

PLAN F-1

EASTPORT HARBOR

MAINE

83092 Eastport (N.E. Me.)

PRELIMINARY EXAMINATION

REVIEW OF REPORTS



CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION, BOSTON, MASS.

JANUARY 13, 1956

NOT FOR PUBLIC RELEASE

PRELIMINARY EXAMINATION
REVIEW OF REPORTS

EASTPORT HARBOR
MAINE

SYLLABUS

The Division Engineer considers that the benefits resulting from construction of a breakwater to provide a protected landing place for commercial navigation at Eastport, Maine are sufficient to warrant further investigation by the United States. He, therefore, recommends that a survey be made to determine the extent and nature of such improvement and its economic justification.

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION
BOSTON, MASS.

NEDGW

13 January 1956

SUBJECT: Preliminary Examination (Review of Reports) of Eastport Harbor, Maine

TO: Chief of Engineers, Department of the Army, Washington 25, D.C.

AUTHORITY

1. This report is submitted in compliance with a resolution adopted December 6, 1950 by the Committee on Public Works of the United States Senate, which reads as follows:

"RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby requested to review the report of the Chief of Engineers on Eastport Harbor, Maine, transmitted to Congress on May 25, 1937, with a view to determining whether any modification of the recommendations contained therein with respect to improvement of the harbor is advisable at this time."

2. A report of preliminary examination scope was authorized December 18, 1950 by the Chief of Engineers.

SCOPE OF EXAMINATION

3. In the preparation of this report, consideration of the locality has been limited to office study of the data obtained from existing records, from local representatives, and from a public hearing. No detailed field work has been undertaken.

DESCRIPTION

4. Eastport Harbor is located on the east side of Moose Island, Maine, and on Friar Roads, an international boundary passage between Moose Island and Campobello Island, New Brunswick. The harbor is the most easterly port in the United States, and lies about 40 miles east-northeast of Machias, Maine.

5. Friar Roads is a rectangular body of water extending about two miles north and south, and about one mile from Campobello Island on the east to Moose Island on the west, with deep water throughout the entire area except along the Eastport waterfront itself. It has two entrances from the sea, one north and one south of Campobello Island. The north entrance is through Head Harbor Passage, a straight natural channel, in Canadian waters, 2,000 feet wide and 90 feet or more deep between Campobello Island and Deer Island. The south entrance is through Quoddy Roads and Lubec Narrows, international boundary waters, which have a dredged channel providing a depth of 12 feet at mean low water for a width of 200 feet. Page Rock and Margie Rock, with depths of 16 and 14 feet respectively, lie close to the city's shore. Clarks Ledge, about 200 yards off the wharves at the northern end of Eastport, is covered at high water. Anchorage is available off the city in Friar Roads itself, the best anchorage being reported to be off the Custom House.

6. Eastport Harbor is exposed to winds from the north through the northeast, and to winds from the south. Although protected to the east and southeast by Campobello Island, it is exposed to limited fetches of wind from these directions. Prevailing winds are from the south during the summer, and from the west through the northwest during the winter, the average velocity for the year being 10.7 miles per hour. Storms of maximum velocity are from the east and northeast. The mean tidal range is 18 feet, the maximum is 25.9 feet, and the minimum 11.0 feet. Tidal currents in Friar Roads have an average velocity of 3 knots at strength. Whirlpools and eddies that are sometimes dangerous for small boats are encountered between Dog Island and Deer Point, about 0.5 miles northwestward of the harbor, at the eastern end of the Western Passage to Passamaquoddy Bay. Such whirlpools and eddies are reported to be strongest about three hours after low water. The locality is shown on U. S. Coast and Geodetic Survey Chart No. 801, and on the plan accompanying this report.

