

## **Latitudinal variations (18°-23°S) in denudation rates of western Andean Syntaxis, Chile, South America.**

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Syntaxial regions of orogens (e.g. the western and eastern Himalayan Syntaxes, St. Elias Mountains Alaska) are regions where curved segments of subducting plates meet and the subducting plate is bent forms a rigid indenter. Previous studies of syntaxial regions in the Himalaya and Alaska document localized and rapid deformation and denudation due to vigorous fluvial or glacial erosional processes. In this study we investigate denudation around an arid end-member syntaxial orogen in South America to understand the interactions between climate and tectonic processes in localizing denudation.

We present 35 new cosmogenic  $^{10}\text{Be}$  analyses of river sediments to quantify spatial variations in erosion along the Andean Coastal Cordillera and Western Cordillera. The sizes of the drainage basin vary from 5 - 5000 square kilometers. These measurements are linked to analysis of digital topography, variations in fluvial steepness indices and Chi- plots.

Cosmogenic derived denudation rates range from 2.5 - 130 mm/kyr. Denudation rates decrease generally from the syntaxis (near Arica, Chile) towards the south (near Antofagasta, Chile) and from the Western Cordillera to the Coastal Cordillera. Topographic analysis of channel steepness variations and Chi-plots also document spatial variations in fluvial erosion and are consistent with spatial pattern in cosmogenic derived denudation rates.

In summary the results document both a north to south and east to west variation in denudation around the western Andean margin. The spatial pattern of denudation is consistent with recently proposed patterns of syntaxial deformation driven by the geometry of the bent subducting plate. Denudation rates are also likely influenced to a lesser degree by a latitudinal variation in climate along the Andean margin.