Did Early Maritime Archaic Indians Ever Live in Newfoundland?\textsuperscript{1}

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Abstract

‘Maritime Archaic Indians’ is the name archaeologists use to refer to particular groups of prehistoric peoples that lived near the ocean in northeastern North America between about 9000 years and 3200 years ago. This paper explores the relationship between relative sea level change and the location of Maritime Archaic Indian habitation sites on the island of Newfoundland.

Keywords

Relative sea level; Maritime Archaic Indian; Newfoundland; Labrador; site location preferences; adapted primary literature.

Introduction

Relative sea level (RSL) can change over time. RSL refers to the position of sea level relative to the land. RSL can change if the volume of water in the oceans increases or decreases, if the land rises or falls, and if both change at once. Land that is covered by glaciers deforms under the weight of ice and warps downward. As the glaciers melt the land rebounds and, at the same time, the meltwater increases the volume of water in the oceans. The sum of these two processes results in RSL and when one or other dominates, the RSL changes. For instance, if land rebound is greater then RSL falls, while a larger ocean volume change will result in a rise in RSL. As RSL changes, it can affect the shape and position of the coastline. In some regions in the past, RSL changed so much that what once was coastal is now on high ground inland from the modern shoreline. In other regions, the ancient coast is now submerged on the modern seafloor.

These changes in coastline have implications for archaeologists who study marine-oriented prehistoric peoples because habitation sites that were once near the coast might now be underwater, eroding into the sea, or indeed well above current sea level. Prehistoric sites of coastal peoples can therefore be quite difficult to find where RSL has changed. Such searches

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require not only a great deal of luck but also an appropriate method of investigation to determine the former position of the coast. Reconstruction of RSL history has proven to be an important first step for predicting prehistoric site locations.

In this study we examine RSL history and its potential for answering two questions regarding the location and distribution of the earliest prehistoric sites in Newfoundland. The earliest inhabitants of Newfoundland and Labrador are referred to by archaeologists as Maritime Archaic Indians (MAI). Early MAI refers to the earliest groups that lived there before 5500 years ago. Late MAI refers to groups that lived there between 5500 and 3200 years ago. Late MAI sites have been found in both Newfoundland and Labrador. Sites where late MAI lived are unevenly distributed across the island of Newfoundland. No early MAI sites have yet been found in Newfoundland, but are found in nearby mainland Labrador. On these bases we ask: can RSL history explain 1) the uneven distribution of late MAI sites and 2) the apparent absence of early MAI sites?

**Early and Late MAI**

One of the ways archaeologists distinguish between early and late MAI is based on a method of evaluating the age of things using knowledge of radioactivity, more specifically knowledge of the radioactive decay of carbon isotopes, which occurs in all organic matter. This method is referred to as [radiocarbon dating](#). Archaeologists also use differences in stone tools to draw conclusions about age. Based on studies of MAI stone tool collections from Newfoundland, Labrador and Quebec, archaeologists have identified two types of stone projectile point: side-notched and stemmed. They link these different shapes to age, with side-notched points dating from 5500 to 3200 years ago in southern Labrador and Newfoundland. Stemmed points date from 8000 to 3200 years ago in central and southern Labrador. Stone tools from both MAI periods demonstrate the importance of coastal resources for these people.

There has been only a few MAI sites investigated in Newfoundland. Most of these sites have a relatively small amount of remains left from the occupation. There is also currently no evidence of dwelling structures. In Labrador, however, both early and late MAI dwellings have been found. These dwellings can range in size from single-family pit houses to longhouses 12 meters (12 m) to 90 m in length. They can be outlined by gravel or rubble walls, occasionally by sunken floors, and in some cases by a linear pattern of hearths, soil staining and stone debitage. Although the evidence from burial sites suggests that coastal resources were important, the limited evidence of dwellings and the low volume of remains suggest a less intense occupation of the coast by MAI in Newfoundland. This conclusion follows because, if these people were occupying coastal areas on a longer term basis, their habitation sites would have more remains, deposited through generations of use. Likewise, if they were staying at one site for an extended period of time, they would need shelter and presumably evidence of such shelter would have been found. These conclusions suggest that MAI in Newfoundland were fairly mobile, moving to and from resources as they became available and thus making relatively short stays at sites.
RSL in Newfoundland

