Photosieving

To automate the otherwise tedious pebble counting method, an image based pebble counting/photosieving method was used (Purinton & Bookhagen, 2019). Using georeferenced orthophotos of the study area, the employed photosieving software, hereby known as PebbleCounts, gathered grain size distribution data over the study area. We opted to use the manual KMS method in order to more precisely select individual sediments. The manual (KMS) method was used in accordance with the settings provided by the PebbleCounts user manual. Due to the size of the images, that being a watershed, we utilized the PebbleCounts-Application, which subset the images to manageable sizes (Purinton & Bookhagen, 2021). To further streamline the process, we developed a more user friendly application which loops through the images created and applies the KMS/manual method to each of the subset images. There is an additional application which compiles the many csv data files created by the subsetting into a single file containing all of the data from the watershed image. All of which is in the GitHub repository for this paper.

Distribution profiles

We used the default 2000px x 2000px size for each subsetted image; this resulted in some of the subsetted images being out of the original recommended range of <1m x 1m as stated in (Purinton & Bookhagen, 2019). Consequently, the data gathered tends to underrepresent smaller grain sizes, <2-3cm x 2-3cm.

Purinton, Benjamin; Bookhagen, Bodo (2019): PebbleCounts: a Python grain-sizing algorithm for gravel-bed river imagery. V. 1.0. GFZ Data Services.<http://doi.org/10.5880/fidgeo.2019.007>

Purinton, B. and Bookhagen, B.: Tracking downstream variability in large grain-size distributions in the south-central Andes, JGR Earth Surface, e2021JF006260,<https://doi.org/10.1029/2021JF006260>, 2021.

<https://github.com/bpurinton/PebbleCounts/blob/master/docs/PebbleCounts_Manual.pdf>