

Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06085, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06085
EGU General Assembly 2008
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Identifying mass wasting through the use of SAR intensity images

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The northern segment of the Peruvian Andes is affected by a twofold climate with measurable implications on landscapes and landscape dynamics. During normal years, the Bolivian High brings rain from the Atlantic to the Sierras, resulting in a seasonal climate with rather low intensity precipitations. In contrast, during the large-scale warm phase of the ENSO cycle, El Niño transfers moisture from the Pacific to the Peruvian coast, resulting in a highly episodic pattern of intense precipitation. For the case of the Piura river, it can be shown that sediment was being transferred only as a response to the 1982/1983 and 1997/1998 El Niño periods.

Using synthetic aperture radar (SAR) intensity images, specifically, intensity images dating from before and after the 97/98 period, it is possible to identify regions that experienced focused surface change, mostly due to mass wasting and gullyng. It can further be shown that these locations are coupled with the channel network. This implies that while the seasonal easterlies are responsible for the production of sediment through weathering, the episodic El Niños power the channelized export of sediment, thus resulting in a partially coupled sediment production-delivery system.