TRIBUTARY AREA

7. The City of Eastport occupies the whole of Moose Island, and is important as one of the major centers of the nation's sardine canning industry, and as a summer colony. The manufacture of extracts from fish scales and scrap for use in the manufacture of paints and other materials is also one of the city's major industries. In addition, several other small industries are located at Quoddy Village, at the western end of the island. In 1955 the permanent population of the city was about 3,200 and the assessed real estate evaluation was \$1,633,510. The port is a customs port, and the city is a rail terminus and shopping center for many residents of nearby islands. It is connected to the north and the west by the Maine Central Railroad, which has spurs to two wharves. In addition, the city is served by four ferries: the Deer Island Ferry, which operates between Eastport, Deer Island, Campobello Island, and St. Andrews, New Brunswick the year round; the Passamaquoddy Ferry, which transport general cargo and freight between Eastport and Lubec the year round; a car ferry to Deer Island, which operates during the summer;

and The Seaport Navigation Ferry which transports passengers between Eastport and Lubec during the summer. Maine State Route No. 190 extends from U. S. Route No. 1 and terminates in the city.

BRIDGES

8. There are no bridges crossing any portion of the waterway under consideration.

PRIOR REPORTS

9. There has been one prior report on Eastport Harbor. This report, an unpublished survey report submitted to Congress on May 25, 1937, is the report under review. The report was unfavorable to the construction of a breakwater extending from the waterfront at Eastport and designed to provide protected anchorage area. Benefits accruing to the then existing commerce at Eastport were found to be inadequate to justify the relatively high construction cost of the desired breakwater, particularly inasmuch as the breakwater which was found to offer the maximum area of protection was in a location then unacceptable to local interests.

EXISTING CORPS OF ENGINEERS PROJECT

10. There is no existing Federal project for Eastport Harbor, and no improvements for navigation have been made either by local or State interests. An existing project for Lubec, authorized by Congress in 1894, and modified in 1954, provides for the improvement of the southern entrance to Friar Roads and Eastport Harbor. This project provides for a channel 500 feet wide and 12 feet deep through Lubec Narrows, and for the extension of a previously constructed breakwater at Gun Point, and the construction of a stone breakwater at Short Point.

TERMINAL AND TRANSFER FACILITIES

11. Approximately 20 wharves are located along the easterly shore of Eastport, on the westerly side of Friar Roads, extending for a distance of about one mile from north to south, with depths varying from 0.0 to 18.0 feet at mean low water at their ends. Among the most active of these are 9 used in the handling of fish, 5 used by ferries and in the handling of freight and general cargo, one used as a customs wharf, one used in the handling of oil and tar, one used by the American Can Company, and the Wadsworth Wharf at which ships chandlery, fuel, and supplies are available. In addition, there are 2 fish wharves in Prince Cove, south of the main harbor area, 2 in Broad Cove on the southerly side of Moose Island, and 2 on the north side of the island. Two wharves, owned by the Maine Central Railroad and used by the Passamaquoddy Ferry and Navigation Company, are equipped with rail sidings and transit sheds. Repairs to machinery are made off the docks by 2 marine repair shops, and machinery is installed in Canadian built ships.

IMPROVEMENT DESIRED

12. In order to give local interests an opportunity to express their views with respect to improvement in Eastport Harbor, a public hearing was held at Eastport, Maine on September 28, 1955. The hearing was attended by representatives of the State and City governments, by representatives of the packing and canning industries and other fishing interests, and by representatives of the ferry companies and other business interests. Among the exhibits presented at the hearing were letters from four packing companies and from the Passamaquoddy Ferry and Navigation Company, and a brief prepared by the Eastport Citizens Committee for Harbor Improvement.

13. Local interests expressed a desire for the construction of a breakwater at some point along the waterfront, or nearby, to provide a protected landing area where fish and general cargo could be landed in rough weather, and if possible to provide sufficient area for the protected anchorage of a small number of fishing and other craft. Although evident advantages would accrue from the location of the breakwater near the business center of the city, local interests expressed the belief that if engineering considerations made construction either to the north or the south of the central waterfront more feasible, substantial benefits would nonetheless accrue.

14. Local interests stated, generally, that the highly exposed nature of the harbor, together with the frequency of relatively high winds, many times made it difficult or impossible to land fish or other cargo, with consequent loss through delay. Since herring, which constitute a large percentage of the fish catch, are highly perishable, such delay frequently results in a substantial decline in value before the fish can be landed. Local interests stated further that inasmuch as no protected anchorage was now available along the waterfront, it was necessary for fishing vessels to anchor at remote points, with consequent loss of time. The desired breakwater, it was believed, would provide adequate protection to craft while landing and unloading the catch, and limited protected anchorage space in emergencies.

