

## ***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.***

**G. Huse et al.**

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Received and published: 3 March 2015

Response to Paul J.B. Hart -We have added a reference to paper discussing sources of variability in acoustic abundance estimation of NSS herring (Løland & al.). -We have defined the acoustic nomenclature with reference to the standard paper for this (MacLennan & al).

Response to David Miller

Specific comments Herring Is there any impact of survey coverage on centre of gravity calculation? Also, NSS herring are known to have size specific migrations (larger ones

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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).

Response: Survey coverage has remained fairly stationary within the period. Comment added on this.

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

Response: Have removed previous figures and now only show figures within the data time series presented.

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.

Response: A reference is added referring to the paper describing the new TS function and the consequence of using the new data set is given.

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

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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.

Response: Figure 9-11 were deleted. Bay of Biscay: We agree that certain environmental conditions might lead to blue whiting being more on the shelf and hence more observable by the Pelgas survey. The following sentence was added: ‘Hence it is difficult to distinguish a situation where blue whiting are more spread out over the continental shelf because of favourable environmental conditions from a situation where spreading is caused by higher densities, or a combination of both.’

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?

Response: Good point. There are two differences between the ICES and ICCAT datasets described here. One is indeed the spatial resolution - the ICES data are resolved by geographic area (regional sea) whereas the ICCAT data are aggregated to the whole stock management area. The second difference is the time period covered – the ICES data include catches before 1950, which is when the ICCAT time series starts. Some lines are added to the text about these points.

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

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

Response: Yes, thank you , this is also a good point. These landings are now mentioned in the revised text, and we cite the Le Gall paper. Many if not most of these landings were included in the new database using original literature.

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.

Response: We have tried to harmonize the presentation of the survey information and specifically added more information about the IESNS.

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).

Response: More information about the survey and references to additional sources of information is added.

Datasets It is a little inconvenient that the data from the Norwegian Sea survey are

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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 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.

Response: New explanations are given to explain each link. The links have been re-ordered. Name for each survey is used consistently.

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

Response: Additional link removed.

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

Response: We have checked with Pangaea about this (the website hosting the data) and all access restrictions are now lifted.

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.

Response: Has been changed to 1906-2010.

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

Response: Statement changed from map to data.

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).

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Response: The figures are best viewed online to take advantage of the coloration and zooming features. However the lines have different symbols, so even with black-white it should be possible to distinguish different countries and areas.

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.

Response: This can be done online with the pdf. We prefer not to include an additional figure because there are many figures already in the paper. Zooming can be done with the pdf.

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 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.

Response: These have been taken into account.

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Interactive comment on Earth Syst. Sci. Data Discuss., 7, 457, 2014.

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