Supplement of Earth Surf. Dynam., 13, 571–591, 2025
https://doi.org/10.5194/esurf-13-571-2025-supplement

Earth Surface Dynamics
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EGU

Supplement of

Spatiotemporal denudation rates of the Swabian Alb escarpment (southwestern Germany) dominated by anthropogenic impact, lithology, and base-level lowering

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Figures

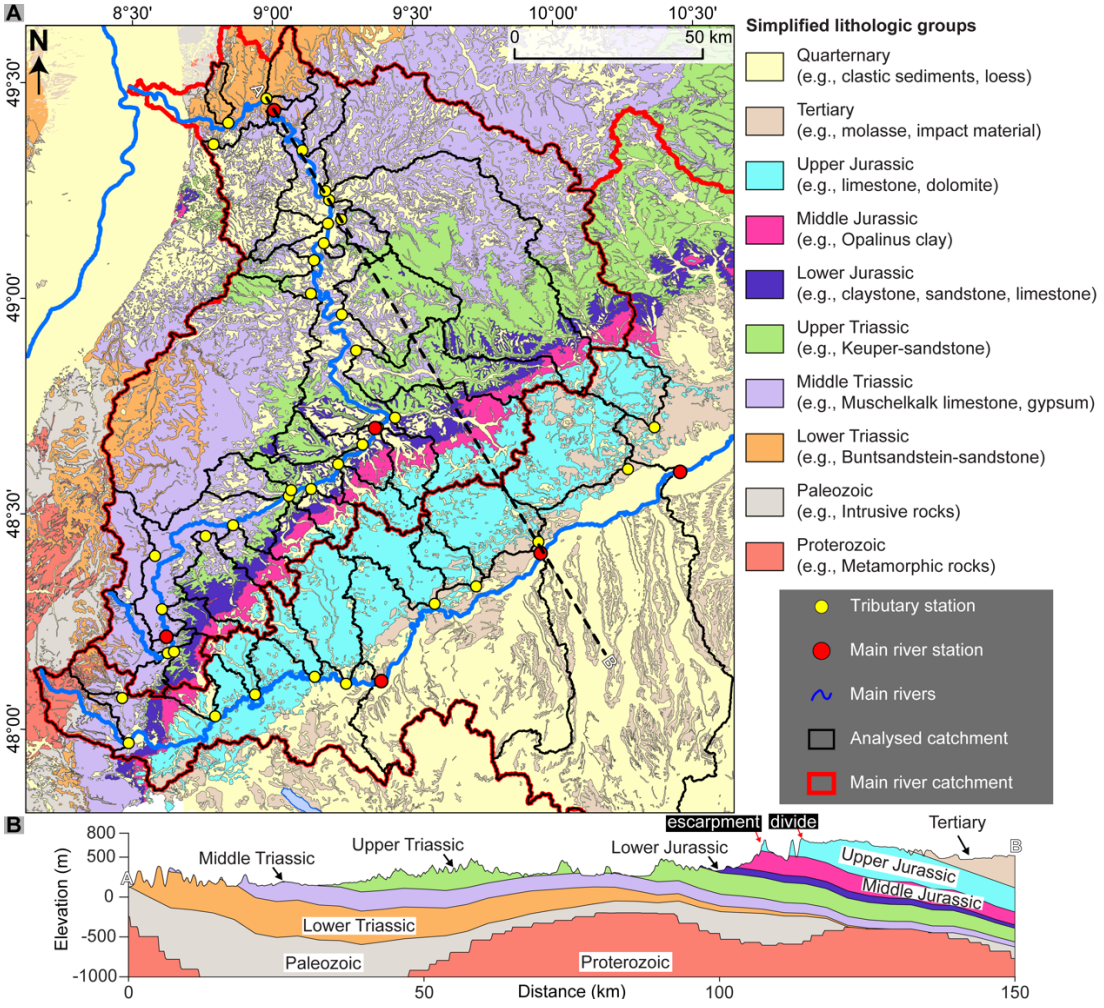

Figure S1 A) Simplified lithologic map for the investigated catchments around the Swabian Alb escarpment (based on map from Bundesanstalt für Geowissenschaften und Rohstoffe. Geologische Übersichtskarte der Bundesrepublik Deutschland 1:250 000 (GÜK250, WMS), 2019). The points give locations of measurement stations providing data to calculate physical erosion and chemical weathering rates. B) Cross-section through the Swabian Alb from Northeast to Southwest (A to B).

