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2d Session
HOUSE OF REPRESENTATIVES
DOCUMENT
No. 558

C.\
BELLINGHAM

BELLINGHAM HARBOR, WASH.

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED MARCH 20, 1951, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON A REVIEW OF REPORTS ON BELLINGHAM HARBOR, WASH., REQUESTED BY A RESOLUTION OF THE COMMITTEE ON RIVERS AND HARBORS, HOUSE OF REPRESENTATIVES, ADOPTED ON AUGUST 30, 1944

SEPTEMBER 30, 1952.—Referred to the Committee on Public Works and ordered to be printed with two illustrations (pursuant to Public Law 504, 82d Cong.)

LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY,
Washington 25, D. C., September 11, 1952.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated March 20, 1951, from the Chief of Engineers, United States Army, together with accompanying papers and illustrations, on a review of reports on Bellingham Harbor, Wash., requested by a resolution of the Committee on Rivers and Harbors, House of Representatives, adopted on August 30, 1944.

In accordance with section 1 of Public Law 14, Seventy-ninth Congress, the views of the Governor, the State of Washington, and the Department of the Interior are set forth in the enclosed communications.

The Bureau of the Budget advises that while the expenditures of such large sums for works of this character would not be justified under existing restrictive budget policies, they would see no reason why the project should not be added to the list of improvements in the backlog of work to be undertaken when the Federal budgetary situation clearly makes possible the initiation of such projects. Accordingly, the Bureau of the Budget advises that there would be no

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objection to the submission of the proposed report to the Congress or to the authorization of the recommended works. The complete views of the Bureau of the Budget are contained in the attached copy of its letter.

Sincerely yours,

FRANK PACE, JR.,
Secretary of the Army.

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington 25, D. C., August 26, 1952.

The honorable the SECRETARY OF THE ARMY,
(Through the Budget Officer for the Department of the Army).

MY DEAR MR. SECRETARY: Receipt is acknowledged of your letter of April 4, 1951, submitting the proposed report of the Chief of Engineers on Bellingham Harbor, Wash., requested by resolution of the Committee on Rivers and Harbors, House of Representatives, adopted August 30, 1944.

The Chief of Engineers recommends modification of the existing project for Bellingham Harbor, Wash., to provide for a small boat basin adjacent to Squalicum Creek waterway, the Federal work to consist of the construction and maintenance of two sections of rubble-mound breakwater, removal of the existing rubble-mound breakwater and use of the rock therefrom in the construction of the new structure, and maintenance of minimum depths of 12 feet in the entrances to the basin at an estimated cost to the United States of $1,224,300 for new work and an additional $13,500 annually for maintenance, subject to certain conditions of local cooperation. The plan of improvement appears to provide the best method of creating additional harbor space. The annual benefits estimated to accrue entirely to fishing and recreational craft would exceed the annual costs.

While the expenditure of such large sums for works of this character would not be justified under existing restrictive budget policies, we would see no reason why the project should not be added to the list of improvements in the backlog of work to be undertaken when the Federal budgetary situation clearly makes possible the initiation of such projects. Accordingly, you are advised that there would be no objection to the submission of the proposed report to the Congress or to the authorization of the recommended works.

Sincerely yours,

F. J. LAWTON, *Director.*

COMMENTS OF THE GOVERNOR OF THE STATE OF WASHINGTON

STATE OF WASHINGTON,
EXECUTIVE DEPARTMENT,
Olympia, January 31, 1951.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers,
Department of the Army, Washington 25, D. C.

DEAR GENERAL PICK: Recent information has come to my office indicating an effort is being made by the city of Bellingham and interested people in that area for establishment of a small boat basin adjacent to Squalicum Creek waterway as a project to be constructed with Federal funds by the Corps of Engineers.

I am personally acquainted with the area in which the project is proposed and the need for it. It will be of much benefit to the local port and the people of Bellingham, as well as the State as a whole. This basin will become an integral part of the great fisheries resource development of the Northwest and is worthy of Federal support; therefore, I would like to endorse wholeheartedly its approval and ask that fullest consideration be given by your Department to adequate appropriation for it.

Sincerely,

ARTHUR B. LANGLIE, *Governor.*

COMMENTS OF THE STATE OF WASHINGTON

STATE OF WASHINGTON,
DEPARTMENT OF CONSERVATION AND DEVELOPMENT,
Olympia, January 31, 1951.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers,
Department of the Army, Washington 25, D. C.

DEAR GENERAL PICK: Referring to our letter of December 18, 1950, dealing with an application for Federal aid in constructing a small boat basin adjacent to Squalicum Creek waterway at Bellingham, Wash., as a part of the Bellingham Harbor development, we attempted only to cover the requirements of the statute as provided in section 1, Public Law 14, Seventy-ninth Congress. In reviewing the report it was found that the construction in no way interfered with the State's interest including State's rights of water or property.

Since writing the routine letter covering the requirements of the law it has come to our attention that this development is highly desirable and one which will be of much benefit to the city of Bellingham and the State as a whole; therefore, we wish to supplement our letter by asking that it be given fullest consideration with an adequate appropriation for completion at the earliest possible date.

In further support we would like to say this particular project ties in with the development of fisheries in the Northwest and will be of considerable direct benefit to the port of Bellingham.

Very sincerely yours,

J. V. ROGERS, *Director.*

COMMENTS OF THE STATE OF WASHINGTON

STATE OF WASHINGTON,
DEPARTMENT OF CONSERVATION AND DEVELOPMENT,
Olympia, December 18, 1950.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers,
Department of the Army, Washington 25, D. C.

DEAR GENERAL PICK: Referring to your letter of December 8 transmitting review of reports on small boat basin adjacent to Squalicum Creek waterway at Bellingham, Wash., please be advised the State has no direct interest in this project, therefore, have no comments or recommendations to make.

Very sincerely yours,

J. V. ROGERS, *Director.*

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington 25, D. C., March 13, 1951.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers, Department of the Army,
Washington 25, D. C.

