Reconstructing Holocene evolution in the archaelogical site of Campo Lameiro (NW Spain): an interdisciplinary approach to geoarchaeology

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The objective of this research was to evaluate the potential of sedimentary deposits for the reconstruction of Holocene environmental changes in the Campo Lameiro area (NW Spain). We focused on the evolution of landforms as a key factor in the configuration of alluvial and colluvial sequences. Geoarchaeology applies techniques and methods of the Human Sciences and Geosciences to reconstruct landscape evolution at different geographical scales. In order to develop our research we have analyzed: relief structure and its role on sediment genesis, distribution and volume of

colluvial deposits; key sedimentary features; and elemental composition and physico-chemical properties of the sediments/soils.
The geomorphological and sedimentological studies point that the distribution of landforms is a main factor to understand the formation of these colluvial deposits. Granitic macroforms dominate the present landscape, constituted by alveolar depressions surrounded by crests and granitic slabs. The thickest sedimentary deposits were found in the depressions. We identified two main stratigraphic units: a basal inorganic layer represented by alluvio-colluvial sediments, formed in a highly energetic environment, probably dating from the Younger Dryas (>11,000 years BP) and a younger unit of thick sandy, blackish, organic matter rich, colluvial soils. The oldest radiocarbon age obtained for this unit indicates that it may have started to form by 11.240-11.130 cal. BP. The Holocene colluvial soils show discontinuities in grain size, soil reaction, elemental composition of the inorganic phase and molecular composition of the soil organic matter. These features are evidence of the occurrence of several phases of erosion/sedimentation (i.e. landscape instability), some of which were coeval with known periods of Holocene abrupt climate change -the 8.2 ka event, the beginning of the Neoglaciation (ca. 6 ka BP) or the 2.8 ka wet/cold event. But some of the most intense phases are coincident with increased human pressure on landscape during the Neolithic, Bronze Age, Roman Period, and the Middle Ages. Charcoal layers, burnt soil layers and the highly aromatic nature of the soil organic matter point to frequent fire episodes. Pollen studies have also indicated a sharp decrease in forest cover beginning by ca. 6500 cal BP, which seems to have been accompanied by a progressive soil acidification with time.
Our research suggests that both climate and human activities played an important role in the formation of colluvial deposits in this area. In agreement with previous studies, this indicates that they are valuable geoarchives to reconstruct Holocene environmental change from a geoarchaeological approach. Given their wide distribution and the time period covered by them, they may also be crucial to decipher and understand human responses to climate change and the impact of anthropogenic activities on the environment at the local and regional scales.

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