

# WATER RESOURCES DEVELOPMENT

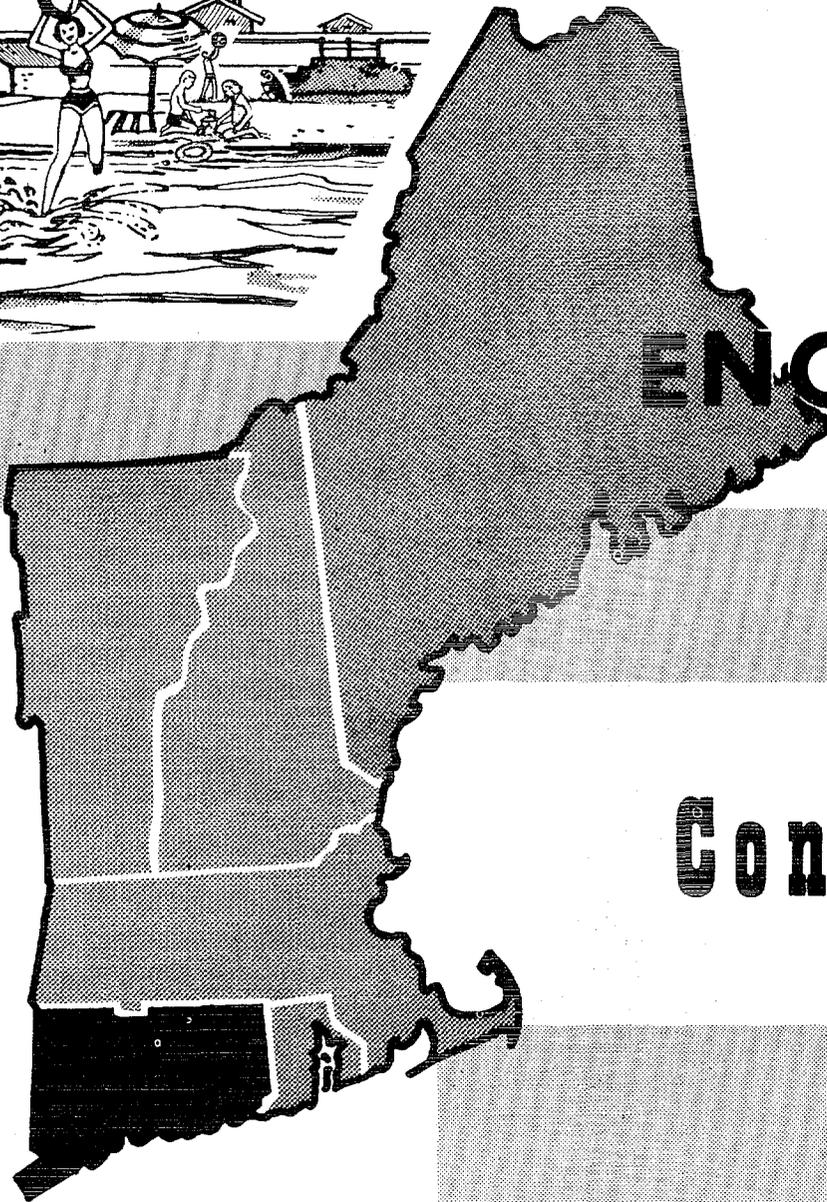
by the U.S. ARMY



# CORPS OF ENGINEERS

in

# Connecticut



January

1958

U.S. Army Engineer Division, New England  
Corps of Engineers  
Boston, Mass.



**Water resources  
development by the  
Corps of Engineers**

**in**

***Connecticut***

**Information on the scope, status and future  
plans for improvement for navigation,  
control of floods and related uses  
of the water resources of the  
State of Connecticut**



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**U.S. Army Engineer Division, New England  
Corps of Engineers  
Boston, Mass.  
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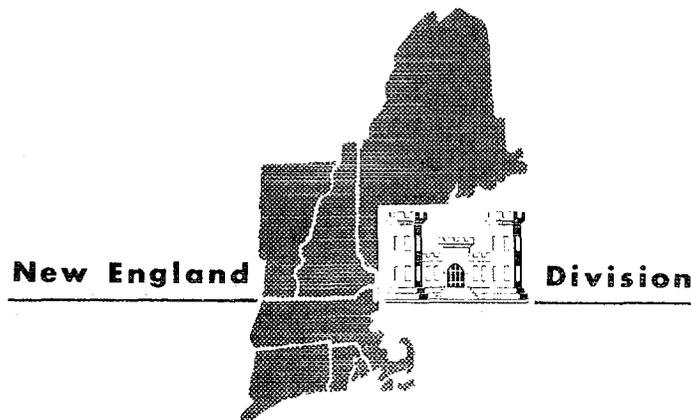
# foreword

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**T**his pamphlet was prepared to describe the work of the Corps of Engineers in the State of Connecticut. It provides concise information on the scope and progress of the Corps of Engineers water resources development program in the State. It tells of the role of the Corps in planning and building projects for navigation, flood control, and shore protection. It supplies information on projects that are completed, under construction or in the planning stage.

Further information on particular projects, activities and areas may be obtained by addressing inquiries to:

The Division Engineer  
U. S. Army Engineer Division, New England  
Corps of Engineers  
424 Trapelo Road  
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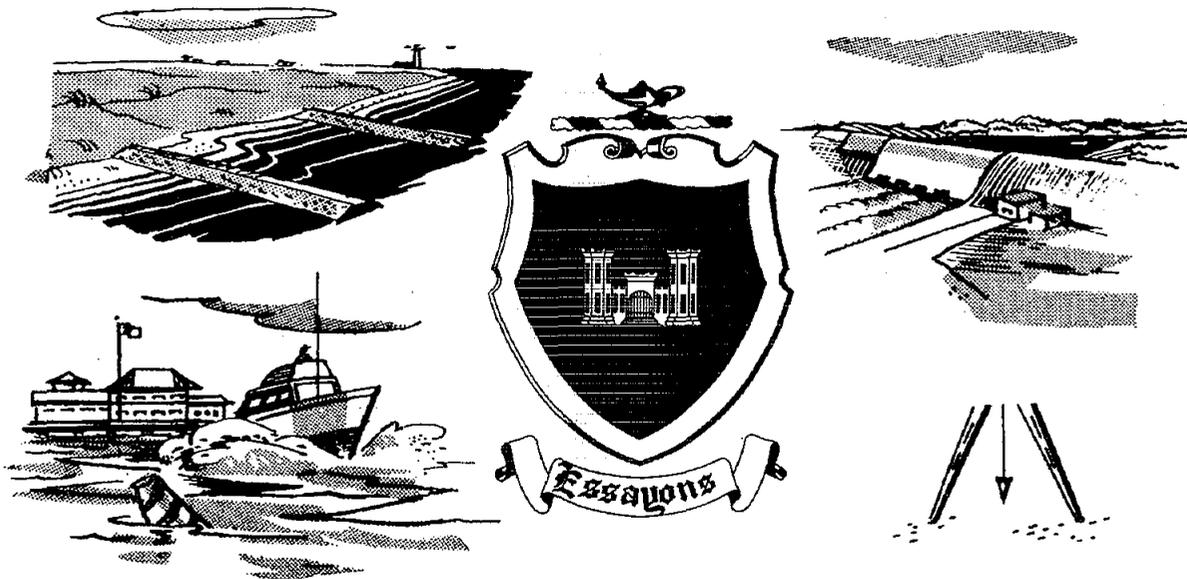
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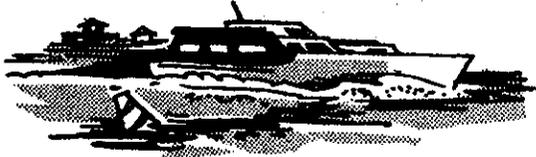
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# introduction

**W**ater Resources Development by the Corps of Engineers in the State of Connecticut consists of works built primarily for navigation, flood control or shore protection. The earliest Corps of Engineers project in Connecticut dates back to 1821 when Congress appropriated funds to provide for the removal of navigational obstructions in the Thames River. Since that time water resources development work has expanded to include improving the harbors of the State, dredging the navigable streams and maintaining navigable channels, administering the laws relative to protection and preservation of navigable waters, providing shore protection and beach erosion measures, making surveys and engineering reports on all major streams of the State, constructing flood control works, making surveys for hurricane protection works, and planning and building projects to provide efficient use of the vital water resources of the State. This work has been performed in accordance with the directions of Congress, in close cooperation with State and local authorities and Federal agencies, to provide beneficial improvements of the type desired by the citizens of the communities and areas most directly concerned.





## navigation works

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**R**iver and harbor improvements have been directed by the Congress for the development of water-borne commerce. Consisting essentially of the deepening of waterways so that ships and other water craft can be accommodated, these improvements provide an economical means of transportation where it can be made available and furnish superior means of moving by boat such products as coal, steel, petroleum, and other bulk commodities. Integrated with rail and truck transportation, improved waterways meet the evergrowing needs of industry and commerce. Other navigation works include the development of safe anchorages for recreational, fishing, and other small craft. The Corps of Engineers is responsible for construction, maintenance and operation of Federal river and harbor (navigation) projects.



## flood control works

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**B**asically, all means of controlling floods can be divided into two broad classifications - first, those which change the channel in which the water flows; and second, those which control the amount of water in the channel at time of flood. Dikes, flood wall, conduits, and channel improvements, provide in various ways a space for the water where it can do no harm. Dams and reservoirs, in contrast, hold back the water and regulate its flow. Dikes, flood walls and smaller improvements are designed to give protection along limited stretches of a river; dams and reservoirs are generally a more practical and economical means of protecting long stretches of river valley. Usually a combination of the two means is desirable and necessary for basin protection.

Local protection works, upon completion, are turned over to local authorities for operation and maintenance. Flood control reservoirs, on the other hand, are usually operated and maintained by the Corps of Engineers unless the protection they provide is mainly local as in the case of reservoirs controlling very small drainage areas. Corps of Engineers operation of major reservoirs is desirable because reservoirs in a given basin provide greater flood flow reductions when operated as an integrated unit.

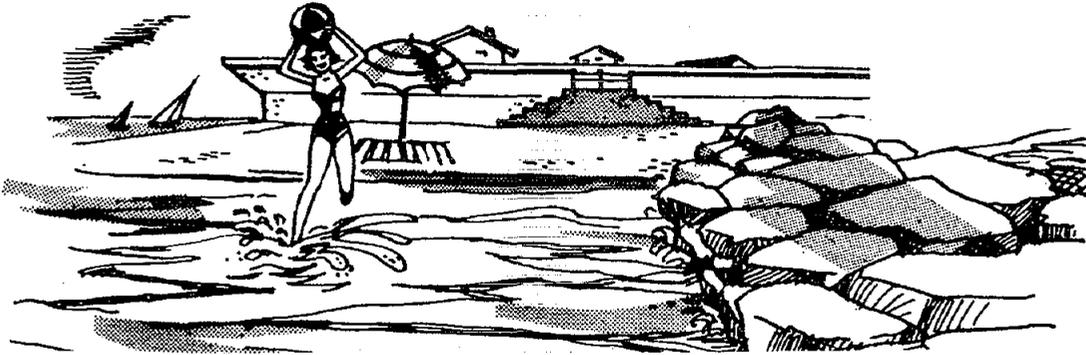


## authority for federal participation in flood control projects

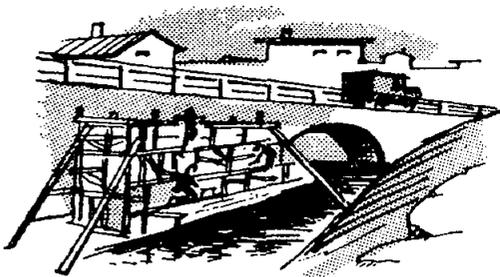
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**T**he Flood Control Act of June 22, 1936, as amended by the acts of June 28, 1938, December 22, 1944 and others, established the Federal policy with regard to flood control; i. e., that "flood control on navigable waters or their tributaries is a proper activity of the Federal Government in cooperation with States, their political subdivisions, and localities thereof...." Each Federal flood control project, except certain small improvements and emergency work, must be specifically authorized by Congress. This authorization usually is in accordance with the recommendations of the Chief of Engineers in a report on the proposed improvement. Authorizing acts do not carry appropriations for undertaking projects; funds for initiating construction are furnished by an appropriation act. Projects are built in accordance with authorizing acts and such general laws as may be applicable after appropriation of funds by the Congress.

## shore protection works



**T**he purpose of shore protection works is to prevent shore damage and promote and encourage the healthful recreation of the people by construction of works for the restoration and protection of shores against erosion by waves and currents. Congress has established a Federal policy of assistance in the construction of works for the shores of the United States, its territories and possessions. This assistance involves the contribution of funds not exceeding (for non-Federal shores) one-third the cost of the project, the remainder to be paid by the State, municipality or other political subdivision in which the project is located.



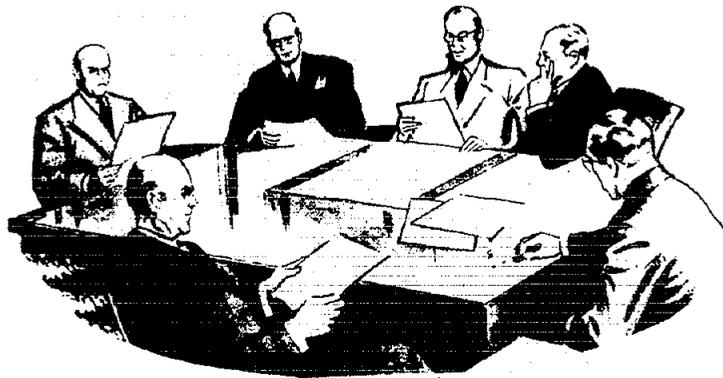
## small projects and emergency works

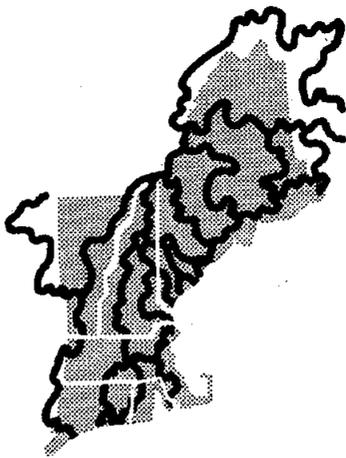
**I**n addition to the regular navigation, flood control, and beach erosion control projects, the Corps of Engineers undertakes small projects and emergency work under various general congressional authorizations and with general funds appropriated annually. These projects are subject to the same principles of feasibility and requirements of local cooperation as specifically authorized projects.

