

Maine Geological Survey
DEPARTMENT OF CONSERVATION
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OPEN-FILE NO. 79-23

Title: Historical Evidence of Sea-Level Change Along the Maine Coast

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Date: 1979

Financial Support: Preparation of this report was supported by funds furnished by the Nuclear Regulatory Commission, Contract No. AT (49-24)-0291.

This report is preliminary and has not been edited or reviewed for conformity with Maine Geological Survey standards.

Contents: 11 page report

Although this is the final report for Fiscal Year 1979, it is also a report of work in progress. The act of historic dating on the items in question has been one of the more difficult tasks undertaken by the writer in some time. This has not been from lack of cooperation, but from the lack generally of first class information.

Research field trips have been taken to Machias (2), Lubec, Addison (2), Augusta, Arrowsic (2), Phippsburg (2), and Portland. Research trips to libraries and archives have been taken to Portland, Augusta, Ellsworth, and the Machias area.

The most difficult areas to date precisely are the tidal dikes located so prominently in the Addison and Machias areas. These dikes were constructed over time by individual farmers seeking to control their output of salt hay, used for cattle in the woods operations common at the first settlement time. Later the dikes were maintained by local farmers who used the salt hay as a supplement, and in recent years some dikes have been repaired by persons who used the hay to hasten the burning of blueberry lands in the Addison and Columbia Falls area.

Settlers came to Addison just prior to the Revolution, from Martha's Vineyard, Massachusetts. They settled at Cape Split (now part of the section known as South Addison, and relatively uninhabited). Apparently on their first trips to the Addison area, these persons cut hay and carried it back to Massachusetts. Soon, probably after the Revolution, the visits became settlement. The need for hay increased, as most of the land now presently in meadow and pasture was covered with trees. The salt marshes offered an opportunity to provide a sure source of hay for these pioneers.

Apparently the farmers began to dike the locally present marshes, working as individuals or perhaps with an adjoining farm; and the work was also apparently reported as rainy day or slack-season work. Gradually they worked up the Pleasant River toward the current town of Addison. The dikes were kept in repair; and as population increased, more and more areas were settled, and more and more dikes were built. Finally by World War I, at the height of the dike period, both sides of the river and many of the tributaries were diked nearly to Columbia Falls. Most of the minor tributaries where natural salt marshes occurred were diked as well.

Locally conducted interviews with elderly and knowledgeable men in the Addison area suggest that repair of the dikes probably ended for the most part by World War I, and the dikes now to be seen are substantially lower than they were when they were in full usage. These interviews also suggest that the dike system was in full place by 1840 at the latest. It is probably true that the dikes we are suggesting for work in the area of coastal submergence date from the period 1795 to 1825. When work is done on the actual dating itself, it is our recommendation that it take place three to four meters behind the dikes as the intervening area was used to patch and repair storm and tide damage. The best dikes for dating are suggested on the Addison Quadrangle with the numerals 1, 2, 3 (Figure 1). These locations are in the area $44^{\circ} 37'$ north, and $67^{\circ} 44' 30''$ west.

The Machias area is somewhat similar. Farmers, this time from Scarborough, came to the Machias area seeking hay from the natural salt marshes in the Middle River area. These visits began about 1767. Settlement did not follow quickly,

