

Review of A study on the drag coefficient in wave attenuation by vegetation by Zhang et al.

The study of Zhang et al. focusses on wave attenuation by vegetation. Specifically, the authors look at an exponential and reciprocal function that describes wave height, and the accompanying damping factors. These damping factors both use the drag coefficient C_d , and the authors derive a new function that connects the two damping factors. Eventually, the authors predict C_d based on the different methods and damping factors. They conclude that the two damping factors are almost equal for submerged vegetation, but the new equation can be used for both submerged and emerged vegetation.

Generally, I like how the authors present their data, and find their conclusions well-supported with what they show. However, I still have several issues that the authors may want to improve on.

Something that confuses me throughout the whole manuscript, is that several steps to get to the drag coefficient are not clearly described. For example, in the results section (sect. 5.1 and 5.3.3) the authors say they calculated alpha, but then the value of k should be known. So how was this done exactly? See also my minor comments for more examples. Generally, I think it would be good if the authors add one extra section in the methodology, where the method related to each section in the results is explained in more detail. There, the authors could state specifically, and maybe even step-wise, which equation was used in which way.

I am also a bit confused about the Taylor expansions and how the authors arrive exactly at equations 11 and 12. This may be the lack of knowledge about this topic on my side, but I believe it is important to elaborate here and make it really clear to the reader what has been done and why.

I think the authors also need to elaborate the discussion. Especially the analyses to relate C_d to Re , KC and U_r are hardly discussed, and I think the authors should reflect here on the implications of their findings. Why is it important to link C_d to the parameters and what can we do with these findings? This is probably obvious for the authors, but it is good to also stress this for the reader. In addition, the authors should also make clear to the reader why the new equation is helpful and why the methods need to be linked. This is briefly done on page 16, but the main point seems here that you can use MS Excel, which is not a good argument in my view (there are so many free tools available, Python, R etc.). So please state clearly what new insights we gain from this and how it is helpful.

Lastly, my list of minor issues is still rather long and probably not even complete. Therefore, I would suggest that the authors go over the article again in full detail and try to improve their text.

To conclude, I like the study and believe the results are clear. Most of my comments are merely textual, so I believe the authors could easily improve the manuscript. I hope the authors find my comments useful, and I am looking forward to a revised version of the manuscript.

Minor comments

Abstract → The abstract should not refer to the main text, so it is better to remove the equation numbers.

P1.L16. Predicting → predict

P1.L24 of practical → of practical use?

P1.L24 barrier → barriers

P1.L29. What do you mean with floodplain resources?

P2.L32. Water motion in researches → water motion, as investigated in different researches

P2.L36. Complicate → complicated

P2.L39. Following → follow a

P2.L44. Later → that?

P2.L47. then → that?

P3.L64. Vertical, rigid cylinder → a vertical, rigid cylinder / vertical, rigid cylinders ?

P3.L66. Of circular → of the circular

P4.L100. What do you mean with the proportionality? I am not sure if I follow how you get to Eq. 11.

P4.L112. Understanding → understand

P4.L120. Why do you use that specific formula?

P4.L131. The three lengths of the canopies → here you mean the horizontal length, correct? So, x in Figure 1?

P4.L132. these → the

P4.L132. Depth → depths

P4.L140. List → listed

P5.L141. Collected more → collected during more?

P7.L151. Had shown → determined?

P7.L158. In laboratory → in a laboratory

P7.L173-174. Also...useful. → How did you use Equation 11 here? How did you determine the k-value?

P8.L180. Was shown → is shown

P8.L187. did not strongly affect → was not strongly affected

P9.L198. Attention..recently.- → Several studies paid attention to the emergent condition of the vegetation recently.

P9.L199. In this part...were compared. → How do you do this exactly? You fit equation 1 for alpha, and then calculate the drag coefficient C_d back with Eqs 2 and 3?

P9.L204. When study → when studying

P9.L213. Decaying function → decaying functions

P11.L223. How did you determine k here?

P11.L224. Decaying → decays

P12.L237. Different densities → what do you mean here?

P12.L238. Why are these considered as outliers?

P12.L238. Tendencies → what do you mean with tendencies here?

P12.L240. Due to → be due to

P12.L240. wave → waves

P12.L240. This might...were small. → This sounds like a bit of guessing, but you should be able to check this.

P12.L240. Results revealed...was ignorable. → How do I see this? Which density differences?

P12.L245. Various groups → do you mean the groups in Table 2? Please be specific.

P12.L247. Case study is → case studies are?

P15.L275. By reciprocal → by a reciprocal

P15.L275. By combining...two perspectives. → These two reliable calibration methods by Dean (1979) and Kobayashi et al. (1993) can be combined from two perspectives:

P15.L277. These relations → the relations

P15.L300. Filed → field?