# coordination of reports

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**I**t is the responsibility of the Corps of Engineers, when making investigations of water resources at Congressional request, to study as completely as necessary for sound conclusions all aspects of local and general needs, and the fullest practicable use of water resources and project sites. In this respect, the Corps of Engineers is an engineering consultant to Congress and the people, and must assure that the fullest practicable degree of participation by the people and their governmental officials in the development of water resources takes place. Within the law, maximum cooperation and coordination with other Federal, State and local agencies is essential from the beginning of investigation. Unless a report shows that a proposed project will meet the needs of the people concerned, has their support, and produces the optimum use of the natural resources required for its realization, the investigation has not achieved its objective. Proper coordination therefore involves cooperation with local, State and regional representatives of other Federal agencies, and with representatives of State and local agencies.





## basin-wide planning

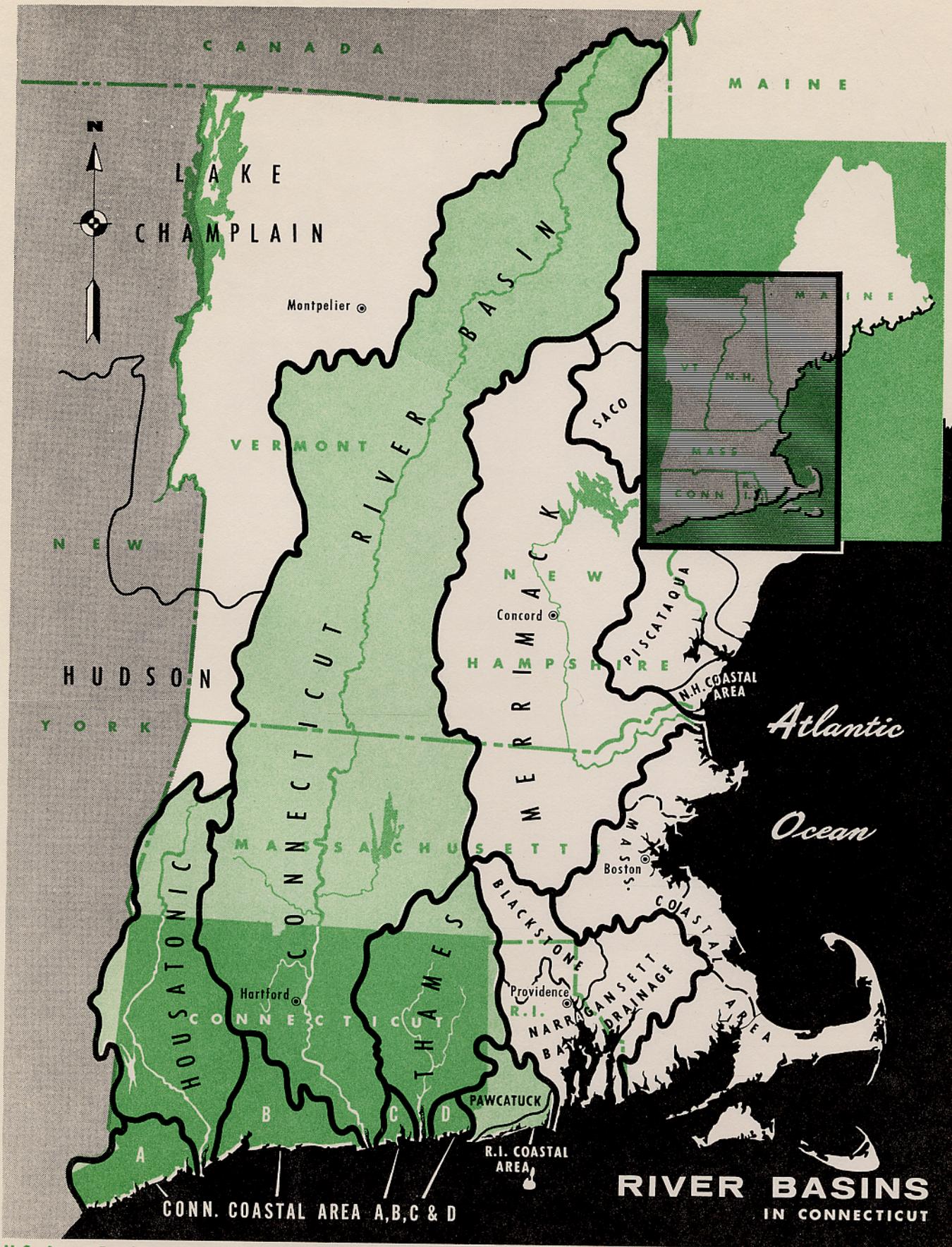
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**E**ach river basin for which Congress has authorized an investigation is studied as a unit in developing comprehensive plans for the improvement of each major watershed. This is an important concept and insures the maximum economical utilization of water resources. In addition to flood control, the studies include consideration of water conservation, domestic and industrial water supply, generation of hydroelectric power, pollution abatement, fish and wildlife, recreation, and such other potential uses of water as can be economically integrated with basic flood control works. Close cooperation with local interests and the plans of other agencies are fully considered. The resulting Corps of Engineers project, by means of such coordination, becomes a properly designed unit in the comprehensive watershed development.

The Corps of Engineers has membership in the Northeastern Resources Committee, an organization composed of representatives of the New England States and Federal agencies. NRC is concerned with the long range, coordinated development and utilization of the regions natural resources.



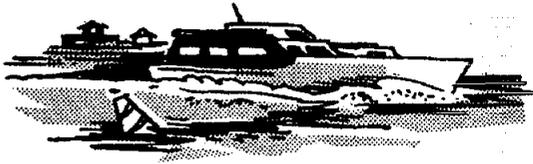
While this pamphlet concerns the development of water resources by the Corps of Engineers in Connecticut, nature is no such respecter of State boundaries. This is readily apparent when it is noted that three major rivers flowing through Connecticut contain drainage from other States. Thus, water resource developments in the Connecticut River Basin in the States of Vermont, New Hampshire and Massachusetts are of considerable importance to the State of Connecticut. Likewise, development of the water resources of the Housatonic River Basin in New York and Massachusetts and the Thames River Basin in Massachusetts have a direct bearing on water resource development in Connecticut. This concept of river basin development is graphically illustrated in the following map.



**RIVER BASINS  
IN CONNECTICUT**

U.S. Army Engineer Division, New England • Corps of Engineers • Boston, Mass.

# navigation projects completed



## BRANFORD HARBOR

Branford Harbor is located on the north shore of Long Island Sound, 5 miles east of New Haven Harbor.

The existing project was adopted in 1902 and modified in 1907. It provides for a Channel 8-1/2 feet deep from the outer harbor to the upper wharf in the Branford River. The project was completed in 1907 at a cost of \$9,540.

The harbor is used chiefly for recreational boating and by the local fishing fleet. There has been no commercial traffic from 1948 until 1956 when 76 tons was reported.

## BREAKWATERS AT NEW HAVEN

New Haven is located on the north shore of Long Island Sound, and 67 miles east of New York City.

The existing project, adopted in 1879, and modified in 1890 and 1910, provides for the construction of three riprap breakwaters at the entrance to the harbor. The project was completed in 1915 at a cost of \$1,240,000.

These structures provide shelter to the harbor and anchorage grounds behind them.

## BRIDGEPORT HARBOR

Bridgeport Harbor is on the north shore of Long Island Sound, about 51 miles east of New York City.

The original project was adopted in 1836, and modified in 1871 and 1884, and provided for a channel 14 feet deep to the city wharves, a breakwater on the east side of the harbor entrance, and the construction of a breakwater at Fayerweather Island, Black Rock Harbor. Work on the project was accomplished at a cost of \$379,000.

The existing project, adopted in 1936 and modified through 1946, provides for the following:

From Long Island Sound to a point about 720' below Stratford Ave. Bridge over Poquonock River	Channel 30' deep
Up the Poquonock River to a point about 500' below the dam at Berkshire Ave.	Channel 18' deep
Up the Yellow Mill Channel to a point about 370' from Crescent Ave.	Channel 18' deep
Up the Johnson River to a point 1,700' below Hollisters Dam, thence to a point 600' below Hollisters Dam.	Channel 15' deep Channel 9' deep
Up the Black Rock Harbor and Cedar Creek to and including the two branches	Channel 18' deep
Up the Burr Creek to the south side of Yacht St. Ext.	Channel 7' deep
At the entrance to Johnsons River Channel	Turning basin, 30' deep

Two anchorage basins 25 and 18' deep

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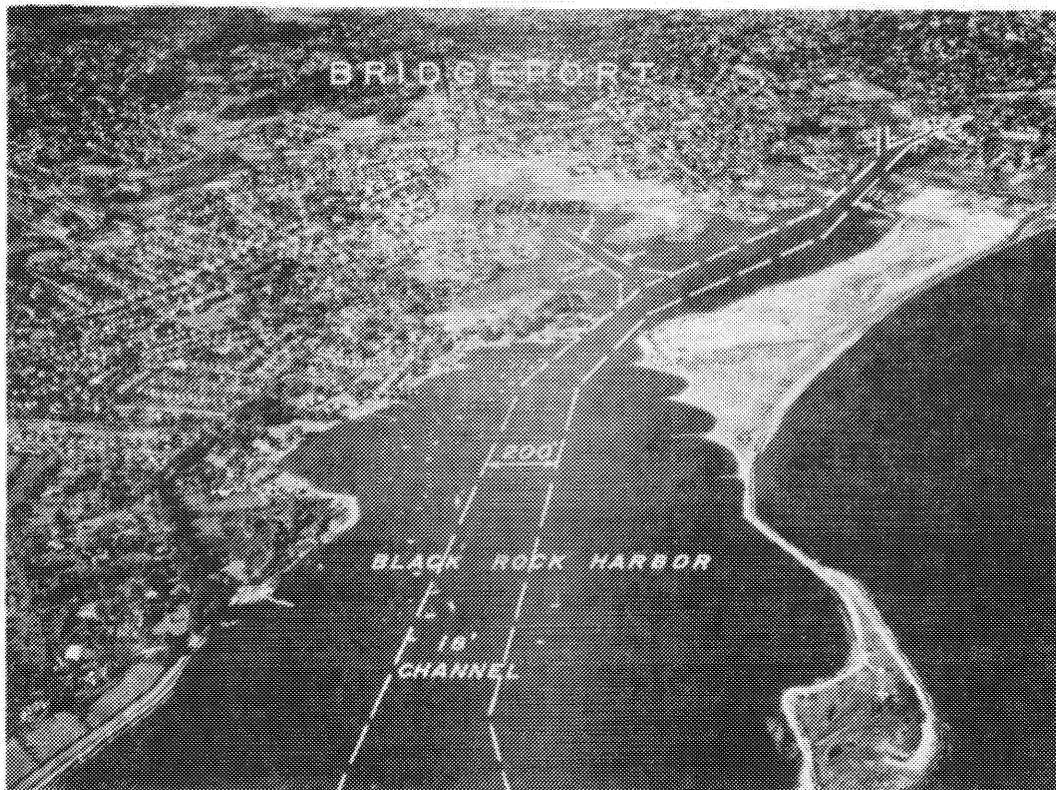
Two riprap breakwaters at the entrance to the main harbor.

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Construction and maintenance of shore protection on Fayerweather Island including a sea wall connecting the northerly and southerly portions of the Island.

The project was completed in 1948 at a cost of \$2,200,000.

Bridgeport Harbor is one of the principal commercial ports of the State of Connecticut. The average annual traffic during the period 1952 through 1956 was 2,481,800 tons. During 1956 there were 2,481,800 tons of commerce reported of which 71.6% was in petroleum and petroleum products. There were 2,820 vessel trips into the harbor in 1956 made by vessels drawing up to 32 feet.



Black Rock Harbor, (Bridgeport) Conn.

## CLINTON HARBOR

Clinton Harbor is located on the north shore of Long Island Sound about 10 miles west of the mouth of the Connecticut River, and about 20 miles east of New Haven Harbor, Connecticut.

The original project, adopted in 1882, provided for an entrance channel 6 feet deep and the construction of a stone dike between Cedar Island and the mainland. This work was completed in 1893 at a cost of \$6,330.

The existing project, adopted in 1882 and modified in 1945, provides for a channel 8 feet deep from Long Island Sound to the wharves at Clinton; an anchorage basin of the same depth opposite and above the wharves; and the maintenance of the dike constructed under the authorization of 1882. This project was completed in 1950 at a cost of \$79,000, of which local interests contributed \$6,600.00 as required under the conditions of local cooperation.

The harbor is used chiefly for recreational boating. Traffic in 1956 amounted to 51 tons.

## DUCK ISLAND HARBOR

Duck Island Harbor is located on the north shore of Long Island Sound about 20 miles east of New Haven, Connecticut.

The original project, adopted in 1890, provided for the construction of three riprap breakwaters for a harbor of refuge. Only one breakwater was constructed under this project at a cost of \$115,000.

The existing project, adopted in 1910 and supplemented in 1916, provides for the construction of three breakwaters and dredging to a depth of 16 feet a portion of the protected area back of the breakwaters. The existing project was completed in 1917 at a cost of \$367,000.

Strategically located, Duck Island Harbor is frequently used as a harbor of refuge by transient vessels. No commerce has been reported.

#### FIVE MILE RIVER HARBOR

Five Mile River Harbor is located on the north shore of Long Island Sound, about 41 miles to the east of New York City.

The existing project adopted in 1888 provides for a channel 8 feet deep from Long Island Sound to the head of the harbor, a length of about 6,000. Work on this project has been accomplished at a cost of \$35,500.

