

ES05: The interaction between climate and tectonics in Late Cenozoic landscape evolution

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Session Description

Earth's surface is shaped by both the constructive force of tectonics—which builds mountains, and the destructive force of erosion by rivers, glaciers and landslides—which tear mountains down. Mantle dynamics and lithospheric loading further modifies Earth's topography. Tectonic Geomorphology in its broadest sense, explores these interactions through remotely sensed data (GPS, InSAR, lidar), paleoseismology, geochronology and thermochronology, landscape morphometrics, and numerical and analogue modeling. Two decades of research have shown that rivers, glaciers and landslides are powerful enough as erosive forces to change the mass balance of an uplifting mountain range, and therefore change the pattern and rate of tectonic deformation, all the way at least to the mantle lithosphere. Other research demonstrates the utility of tectonic geomorphology in understanding active tectonic processes in increasingly greater detail, to help establish, for example, strain partitioning and fault kinematics in a tectonically active area, or interrogating the earthquake cycle and constraining seismic hazards. Meanwhile, climate-controlled sediment availability will dictate the rates and styles of sedimentation in various tectonic basins. This session seeks to bring together emerging and established researchers in Canada and abroad to discuss their work around the world on neotectonics, large-scale landscape evolution, and late Cenozoic mountain building.

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Solid Earth