

2011 GSA Annual Meeting in Minneapolis (9♦12 October 2011)

## Paper No. 102-14

Presentation Time: 9:00 AM-6:00 PM

# DETERMINING LONG TERM EROSION RATES IN PANAMA- AN APPLICATION OF <sup>10</sup>BE

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In order to characterize long-term erosion rates in Panama, we sampled river sediment from streams draining 16 watersheds, all of which contained at least some quartz-bearing rocks. Watershed area ranges between 22 km<sup>2</sup> and 2560 km<sup>2</sup>. Mean watershed elevation ranges from 151 m to 2267 m and mean basin slope was between 5 and 18 degrees. The watersheds stretch from east to west across the country and most include at least some of the mountainous spine of the isthmus.

We measured the concentration of in situ produced <sup>10</sup>Be in quartz purified from the sand fraction of all samples (250-850 ug); measured concentrations of <sup>10</sup>Be range between 7.61x10<sup>3</sup> and 1.37x10<sup>5</sup> atoms/g. Erosion rates derived from these concentrations range from ~ 20 m/My to almost 600 m/My, average about 200 m/Myr, and have a median of 100m/Myr. There seems to be no spatial pattern in the distribution of erosion rates along the spine of Panama nor is there any statistically significant relationship between erosion rates and average basin slope, mean basin elevation, or watershed area.

To investigate the influence of landslides on the <sup>10</sup>Be concentration of stream sediments, we sampled sediment from an active landslide as well as from the river several hundred meters up and downstream of the slide. We split the samples into 7 different grain sizes and measured each grain size separately. The <sup>10</sup>Be concentration upstream averaged 2.15x10<sup>4</sup> atoms/g; downstream it averaged 1.67x10<sup>4</sup> atoms/g; the landslide sediment contained 1.17x10<sup>4</sup> atoms/g. Assuming a two-component mixture, it appears that sediment from the landslide makes up about half (49%) of the sediment sampled downstream. We observed an inverse relationship between grain size and <sup>10</sup>Be concentration in all three of the samples for which we analyzed multiple grain sizes.

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Session No. 102--Booth# 176

[Quaternary Geology \(Posters\): Recent Developments and Applications in Quaternary Geochronology](#)

Minneapolis Convention Center: Hall C

9:00 AM-6:00 PM, Monday, 10 October 2011

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