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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 #2**

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The paper presents a novel tool that has the potential of substantially enhancing the capability of the marine ecosystem modelling community. EwE-F enables the application of a well-established and tested food-web modelling framework (Ecopath with Ecosim, EwE) to questions that go beyond the immediate scope of the original EwE software, such as end-to-end modelling from biogeochemical to socioeconomic concerns, multiple run analyses to study structural uncertainty or policy optimizations, and enhanced physiological or demographic detail where needed, while safeguarding the tested and proven EwE concept. This capability is well illustrated by the exemplary application provided, which can additionally serve as an inspiration or guideline for future coupling of EwE with biogeochemical models. The translation of EwE into Fortran is not the only endeavour to allow such coupling, it will, however, be amongst the most straight forward attempts to do so with the publication of the current paper and code.



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A) The title is a suitable representation of the study, however, given the potential significance of the work also for a less technical audience, the term 'for coupling' may benefit from increased clarity for scientists less familiar with geoscientific modelling.

B) The abstract represents a complete, yet brief summary of the content. However, I perceive the attribute 'great' in p. 1512, line 7, as too judging.

C) The introduction presents a clear and shortest appropriate presentation of the study's background, motivation and approach. I would have appreciated references that underpin the claim that 'Oceanographic models [. . .] have mostly been written in Fortran' (p. 1514, line 1).

D) A description of the time-dynamic Ecosim module prior to outlining the stationary state Ecopath in Sect. 2 is unusual. Most published descriptions of the EwE model follow the logic that the earlier is based on the latter. Also the following description of the implementation of both modules in EwE-F in Sect. 3.1 and 3.2 follow this principle, potentially hindering the understanding for a reader new to the concept of EwE. Else, the paper is conclusive structured and references to the respective sections throughout the text facilitate its comprehension.

E) I agree with Rev. #1 that the concepts of vulnerabilities and Foraging Arena have to be outlined at first mentioning (Sect. 3.2, p. 1518, line 5).

F) It has not become clear to me whether Ecosim-F at the current state allows the inclusion of fishing effort time series or fishing mortalities only, as my interpretation of p. 1518, lines 6-7 go. If efforts cannot be included yet, I regard that as a considerable drawback of the method that should be discussed.

G) The exploration of EwE-F's flexibility in the coupling exercise, else a well readable demonstration of the tool's capabilities, lacks detail on the sensitivity experiments mentioned in p. 1521, line 7, which appears to affect the reproducibility of the study. Also, having both an EwE and EwE-F version of the Northern Adriatic model at hand offers,



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a priori to the coupling exercise, another opportunity to evaluate the skills of EwE-F by comparing both runs. Given the prospect of the procedure outlined in Sect. 4 of this study to become state of the art when coupling biogeochemical models with EwE-F, reporting differences in model results depending on the version used is supposedly good advice.

H) The real-time coupling method sketched in Sect. 5.1.1 is not exclusive to a Fortran version of EwE, as might be perceived from p. 1524, line 16.

I) Examples of an implicit representation of nutrient limitations in food-webs modelled with EwE, as mentioned in p. 1524, line 24, could be interesting for a reader to be referred to.

J) Sect. 5.2, in p. 1527, line 1, could awake the impression that vulnerability search and time series fitting are independent affairs, which they are not. Besides, the lack of a such fitting routine in EwE-F (p. 1527, line 5) is probably less of an obstacle than the implementation of those elements that enable a one-to-one representation of normal Ecosim runs: mediation function, consumer and producer forcing function, egg production and, if not yet implemented, fishing effort time series.

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