

Dear authors,

Review of the manuscript: Coexistence of two dune scales in a lowland river, by Zomer, Vermeulen and Hoitink.

I have read the paper with pleasure and recommend publication after minor revisions. This clearly written manuscript presents interesting findings about the morphology and behaviour of secondary dunes in a river stretch of the river Rhine in the Netherlands. This topic is very interesting for the audience of eSurf.

The conclusions are interesting and novel and well supported by the results. The manuscript is clearly written and edited. Figures are clear and informative, although explanation in the captions could be extended, such that readers can understand the figures without reading the text. The manuscript presents new and clear messages.

I have two small concerns that should be addressed.

- 1) Although the study area is 38 km and data covers 3 years (bi-weekly), several observations and associated conclusions seem to have been drawn from small sections or a few snapshots in time. For example, figure 4 (only km 34-36) or figure 5 (only high and low discharge). I understand that not all data can be shown, but did the authors check their findings for other locations/periods? This at least warrants a discussion about the validity of the findings for other locations in the study area or comparison with other high/low discharges.
- 2) In their method the authors briefly describe criteria for identifying dunes (L151-155). However, the exclusion criteria might have a significant impact on the results of for example the coverage, dune characteristics, etc. It effectively means that authors are defining a certain area as flat bed, which they do not show in their results. It would be valuable to know if these flat bed area's are connected or exits within a dune field. Do secondary dunes persist on these flat beds or not? This might also affect the methodology: how is a dune length determined near a spatial transition to flat bed. This at least warrants a discussion.

Minor comments:

P9, Fig.2. Please state the discharge for each panel in the caption.

P8,L190. "Secondary dune crests are transverse to the channel axis". Where can readers see this?

P8,L199. "... cover correlates with discharge". The correlation seems rather weak, to what extent is this correlation significant?

P8,L198. "... cover fraction for kilometers 34.3-36 ..." Why do the authors only show results for this section, the study area was 38 km (L74). Please explain if these findings (L198-199) are also valid for other sections of the studied river stretch?

P10, Fig.4. Please explain the difference between panel a and panel b. Is panel a showing the coverage of primary dunes? If so, please explain how the primary dune cover was determined and how the authors explain that for some locations primary dune coverage was below 50%. Is this related to the selection criteria mentioned on L154-155? Which would imply that areas with dunes lower than 25 cm or shorter

than 25m are considered flat bed? It would be helpful if authors state explicitly that flat bed occurs for a significant percentage of the river stretch.

P10,L218. "... and dunes become longer." Where can readers see this? Figure 5 shows that primary dune length is comparable (slightly lower) at $n=50$ for high discharges. Please explain.

P11, Fig. 5. Please explain orange vs. green line in the caption. In caption panel a shows D50 not panel (c).

P12, Fig 6. Please add panel numbers c,d,e to the figure. (e) is not mentioned in the caption.

P14,L245-247. For which grain sizes is this statement valid? Is it possible that the difference with the findings of Wilbers and Ten Brinke (upstream Rhine, larger grain size) can be explained by grain size differences?

P14,L255. More recent studies exist about transitions to USPB, e.g. work of Naqshband (<http://doi.wiley.com/10.1002/esp.3789>) and Van Duin (<https://www.mdpi.com/2076-3417/11/23/11212>).

P15,L261. Is this observation of Van Rijn also observed in this study?