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Anthropogenic relief features in tropical northern Australia: a physical and chemical analysis of the Weipa shell mounds

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Large mounded deposits of shell are prominent archaeological features across much of the north Australian tropical coast. Many of the shell mounds are composed almost entirely of the bivalve Anadara granosa (Linnaeus 1758), a food source for Aboriginal people in the past. They are identified in the field by their distinct mounded topographic form and the unique vegetation community growing on them. A relatively long history of inquiry into the nature and significance of the shell mounds has focused primarily on analysing the shell component as clues to Australian Aboriginal coastal economies in the past. This paper presents results of new analyses on the non-shell sediments of mounds located near Weipa in far north Queensland, examining the physical and chemical signatures of depositional and post-depositional processes with a view to obtaining insights into how the mounds formed and for what purposes, and how their morphology, structure and content may have changed since they ceased accumulating. We also consider how such changes might relate to past and present environmental conditions. The mounds we studied are primarily located on topographic high points, such as cliffs, hillslopes and beach ridges, though a proportion are located on estuarine floodplains at low elevations. Terrestrial Laser Scanning (TLS) of a sample of 51 shell mounds demonstrates substantial variation in mound size and shape, and suggests patterning in mound form related to age as well as position on the landscape. However, radiocarbon chronologies demonstrate that the mounds do not conform to a model of linear formation of a shell deposit, suggesting mound histories are variable in both the nature of shell deposition as well as post-depositional processes. Soil physical and chemical analyses indicate that post-depositional diagenetic alteration has strongly influenced the present day composition and form of the shell mounds, in particular the accession of carbon and silica to the mounds by environmental burning aided by strong leaching under seasonal high rainfall conditions. As such, mound chemistry is more likely to reflect modern environmental conditions rather than provide an archive of the past.