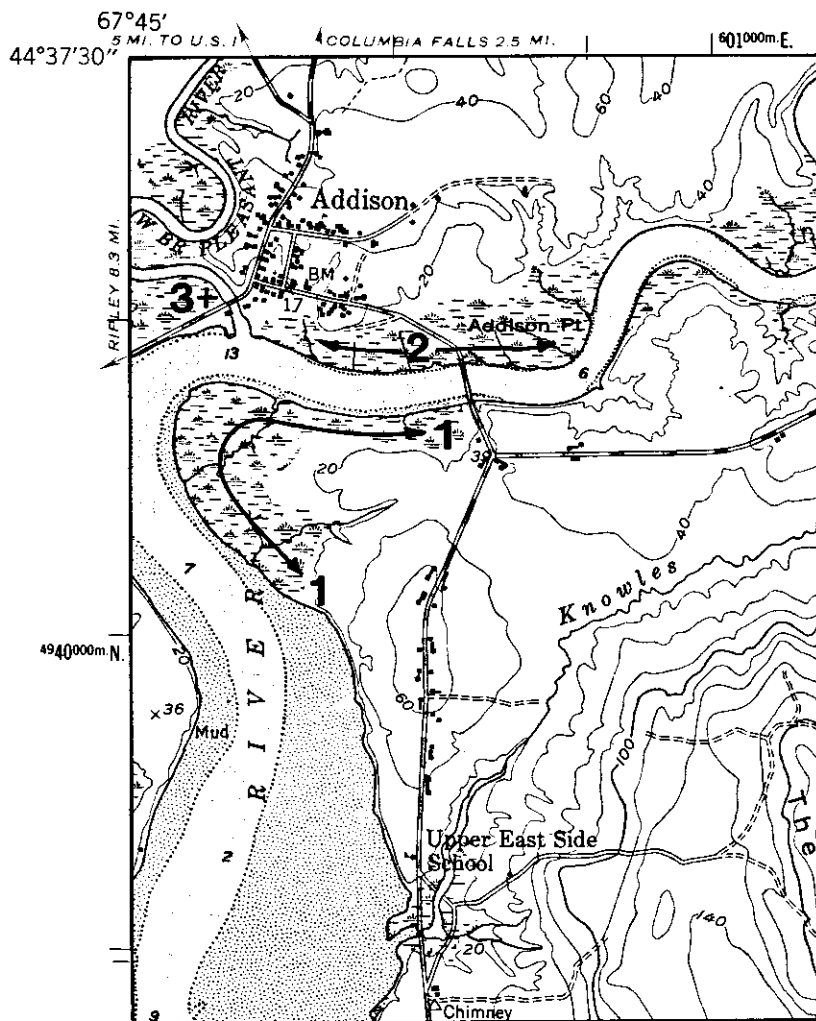


Figure 1. Map showing locations of dikes in northwest part of Addison 7.5-minute Quadrangle.

in part because of the Revolutionary War, as the area was in dispute. When settlement did begin, the first lands lotted out to the original fifteen settlers were the salt marshes. It was not until nearly 1790 that any substantial population arrived in the Machias area to farm and subsequently dike the marshes. The dikes were built in much the same way - by one or two farmers working in slack seasons. The network of marshes was less extensive than in Addison, but apparently the value of the hay was greater. According to the tax records of Machias for 1848 (earlier records are not available) diked marshes were taxed at a rate higher than any land in the area other than industrial property.

The marshes fell in disuse fairly rapidly thereafter, however, as Machias area lumbering began to diminish steadily. The technique of diking remained, however, and in 1858 a large dike was built to control the marsh at Middle River. Today, as one crosses the river on U.S. Route 1, this dike and its attendant marsh are visible to the north. The coming of the Washington County railroad disrupted some marshes and dikes including the dike and marsh marked No. 1 in Machiasport (Figure 2). The 1855 marsh dike, repaired in 1867 and 1868, was rebuilt again in 1926. On Figure 3 it appears as No. 2. No. 3 (Figure 3) is the marsh taxed in 1848 across from the Middle River.

Two other items are of considerable importance in the Machias area. Both have received considerable investigation, and more is being undertaken in conjunction with further work on the previously mentioned diked marshes.

The item marked No. 4 on Figure 3 is a group of old wharves and piers, built in the 1830's, apparently, and perhaps before, and generally allowed to deteriorate after 1880. They are interesting now as they appear to be out of the water only at dead low tide, while when they were in use they must have been out of the water at all times. No. 5 (Figure 2) is also very interesting. Located in East Machias it is the site of an extensive shipbuilding operation. The first vessel, the Andrew Jackson, went down the ways in 1827. The last vessel was launched in 1891 or 2. It stuck on mud in the channel and the yards had to be abandoned. Extensive salt marshes have grown over the area previously used as shipyard ways, storehouse, boarding houses and other buildings as the coastal area has changed substantially.

Another site is marked as No. 6 on Figure 4. Eventually this area, not yet visited, may be very interesting. It is a potential site of long duration, perhaps abandoned from subsidence; but as yet only the map and aerial photographs have been investigated.

Dikes used to control the salt marshes in the Machias - East Machias - Machiasport area again date approximately from 1795 to 1825. Efforts are being undertaken to date both of these networks of dikes more precisely, and it is hoped that by the end of August the time span may be narrowed even more.

