Hohokam Snowbirds
Archaeology, Geochemistry, and Seasonality
in the Puerto Peñasco Region

By David Dettman and Gary Huckleberry

Three years ago, David Dettman, Research Scientist, and Gary Huckleberry, Adjunct Research Scientist, spent a long weekend looking for datable material in prehistoric shell middens along the Gulf of California coast in the Puerto Peñasco region. The push to more precisely date the middens in this region grew out of the need to map these middens using dating methods. The push to more precisely date the middens in this region grew out of the need to map these middens using dating methods.

Their work has documented 49 midden sites along ~80 km of coastline (see map below). These middens are currently under significant threat from the explosion of tourism in the area, development of shorefront property, and improved access due to the construction of a new coastal highway. INAH, the Mexican National Institute of Anthropology and History, is performing limited salvage archaeology in the path of the new coastal road and along newly developed shoreline. Mitchell, Foster, Dettman, and Huckleberry are now working with faculty and graduate students in the Department of Anthropology to develop a systematic archaeological investigation of this area.

Shell middens in the Puerto Peñasco area are distributed along the coast and in estuary embayments stretching from western Bahía Adair to Estero Morua. Most of the middens are thin, with sparse cultural material at the surface including ceramics, ground and flaked stone tools, and modified shell, suggesting that these are short-term occupations, e.g., seasonal fishing and shellfishing camps. This is also an area that has long been thought to be the source of marine shell used in Hohokam (AD 500–1400) jewelry manufacture and trade in central and southern Arizona.

It is generally believed that the Hohokam procured shell from the northern Gulf of California both directly and through trade with neighboring groups. Indeed, Hohokam, Yuman, and Trincheras pottery are present on the surface, but several middens lack pottery and a few contain Late Archaic projectile points implying use of the area extending back as early as 1200 to 800 B.C.

Previous, nonsystematic \(^{14}C\) dating of shell from the surface of these middens has been plagued with uncertainty due to the high variability in the marine reservoir effect in the northern Gulf of California and the poorly defined context of the dated samples in relation to the artifacts. Some samples yielded ages older than 37,000 years BP suggesting older fossil shell was being reworked into some of the younger midden material.

Our geochemical work on these middens has been focused in three areas: dating the middens, determining the season of occupation, and developing geochemical tracers that can be used to identify shell from this region. We focused our initial \(^{14}C\) work on sites that may be older than Hohokam, i.e., those with no ceramics and those that contained buried charcoal as revealed in naturally eroded exposures.

With the help of ethnobotanist Karen Adams, we have identified the charred remains of saltbush and other shrubs that were used to cook the shellfish, and we can use these remains to more precisely date human activity associated with the middens. Thus far, the ages range from about 5500 cal yr BP to 1900 cal yr BP, thus predating the Hohokam and extending back as far as the Middle Archaic. The hearth dated 5500 cal yr BP appears to be the oldest dated archaeological feature from this part of the Sonoran coast and suggests that people were utilizing coastal habitats around Puerto Peñasco soon after stabilization of the early Holocene sea level rise.

Working with burned shell from well-dated midden fires leads to a number of interesting avenues for research. Mollusks from midden contexts were collected alive by prehistoric peoples and cooked and consumed on the beach. These shells carry both morphological and geochemical records of seasonal environmental change that allow us to determine the season in which this activity occurred.

Both growth banding in the shell (see Figure 1 on page 7) and oxygen isotope ratios of shell carbonate respond strongly to the seasonal temperature cycle, and the time of death within this seasonal context (represented by the outermost band) gives us a good estimate of when during the year the shell was harvested.

In this area the oxygen isotope ratio of seawater doesn’t change, leaving temperature as the only factor affecting shell oxygen isotope ratios. Ratios are most negative in the warmest months and most positive in the fall and winter. Winters are
Oxygen isotope ratios can be used to uniquely identify the source areas for these shells, because they respond strongly to water temperature. Upwelling along the Pacific coast leads to significantly cooler water temperatures, whereas the Sea of Cortez is isolated from upwelling and is a relatively shallow sea in a region with very hot summers. Both regions have clear seasonal cycles in $\delta^{18}O$, but the ranges barely overlap. Sourcing studies are also aided by the large plume of Colorado River water that hugged the western shore of the Sea of Cortez. Our provenience work can therefore distinguish three different sources for shell: the Pacific coast, the Gulf of California (east side), and the Colorado River delta.

Working with geochemical cycles in marine shell gives us a very powerful tool for studying human behavior and seasonal environmental variability over the course of several thousand years. Our work will continue to document the age and seasonal patterns in the harvesting of fish and shellfish by prehistoric peoples in the northern Gulf of California and beyond. For more than 5,000 years, groups of people have been going down to Puerto Peñasco. With isotope geochemistry, we are able to follow them through the seasons.