



*Supplement of*

## **High-resolution automated detection of headwater streambeds for large watersheds**

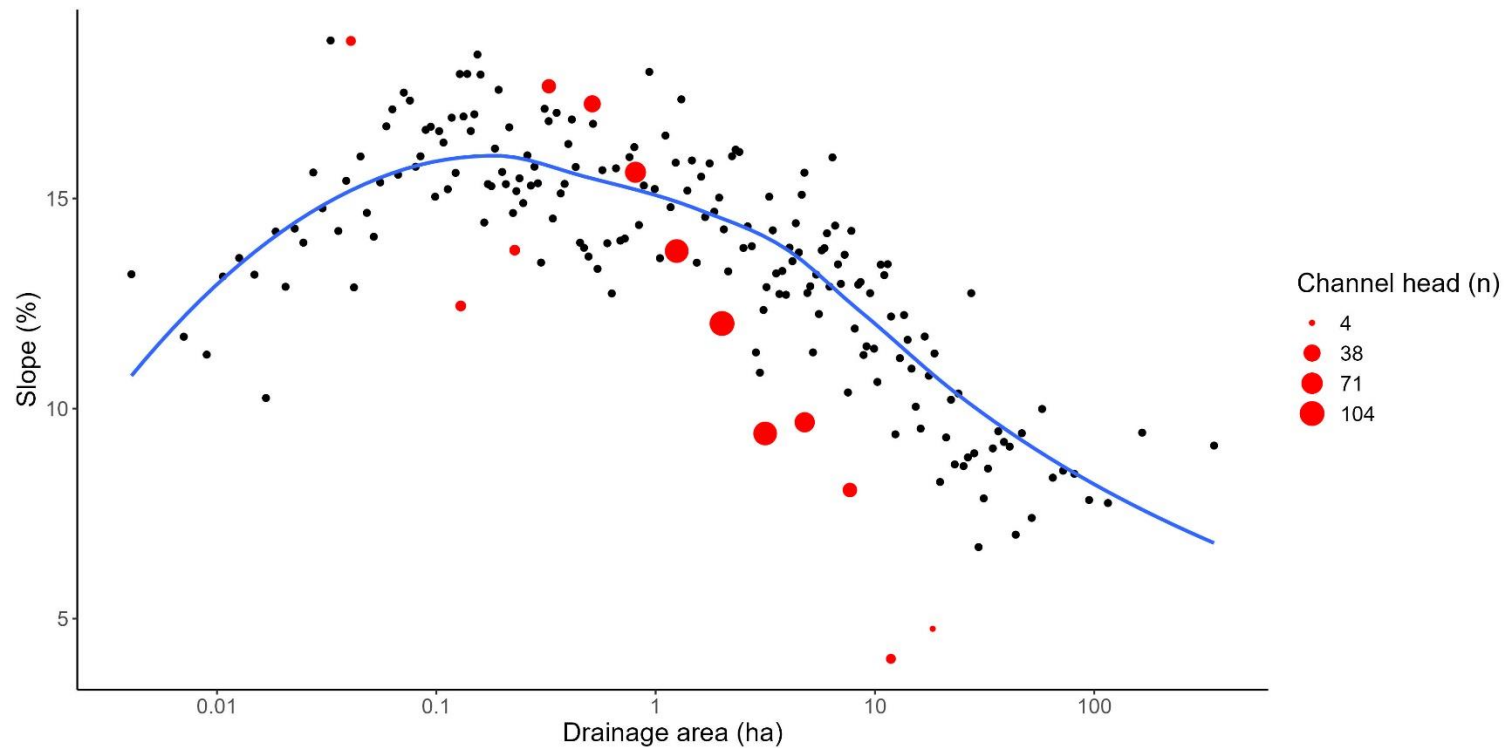
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## S1: Visual description of hydrological classes

### Shallow soil



**Figure S1** Slope-drainage area relationship for all used data of shallow soil ( $n = 18\,935$ ). Slope and drainage area have been averaged for every 100 binned drainage area data (black dots). Channel heads have been added to the figure by averaging slope and drainage area for every 0.2 value of drainage area of  $m^2$  on a logarithm scale (red dots).



**Figure S2** General visualisation of study area in shallow soil. The area is mountainous, with steeper slopes, and the Quaternary deposits generally consist of thin till.