The other items useful to this investigation include the British Canal at Castine. This canal was dug in 1779 and abandoned almost immediately, so the dating process in areas not disturbed by twentieth century road construction should be fairly uncomplicated.

To date the Army Corps of Engineers has been unable to come up with the initial work useful in this tidal heights and dating problem. They believe the original specifications exist, but as yet have not found them. In connection with another part of this project, a trip to the National Archives in Washington

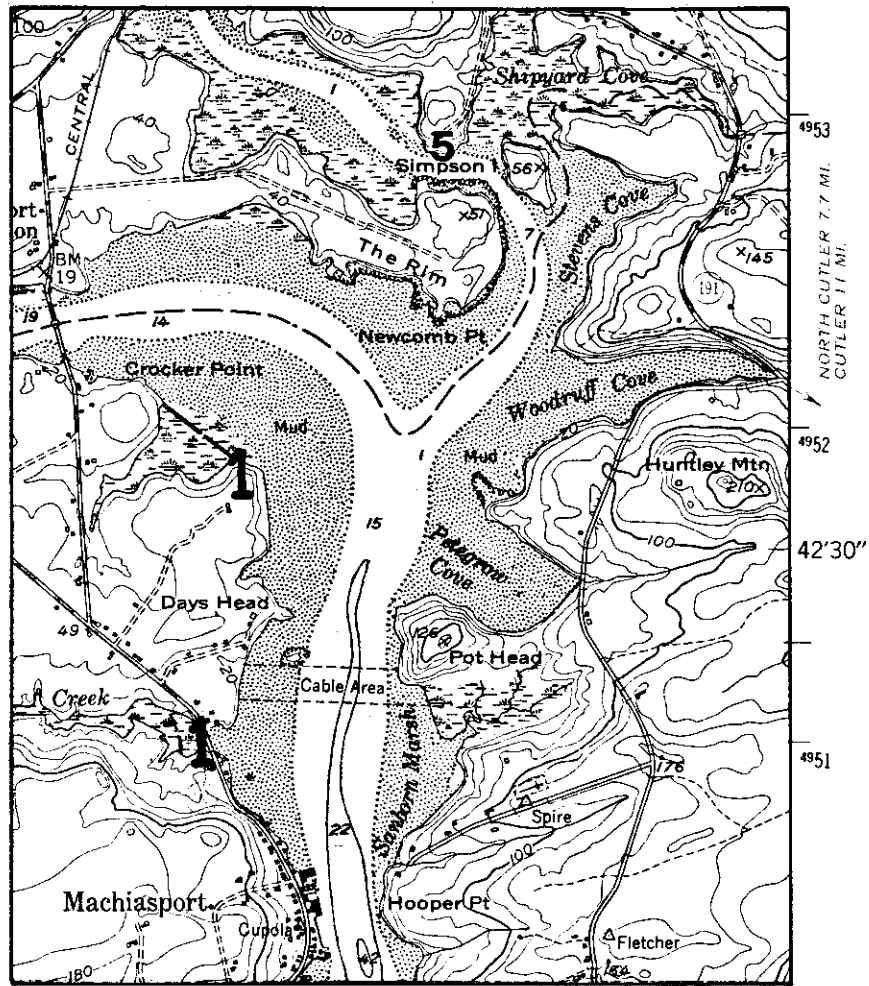


Figure 2. Map showing locations of dikes (1) and shipyard site (5) in northeast part of Machias 7.5-minute Quadrangle.

