I thank the authors for their substantial revisions made to the paper. The details of the equations and numerical implementation have been significantly improved. Most of my previous comments have been addressed. I only have a few comments for the authors to final consideration. Please pay attention to comments 4, 5, 8, and 9. The equations mentioned for these comments have inconsistent units.

1. Line 10: change “Experiments” to “Numerical experiment”.
2. Line 12: add “also” between “we” and “apply”.
3. Line 91: change “Weissbach” to “Weisbach”
4. Equation 1: It seems wc was not explained. Also, in the previous version of the paper, Equation 1 does not have a wc term, but you have one in this version, could you explain the difference?
   Based on my ow calculation, the ratio of Psi*/rho_i has a unit of m/s^2 based on Equation 4. For equation 1, the ratio of Phi to rho_w should be the same unit, which means Psi/rho_w ~ Q_w^2/Dh^5*wc. However, the last term (Q_w^2/Dh^5*wc) has a unit of (m^3/s)^2/m^5*m =m^2/s^2. This means that the units of Psi in Equation 1 and Equation 4 are inconsistent. I suspect that wc should be removed from Equation 1. Please check this problem.
5. Equation 3: Equation 1 has the variable wc, while Equation 3 does not. Please check this inconsistency.
6. Line 124: Change “the first term” to “the first term on the right-hand side”.
7. Line 128: what is the difference between "a width of the glacier bed w" at line 128 and "channel width wc" defined at Equation 9? Are they the same or not? If they are the same, please explicitly describe this. If not, then please explain the difference and clarify how to calculate glacier bed width w.
8. Line 135: In Equation 7, is the term, (2 - Delta sigma H)/5, a dimensionless value? I suspect the format Delta sigma*H should be Delta sigma/H? From the texts at Line 135, Delta sigma has the same unit of H. The unit will be the squared unit of H if you multiply Delta sigma with H. Please add clarification for this.
   If I am correct that (2 - Delta sigma H)/5 should be (2 - Delta sigma/H)/5, then H = Delta sigma, means sigma(H) = (1+exp(1/5))^{-1} = 0.45, which is not 0 as you mentioned at line 135. Please check on this.
9. Equation 8: In the previous version, the right-hand term is multiplied by wc, but in this new version, the wc is omitted. Is there a reason to do this? Based on my calculation, the units for Dm, g, and (tau/rho_w)^(5/2) is m, m/s^2, and (m/s)^5, this means that the Qsc has a unit of m^2/s. Based on Equations 5 and 6, erosion rate mt. has a unit of m/s (identical to partial H/partial t), which means Qsc and Qs should have a unit of m^3/s because their units are proportional to mt*w*l (with unit m^3/s) based on Equation 6a. These calculations mean that the new version of Equation 8 is not correct, while the old version is correct, in terms of their units. Please check if there is a mistyping error.
10. Line 254: add parenthesis to separate T and C?
11. Line 339: Here you mentioned that the grain size is the most influential factor controlling the model’s predictive capability. In my understanding, the grain size also has impacts on the Darcy-Weisbach friction factor. In this paper, the friction factor is assumed as a constant. Could you add a few comments on how the combined impacts of grain size on friction factor (Equations 1 and 11) and transport capacity (Equation 8) can likely affect the mode performance?
12. Line 359: add a space between “13” and “are”.