tion in the DB and the MP occurred between 13.5 and 7 ka BP, during the cold and arid Younger Dryas stadial and the Early Holocene cold episode around 8 ka BP. The clay dunes of the MP have been accumulated mainly from 29 to 19 ka BP that correspond with the Dansgaard-Oescher 3-2 stadial. However, clay dunes also were formed between 13.5 and 7 ka BP. In both locations, there are reactivations in the recent Holocene, with maximum activity around 5-2 ka BP and 0.5-0.2 ka BP, the firs one probably linked to human agriculture expansion, and the second one linked to dry-cold climate during the Little Ice Age on the Iberian Peninsula. Acknowledgements: PCI-2005-A5-0208.

0388

Searching for Old Tsunamis and Earthquakes in Banda Aceh and the Application of the INQUA Intensity Scale

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Since the occurrence of the 2004 Sumatra earthquake, the Nagoya University (NU) team together with the Syah Kuala University (SKU) had undertaken several field surveys related to that earthquake. Most of the field surveys were related to the effects of tsunami, Global Positioning Satellite measurements, and building/engineering inspection. This study presents the results of the field surveys that were done mostly in the north and northeastern shorelines of Banda Aceh. Due to limited time and logistical constraints, the investigations in each area were mostly ocular investigations wherein measurements of wave heights and relative subsidence or uplift were estimates from other cultural monuments using a hand-held level, Brunton compass, portable GPS receivers, topographic maps, satellite imageries, and pacing. Parts of the surveys also included search for old tsunami deposits and investigations of the Sumatra fault. Based on two field surveys, tsunami effects from the 2004 Sumatra quake vary from erosion to deposition of huge boulders, sand, mud and debris from the shorelines. In Aceh city and along the northwestern shorelines, most of the damage was from the debris-laden flood-like waters while total devastation of communities were observed near and along the shore. Many communities were also lost, vast land areas were eroded and subsidence of at least 40 cm were observed extensively. On the other hand, the moderate ground shaking produced by the 2004 Sumatra quake caused extensive damage on poorly-built structures in Aceh city. Damage ranges from minor damage on walls, pancake collapse, collapse of soft floors, and structural failure of beams and columns. No liquefaction-like damage was observed. In case of the old earthquakes and tsunamis, evidence of liquefaction was found in Lhok Ngah within a massive sand layer near the shore. However, no tsunami deposit prior to the 2004 event was found in the same vicinity. Moreover, clear evidence of active faulting was observed on the western splay of the Sumatra fault in Matair and the southwestern portion of Aceh city. Application of INQUA intensity scale for this event would be attempted for uniform data acquisition/banking that could be useful for future earthquake disaster mitigation and education campaign. The local construction practices should also be given more attention to mitigate future disasters related to ground shaking.

0921

10-Be shows that Namibian drainage basins are slowly, steadily, and uniformly eroding

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Namibia, home to the dramatic Great Escarpment and one of the driest coastal plain deserts in the world is eroding slowly and uniformly at an average rate of ~8 m/My. To estimate this overall erosion rate, we collected water-transported sand from small ephemeral stream and river beds draining the coastal plain, the Great Escarpment, and the uplands as well as from the drainage networks of two major rivers, the Swakop and Omaruru, which have their headwaters on the uplands, cut across the escarpment zone, and traverse the coastal plain. We sampled sediment from a variety of basin sizes (1 – 29,000 km^2).

We infer rates of landscape change from a series of 38 high precision (1 sigma, 1.3–3.2%; mean = 1.7±0.5%) measurements of 10-Be made in quartz extracted from samples of river-borne sand (250 – 850 um grain size). All samples contain significant concentrations of 10-Be (0.54 – 1.75 million atoms/g quartz) which when considered as steady state erosion rates, results in a range from 4.1 to 12.2 m/My and an average of 8.3±1.9 m/My for the dataset as a whole. Considering the small basins by province, the upland is eroding at 4.9±0.8 m/My (n=3), the lowland at 7.8±1 m/My (n=1), and the escarpment zone at 8.2±2.3 m/My (n=11). The furthest downstream samples on the Swakop (29,000 km^2) and Omaruru Rivers (8000 km^2) give model erosion rates of 8.8±1.0 and 8.6±1.1 m/My respectively, rates which match well area-weighted averages of tributary streams (8.9±1.6 (n= 6) and 8.3±1.3 m/My (n=4), respectively). There is no downstream pattern in the 10-Be concentration along either main stem river nor is there any relationship between erosion rate and basin area in the dataset as a whole.

What does all this mean? First, we find that basin-scale rates of erosion are 2X higher than those on exposed rock surfaces (as reported in Bierman and Caffee, 2001) suggesting that the presence of even a thin veneer of regolith speeds rock weathering. Second, rates of erosion estimated in fluvial sediment using 10-Be are remarkably homogeneous, varying < 3X over large areas. Third, slow rates of erosion determined cosmogenically match well those modeled from thermochronologic data suggesting steady, slow erosion over time and fourth, the new cosmogenic data provide no evidence for significant escarpment retreat over time; rather, they suggest that the escarpment, and all other mega-geomorphic features of the Namibian landscape must be long-lived, stable landforms.

0160

Radar-derived bed roughness characterization of Institute and Möller Ice Streams, West Antarctica, and comparison with Siple Coast ice streams

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Subglacial bed conditions exert a significant control on ice stream behavior and evolution, and can usefully be characterized by determining bed roughness from FFT analysis of radar-imaged basal reflectors. In