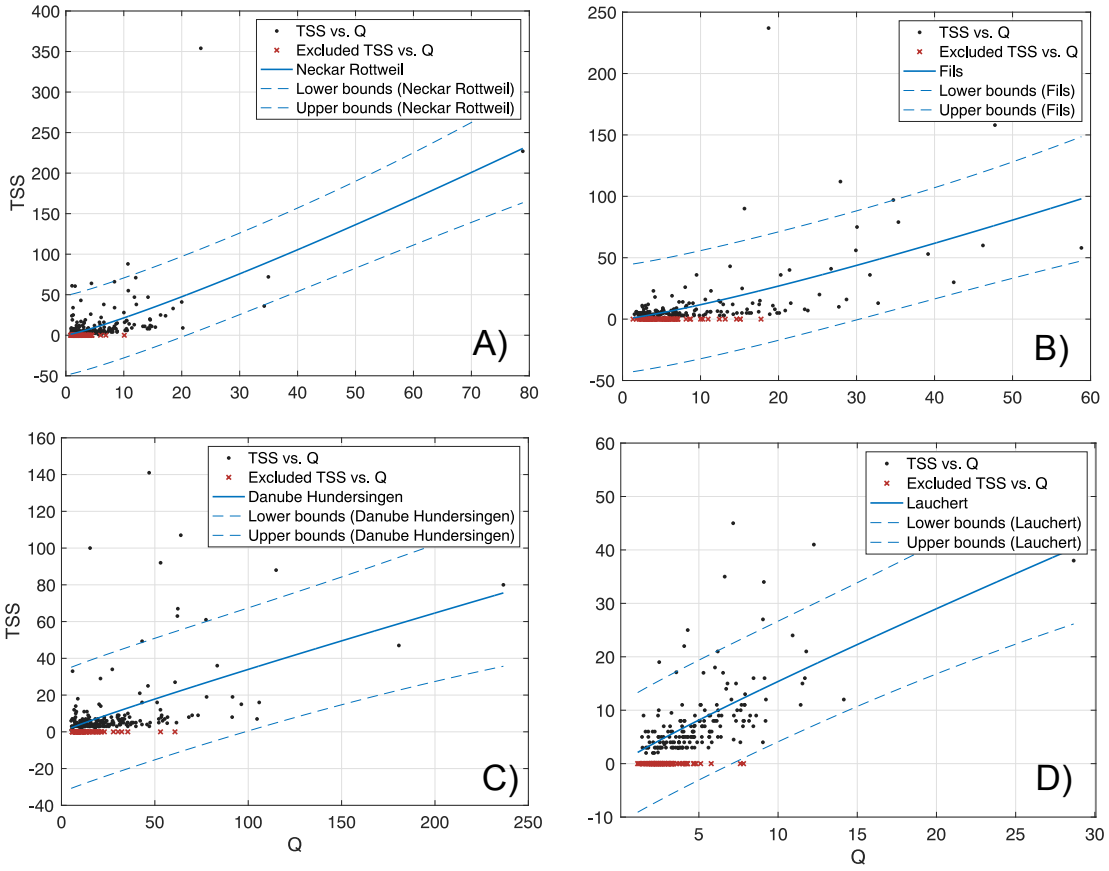

Figure S2: Plots of total suspended sediment TSS versus river discharge Q: A) Neckar at Rottweil; B) Fils, a Neckar Swabian Alb tributary ; C) Danube at Hundresingen; and D) Lauchert, a Danube Swabian Alb tributary.