15. Local interests indicated that their desires were essentially the same as those considered unfavorably in the unpublished survey report of 1937, but expressed the belief that the increase in the amount of commerce, and particularly in the number of fish plants in Eastport will produce substantially greater benefits than would have then been provided by the desired construction. In addition, the belief was expressed that the majority of the potential benefits would accrue from the location of the breakwater at any point along the waterfront, rather than, as was thought in 1937, only at one or two possible points. Finally, it was observed that rights of way which had not been available in 1937 would now be provided, thus making possible the consideration of additional locations.

16. It was stated that at the present time there is no safe berth

along the waterfront during an easterly, northeasterly, or southeasterly storm, the directions from which storms predominate. During such storms, a boat must be moved to the opposite side of the island to lay at a private wharf, the MacNichol Wharf, which has been condemned and which at best can accommodate only four or five boats. The only protection owners of small boats have in rough weather is to beach their boats.

17. At present, the only public landing is the wharf approach to the Custom and Immigration offices, which is rented by the city from a local business man. The landing offers no protection from wind or sea, and is inadequate to handle the traffic moving over it. However, were the desired breakwater provided so that a protected area were available, the city has been authorized by the State of Maine and in a city referendum to build or improve a public landing. With the Act of the State Legislature, the city has the necessary authority to act in any manner it may deem necessary to provide the required local cooperation for the desired improvement.

18. The Passamaquoddy Ferry and Navigation Company, which transports an average of about 30,000 tons of commodities annually between Lubec and Eastport, stated that no wharf or anchorage in Eastport Harbor offered protection during heavy onshore winds. They further stated that it was necessary to have vessels fully manned and to navigate them from wharf to wharf and cove to cove to derive any protection under storm conditions. They cited an instance of considerable damage sustained by a sardine carrier at Deep Cove during an easterly storm in the Fall of 1954, and of damage sustained by their own vessel when it parted 72 thread deck lines doubled while berthed at the Maine Central Railroad Company wharf in January, 1955.

19. The Holmes Packing Corporation, which has received over its wharf an average of approximately 2,600 tons of fish annually in an average of 133 vessel trips, stated that their wharf is completely exposed to easterly winds, from which direction maximum storms occur, and that during severe weather it is necessary to maintain crews aboard their carriers and move them from cove to cove as the wind shifts. They stated their belief that a breakwater would greatly facilitate the fishing commerce of the port, and expressed the opinion that the area protected should be sufficient to shelter a substantial number of small boats in emergencies.

20. The Peacock Packing Company, which owns four boats and charters eight Canadian boats, stated that it is necessary for both American and Canadian vessels to seek refuge at nearby Canadian Islands in bad weather. They stated that at present it is impossible to leave a boat at the Eastport waterfront in any storm from the northeast, east, or southeast; that it is necessary to get boats away from the waterfront in rough weather, and many times to shift them from point to point to gain protection. They cited the loss in December, 1954, of a 30 foot boat valued at \$3,000 and used for personal business.

21. The Riviera Packing Company stated that high tides at Eastport

are dangerous to vessels in the vicinity of Clarks Ledge, and that the lack of protected public landing facilities was highly detrimental to shipping at Eastport, whose deep and extended harbor would otherwise be highly attractive to commerce. They expressed the belief that the provision of adequate protected landing facilities would encourage the shipping of other Maine products from Eastport, since it is a conveniently accessible rail terminus. They cited the fact that when adverse weather conditions prevent sardine carriers from landing their catch at Eastport, the canning plants, upon which the economy of the town is heavily dependent, are deprived of their raw materials and cannot operate. They further stated their opinion that more adequate protection would encourage the further development of tuna fishing and tuna canning, which has recently been started at Eastport. They particularly cited the proximity of Eastport to rich fishing grounds, which makes it a natural fishing port, and hence in their opinion potentially productive of substantial benefits to be derived from the desired improvement.

COMMERCE

22. Reported commerce at Eastport Harbor averaged about 85,000 tons annually from 1950 through 1954 inclusive, varying between a maximum of about 108,000 tons in 1952 and a minimum of about 63,000 tons in 1954. Of the total average commerce, about 50% is in fish and fish products. In 1954, of a total commerce of over 63,000 tons, approximately 35,000 tons or about 55 percent was fish and fish products; about 8,000 tons or 13 percent was metal and metal products; about 6,500 tons or 10 percent was inedible animal products; and about 13,500 tons, or 22 percent was other commodities. In addition to this commerce, records indicate an average of approximately 90,000 passengers annually landed at Eastport from 1950 through 1954 inclusive.

