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TEPHROCHRONOLOGY AND DEPOSITIONAL ENVIRONMENTS OF THE HADAR FORMATION FROM THE NORTHERN AWASH CORES OF THE HOMININ SITES AND PALEOLAKES DRILLING PROJECT (HSPDP)

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The fossiliferous Plio-Pleistocene Hadar Formation in the southern Afar Depression of Ethiopia was deposited during a shift to more arid regional climate coinciding with the transition from *Australopithecus afarensis* to early *Homo* and the transition from Lomekwian to Oldowan technology. The Hadar Formation at its type locality is ~160 meters thick consisting of lacustrine, deltaic and fluvial deposits with at least 10 chemically distinct tephras in outcrop. These sediments are the target for the Northern Awash drilling (NAW/NAO), one of the Hominin Sites and Paleolakes Drilling Project (HSPDP) sites, located ~30km NE of the Hadar Site. The HSPDP NAW/NAO cores provide a more complete and higher resolution record of the Hadar Formation including additional tephras not found in outcrops. The two Northern Awash drill sites produced 3 boreholes with over 600 meters of core collected and a total composite thickness of ~285 meters with ~98% recovery and significant overlap between boreholes. The cores are dominated by fine-grained sediments, primarily laminated or massive brown and green mudstone; sands are rare. Three major basalt sequences are interbedded with the sediments and range from 10-65m thick. Facies analysis of the NAW/NAO cores suggest that the depositional environment was lacustrine dominated with numerous intervals of subaerial exposure, lava flow emplacement, and pedogenesis.

Including duplicates, a total of 56 tephras were logged in the cores. There is a mixture of rhyolitic and basaltic tephras, dominantly 0.5-2cm thick and generally fine grained, and typically found within the lacustrine facies. The tephras contain 0 to < 50% glass, with varying glass morphologies (platy, elongate, frothy) or have been altered to bentonite. Preliminary dating of the NAO cores range from ~2.93 to >3.22 Ma and provide coarse resolution correlations to outcrop. The geochemical fingerprinting of the NAW/NAO tephras, presented here, is essential to establish higher resolution chronostratigraphic links with the Hadar Formation. These links will allow us better resolution of lake level fluctuations, improve our interpretation of the Hadar paleo-lake, and provide a better understanding of the tectonics and climate interactions on rift-basin development and on hominin environments during the Plio-Pleistocene.

Session No. 102

T195. Paleoenvironmental Reconstruction of Hominin Sites: New Methods, New Data, and New Insights I
Monday, 2 November 2015: 8:00 AM-12:00 PM
Room 324 (Baltimore Convention Center)