Introduction

In recent years a number of archaeological excavations in coastal Alaska and the Northwest Coast (Ames and Maschner 1999; West 1996), as well as along the California Coast (Erlandson and Colten 1991), and even South America (Dillehay 1989, 1997; Meltzser et al. 1997) have yielded an ever increasing number of radiocarbon dates that either coincide with or predate the Paleo-Indian mammoth hunters. In the last decade the idea of a Paleo-Coastal tradition has been supported by the identification of more than forty Southern California coastal sites that date to the terminal Pleistocene/early Holocene transition (12,000-8,000 years ago) (Cassidy et al. 2004; Cassidy 2007; Dixon 1999; Erlandson and Moss 1996; Fedje and Christensen 1999; Jones 1991, 1992). This has resulted in an increased interest in the origins of early maritime peoples who may have been among the first to colonize the New World.

Archaeological Evidence of Late Pleistocene/Early Holocene “Seafaring”

Processes that result in the destruction of coastal and island sites, such as sea level rise and coastal erosion, have long been lamented as reasons why early sites have been difficult to find. In spite of this, the number of sites that have been discovered strongly suggests that these only represent the proverbial “tip of the iceberg” and many more must have existed that have either been destroyed, or are yet to be discovered. A number of early insular sites have already been found in the Gulf of Alaska, such as the Anangula site on Ananiuliak Island that dates to 10,000 years before present (B.P.) (Laughlin and Aigner 1966), Hidden Falls on Baranof Island dating to 9,500 years B.P. (Davis 1989, 1996), Ground Hog Bay on the Chilkat Peninsula at 9,200 years ago (Ackerman 1968), On Your Knees Cave on Prince of Wales Island at 9,200 years ago (Dixon 1999), and sites on the Queen Charlotte Islands that date to between 8,300-9,300 years B.P. (Fedje and Christensen 1999).

Four island sites dating to this time period have also been identified on the California Channel Islands. These include Daisy Cave on San Miguel Island that dates in excess of 12,000 calendar years (Erlandson et al. 1996), Arlington Springs on Santa Rosa Island at about 13,000 years B.P. (Johnson et al. 1999), Punta Arena on Santa Cruz Island at 8,400 years of age (Glassow 2000), and Eel Point on San Clemente Island at 8,500 years B.P. (Cassidy et al. 2004). All of these sites date in excess of 8,000 years before present and necessitated the use of watercraft to cross open bodies of water spanning from 10 to 80 km in distance. Not only does this reflect a widespread distribution of insular maritime locations, but also suggests that this was not a short-lived adaptation. One of the most intensively studied of these sites is Eel Point, where a series of ten radiocarbon dates from the Early Holocene layer spans an occupation period of over 500 years (Raab et al. 1994).

Thus, a widespread pattern of occupation of islands and insular locations during the early Holocene would appear to argue against any assumption that these were merely casual visits made through the use of rudimentary watercraft. In fact, to the contrary, the emerging pattern appears to suggest that these sites represent widespread seafaring populations who utilized watercraft transport on an ongoing basis and formed a distinctly different type of

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Having spent my early years living along the coast of California, I have always nurtured a fascination with the sea and its limitless possibilities. Throughout my adult life I have often found myself far from the ocean, but inevitably drawn back as though by the tides. As a young Sea Explorer, based out of King Harbor in Redondo Beach, there were endless summers at the beach, harbor and sailing among the Channel Islands. As an adult I have had the pleasure of lecturing aboard cruise ships in both the Caribbean and Mediterranean Seas on the unique evolution of maritime societies.

It was my good fortune, at mid-career, to return to academia and retrain as an Archaeologist, with an emphasis on the development of maritime cultures across the north Pacific Rim. This included a Masters degree focused on the origins of early Holocene mariners who resided on San Clemente Island 9,000 years ago. My doctoral dissertation, completed at the University of California Santa Barbara, was conducted on the northern coast of the Sea of Japan, in the Russian Far East. This explored the transition of mariners from hunter-gatherer-fishermen to Bronze Age complex societies in Northeast Asia. As a consequence, it is my privilege to be co-editor and author, in the soon to be published journal of North Pacific Prehistory, Volumes I and II. The abstracts of articles for these volumes can be found at www.northpacificprehistory.com.

— Jim Cassidy
adaptation than terrestrial hunters who occasionally exploited littoral settings. Further, it appears likely that seafaring populations dispersed along the North Pacific coasts very rapidly during a period of dramatic climatic warming and sea-level rise at the terminal Pleistocene/early Holocene transition.