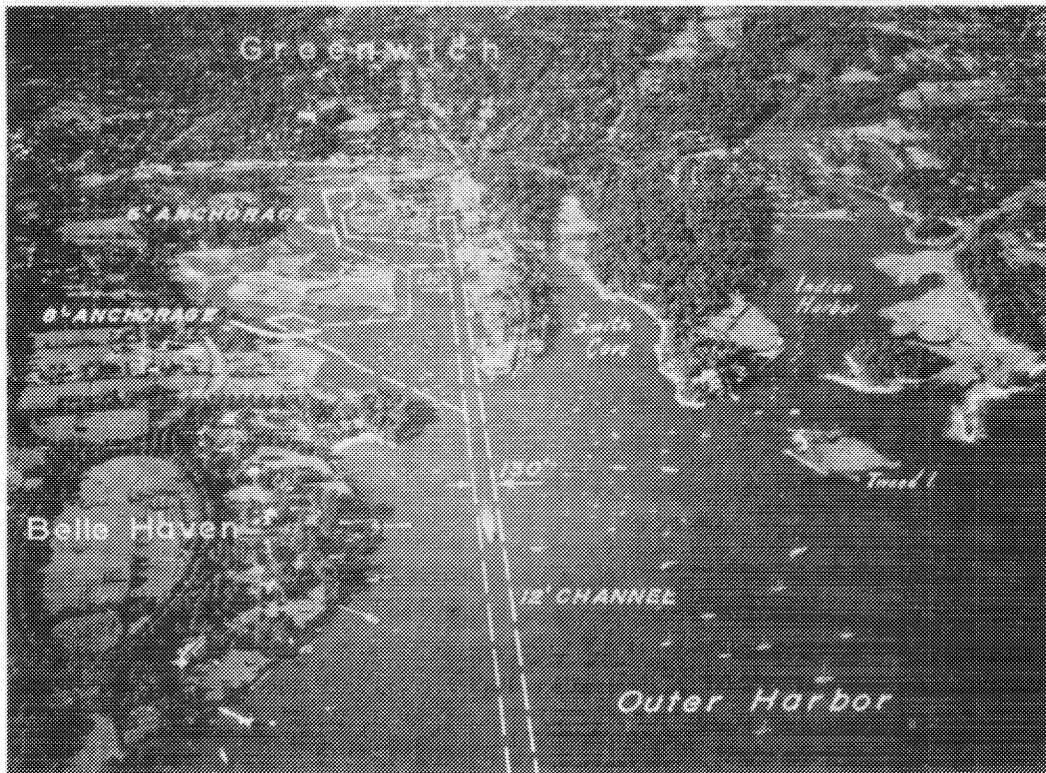
The river is used chiefly for recreational boating. There were 1,094 tons of commercial traffic reported in 1956, consisting of shellfish products, and sand, gravel and crushed rock.

#### GREENWICH HARBOR

Greenwich Harbor is located on the north shore of Long Island Sound, about 29 miles east of New York City.

The original project, adopted in 1896, provided for a channel 9 feet deep from the outer bay to the Steamboat Wharf, thence 6 feet to the head of the harbor with a turning basin of the same depth at the upper end. The project was completed in 1905 at a cost of \$17,000.

The existing project, adopted in 1909, and modified in 1945 and 1948, provides for a channel 12 feet deep from Long Island Sound to the head of the harbor and two anchorage areas on the west side of the channel, one 6 feet deep north of Grass Island and the other 8 feet deep south thereof.



Greenwich Harbor, Conn.

The existing project was completed in 1951 at a cost of \$282,000 of which \$100,000 was contributed by local interests under the conditions of local cooperation.

The harbor is used chiefly for recreational boating and for the receipt of sand, gravel and crushed rock. The average annual traffic during the period 1952 through 1956 amounted to 99,700 tons. Traffic in 1956 amounted to 182,418 tons of which 83% was in sand, gravel and crushed rock. There were 1,618 inbound vessel trips in 1956 made by vessels with drafts up to 14 feet.

#### HARBOR AT WILSON POINT

The harbor at Wilson Point is a small cove located on the north shore of Long Island Sound about one and one-half miles southwest of Norwalk Harbor.

The existing project adopted in 1888 provides for a channel 15 feet deep from Long Island Sound to the wharves at Wilson Point. The project was completed in 1894 at a cost of \$54,200.

There has been no commercial traffic reported.

## HOUSATONIC RIVER

The Housatonic River rises in northwestern Massachusetts, flows southerly 130 miles through Massachusetts and Connecticut, and empties into Long Island Sound at Stratford, 5 miles east of Bridgeport Harbor.

The existing project, adopted in 1871, and modified by enactments in 1888, 1892 and 1930, provides for a channel 18 feet deep from the mouth to Culvers Bar, thence 7 feet to Derby and Shelton; a riprap breakwater 5,820 feet long, at the mouth of the river; a riprap dike about 1,500 feet long at Stratford, and a riprap jetty 163 feet long at Sow and Pigs Rock.

Construction of the breakwater, dike and jetty and the 7-foot channel to Derby and Shelton were completed by 1916 at a cost of \$234,000. Work on the 18-foot channel to Devon was completed during 1956 at a cost of \$650,000 to the Federal government, exclusive of \$150,000 cash contribution by local interests in compliance with the requirements of local cooperation.

The average annual traffic during the period 1952 through 1956 amounted to 782,250 tons. During 1956 there were 842,476 tons carried over the waterway of which 93% was traffic in bituminous coal and lignite. There was a total of 2,367 vessel trips on the river in 1956, 1,220 upbound and 1,167 downbound, made by vessels drawing up to 16 feet.

## MIANUS RIVER

Mianus River has its source in southeastern New York. It flows in a southerly direction about 20 miles, crossing the southwestern corner of Connecticut, and empties into Captain Harbor, an arm of Long Island Sound, about 3 miles west of Stamford Harbor, Connecticut.

A previous project was originally adopted in 1892, modified in 1896, and then abandoned in 1905. A channel 6 feet deep from the mouth of Mianus and a turning basin were dredged at a cost of \$19,000.

The existing project, adopted in 1945, provides for a channel 6 feet deep from Cos Cob Harbor to the head of navigation at the Boston Post Road. The existing project was completed in 1951 at a cost of \$160,000, of which local interests contributed \$26,500 under the conditions of local cooperation and \$20,000 in lieu of spoil disposal areas.

The waterway is used chiefly for recreational boating and the receipt of sand, gravel and crushed rock. The average annual traffic during the period 1952 through 1956 amounted to 44,100 T. Traffic in 1956 amounted to 150,031 tons of which 96.8% was in sand, gravel and crushed rock. There were 283 inbound vessel trips in 1956 made by vessels with drafts up to 12 feet.

#### MILFORD HARBOR

Milford Harbor is on the north shore of Long Island Sound, about 8 miles west of New Haven Harbor.

The original project was adopted in 1874, and modified in 1878, 1880 and 1882. It provided for a breakwater and jetties at the mouth of the harbor, a channel 8 feet deep through the entrance, and a channel 4 feet deep to the wharves at Milford. Work was accomplished on this project at a cost of \$42,300.

Under an existing project, adopted in 1874, and modified in 1902 and 1937, work performed on this project provides for a channel 10 feet deep to Merwin's Wharf, thence 8 feet deep to a point 400 feet above the Town Wharf; an anchorage basin 10 feet deep in the lower portion, and 8 feet deep in the upper portion on the west side of the channel; and two riprap jetties at the harbor entrance.

Work on this project has been accomplished at a cost of \$58,000, including \$11,380 contributed by local interests under the conditions of local cooperation.

Milford Harbor is used chiefly for the receipt and shipment of shellfish. The average annual traffic during the period 1952 through 1956 amounted to 6,200 tons. Traffic in 1956 totaled 3,891 tons.

## MYSTIC RIVER

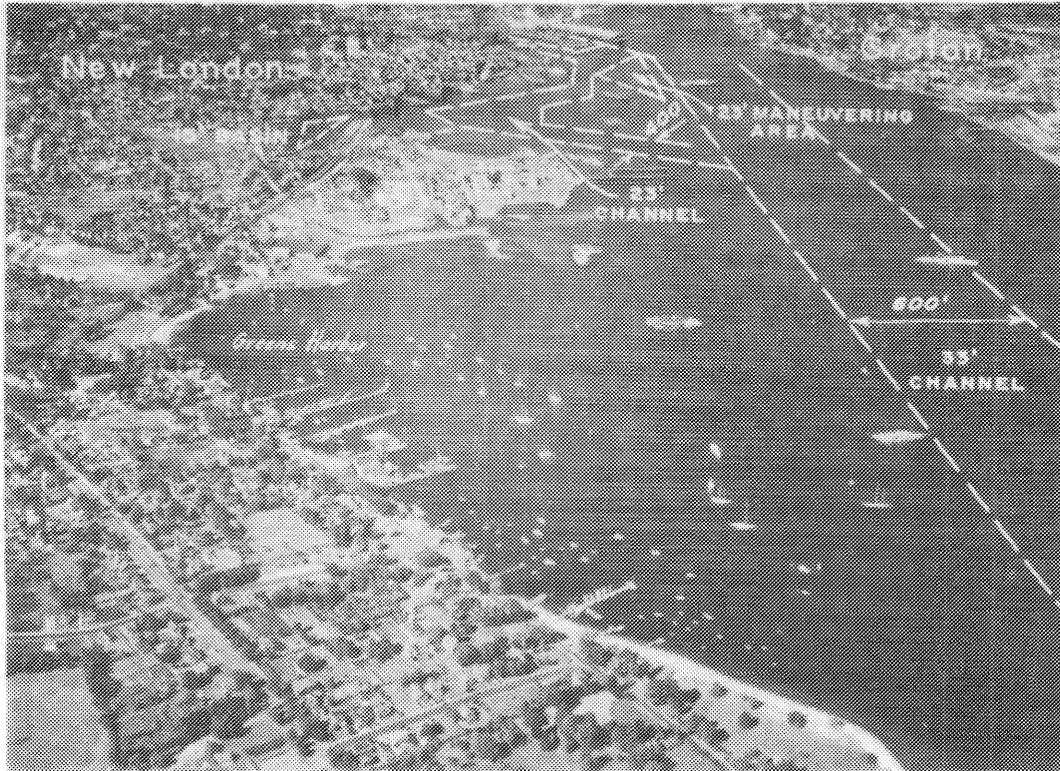
The Mystic River has its source in southeastern Connecticut. It flows in a southerly direction for about 8 miles and empties into Fishers Island Sound at Noank, 11 miles east of New London.

Improvements were originally adopted in 1890 and provided for a 15-foot channel from Fishers Island Sound to the highway bridge at Mystic. This work was completed in 1891 at a cost of \$36,600.

The existing project, as initially authorized by the Act of 1890 and modified in 1912 and 1913, provides for maintaining the original 15-foot channel and dredging a channel 12 feet deep from the highway bridge at Mystic northerly to the wharf of the Marine Historical Association. The project was further modified by the River and Harbor Act of 1945 which provided for dredging an anchorage basin north of Mason Island and a turning basin below the highway bridge, both to a depth of 9 feet, and widening a section of the existing 15-foot channel.

Dredging operations started in September 1956 and were completed in May 1957. Maintenance dredging of the 12-foot channel was accomplished in conjunction with the new work. The cost of this work was approximately \$163,000 including a cash contribution of \$14,000 by local interests as required in accordance with the requirements of local cooperation.

The river is used chiefly for recreational boating and by the local fishing fleet. Traffic in 1955 and 1956 amounted to 669 and 163 tons respectively.



NEW LONDON HARBOR

New London Harbor is located at the mouth of the Thames River on the north shore of Long Island Sound, at its eastern end, and is about 14 miles east of the mouth of the Connecticut River.

Improvements of the Harbor were originally adopted in 1880, 1881, and 1892, and provided for removing a shoal to a depth of 16 feet near the Central Vermont Railroad pier and dredging Shaw Cove to a depth of 12 feet. This work was completed in 1897 at a cost of \$40,800.

The existing project, adopted in 1902 and supplemented by enactments in 1910, 1916 and 1937, provides for an entrance channel 33 feet deep from Long Island Sound to the State Pier; a waterfront channel 23 feet deep; a branch channel 23 feet deep in Winthrop Cove and east of the Central Vermont Railroad pier; a maneuvering area 23 feet deep west of the main channel and south of the State Pier; and for dredging Shaw Cove to a depth of 15 feet. This project was completed in 1938 at a cost of \$568,000.

New London Harbor is one of the major ports of the State. The average annual traffic during the period 1952 through 1956 was 1,035,900 tons carried in vessels with drafts up to 32 feet. Traffic in 1956 amounted to 1,456,363 of which 92% was traffic in petroleum and petroleum products.

## NORWALK HARBOR

Norwalk Harbor is located on the north shore of Long Island Sound, about 40 miles east of New York City.

The original project was adopted in 1872, and modified in 1896 and 1907, and provided for a channel 10 feet deep from the outer harbor to South Norwalk, thence a channel 8 feet deep to Norwalk, and a channel 6 feet deep to East Norwalk. Work on this project was accomplished at a cost of \$163,000.

The existing project, adopted in 1919 and modified in 1945, provides for a channel 12 feet deep to South Norwalk, thence a channel 10 feet deep to Norwalk; an anchorage area 10 feet deep opposite Fitch Point; a channel 6 feet deep from the anchorage to East Norwalk; and an anchorage area 6 feet deep adjacent to the upper portion of the East Norwalk Channel.

The existing project was completed in 1950 at a cost of \$403,000 of which local interests contributed \$16,500 under the conditions of local cooperation and \$18,000 in lieu of spoil disposal areas.

The waterway is used principally for the receipt of petroleum products, coal, sand and gravel, fish and shellfish. The average annual traffic during the period 1952 through 1956 amounted to 320,800 tons. During 1956 there were 542,124 tons of commerce reported of which about 57% was in coal, lignite and coal products, and 38% was in petroleum and petroleum products. There were 1,411 vessel trips into the harbor in 1956 made by vessels drawing up to 15 feet.

## PATCHOGUE RIVER

Patchogue River is a small tidal stream about 3 miles long, situated in the town of Westbrook, on the north shore of Long Island Sound, about 7 miles west of the mouth of the Connecticut River.

The existing project was adopted in 1954 and provides for a channel 8 feet deep and 75 feet wide, extending from deep water in Duck Island Roads to the highway bridge on United States Route 1, a distance of about 5,100 feet; an anchorage and maneuvering area 8 feet deep, 75 feet wide, and 500 feet long in the reach of the river opposite the town wharf; and a sand-tight stone jetty extending 600 feet southerly into Duck Island Roads from a point on the west side of the mouth of the river. The jetty construction was completed in July 1956 and the dredging was completed in November 1956.

The estimated cost of the project to the United States was about \$150,000. In addition, local interests contributed \$100,000, or 40% of the cost of construction, and furnished suitable spoil-disposal areas.

The river is used chiefly by recreational and fishing craft.

## PAWCATUCK RIVER, CONNECTICUT AND RHODE ISLAND

Pawcatuck River rises in Worden Pond, South Kingston, in south central Rhode Island and flows westerly and southerly and enters Little Narragansett Bay about 13 miles east of New London, Connecticut.

The original project, which was adopted in 1871 and modified in 1885 and 1896, provided for a channel 5 to 8 feet deep through Little Narragansett Bay and Pawcatuck River to Westerly. This work was completed in 1903 at a cost of \$133,000.

The existing project, authorized in 1896 and modified in 1905 and 1945, provides for a channel 10 feet deep through Little Narragansett Bay and Pawcatuck River to Westerly, a length of 7.5 miles; a channel 10 feet deep from the mouth into Watch Hill Cove and an anchorage basin of the same depth in Watch Hill Cove; removal of obstructions at Watch Hill and the construction of a rip-rap groin near the southwest corner of the basin. Work on this project has been accomplished at a cost of \$202,000, of which local interests contributed \$20,000 as required under the conditions of local cooperation.

