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Soil-landscape development and late Quaternary environmental change in coastal Estremadura, Portugal

Michael Daniels (1), Jonathan Haws (2), Michael Benedetti (3), and Nuno Bicho (4)

(1) Department of Geography and the Environment, University of Denver, Denver, USA, (2) Department of Anthropology, University of Louisville, Louisville, USA, (3) Department of Geography and Geology, University of North Carolina at Wilmington, Wilmington, USA, (4) Faculdade de Ciencias Humanas e Sociais, Universidade do Algarve, Faro, Portugal

This poster integrates soil-landscape analysis with archaeological survey and paleoenvironmental reconstruction. Soils in surface and buried contexts in Estremadura, Portugal, provide evidence of landscape stability and instability, relative age relationships between landforms, and general paleoenvironmental conditions during the late Quaternary. These factors provide insight into the distribution and condition of Paleolithic archaeological sites and help understand the record of human settlement in the region. Late Pleistocene and Holocene dunes extend inland approximately 10 km from coastal source regions. Surface soils in Holocene dunes under maritime pine (Pinus pinaster) forest exhibit A, E, C/Bh and A, C horizon sequences and classify as Quartzipsamments. Surface soils in late Pleistocene dunes exhibit A, E, Bh, Bhs, Bs horizon sequences and classify as Haplorthods. Both Pleistocene and Holocene dunes commonly bury a heavily weathered soil formed in calcareous sandstone. The boundary between underlying buried soils and overlying surface soils is characterized by a lag deposit of medium to coarse, moderately-rounded gravels, underlain immediately by subsurface Bt and Bss horizons. The lag deposit and absence of buried A horizons both indicate intense and/or prolonged surface erosion prior to burial by late Quaternary dunes. Soil-geomorphic relationships therefore suggest at least two distinct episodes of dune emplacement and subsequent landscape stability following an extensive episode late Pleistocene landscape instability and soil erosion. A conceptual model of soil-landscape evolution through the late Quaternary and Holocene results from the integration of soil profile data, proxy paleoenvironmental data, and the partial record of human settled as revealed in the archaeological record.