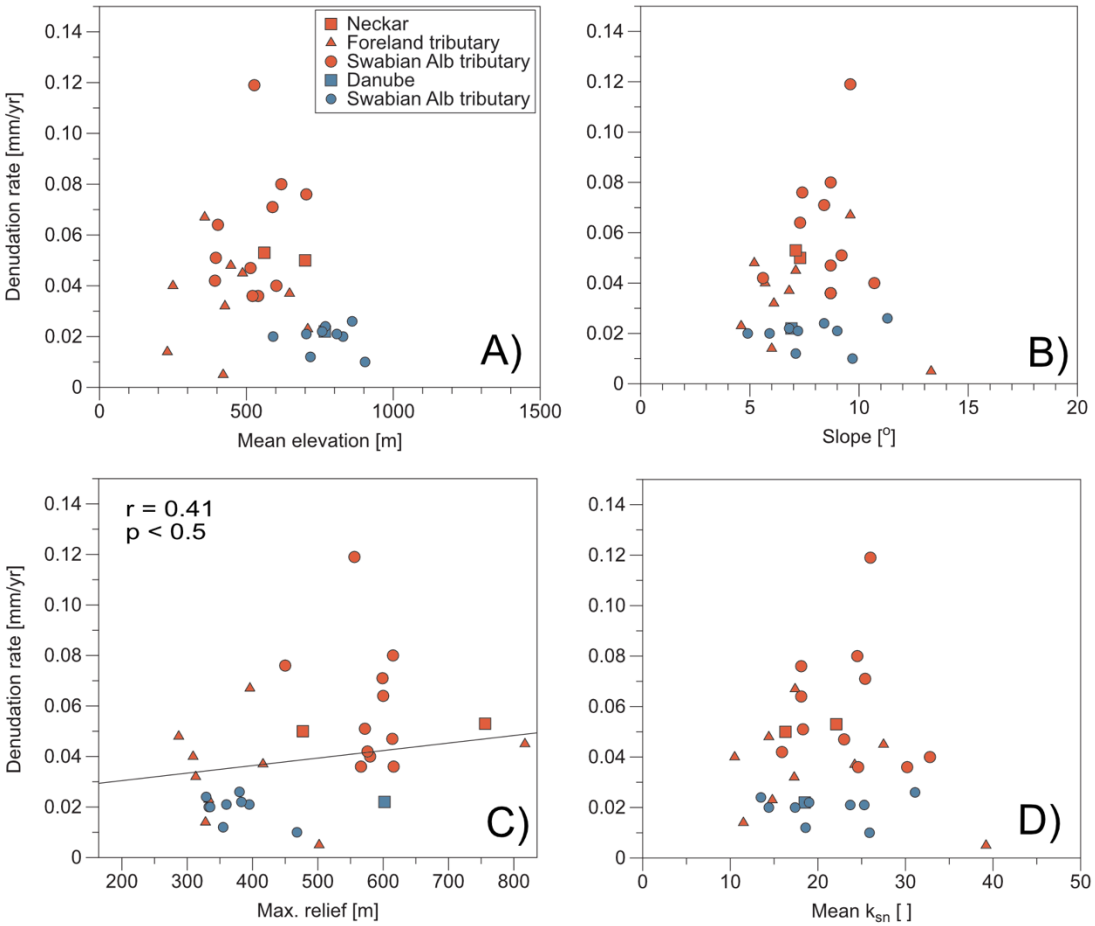

Figure S3: Decadal-scale total denudation rates versus topographic metrics; A) Mean elevation of drainage basin; B) Maximum relief; C) Mean slope; and D) Mean k_{sn}.