VESSEL TRAFFIC

23. A total of 31,522 vessel trips were reported in Eastport Harbor in 1954. Eastport is the home port for approximately 60 fishing and other commercial craft ranging in length from 35 to 80 feet. Between September and January from 12 to 15 trawlers annually fish out of Eastport, and during 1954-55 a fleet of 18 to 20 commercial scallop boats from all along the Maine coast made their headquarters at Eastport and are expected to continue to do so. As a customs port, Eastport Harbor is used by large numbers of transient vessels, commercial fishing boats built in Nova Scotia entering through Eastport, and foreign entries and clearances through the port exceeding those in any other port in the State of Maine.

DIFFICULTIES ATTENDING NAVIGATION

24. The difficulties attending navigation in Eastport Harbor are those associated with extreme tides, strong tidal currents, and lack of anchorage areas protected from relatively frequent winds and storms.

WATER POWER AND OTHER SPECIAL SUBJECTS

25. The waterway is tidal. Matters of flood control, pollution and related subjects are not pertinent to this investigation. None of the contemplated work would have an adverse effect on wildlife or shellfish.

SHORE LINE CHANGES

26. The breakwater requested by local interests would have no adverse effect on the configuration of the shore line at Eastport Harbor.

DISCUSSION

27. Eastport Harbor, located on the east side of Moose Island, Maine, and on Friar Roads, an international boundary passage between Moose Island and Campobello Island, New Brunswick, is the most easterly port in the United States. Friar Roads and Eastport Harbor are approached from the north through Head Harbor Passage, a straight natural channel 2,000 feet wide and 90 feet or more deep through Canadian waters, and from the south through Quoddy Roads and Lubec Narrows, international waters, which provide an improved channel 500 feet wide and 12 feet deep. Eastport Harbor is exposed to winds from the north through the northeast and from the south, and to limited fetches from the east and southeast. Prevailing winds are south during the summer and west to northwest during the winter, with an average velocity for the year of 10.7 miles per hour. Winds of the highest velocity are from the east and northeast. The mean range of tide is 18.0 feet, with a recorded maximum of 25.9 feet, and a minimum of 11.0 feet. Tidal currents in Friar Roads have an average velocity of 3 knots at strength.

28. The area tributary to Eastport Harbor is the city of Eastport, which occupies all of Moose Island, and had a permanent population of about 3,200 and a real estate evaluation of about \$1,633,000 in 1955. Located within 5 to 30 miles of excellent fishing grounds, the harbor is a major fishing port, and one of the important centers of the nation's sardine canning industry. At present there are 7 sardine packing plants, and several factories producing fish meal and pearl essence, as well as a number of fresh fish companies. In addition, Eastport is a customs port, a rail terminus, and the shopping center for many residents of nearby islands, the permanent populations of which are substantially increased by summer residents and vacationists. The city is connected to the north and the west by the Maine Central Railroad, and is served by two year round ferries as well as two additional ferries which operate during the summer only. Maine State Route No. 190, extending from U. S. Route No. 1, terminates in the city.

29. Local interests desire the construction of a breakwater, preferably a rock-filled timber crib structure, which will be designed to provide a protected basin for fishing craft and other small vessels, and

to provide a protected area where cargo can be unloaded without delay during rough weather. If engineering considerations permit, local interests prefer such a breakwater located near the business center along the central waterfront, but a location removed from the center, if such proves more feasible, would be fully acceptable. Local interests state that numerous rights of way along the waterfront are now available, and if none of these prove to be at the most practicable location, the Eastport Wharf Authority is authorized by the State of Maine to acquire such rights of way as may be necessary.

