Archaeology and coastal conservation

Torben C. Rick • Scott M. Fitzpatrick

Received: 29 April 2010 / Revised: 13 August 2010 / Accepted: 13 August 2010 / Published online: 1 September 2010
© US Government 2010

People occupied and exploited the world's coastlines deep in the past, including early modern humans in South Africa some 150,000 to 100,000 years ago (see Bailey and Milner 2002; Erlandson 2001; Marean et al. 2007). Through time, coastlines and oceans became increasingly important parts of the human experience, with the ocean acting as a gateway for colonization of distant islands and coastlines and coastal resources forming a fundamental component of subsistence economies (Erlandson and Fitzpatrick 2006). Ancient peoples from hunter-gatherers to agriculturalists also had an important impact and influence on marine ecosystems, ranging from overexploitation of resources (e.g., fish, shellfish, and sea mammals) to environmental enhancement (see Campbell and Butler 2010; Erlandson and Rick 2010; Rick and Erlandson 2008, 2009). During the last decade, archaeological research on human alteration of marine, island, and other ecosystems has helped improve our understanding of modern coastal ecosystems and provided benchmarks and baselines for contemporary management and restoration (Braje 2010; Erlandson and Rick 2010; Jackson et al. 2001; Pinnegar and Engelhard 2008; Rick and Erlandson 2009). With recognition that

many marine ecosystems were altered by human activities for decades, centuries, or more prior to modern ecological studies, archaeological data can provide the context for understanding prehistoric ecosystem structure and function (see Erlandson and Rick 2010).

Coastal regions, which are extremely dynamic, are highly susceptible to the destructive forces of a wide variety of natural and human-induced processes (e.g., tectonic and geological instability, tsunamis, volcanism, attrition, wave and tidal action, sea level rise, storm events, near shore development, offshore dredging, and coral or sand mining) that threaten the global coastal archaeological record. Individually, or in concert, these processes can cause extensive damage to both terrestrial and submerged archaeological sites; in many cases, catastrophic events may completely destroy evidence for past human occupation. Sea level rise, exacerbated by climate change, is a particularly prominent threat that will erode or destroy a massive number of coastal archaeological sites in the coming decades. Further complicating the issue is the fact that archaeological sites are non-renewable resources and the vast majority of coastal sites around the world are threatened and endangered pieces of coastal history (Erlandson 2008; Fitzpatrick et al. 2006).

Because many countries lack sufficient laws to protect archaeological sites, particularly in coastal areas where development is extremely desirable, archaeologists are working quickly to survey and record the wide array of prehistoric settlements in these regions before they are disturbed or destroyed. Given the volume of coastal archaeological sites around the world, the complexities of site preservation, and the dearth of funding, this is often a daunting task that goes unrecognized by the non-

T. C. Rick (✉)
Archaeobiology Program, Department of Anthropology,
National Museum of Natural History, Smithsonian Institution,
Washington, DC, USA
e-mail: rickt@si.edu

S. M. Fitzpatrick
Department of Sociology and Anthropology,
North Carolina State University,
Raleigh, NC, USA

archaeologist. Trying to convince local governments of the need to preserve coastal archaeological sites becomes even more complicated when one considers the growing threat of climate change that will lead to sea level rise and a host of associated issues such as more intensive and frequent storm activity.

Another problem is that archaeologists have not always been effective at demonstrating the relevance and applicability of archaeological data to better understanding contemporary global problems. With this in mind, this special issue brings together leading scholars working around the world on coastal archaeology and historical ecology. A series of case studies from Europe, Australia, North America, the Caribbean, Pacific Islands, and Africa, along with a global overview, highlight the significance of coastal archaeology and the natural and anthropogenic threats to coastal archaeological resources. Geared primarily for the non-specialist and non-archaeologist, one goal of this special issue is to underscore the utility of archaeology to other coastal researchers, resource managers, and the public. Some of the themes that emerge from this special issue include the ability of archaeology to provide unique bodies of data on the long-term (centuries to millennia) environmental and cultural histories of coastal and island regions, the influence and impacts of ancient peoples on marine resources and ecosystems, and the importance of the coast in human history. Coastal archaeological sites are also important to many local descendant communities whose ancestors left behind traces of their past.

The papers that follow challenge those of us working on the coast (and beyond) to increase collaboration and to cross disciplinary boundaries, especially by integrating archaeology and history into contemporary coastal research (ecology, geography, etc.) conducted by other scientists. Ultimately, these studies illustrate the need to include archaeology and its unique perspective on coastal environments and peoples as a component of larger coastal conservation and management efforts. As noted throughout this special issue, coastal archaeological resources are a highly threatened, but critically important part of our shared global cultural heritage.

References

- Bailey G, Milner N (2002) Coastal hunter-gatherers and social evolution: marginal or central? *Before Farming* 3–4:1–15
- Braje TJ (2010) *Modern oceans, ancient sites: archaeology and marine conservation on San Miguel Island, California*. University of Utah Press, Salt Lake City
- Campbell SK, Butler V (2010) Archaeological evidence for resilience of Pacific Northwest salmon populations and the socioecological system over the last 7,500 Years. *Ecology and Society* 15:17
- Erlandson JM (2001) The archaeology of aquatic adaptations: paradigms for a new millennium. *Journal of Archaeological Research* 9:287–350
- Erlandson JM (2008) Racing a rising tide: global warming, rising seas, and the erosion of human history. *Journal of Island and Coastal Archaeology* 3:167–169
- Erlandson JM, Fitzpatrick SM (2006) Oceans, islands, and coasts: current perspectives on the role of the sea in human prehistory. *Journal of Island and Coastal Archaeology* 1:5–32
- Erlandson JM, Rick TC (2010) Archaeology meets marine ecology: the antiquity of maritime cultures and human impacts on marine fisheries and ecosystems. *Annual Review of Marine Science* 2:231–251
- Fitzpatrick SM, Kappers K, Kaye Q (2006) Coastal erosion and site destruction on Carriacou, West Indies. *Journal of Field Archaeology* 31:251–262
- Jackson JBC, Kirby MX, Berger WH, Bjorndal KA, Botsford LW, Bourque BJ, Bradbury RH, Cooke R, Erlandson J, Estes JA, Hughes TP, Kidwell S, Lange CB, Lenihan HS, Pandolfi JM, Peterson CH, Steneck RS, Tegner MJ, Warner RR (2001) Historical overfishing and the recent collapse of coastal ecosystems. *Science* 293:629–637
- Pinnegar JK, Engelhard GH (2008) The ‘shifting baseline’ phenomenon: a global perspective. *Reviews in Fish Biology and Fisheries* 18:1–16
- Marean CW, Bar-Matthews M, Bernatchez J, Fisher E, Goldberg P, Herries A, Jacobs Z, Jerardino A, Karkanas P, Minichillo T, Nilssen P, Thompson E, Watts I, Williams H (2007) Early human use of marine resources and pigment in South Africa During the Middle Pleistocene. *Nature* 449:905–908
- Rick TC, Erlandson JM (eds) (2008) *Human impacts on ancient marine ecosystems: a global perspective*. University of California Press, Berkeley
- Rick TC, Erlandson JM (2009) Coastal exploitation. *Science* 325:952–953