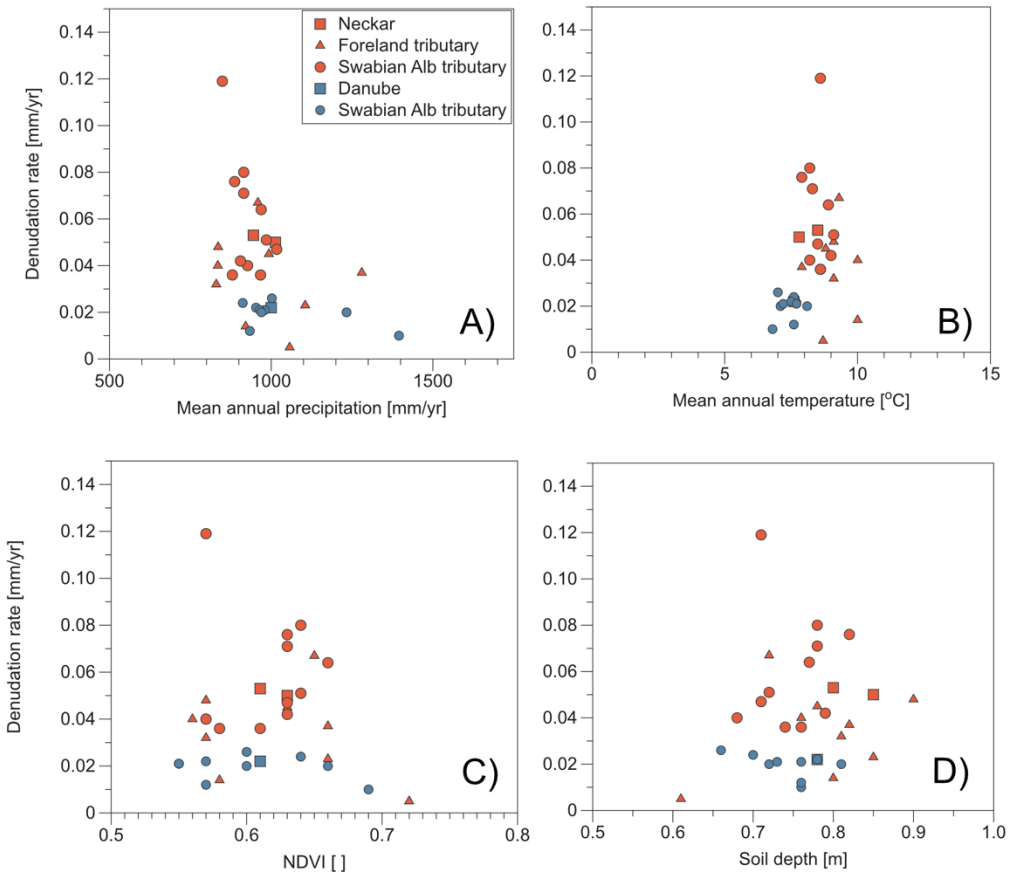

Figure S4: Decadal-scale total denudation rates versus climatic metrics: A) Mean annual precipitation; and B) Mean annual temperature; C) NDVI as vegetation cover; and D) Soil depth,

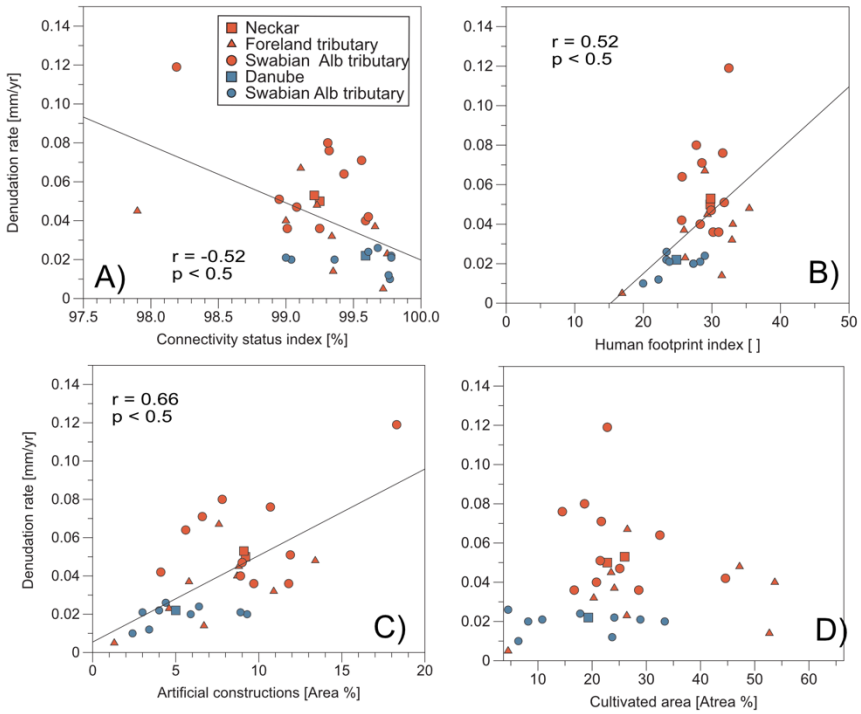

Figure S5: Decadal-scale total denudation rates versus percent exposure area of four selected anthropogenic impact: A) Connectivity status index (100% = undisturbed system); B) Human footprint index (50 = highest footprint); C) Artificial constructions; and D) Cultivated area.

