

Figure S1: Geologic map of the Marañón basin. Geologic units are a simplified categorization of the 1999 1:100,000 scale Peruvian Geology map (Instituto Geológico, Minero y Metalúrgico (INGEMMET), 1999) where similar rock types were grouped together to consolidate classes. Continental deposits classes include clastic sediments (sandstones, river conglomerate, facies and soils). Marine sediments refer to limestones and chemical sedimentary rocks generally high in calcium carbonate.

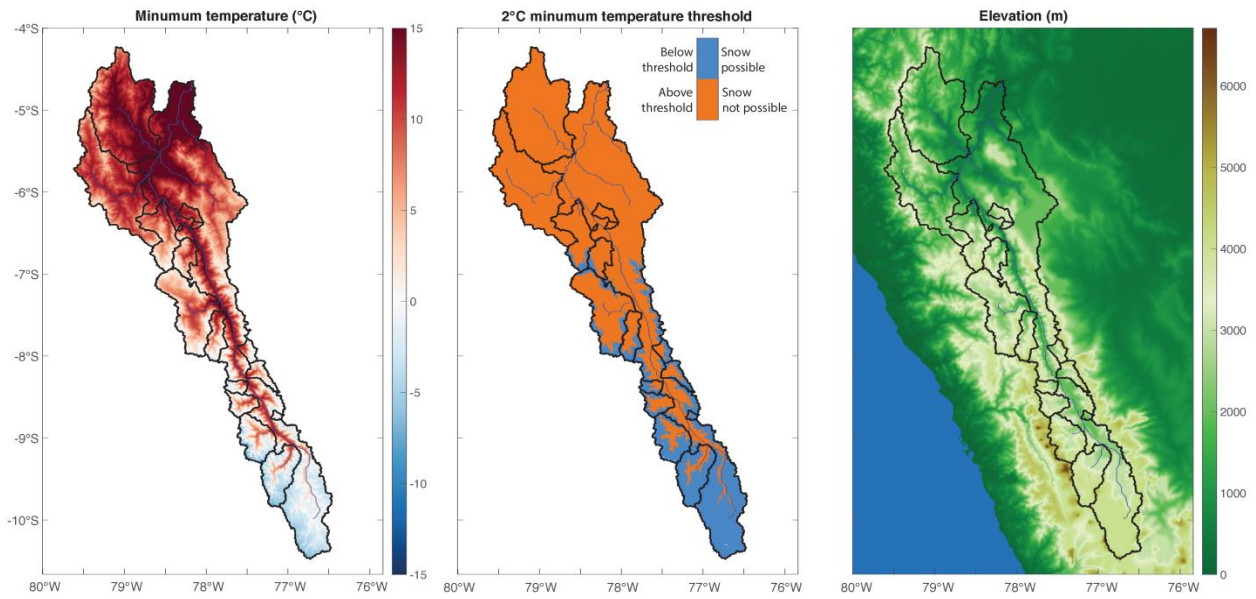


Figure S2: Visual demonstration of the technique used for mapping snow cover given the high frequency cloud environment of the LLBs. Left: Temperature surface based on WorldClim’s mean minimum temperature for the coldest month (MMTCM). Center: Binary temperature threshold map using MMTCM of 2°C to differentiate sub-regions of the domain where snow is or is not possible. Orange areas were masked out of the snow probability raster to result in the final snow probability distribution across the domain. Right: Elevation across the study domain which is highly correlated to colder temperatures and thus snow probability.