Although the existence of marine adapted peoples and seafaring populations have been well established for Southeast Asia, Australia and Japan during the late Pleistocene and early Holocene (Bednarik 2003; Earlandson 2000), the same cannot be said for the Americas. Aside from an assumed logic in the logistical tracing of island proximities on a map, there are many other issues pertaining to geography, climate, biological reproduction, social organization, settlement pattern and technological skills that must be addressed before we may advocate the existence of any form of seafaring culture, and especially maritime migrations along the west coast of North America.

**Seafaring vs. Maritime Adaptations**

In instances where maritime sites are identified in littoral settings it is often not possible to determine if the site is simply an expansion of existing terrestrial populations to the coast, or the intrusion of a new maritime adapted group. In fact, the term “maritime” is usually assumed to refer to the exploitation of marine resources, and does not specifically refer to differences between land-based populations who exploit littoral settings and seafaring groups who venture beyond the shoreline. However, in the case of insular island locations this task is made somewhat easier through the necessary assumption that “seafaring” (i.e. the use of watercraft) must have been involved (Keegan and Diamond 1987). Thus, we may define “maritime migration” as the use of seafaring technology to occupy new coastal locations by people who primarily subsist on marine resources. This suggests that seafaring groups should represent a qualitatively distinct adaptation from coastal collectors who simply took advantage of easily accessed littoral resources. The ability to construct seaworthy watercraft, and pilot them in open waters, presumes a significantly more complex mode of social organization and command of technology than that found among generalized foragers (Kelly 1995).

**Marine Environment**

Before we can evaluate the robustness of such ideas we must address the substantial technological challenges posed by open-water conditions for the use of watercraft. Even today, to say nothing of during the Last Glacial Maximum, the challenges posed in northern latitude regions in the form of frigid temperatures, high precipitation, low visibility, high energy winds and related wave amplitudes, and forceful currents, all pose life-threatening challenges for people involved in any proposed maritime passage. While conditions in the more temperate waters of the California Channel Islands are considerably less challenging, they must still be taken seriously. Even in modern times, small craft that venture into open waters between the mainland and the Channel Islands frequently encounter two- to four-foot swells, gale force winds, strong currents, and seasonally frigid conditions, which result in
unexpected disasters. If we accept that the long-term occupation of island sites required repeated seafaring ventures between the islands, and from the islands to the mainland, then it seems reasonable to assume that these hearty mariners possessed significant knowledge pertaining to the construction and operation of reliable watercraft, as well as the natural elements encountered during open-water voyages.

**Settlement Patterns**

A picture of terminal Pleistocene/early Holocene settlement of island locations is only beginning to emerge. A number of the sites are from cave deposits, or eroded beach terraces, where it is difficult to reconstruct settlement data. Other sites are covered by the overburden of later occupations. The ephemeral nature of some deposits suggests that they may have been short-term seasonal camps. On the other hand, other locations appear to reflect long-term occupations of at least a semi-permanent nature. At present the most intensively studied early Holocene site is **Eel Point** on San Clemente Island, California.

These excavations have revealed a wide range of artifactual and faunal evidence that includes habitation structures and work areas. These features yielded dates that span a 500-year period and suggest the site may have been occupied on a semi-permanent basis (Cassidy 2007). The location of early sites on the Channel Islands is associated with rocky headlands adjacent to deep submerged canyons that cause the upwelling of cold waters and enriched marine resources. This may suggest that they were attractive locations for accessing deep-water species, rather than purely littoral resources.
In the Eel Point study a comparison was made of the chipped-stone tool-kit employed by historic Chumash boatwrights, identified in the ethnographic notes of J. P. Harrington (Hudson, Timbrook and Rempe 1978:21-53), with the stone tools found among the excavated materials in the site. Through an analysis of morphological features, tool replication, use-wear experiments, and high-power microscopic use-wear analysis (Kelly 1980), it was possible to identify a comparable tool-kit from a localized area in the early Holocene component of the Eel Point site that met all of the technological requirements of watercraft construction and maintenance. These tools include choppers, flake cores, retouched and utilized flakes, drills, reamers, scraper-planes, sandstone abraders, tar smeared pebbles, a worked sea mammal rib (with asphalt stains), wood-splitting wedges, microlithic cores, and a burin (Cassidy et al. 2004).

The Eel Point stone tool-kit bears a remarkable resemblance to stone tool assemblages identified in Northwest Coast sites for the same time period (Matson and Coupland 1995; Ames and Maschner 1999). Whether this is a reflection of contact between the two widely separated regions, or is a function of similar solutions for similar problems (i.e. independent invention).
is a matter of ongoing investigation. It does appear to suggest, however, that bifacial projectile points are more closely associated with terrestrial hunting practices, and early sites with strongly maritime oriented hunting strategies tended to heavily rely upon flake-core assemblages, augmented by microliths and chopping tools.