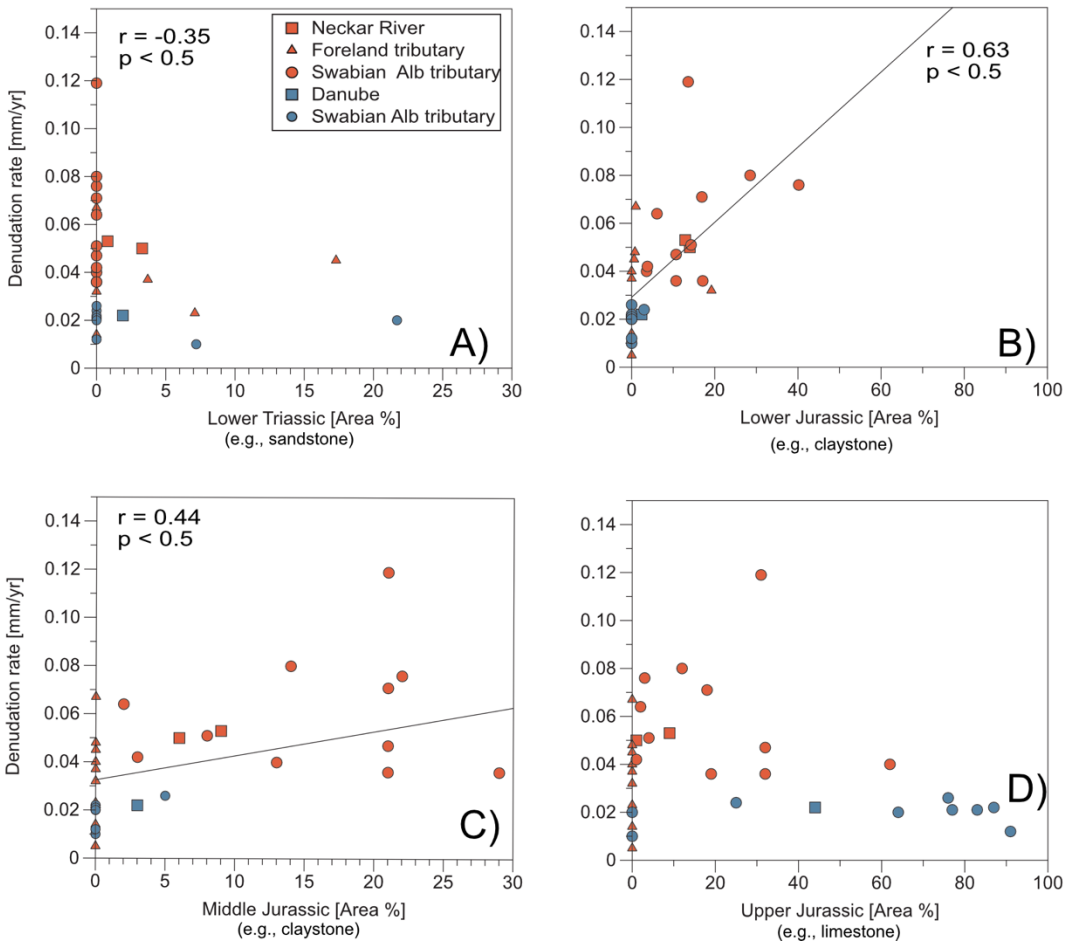

Figure S6: Decadal-scale total denudation rates versus percent exposure area of four selected lithologies: A) Lower Triassic; B) Lower Jurassic; C) Middle Jurassic; and D) Upper Jurassic.