MY DEAR GENERAL PICK: By letter dated December 8, 1950 (ENGWD), you transmitted for the information and comments of the Department copies of your proposed report on a review of reports on Bellingham Harbor, Wash., together with the reports of the Board of Engineers for Rivers and Harbors, and the district and division engineers.

The district engineer reports that increasing small-boat activities and lack of adequate moorage facilities in Bellingham Harbor necessitate enlargement of the present small-boat basin southeasterly of Squalicum Creek waterway and that general benefits therefrom are sufficient to warrant Federal participation in the improvement. He accordingly recommends that the existing navigation project for Bellingham Harbor be modified to provide for removal of the existing rubble-mound breakwater southeasterly of Squalicum Creek waterway and the construction of a new rubble-mound breakwater seaward of the existing one and in two sections, totaling 3,900 feet in length, as shown on the accompanying map, at an estimated Corps of Engineers first cost of $1,224,300 and $13,500 for annual maintenance above that now required, subject to certain conditions of local cooperation as outlined in the report. The Board of Engineers for Rivers and Harbors and the Chief of Engineers concur with the district engineer.

The Fish and Wildlife Service was consulted during the course of the investigation and offered no objection to the proposed work on the assumption that disposition of spoil would be carried out in accordance with plans available at that time. Subsequent information received indicates that there has been no change in the plan for disposal of spoil in connection with this harbor development. The Fish and Wildlife Service, therefore, has no objection to the proposed plan. However, if the spoil disposal area is inadequate or its location is changed, the Fish and Wildlife Service of the Department would appreciate being consulted further in order that plans can insure that dredging will not interfere with the shell fish resource or aquatic food plants.

I am pleased to advise you that the favorable recommendations reached in your report will not adversely affect the interests of the Department.

Opportunity to review the report is appreciated.

Sincerely yours,

WILLIAM E. WARNE,
Assistant Secretary of the Interior.

REPORT OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington 25, D. C., March 20, 1951.

Subject: Bellingham Harbor, Wash.

To: The Secretary of the Army.

1. I submit herewith for transmission to Congress the report of the Board of Engineers for Rivers and Harbors in response to resolution of the Committee on Rivers and Harbors of the House of Representatives, adopted August 30, 1944, requesting the Board to review the reports on Bellingham Harbor, Wash., submitted in House Document No. 1161, Sixtieth Congress, second session, and subsequent reports, with a view to determining if it is advisable to modify the existing project in any way at this time.

2. After full consideration of the reports secured from the district and division engineers, and after affording local interests full opportunity to be heard, the Board recommends modification of the existing project for Bellingham Harbor, Wash., to provide for a small-boat basin adjacent to Squalicum Creek waterway, the Federal work to consist of construction and maintenance of two sections of rubble-mound breakwater with combined length of about 3,900 feet, removal of the existing rubble-mound breakwater now included for maintenance in the existing project and use of the rock therefrom in construction of the new breakwater, and maintenance of minimum depths of 12 feet in the entrances to the basin, generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated cost to the United States of $1,224,300 for new work and $13,500 annually for maintenance in addition to that now required; provided local interests agree to (*a*) furnish without cost to the United States all lands, easements, rights-of-way, and suitable spoil-disposal areas for the new work and for subsequent maintenance, when and as required, including title to the portion of the proposed breakwater already constructed by local interests and including the right to remove rock from the previously constructed project breakwater for use in the proposed Federal work; (*b*) hold and save the United States free from damages due to construction and maintenance of the improvement; (*c*) remove the timber-pile portions of the existing breakwater, perform all dredging required to provide and maintain in the basin a depth of 12 feet at mean lower low water; (*d*) construct protective dolphins at

the ends of the breakwaters when and as required; and (*e*) provide, maintain, and operate adequate moorage facilities, utilities, and a public landing with suitable service and supply facilities open to all on equal terms.

3. After due consideration of these reports, I concur in the views and recommendations of the Board.

LEWIS A. PICK,
Major General, Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

DEPARTMENT OF THE ARMY,
BOARD OF ENGINEERS FOR RIVERS AND HARBORS
Washington 25, D. C., October 24, 1950.

Subject: Bellingham Harbor, Wash.
To: The Chief of Engineers, United States Army.

1. This report is submitted in response to the following resolution adopted August 30, 1944:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved 13 June 1902, be, and is hereby, requested to review the reports on Bellingham Harbor, Washington, submitted in House Document Numbered 1161, Sixtieth Congress, second session, and subsequent reports, with a view to determining if it is advisable to modify the existing project in any way at this time.

2. Bellingham, Wash., is on the northeasterly shore of Bellingham Bay, about 90 miles north of Seattle. From the northerly extremity of the harbor along the city front the bay extends south about 12 miles to waters connecting with Georgia Strait. Natural deep water extends close to shore at Bellingham except in the northeasterly section of the harbor. The mean range of tides is 5.2 feet and the estimated extreme range is 16 feet. Three waterways have been dredged at the north end of the harbor extending from deep water northeasterly to the shore. The easterly of these is Whatcom Creek waterway which provides access to the municipal dock where a large part of the port commerce is handled. Adjacent to this waterway and the dock local interests maintain a moorage area for about 50 small boats. This is regarded as a temporary arrangement as the space is needed for expansion of the terminal facilities. The I and J Street waterway, about 2,000 feet northwest of Whatcom Creek waterway, is a channel 18 feet deep dredged by the United States Navy to its wharf. About 4,000 feet farther northwest is Squalicum Creek waterway where local interests have provided a basin about 590 feet wide and 1,500 feet long extending shoreward from the United States pierhead line. Finger piers and floats at the inner end of this basin provide temporary moorage for 50 small boats. This moorage restricts access to adjacent boat repair and service facilities. In 1934, with the aid of Federal funds, the port commission constructed a rock breakwater 1,400 feet long extending east from the outer end of the basin at Squalicum Creek waterway. Several years later, local interests constructed pile breakwaters at each end of the rock structure. Between the rock breakwater and a bulkheaded fill to the