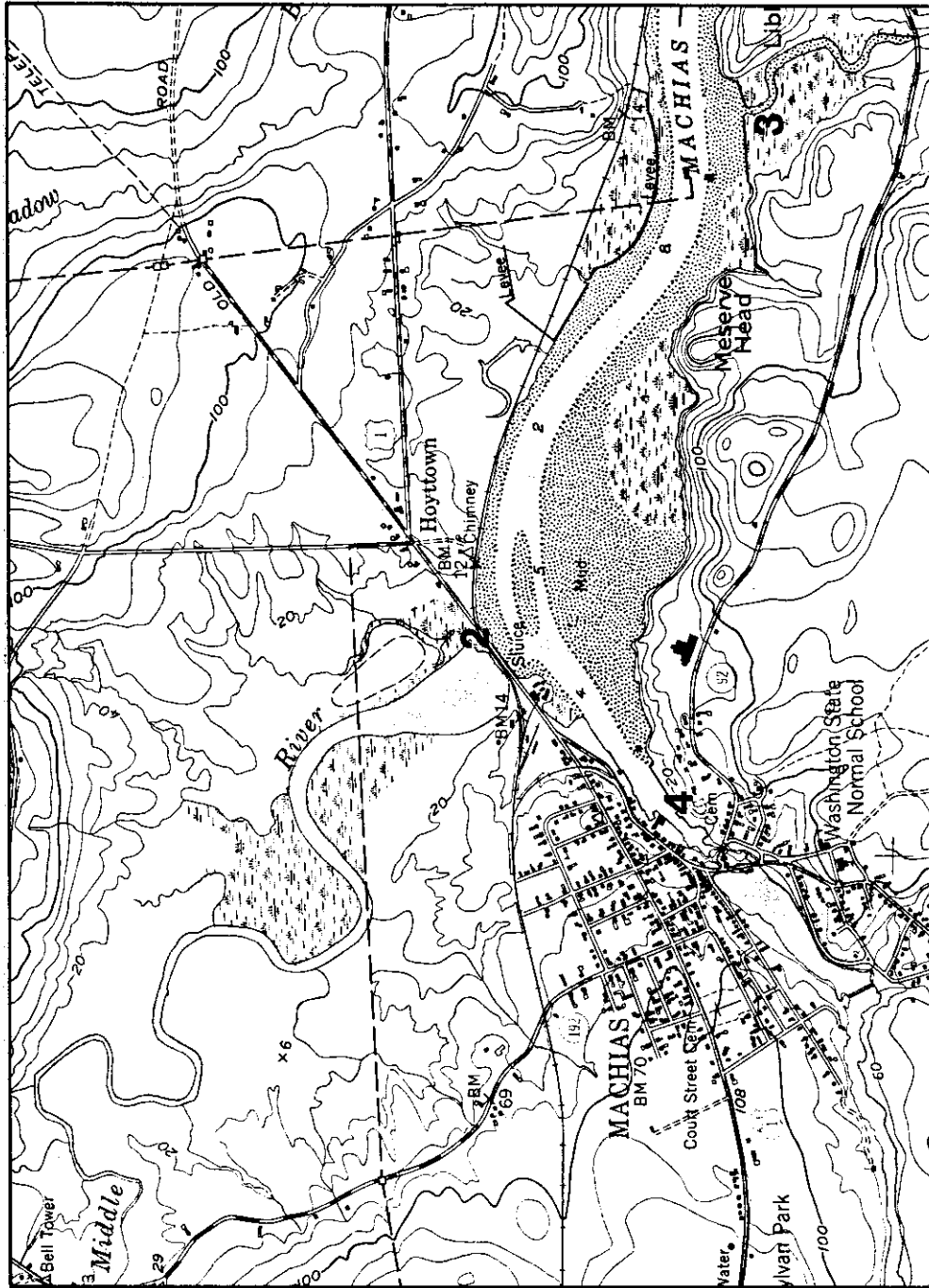


Figure 3. Map showing locations of dikes (2,3) and shipyard site (4) in northwest part of Machias 7.5-minute Quadrangle.

