Reply on RC2
Maxwell P. Dahlquist and A. Joshua West

Author comment on "Central Himalayan rivers record the topographic signature of erosion by glacial lake outburst floods" by Maxwell P. Dahlquist and A. Joshua West, Earth Surf. Dynam. Discuss., https://doi.org/10.5194/esurf-2021-54-AC2, 2021

Thank you for your thoughtful and constructive review and for your enthusiasm for our work! We appreciate the suggestions and will incorporate as many as possible into the revised manuscript. In the meantime, I want to address some of the major points you raise.

Regarding landslide dams: This is an interesting point that I’m not sure how to satisfyingly address. Since landslide dams should form more stochastically while the locations of moraine or ice dammed lakes are predictable it’s a lot easier to analyze the effects of GLOFs independently. LDOFs are certainly important to this model and they could obfuscate the GLOF effect, by giving channels access to outburst flood erosion even with no upstream glaciers.

Lithology definitely does exert a control on landsliding, but it’s hard to know how it ought to be considered here, given the observation that the Kathmandu Nappe juxtaposes High Himalayan rocks into the Lesser Himalayas without a substantial effect on topography.

Regarding knickpoints: Good question regarding knickpoint substrate, we’ll look into this for the revised manuscript as we agree this section could use a bit more depth. It might be possible to at least investigate this for a subset of the knickpoints.

Regarding debris flows/threshold drainage area: This is something I’d been thinking about a bit already and it probably would be a good idea to discuss debris flows more in this context and perhaps include some analysis of channels specifically with regard to the efficacy of debris flow erosion, since that could be a major factor in how tributaries respond to increased GLOF erosion in trunk streams, especially at small drainage areas as you have mentioned. We will address this further in the revised manuscript.

Regarding in situ breakdown of large boulders: Thank you for the suggestion, we will incorporate some discussion of this process and include the references you mentioned.

Thanks again,

Max Dahlquist