shoreward the port of Bellingham maintains a small-boat basin 12 feet deep which is sufficient for accommodation of 180 boats without congestion. While originally intended for commercial fishing boats, it is now used also by recreational craft and is overcrowded. Local interests have initiated enlargement of this basin to extend it southeastward. The work accomplished consists of construction of 1,360 feet of bulkhead along the shoreward, or easterly, end of the additional area, placement of 60,000 tons of rock which forms the nucleus of a breakwater along the southeast side, and dredging a portion of the area to a depth of 12 feet. Prior to 1947 the port of Bellingham also maintained a small-boat basin in a cove to the south of the Whatcom Creek waterway. In view of the excessive cost of maintaining the timberpile breakwater there and the need of the space by adjacent industries, this basin has been abandoned as a haven for small boats. The existing Federal project for Bellingham Harbor, completed in 1931, provides for depths of 26 feet in the outer 3,800 feet of Whatcom Creek waterway and of 18 feet in the inner 1,300 feet; dredging an entrance channel 200 feet wide and 26 feet deep from deep water to the west end of Squalicum Creek basin; maintenance of the southerly half and westerly end of Squalicum Creek basin to depth of 26 feet; and maintenance of the breakwater constructed by local interests in 1934. Costs to the United States for the existing project to June 30, 1949, were $112,013 for new work and $90,179 for maintenance.

3. The area commercially tributary to Bellingham Harbor, embracing most of Whatcom County, had a population of 58,315 in 1940. The estimated population of the city of Bellingham was 32,700 in 1948. Manufacture of forest products, agriculture, commercial fishing, and recreational pursuits are among the important activities of the region. Rail, highway, and air services are available. Commerce of the harbor for the 10-year period 1940 through 1949 averaged 1,026,030 tons annually of which 361,250 tons was vessel commerce and 664,780 tons was rafted logs. Vessel traffic in 1949 consisted of 12,848 in-bound and out-bound trips of which 12,466 were by vessels with drafts of less than 12 feet. From 1938 to 1949 the number of locally based commercial fishing boats increased from 21 to 120 and locally based recreational craft increased from 60 to 202. The nearby waters are popular for commercial fishing, sports fishing, and cruising. As a result, transient small craft frequently visit Bellingham Harbor or seek shelter there during storms.

4. Local interests desire Federal participation in completing the expansion of the existing moorage basin southeasterly of Squalicum Creek waterway so as to suitably accommodate a minimum of 300 commercial fishing vessels and 700 recreational craft. They point out that existing moorage areas are inadequate and claim that the desired improvement would result in substantial benefits in connection with the fishing industry and recreational boating including reduction in boat damages. The improvement will also permit abandonment of the small-boat moorage facilities at the inshore end of Squalicum Creek waterway and on Whatcom Creek waterway so that the spaces occupied may be used for other purposes to improve the efficiency of the port. Local interests offer to furnish rights-of-way for the proposed work, complete the dredging required to provide a

depth of 12 feet in the basin area, maintain this depth, construct any necessary additional bulkheads, and provide a public wharf, moorage facilities, utilities, roads, and parking area.

5. The district engineer states that storm waves are a hazard to small boats moored in unprotected locations in Bellingham Harbor and that suitable moorage space is insufficient to meet the needs of the commercial fishing fleet, locally based recreational boats, and transient small craft. He finds that the most practicable means of securing the needed moorage space for small boats at the harbor is to complete the basin expansion southeasterly of, and adjacent to, Squalicum Creek waterway initiated by local interests. His plan for this purpose contemplates a basin area, as enlarged, of about 46.7 acres with minimum depth of 12 feet bounded to shoreward by the existing bulkheads and extending seaward to a rock breakwater to be constructed generally along the United States pierhead line. Where the basin borders the Squalicum Creek waterway it would be protected by a shoreward extension of the breakwater leaving an entrance 100 feet wide between the breakwater and existing bulkhead. Protection at the southeasterly end of the basin would be afforded by construction of a separate rock breakwater consisting in part of the rock core recently placed by local interests. At the seaward end of this structure an entrance channel 150 feet wide would be maintained to a depth of 12 feet. It is planned that the existing rock breakwater constructed by local interests in 1934, which extends into the basin area, will be removed and the rock therefrom used in constructing the new breakwaters. The district engineer estimates the construction cost to the United States at $1,224,300 for removal of the existing breakwater and construction of the two sections of new breakwater, 2,025 and 1,875 feet long, and at $21,860 for establishing navigation aids, a total of $1,246,160. He estimates the first cost to local interests at $454,080 for removing existing piling; dredging to secure the minimum depth of 12 feet; and establishing dolphins at the outer entrance, mooring facilities, terminal facilities, and utilities. The total estimated first cost is thus $1,700,240. The district engineer estimates the Federal annual carrying charges at $62,930 which includes $13,500 for maintenance in addition to the amount now required. The district engineer estimates the net non-Federal annual carrying charges at $15,450, including the cost of dredging to maintain depths of 12 feet in the basin. The estimated annual carrying charges total $78,380.

6. Prospective annual benefits of the planned improvement as evaluated by the district engineer include $47,400 for elimination of vessel damages and losses, and expenses which will otherwise be incurred in precautionary measures to keep such damages and losses at a minimum; $62,600 for the net value of the increased catch of fish resulting from elimination of harbor delays for commercial fishing vessels and from enabling vessels now based at ports more distant from the fishing grounds to use Bellingham Harbor as a base with resulting reduction in the nonproductive time consumed in their operations; and $18,480 for additional recreational boating values. These estimated benefits total $128,480. The benefit-cost ratio is 1.64.

7. The district engineer recommends modification of the existing project to provide for a small-boat harbor in accordance with his described plan, provided that local interests furnish satisfactory assurances that they will, without cost to the United States, furnish

necessary rights-of-way and spoil-disposal areas, including the right to remove and use rock from the previously constructed breakwater, and title to the portion of the proposed breakwater already constructed by local interests; hold the United States free from property damages that may result; remove the timber-pile breakwaters; complete the dredging required to deepen the basin to 12 feet, and maintain that depth; provide and maintain any bulkheads required to retain dredged material; construct required dolphins at the ends of the breakwater; construct in accordance with approved plans, maintain, and operate without profit, adequate moorage facilities, utilities, and a public landing with suitable services and supplies open to all on equal and reaonable terms. The division engineer concurs.