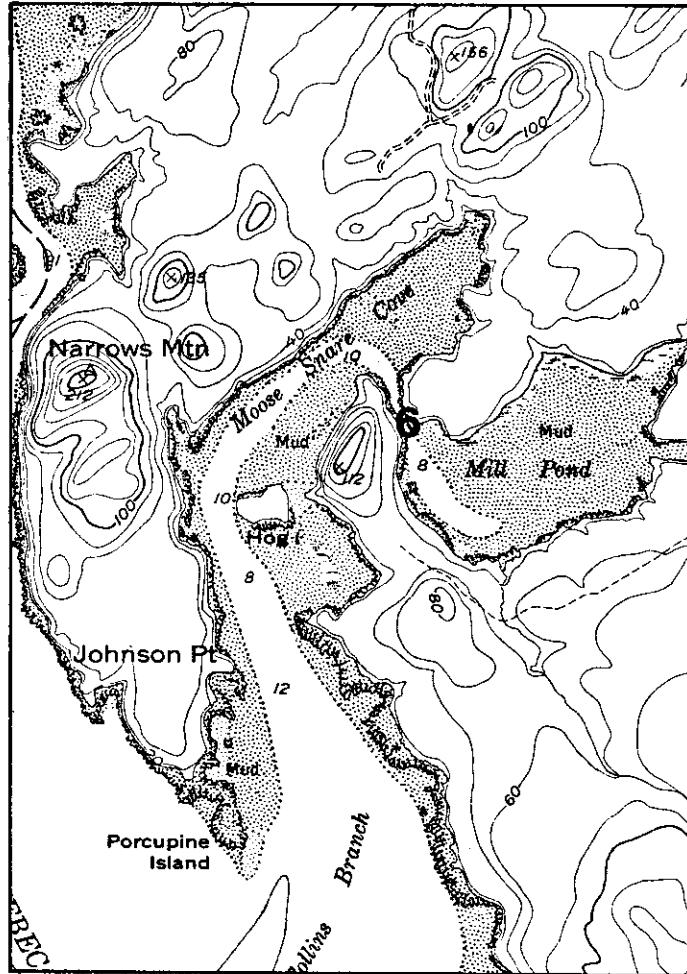


Figure 4. Map showing location of mill site in southern part of Machias 7.5-minute Quadrangle.

is planned for late August. It may produce the military figures in question.

Work on the Cumberland and Oxford canal is proceeding as well. The date of building is 1824; but as yet the original tidal heights are unknown, although the clam flats and marshes at the place where the canal comes to the sea in the Presumpscot River may be a good source if this work continues.

Much work has been given to the tidal mills at Arrowsic and Woolwich. These mills were in use in every inlet on these islands, as well as neighboring Phippsburg, beginning with the first ones in 1695, and remaining in some usage until 1921. At Winnegance, where at dead low water the piers used for the mills may still be seen, eleven mills were in operation as late as 1887. This site is marked No. 1 on Figure 5. At Mill Island, Arrowsic, a mill (No. 2) was in operation from a very early date until this century. This site, as yet unvisited because it is on private land, appears from long range views and aerial photographs to be a prime site. A third site (No. 3), visited by the research team, was in operation until 1921 and offers a possible mill site as well. The owners are very cordial. A fourth site (No. 4) is a very old dam, with silting and marsh building taking place behind it. The dam may be pre-Revolution in origin, and work continues on the dating process. A fifth site, just south of the Bath Quadrangle, is a network of diked and canalled meadows, on which some of the work may be from the 1930's, although the earliest of the work may be from the "normal" diking time from 1795-1825.

A final site very useful to dating is the canal dug in 1841, which now is the channel separating North Lubec from Lubec. The canal was in heavy usage until after the Civil War, as many vessels carrying lumber, provisions, and most importantly iron from the Pembroke Iron Works passed through the channel. The iron works died in the 1870's with the discovery of better smelting processes, and thus the time period is relatively short, and the marsh and silting action is clearly visible today. It must have begun immediately. This site is marked No. 1 on Figure 6.

Work is proceeding this summer in the papers of the Black-Cobb family who were the administrators of the William Bingham Maine lands. It is hoped that much may be determined about the hay lands and diked marshes, as apparently some correspondence and many journals and ledgers have records of hay cut, purchased, sold, and so on. More work will be necessary on the Thomaston lands of Henry Knox, diked in 1795 and extensively hayed before lime burning became the major local activity. The proposed site is marked No. 1 on Figure 7.

Many other sites have been identified in Kittery, Cape Elizabeth, Scarborough (where a large diked meadow exists from 1866), Harpswell, Longfellow Island (off Yoho Point in the Addison area), and elsewhere. In addition long continuous observations of tidal levels were taken in Eastport, Portland, and North Haven in the period just prior to the Civil War. The investigators hope to provide this data by the end of the summer, and the projected trip to the National Archives concerns these findings. Placement of a self-registering tidal gauge at these same sites will give after time a good analysis of coastal movement in these three areas.

The following table indicates the best sites with their dates as presently known. They proceed west to east on the coast of Maine.

