Chapter 3

Maine

The First Twenty-Five Years

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INTRODUCTION

Maine is rich in maritime prehistory and history. Blessed with an abundance of sea life for food and navigable waterways for transportation, its coast has attracted people since the glaciers receded more than 10,000 B.P. (Before Present). But for most people, the problems with the area's harsh climate have outweighed the coast's benefits. Long distances from more settled regions, thin soil, and short growing seasons kept people from using agriculture until approximately 150 years before Europeans began to settle in Maine.

The same problems kept historic Mainers from enjoying surpluses to supplement their needs, even with advanced farming tools. Until the mid-19th century, timber, ice, and granite harvesting and small industry were the only nonmaritime activities of any size. Even they were dependent on maritime activities to ship supplies in, and products out of the state until the railroads developed in the late 19th century.

Studies of Maine's prehistory and history have therefore focused mostly on people who lived along the coast, the vast majority of past Mainers. Archaeologists have studied sites on the coastal mainland, the intertidal zone, and lately the subtidal zone to discover much about the prehistoric people and to augment historic archival data. As with many regions of the United States, there were few archaeology investigations in the state until the 1970s, when the number of projects increased dramatically, due partially to changes in federal law.

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The University of Maine System, Maine State Museum, and Maine Historic Preservation Commission archaeologists have conducted most maritime archaeological investigations in the state. State law since 1969 reserves all archaeological sites on state property, including state-controlled submerged land, to be the property of the state. The Maine State Museum holds title to artifacts from such sites.

MAINE'S ENVIRONMENT

Geography

The Maine coastline was formed by a series of glaciers that ended approximately 12,000 B.P. It is a coastline dominated by estuaries. Many rivers start in the interior hills and drop through a series of falls until they reach sea level, typically a few miles inland. There, the rivers become brackish-water estuaries and continue until they enter one of the many bays that open into the Gulf of Maine. Typically, the bays are several miles wide and long, with a series of large and small islands spread throughout (Figure 3.1).

The underlying bedrock mostly consists of granite and slate, while the topsoil in most places on land and the sediment underwater is thin. Glaciers formed not only the bays, rivers, and their tributary ponds and streams, but also many adjacent coves. Generally, the coves have filled with silt during the past millennia, becoming intertidal mud flats with minor streams leaving small channels in the sediment.

After the glaciers receded and the land mass rebounded, the water level was approximately 60 m lower than today. The outer banks of the Gulf of Maine kept the gulf quite still by comparison to today. As the water level rose, the banks and outer shores were left underwater. At approximately 6000 B.P., major tidal flows and upwelling of nutrient-rich deep water began, causing the gulf and its estuaries to teem with many species of sea life.

Dynamics

Most of Maine's coastline is open to ocean waves, which have great energy during storms. Each year brings several storms that center off the coast, producing high winds from the northeast with a long fetch. Storm waves are typically 3–6 m along the coast.

Diurnal 3–4-m tides produce a complex and almost constant current system along the coast and throughout the estuaries. Tidal currents are typically 1 knot but approach 4 knots in specific locations.

Rivers and their tributaries drain thousands of square miles of Maine. Watersheds provide the rivers with a great quantity of fresh water that mixes with tidal salt water in the estuaries and bays. There is no particularly dry season in this region; therefore the quantity of fresh water moving down the rivers causes a noticeable balance of flow weighted toward the ebb throughout the year.

Many rivers are experiencing a natural change to a more meandering shape where their course is not determined by granite ledge. This usually causes the outside shore of a turn in the river to erode, while sediment builds at the inside of the turn. Rock outcrops variously resistant to erosion and human intervention keep the rivers from forming classic examples of meandering, but the process proceeds where it can. This process adds shallow areas of low tidal flow to the river basins.

General Environmental Factors Affecting Site Preservation

Natural physical, chemical, and biological forces affect underwater site preservation in Maine's rivers. Physical forces, especially strong currents and moving ice, can dislodge artifacts from a site and scatter them a great distance. If a site is in relatively shallow waters along a river shore, its remains are particularly susceptible to destruction from tidal currents and ice. River currents cause the upper sediment layers to move downstream and be replaced at slack tide by sediment from further upriver. Light artifacts, such as small items made from organics and ceramics, can be carried by the currents unless they are covered and pressed deep into the sediment. Such artifacts could

