

Address here: cover letter on other computer.

Dear xyz,
RE: Ms. No. ECOMOD-19-631

Thank you for your email of 5 December 2019 with the favourable 'minor revisions' review of our manuscript submission. We have reviewed all the comments made by the editor and the two reviewers and addressed them accordingly. We thank the reviewers for a constructive review which undoubtedly improves the manuscript and we found little reason to disagree with their comments. A summary of our changes are presented overleaf.

We look forward to hearing back positively on these changes, and publication of the manuscript in Ecological Modelling.

Kind Regards,

Paul J. Dolder, C  il  n Minto, Jean-Marc Guarini & Jan Jaap Poos

Editor's comments

After considering the comments of the two reviewers, which are provided below, I think your manuscript should be acceptable for publication after satisfactory revision. Please address the reviewers' comments when revising your manuscript. Thank you again for submitting your manuscript to Ecological Modelling.

Thank you for your comments, we have provided a detailed response to each of the points made by the reviewers; we hope this satisfies your requirements and look forward to seeing the manuscript published.

Reviewer 1 comments

This paper introduces a simulation framework for assessing the effects of different spatial and temporal observation scales on management of mixed fisheries. An application of the framework is presented, and the findings from the example application provided insights into the importance of data resolution on design and effectiveness of closed areas. The model code is included as an R package so that other researchers will be able to implement it readily to address a wide variety of management questions. The question of appropriate scales is an important one, and I think this will be a valuable tool for researchers and managers. I recommend that it be published after minor revisions.

Thank etc..

Comment	Response
Abstract I think it would be helpful to mention the name of the R package (MixFishSim) that accompanies this paper somewhere in the abstract. People will search for the package name, it would be nice if the term was included in the abstract so the paper will show up in the search too. "true underlying populations" - somehow make sure readers know this is referring to simulated populations.	 Thank you, we agree and have included in the first sentence of the abstract. We have changed to "true (simulated) underlying populations"

<p>Could add something like "bycatch avoidance", or something like that, somewhere in key words or abstract; people searching for that term would be glad to find this paper, I would think!</p> <p>I think the abstract could be streamlined a bit. You seem to have 2 major objectives with this paper: 1) introducing and describing the simulation framework that could answer a number of important management questions, and 2) demonstrating its usefulness with an example application. One full paragraph for each should be adequate, with a conclusion that states the usefulness of the framework for answering a number of fisheries management questions.</p> <p>Introduction</p> <p>Nice introduction to the need for the simulation framework</p> <p>Line 62: "Do different sources of sampling-derived fisheries data reflect" ...</p> <p>hline Methods</p>	
	<p>Thank you, we have kept this text unchanged.</p> <p>Thanks, corrected.</p>

<p>Why was the Matern covariance structure chosen? I am just curious about this; does it reflect the spatial autocorrelation of animal distributions better than a Gaussian or other type of covariance structure?</p> <p>It would be helpful to have explanation of thermal tolerance earlier than line 155</p> <p>The paragraph starting at line 179 would be helpful to have at the beginning of the section</p> <p>Line 187, make tenses consistent (e.g. determined vs. determines) - also this sentence is a little awkward to read.</p>	<p>We used the Matérn covariance structure as it allows for a non-linear decrease in correlation as distance increases and is flexible, in that it reverts to an exponential form under specific conditions. As such it is capable of taking any number of forms, as required. Alternative covariance structures could also be used, but Matérn is the most commonly used. We've added text to say "We use the Matérn covariance structure as it is most commonly used being a flexible form that under certain conditions is of the same form as an exponential function and it enables us to model the spatial autocorrelation observed in animal populations where density is more similar in nearby locations, but that correlation decreases non-linearly...."</p>
<p>Results</p> <p>Line 376: What does "Visualized using Gerritsen (2014)" mean?</p> <p>Line 397: Are these the same figures in Table 7? If so, just refer to the table and summarize</p> <p>Line 400: move % sign</p> <p>Line 406: "(in red)" - leave reference to color for figure legend</p>	<p>This has been corrected. [Note, may be redundant if change text]</p> <p>Removed reference to color.</p>