1. Harpswell - a possibility of a diked marsh from 1781.
2. Phippsburg - diked tidal marsh, and a dam at Parker Head. Dates pending,

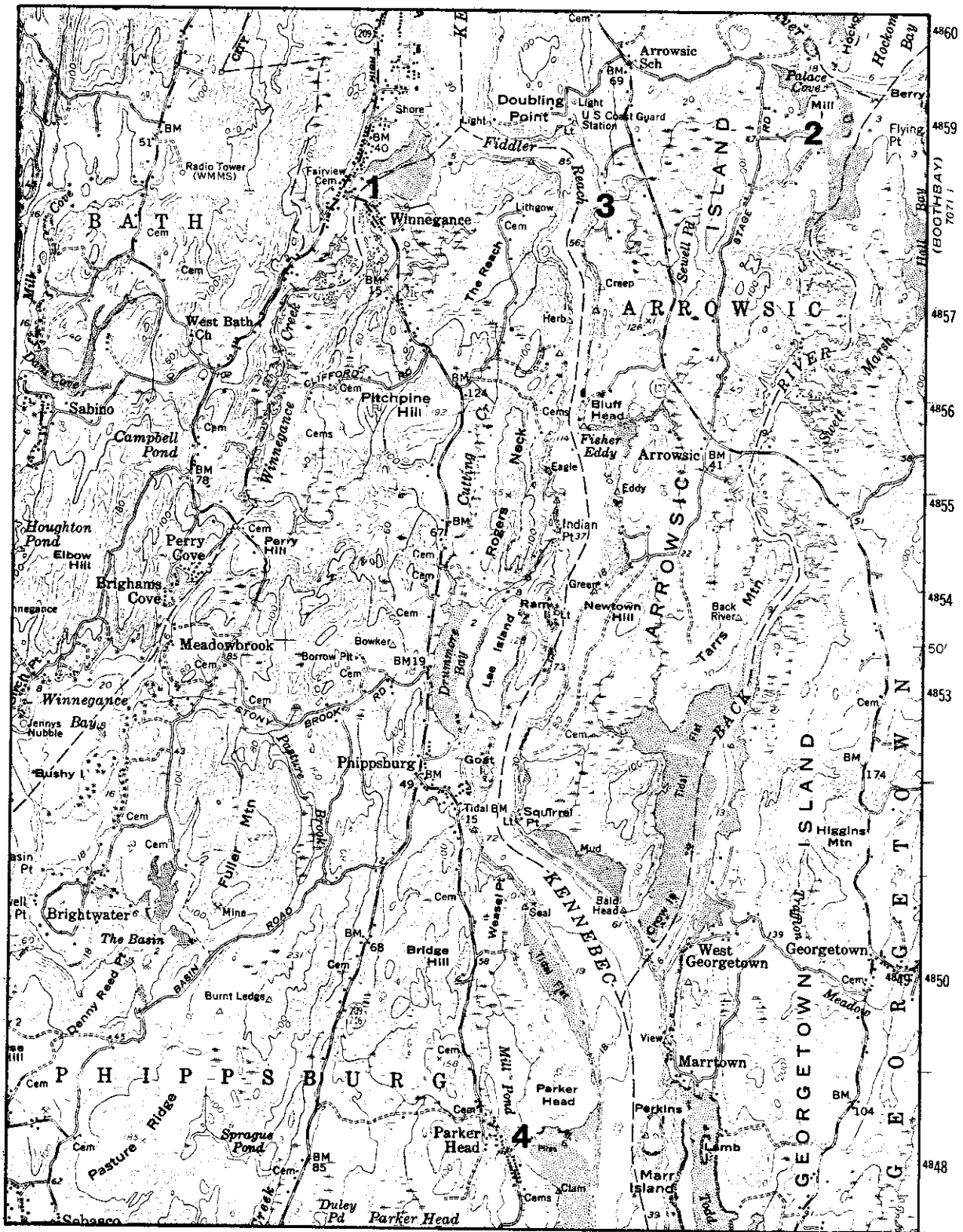


Figure 5. Map showing locations of tidal mill and dam sites in Bath 15-minute Quadrangle.

