Anderson et al: "Debris cover and the thinning of Kennicott Glacier (Part C)…."

Detailed minor comments

Line

15 How can mass balance be "enhanced": rephrase.

24 Need to define upper limb and lower limb of Østrem's curve, because what is referred to here are really segments of the same limb (debris thicker than effective thickness). Don't hyphenate "upper limb" or "lower limb".

26 Suggest "in spite of" instead of "as well as"?

30 "may…control": it clearly does!

36-7 Why is the term "melt hotspots" in italics? Unnecessary.

35 Although the term "debris-cover anomaly" has gained currency since 2015, there is often a careless use of terminology in this context, where glacier thinning and melting are used synonymously. The "anomaly" (if one exists" is in the thinning rates, not the sub-debris melt rates. Make this clear.

54 "causes", not "cause" (process is singular).

62-3 One cannot estimate a supraglacial stream. Rephrase.

65 "south-facing"

70 Suggest "more cliffs per unit area".

83 Add comma after "significantly".

97 Add hyphen after "column".

105 Remove hyphen after "corrected".

135 I take issue with the use of "bi-modal" here, because a bimodal distribution has two modes (peaks). Here, the term is used to indicate an absence of streams on thickly debris-covered ice: this isn't "bimodal", rather it's a threshold control.

147-152 Remove hyphens in "upper limb" and "lower limb". See comment re. line 24 about clarity of what these terms mean.

157 Remove italics: unnecessary.

164 See l. 147

169 Why use the term "attractor state" here? You imply the glacier is attracted to an equilibrium state of mass balance, but there's no reason for this to be more likely than any other mass balance state because mass balance is not controlled by internal system dynamics.

179 Commas after "are high" and "are low".

186 Re. chicken-egg quandary: this disappears if a longer-term view is taken, in which velocity is the ultimate control, because the glacier must slow down to allow debris cover to accumulate ("ablation-dominant" conditions of Kirkbride (2000 IAHS))". So the question becomes what causes change to the longitudinal velocity profile of the glacier over time, where does velocity reduce earliest on this profile, and why? (See my general comments).

194 See l. 135

197 See l. 135

197 et seq. It's really no surprise that streams are more abundant on steeper gradients, and lakes on gentle gradients, since water flows downhill. What point is being made here?

216 I'm perplexed by the conclusion that ice cliff abundance is related to basal sliding rate. I simply don't see a direct connection here, and wonder whether you are taking spatial associations too far down the line of causal relationships. If the connection is indirect, it needs to explained clearly and in full.

231 I don't understand how stream undercutting od ice walls increases debris thickness at the base of the ice slope. This implies that the ice slopes must decline in angle, for which no evidence is given: parallel retreat will give the same thickness at the base as at the top. (More likely, fluvial removal of

debris occurs, so an apparent thickening as seen in Fig 9 may be debris brought to the site from upstream). Suggest omitting these two sentences.

234 I disagree that the lower glacier is "hydrologically disconnected". Supraglacial drainage becomes englacial (and subglacial?) which isn't the same as being disconnected (see Fyffe et al 2019 *J Hydrol* 570, 584-597).

236 "Ice cliffs are … more likely to be buried". Buried how? This assumes a process of disappearance which isn't explained. I agree with the general point about their removal, but the process needs careful explanation.

237 Debris cover and surface drainage basin relationships are shown nicely in Catriona Fyffe's recent paper (see l. 234 comment).

242 The effect of this slope reduction is probably a key observation, because on thick, gentle glaciers the driving stress can be at least as sensitive to small changes in slope as to ice thinning. It would be interesting to see how this slope reduction plays out with changes to the basal stress profile over time, which may show something useful re. velocity.

255 See l. 242: on steep, thin glaciers, thickness change is the main control: on gentle, thick glaciers, slope is more important. Perhaps refine this sentence in the context that DCGs are characteristically thick and gentle.

273 Replace "pattern of debris" with "distribution of debris thickness": be specific.

273 "… this pattern over time"

278 Desperately needs a comma after " thinned" , otherwise the sentence makes no sense.

279 "have", not "has". The stated change in the surface flow field is not supported by any evidence. Either omit this point, or provide evidence for it. If true (which I'm sure it is), clean ice would be redistributed as well as debris-covered ice, so is it an explanation at all?

299 See l.147

310 Spelling "Glaicer"

317 "DS" is acknowleged here, but isn't a named author of the paper.

Captions

Fig 1 Panel (a) doesn't show the location of Panel (b).

Fig 2. I would go further in saying the elbow of the curve lies between 12 and 14 cm. Could you fit best-fit lines to each segment iteratively to find the location of the angle? Also, highlight the bare ice point more clearly. Which altitude does this point originate from? (it can't be a unique point).

Fig 5. The key figure in the paper, and really interesting to absorb. One query is why in (e) the elevation difference decreases below c. 3km above the terminus, but in (f) the surface lowering rate increases over the same distance? This seems inconsistent.

Fig 7. While interesting in its own right, I'm sure what data on stream sinuousity contributes to the overall interpretations and conclusions. This figure and the accompanying text could be omitted, unless a stronger case is made for its inclusion.