The bay and river are used by commercial and pleasure craft. The average annual traffic during the period 1952 through 1956 was 13,100 tons. Traffic in 1956 amounted to 5,600 tons.

### SOUTHPORT HARBOR

Southport Harbor is located on the north shore of Long Island Sound, about 50 miles east of New York City.

The original project, adopted in 1829 and modified in 1876, 1881, 1902 and 1912, provided for a channel 6 feet deep from Long Island Sound to the wharves at Southport; an anchorage 6 feet deep at the head of navigation; a stone breakwater about 1,320 feet long at the harbor entrance; and a dike about 1,350 feet long on the east side of the channel. Work was accomplished on this project at a cost of \$59,200.

The existing project, adopted in 1829 and modified in 1935, provides for a channel 9 feet deep from Long Island Sound to the Golf Club Wharf; an anchorage .6 feet deep at the upstream end of the channel; and the maintenance of the breakwater and dike constructed under the authorization of 1829. The existing project was completed in 1936 at a cost of \$54,000 of which \$16,500 was contributed by local interests under the conditions of local cooperation.

The harbor is used principally for recreational boating. No commercial traffic has been reported.

## STAMFORD HARBOR

Stamford Harbor is located on the north shore of Long Island Sound, 32 miles east of New York City.

The original project, adopted in 1886, and modified in 1892 and 1901, provided for a channel 7 feet deep with a basin of the same depth at the head of the harbor in the west branch and 9 feet deep in the east branch. This work was completed in 1911 at a cost of \$135,000.

The following work has been performed at Stamford Harbor under an existing project adopted in 1919 and modified in 1935, 1937 and 1946, and provides for:

On each side of the channel at the entrance to the harbor	A detached breakwater
Through the anchorage area on the channel	Entrance channel 18' deep
Thence to the junction of the two branches	Channel 15' deep
In the West Branch	Channel 15' deep
At the head of the Branch	Basin 15' deep
To the head of navigation in the East Branch	Channel 12' deep
On the west side of the entrance channel	Anchorage 18' deep

Work has been accomplished at a cost of \$927,000, of which \$169,636 was contributed by local interests.

The harbor is used principally for the receipt of petroleum and petroleum products, coal and lignite, and sand, gravel and crushed rock. The average annual traffic during the period 1952 through 1956 amounted to 803,200 tons. During 1956 there were 1,028,938 tons of commercial traffic reported of which 43% was in petroleum and petroleum products and 44% was in sand, gravel and crushed rock. There were 1,769 vessel trips into the harbor in 1956 made by vessels with drafts up to 20 feet.

#### STONINGTON HARBOR

This harbor is situated in the southeast corner of Connecticut, on the north shore of Fishers Island Sound. It is 9 miles east of the entrance to New London Harbor.

Improvement of the harbor was first adopted in 1828 and then modified by enactments through 1896, and provided for the erection of protective works; the construction of an east and west breakwater; dredging the inner harbor and across Noyes Shoal; and the construction of a seawall at Stonington Point. This work was completed at a cost of \$337,000.

The existing project, adopted in 1950, provides for maintaining the existing breakwater and the 12-foot inner harbor; dredging Penguin Shoals to a depth of 10 feet; and dredging an anchorage in the northeast corner of the harbor to a depth of 6 feet. Local interests did not desire dredging of the 6-foot anchorage. The dredging of Penguin Shoals was completed in May 1957 at a cost of about \$39,900.

Stonington Harbor is used chiefly as a fishing port. Commercial traffic in 1956 amounted to 5,489 tons, all fish and shellfish and their products.

#### THAMES RIVER

This is a tidal estuary, extending from the junction of the Yantic and Shetucket Rivers at Norwich, Connecticut, 15 miles southerly to New London Harbor on Long Island Sound.

The original project, adopted in 1936 and modified in 1879, provided for deepening of the channel of the river leading into Norwich, Connecticut. The work consisted of the building of 11 piers or wing dams, adding to three wings already built by private enterprise, and the dredging of a channel 14 feet deep, all in the portion of the river immediately below Norwich. This work was completed in 1882 at a cost of \$148,000.

The existing project, adopted in 1882 and supplemented by enactments through 1945, provides for a channel 25 feet deep to Norwich; widening the channel opposite the submarine base by an average of about 350 feet with a depth of 20 feet; the construction of five training walls; and the removal of obstructions in the Shetucket River at Norwich. Work on the project has been completed at a cost of \$1,320,000.

The average annual traffic during the period 1952 through 1956 was 795,300 tons carried in vessels with drafts up to 25 feet. Traffic in 1956 amounted to 973,292 tons of which about 58% of the commerce was in coal, lignite and coal products, and 37% was in petroleum and petroleum products.

#### WESTCOTT COVE

Westcott Cove is on the north side of Long Island Sound, 1 mile east of the entrance to Stamford Harbor and separated from the harbor by a narrow neck of land known as Shippen Point.

The existing project was adopted in 1948 and provides for dredging a channel 100 feet wide and 8 feet deep from Long Island Sound through the Cove to the south limit of the lagoon. The improvement was completed in January 1957.

The Federal cost for the completed project was \$55,960. In addition, local interests were required to contribute \$21,000 under the conditions of local cooperation.

The waterway is used chiefly for recreational boating.



## navigation project under way

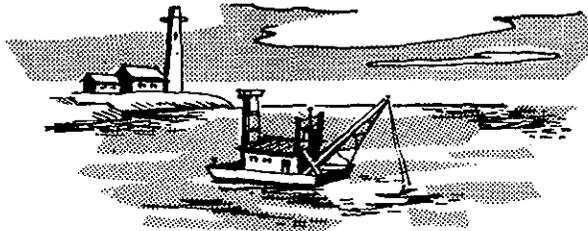
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### GUILFORD HARBOR

Guilford Harbor is on the north shore of Long Island Sound about 13 miles east of New Haven Harbor, Connecticut.

The existing project, adopted in 1945, provides for an entrance channel in East River with an anchorage basin at the head of the channel, a branch channel in Sluice Creek, all to a depth of 6 feet. Improvement dredging was initiated in February 1957 and completed in April 1957. During dredging operations, boulders were encountered which could not be removed by the plant employed. It is expected that removal of boulders will be accomplished during FY 1958.

The estimated cost of the entire project is \$175,500. Local interests have contributed \$25,500 under the requirements of local cooperation.



# navigation projects authorized



## CONNECTICUT RIVER BELOW HARTFORD

This river has its source in Connecticut Lake in northern New Hampshire, flows southerly 380 miles, and empties into Long Island Sound at Saybrook, Connecticut, 14 miles west of New London. Hartford, now the head of commercial navigation, is 52 statute miles by channel from the mouth.

The original project, adopted in 1836 and modified in 1870, provided for the improvement of the harbor at Saybrook by removing the bar at the mouth of the river. This work was accomplished at a cost of \$287,000.

The existing project, adopted in 1872 and supplemented by enactments through 1950, provides for the following:

From the mouth of the Connecticut River to Hartford	Channel 15' deep
At the mouth of the river	Two riprap jetties
At Hartford	A training dike
Entrance Channel to North Cove	11 feet deep
In North Cove at Old Saybrook	A 6-foot and 11-foot anchorage
In Eightmile River to Hamburg	Channel 8' deep
In Hamburg	Turning basin 8' deep; anchorage 6' deep

The construction of dikes, training walls, revetments and accessory works.

Work has been accomplished on the existing project at a cost of \$858,500. To complete the project requires the improvement in North Cove at an estimated cost of \$664,500 including \$67,500 to be contributed by local interests. The project for Eightmile River has been deferred indefinitely due to the non-compliance with the requirements of local cooperation and the apparent lack of interest in the project by local people.

The Connecticut River below Hartford is used principally for the transportation of coal, petroleum products and chemicals. The average annual traffic during the period 1952 through 1956 amounted to 2,418,400 tons; traffic in 1956 amounted to 2,894,673.

#### NEW HAVEN HARBOR

New Haven Harbor is located on the north shore of Long Island Sound, about 67 miles to the east of New York City.

Improvement of the harbor was originally adopted in 1852 and modified in 1871 and 1905, and provided for the removal of Middle Rock at the entrance to the harbor and dredging a channel 12 feet deep in West River. Work on this project was accomplished through 1906 at a cost of \$332,000.

The existing project, adopted in 1882, with supplemental enactments through 1946, provides for the following:

From Long Island Sound to the head of the main harbor	Channel 35' deep
<hr/>	
From the 16-foot anchorage	Channel 12' deep
<hr/>	
Up West River nearly to the railroad bridge	Channel 12' deep

From the head of the main harbor up Quinnipiac River to a point 1,000 feet above Ferry Street	Channel 22' deep
To Grand Avenue	Channel 16' deep
Up Mill River to the junction of the two branches	Channel 12' deep in each branch
Thence, to Grand Avenue Bridge	Channel 12' deep
At the mouth of Mill River	Turning basin 22' deep
Opposite Fort Hale Bar	Pile and riprap dike (Sandy Point Dike)
In Morris Cove	Removal of certain obstructive rocks
From the 15-foot anchorage to Brewery Street	Channel 12' deep*
Three anchorage basins; 6, 15 and 16 feet deep	

Work on this project has been accomplished at a cost of \$3,873,500. The last work performed was the dredging of the 35-foot main ship channel, which was completed in September 1949. To complete the project requires the dredging of the 22-foot channel in the Quinnipiac River. The estimated cost of this work is \$870,000. Work on this part of the project is dependent upon appropriation of necessary funds.

New Haven Harbor is the largest commercial harbor in the State. The average annual traffic during the period 1952 through 1956 amounted to 6,836,300 tons. Traffic in 1956 was 8,291,323 tons.

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\*Abandoned in 1949 after Congress had declared the waterway non-navigable.

## WESTPORT HARBOR AND SAUGATUCK RIVER

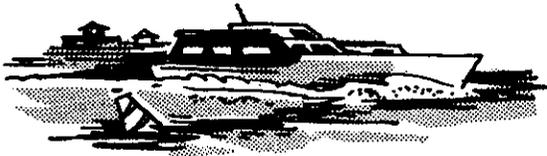
This project is located on the North Shore of Long Island Sound, about 11 miles west of Bridgeport Harbor.

The original project, adopted in 1827, provided for deepening the channel near Westport, removing two rocks from the river, building a breakwater at Cedar Point, and cutting a canal through Great March. This work was completed in 1840 at a cost of \$17,000.

The existing project, adopted in 1892 and modified in 1896 and 1954, provides for a channel 4 feet deep to Westport, the removal of ledge rock and boulders from the channel and repairing the Cedar Point breakwater constructed under the previous project, and a channel 9 feet deep at mean low water and 125 feet wide across the outer bar, thence generally 100 feet wide to the town highway bridge at Saugatuck, with a turning and anchorage basin 6 feet deep and 3.5 acres in area below the bridge. Work completed to date consists of a channel 4 feet deep to Westport, removal of ledge rock and boulders from the channel and repairing the Cedar Point breakwater constructed under the original project, at a cost of \$15,200. To complete the project requires deepening the channel to 9 feet estimated in 1956 to cost \$182,000 of which local interests are required to make a cash contribution of \$46,000, furnish disposal areas for the construction and subsequent maintenance of the project when and as required, and to bulkhead those portions of the disposal areas which lie below high water.

Funds were appropriated for construction of the project during FY 1956. Local interests voted not to appropriate the required cash contribution. Construction of the project has been deferred indefinitely pending compliance with requirements of local interests.

Westport Harbor and the Saugatuck River are used chiefly for the receipt of coal and petroleum products and for recreational boating. The average annual traffic during the period 1952 through 1956 was 30,500 tons. Traffic in 1956 amounted to 90,364 tons.



# navigation studies

LOCALITY - PURPOSE & SCOPE	PRESENT STATUS
<p data-bbox="277 457 570 489">BRANFORD HARBOR</p> <p data-bbox="277 531 760 905">A survey to determine the feasibility of improving navigation for commerce and pleasure craft by providing a channel 12 feet deep extending from Long Island Sound to Highway Bridge, and an anchorage 6 feet deep, 1100 feet long and 250 feet wide, near Branford Point.</p>	<p data-bbox="946 531 1334 695">Report completed and submitted in February 1956. Further improvement of harbor not recommended.</p>
<p data-bbox="277 1003 605 1035">BRIDGEPORT HARBOR</p> <p data-bbox="277 1077 760 1827">A survey to determine the feasibility of further increasing the width and depth of the present 30-foot channel and 25-foot anchorage basin to depths of 35 or 40 feet in order to accommodate commerce, particularly oil receipts, carried in deep-draft vessels, and further development of Black Rock Harbor and Johnsons River. Commerce, consisting chiefly of petroleum products is being carried in larger and deeper draft tankers, which are subject to numerous tidal delays due to insufficient depth in the existing channel.</p>	<p data-bbox="946 1077 1334 1703">Report completed and submitted in February 1956. Report recommended dredging 35-foot main harbor channel; constructing 2 breakwaters at Black Rock Harbor and anchorage at Burr &amp; Cedar Creeks; and 6 &amp; 9-foot anchorages in Johnsons River. The project is not presently authorized but may be contained in the current River and Harbor Omnibus Bill.</p>

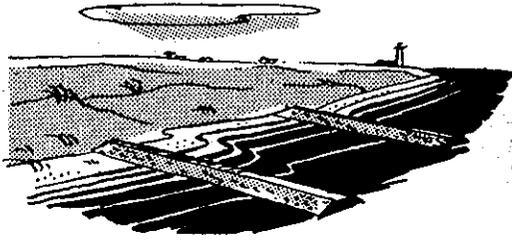
LOCALITY - PURPOSE & SCOPE	PRESENT STATUS
<p>CONNECTICUT RIVER, LONG ISLAND SOUND TO HOLYOKE, MASS.</p> <p>Studies and investigations have been made to determine the feasibility of extending navigation to Holyoke, Mass. by providing a 12-foot deep channel from Hartford, Conn. The project would provide for the hydroelectric power at Enfield.</p>	<p>Review of data deferred pending completion of study by Connecticut Light &amp; Power Co. to determine the feasibility of construction by that utility of a new dam at Enfield with necessary provisions for existing regulations.</p>
<p>CONNECTICUT RIVER, BELOW HARTFORD (Vicinity of Saybrook-Lyme Bridge)</p> <p>A preliminary examination to determine possibilities for development of a small boat harbor in the vicinity of the Saybrook-Lyme Bridge.</p>	<p>Preliminary examination report completed and submitted in December 1955. Further study not recommended.</p>
<p>CONNECTICUT RIVER, WETHERSFIELD COVE</p> <p>Preliminary examination and survey to determine the feasibility of improving the entrance channel and enlarging the anchorage in the interests of recreational boating.</p>	<p>Preliminary examination presently underway. Completion anticipated during August 1958. Survey scheduled in FY 1959.</p>
<p>COVE HARBOR AND COVE POND</p> <p>A preliminary examination to determine the feasibility of navigational improvements in the interest of recreational boating.</p>	<p>Initiation of study dependent upon appropriation of funds.</p>

