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 an interesting topic , sadly very poorly written.

Line 55- there are multiple papers outlining how incipient or embryo dunes develop in multiple countries so this is patently wrong – remove or rephrase.

Lines 57 to 63- actually Hesp stated that incipient foredunes are initiated in several ways and by nebkha and shadow dune formation is only ONE way. If the authors are going to review how incipoinet foredunes are formed they need to state all the other

ways too – e.g. by aeolian deposition in continuous alongshore canopies of vegetation as well as discrete nebkha. And its: incipient foredunes" NOT incipient dunes" - the latter describes any type of dune. . .

Lines 79-80 these refs are very recent – the more comprehensive reviews of e.g. effect of veg density and distribution are in hesp papers – 1983, 1988 for example so cite these and Arens papers.

Lines 91-92. You need to explain better WHY u think greater dune size should mean greater accretion/deposition. Is it because u think if a dune is big then it obviously has a greater sediment supply than a small dune? BUT what about age? How has this been taken into account? A dune might be small because its young/in early development stage, a big one because its been sitting there for 200 years or gets regular scarping, scarp fill, crest growth due to that. . . Also is it because a larger vegetation patch would produce a larger nebkha and therefore would be able to collect more sand? There are multiple answers here and you must discuss there and later in the discussion/conclusions the impacts of these on your results.

Lines 92-93: WHY? Because of snow cover, more wave energy and erosion, wet sand WHAT? Please explain.

Lines 101-102: WHAT 3 types of dunes? You haven't said before this that there are 3 types. In line 100 u say dunes are formed by 1, 2 or a mixture. . . is that what u mean by saying 3 TYPES of dunes? In which case they are NOT types.(im convinced even by this stage you do not understand how dunes are classified. . .) they are ALL incipient foredunes formed in diff species or mixtures of species. REWRITE. Elucidate please!

It is NOT obvious until one gets into the methods section that you are mostly, or entirely talking about incipient foredunes and mostly nebkha and shadow dunes. You need to state this clearly at the start of the paper and also in the abstract.

Lines 275-276: dune ht - WHY? Because these are older since they are more land-

ward? Explain 289-290: obviously because they formed earlier and are older and have had a greater time to collect sand. How about stating these kinds of associations when u state your results?

Also u are omitting the important papers on flow and sedimentation in patches or vegetation – classic study of diff patch density by Qian et al; Liu papers, Bouma paper on flow in veg patches underwater etc – these all provide excellent explanations of how density controls nebkha development and need to be reviewed and cited.

Bouma, T.J., van Duren, L.A., Temmerman, S., Claverie, T., Blanco-Garcia, A., Ysebaert, T., Herman, P.M.J., 2007. Spatial flow and sedimentation patterns within patches of epibenthic structures: Combining field, flume and modelling experiments. Continental Shelf Research 27, 1020–1045.

Dong.,Z., Wanyin, L., Guangqiang, Q., Ping, L., 2008.Wind tunnel simulations of the three-dimensional airflow patterns around shrubs. Journal of Geophysical Research 113: F202016, doi: 10.1029/2007JF000880

Lines 337-340: its strange and weird that you state dune vol is related to dune volume! Of course its is as it's the same thing. ... Rewrite to explain better what you are correlating here.

Line 358: YOU MEAN: "The aim of this study was to explore the contributions of vegetation and dune size to NEBKHA dune development" - add this word otherwise its totally confusing and non-obvious what u are talking about; i.e. ANY dune development??!

Line 359 – now your aim is ONLY about degree of shelter? What about the other aims stated at the start of the paper??

Lines 368-369: because you have failed to adequately review the literature you are stating untruths here. One of the great papers to fully show how seasons control foredune growth is the one by Davidson-Arnott (ref in Hesp 2002 paper maybe) . Check his book which has the model in it I think. At any case remove the statement that this

is the first to relate foredune growth to seasonal change.

Lines 390-393: the referencing of the transverse dune lit here doesn't compute. Shadow dunes and/or nebkha do not at all have the same flow dynamics as transverse dunes. You need to rethink this entire idea and writing. Shadow dunes for example are controlled by paired horizontal flow vortices and max slope angle (hesp 1981). Nebkha vol and height is largely controlled by veg density and nebkha age and rate of plant growth....

Lines 415-416- and less storm surge, wet high tide beach, etc on the sheltered side??

Line 418 and subsequent lines: You are NOT describing "veg characteristics" here. BE specific – u are at least first describing the effect of veg species differences or combinations of species, NOT density, distribution, height etc. So be specific – rewrite.

OK I see that you discuss these other factors next BUT would be better to still rewrite the first part to make it clear you are first just talking about species differences.Lines 448-449: there are several studies showing that ammophila does trap more sand generally compared to other species due to its high density clump-like nature so cite some of these.

lines 514-515: I don't see anywhere a decent explanation of why this is the case. You need to better explain this conclusion.

Cheers

Patrick Hesp

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