

**Review of revision for “Effect of hydro-climate variation on biofilm dynamic and impact in intertidal environment”**

**Review date:** August 12, 2022

**Ethics:** This is my second review of the manuscript and I identify no conflicts of interest.

**Review by:** Matthew Hiatt

**Summary (unchanged from previous report):** This manuscript presents an analysis of the influences of biomass and biostabilization on 1D tidal morphodynamics. A validated hydro-morphodynamic model is presented and amended to include the effects of biostabilization on long-term ( $\sim 10^4$  tidal cycles) tidal channel morphology and depositional/stratigraphic patterns. The influences of hydrodynamic disturbances (frequent, infrequent, small, and large) on biofilm development are also assessed alongside the effects of temperature, biofilm development depth, and biofilm growth rates.

**Assessment (from previous report, but still applies):** Overall, the topic is of interest to readers of ESurf. The paper presents a novel combination of models on an emerging topic addressing the role of smaller scale biological processes on channel-scale geomorphology. This topic fits the journal quite well and is timely.

**Assessment of revision:** The authors have taken great care to assess and respond to my recommendations for the first draft of the manuscript. I agree with their changes and greatly appreciate the revamped subsection 2.3. With the inclusion of the additional specific details on what will be tested in the paragraphs preceding Table 3 (and the very helpful inclusion of Table 3 itself). I now think tables like Table 3 should be included in all modeling papers! I found the direction of the manuscript to be very clear. As with my first report, the results were easy to understand, but the enhancements to the methods section dramatically improved readability for me. Well done on that point.

I think the new figure 5 (a revamped version of the previously submitted Figure 4) is significantly better because it is more targeted. This improves understanding.

I appreciate the clarification on the hydrodynamic disturbances applied at the boundary in lines 310 and onward. This is helpful for contextualizing the results.

Overall, this represents a strong contribution to Earth Surface Dynamics after the careful consideration of the reviewers' comments. My recommendation is to accept in present form.