LOCALITY - PURPOSE & SCOPE	PRESENT STATUS
<p><b>FIVE MILE RIVER</b></p> <p>A survey to determine whether or not it is economically justifiable at this time to provide additional anchorage for recreational craft.</p>	<p>Study will be initiated in FY 1958 and is scheduled for completion during FY 1959.</p>
<p><b>GREENWICH COVE</b></p> <p>A survey to determine whether or not it is economically justifiable at this time to develop a small boat harbor, including channels and anchorage, 6 feet deep.</p>	<p>Report completed and submitted in June 1956. Improvement not recommended.</p>
<p><b>HARBOR AT PINE ORCHARD, BRANFORD</b></p> <p>A preliminary examination and survey to determine the possibility of development of a small boat harbor by dredging and breakwater construction.</p>	<p>Preliminary examination completed. Survey report completed and submitted on July 1957.</p>
<p><b>HOUSATONIC RIVER</b></p> <p>A preliminary examination to determine whether or not it is economically justifiable at this time to provide anchorage areas for recreational craft.</p>	<p>Study presently underway. It is anticipated that completion will be in August 1958.</p>
<p><b>MILFORD HARBOR</b></p> <p>A survey to determine the feasibility of providing small boat facilities.</p>	<p>Presently underway. It is anticipated that the report will be completed during 1958.</p>

LOCALITY - PURPOSE & SCOPE	PRESENT STATUS
<p><b>MYSTIC RIVER</b></p> <p>A survey to determine whether or not it is economically justifiable at this time to provide additional anchorage area for recreational craft.</p>	<p>Study presently underway. It is anticipated that completion will be in October 1958.</p>
<p><b>NEW HAVEN HARBOR</b></p> <p>A preliminary examination and survey to determine the possibilities for development of a small boat anchorage in the harbor and deepening the main harbor for commercial navigation.</p>	<p>Preliminary examination report completed and submitted in July 1956. Survey study is underway. It is expected that the study will be completed during 1958.</p>
<p><b>NEW LONDON HARBOR</b> (Bentleys Creek)</p> <p>A preliminary examination to determine whether or not the possibilities for development of Bentleys Creek to permit safe navigation for vessels 85 feet long and of 60 gross tons requiring a channel dredged to 15 feet warrant the expenditure of funds for a survey.</p>	<p>Report was completed and submitted in November 1955. Further study not recommended.</p>
<p><b>NORWALK HARBOR</b></p> <p>A preliminary examination and survey to determine the advisability of a small boat anchorage in the cove immediately west of the harbor.</p>	<p>Favorable preliminary examination report completed and submitted in March 1956. Survey study will be initiated in FY 1958 and completed in FY 1959.</p>
<p><b>THAMES RIVER</b></p> <p>A survey to determine the feasibility of providing greater depths in the harbor for commercial navigation.</p>	<p>Initiation of study dependent upon appropriation of funds.</p>



Public Recreation Area. Hammonasset Beach State Park, Madison, Conn.



## shore protection projects completed

### BURIAL HILL BEACH

Burial Hill Beach, a public beach owned by the town of Westport, is located on the north shore of Long Island Sound about 40 miles east of New York City.

The project as authorized provided for widening the beach to a 100-foot width by direct placement of sand. This project was contingent upon construction of a 400-foot training wall at Burial Hill Creek at the west limit of the fill under a project adopted for Sherwood Island State Park. The project was completed in June 1957 by the State of Connecticut.

Federal funds appropriated in the amount of \$10,000 will be used to reimburse the State of Connecticut for the Federal share of the cost of the construction upon completion of audit.

### GULF BEACH

Gulf Beach, a publicly-owned beach, is located in the Town of Milford on the north shore of Long Island Sound about 50 miles east of New York City.

The project provides for widening to a 100-foot width about 1,200 feet of beach by direct placement of sand. Construction of the project was completed by the State of Connecticut in May 1957, at a total estimated cost of \$75,000. Federal funds appropriated in the amount \$25,000 will be utilized to reimburse the State of Connecticut for the Federal share of the cost of the construction upon completion of audit.

## HAMMONASSET STATE PARK

Hammonasset State Park, the central and best known of three state-owned beaches spaced evenly along the Connecticut shore, is located in the town of Clinton which is about 25 miles east of New Haven and about 10 miles west of the Connecticut River at Saybrook.

The existing project authorized in 1954, provided for Federal participation in the amount of one-third of the cost of widening the beach, constructing two impermeable training walls at Toms Creek and an impermeable groin at Hammonasset Point. Work on this project was accomplished by the State of Connecticut in July 1955. The Federal share of the project cost was \$163,200.

## JENNINGS BEACH

The project provides for the construction of an impermeable jetty 800 feet long, extending southeasterly from the west side of the mouth of Ash Creek, and, if necessary, dredging an inlet channel and jetty foundation through the outer bar.

The jetty was constructed by the State of Connecticut and the town of Fairfield in 1951. The Federal share of the project cost was \$14,401.

## MIDDLE BEACH

Middle Beach, a publicly owned stretch of shore located in the town of Madison about midway between New Haven and New London is a walled section of shore with no beach at high water.

The project as authorized provides for revetment of 700 feet of seawall by placement of riprap for a width of 20 feet. The estimated total cost of the improvement is \$36,000 of which the Federal share of the project cost is \$12,000. Construction of the project was completed by the State of Connecticut in June 1957.

Federal funds in the amount of \$10,000 have been appropriated and will be utilized to reimburse the State of Connecticut for the Federal share of the project cost upon completion of audit.

#### PROSPECT BEACH

Prospect Beach is a town-owned beach closely bordering the State highway in the town of West Haven which is adjacent to the city of New Haven and approximately 60 miles east of New York City.

The project provides for widening to a 100-foot width by direct placement of sand, 6,000 feet of shore from a point about 350 feet south of South Street, northerly to Ivy Street, with an added 50-foot widening at the south end of the fill, and construction of 8 impermeable groins, each 330 feet long. The project was constructed by the Corps of Engineers for the State of Connecticut and completed in May 1957, at a cost of about \$370,000.

Federal funds in the amount of \$111,000 have been appropriated as the Federal share of the project cost.

#### SEASIDE PARK

Seaside Park, a publicly owned beach, is located in the city of Bridgeport on the north shore of Long Island Sound about 50 miles east of New York City.

The project provides for widening to 125-foot width by direct placement of sandfill approximately 8,800 feet of shore. The construction of the project was completed by the State of Connecticut in March 1957 at a cost of about \$500,000.

Federal funds in the amount of \$150,000 will be used to reimburse the State of Connecticut upon completion of audit.



Seaside Park, Bridgeport, Conn. Before and After Improvement

## SHERWOOD ISLAND STATE PARK

Sherwood Island State Park, located in Fairfield County, is the westernmost of three State-owned beaches on the Connecticut shore about 40 miles east of New York City.

The project provides for widening to a 150-foot width about 6,000 feet of beach by direct placement of sand, the creation of a stockpile by direct placement of sand for an additional width of 100 feet for a distance of 1,000 feet each side of Sherwood Point, the construction of two training walls 400 to 500 feet long at Burial Hill Creek, and the construction of an impermeable groin 500 feet long at the west end of the improvement. Construction of the project was completed by the State of Connecticut in June 1957 at a cost of about \$567,000, of which the Federal share is \$189,000.

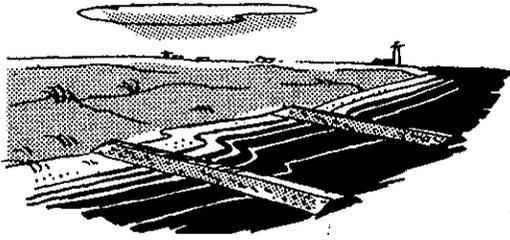
Federal funds in the amount of \$159,000 have been appropriated to date and will be utilized to reimburse the State of Connecticut for part of the Federal share of the cost of construction upon completion of audit.

## SHORT BEACH

The project consists of widening the beach to a 125-foot width by direct placement of sandfill along the shore now used for public bathing and north thereof in front of existing cottages which closely border the shore.

The project was completed in June 1955 at no cost to the Federal Government, by placement of sand dredged from the Housatonic River navigation project.





## shore protection projects under way

### COMPO BEACH

Compo Beach is a town-owned beach located in the town of Westport, east of the Saugatuck River and about 40 miles east of New York City.

The project provides for widening to 100-foot width the beaches east and west of Cedar Point about 2,600 and 1,100 feet long, respectively, by direct placement of sand, construction of two impermeable groins 500 feet long, one at Hills Point and one at the west end of the improvement. Construction of the groins was completed in December 1956 by the State of Connecticut. Placement of sand fill has been deferred by the State of Connecticut and the town of Westport.

The estimated total cost of the improvement is \$327,000, of which the Federal share of the project cost is \$109,000. Reimbursement of the Federal share of the cost of the completed work is in progress.

### GUILFORD POINT BEACH

Guilford Point Beach, a town-owned beach, is located just east of Guilford Point on Guilford Harbor at the mouth of the East River and about 11 miles east of the city of New Haven.

The project provides for widening to 125-foot width approximately 400 feet of beach by direct placement of sand fill and construction of an impermeable groin, 300 feet long, at the east end of the fill. The Federal project has not yet been authorized. The total cost of the improvement is estimated to be \$87,000 of which the Federal share of the project cost is \$18,000.

The groin has been constructed by the State of Connecticut. Material dredged from the nearby Guilford Harbor navigation project was found to be unsatisfactory for beach fill. Review of prior study will be made to determine the feasibility of sand fill

from other sources. If Federal project is authorized, Federal funds when appropriated will be used to reimburse the State of Connecticut for the Federal share of the groin construction.

#### SASCO HILL BEACH

Sasco Hill Beach is a publicly-owned beach extending from Kensie Point to Southport Harbor on the north shore of Long Island Sound about 50 miles east of New York City.

The project provides for widening to 100-foot width about 900 feet of beach by direct placement of sand and construction of one impermeable groin 400 feet long at the west end of the improvement. The project is being constructed by the State of Connecticut. The groin has been constructed. Placement of the beach fill was advertised and unsatisfactory bids were received in November 1957. The work will be readvertised in FY 1958.

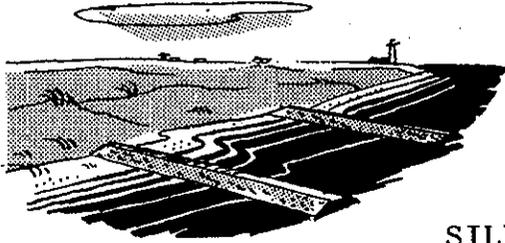
The total estimated cost of the improvement is \$90,000 of which the Federal share of the project cost is \$30,000. Federal funds in the amount of \$22,000 have been appropriated and will be used to reimburse the State of Connecticut upon completion of the project.

#### SOUTHPORT BEACH

Southport Beach is a town owned beach located in the Town of Fairfield on the north shore of Long Island Sound about 50 miles from New York City.

The project provides for widening to 100-foot width about 700 feet of beach by direct placement of sand, and construction of one impermeable groin 400 feet long at the west end of the improvement. The total estimated cost of the improvement is \$66,000 of which the Federal share of the project cost is \$22,000. The project is being constructed by the State of Connecticut. The groin or about 39% of the work is completed. Placement of the beach fill was advertised and unsatisfactory bids were received in November 1956. The work is to be readvertised in FY 1958.

Upon completion of the project, Federal funds appropriated to date in the amount of \$20,000 will be used to reimburse the State of Connecticut as part of the Federal share of the project cost.



## shore protection projects authorized

### SILVER BEACH TO CEDAR BEACH

The project consists of widening to 100-foot width by direct placement of sand 15,600 feet of shore along Silver, Myrtle, Walnut, Laurel, and Cedar Beaches and Meadows End, with an added widening of 150 feet around Meadows End, and the construction of 11 impermeable groins 350 to 400 feet long. The estimated total cost of the improvement is \$820,000 of which \$47,000 is the Federal share.

The State has included in its 1958 construction program a portion of the Silver to Cedar Beach project, about one mile in length comprised of all of Meadows End and part each of the abutting Silver and Myrtle Beaches. The estimated total cost of this portion is \$376,000 of which \$34,000 is the Federal share. Federal funds in the amount of \$34,000 will be utilized to reimburse the State of Connecticut for the Federal share of that portion of the improvement which the state has included in its 1958 construction program.

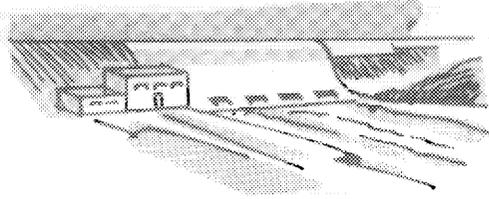
### WOODMONT SHORE

The project provides for widening to a 100-foot width, by direct placement of sand, 500 feet of shore in the first pocket beach west of Merwin Point; widening to a 100-150 foot width, 3,500 feet of the shore for Chapel Street northerly to a point about 400 feet north of Anderson Avenue; and construction of five impermeable groins 300 to 400 feet long.