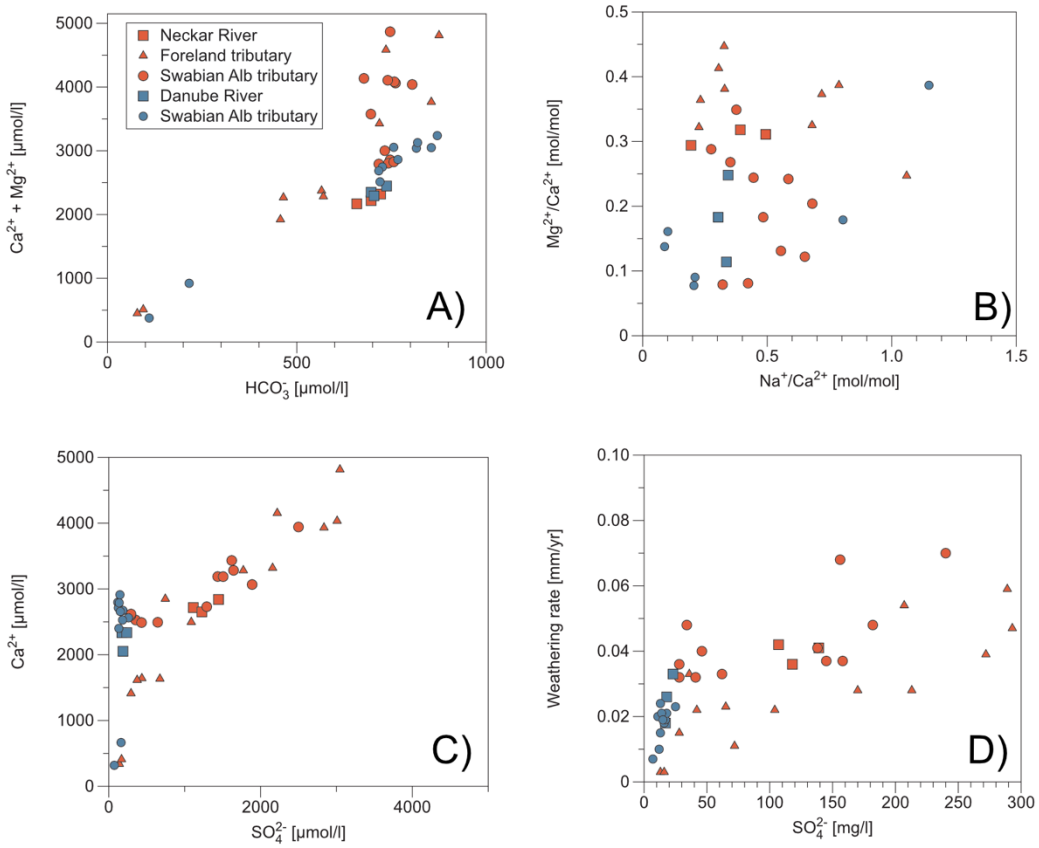

Figure S7: Plots for different chemical parameters: A) Ca^{2+} plus Mg^{2+} versus calculated HCO_3^- corrected for atmospheric input; B) Mg^{2+}/Ca^{2+} versus Na^+/Ca^{2+}; C) Ca^{2+} versus SO_4^{2-}; D) Chemical weathering rate over SO_4^{2-}.

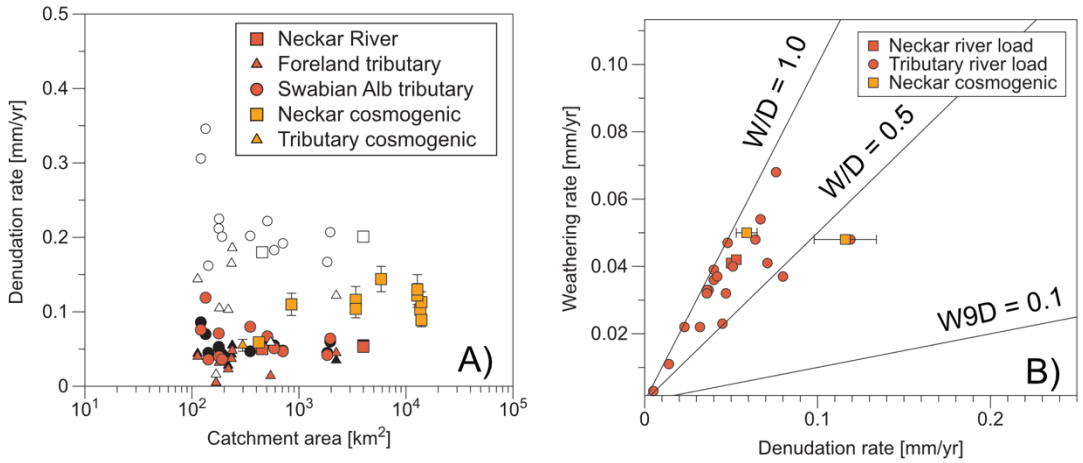

Figure S8: Total denudation rate based on river load (cred circles, this study) compared to cosmogenic nuclide-derived denudation rates from in situ-produced ^{10}Be in quartz (Schaller et al., 2001 and 2002; black squares). A) Denudation rate versus catchment area. B) Chemical weathering rate versus total denudation rates based on river load and the combination of river load and cosmogenic nuclide-derived rates. Lines indicate different chemical weathering over total denudation rates *W/D*.