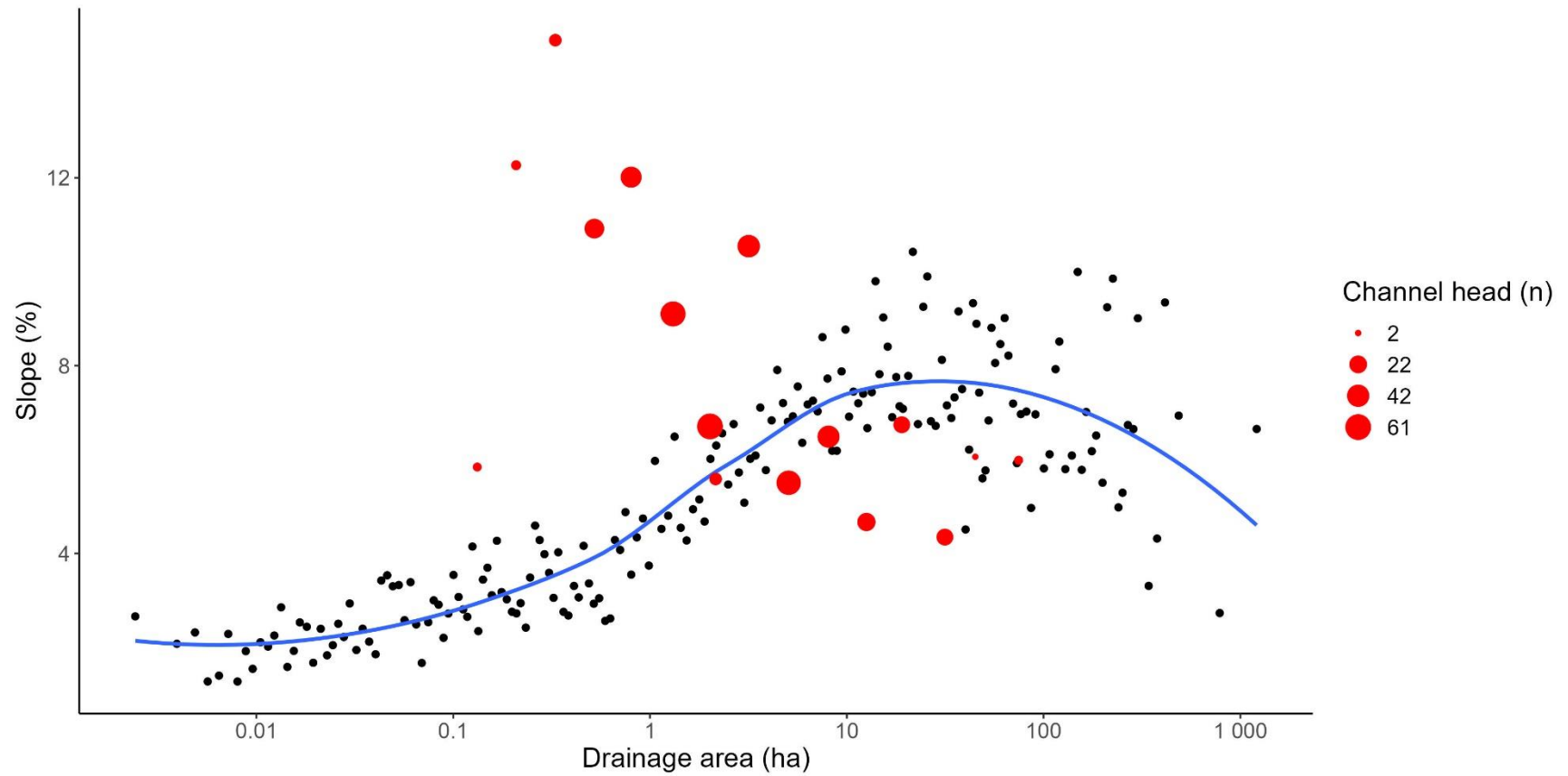
**Figure S3** Visualisation of a channel head in shallow soil. Drainage area is 4 ha.



**Figure S4** Visualisation of a streambed in shallow soil. Drainage area is 6 ha.



**Figure S5** Visualisation of a streambed in shallow soil. Drainage area is 32 ha.



**Figure S6** Slope-drainage area relationship for all used data of thick soil with high infiltration rate ( $n = 19\,462$ ). Slope and drainage area have been averaged for every 100 binned drainage area data (black dots). Channel heads have been added to the figure by averaging slope and drainage area for every 0.2 value of drainage area of  $m^2$  on a logarithm scale (red dots).



**Figure S7** General visualisation of study area in thick soil with high infiltration rate. Old sandy borrow pit that shows the preponderance of thick, coarse Quaternary deposits.





