

Reply to 'Comments by AE' from EC 1 Yeong Bae Seong

We thank the associate editor for their consideration of our manuscript and their constructive comments. Below, please find the original comments bolded and italicized and our reply in normal font.

Ln 271-2: "We find that all three valley glaciers did not begin significantly retreating until ~5 – 6 kyr after the culmination of the LGM in the Sawatch Range". You cannot jump over the gun like above because you are based on the different types of samples (i.e. Moraine erratics VS bedrock). Moraine boulders can indicate advance or stagnation (As you know there is some debate on the implication of ages of boulders on a moraine. Polished bedrock usually indicates the timing of deglaciation as you did. There should be differentiation on the interpretation of ages of two types sampled (Reviewer 2 told about this problem). You may want to make more explanation and discussion on this matter.

We, along with other groups working on moraine dating, interpret moraine boulder ages as the culmination of a glacier advance. We think that the boulders on top of a moraine are the last to be deposited, thus represent the end of the advance. And when the moraine, and the uppermost layer of sediment (the surface boulders that we often choose to date), becomes abandoned, the boulder clocks begin. Thus, we think that the 16 ka moraines in our study valleys ought to be a suitable starting point for our up-valley bedrock transects.

We added in the following phrase to the highlighted sentence:

"We find that all three valley glaciers did not begin significantly retreating until ~5 – 6 kyr after the culmination of the LGM in the Sawatch Range (since we assume boulder ages on LGM moraines represent the timing of moraine abandonment)."

Figure 2: Can you separate the type of samples for ¹⁰Be dating? For example, erratics (open circle) Vs bedrock (filled circle).

In figure 2, all of the samples with circles are from sculpted bedrock. The only ages from moraine boulders are the ones that are averages for the recessional moraines in Lake Creek and younger mode of ages on the terminal moraine in Pine Creek. We thank you for the comment, it will help clarify for our readers should the manuscript be accepted.

We changed the label for the moraine ages in all three valleys to better distinguish moraine boulder ages from sculpted bedrock ages.

Figure 3: How about showing the sample number on the picture (or on the sampled boulder or bedrock), which is better to readers?

Great – this also helps to clarify. We now include sample names in the images along with the reported ages.