Sea levels fluctuate. One cause of fluctuation is change in ocean volume due to formation and melting of continental ice sheets during Ice Ages, referred to as glacio-eustasy. Ocean volume can decrease when ocean water is frozen within ice sheets resulting in global sea level lowering. Ocean volume can increase due to meltwater returning to the oceans from melting ice sheets causing sea level to rise. During the last Ice Age, global sea levels fell and rose by more than 100 m, causing temporary land bridges to form where today there are seas (e.g., Alaska was connected to Siberia across the Bering Strait). Another cause of RSL change is vertical movement of the Earth’s crust due to loading and unloading by ice sheets, referred to as glacioisostasy. As ice sheets melt, their weight decreases. The reduced weight releases pressure on underlying land masses. As pressure is released, landmasses rebound, rapidly at first and then slowly over 10,000 years or so (known as glacio-isostatic rebound). Regions of Canada that were under the thickest part of the last ice sheet are still rebounding today (e.g., Hudson Bay).

Reconstruction of post-glacial RSL history in Newfoundland has relied on the use of sea-level index points from both onshore and offshore locations. An index point is a documented sea-level elevation for a particular feature or location with an established age for when the sea stood at that level. The age of these levels is determined through the radiocarbon dating of associated organic materials, such as marine shell and bone. Index points from a variety of different levels in a particular region can outline the relative sea level change over time in that region.

Since the end of the last glaciation about 12,000 to 10,000 years ago, RSL has varied significantly in Newfoundland, both through time and across regions. This wide variation contrasts with southern Labrador, which has had a relatively straightforward post-glacial RSL history. In southern Labrador, after the last glaciation RSL fell quite rapidly to near its present level. Geophysicists have generated models that predict the history of RSL fall. Archaeological surveys in southern Labrador support such models, with early MAI sites occurring at higher elevations and farther from the coast than late MAI sites. In Newfoundland, however, RSL was complicated by the combined effects of being near the margin of a continental ice sheet and having local ice centers. Taking these factors into consideration, one geophysical model published for Atlantic Canada in 1981 by geophysicists Gary Quinlan and Christopher Beaumont predicted three types of RSL history for different regions of Newfoundland. Type A predicts continuous RSL fall in the northwest (Figure 1) and hence all ancient shorelines should be preserved above the modern coast. Type B, relevant for most of the island, predicts an initial RSL fall to a sea-level lowstand, followed by an RSL rise to present. Under the Type B scenario, the age and depth of the lowstand is an indication of how much of the RSL record is submerged on the seafloor in contrast to raised on the landscape. An older deeper lowstand means a significant portion of the RSL record is now submerged, while a younger, shallower lowstand implies a substantial RSL record above present sea level. Type C predicts RSL changes entirely below modern sea level for easternmost Newfoundland. The data from sea-level index points generally support this three-part model.

Figure 1 Animation depicting a Type A RSL history.
As shown in Figure 2, the depth of the post-glacial **lowstand** in Newfoundland generally decreases towards the heads of the major bays and northwest towards the Northern Peninsula. Where the lowstand was deeper than 25 m below present sea level it was probably earlier than 9500 years ago and where it was shallower than 16 m below present sea level it was probably later than 8500 years ago. In areas where the lowstand is deeper than 15 to 20 m, late MAI sites would probably be submerged.

*Figure 2* The map contours show the pattern of the post-glacial lowstand depth in Newfoundland. The dots show the locations of late MAI sites. In areas where the lowstand was deeper than 15 to 20 m, late MAI sites were probably submerged by rising RSL.
Late MAI Site Locations

To date, late MAI sites have been found in both Labrador and insular Newfoundland. Whereas early MAI sites have been found only in mainland Labrador, for the present study, we examined the location characteristics of 80 late MAI sites in Newfoundland. We found that 84% of these sites are located along the coast and are concentrated in areas where marine food resources (e.g., seals, birds, fish and shellfish) were relatively abundant and close to shore. Sixteen percent are located in the interior. At a smaller spatial scale, we found that most sites are in nearshore (71%) rather than offshore (13%) locations. Based on an examination of coastal sites only (n=67), we found that most (63%) are located in sheltered coves. Sites are regularly found near a river, stream or pond. They also have a view in more than one direction and are near heights of land, which could be used for lookouts. A comparison of known site elevations with the RSL record tells us that most late MAI coastal sites were within 5 m of the shore during their respective occupations. We examined the distribution of late MAI sites and found that the highest concentration (61%) of known sites is in northeast Newfoundland between Notre Dame Bay and Trinity Bay. There are no known late MAI sites on the west coast south of Bonne Bay and very few on the south coast or Avalon Peninsula.

