

Table DR1: Topographic and ¹⁰Be data for the detrital cosmogenic nuclide sample sites.

Sediment Sample Name	UTM Easting (m)	UTM Northing (m)	Altitude via GPS (m)	Denudation Rate (mm/yr)	Rate Uncert. (mm/yr)	Basin Area (km ²)	Basin Slope (deg)	Fraction Topography Unadjusted
ANG05SFE11	4398400	444750	580	0.22	0.02	143.7	20.47	0.984
ANG05SFE12	4400636	445912	580	0.17	0.02	323.2	18.32	0.969
ANG07SFE09	4408428	441830	260	0.32	0.02	466.8	20.03	0.937
ANG07SFE07	4414092	437381	214	0.29	0.02	649.4	20.91	0.922
ANG07SFE06	4423851	432395	216	0.34	0.03	771.6	21.30	0.893
ANG07SFE10	4430280	432664	124	0.41	0.03	903.9	21.44	0.853
ANG07SFE11	4443875	430997	78	0.49	0.05	1368.2	20.87	0.804
ANG07SFE12	4457103	425220	37	0.48	0.03	1605.8	20.42	0.783
ANG07SFE13	4467460	421188	29	0.52	0.04	1783.1	20.36	0.751

Figure DR1: Supplemental Geology map modified from Stillwater Sciences, 1999.

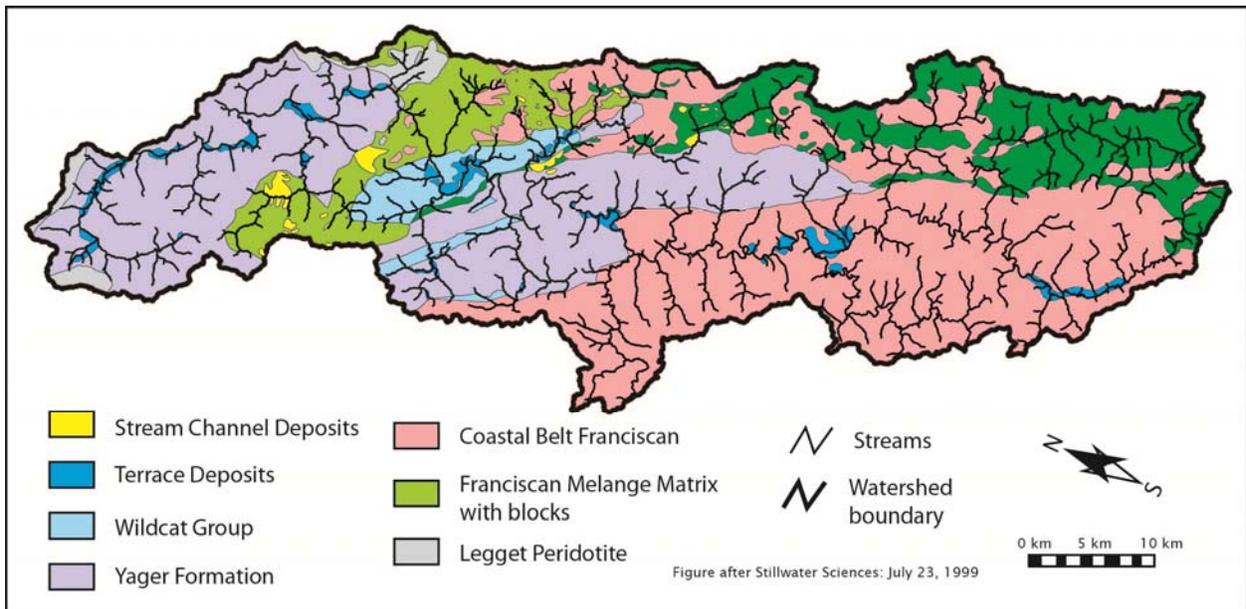
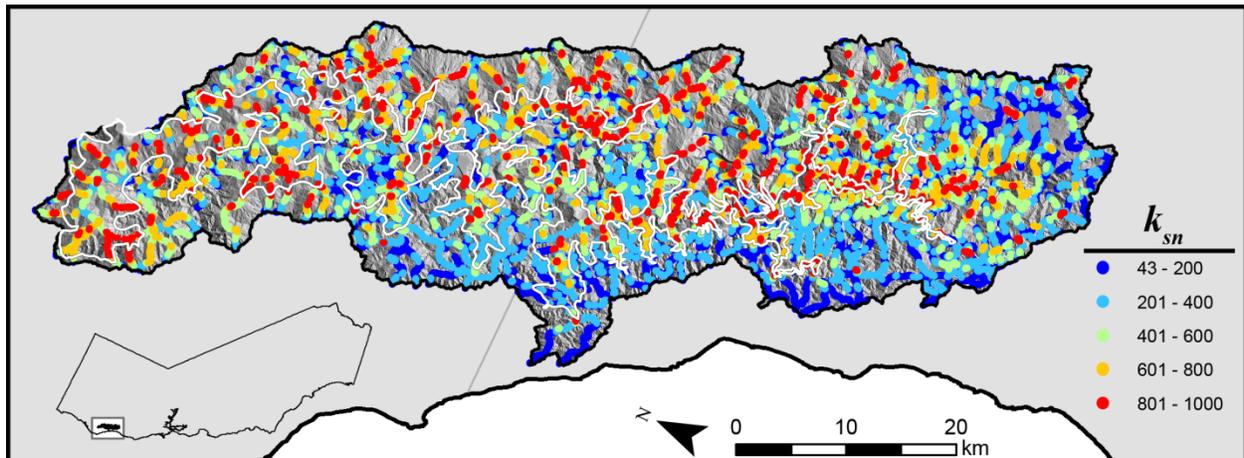


Figure DR2: Map of the South Fork Eel River with point locations of automated k_{sn} values calculated stepwise along 45 major channels within the basin ($\theta_{ref} = 0.6$). The white line denotes the observed boundary between the relic and adjusting portions of the basin. Note that most of the high channel steepness values (red) are within or close to this boundary. Low steepness values (blue) are typically high in the basin, upstream of the knickpoints in the relic region. Inset map shows basin location within California.



Video DR1: Animation of modeled landscape response to a mobile wave of rock uplift. The top figure illustrates the rock uplift pattern through time. The map below illustrates local incision rates, using the color scale below the map. The locations of the nine sampling points in the modeled landscape are shown on the map, and the symbols and colors identify the values from these points on the plots below. Below the map is a plot of the mainstem channel profile, and the basin wide erosion rates (symbol values on right axis) at each of the nine sampling locations. The plot on the lower left illustrates the evolution of basin wide erosion rates at each of the nine sampling locations. The plot on the lower right illustrates the evolution of erosion rates with the distribution of relict topography at each of the nine sampling locations.