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Editorial: Prehistoric humans and eroding landscapes

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Editorial on the Research Topic
Prehistoric humans and eroding landscapes

Landscapes are often treated as the setting in which human history unfolds. The studies assembled here suggest a different perspective: landscapes are themselves products of past human and environmental histories, continuously shaped by the actions of past communities and inherited by those that follow. Understanding prehistoric societies, therefore, requires understanding not only how people responded to environmental change but also how their activities reshaped the environments that later generations encountered.

Research on erosion has played an important role in addressing this challenge. Once regarded primarily as a source of archaeological bias, erosion is increasingly understood as a process that links human activities, geomorphic change, and long-term environmental transformation. Studies from diverse environmental settings have shown that erosional processes affect archaeological visibility (Barbieri et al., 2018, 2021), influence resource availability (Velliky et al., 2019), shape human resilience (Barbieri et al., 2026), and preserve evidence of long-term human impacts on ecosystems (Thompson et al., 2021). The contributions assembled in this research topic build on these developments by examining how interactions between human activities and erosion shaped landscapes across millennial timescales, creating environmental legacies that extended beyond the societies that produced them.

Marras and Boschian (2023) illustrated how human-induced landscape modifications can generate enduring pedological legacies. At Contraguda in northern Sardinia, agricultural practices and settlement activities promoted erosion and soil transformation, creating environmental conditions that persisted long after the communities themselves had disappeared. Their study demonstrates how prehistoric land-use decisions became embedded within the landscape, contributing to ecological trajectories that remain visible today.

A comparable pattern emerges in the multiproxy paleoenvironmental study of Wright et al. (2024) in northern Malawi. The authors identify a close relationship between the expansion of agricultural communities, accelerated erosion, and ecological transformation around 3 ka. These changes exceeded the range of natural climatic variability alone and produced environmental conditions that continued to shape the region for millennia. Their findings add to growing evidence that human societies became significant agents of ecological and geomorphic change long before industrialization.

Martinez et al. (2024) explored similar processes from a different perspective. By integrating archaeological evidence with paleoenvironmental modeling from Cantabrian Spain, they identified repeated phases of devegetation, erosion, and pollution associated with changing systems of production and resource use. Their application of Energy Regimes as a comparative framework suggests that long-term socio-environmental dynamics may be analyzed across cultural and chronological boundaries through shared energetic relationships rather than conventional archaeological periodization.

While these studies focus primarily on how societies transformed landscapes, Friesem and Shtienberg (2026) emphasized the reciprocal process: how inherited environmental conditions shaped human responses. Reviewing evidence from submerged Neolithic settlements along the Carmel Coast, they demonstrated how coastal communities adapted to sea-level rise and coastal erosion by changing settlement organization, subsistence strategies, and risk-management practices. Their study highlights the capacity of human populations to respond creatively to rapidly changing environmental conditions.

Taken together, the contributions in this research topic demonstrate that erosion should not be viewed solely as a destructive force acting upon archaeological records and human communities. Rather, it emerges as a central component of long-term socio-environmental systems, simultaneously preserving traces of past activities, mediating ecological transformations, and influencing future possibilities for human occupation and land use.

This perspective is particularly relevant to contemporary debates surrounding the Anthropocene (Martinez et al., 2024). The studies presented here suggest that many processes in landscapes often considered uniquely modern—including soil degradation, accelerated erosion, ecological transformation, and increasing environmental vulnerability—have much deeper histories, sometimes extending beyond the Holocene (Ellis et al., 2021). Such long-term relationships between human communities and their environments also resonate with the concept of niche construction, whereby organisms, and particularly humans, actively modify their environments in ways that shape the conditions experienced by subsequent generations (Laland and Brown, 2006). If present-day societies increasingly confront inherited environmental challenges, many of these conditions result from cumulative interactions between people and landscapes over centuries and millennia rather than recent processes alone. Geoarchaeology is therefore well positioned to provide long-term perspectives on anthropogenic landscape change. Tracing how human activities and environmental processes became intertwined over time reveals not only how landscapes preserve evidence of past actions but also how those actions continue to shape future possibilities.

Viewed in this light, erosion is not simply a process of loss. It is also a mechanism through which environmental legacies are created and transmitted across generations. Understanding these long-term relationships allows geoarchaeology to move beyond narratives of environmental impact or adaptation alone and to explore how societies and landscapes continuously shape one another through time.

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