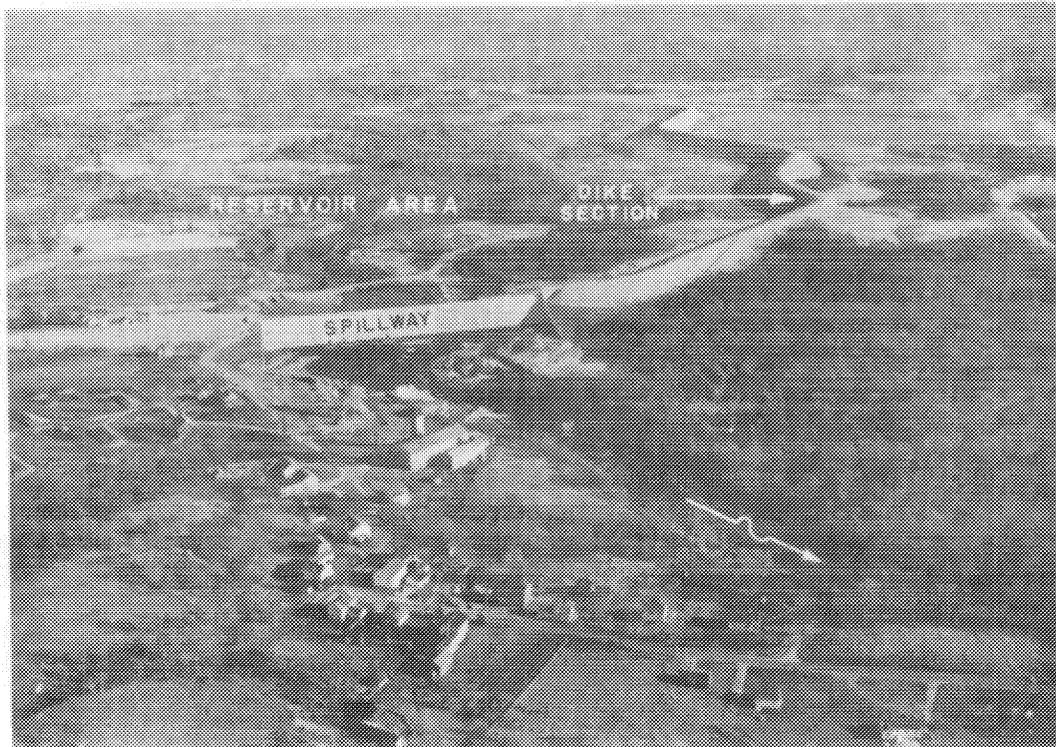
The estimated total cost of the project is \$340,000 of which the Federal share is \$79,000. Construction of the project is included in the 1958 construction program of the state of Connecticut. Federal funds in the amount of \$79,000 will be utilized to reimburse the State of Connecticut upon completion of the improvement.

# shore protection studies

LOCALITY - PURPOSE & SCOPE	PRESENT STATUS
<p><u>EAST RIVER TO NEW HAVEN HARBOR</u></p> <p>A cooperative study to determine the most suitable methods of stabilizing and improving the shoreline.</p>	<p>Study completed and submitted in August 1955. Recommended Federal participation in construction of protective measures for Guilford Point Beach, Guilford and Lighthouse Point Park, New Haven, subject to certain conditions of local cooperation. Project not presently authorized.</p>
<p><u>SAUGATUCK RIVER TO BYRAM RIVER</u></p> <p>A cooperative study to determine the most suitable methods of stabilizing and improving the shoreline.</p>	<p>Study completed and submitted in July 1956. Recommended Federal participation in construction of protective measures for Calf Pasture, Beach Park (East shore), Norwalk; Cove Island and Cummings Park, Stamford; and Greenwich Point, Greenwich; subject to certain conditions of local cooperation. Project not presently authorized.</p>
<p><u>THAMES RIVER TO NIAN TIC BAY</u></p> <p>A cooperative study to determine the most suitable methods of stabilizing and improving the shoreline.</p>	<p>Study completed and submitted in April 1957. No Federal participation recommended.</p>



## flood control projects completed



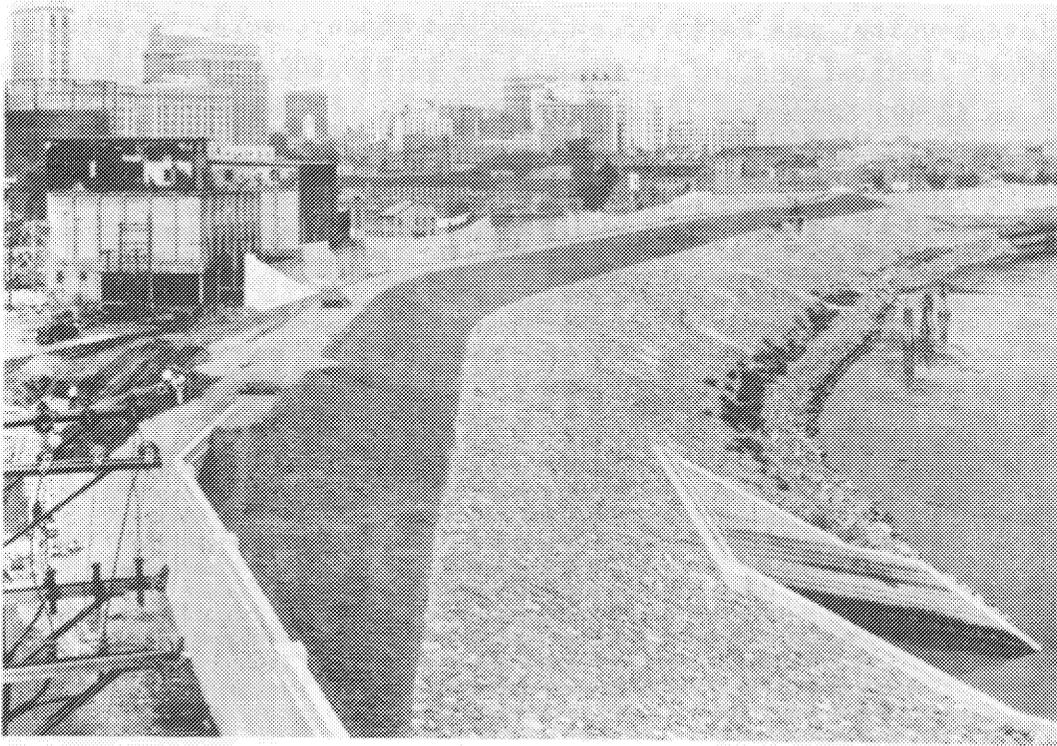
MANSFIELD HOLLOW DAM AND RESERVOIR, THAMES RIVER BASIN

Mansfield Hollow Dam is located at Mansfield, on the Natchaug River, 5.3 miles above its confluence with the Willimantic River; and 4 miles northeast of the city of Willimantic, Connecticut. It was substantially completed in 1952 at a cost of \$6,399,000.

The dam is of the rolled-earth type with a dumped rock blanket on the upstream face. It has a top length, including spillway, of 12,420 feet, and a maximum height of 70 feet.

The reservoir is operated for flood control purposes and has a storage capacity of 52,000 acre-feet, which is equivalent to 6.1 inches of runoff from its drainage area of 159 square miles. The reservoir is normally kept empty. Control gates, operated from a gallery within the spillway section, are lowered to enable storage of flood waters.

The project provides substantial flood protection for a portion of Willimantic, and for Baltic, Orcum, and Taftville. In conjunction with other units of the comprehensive plan for flood control in the Thames River Basin, it will provide a high degree of flood protection for Norwich and other downstream damage centers in Connecticut. Since June 1952 there have been 9 significant operations to prevent downstream flood damages and in August 1955 the reservoir was filled to 67% of capacity. Damages prevented by reservoir operations now total \$3,770,000.

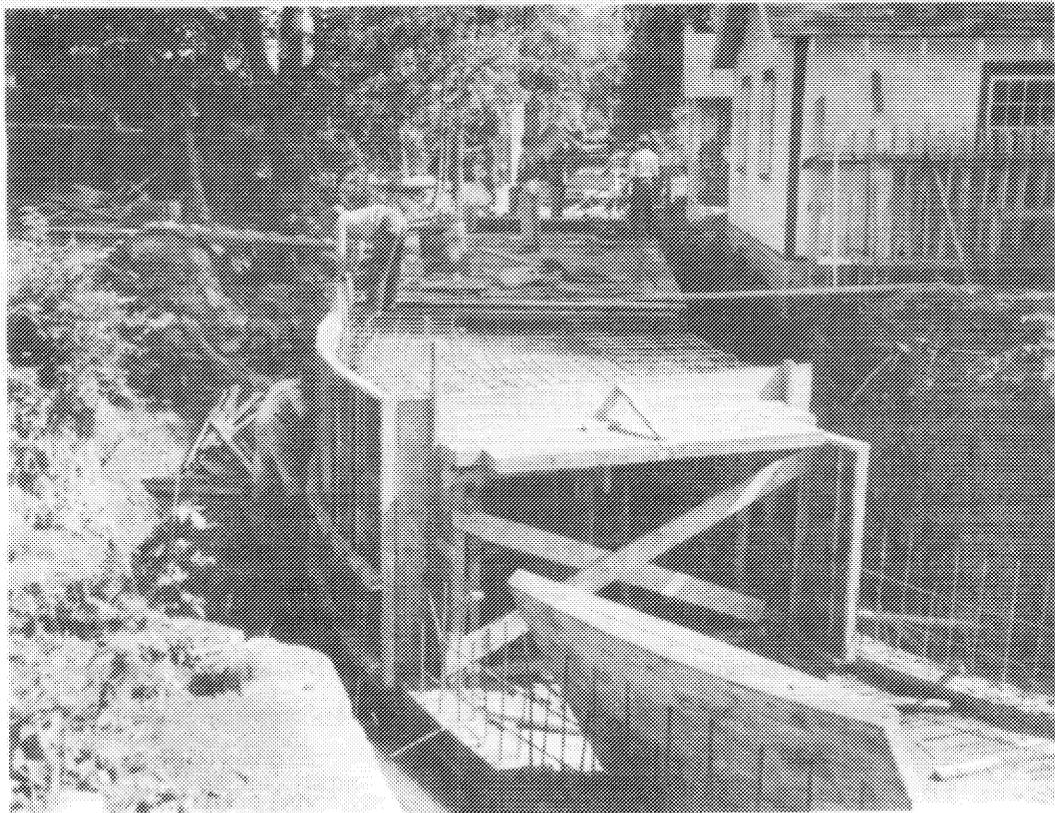


#### HARTFORD LOCAL PROTECTION - CONNECTICUT RIVER BASIN

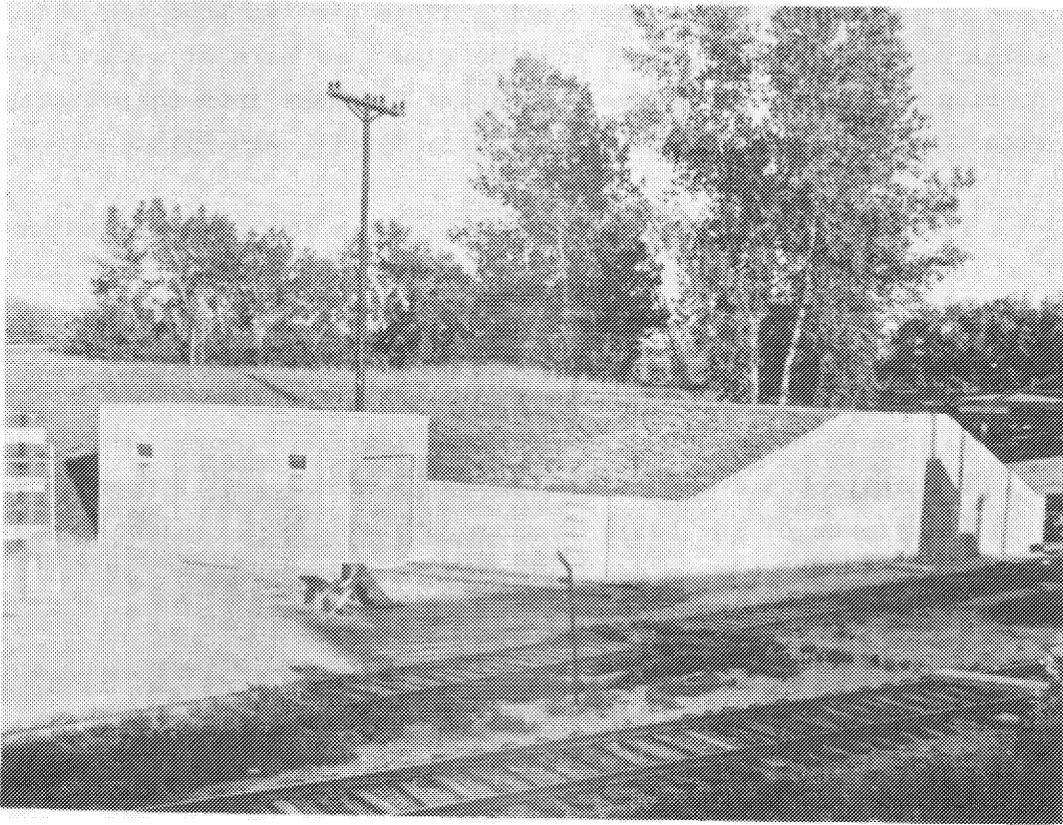
The Hartford Local protection Project is located along the west bank of the Connecticut River, 52 miles above its mouth.

The completed works consist of dikes, walls, stop-log structures, pressure conduits, pumping stations and other facilities. There are about 35,000 feet of earth dikes and 4400 feet of concrete flood walls along the Connecticut River extending from high

ground on Windsor Avenue near the Hartford- Windsor town line south to high ground just south of the Hartford-Wethersfield town line. Along this perimeter there are six stop-log structures which are closed when flood waters threaten to spill into the protected area. Storm and sanitary sewerage into and in the protected area is handled by six pumping stations, three of which have been built by the city of Hartford. There are also three pressure conduits; the 5600-foot Park River Conduit, discharging into the Connecticut River; the 3100-foot Gully Brook Conduit, which ties into the Park River Conduit; and the Folly Brook Conduit. The basic project was initiated in 1938 and was substantially completed in 1944. The latest units, the Folly Brook Dike and Conduit were completed in 1957. Federal cost of the project is \$6,839,500 and local cost has been \$3,692,500. Local interests contributed substantially to the project for special features. These included increased grades for dikes and walls, a conduit for Park River in lieu of an open channel and special architectural treatment for the Bushnell Park pumping station. The entire project is now operated and maintained by the city of Hartford.



Folly Brook Conduit, Hartford, Conn.



Folly Brook, Stop-log Storage Building and Dike, Hartford, Conn.

The project has prevented \$38,910,000 in damages through 1957. With recurrence of the basin flood of record, 1936, it would prevent about \$35,250,000 in damages in the 2800 acres of heavily built up Hartford now protected.

#### EAST HARTFORD LOCAL PROTECTION, CONNECTICUT RIVER BASIN

The East Hartford Local Protection Project is located along the east bank of the Connecticut River, 52 miles above its mouth.

The completed works consist of dikes, walls, stop-log structures, pumping stations and other facilities. There are about 19,000 feet of earth dikes and 750 feet of concrete flood walls along the Connecticut and Hockanum Rivers extending from the high ground near Greene Terrace in the north to high ground at Brewer

Lane and Central Avenue in the south. There are two stop-log structures, one at the railroad and the other at Main Street. Three pumping stations, for disposal of local drainage into the protected area, are located at Meadow Hill, Cherry Street, and Pitkin Street.

The project provides protection for about 760 acres of residential commercial, industrial and public property within East Hartford. Completed in 1943 at a Federal cost of \$2,135,500 and a local cost of about \$270,000, the project is now operated and maintained by the town of East Hartford.

The project has prevented \$2,904,000 in damages through 1957. With recurrence of the basin flood of record, 1936, it would prevent about \$5,460,000 in damages.