8. Local interests were informed of the recommendations of the reporting officers and given an opportunity to present additional information to the Board. On October 24, 1950, the Board held a hearing at which an official of the port of Bellingham stressed the need for additional, protected, mooring space to accommodate commercial fishing boats and recreational craft, expressed approval of the plan for further improvement, and indicated that local interests will meet the requirements of cooperation.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

9. The Board of Engineers for Rivers and Harbors concurs in the finding of the reporting officers that available moorage areas for fishing boats and recreational craft at Bellingham Harbor are insufficient to meet the needs of existing and prospective commerce. The district engineer presents a suitable plan for remedying this situation by completing the enlargement of the small-boat basin, adjacent to Squalicum Creek waterway, which has been initiated and partially accomplished by local interests at considerable expense to themselves. He proposes appropriate conditions of local cooperation. The prospective benefits economically justify the estimated expenditures required for the proposed work.

10. Accordingly, the Board recommends modification of the existing project for Bellingham Harbor, Wash., to provide for a small-boat basin adjacent to Squalicum Creek waterway, the Federal work to consist of construction and maintenance of two sections of rubble-mound breakwater with combined length of about 3,900 feet, removal of the existing rubble-mound breakwater now included for maintenance in the existing project and use of the rock therefrom in construction of the new breakwater, and maintenance of minimum depths of 12 feet in the entrances to the basin, generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated cost to the United States of $1,224,300 for new work and $13,500 annually for maintenance in addition to that now required; provided local interests agree to (*a*) furnish without cost to the United States all lands, easements, rights-of-way, and suitable spoil-disposal areas for the new work and for subsequent maintenance, when and as required, including title to the portion of the proposed breakwater already constructed by local interests and including the right to remove rock from the previously constructed project breakwater for

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use in the proposed Federal work; (*b*) hold and save the United States free from damages due to construction and maintenance of the improvement; (*c*) remove the timber-pile portions of the existing breakwater, perform all dredging required to provide and maintain in the basin a depth of 12 feet at mean lower low water; (*d*) construct protective dolphins at the ends of the breakwaters when and as required; and (*e*) provide, maintain, and operate adequate moorage facilities, utilities, and a public landing with suitable service and supply facilities open to all on equal terms.

For the Board:

J. S. BRAGDON,
Major General, Chairman.

REPORT OF THE DISTRICT ENGINEER

SYLLABUS

The district engineer reports that increasing small-boat activities and lack of adequate moorage facilities in Bellingham Harbor necessitate enlargement of the present small-boat basin southeasterly of Squalicum Creek waterway and that general benefits therefrom are sufficient to warrant Federal participation in the improvement. He accordingly recommends that the existing navigation project for Bellingham Harbor be modified to provide for removal of the existing rubble-mound breakwater southeasterly of Squalicum Creek waterway and the construction of a new rubble-mound breakwater seaward of the existing one and in two sections, totaling 3,900 feet in length, as shown on the accompanying map, at an estimated Corps of Engineers first cost of $1,224,300 and $13,500 for annual maintenance above that now required, subject to certain conditions of local cooperation as outlined in the report.

CORPS OF ENGINEERS, UNITED STATES ARMY,
OFFICE OF THE DISTRICT ENGINEER,
SEATTLE DISTRICT,
Seattle 4, Wash., May 17, 1949.

Subject: Review of reports on Bellingham Harbor, Wash.
To: The Division Engineer, North Pacific Division, Corps of Engineers, Portland 5, Oreg.

1. *Authority.*—This report is submitted in compliance with a resolution adopted August 30, 1944, by the Committee on Rivers and Harbors of the House of Representatives which reads as follows:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the Rivers and Harbors Act approved June 13, 1902, be, and is hereby, requested to review the reports on Bellingham Harbor submitted in House Document Numbered 1161, Sixtieth Congress, second session, and subsequent reports, with a view to determining if it is advisable to modify the existing project in any way at this time.

2. *Scope of review.*—A review of survey scope was authorized by the Chief of Engineers on February 16, 1945. The report studies are based on data available in published documents and in the files of this office, on information furnished by local interests, and on topographic and hydrographic surveys of Bellingham Harbor conducted by this office and the port of Bellingham during 1946 and 1948. During the course of the investigation interested local, port, city, county, State, and Federal agencies were consulted. Their requests, comments, and suggestions have been given full consideration in the studies.

3. This report reviews House Document No. 1161, Sixtieth Congress, second session, and subsequent reports listed in table 1, particularly House Document No. 187, Seventieth Congress, first session, and House Committee on Rivers and Harbors Document No. 70, Seventy-fourth Congress, first session.

TABLE 1.—*Prior reports under review*

Document number and date of report	Authority and type of report	Recommendation of Chief of Engineers congressional action
H. Doc. No. 1161, 60th Cong., 2d sess., Dec. 9, 1908.[1]	River and Harbor Act, Mar. 2, 1907, preliminary examination and survey.	Favorable to dredging Whatcom Creek waterway to depth of 26 feet in outer part, 18 feet in inner part; subject to local cooperation. Adopted by River and Harbor Act, June 25, 1910.
Not published; Mar. 10, 1924 [2]	River and Harbor Act, Sept. 22, 1922, preliminary examination.	Unfavorable for survey with a view to deepening Whatcom Creek waterway, and providing turning basin.
Not published; Dec. 11, 1925.[2]	River and Harbor Act, Mar. 3, 1925, preliminary examination.	Unfavorable for survey with a view to removing Starr Rock.
H. Doc. No. 187, 70th Cong., 1st sess., Feb. 24, 1928.[1]	River and Harbor Act, Jan. 21, 1927, preliminary examination and survey.	Favorable for a channel 26 feet deep, 200 feet wide from deep water to pierhead line in Squalicum Creek waterway. Subject to local cooperation. Adopted by River and Harbor Act, July 3, 1930.
Not published; May 4, 1932 [2]	River and Harbor Act, July 3, 1930, preliminary examination.	Unfavorable for a survey with a view to diverting Nooksack River from the harbor, and to construction of a breakwater.
House Committee on Rivers and Harbors Doc. No. 70, 74th Cong., 1st sess., July 26, 1935.[1]	Resolution, House Committee on Rivers and Harbors, Jan. 29, 1934, review of reports.	Favorable for maintenance of southerly half and westerly end of Squalicum Creek basin to 26-foot depth, and for maintenance of existing breakwater to 14-foot height. Adopted by River and Harbor Act of Aug. 26, 1937.

