0830h
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TI: Erosion Rates Over Millennial and Decadal Timescales: Measurements at Caspar Creek and Redwood Creek, Northern California

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AB: Erosion rate measurements are essential for modeling landscape evolution and for discerning how sediment loading affects stream ecosystems. Cosmogenic nuclides such as ^{10}Be in stream sediments can be used to measure whole-catchment erosion rates averaged over thousands of years, a timescale that is unobservable by other methods. Comparing long-term erosion rates from cosmogenic nuclides with short-term sediment yields can shed light on erosional processes and on the effects of land use on sediment delivery to streams. Using cosmogenic ^{10}Be, we measured erosion rates averaged over the past several thousand years at Caspar Creek and Redwood Creek in Northern California. Sediment yields have also been measured at Caspar Creek since 1963 using sediment trapping and gauging methods, and sediment yield data have been collected at Redwood Creek since 1974. The cosmogenic ^{10}Be signature of Caspar Creek sediments indicates an average erosion rate of 0.13 mm/yr, which agrees with the short-term sediment yield data within error. The cosmogenic ^{10}Be signature of Redwood Creek sediments implies an average long-term erosion rate of 0.3 mm/yr, which is in rough agreement with traditional measurements of stream sediment flux. These results imply that the rate of sediment delivery to Caspar Creek and Redwood Creek over the past few decades is broadly consistent with the long-term average rate of sediment production in these watersheds.
DE: 1815 Erosion and sedimentation
DE: 1824 Geomorphology (1625)
SC: Hydrology [H]
MN: 2003 Fall Meeting