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Comment

***Interactive comment on* “Putative fishery-induced changes in biomass and population size structures of demersal deep-sea fishes in ICES Sub-area VII, North East Atlantic Ocean” by J. A. Godbold et al.**

**Anonymous Referee #3**

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This is a yet another very interesting work coming out of a unique time series data of deep water fish. In this study, the authors study in long terms changes in biomass and size structure a deep water community around the Porcupine Seabight. This dataset was already useful in demonstrating a 50% decline in fish abundances but, as the authors very well state, information on population biomass and size-structure is fundamental for a complete understanding of the ecosystem effects of fishing. Overall, the paper is very well written, addresses extremely relevant scientific questions, and achieves extremely interesting conclusions particularly relevant for the improvements

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of ecosystem based management of the deep-sea. The methods used to address the research questions are appropriated but the need for using spatial modelling techniques is not clear and doesn't seem to fit the objectives of the paper. The results are well explained and sufficient to support the conclusions.

Introduction 10759, L23: The fact that the deep-sea harbours high biodiversity is questionable and should be put into context. 10760, L26: The authors statement that “understanding which species are most at risk remains a challenge” is also questionable in times where an ecosystem based approach to management is being argued as urgent. 10761, L12: the use of “>50%” to refer to a reduction in abundance is misleading. 10761, L27: what are the two periods? 10761, L28: long term changes in biomass may have been produced by a variety of factors including fisheries. Although I believe that fisheries may have been the main driver of biomass changes the authors have no data to test the “effects of deep-water fishery” but rather only to test for changes in biomass. Simple solution would be to just add putative to the sentence as you did to the title. 10761, L21-30: although I understand the main goals of the paper, the authors could have explained them better and more objectively. I'd suggest the authors to state here very briefly how they will address the main objectives of the paper. I.e. by analysing research survey data? Modelling spatial fish abundance? I'd also suggest adding that another objective would be to estimate the total biomass of deep-water species for the ICES sub-area VII. 10762, L1-3: What were the criteria for selecting these 3 species?

Methods 10762, L8: How does spatial differences in the sampling periods may affect the results? From figure 1, sets from period 1 were mainly in the north area while for period 2 were mostly in the south part. 10762, L22: What are the landings data for? From the objectives of the paper there's no need for this information. 10763, L9: Did the tow speed change with depth of trawling? If yes, how this will affect the analyses of total biomass with depth? 10764, L15: did the authors try the model with other variables (such as year, month, duration of the trawl, area of trawling, latitude or longitude, among many others) that were afterwards rejected? If yes, let the reader know. If not,

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explain why you choose to model using only 2 variables (depth and period). 10764, L15: why did you choose to model using period has the main variable and not year? I believe the effect of pre- and post- fisheries development could also be detected using year. 10765, 2.4 GIS methods: How this section relates to the objectives of the paper? No such detail is needed when describing what you've done. 10765, L12: the assumption that spatial fish distribution and abundance can be modelled using depth as the unique explanatory variable needs to be better supported or will look like a gross simplification. 10765, L15: give some statistics on the regressions

Results 10766, L8, 10, 13: it would be nice to know the models' 95% confident limits. It looks like they will overlap significantly, mainly for the abyssal plain. 10766, 3.2: The results of the model show inconsistent results among results. How to explain that 3 out of 8 species declined in biomass, 3 had no changes and 2 may have increased their biomass? It may look like having detected the biomass changes by chance (3, 3, 2). How the modelling approaches may have influenced the outcome of the models? 10766, 3.3: likely, size frequency distributions have decreased in 1 spp, have increased in the deeper range of 1 spp, and didn't change for the third spp.

Discussion 10768, L12-15: The authors could provide information on average landings per year for both periods. 10769, L21-22: how this conclusion contradicts Bailey et al., 2009 general conclusions? 10769 and 10770: the discussion of the communalities and differences among species is difficult to follow. A general discussion on factors affecting the differences observed between species could be provided.

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