

***Interactive comment on* “Technical Note: Semi-automated classification of time-lapse RGB imagery for a remote Greenlandic river” by C. J. Gleason et al.**

Anonymous Referee #1

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This is a very useful technical note that is primarily concerned with ways of automating selection and measurement of water surface width from large (104) numbers of time-lapse images of the same scene under a range of lighting and other environmental conditions. The proposed methods are likely of general use but it seems that they would need customizing for any particular site. As this type of monitoring increases then these semi-automated methods will become important to reducing the task of data extraction from images. Two things come to mind regarding the method. In many cases this type of river has substantial range in water turbidity that may correlate generally with discharge but also due to other conditions. It would be helpful to know whether the

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'light water' /'dark water' categories account for this or if a wider range of RGB values might be expected related to this characteristic of the water. Also at low flow, in fairly clear water, shallow flows may look different because of the bed being visible under the water which may cause different RGB histograms – to what extent is there a need for a range of filters for these conditions? To what extent does the filtering/selection of images reduce the total number of usable images and the sample size over the range of discharges? The larger question raised by the paper is equally important: the results add support to previous research showing that, for wide and multi-channel rivers in which much of the hydraulic accommodation of discharge (at a station hydraulic geometry) is via width rather than velocity and depth, then quite precise measurements of discharge variation (certainly at least relative change of discharge) can be derived from time-lapse images potentially at very high frequency (minutes). In this case it provides valuable information on the timing, location/extent and (relative) magnitude of flows in remote and 'un-gaugable' situations or may supplement more traditional stage –discharge records in some locations. The un-calibrated record in the paper still provides useful insights into the seasonal hydrograph, extreme events and inter-annual comparisons. From other examples referred to in the paper calibrated records are possible in some cases showing the reliability of the approach. The key here will be to begin making comparisons between rivers to see if any generalities are possible, at least in the rate of change of effective width with discharge in which there appears to be some variation among the few sites at which this has been done to date.

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