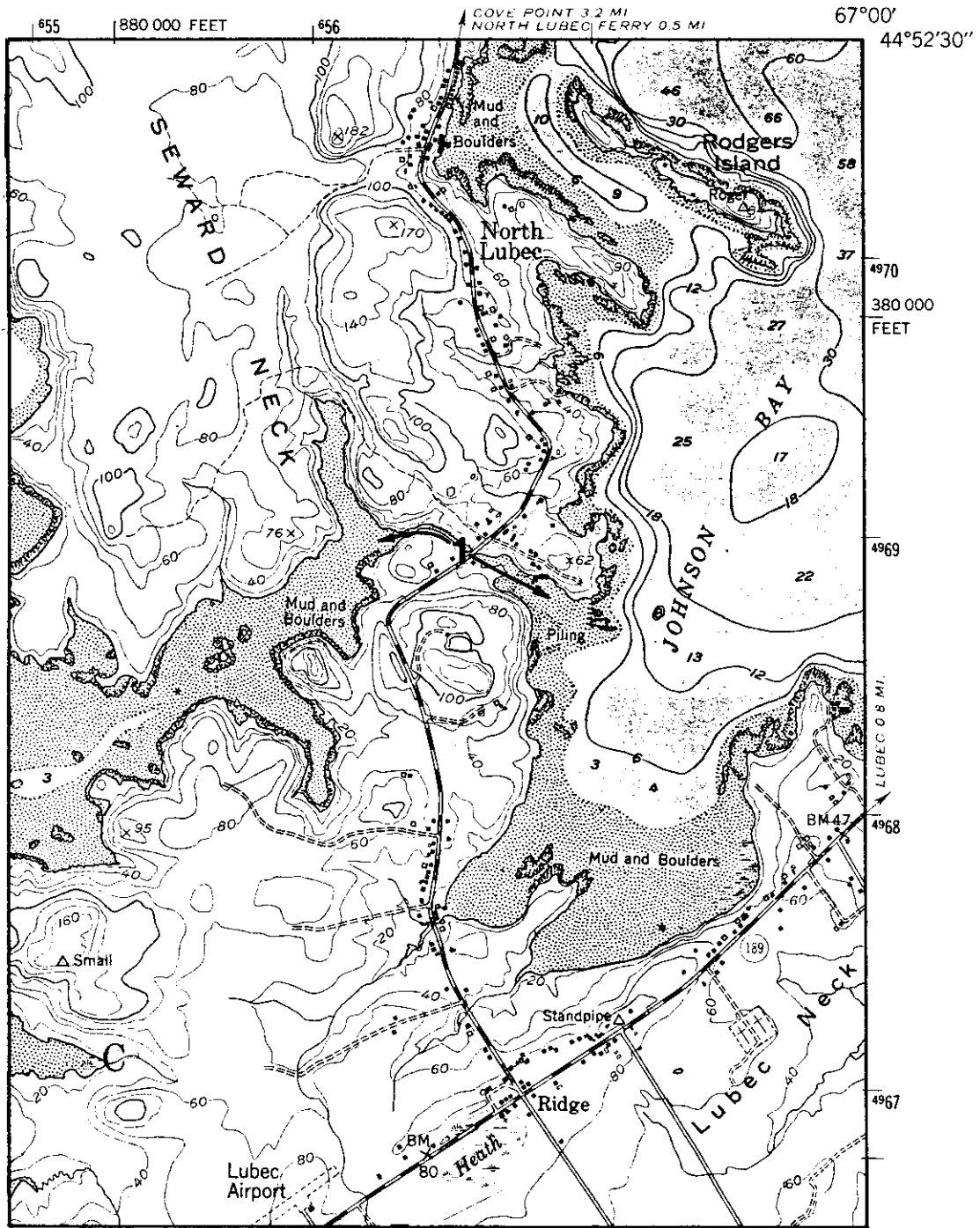


Figure 6. Map showing location of canal in northeast part of West Lubec 7.5-minute Quadrangle.