#### WINSTED CHANNEL IMPROVEMENT, CONNECTICUT RIVER BASIN

The Winsted Project is located in the city of Winsted, on the Mad River, a tributary of the Farmington River which, in turn, flows into the Connecticut River.

The original work, completed in 1951 at a Federal cost of \$245,500, consisted of removing an abandoned dam and excavating the channel for 4900 feet from Lake Street to a point approximately 1700 feet below the Case Avenue Bridge. The project was designed to protect 73 acres of commercial, industrial and residential property from a flood 50 percent greater than the then known flood of record, September 1938.

In August 1955, this area of Winsted was devastated by a flood five times greater than the 1938 flood. Disaster operations following the flood included restoration of the river channel as provided by Public Laws 99 and 875.

Studies of an increased degree of protection for Winsted resulted in the recommendation of the construction of a flood control reservoir on the Mad River above Winsted. This recommendation is now before Congress for its consideration.

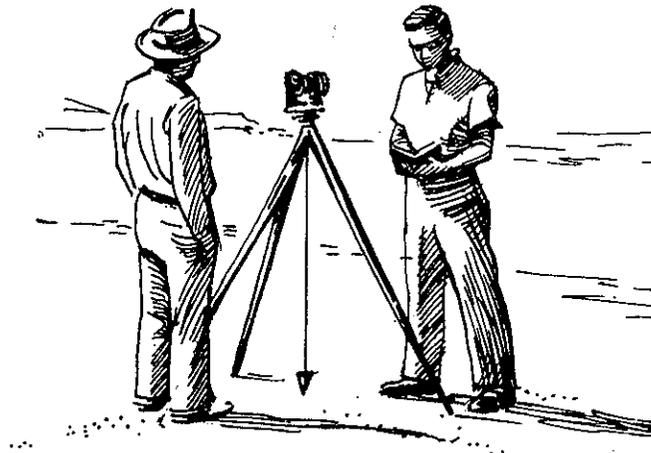
## NORWALK CHANNEL IMPROVEMENT, NORWALK RIVER

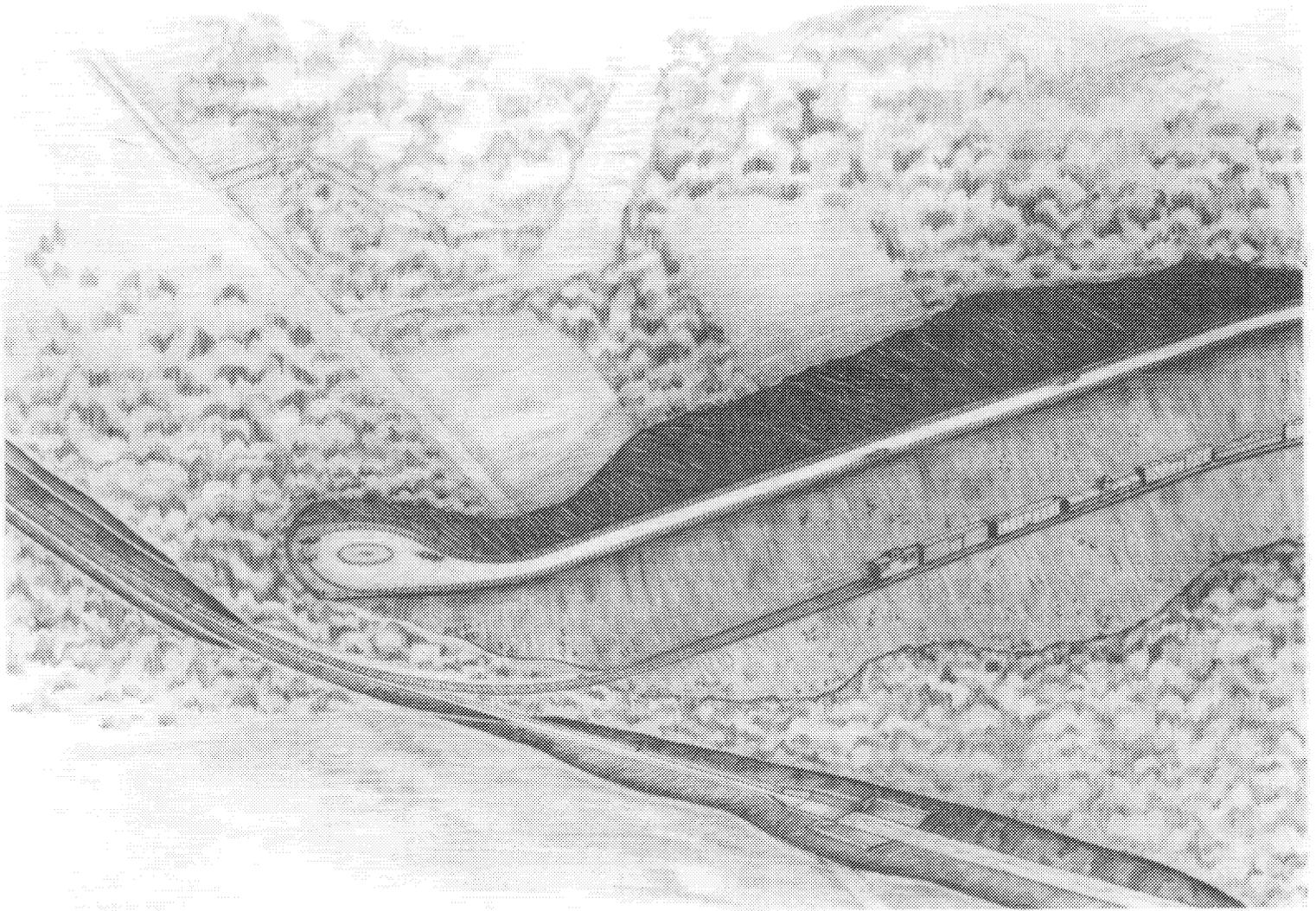
The Norwalk Channel Improvement is located on the Norwalk River in the Perry Avenue section of the city of Norwalk about 4.7 miles above the mouth of the Norwalk River and 0.4 miles above the confluence of the Norwalk and Silvermine Rivers.

The project consists of enlargement and realignment of the Norwalk River channel from about 1100 feet upstream of the Perry Avenue bridge to about 600 feet downstream of the bridge, construction of 1100 feet of dike along the west bank of the river; removal of a dam below Perry Avenue; and installation of a row of steel sheet piling just downstream from the Perry Avenue bridge to prevent channel scouring near the bridge.

The project was designed to protect about 8 acres of residential and commercial property which had been subjected to as many as three floods each year.

Completed in December 1951 at a Federal cost of \$52,200, the project is now under the jurisdiction of the city of Norwalk for operation and maintenance.



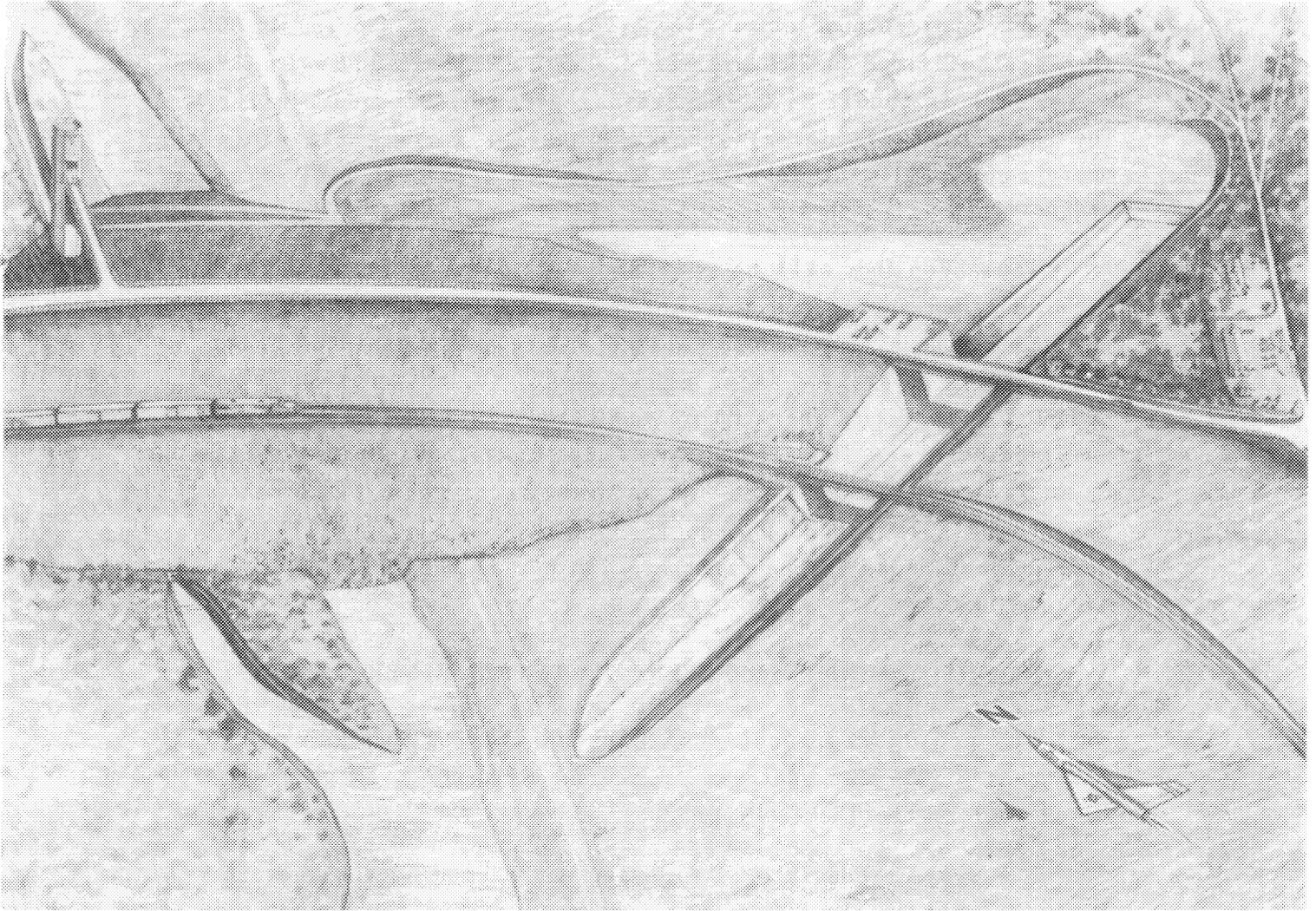


## THOMASTON DAM AND RESERVOIR

### **flood control projects under way**

#### THOMASTON DAM AND RESERVOIR, HOUSATONIC RIVER BASIN

Thomaston Dam is being built on the Naugatuck River 30.4 miles above the confluence of the Naugatuck and Housatonic Rivers. The site is 1.6 miles north of the town of Thomaston.



## HOUSATONIC RIVER BASIN

Construction of the project, to cost an estimated \$17,500,000 was started in November 1957 with the railroad relocation. The project plan calls for an earth and rock fill dam 142 feet high and 2000 feet long across the Naugatuck Valley, an outlet works founded on bed rock under the dam, and a side channel spillway 450 feet long on the left abutment. The project requires the relocation of portions of State Routes No. 8 and No. 722 and several affected town roads, and the relocation of a portion of the Devon Branch of the New York, New Haven, and Hartford Railroad.

Upon project completion a reservoir capable of storing 42,000 acre-feet of flood waters will be created. This is equivalent to 8.1 inches of runoff from the drainage area of 97 square miles. The reservoir will normally be empty except for a small winter operational pool. At full flood pool a 950 acre pool will extend upstream 6.5 miles in Thomaston, Harwinton and Litchfield.

Thomaston Dam will be operated for flood control and will provide flood protection for public and private facilities below the dam in the highly industrialized and densely populated Naugatuck Valley, an area of major importance to the national and state economy. Locations where major reductions in flood damages will be effected are: Thomaston, Waterbury, Naugatuck, Beacon Falls, Seymour, Ansonia and Derby. The future effectiveness of Thomaston Reservoir is indicated by the \$163,500,000 in damages it would have prevented had it been in operation during the record flood of August, 1955.

#### NORWICH CHANNEL IMPROVEMENT, THAMES RIVER BASIN

The project is located within the city of Norwich on the Shetucket River just upstream from its confluence with the Yantic River to form the Thames River.

The project consists of widening and deepening the Shetucket River channel in the 800-foot reach centering on the Laurel Hill Bridge. The channel here passed through a narrow rock constriction. The initial portion of the project was started in June 1947 and was completed in March 1949 at a Federal cost of \$643,000. The remaining portion of the work was initiated in June 1957, and consists of the remaining channel excavation and reconstruction of the Laurel Hill Bridge. This work is being performed under an agreement with the State of Connecticut and is scheduled for completion in September 1959.

The total Federal cost of the project, including both phases, is estimated at \$1,300,000. The project reduces flood stages in the two mile reach from the mouth of the Shetucket River to the site of Greenville Dam. The completed portion of the project has already prevented about \$1,195,000 in damages.

TORRINGTON LOCAL PROTECTION, EAST BRANCH AND  
NAUGATUCK RIVER, HOUSATONIC RIVER BASIN

(Small project not specifically authorized by Congress)

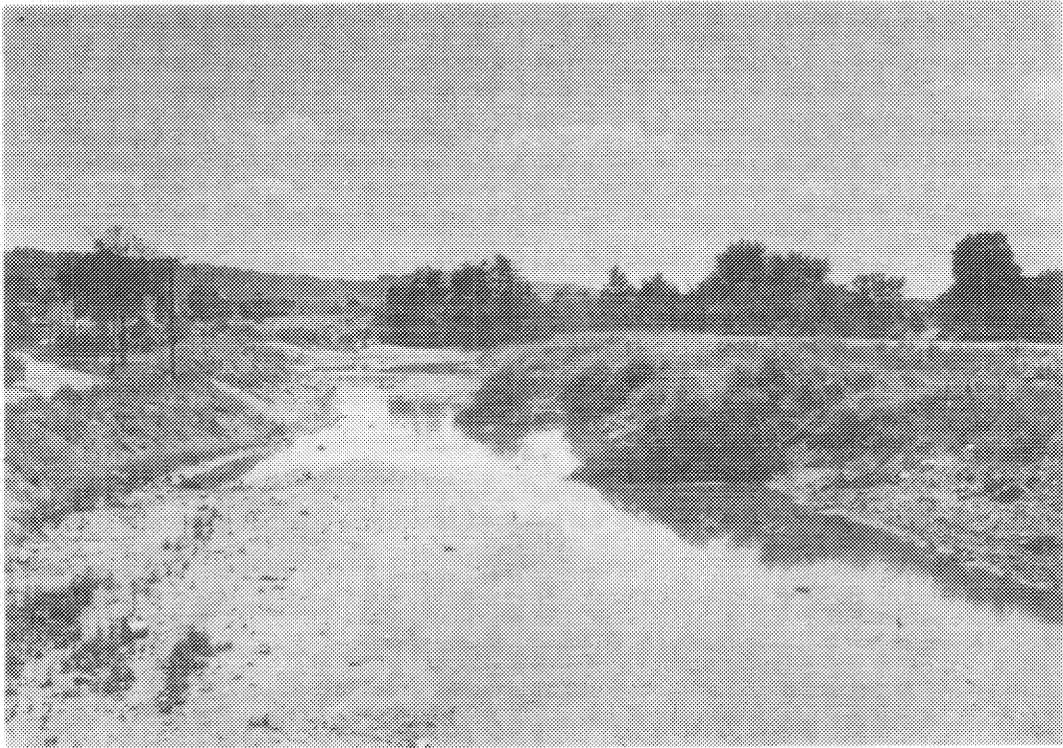
This project, the first to be constructed in New England under Public Law 685 as passed July 1956, is located in Torrington and extends along the East Branch of the Naugatuck River and the Naugatuck River about 9300 feet from the Papier Mache' Dam of the Connecticut Power Company downstream to St. Francis Cemetery. The improvement, under construction since June 1957, consists of channel straightening, deepening and widening and construction of intermittent earth dikes and flood walls.

