Comment on wes-2021-123
Joop W.P. Coolen (Referee)

Referee comment on "Artificial hard substrate colonisation in the offshore Hywind Scotland Pilot Park" by Rikard Karlsson et al., Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2021-123-RC1, 2021

General
I read the manuscript with interest. It is a descriptive text presenting the various species and communities on floating offshore wind structures. As this is the first study performed on this type of installation I believe the manuscript is worth publication. However, I am missing multiple elements I consider essential in a paper like this and I suggest the authors revise their manuscript following the comments below.
I would like to stress the importance of publication of data like the data this paper is based on, please publish the raw data together with the manuscript.

Introduction
The short introduction is clear and to the point. I would welcome some thoughts in the introduction on why the aims under 1.1 are interesting to study? Do you expect differences between FOWF and standard OWF? Perhaps due to the floating and lack of tidal zonation?
The technical report by Vattenfall 2006 is often cited in the first paragraphs (as are some other technical reports later on). Although much information is in this report, multiple peer reviewed scientific publications are out there that describe similar effects and show patterns on multiple wind farms. I suggest the authors include these newer publications instead of the Vattenfall report. e.g.
And some of the papers in the special issue in Oceanography https://tos.org/oceanography/issue/volume-33-issue-4

2 Methods
The methods are mostly clear, although I am confused about the different surveys. The figures included important as this novel energy system is not common yet and I needed the figures to understand all the components. Please include a definition of all the EUNIS
coding used in Fig 1, not only for the blue parts.
I am missing when (month + year please) the survey described in lines 65 - 75 was carried out and whether this survey was one of the two that were compared in lines 95 - 101.
L58, the anchor chains are connected to the turbine foundation, which is connected to the turbine, the latter I consider to be the large machine on top of the structure, not the whole structure.
L86 what do you mean by colonisation? The actual colonisation of the foundations by the species was not observed, was it? Perhaps you mean species presence? Of densities?
L90 I dont understand. In the lines above you state that fauna was counted, but here you state that fauna was scored presence absence. Many Epifouling species can be easily quantified as percentage covered.
L 95 - 101 which month of the year were these surveys carried out? And was it done using similar techniques as the other survey?

Results
The results only include summary data in Table 1. Please also publish the raw data, e.g. as online supplement, as these type of data are often hard to attain for others and it will increase the citations of your paper.
Fig 5 please explain the difference between 'M senile and spirobranchun' and 'Spirobranchus and M senile'. Is this a dominance difference?
L 126 What is biofilm? I know biofilm as microbial layers but I imagine one cannot see this on the footage. I cannot properly see this in Fig 5 as the photo has a very low resolution, but the brown matter between the anemones in the second photo from the left appears as dense aggregations of Jassa spp (aka Jassa silk) or other amipods. See for example https://doris.ffessm.fr/var/doris/storage/images/images/jassa_denombrement_my_02/12766088-1-fre-FR/Jassa_denombrement_my_02.jpg
L 143 How did you test for significance of differences between the mooring lines? This is not described in the methods.
Figure 6 please include a size reference or a statement on the size of the chain links

L170 I dont understand, the overall change in faunal thickness has decreased? What does this mean? Did you mean that there was a decrease in thickness between the 2 years? So the change is negative?

Discussion
The discussion presents several results that are not in the results section. These should be moved to results and only discussed, not presented (again).
L176 The starting statement is a result and should be presented there
L190 need a reference for your statement that S. spinulosa habitats are often associated with high faunal biodiversity
L192 need a reference for 'which could further benefit commercial fish species' and please elaborate on the benefit, how does this benefit commercial species?
L195 you are introducing new results in the discussion, these should be included in the results section, together with fig 9. At what depth was this recorded and what was the size?
Fig 9 where in the picture is the D pertusum colony? This round shape in the top middle? Indeed an atypical and very closed growth form. Please include a size reference
L205 - 207 some of these are not stated in the results, this should go to results section.

L225 I dont understand how a floating structure can have an intertidal zone. Since it is floating the water surface is always at the same position on the structure, is it not?
L229 I am confused about teh intertidal zones in this line. What is the difference between low intertidal and deep intertidal?
L233 a difference is either significant or not, it cannot be significant enough. Probably you meant large enough?
L238 - 245 is a lot of information that should be in the results, new data is not expected in the discussion.
L250-251 I disagree, figure 8 shows one large increase and multiple small decreases, most with a lot of variation, in all but 1 case I see zero is included in the mean +/- SD interval, indicating that the differences are likely not significant, although the authors did not test for this. I suggest to state that variation is large but no clear pattern was observed, or actually test for differences between years and present the results.
L273 please publish the data with the paper as online supplement or place it in an open access repository. Available upon request is not ideal for long term availability.

Line by line short comments
L37 Whomersley and Picken is not a publication of OWF
L44 please define FOWF at first use
L68 WROW should be WROV
L72 what was the speed of the slower speed?
L86 what is QC
L87-89 what software did you use for the viewing and registration?
L224 Whomersley and Picken is not about OWF
L227 Wilhelmsson and Malm, 2008 is not in the North Sea.
L290 Lengkeek is spelled wrong