[1] Date of transmittal to Congress.
[2] Date of Chief of Engineers report.

4. *Description.*—Bellingham Harbor is in the northwestern part of the State of Washington, at approximate latitude 48°45′ north and longitude 122°30′ west. It is situated along the easterly shore of Bellingham Bay, about 80 nautical miles north of Seattle and about 40 nautical miles southeast of Blaine as measured by ordinary steamer route. Bellingham Bay is about 12 miles long and 3 miles wide. It is bounded by the mainland on the east and north, and by a low, sandy peninsula and Lummi Island on the northwest and west. The bay is open to the south and southwest. Cypress, Guemes, and other islands located off the bay entrance provide considerable protection against the open waters of Rosario Strait. The easterly shore of Bellingham Bay is indented by Chuckanut Bay, a deep-water cove located about 5 miles south of the main part of Bellingham Harbor. Samish Bay constitutes the southeasterly part of Bellingham Bay.

5. Bellingham Harbor has a deep-water approach ranging from about 16 fathoms in the outer part to 4 fathoms near shore except in the northeasterly portion where tidal flats extend about one-fourth to one-half mile from shore and the bottom slopes gradually to deep water. Three waterways extend across these tidal flats, namely Squalicum Creek, I and J Street, and Whatcom Creek waterways. These waterways were originally established by the State of Washington. Squalicum Creek and Whatcom Creek waterways have been improved under a Federal project to accommodate deep-water traffic.

I and J Street waterway has been partially dredged by the United States Navy and local interests. A Federal pierhead line has been established.

6. Bellingham channel, lying between Cypress and Guemes Islands, is generally used by ships proceeding to Bellingham Bay from Strait of Juan de Fuca and from the southward. The channel varies from 17 to 60 fathoms in depth and from one-half to 1½ miles in width. Light-draft vessels also frequently approach the bay from the south by way of Swinomish Slough and Padilla Bay. Deep-draft vessels approaching Bellingham Bay from the northward use the channel between Lummi and Sinclair Islands. This channel has a minimum depth of 30 fathoms and a minimum width of 1,200 yards. Hale Passage, lying between Lummi Island and the mainland, is frequently used by light-draft vessels approaching from the northward. This passage, connecting Bellingham Bay with the Straits of Georgia, is about 6 miles long and about three-fourths mile wide. Its depth varies from 15 feet at the northwestern end to 60 feet at the southeastern end. Bellingham Bay and its approaches are shown on United States Coast and Geodetic Charts Nos. 6378, 6380, and 6300, and the maps accompanying this report.

7. *Tides and currents.*—The mean range of tides in Bellingham Harbor is 5.2 feet, the diurnal range is 8.6 feet, and the estimated extreme range is 16.0 feet. Tidal currents in the harbor and bay have little velocity and do not interfere with navigation. Their general direction is north and south. With respect to currents in the approaches to Bellingham Bay, the United States Coast Pilot, Pacific Coast, sixth edition, states, "between Cypress and Guemes and Sinclair Islands the tidal currents have considerable velocity, but between Sinclair and Vendovi Islands the current is considerably less."

8. *Climate.*—The climate of the locality is mild and equitable. Records of observations near Bellingham over a period of 35 years show a maximum temperature of 97°, a minimum of −4°, and a mean of 48.9°. Extreme temperatures are rare and of short duration as indicated by an average minimum temperature of 29° for January, the coldest month, and an average maximum temperature of 74.2° for August, the warmest month. The mean annual precipitation is 33.67 inches and the average snowfall 9.6 inches. Bellingham Harbor and approaches are ice-free throughout the year. The prevailing winds are from the west and southwest during the spring, summer, and autumn months and from the southeast during winter months. Fogs may occur at any time of the year but are most frequent during the spring and autumn months.

9. *Tributary area.*—The area tributary to Bellingham Harbor includes all of Whatcom County except Point Roberts and the city of Blaine and its environs. The topography of Whatcom County varies from rich tidal plains along the east shore of Bellingham Bay and the valley of the Nooksack River in the western portion to the mountainous areas comprising the eastern portion.

10. *National and departmental reservations.*—The Lummi Indian Reservation, with an area of about 20 square miles, includes all of the peninsula west of Bellingham Bay and a portion of the mainland adjacent thereto. Some 1,300 square miles of the eastern part of the tributary area is in the Mount Baker National Forest.

11. *Cities.*—Bellingham, situated on the northeasterly shore of the bay, is the seat of the county government and the principal outlet for the water-borne commerce of the tributary area. In 1940 the city had a population of 29,314, a decrease of 1,509 from 1930. The State census board, however, estimated the population at 32,700 in 1948. Bellingham is a port of entry with United States Customs and Immigration Service offices located therein. Other incorporated cities and towns in the tributary area are Everson, Ferndale, Lynden, Nooksack, and Sumas, all of which are located inland. These communities are dependent upon the agricultural, logging, or mining operations in their immediate vicinities. Distribution and trend of population are given in table 2 adapted from the Federal census for the earlier years and estimates of the Washington State Census Board for 1948.

TABLE 2.—*Distribution of population, area tributary to Bellingham Harbor*

Locality	Population			
	1920	1930	1940	1948 [1]
Bellingham (city)	25,585	30,823	29,314	32,700
Everson (town)	(2)	295	292	314
Ferndale (town)	759	752	717	850
Lynden (town)	1,244	1,564	1,696	2,358
Nooksack (town)	283	293	302	298
Sumas (city)	854	647	650	670
Remainder of tributary area	19,150	22,646	25,344	(2)
Total, tributary area	47,875	57,020	58,315	(2)

[1] State census board estimate.
[2] Not available.

12. The population statistics reflect a slow over-all growth. The increase since 1940, particularly in Bellingham, is believed to have resulted from the wartime increase in industrial activity. Future growth will depend largely on development of new industries and resources other than forest products.

