst failing to mention that the choice of approach is very much dependent on system organisational and objective considerations and by no means the only or indeed always the best approach. There needs to be more comparison and evaluation of the quality of the results.

I suggest that the authors change the emphasis of the introduction and particularly the

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discussion. I am happy for the model and results section to be kept substantially as is – except for one or two specific comments.

A.) The sentence ‘ Ecopath is also characterized by a top-down assumption’ is not strictly true Ecopath finds an equilibrium for a moment in time and do there is no regulation per se.

B.) When the authors move from Ecopath to Ecosim they do not discuss the additional model parameters. Although some of these are beyond the scope of the current paper they omit the discussion of the vulnerability parameter which defines how bottom-up versus top-down the model is and affects model stability. It is possible that some aspects of the LTL and physical models may affect this so it should not be ignored. However it is disingenuous to suggest that translating EwE code into FORTRAN is the only solution to joining the two modelling components and that they are perusing only one possible approaches, whilst accepting that it is beyond the scope of the current paper to compare all approaches it is hoped that a review paper will address it and that this paper will be evidence for such a review paper. C.) The authors should point out that there are at least three possible approaches to reconciling EwE with FORTAN biogeochemical models: 1.) Keeping everything as a single model – but using both languages and using a Thunking or data translation layer between the VB and FORTRAN components (Visual studio does this by using mixed native and managed code in C++, and copying across between arrays and similar. In a unix environment f2c can be used 2.) Using inter-process communication such as pipes or sockets –could work across sockets or mechanisms 3.) The approach used here. We should probably discount the reverse approach of writing biogeochemical models in Visual Basic.

4.) The ecology results are a mixed bag and should be stated as such. In particular a lot of things are dying and it would be interesting to know why they are dying (starvation, predation, fishing etc.) and what can be done about this. Given we are starting with existing models what we most need to know is whether we can fix this kind of thing in model or will need to add a lot more code. 5.) The authors quite rightly allude to

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the different time scales of the two models and how they have been reconciled but should focus more on the implications of time on the problem of marrying two such different models, especially given the long-term nature of Ecosim 6.) The authors allude to Ecospace as somewhat beyond the scope of this paper but this seems to be the main raison d'etre of the FORTAN translation. A platform independent EwE model would have the advantage of being able to run on UNIX clusters which is going to be a requirement if large scale spatial models are to be run. 7.) There is currently a fluidity of model and approaches to E2E modelling, it would be helpful if the authors could carry out some kind of compare and contrast exercise 8.) Similarly it would be helpful if the usefulness of Ecosim as the HTL component could be evaluated. The impression I get is that Ecosim adds more to the biogeochemical models than the biogeochemical models add to Ecosim at the moment – not sure if that is a fair evaluation. 9.) The move away from EwE databases and front ends towards namelists and HDF files may be seen as a usability disadvantage, the authors should consider how usable EwE-F is for an experienced EwE developer. 10.) The authors have a big wish list and because they have in effect created a fork will always to an extent be playing catch up with the official EwE release. Which of these improvements are most critical to the model's role in end to end modelling.

Interactive comment on Geosci. Model Dev. Discuss., 8, 1511, 2015.