Interpretations

Late MAI sites and RSL history

If we return to Figure 2 we can see that the gap in late MAI site distribution coincides with the region of maximum lowstand depth. There are no known MAI sites in St. George’s Bay on the southwest coast, where the lowstand reached 25 m below present sea level and 10 m of marine submergence has occurred since late MAI occupation of Newfoundland. In the Burgeo region, on the south coast, the post-glacial lowstand reached 27 m below present sea level about 600 years earlier than St. George’s Bay. Since 5500 years ago RSL in the Burgeo region has risen 8 m above its former level. Only three MAI sites have been identified in this region. These sites are between 7 and 12 m above where the sea level would have been during their occupation. This suggests that they were once on high land. Today these sites are exposed only at low tide. In contrast, if we look at the Hamilton Sound region along the northeast coast where MAI sites are more common, the lowstand reached 17 m below present sea level and RSL has risen only 1 to 3 m since late MAI occupation.

Based on these data, we infer that the uneven distribution of late MAI sites in Newfoundland is linked to RSL changes after that occupation. Sites along the coast that have experienced more than 5 m of marine submergence since 5500 to 3200 years ago are today submerged. The exceptions are sites on higher elevations (greater than 7 m above sea level) at the time of occupation, which remain at or above present sea level. Late MAI sites that are preserved above sea level occur in regions that have had very little or no marine submergence in the last 5000 years.
**Early MAI sites and RSL history**

In order to assess whether the absence of early MAI sites is related to RSL history we must examine the RSL record for early MAI occupation. Figure 3 shows where RSL was likely positioned relative to the present sea level at 6000 years, 7000 years and 8000 years ago. For most of Newfoundland, with the exception of the Northern Peninsula and western Notre Dame Bay, RSL was below its present level between 8000 and 6000 years ago, as indicated by the negative numbers. Most of these regions experienced RSL lowstands more than 10 m below their present level. This was of sufficient magnitude to cause early MAI sites to be submerged today. As we mentioned earlier, the Northern Peninsula is the only region with a Type A sea-level history. It thus never experienced any marine submergence and ancient shorelines are found inland from the present coast. Therefore MAI sites that were once close to the shore are now farther inland. Since all sites on the Northern Peninsula are above water and have likely not been eroded, this region has the best potential for finding early MAI sites.

![Figure 3](image)

**Figure 3**  Isobase maps for 8000, 7000 and 6000 years ago modified from Shaw et al. (2002). Individual isobases were interpolated from point data derived from local RSL curves. Where the isobase value equals zero it indicates that the modern shoreline intersects the ancient shoreline.

Most known late MAI sites on the Northern Peninsula are found at 6 to 10 m above present sea level. They are set back 50 to 150 m from the present-day shore. In addition, most are located near rivers or ponds. Considering these late MAI site locations, early MAI sites must be at higher elevations and therefore even further back from the present-day shore. Extrapolating from these patterns to early MAI site locations, we propose that early MAI sites on the Northern Peninsula are most likely to be found at elevations greater than 14 m above present sea level. In addition, based on the information on late MAI site settings, these sites are also likely to be found in areas of high marine productivity, at nearshore rather than offshore locations, in a sheltered area such as a cove, near a river, stream or pond, with a view in more than one direction, and near spots of high land. Due in part to the thick layer of peat as well as dense vegetation that covers much of
the Northern Peninsula, many of these locations are today difficult to access or identify. This may explain the absence of known early MAI sites on the Northern Peninsula.

Conclusions

Can RSL history explain the uneven distribution of late MAI sites in Newfoundland? Through examination of the RSL history of Newfoundland, which was shown to be variable and complex, we were able to conclude that the uneven distribution of late MAI sites was likely related to differing RSL around the island of Newfoundland. Late MAI sites that are preserved above sea level occur in regions that have had very little or no marine submergence in the last 5000 years. Our second question asked whether RSL history could explain the apparent absence of early MAI sites in Newfoundland. We examined the RSL history of the early MAI period and concluded that early MAI sites, if they exist, are likely submerged in most regions of the island. The one exception is the Northern Peninsula, which has not seen any marine submergence since the early MAI period.

References