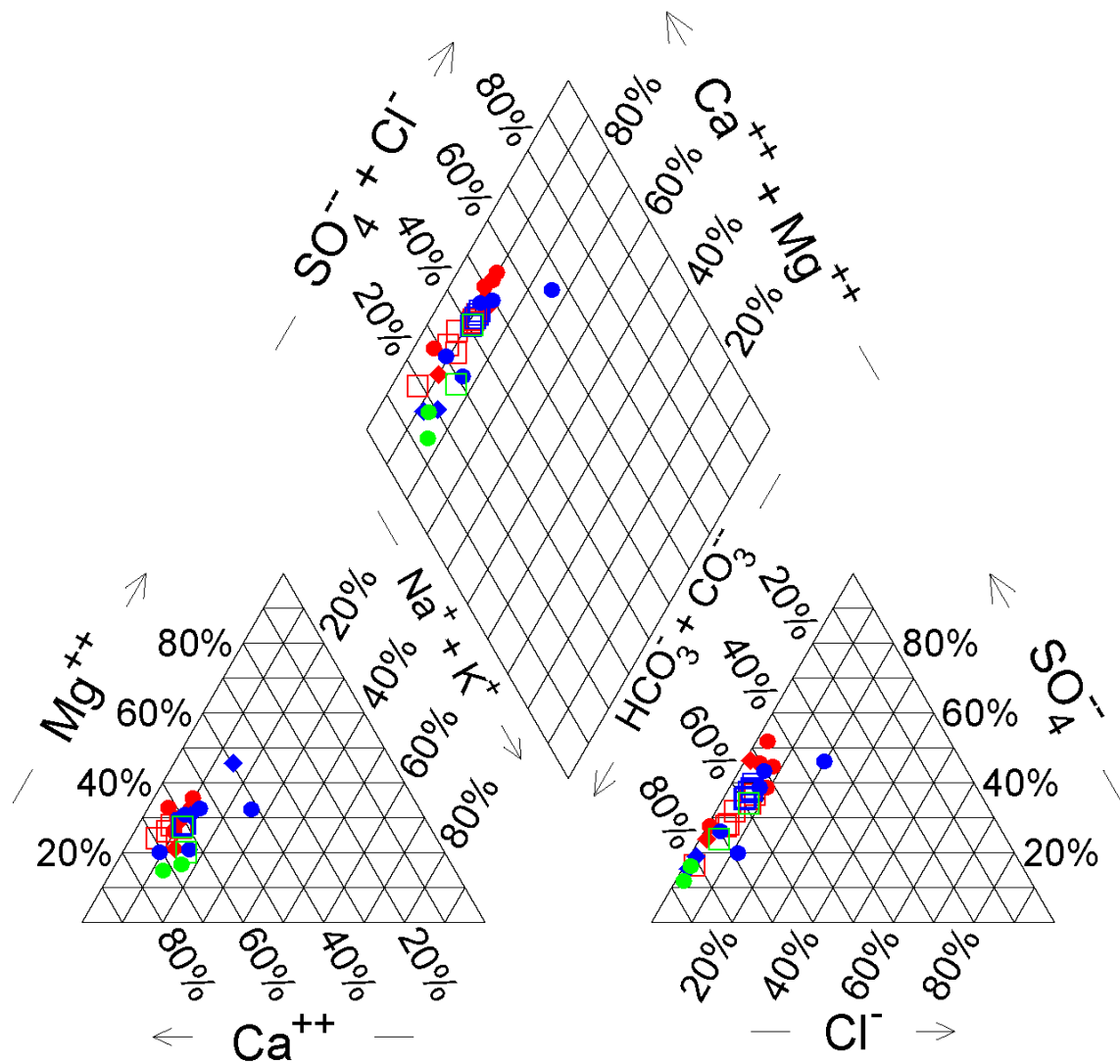


Figure S3: Piper diagram for all water samples. Alkalinity, SO_4^{2-} , and Ca^{2+} dominate the constituents of Marañón waters. Jungle tributaries have a higher dominance of carbonate hardness than alpine or transitional tributaries that are balanced by other anion sources. Colors indicate the river zone of each sample: alpine (red), transition (blue), jungle (green). Filled symbols denote tributary samples draining the left bank (filled circle) and right bank (filled diamond). Mainstem samples are shown as open squares.

References

Instituto Geologico, Minero y Metalurgico (INGEMMET). 1999. National Geologic Map of Peru.