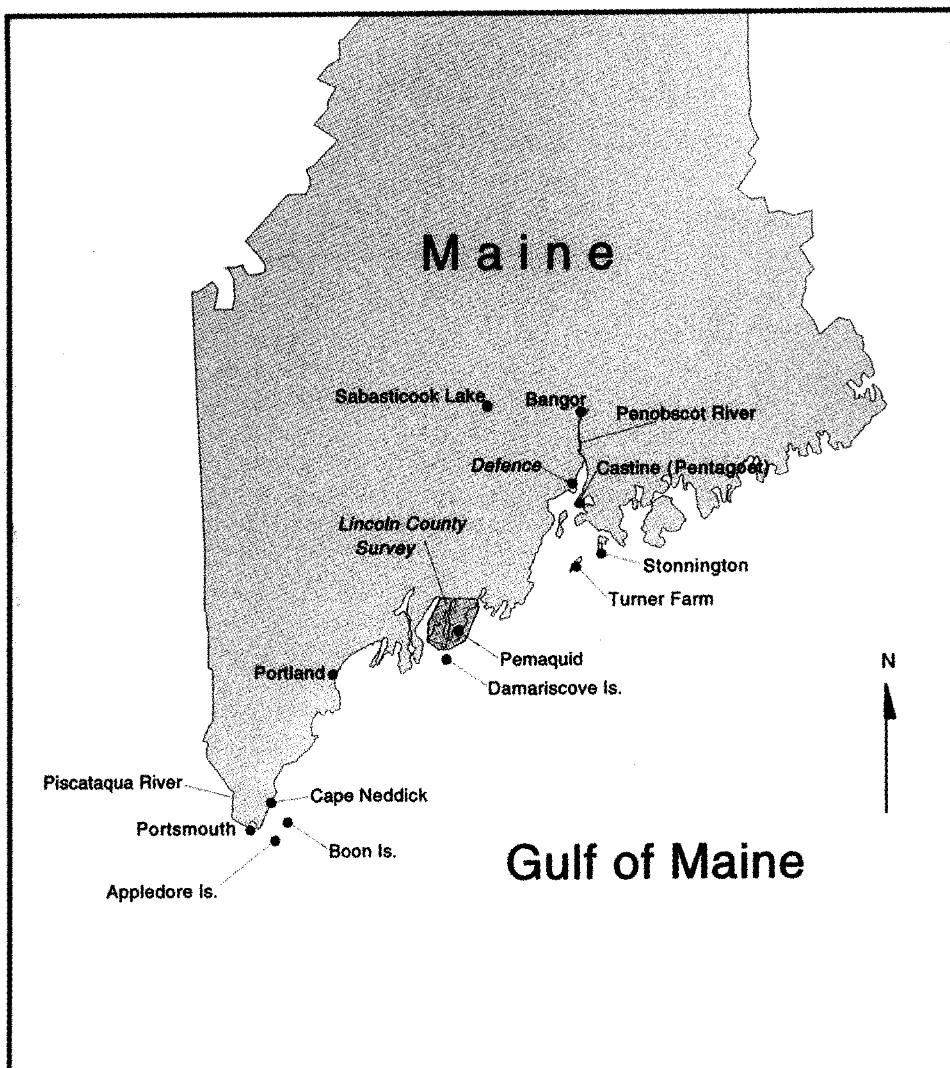

Figure 3.1. Several underwater archaeology sites in Maine.

be carried for many meters during one ebb tide and for many kilometers during the past centuries. This might also be the situation for ship timbers, or sections of timbers, that break away from a ship's hull. The lowest section of the hulls, usually covered by ballast, would not be affected as much by currents or ice.

In the winter, ice forms along sea and river shores, sometimes as much as a meter thick. The weight of the ice can be destructive to sites; its movement is even more destructive. As the water freezes, it forms around objects (such as stones and possibly artifacts), even those usually underwater in the shallows at the riverbank. When the ice breaks during a thaw or a water level change, it moves with the currents, often taking objects with it. Those objects typically are released later down river or at sea when the pieces of ice are further broken by melting and mechanical dynamics. Material in sites deeper than 1 m of water at low tide are not affected by ice flows, while sites in more protected waters, such as that of the privateer *Defence* in Stockton Harbor, are not damaged by ice or normal river currents.

Chemical and biological degradation of underwater sites not only affect individual artifacts but also the relative position of artifacts as they change density and lose integrity at different rates. While both of these processes can be rapid in the water column, both are significantly retarded below the water–sediment interface. Within the sediment (as little as 0.4 cm below the water), the environment is anaerobic (no available oxygen) and relatively still, and oxidizing chemicals are not readily available for chemical or biological degradation within the sediment.