The project is designed, in conjunction with the proposed Hall Meadow Brook and East Branch Reservoirs, to provide needed protection to residential, commercial, industrial, and public property along both banks of the East Branch and the Naugatuck River from east Pearl Street downstream to the vicinity of King Street. The project has an estimated Federal cost of \$355,000 and a local cost of \$40,000 in addition to provision of lands and rights-of-way.

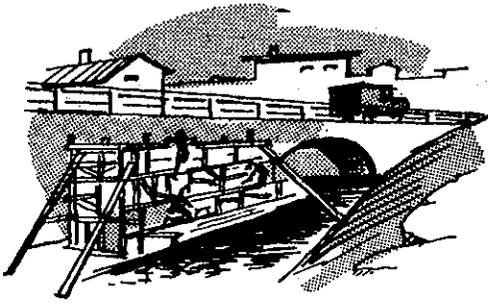
TORRINGTON LOCAL PROTECTION, WEST BRANCH  
NAUGATUCK RIVER, HOUSATONIC RIVER BASIN

(Small project not specifically authorized by Congress)

Planning is now underway on a project along the West Branch of the Naugatuck River in Torrington. It will provide an enlarged channel capacity by channel improvement, flood walls and rock filled slopes from Prospect Street downstream to the confluence with the East Branch. This is a revised project from one previously approved but held in abeyance due to channel limitations and foundation conditions found during investigations for contract plans. The revised plan also considers local desires to limit encroachment on Fuessenich Park. The project's Federal cost is estimated at \$400,000.



Torrington Local Protection Before and After Improvement



## small flood control project studies

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Under various Public Laws Congress each year appropriates general funds for the construction of small flood control projects throughout the country. These funds are expended by the Chief of Engineers for projects which must meet the same criteria of costs and benefits as projects specifically authorized by Congress.

Under the authority of Public Law 685 studies have been completed or are under way at sixteen locations in Connecticut to determine the need and justification of flood protective works. Federal costs of Public Law 685 projects are limited to \$400,000. The locations and the status of projects are listed below:

1. Projects Under Construction.  
East Branch and Naugatuck River at Torrington.
2. Projects Approved and Under Final Design.  
West Branch Naugatuck River at Torrington.
3. Projects for which Study is Complete and under Review by Chief of Engineers.  
Naugatuck River at Waterville, Waterbury.
4. Projects Under Study.
  - a. Willow Brook at New Britain.
  - b. Furnace Brook and Middle River at Stafford Springs.

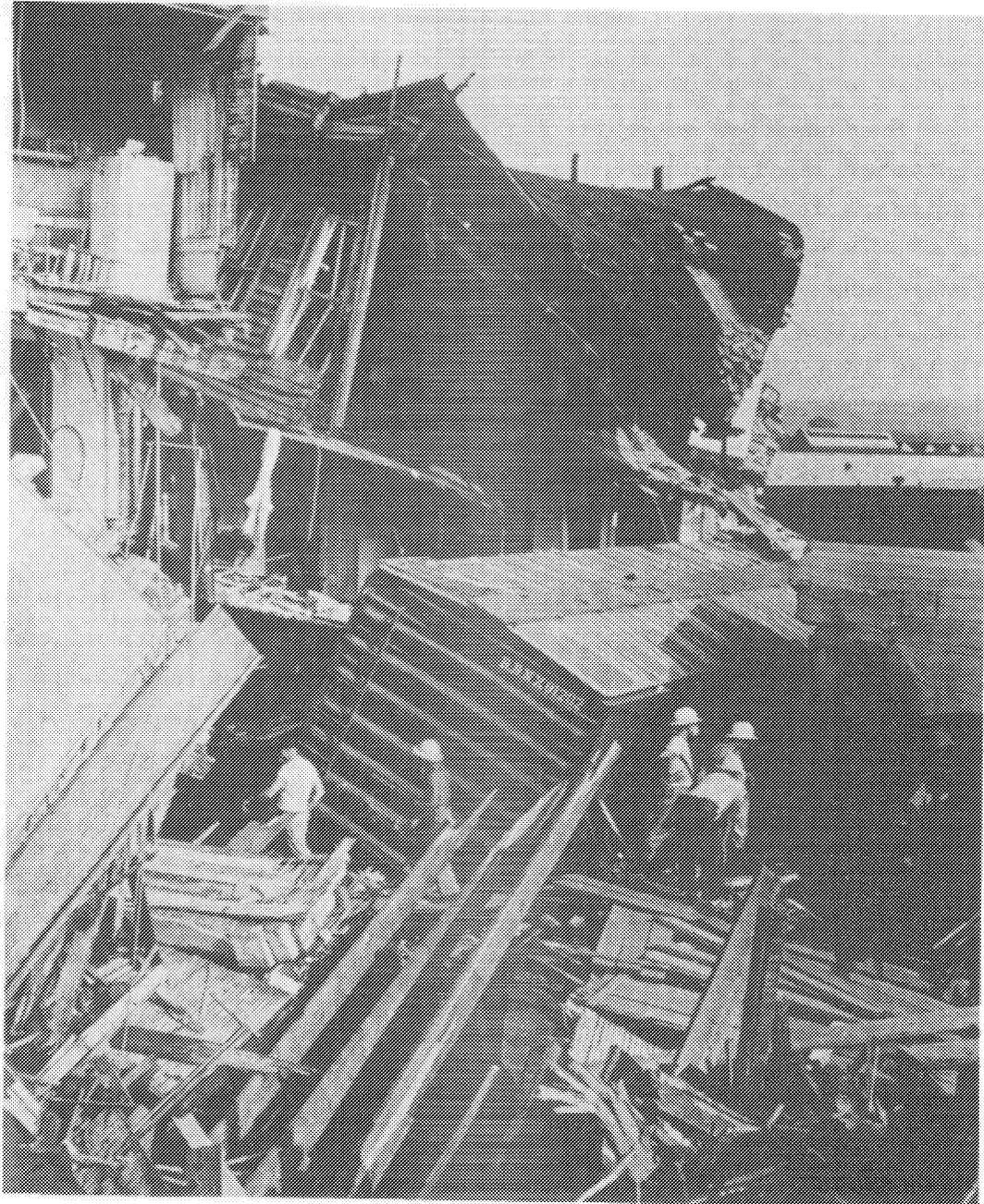
- c. Steel Brook at Watertown.
- d. Naugatuck River at Beacon Falls.
- e. Quinnipiac River at Southington.
- f. Quinnipiac River at North Haven.

5. Projects Referred to Northeast Flood Studies Because of Excess Cost or Because Related to Integrated Basin Development.

- a. Farmington River at Riverton.
- b. Shetucket River at Baltic.
- c. Shetucket River at Occum.
- d. Farmington River at New Hartford.
- e. Willimantic River at Willimantic.
- f. Norwalk River at Norwalk.
- g. Connecticut River at Windsor.



Main St., Winsted, Conn., After Aug. 1955 Flood  
Looking North from Bridge St.



Debris near Bank St. Bridge, Waterbury, Conn. After  
Aug. 1955 Flood

# **northeast flood studies**

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The Committee on Public Works of the United States Senate on September 14, 1955 adopted a resolution requesting the Board of Engineers for Rivers and Harbors to review previous reports on rivers in New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, and the District of Columbia and intervening streams in the area affected by the hurricane flood of August 1955 to determine the need for modification of the recommendations in such previous reports, and the advisability of adopting further improvements for flood control and allied purposes, in view of the heavy damages and loss of life caused by such floods.

A public hearing was held in Waterbury on December 11, 1956 to determine the improvements desired by the residents of the Naugatuck River Valley. An interim report recommending construction of two flood control dams, East Branch and Hall Meadow Brook, upstream from Torrington has been submitted to the Congress.

A public hearing was held in Unionville on December 18, 1956 to determine the improvements desired by residents of the Farmington River basin. An interim report recommending construction of a flood control dam on the Mad River upstream from Winsted has been submitted to the Congress.

A public hearing was held in Putnam on December 12, 1956, to determine the improvements desired by residents of the Quinebaug and French River basins (tributaries of the Thames River). An interim report covering the advisability of further improvements in these two river basins is in process of preparation for submission early in 1958.

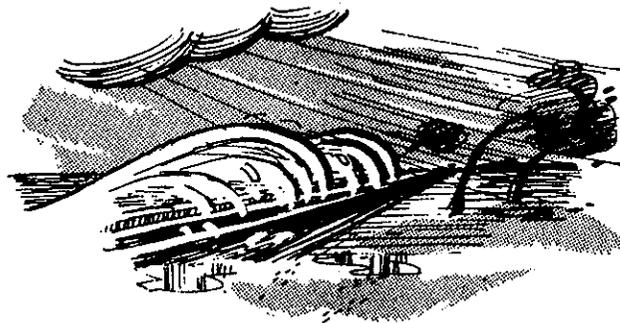
Studies are also under way to determine whether further improvements for flood control and allied purposes in the Farmington and Naugatuck River basins are advisable at this time.

# hurricane-protection studies

Public Law 71, 84th Congress, adopted 15 June 1955, authorizes an examination and survey of the eastern and southern seaboard of the United States with respect to hurricanes, with particular reference to areas where severe damages occurred. The authorization directs that the survey, to be made under the direction of the Chief of Engineers, shall include "the securing of data on the behavior and frequency of hurricanes, and the determination of methods of forecasting their paths and improving warning services, and of possible means of preventing loss of human lives and damages to property, with due consideration of the economics of proposed breakwaters, seawalls, dikes, dams, and other structures, warning services, or other measures which might be required."

Surveys of tidal flood damages have been completed for the Connecticut Coast. Investigations of experienced high water profiles for Long Island Sound are complete.

Studies of survey scope are under way to determine the possibilities of providing economical protection at Stamford, Fairfield, Mystic, Stonington and Pawcatuck. Preliminary studies are under way at Greenwich, Norwalk, Saybrook and Long Point (Groton) to determine the feasibility of undertaking survey studies in these areas. Studies of other areas will follow with priority, in general, being given to areas which have sustained the severest damage in past hurricanes.





The waters of Long Island Sound dashed in raging waves against the seawall and cottages at Sea Bluff, West Haven.

Boats rode over each other as they were driven aground at Black Rock Shipyard, Bridgepo



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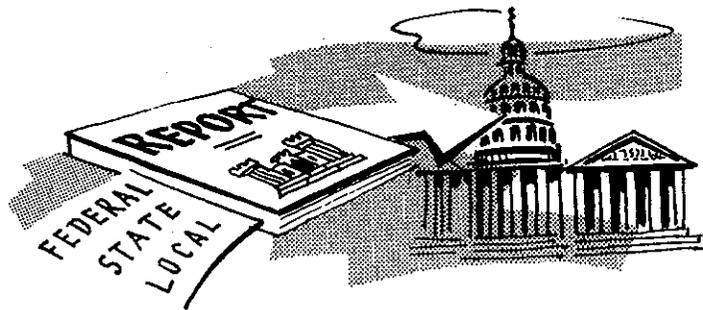
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N E W E N G L A N D D I V I S I O N

NORTH ATLANTIC DIVISION



DISTRICT DIVISION  
NEW YORK  
NEW ENGLAND

RHODE ISLAND

WINSTED CHANNEL IMPROVEMENT  
TORRINGTON LOCAL PROTECTION  
EAST BRANCH NAUGATUCK RIVER  
TORRINGTON LOCAL PROTECTION  
WEST BRANCH NAUGATUCK RIVER  
THOMASTON RESERVOIR

HARTFORD LOCAL PROTECTION

EAST HARTFORD LOCAL PROTECTION

MANSFIELD HOLLOW RESERVOIR

CONNECTICUT RIVER BELOW HARTFORD  
RIVER CHANNEL  
NORTH COVE

NORWICH CHANNEL IMPROVEMENT

PAWCATUCK RIVER CONN. & R.I.

MYSTIC RIVER

HOUSATONIC RIVER

PATCHOGUE RIVER

THAMES RIVER

STONINGTON HARBOR

NEW LONDON HARBOR

BRANFORD HARBOR

NEW HAVEN HARBOR

BREAKWATERS at NEW HAVEN

PROSPECT BEACH

WOODMONT SHORE

GULF BEACH

MILFORD HARBOR

SILVER BEACH to CEDAR BEACH

SHORT BEACH

DUCK ISLAND HARBOR

CLINTON HARBOR

HAMMONASSET BEACH

MIDDLE BEACH

GUILFORD POINT BEACH

GUILFORD HARBOR

BRIDGEPORT HARBOR

SEASIDE PARK

JENNINGS BEACH & ASH CREEK

SASCO HILL BEACH

SOUTHPORT HARBOR

SOUTHPORT BEACH

BURIAL HILL BEACH

SHERWOOD ISLAND STATE PARK

COMPO BEACH

MIANUS RIVER

FIVE MILE RIVER HARBOR

HARBOR at WILSON POINT

NORWALK HARBOR

NORWALK CHANNEL IMPROVEMENT

GREENWICH HARBOR

STAMFORD HARBOR

WESTCOTT COVE

WESTPORT HARBOR & SAUGATUCK RIVER

authorized federal PROJECTS

	COMPLETE	UNDER WAY	NOT STARTED
FLOOD CONTROL			( NONE )
NAVIGATION			
SHORE PROTECTION			
SMALL FLOOD CONTROL			( NONE )

CONGRESSIONAL DISTRICTS 5

in CONNECTICUT



U.S. Army Engineer Division, New England  
Corps of Engineers Boston, Mass.