30. The stated desires of local interests are very similar to those expressed in 1936, at which time an unpublished survey report submitted to Congress on May 25, 1937 found prospective benefits inadequate to justify the construction of a breakwater at the only site then both practicable and acceptable to local interests. Since that time, commerce has increased and the fishing industry in Eastport has expanded substantially. During the five year period from 1950 through 1954, inclusive, reported commerce averaged over 85,000 tons per year, of which about 50 percent was in fish and fish products. The harbor is the year round home port for some 60 fishing and commercial craft, the base for 12 to 15 trawlers from September to January annually, and more recently the temporary base for a fleet of 8 to 20 scallop boats during a part of the year. In addition, it is a customs port and handles an average of about 90,000 passengers per year.

31. Benefits to commercial navigation resulting from the construction of the breakwater desired by local interests would accrue primarily from the reduction in deterioration and loss of value of fish cargoes or from increase in fishing time gained by the reduction or elimination of delay in landing the catch at Eastport; from the reduction or elimination of delay in the transport of general cargo; from the provision of a safe anchorage for fishermen nearer home and the consequent reduction of travel time; from the reduction of direct damage sustained to general cargo landed under adverse conditions; and from the reduction of vessel damage.

32. Of these benefits, the major part would accrue from the increase in fishing time gained from the reduction or elimination of delay in landing the catch at Eastport. The operation of the cannery boats at Eastport is as follows: fishing vessels hold their fish alive in seines until the carriers arrive. The fish are then pumped into the carriers, being killed and half scaled in the pumping. If the fish remain in the carrier more than 6 hours after they have been killed, they become trash fish at a value of only about one third their value as fresh fish. In practice, if the weather is such that fish cannot be landed, the carriers will not pick up the catch from the fishing craft and try to bring it into Eastport. Consequently, if the fish are running, the possibility of additional catches is lost, inasmuch as the fishermen cannot catch more until their nets have been emptied. It is believed that the consequent time loss to the fishermen and to the canneries is actually greater than the loss estimated on the basis of spoilage assuming the fish were picked up

and could not be landed. Since such a loss is not susceptible of evaluation, however, benefits for the purposes of this report have been assumed to be equivalent to the loss from spoilage.

33. Under present exposed conditions, waves caused by winds of 25 miles per hour or more close Eastport for fishing vessels and other small craft which wish to utilize the harbor. Such conditions occur about 12 days per year during the fishing season which extends from April 15 to December 1. Were a protected landing available, so that the catch could be landed during adverse weather, it could be pumped into trucks and transported to the various canneries at a small additional cost. Such a method has been used in the past by the Maine Sardine Company and the Riviera Packing Company, which unloaded at the Customs Wharf and trucked to their own plants during 1950 to 1952, when tide conditions left inadequate depth at their own wharves. Since a single cannery uses approximately 50,000 pounds of fish, or one carrier load, per day, the provision of a protected landing area which permitted carriers to land an adequate supply for the seven operating canneries either on all of the 12 days now estimated to be lost by reason of bad weather, or on some substantial fraction of these days, would produce very substantial tangible benefits.

34. Under present conditions, crews operating carriers for Eastport canneries must live at other points in order to be able to leave their boats unattended. A protected anchorage at Eastport would permit some of the 46 carriers to remain at Eastport, with consequent elimination of the delay required for the home trip after unloading, a delay estimated at an average of about 1 hour for approximately 100 days per year.

35. In addition to the benefits to the fishing fleet, a protected landing and anchorage would provide benefits to the ferry companies and to other companies engaged in the transport of general cargo and other commodities. These benefits would accrue from the reduction of lost operating time, and from the reduction of direct cargo loss or damage sustained while loading or unloading cargo under adverse conditions. Further benefits in the form of reduction of vessel damage to both fishing and other craft would accrue from the provision of a protected anchorage, the extent of such benefits being dependent upon the size of the protected area.

36. In addition to the tangible commercial benefits outlined above, substantial intangible benefits would accrue through the provision of a protected landing and anchorage area at Eastport. The safety of large numbers of passengers using the port would be increased; the use of a naturally deep and extended harbor at a rail terminus for additional commerce would be encouraged; and desirable protection for numerous transient craft on a main thoroughfare in an area subject to sudden winds and storms would be provided. Though not readily susceptible of monetary evaluation, these benefits are considered significant.