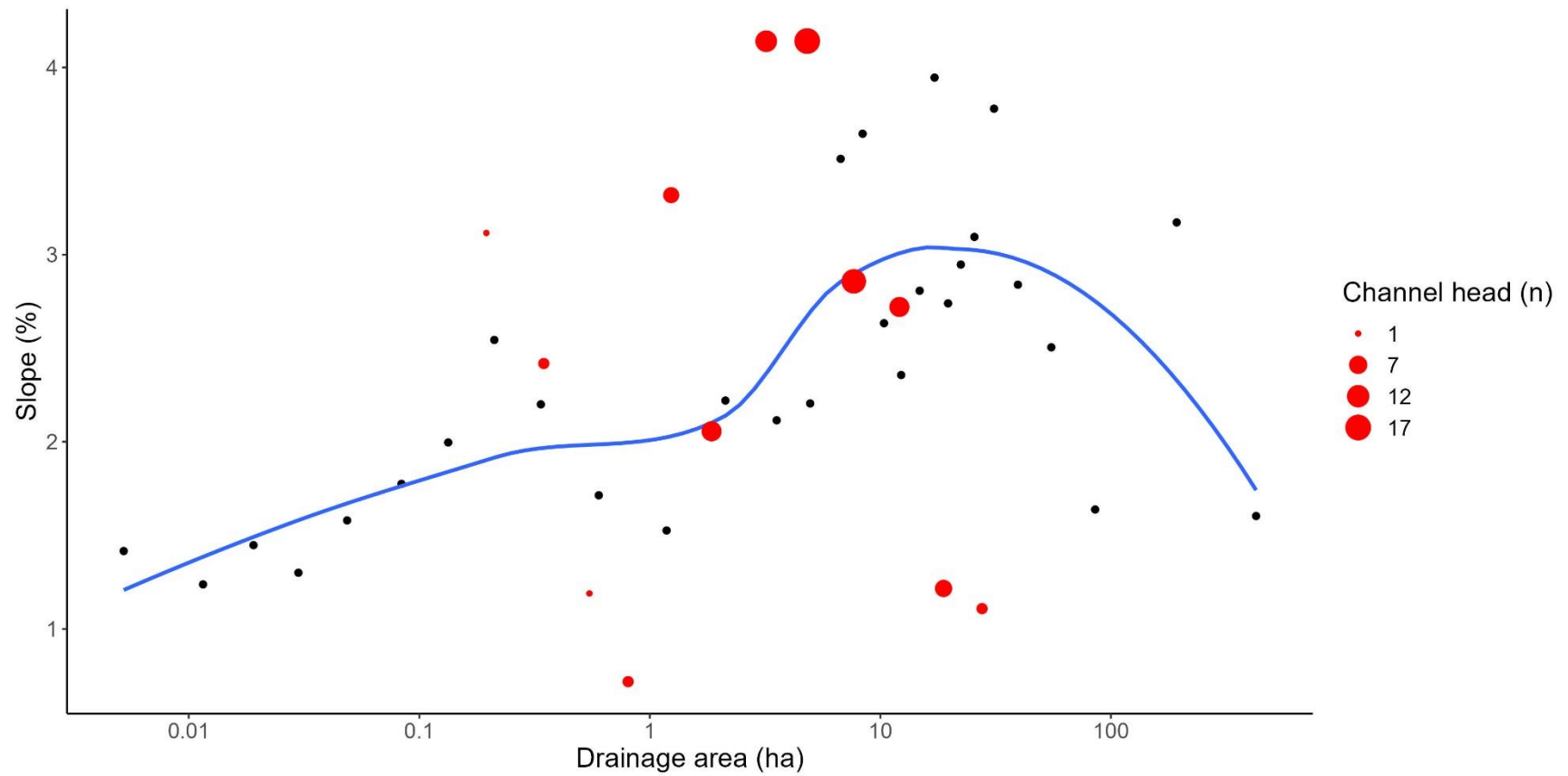
**Figure S8** Visualisation of a linearized and deepened streambed in thick soil with high infiltration rate. Drainage area is 42 ha.



**Figure S9** Visualisation of a streambed in thick soil with high infiltration rate. Drainage area is 137 ha.



**Figure S10** Visualisation of a linearized and deepened streambed in thick soil with high infiltration rate. Drainage area is 872 ha.



**Figure S11** Slope-drainage area relationship for all used data of thick soil with low infiltration rate ( $n = 2\,942$ ). Slope and drainage area have been averaged for every 100 binned drainage area data (black dots). Channel heads have been added to the figure by averaging slope and drainage area for every 0.2 value of drainage area of  $m^2$  on a logarithm scale (red dots).



**Figure S12** General visualisation of study area in thick soil with low infiltration rate. A layer of clay is generally present in these area, which favors water retention and the formation of wetlands.



**Figure S13** Visualisation of a streambed in thick soil with low infiltration rate. Drainage area is 4 ha.



**Figure S14** Visualisation of a streambed in thick soil with low infiltration rate. Drainage area is 11 ha.



**Figure S15** Visualisation of a streambed in thick soil with low infiltration rate. Drainage area is 35 ha.