13. *Resources and industries.*—The principal resources of the tributary area are its forests, agricultural lands, fisheries, mineral deposits, and natural recreational features. Past industrial development centered chiefly on forest resources. In recent years agriculture, fishing, and the processing of their products have become increasingly important.

14. *Forest resources and industries.*—Statistics compiled by the Pacific Northwest Forest and Range Experiment Station, United States Forest Service, as of September 1941 showed the total volume of merchantable timber resources in Whatcom County to be approximately 9 billion board feet. Of this total roughly two-thirds was on timberlands in Federal, State, or county ownership. Approximately one-third of this publicly owned timber was reserved from cutting. Statistics compiled by the same agency as of January 1943 show the total volume of saw timber on the unreserved lands of Whatcom County to be approximately 7 billion board feet. An estimated distribution of the saw timber on the unreserved lands is given by species in table 3.

TABLE 3.—*Saw timber on unreserved lands of Whatcom County, Jan. 1, 1943*

Species:	*Volume (thousand board feet)*
Douglas fir	2, 010, 000
Sitka spruce	5, 000
Western hemlock	2, 434, 000
Western red cedar	983, 000
Balsam firs	1, 551, 000
Other conifers	95, 000
Hardwoods	96, 000
Total	7, 174, 000

15. In 1943 the current annual growth on trees 15.1 inches or more in diameter was estimated to exceed 41 million feet board measure and on trees 5.1 inches or more, the current annual growth was estimated to exceed 20 million cubic feet. During the last two decades large quantities of sawlogs have been imported by rail from Skagit County and by water from British Columbia and from Clallam County on the Olympic Peninsula.

16. The manufacture of forest products is one of the principal industries of the tributary area. In earlier years the industry centered chiefly on manufacture of lumber from the Douglas fir species. In more recent years the use of pulpwood species has become increasingly important. In 1945 15 mills produced approximately 73 million feet of lumber, board measure. In addition to the sawmills, a pulp mill of about 360 tons daily capacity, a paper mill of 40 tons daily capacity, a plywood plant, several shingle mills, door and furniture factories, and other wood-using plants are located in the tributary area. A distillery located at Bellingham produces approximately 5,000 gallons of alcohol daily from forest products. It is reported that the capacity of the plant is to be doubled. The Federal census of 1940 showed the value of all products manufactured in 111 establishments employing approximately 2,600 persons in Whatcom County as about $16,000,000, the bulk of which emanated directly or indirectly from forest resources.

17. *Agriculture.*—About 15 percent of the land in Whatcom County was used for agricultural purposes in 1945. This land, valued at approximately $35,000,000 including improvements, is largely confined to the Nooksack Basin in the western portion of the county. The census of agriculture for 1945 enumerated 4,845 farms in the county with a total acreage of 206,781, of which about 71,500 acres were in crops. The value of farm products sold was approximately $14,240,000, approximately 83 percent of which represented livestock and livestock products, mainly dairy and poultry products. Other farm products included forage crops, grain, fruits, nuts, and vegetables. The farm population in 1945 was 17,883, and the number of persons employed on farms was 6,830.

18. *Fisheries.*—Bellingham Harbor is particularly well situated with respect to the fishing banks of Rosario and Georgia Straits, Bellingham Bay, Hale Passage, and the waters of the San Juan Archipelago. It is near the inside water route to Alaska, and is one of the United States ports to which large quantities of fish are transported from southeastern Alaska for processing and distribution. The Pacific American Fisheries, a corporation whose fishing operations are carried on mainly in Alaska waters, has its headquarters, supply, service, and repair facilities at Bellingham. Three canneries, a cold storage plant, and several receiving stations are situated at Bellingham for receipt, processing, storage, and distribution of fish caught in local waters. Records maintained by the processing plants and receiving stations show that 7,018 tons of locally caught fish and shellfish, having a value of about $2,161,000 at the fishermen's price level, were landed at Bellingham in 1947. A survey conducted by local interests indicated that fishing and allied industries (such as the fish processing and distribution industries, and marine supply, repair, and servicing businesses) had a total value of $5,675,000 in 1947. Because of its advantageous location with respect to the fishing banks and because of availability of icing facilities, marine repair, service and supply facilities, Bellingham has become increasingly important as a base for a large number of local and transient boats. The number of locally based fishing boats is estimated to be 120, consisting of 60 purse seiners, 30 beam trawlers, and 30 trollers and gill-netters. These have a total value of about $2,000,000 and employ about 630 fishermen. The species of fish landed at Bellingham include salmon, halibut, true cod, ling cod, rockfish, sable fish, sole, sturgeon, crabs, and clams.

19. *Recreation.*—The area tributary to Bellingham Harbor has many natural recreation features. The waters surrounding the San Juan Islands attract pleasure craft from all parts of Puget Sound and the coastal areas of British Columbia. At present, about 202 pleasure craft, representing an investment of about $1,010,000, are based in Bellingham Harbor. Many summer homes, beach resorts, and sports-fishing facilities are found on the islands and on the shores of the mainland adjacent to Bellingham and Chuckanut Bays. Bellingham Bay, Hale Passage, Rosario Straits, and the Straits of Georgia are favorite spots for salt water sport fishing. Local interests estimate that approximately 143,000 pounds of food fish (mostly troll-caught salmon) were taken in these waters by salt water sports fishermen during 1948. Based on the average price received by commercial fishermen for salmon (which commands a high price), the value of this catch would be about $37,400. Local interests assert that the amount of food fish taken by sports fishermen would be doubled if sufficient moorage facilities were available to accommodate all pleasure and sports-fishing craft seeking use of the harbor. Snowcapped Mount Baker, reaching an elevation of 10,750 feet, and located in the central part of Whatcom County, is accessible by highway. It is one of the most popular winter sports playgrounds and summer recreational areas of the Pacific Northwest. Many campgrounds, fishing streams, and game-hunting areas are available in the mountainous areas of the county. Numerous lakes, accessible by highway, are suitable for boating, fishing, swimming, and summer homes. The lowlands adjacent to Bellingham and Samish Bays are popular spots for waterfowl hunting. In addition to the vast recreational area in Mount Baker National Forest, the tributary area contains a State park and 23 city parks.