Chemical deterioration of underwater sites is generally related to salinity, amount of dissolved oxygen, and water temperature. The average salinity of Maine's seawater is 31 parts per thousand (ppt), whereas river water varies from 0 ppt to approximately 30 ppt near the ocean. Geographical complexity, 3-m tides, and constant fresh water flow into and out of the estuaries cause the salinity and dissolved oxygen to change almost constantly at various locations and water depths along the coast. Fresh water running downstream usually rides above the salt water mass, mixing mostly in the lower reaches of the rivers. For example, in the Penobscot River at Hampden, the surface water at a particular moment might contain 3.6 ppt dissolved salt, while bottom water (10 m) at the same location might contain 8.5 ppt (Townsend, 1985).

Likewise, bottom temperatures vary from a typical August high of 24 °C (75 °F) at the rivers' falls to 12.5 °C (55 °F) in the ocean. Winter temperatures can reach as low as −0.5 °C (31 °F). Active currents, waves, and irregular underwater geography along the shore and in the estuaries cause turbulence in the water column that keeps the oxygen level high. Bottom dissolved oxygen varies from 2 to 8 parts per million (Townsend, 1985). These conditions allow rapid chemical deterioration of many materials above the sediment. Most metals are especially vulnerable to chemical deterioration, while organics, glass, ceramics, and other materials are effected at a slower rate.

Biological deterioration of underwater artifacts is related to present marine organisms. In Maine's ocean and lower estuary waters, the major species to consider are those that eat or bore into organic material. These include fin fish, shellfish, teredos (ship worms), limnoria (an isopod), and microorganisms. Fish eat organic cargos and other organic material that they can reach above the sediment. Likewise, teredos, limnoria, and oxygen-breathing microorganisms attack organics above the sediment. Wooden ship hulls and other organic artifacts remaining above the sediment are rapidly reduced to weak, honey-combed material and then completely destroyed by the sea life. In the upper estuaries, salinity is generally too low to support teredos and limnoria, the greatest threats to wood in Maine's cold water.

Within the sediment, most artifacts are protected from rapid degradation. The material will be degraded and often chemically changed, requiring intense conservation treatment if recovered. However, artifacts can retain their detailed form and often their relative position in a site through many centuries of burial in underwater sediment.

Some sites may be located where nature continues to deposit more sediment than it removes. This situation often exists on the inside of a curve in a river, where heavier material drops out of the water column as the water slows. A second cause for burial has been the intense use of Maine's rivers as conduits for lumber industry waste material since the early 19th century. Sawdust, log ends, bark, and other timber waste were thrown into the rivers for more than a century. In some places along the estuaries, lumber mill waste deposits are reported to be more than 7 m thick.

PREHISTORIC SITE STUDIES

Professional archaeological investigations began in Maine in the late 1960s. Before that, work was focused primarily on prehistoric Maine, especially the elusive "red paint people." As early as the 1880s, archaeologists used cutting-edge techniques at a few sites while relic hunters excavated and looted some important sites.

Since the mid-1960s, professional archaeologists have studied many small coastal prehistoric sites, including habitation and burial sites along the estuaries, seashore, and islands. Prehistoric people evidently preferred the coastal region, possibly more than people in the historic period. Though they were not "seafaring" in the modern sense, evidence indicates they fished and traveled in dugout canoes for millennia.

Many sites are shell middens, where thousands of empty clam, mussel, or oyster shells are found. Typically, coastal prehistoric people processed the gathered shellfish at their village, where the shells accumulated through the centuries. In the many shell middens, deteriorating shells keep the soil alkaline rather than acidic, allowing the preservation of bone, antler, and tooth artifacts. David Sanger, University of Maine, has conducted extensive coastal and island surveys for the sites and has excavated a number of these artifacts (Sanger, 1979).

Turner Farm, on the shore at North Haven, has been one of the most fruitful maritime prehistoric site investigations in the state. Bruce Bourque, Maine State Museum, directed excavations there between 1971–1980. He found the site was occupied from ±5300 B.P. until the European settlement period, making the Turner Farm site the earliest-dated shell midden in New England. The inhabitants were maritime oriented in the summer months, gathering shellfish and using dugouts canoes to harvest fin fish and sea mammals. In spring and autumn, they hunted and fished in nearby rivers. In winter, there were some who hunted inland for larger game. Data from other archaeological sites and early European observations indicate that these seasonal changes were common for Maine native people (Bourque, 1995).

Underwater prehistoric archaeology studies have been few because of limited resources. In the late 1970s, fishermen dragging an area off Stonnington occasionally brought up stone artifacts in their nets. The subject area was an extension of a present peninsula, probably dry in 6000 B.P. but under 10 m of water today. Steven Cox, Maine State Museum, led two short reconnaissance inspections of the area. He found only two

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