**Subsistence**

A n important issue pertaining to the survival of maritime populations, on islands with relatively depauperate terrestrial resources, is the ability of human populations to sustain themselves on a solely marine diet. The differences between specialized terrestrial and aquatic hunters and gatherers have been noted in subsistence practices, as well as their techno-economic orientations and social organizations (Schalk 1977; Hayden 1997; Yesner 1980). Once access to highly productive aquatic resources has been achieved, through the development of specialized social and technological elaborations, it appears that marine resource procurement strategies are fully comparable to terrestrial ones. Recent research has demonstrated that aquatic resources such as fish, sea mammals and shellfish represent nutritional packages that are comparable to those found on land (Erlandson 1988; Glassow and Wilcoxon 1988; Meehan 1977). These findings have been supported by isotope studies of human remains found in island locations that reflect a diet made up almost exclusively of marine resources such as fish, shellfish and sea mammals (Dixon 1999; Foley 1987). Also, recent research on the California Channel Islands suggests that dolphins played a more important role in subsistence activities during the early and middle Holocene than previously suspected (Glassow 2000; Porcasi and Fujita 2000; Raab et al. 1995). This further supports suppositions pertaining to the importance of the use of reliable watercraft in deep water hunting activities.

Those individuals who, through the possession of sacred knowledge and control over resources, such as watercraft, have always held the power of life and death over their peers and occupied positions of high status (Ames 1994; Ames and Maschner 1999; Hayden 1997). As specialized knowledge for the construction and piloting of privately owned watercraft developed, so would the ability of individuals to acquire unequal amounts of wealth and power. An example of the expression of ritual knowledge and power was identified in the Eel Point site, where it appears a chipped-stone effigy of a canoe was cast into the fire of a hearth in an effort to solicit the favor of supernatural forces (Cassidy 2006).

Below: Possible chipped-stone boat effigy from the early Holocene component of the Eel Point site, San Clemente Island, California. Courtesy the author
Reproductive Viability

On logical grounds, the concept of any form of migration implies the distribution of sufficient sized populations to maintain reproductive viability, defined by Birdsell (1968) as a minimum of approximately 175 individuals (Wobst 1974). Since the known terminal Pleistocene/early Holocene maritime sites ranged from small ephemeral artifact scatters to band-sized settlements, it must be assumed that they were incapable of independently maintaining reproductive viability over the long span of time reflected in the existing archaeological record without regular contact with other groups. This means that the use of watercraft to visit other nearby groups for the purpose of social interaction and obtaining mates must have occurred on a regular and ongoing basis.

Conclusions

The fact that an increasing number of early sites are being found in insular locations verifies that people commanded the regular use of watercraft in the New World much earlier than has been generally acknowledged in the archaeological literature. It seems reasonable to assume that they could employ these crafts at will to visit nearby locations for the purposes of social interaction and obtaining mates. The use of watercraft could even provide a degree of autonomy and anonymity when engaging groups who did not command the use of watercraft and could have taken the form of either friendly contact or raiding to obtain mates and other resources (Kelly 1995).

Seafaring activities would have placed specific demands upon a group’s social organization, group and individual knowledge, and technological skills. This, in turn, may have resulted in the development of a qualitative difference between generalized foragers who exploited littoral resources and some truly maritime people who may have developed the potential to become affluent foragers (Arnold 2001:3; Kelly 1995; Meighan 1990). This label could be applied to some early seafaring groups who developed the ability to construct sophisticated forms of watercraft, private ownership and control over the use of watercraft, secret knowledge pertaining to boat construction, and the ability to control the distribution of resources obtained through their use.

The isolated nature of the Eel Point site on San Clemente Island permitted the examination of a stone tool assemblage that was virtually free of mainland terrestrial influence. What was found was a well-developed flake-core industry entailing the fabrication of formal tools that were well suited for the construction of composite watercraft from wood. Accumulating evidence reveals a pattern of widespread settlement of coastal and insular locations during the terminal Pleistocene/early Holocene transition. These highly mobile foragers were fully dependent upon the procurement of marine resources for survival, and commanded the technological skills to construct, maintain and pilot reliable watercraft in open waters on a regular basis. The late Pleistocene/early Holocene transition was a period of ameliorating climatic conditions and increasing resource abundance that provided great opportunities for accelerated processes of independent invention and related individual aggrandizement through increased mobility and the colonization of new territories.