

Interactive comment on “Spatially explicit estimates of stocks sizes, structure and biomass of herring and blue whiting, and catch data of bluefin tuna” by G. Huse et al.

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General comments

This paper presents survey and catch datasets of three ecologically and economically important pelagic species in the northern Atlantic. It is hoped that these data will help understand the causes of fluctuations in abundance and distribution of these species, while contributing to understanding how climate variability and fisheries affect food webs. The data are well described, with notes where necessary, to allow users to understand what is contained in each set.

C220

Not all of the data presented are completely ‘new’, with the international PGNAPES survey in May being used in the ICES assessment of the NSSH (though not spatially used, maps are presented). There is lots of interest in ‘southern’ blue whiting at the moment so having data, though imperfect, from this part of its distribution is useful. The compiled catch data for Bluefin tuna also addresses some gaps in the ICES database for this stock.

Finally, some text tying together these disparate databases (e.g. tuna time frame radically different to pelagic abundance/biomass) could be useful. More description of the links between these data and how they could be used to address the aim stated in the objectives would be beneficial.

Specific comments

Herring

No plots or tables of total biomass over years are to be found, even though it is described how this is calculated.

Is there any impact of survey coverage on centre of gravity calculation? Also, NSS herring are known to have size specific migrations (larger ones going further), so the age structure of the population is likely to affect the centre of gravity (though this cannot be examined with the data provided since only 2012 includes average length per rectangle).

It would have been useful to see the 2003 distribution (when the centre of gravity was furthest north) to better visualise the shift, rather than only 1998-1999 and 2009.

Blue whiting

It is not ideal that the abundance estimates in the Norwegian Sea data provided does not use the new TS for blue whiting. What is the impact of this new target strength? Does it affect the relevance of the data presented? This requires some description/discussion.

C221

Recent work modelling CPR data (Pointin and Payne, 2014) suggests that blue whiting spawning may occur earlier and more southerly than shown in the map in Fig. 2., based on the distribution of blue whiting larvae. The young-of-the-year in the Bay of Biscay found in the EVHOE trawl survey may originate from more southerly spawning.

Figs. 9-11 shown distribution from 2000, 2001 and 2003. These data are not included in the datasets and certainly do not represent enough examples of changes in spatial distribution as the stock fluctuated over the last three decades. Some editing could fix this (e.g. "Examples of changes in spatial distribution as SSB increases ..." instead of "Examples of concurrent changes in spatial distribution..."). The stock was increasing over this period, but maybe a greater spread of years including the peak in the early 2000s and the low abundance around 2010 would illustrate the changes better.

It is relevant to be looking in the more southern waters of the blue whiting distribution, but the Bay of Biscay series seem tricky to use. In particular the PELGAS survey may merely reflect when conditions, for whatever reason, lead to blue whiting being more on the coastal shelf and less in deeper waters, rather than changes in abundance over time. It would be useful to have some ideas on how can this data best be used when examining the blue whiting stock abundance and distribution.

Tuna

It is not automatically clear how the tuna catch data presented here, while improving holes in the ICES dataset, are an improvement over the ICCAT catch data for this species. Is the ICCAT data also missing the additional sources added to this dataset? The value of the data presented here vs the ICCAT data could be discussed. Is the uniqueness of this dataset the spatial breakdown of catches?

Le Gall (1927) reported numerous observations of tuna prior to the 20th century, some with precise weights and lengths, suggesting they were landed. Of course these may not have been accurately identified as Bluefin tuna and not officially registered as landings. But it may be worth pointing out that tuna was present in this area, and sometimes

C222

caught in small quantities, before the first official landings in 1907.

Technical corrections

Overall it reads as if each section has been written by a different author, which is probably the case. This is not too problematic as each section is fairly well described, but there could be some improvements in the consistency between sections e.g. the description of the survey procedures for blue whiting in the Bay of Biscay and Celtic Sea are described in more detail than the survey procedures for the NSSH in the Norwegian Sea; blue whiting and NSSH have descriptions of historic trends in stock abundance while ABFT does not etc.

Norwegian acoustic survey

There is limited detail about the survey itself e.g. time of day of operation, echo sounder frequencies, transect design, interannual differences in coverage etc. At least centre of gravity calculations could be impacted by survey coverage, and the varying number of data points between years suggests coverage is not always constant.

The name of this survey is unclear. The section heading calls it the "Norwegian Sea acoustic survey", in the text it is described as the "PGNAPES survey" and ICES calls it the "IESNS (International ecosystem survey in the Nordic Seas)".

ABFT catches

Maybe a full list of the areas considered would be better than saying "II-VII". Areas IX and VIII are also contained in the data set (in the old set at least, can't access the new one).

Datasets

It is a little inconvenient that the data from the Norwegian Sea survey are in separate sets for each year (and not clearly ordered).

It is also not clear why the Norwegian Sea data provided only starts in 2004, when

C223

maps a descriptions of the stock distributions in the area are given before then (e.g. 2000-2003 for blue whiting, and 1998 and 1999 for herring).

Clearer descriptions of what each link is for (e.g. headings rather than in brackets at the end) and a clear order of the links would be useful, even if just the year of the data is mentioned.

The 2012 data set contains a bonus average length column, but this is not particularly useful without similar information from the other years.

Pg 3, line 23-24: The link to the dataset for 2006 is repeated.

Pg 4, line 7: Last Bluefin tuna data set is under moratorium, can't access with standard login.

Pg 12, line 3: Data were extracted for 1903-2010, but the dataset only goes back to 1906, with the first catch in 1907. It is not clear why the dataset does not include 1903-1905 even if there were not official catches in that period.

Pg 14, line 1: Can't easily find the maps on PANGAEA referred to here.

Figures Figure 12 and 13 captions (and the paragraph describing Figure 13) should include the survey names as well.

For the tuna plots, spatial/temporal shifts could be observed easier by plotting relative catches by area/country rather than the noisy excel plots (which are very difficult to interpret in black and white). Also, zooming in on the key fishery period (1940-1970) in some graphs may be useful, since early and recent catches are significantly lower than 1940-1970.

Typos

Pg 5, line 20: "conditions" not "condition"

Pg 6, line 7: "Fig. 1" could be used to infer centre of gravity, but "Fig. 5" plots the actual

C224

centre of gravity calculated from the data, so it may be better to refer to this figure (and change the order of the others (i.e. 5->2, 2->3, 3->4, 4->5)

Pg 6, line 9: "This northern shift" rather than "This northern shifted". "Reverse" could be used instead of "backward" on line 10 too.

Pg 8, line 24: "estimating" rather than "estimate".

Pg 13, line 19: "Figs. 6-8" rather than "Figs. 6 and 7".

Pg 14, line 2: "Figs. 6-8" rather than "Figs. 4-6".

Pg 14, line 5: "SSB" should be defined earlier on in the document.

References

Le Gall, J. (1927) Contribution à l'étude de la Biologie du Thon Rouge (*Thunnus thynnus* L.): Sur la presence de Thons Rouges en Mer du Nord et dans l'Atlantique Nord-Est. *J. Cons. int. Explor. Mer* 2 (3): 309-329. doi:10.1093/icesjms/2.3.309

Pointin, F. and Payne, M.R. 2014. A resolution to the blue whiting (*Micromesistius poutassou*) population paradox? *PLOS ONE*, In press.

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C225