<p>Line 410: "Again" doesn't need to be there, same in line 413</p> <p>Line 416: This section is a little confusing and needs to be re-fined/streamlined.</p> <p>Line 418: This paragraph should be in methods. But you did it for all populations, right? Not just population 3?</p>	<p>Agree, it has been removed.</p>
<p>Discussion / Conclusion</p> <p>The discussion and conclusion overlap a bit; I felt I was reading similar things over again; perhaps these can be streamlined?</p> <p>Line 560: change "reduced" to "reduce"</p> <p>Line 663: change "hypothesis" to "hypotheses"</p>	<p>Thank you, corrected.</p> <p>Done.</p>
<p>Figures</p> <p>Figure 1: nicely summarizes the model. It took me a little bit to figure out that "Rec" referred to recruitment - even though it was in the legend (I missed it when I read it the first time)... is it possible to choose an abbreviation that makes it more obvious, maybe something like "Recruit" or even "Recr"? It also occurs to me that there is an opportunity to introduce the terminology from your R package here to make it very clear to the people using your code how the functions work together... this is only an idea though... or maybe a similar figure could be included with the vignette.</p>	

Figure 5: Do the colors indicate the dominant population in each cell? It is hard to imagine that one would assume only the presence of specific population in the cell? Or do I have the wrong idea about what the plot is showing?

Figure 9: So the top two panels show spatial distribution for population 3? That needs to be added to the legend. Also there should be a red box on the top plot too.

Figure 10: I really like this plot! Very effective.

Reviewer 2 comments

The paper Dolder et al. presents a new highly resolved spatiotemporal model that simulates populations of species and fishery dynamics to assess if data from commercial catches and fixed-site sampling surveys on different spatiotemporal scales represent the real distribution of the populations, and if these data are effective to base management programs. Moreover, they presents other applications of the model.

This is a very interesting paper, and the model provides several applications for management programs. I have only few greater questions and some small issues, most of them about the presentation of the information.

Thank etc..

Comment	Response
General comments	

How many species does the model simulate? The authors refer to the issue of catching unwanted species (vulnerable or low quota species) when available quota species is caught, and it suggested me that populations of different species is modeled at the same time. However, they did not describe how many species could be simulated in each simulation, only that four populations were simulated. Does the populations simulated in different simulations, or all of them are simulated simultaneously? The results indicate that the four populations were simulated in the same simulation. Please, clarify this in the MM.

There are too many figures and they should be better edited. Why the name of the row and columns are inside the graphics? The axes scales and the axes title should be greater. I would also send the figure 2, 3 and 9 as supplementary data.

The legends of the supplementary figures should be more informative. In the Figure S2, what the light gray spots are? Habitat preference? Are the squares the spawning areas? In the figure S3, are each square a week?

I am not native English, but the language seems good for me. However, I missed several commas along the text that make the sentences too long and hard to understand. I suggest a revision of this.

Small issues

Line 14 - 18: This phrase is too long and hard to understand. Please, rephrase this in shorter sentences to clarify this idea.

Lines 20 - 43: These two paragraphs seem redundant.

Line 68 - 72: The authors mentioned that the MixFishSim could be used to infer if fisheries data are the real community structure. I suggest adding one or two phrases to explain how the model could help in this.

Line 90. The authors presented the time-step of each module, except the Recruitment dynamics. The recruitment dynamics probably follow the population dynamic, but it would be interesting present this explicitly.

Line 282: How these population parameters were selected? Randomly? Using real data? Or the authors only created them?

Line 426: What does adapted means in this context? Exploring new opened areas?

Line 613: Do not use parenthesis inside of other parenthesis.

Table 2 and table 3 are not cited in the text Citation of the supplementary figures are out of order

Figure 3: Individual years ARE the light grey lines

Figure 4. What do the purple spots represent? Describe these spots in the capture Figure 7. Add what "res" means in the caption.

Figure 8. What F means?

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We have changed to ", e.g." from "(e.g." to eliminate one set of parenthesis.

Thanks! Corrected.