22-25 October
Seattle, Washington, USA
GSA 2017
THE GEOLOGICAL SOCIETY OF AMERICA®

160-11: MODELING POST-DEPOSITIONAL ACCUMULATION OF ^{10}BE IN SANDSTONES FROM THE HOMININ SITES AND PALEOLAKES DRILLING PROJECT (HSPDP) CORES FOR *IN SITU* COSMOGENIC RADIONUCLIDE PALEOEROSION RATE ANALYSES

Monday, 23 October 2017
09:00 AM - 06:30 PM
Washington State Convention Center - Halls 4EF

Sandstones from drill cores collected in Ethiopia and Kenya by the Hominin Sites and Paleolakes Drilling Project (HSPDP) present a novel opportunity to reconstruct paleoerosion rates utilizing *in situ* cosmogenic radionuclides (CRNs). Concentrations of CRNs such as ^{10}Be indicate the amount of time a material has been exposed to cosmic radiation at or near the earth's surface. CRNs are produced in the watershed while the material is actively being eroded and transported, and decay at a fixed rate over time upon burial and shielding from further CRN accumulation. We collected 20 total samples from the Baringo Basin/Tugen Hills, Chew Bahir, Northern Awash and West Turkana drill cores for paleoerosion rate analyses to investigate global climate variation, regional orography, local faulting and fluvial network reorganization within the watersheds of the drill sites. In addition, there is a unique opportunity to tie the inferred paleoerosion rates to the rich paleoenvironmental proxies determined by the HSPDP. However, an important consideration when calculating paleoerosion rates is the amount of ^{10}Be accumulated after sediments have been deposited. Material will only be shielded from significant nuclide accumulation when buried by ~3–5 m of additional sediment. The simplest scenario assumes no significant post-depositional ^{10}Be accumulation, but sediment burial histories are likely more complex and varied. We model the potential range of post-depositional ^{10}Be accumulation in the HSPDP sandstone samples to examine its importance when calculating paleoerosion rates. We utilize sedimentation rates derived from age models of the cores to assess post-depositional nuclide accumulation. Because the drill cores are predominantly lacustrine, we also identify sandstone units overlain by lacustrine sediments and model post-depositional ^{10}Be accumulation for sediment shielding under a water column. Given that the cores range in age from <500 ka to >3 Ma, we finally consider the amount of ^{10}Be lost to radioactive decay and its impact on post-depositional ^{10}Be accumulation.

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Final Paper Number 160-11
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Day: Monday, 23 October 2017

Geological Society of America Abstracts with Programs. Vol. 49, No. 6
doi: 10.1130/abs/2017AM-306944