37. The total benefits accruing from the provision of a breakwater

at Eastport will vary according to the location of the structure and the size of the protected area. The survey conducted by the Corps of Engineers in 1936 considered three breakwater locations, two of these, one an L-head breakwater extending from the central waterfront, and one north of the business center, at Clarks Ledge, appear to be feasible at this time. The northerly of the two, while providing far more protected area, and hence more benefits from reduction of vessel damage and elimination of delay resulting from the necessity for fishermen to anchor at remote locations, provides lesser benefits to the substantial amounts of general cargo commerce and ferry traffic. No accurate estimate of the relative merits of these two locations can be made without further study. In addition, it would appear that the destruction of certain wharves by fire, the acquisition of new rights of way by the City of Eastport, and the present authority of the city to acquire such additional rights of way as may be necessary, would require the consideration of additional locations not accessible in 1936.

38. Though the cost of breakwater construction at either of the locations considered by the previous report, or at adjacent locations is estimated to be relatively high in view of the deep water at Eastport, it is considered that the very substantial general benefits expected to accrue to fishing and other commerce would probably produce a favorable benefit cost ratio for the desired improvement, or some locally acceptable modification thereof.

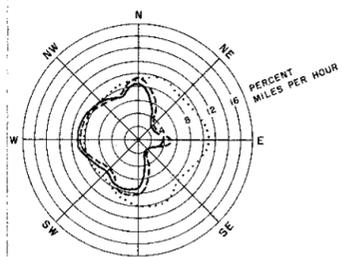
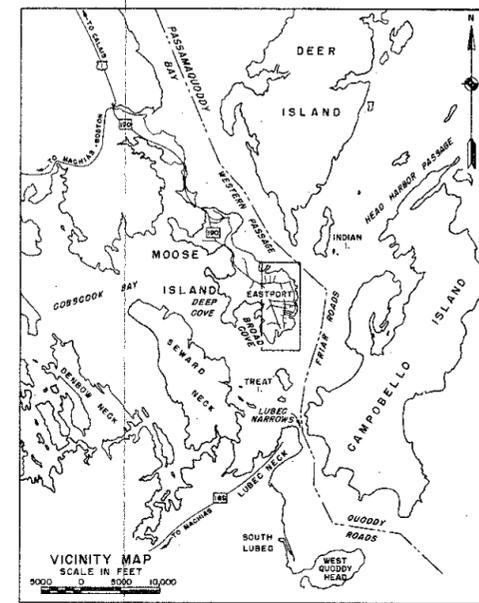
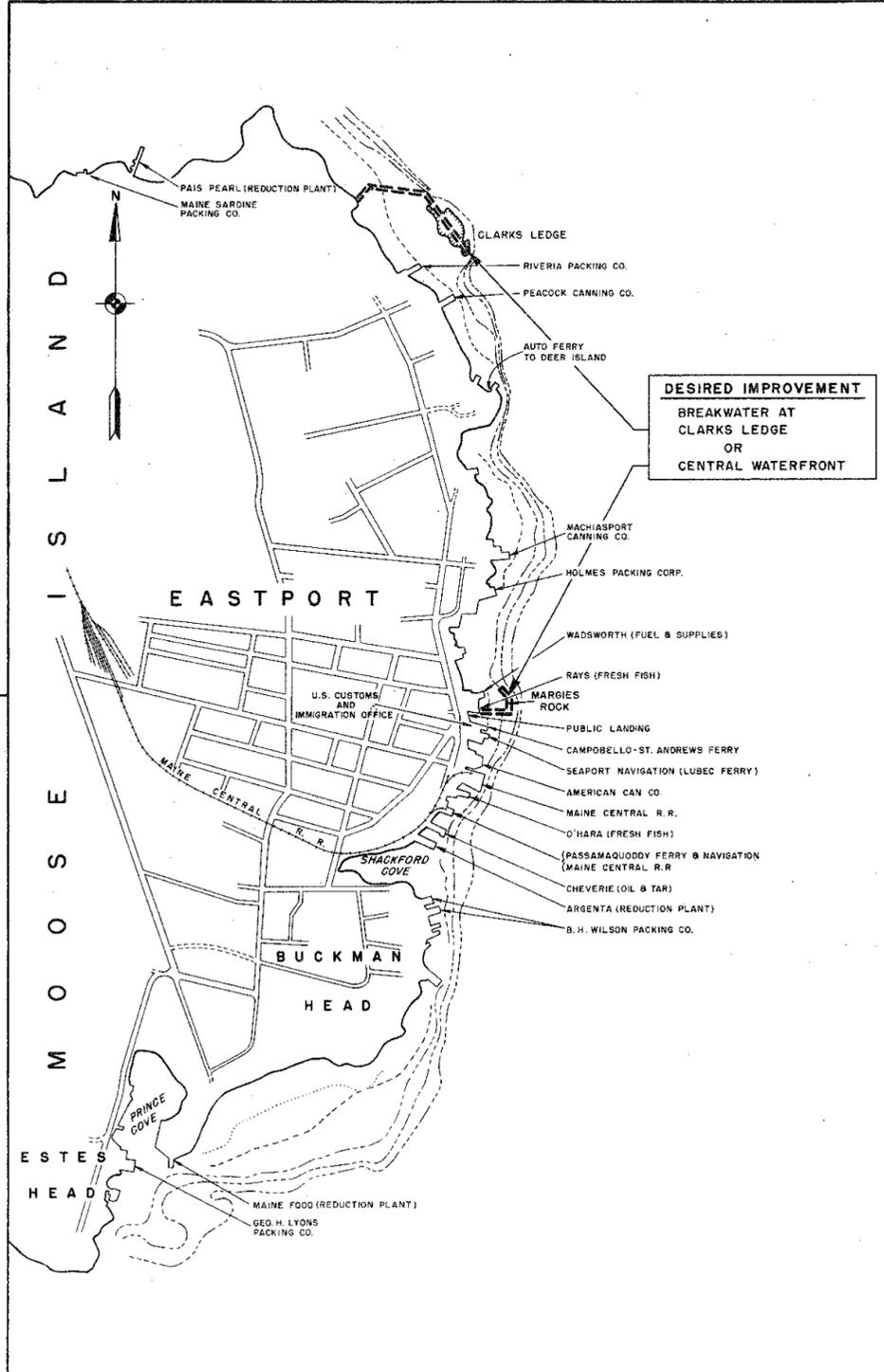
CONCLUSION

