Channel Initiation of Headwater Streams in Western Colorado

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Abstract. Headwater streams are increasingly recognized as important components of the watershed network and therefore understanding channel initiation is valuable for delineating and managing headwater stream systems. A channel head defines the upstream-most point of a longitudinally continuous channel delineated by the presence of a bed and channel banks. We map channel head locations in the Uncompahgre National Forest (UNF) in western Colorado and examine potential surficial controls such as contributing drainage area and local basin slope. The semiarid drainages of the UNF are underlain by sandstone and shale lithologies and some of the channel heads clearly reflect surface erosion, whereas others are associated with springs and reflect subsurface flow paths. Using a dataset of 37 channel heads, we test the hypotheses that channel heads with evidence of subsurface flow have shallower local slopes and larger drainage areas, and that channel heads with steeper local slopes have smaller drainage areas. The UNF channel head data are further compared with existing channel head datasets from other geographic regions to test for regionally significant differences in contributing drainage area and basin slope.