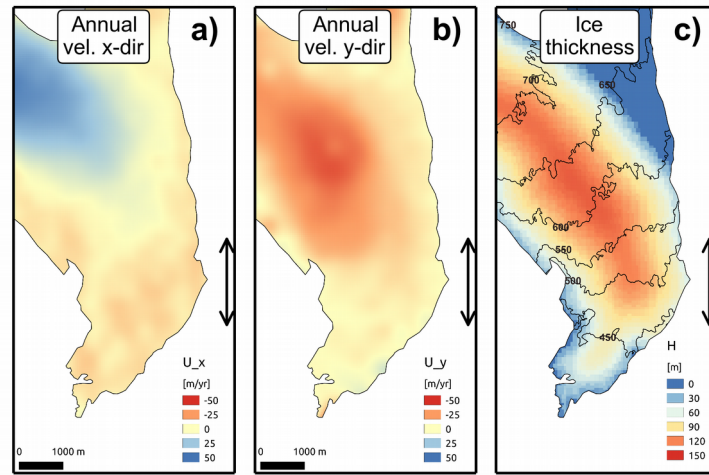


## Supplemental Figures



**Figure S1. Components required for calculating ice emergence rate.** The zone of maximum thinning (*ZMT*) is defined by the double-headed arrow in each panel. a) Mean annual velocity in the *x* direction. Positive is to the right and negative to the left b) Mean annual velocity in the *y* direction. Positive is for flow towards the top of the figure and negative is for flow towards the bottom c) Ice thickness estimated across the study area based on Huss and Farinotti (2012). Note that we did not calculate the emergence rate for Root glacier (blue area at the upper end of the panel).