

# **Geochronological Evidence for Rates of Geodynamic Evolution in the Himalayan Syntaxes**

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At both ends of the Himalayan orogen, tectonic and surface processes interact at both local and regional scales to produce characteristic landscapes. The Himalayan syntaxes are most prominently characterized by extremely rapid incision and exhumation. Locally these processes can induce intense crustal overprinting through feedbacks involving thermally controlled rheological changes that couple with the large through-going fluvial networks found in the syntaxes. The regional consequences of these processes can include the formation of elevated surfaces of surprising youth. Bedrock and detrital evidence from a suite of U/Pb, U-Th/He, and Ar/Ar chronometers documents that in both time and space, cooling and exhumation rates can vary greatly, from incision rates approaching or exceeding 1 cm/yr to near stagnation in rates of crustal cooling and regional exhumation. The degree to which geodynamic hyperactivity in the syntaxes has a significant integrated impact on the geologic record remains unclear, but evidence from detrital geochronology suggests that remarkably small segments of the hinterland can dominate the surficial mass flux from the syntaxes and their surroundings.