20. *Minerals.*—The tributary area has extensive mineral resources, both developed and undeveloped. Whatcom County has a number of coal mines, among them the largest one in the State. The production of these mines averages approximately 225,000 tons annually. The coal deposits are believed sufficient to retain this rate of production for many years. Considerable deposits of limestone occur throughout the county. A limestone quarry about 20 miles east of Bellingham supplies a large cement plant in that city. Clay, molding sand, sand,

gravel, and stone deposits occur in large quantities and are used extensively. Other nonmetallic minerals found in the locality include amphibole asbestos, diatomite, graphite, marble, mineral pigments, mineral waters, olivine, natural gas, peat, silica, and strontium. A number of metallic minerals also exist in the area of which gold, silver, lead, and copper are mined on a small scale.

21. *Railroads.*—A coastal line of the Great Northern Railway extends from the main line at Everett, Wash., to Vancouver, British Columbia, passing through Bellingham. It provides daily passenger and freight service. The Northern Pacific Railway and the Chicago, Milwaukee, St. Paul & Pacific Railroad have branch lines to Bellingham.

22. *Highways.*—Federal and State highways with local feeder roads provide access to most parts of the tributary area except the mountainous eastern part. The Pacific Highway (U. S. No. 99 and State No. 1) extends along the coast through Bellingham. A branch of State Highway No. 1 extends from Bellingham to Mount Baker. Local feeder roads connect with these highways throughout the settled western part of the tributary area. Regular car and passenger ferry service is available between Bellingham and the San Juan Islands.

23. *Air transportation.*—Bellingham Airport, about 2 miles north of the city, provides adequate facilities for commercial airlines. The West Coast and United Airlines provide direct and interconnected daily service to all parts of the United States, Canada, and Alaska.

24. *Adjacent ports.*—Blaine Harbor is situated about 40 nautical miles north of Bellingham, just south of the international boundary between United States and Canada. The city of Blaine and the small cannery village of Semiahmoo, with a combined population of 1,730 in 1940, are adjacent to that harbor. The commerce of Blaine Harbor, amounting in volume to about 3 percent of that for Bellingham Harbor over the past 10 years, consists chiefly of rafted logs and fresh and canned fish.

25. Anacortes Harbor is on the northern point of Fidalgo Island, about 16 nautical miles south of Bellingham by the most direct route, and 18 nautical miles by ordinary steamer route. The city of Anacortes, with an estimated population of 7,200 as of April 1948, is on that harbor. The commerce of Anacortes Harbor, amounting in volume to about 55 percent of that for Bellingham Harbor over the past 10 years, consists chiefly of rafted logs, petroleum products, fresh and canned fish, wood pulp, and canned vegetables.

26. Everett Harbor on Port Gardner Bay is about 62 nautical miles south of Bellingham. The city of Everett, with an estimated population of 35,000 as of April 1948, is adjacent to that harbor. The commerce of Everett Harbor averages about four times the volume for Bellingham Harbor, and consists principally of rafted logs, petroleum products, lumber, sand, gravel, stone, wood pulp, and fresh and canned fish.

27. *Bridges.*—A fixed timber trestle was constructed by the Great Northern Railway across the head of Chuckanut Bay in 1902. All but 210 feet of the trestle was replaced with a fill in 1920. This structure is about 4 miles south of the railway station in Bellingham and lies between the shore and the established pierhead line. The trestle has a maximum horizontal clearance of 16 feet between bents and a vertical clearance of 14.6 feet at mean lower low water and 6.0 feet at mean higher high water. The trestle and fill were constructed without Department of the Army permit. The trestle was constructed prior to establishment of pierhead lines.

28. *Prior reports.*—In addition to the reports listed in table 1, the following reports relating to navigation on Bellingham Bay have been prepared and submitted by the Corps of Engineers.

29. A report on a preliminary exmination of Bellingham Bay, published in House Document No. 228, Fifty-third Congress, third session, was favorable for a survey to determine the advisability of removing Starr Rock as a menace to navigation. The River and Harbor Act of March 3, 1905, authorized a survey of Starr Rock. Because of excessive cost, removal was not recommended (Annual Report of Chief of Engineers for 1906, p. 2026).

30. House Document No. 80, Fifty-fifth Congress, first session, contained a report on a survey of Bellingham Bay recommending dredging of Whatcom Creek waterway to a depth of 12 feet at mean lower low water. This improvement was adopted by the River and Harbor Act of June 13, 1902.

31. *Existing Corps of Engineers project.*—The original project, adopted by River and Harbor Act of June 13, 1902, provided for dredging of Whatcom Creek waterway to a depth of 12 feet at mean lower low water over a width of 200 feet from deep water to the then existing railroad bridge and thence over the full width of the waterway to its inner end. Cost and expenditures on this project, prior to adoption of the existing project in 1910, were $56,581.93 for new work and $1,092.05 for maintenance, a total of $57,673.98.

32. The existing project as defined and modified by the River and Harbor Acts of June 25, 1910, July 3, 1930, and August 26, 1937, and described in House Document No. 1161, Sixtieth Congress, second session; House Document No. 187, Seventieth Congress, first session; and Rivers and Harbors Committee Document No. 70, Seventy-fourth Congress, first session, provides for (*a*) dredging and maintaining the outer 3,800 feet of Whatcom Creek waterway (363.2 feet wide) to a depth of 26 feet at mean lower low water and the inner 1,300 feet to a depth of 18 feet; (*b*) dredging and maintaining a channel in Squalicum Creek waterway 200 feet wide and 26 feet deep from deep water in the bay to the main pierhead line; (*c*) maintenance of the southerly half and westerly end of Squalicum Creek Basin to a depth of 26 feet at mean lower low water provided that no dredging be done within 75 feet of wharves, piers, or similar structures; and (*d*) maintenance of the existing breakwater to a crest height of 14 feet. Dredging of Whatcom Creek waterway was completed in 1913. Dredging of the outer channel in Squalicum Creek waterway was completed in 1931.

