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UNDERSTANDING MODERN LANDSCAPE BEHAVIOR USING METEORIC AND *IN SITU* ^{10}BE AND ^{137}CS IN LARGE RIVER BASINS, SW CHINA

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We measured ^{137}Cs and meteoric ^{10}Be in 35 samples previously measured for *in situ* ^{10}Be (Henck et al., 2011) in the Salween, Mekong, and Yangtze river systems in SW China to better understand long-term landscape behavior and effects of human-induced landscape change. Samples were collected from basins spanning ~10 to 10^5 km^2. Meteoric ^{10}Be concentration varied by an order of magnitude, from 3.4 to 76 x 10^6 atoms/g. There was no systematic spatial patterning in meteoric ^{10}Be values. ^{137}Cs activity was only measureable in five samples.

No significant relationships were found between meteoric ^{10}Be concentrations and mean local relief, mean annual rainfall, or basin area. Areas with high erosion rates (>0.4 mm/yr) had low meteoric ^{10}Be values (R^2= 0.34, p= 0.0002). While meteoric ^{10}Be and basin size did not strongly correlate, basins <10^4 km^2 had highly variable meteoric ^{10}Be values, while basins >10^4 km^2 had significantly less variability (p= 0.11). Analysis of meteoric ^{10}Be, mean annual rainfall, and mean local relief grouped by stream order suggests high variability in small basins may mask relationships found in large basins.

Erosion indices (EI) were calculated for each sample using *in situ* ^{10}Be erosion rates to calculate long-term sediment flux and ranged from 0.11 to 1.48 (median = 0.55). The EI represents the ratio of total meteoric ^{10}Be leaving the basin on sediment grains over the total estimated atmospheric delivery of ^{10}Be. The highest EI's were in the northern portion of the Yangtze drainage, and corresponded to moderate erosion rates of 0.06 – 0.13 mm/yr. Variability in EI was significantly higher in basins <10^4 km^2 (p= 0.14).

EI's calculated from long-term sediment yield allow modern events, such as land-use change, to be isolated from long-term geomorphic trends. A median EI of 0.55, with 91% of measurements below 1, suggests that less meteoric ^{10}Be is exported than is incident upon the landscape. The absence of measureable ^{137}Cs in the majority of samples indicates that significant erosion has occurred since 1954. EI and ^{137}Cs activity suggest that there is a "disconnect" between long-term sediment yield estimates and modern erosion rates, potentially caused by human impact changing the style and/or distribution of erosion.

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