39. Eastport Harbor is a customs port, and the home port of a substantial fishing fleet serving seven canneries, several trash fish plants, and a number of fresh fish companies. In addition, it is a rail terminus and a center of shipping and passenger traffic. Further development of the harbor for commercial purposes appears adequately warranted. The benefits resulting from the construction of a breakwater to provide a protected landing and anchorage area as desired by local interests appear to be sufficient to warrant further investigation of such improvement by the United States, particularly in view of the very exposed nature of the waterfront in an area subject to strong tides and sudden high winds and storms. Determination of the relative merits of various possible sites, of the most desirable type of construction, and of the optimum extent of protected area cannot be made without further study. Benefits resulting from improvement would extend to the surrounding region and would be general in character. No local cash contribution should be required. However, local interests should be required to provide suitably equipped public landing facilities with equal access to all in the protected area.

RECOMMENDATION

40. In view of the foregoing, the Division Engineer recommends that a survey be made to determine the exact nature and extent of improvement warranted in Eastport Harbor for commercial navigation and the cost of providing such improvement.

ROBERT J. FLEMING, JR.
Brigadier General, USA
Division Engineer



NOTE:
Offshore depths and topography from survey of 1936 by U.S.E.D.

LEGEND

MEAN HIGH WATER	—————
MEAN LOW WATER
10 FOOT DEPTH CURVE	-----
20 FOOT DEPTH CURVE	-----
30 FOOT DEPTH CURVE	-----
40 FOOT DEPTH CURVE	-----

EASTPORT HARBOR MAINE

IN 1 SHEET 200 SCALE IN FEET 0 500 1000 1500

NEW ENGLAND DIVISION, BOSTON, MASS. JAN. 10, 1956

APPROVED	APPROVED
<i>[Signature]</i>	<i>[Signature]</i>
CHIEF ENGINEER	CHIEF OF DISTRICT
SUBMITTED	TO ACCOMPANY PRELIMINARY EXAMINATION REPORT
DATE: JAN. 13, 1956	DATE: JAN. 13, 1956
BY: A.L.D.	FILE NO. 1275 D-9-4
BY: A.L.D.	
BY: A.L.C.	