33. The costs of the existing project to June 30, 1948, have been $112,013.16 for new work and $69,826.32 for maintenance, a total of $181,839.48. The latest approved estimate of annual maintenance is $2,000 (1928) for Whatcom Creek waterway, and $2,500 (1937) for Squalicum Creek waterway. The amount for Squalicum Creek waterway is considered adequate for the present and immediate future, but recent experience indicates that maintenance cost of Whatcom Creek waterway is averaging about $5,000 annually. Maintenance dredging in Whatcom Creek waterway was done during the 1949 fiscal year.

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34. *Existing local cooperation.*—No local cooperation was required in connection with the original project for improvement of Bellingham Harbor. The River and Harbor Act of June 25, 1910, required local interests to furnish the necessary rights-of-way and easements for disposal of the material dredged from Whatcom Creek waterway and to construct the necessary bulkheads and groins. The River and Harbor Act of July 3, 1930, required local interests to dredge and maintain the southerly half and westerly end of that portion of Squalicum Creek waterway lying shoreward of the main pierhead line and to construct a suitable public terminal. All conditions of cooperation were met in full by local interests. The sum of $155,231.18 was expended by them for dredging. The River and Harbor Act of August 26, 1937, released local interests from the responsibility of maintaining Squalicum Creek waterway. In addition to the required cooperation, the port commission in 1934 constructed, with the aid of Federal relief funds, a rubble-mound breakwater 1,400 feet long southeasterly of Squalicum Creek waterway. The cost of this breakwater was approximately $139,000 of which the port contributed about $51,000. It was later incorporated in the Federal project for maintenance but its ownership has thus far remained with the port of Bellingham.

35. *Other improvements.*—Improvements for navigation made by local interests other than those required by the prescribed conditions of cooperation are shown in table 4. All cost for these improvements was borne by the port of Bellingham except the basin southeast of Squalicum Creek waterway for which the city of Bellingham contributed $100,000. Various local interests have dredged approaches to privately owned wharves, piers, and log storage and sorting areas. The cost and extent of those improvements are not known.

TABLE 4.—*Improvements to navigation in Bellingham Harbor made by the port of Bellingham*

Date	Nature and location of improvement		Expenditure
1937	Dredging in Whatcom Creek waterway and constructing moorage facilities for small boats on easterly side thereof		$45,800
1937–46	Dredging basin and constructing timber-pile breakwaters and moorage facilities for small boats on southerly shore of Bellingham Bay (this haven has been abandoned)		191,800
1946–47	Dredging and constructing a rock-crib breakwater and moorage facilities for small boats at inner northwesterly end of Squalicum Creek waterway		18,400
1946	Dredging channel and constructing bulkhead along easterly margin of I and J Streets waterway		30,000
1937–48	Constructing extensions to and increasing height of breakwater southeast of Squalicum Creek waterway		87,800
1946–49	Small-boat basin southeast of Sqalicum Creek waterway:		
	Rock in new breakwater	$148,000	
	Dredging	105,800	
	Bulkheads	53,300	
	Floats and terminal facilities	178,750	
	Subtotal		485,850
	Total expenditures on completed improvements		859,650

36. *Terminal and transfer facilities.*—There are 23 usable piers and wharves in Bellingham Harbor. These are distributed as follows: one north of Squalicum Creek waterway; five in and adjacent to Squalicum Creek waterway; one in I and J Street waterway; seven in Whatcom Creek waterway; eight along the southern shore of Bellingham Harbor, and one on the eastern shore of Chuckanut Bay. In addition, there are four small-boat moorages and three log dumps (with booming grounds).

37. Four piers and wharves and four small-boat moorages are owned and operated by local governmental agencies. These facilities are open to all on equal and reasonable terms. The municipal dock, located on Whatcom Creek waterway, is owned and operated by the port of Bellingham, and is used for handling general cargo in foreign and domestic trade. This wharf has 1,350 feet of berthing space at depths ranging from 26 to 30 feet at mean lower low water. Transit sheds thereon have 68,000 square feet of storage space. The wharf, transit sheds, and storage areas are constructed on timber piling. A grain elevator, with hopper, and electric conveyor located on the wharf is leased to a private concern and is not available for public use. The freight-handling equipment is considered adequate. The wharf has connections with three railroads, but the railway spur is so located that direct transfer between ship and railway car is not possible. A large part of the commerce of the port passes over this wharf. However, port officials are desirous of developing a new terminal elsewhere because of the high cost of cargo transfer at the present wharf, the high cost of wharf maintenance, and the impracticability of wharf extension.

38. The city of Bellingham owns and operates a wharf at the upper end of Whatcom Creek waterway for local cargo and passenger trade, principally between the mainland and the San Juan Islands. The wharf has 400 feet of frontage with a depth of 16 feet at mean lower low water. No transit sheds, mechanical freight-handling equipment, or railway connections are available.

39. An oil wharf, owned by the port of Bellingham and located in Squalicum Creek waterway, has 310 feet of berthing space at a depth of 26 feet at mean lower low water. The wharf is leased to oil companies for servicing and bunkering small craft. The wharf has no railway connections, but is adequately equipped for the purposes for which it is used. The port of Bellingham also owns and operates a wharf on the inshore end of Squalicum Creek waterway, which is used primarily by concerns engaged in the construction, repair, supply, and servicing of small boats. That wharf is U-shaped and has a frontage of about 450 feet with water averaging about 16 feet in depth at mean lower low water. It has no railway connections but is adequately equipped for its needs. The port has installed floats and finger piers in the basin inclosed by this wharf to provide a temporary moorage for about 50 boats. Port officials plan to remove the moorage facilities as soon as adequate space becomes available elsewhere, in order to provide better access to the wharf and its marine repair facilities.

40. The port of Bellingham maintains a small-boat basin just southeasterly of Squalicum Creek waterway, shoreward of the rubble-mound breakwater. Fueling, servicing, and equipment for handling fish cargoes are available. The basin has facilities for mooring about 180 boats without congestion. Originally developed as a fishing boat moorage, the basin is now used for both fishing and pleasure boats. Consequently, it has become overcrowded and inadequate, and the port has found it necessary to begin its enlargement. Because of limited