

Review after Major Edits: **Marine heatwaves deeply alter marine food web structure and function**

Summary:

This paper analyzes the influence of marine heat waves (MHWs) on ecosystem dynamics using the EcoTroph-Dyn model. This dynamic model is driven by satellite-based estimates of NPP and SST, and by removing MHWs from the SST dataset, the authors compare and contrast the results of a the model (eg. biomass flow, transfer efficiency) with and without the influence of MHWs. Adding clarifications suggested by previous reviewers has improved this paper from the previous version.

They find, and clearly present, that that highest declines in biomass occur in higher trophic levels, and the tropical biome was most impacted (largest decrease in biomass and highest sensitivity). They adequately discuss the assumptions and uncertainties in their analyses, and noted some possible next steps.

General/specific comments:

Generally reads well. Some sentences became confusing when using parameters that had not yet been defined, or using symbols/names inconsistently. I also had trouble with some plural/singular versions of words (kinetic flow vs kinetic flows), which might be eased if parameters symbols/shorthands (e.g. K) were used consistently (?). Below are some minor technical edits by line, with a few minor questions for clarification.

How does EcoTrophDyn determine how many Trophic Levels are included in each biome?

18 – is the years warmest month the same each year?

35- defined as a period of more than 5 days of....

47 – related to impacts on their body temperature

48 –within a range of body temperatures

49 – ~~certain~~

50 – exceed the temperature optima

59 – not sure what you mean by “imply” here?

74 – ~~employed~~—(written twice)

80 – years and location of “the blob” or reference “the blob” in the intro paragraph 1.

81- MHW, no plural

84 – the ecosystem modelling framework

87,88 – haven't explained flow kinetic, and it feels like it needs a plural!

89 – trophic level (TL), I don't think you've introduced TL abbreviation yet

100 - a

100 – change “with” to “from”

116 – no comma

116 – add comma (trophic level, TL = 1)

122 – with conventional TL width = 0.1...

129 – remove a comma, move the parenthesis

....fishing (e.g., du Pontivice et al.,)

133 - ...a 15-day time step

133 – change “as” to “because”

152 - ...flow kinetic parameter, Kt.... Or at least put a comma

152 – I'm confused about whether you actually have flows (plural) to assess in each spectrum or you really mean flow (also line 132) like the flow kinetic.

165 – are

178 - is this the right bracket?

183- one, I think convention is write out every number below 10? Not sure here

Figure 1 –

214 – didn't define this alpha term for us yet.

227

238

314

384 – hard to see the decline in tropical biome> than world because the graphs are on different scales....

Figure 5 – I'd almost rather see this figure plotting single TL groups for both with and without MHW, then you'd be able to see the change caused by the MHW. In this version it is harder to scan across two panels to see how different the red lines are....

Why are tropical biomes more sensitive?

467 – Figure 8a is of temperature not biomass spectra

472 – wrong figure panel again

479 – wrong figure panel #

535 – plural

554 – so why was the tropical biome TL biomass more permanently affected? Do tropical foodwebs have a slower turnover rate?? Are warm water organisms already living closer to their metabolic limits? (sort of addressed in discussion 591+)

579 - do you mean disrupt catabolic processes and be undetectable (and/or confounding) in the anabolic-based TE measure?

579 - flow kinetic is a singular parameter here? (again line 584)

580 – transfer

588 – I don't see an S10

595 – is rapid biomass flow helpful for ecosystem recovery after MHW impacts?

640 – I think two commas would help readability
...species, and the growth of populations, adapted..."

694 – scenario?

726 – remove “

814 – response to MHWs of species?