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Discussions

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Interactive comment on "Exploring the contributions of vegetation and dune size to early dune building using unmanned aerial vehicle (UAV)-imaging" *by* Marinka E. B. van Puijenbroek et al.

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This is a very interesting piece of work that assesses the relationships between vegetation and dune morphology based on UAV surveys. The authors successfully follow the contributions of vegetation and dune morphology to dune development on a large beach in the Netherlands. A truly interesting part of this study is the fact the dune growth is determined in summer and winter by dune size and vegetation respectively. I believe the paper is a valuable contribution, and I think it should be published after the authors have clarified/reviewed a few points. I have no issues with the work per se

in terms of the statistical analyses applied to relate dune volume with both vegetation species and characteristics. However, I have some moderate comments regarding the analysis of the UAV acquisition and processing.

Moderate concerns:

There are only 5 ground control points used which are not homogenously located in the investigated study site (e.g. not in each corner and middle of the site). Thus, my concern is that the sum of error from data acquisition to DTM generation is likely to be above 5cm. Also the error of the DSM for each survey is likely to be different due to difference of weather conditions and survey acquisition. I would suggest the authors to report the error of the DSM of each survey.

Unfortunately no field vegetation height surveys are reported to be carried out during the UAV flight. Could the authors report the error of vegetation height extracted by the difference between DSM and DTM? I would expect a difference between summer and winter since the vegetation binding is likely to be higher for the latter.

I would suggest the authors to be critical about the limitations of their technique.

I think that it would be nice if the authors present the DTM, DEM and orthomosaics for each survey in a Figure. This could help further to support the analysis.

Minor comments:

- In the abstract, some result values should be added to support the interpretation of the findings. I would not suggest to have biogeomorphology as a keyword because it is not mentioned in the text of the manuscript.

- I would suggest to modify Figure 1 by: adding a ground picture where dunes, and vegetation could be visualized and locating the foredune.

-The methodology section is quite long. I would suggest to have a separate study site section. Also I think that it would be easier for the reader to have a figure of the

workflow of the methodology.

- Could the authors justify the thresholds used to define the dunes in lines 184-185.

- Authors said that there are 11 blocks landward from the foredune in line 236 . However only 10 blocks could be seen in Figure 2.

- In Figure 4, the markers for seaward and landward cannot be differentiated. They should not be the same.

I truly enjoyed the discussion part. I checked the references and found them all correct and found them all correct (i.e. references cited in the text are in the list and vice versa). The manuscript is well written. I could not find grammatical errors or awkward sentences that would distract me as a reader. On the contrary, the text is easy to follow. I believe the manuscript should proceed to publication after the revision outlined above. UAV systems are becoming more and more accessible to a wider community and hence I believe contributions such as the one outlined in this paper will be welcome by a number of other coastal researchers.

All the best

Anne-Lise Montreuil

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