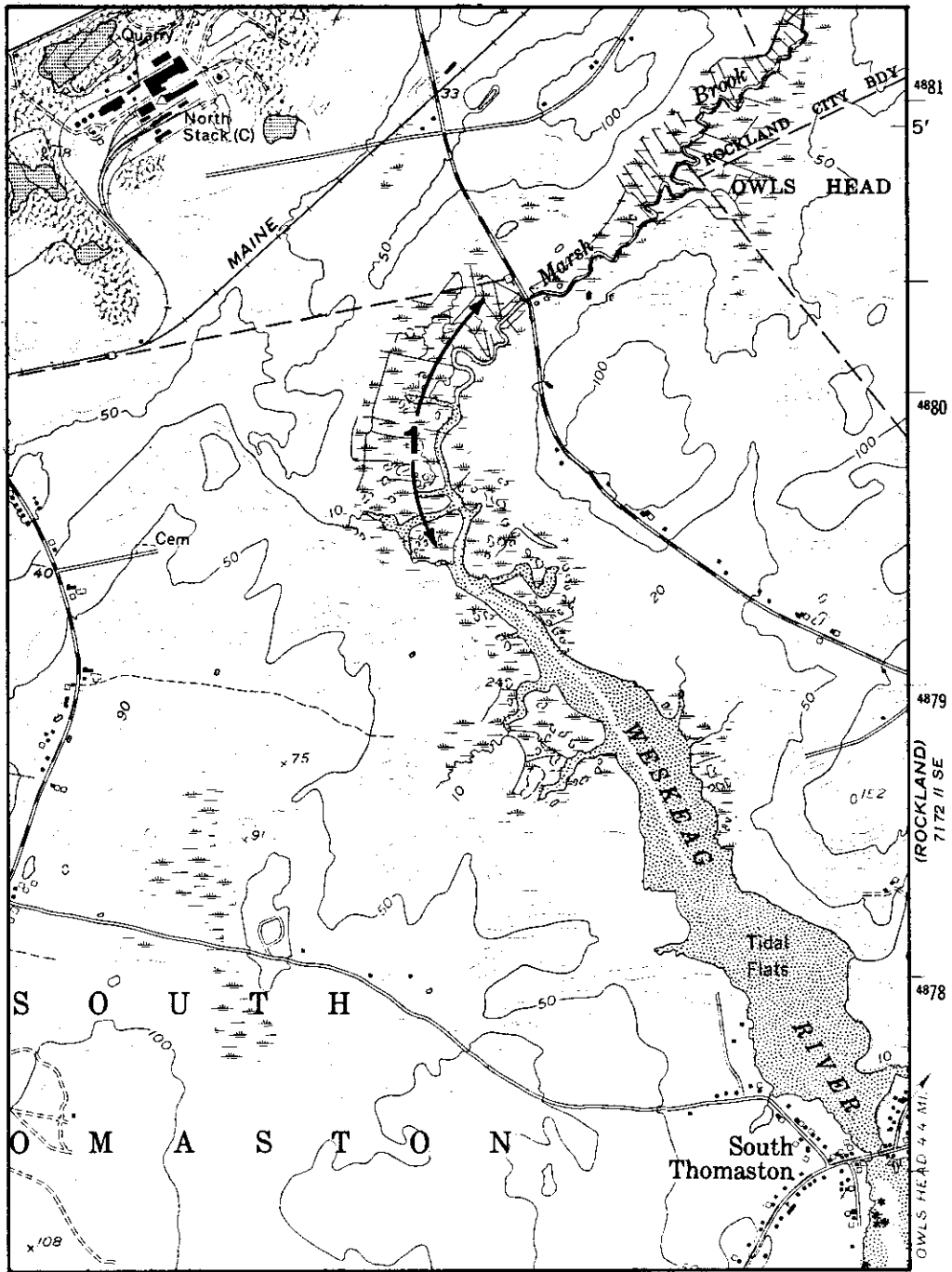


Figure 7. Map showing location of salt marsh (diked in 1795) in eastern part of Thomaston 7.5-minute Quadrangle.

but the dam is very early, 1800 probable, and 1660 perhaps.

3. Arrowsic - three sites, all from early in the nineteenth century.
4. Thomaston - diked marsh from 1795.
5. Pulpit Harbor, North Haven - complete daily tidal record taken, and being sought. Record kept 1855-1861.
6. Longfellow Island, SW of Yoho Head, tidal mill from 1860's, and perhaps earlier.
7. Castine - English canal, 1779.
8. Addison - 3 good diked marshes, proposed dates 1795-1825.
9. Main diked marsh - Middle River, Machias, completely repaired in 1866, and new clapper valve in 1926.
10. Other in Machias, East Machias, Machiasport area. Shipyard Cove, East Machias, flourished 1827-1891. Dikes, as on map, before 1848. Probable Period 1795-1825.
11. Lubec - canal separating North Lubec from Lubec built 1841. A tidal mill site exists about 1 km from canal up the neck.
12. Eastport - A tidal record exists for every tide from 1858 to 1863.