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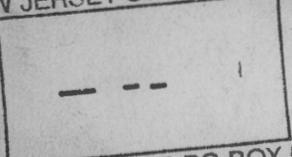
ANNUAL REPORT

BY THE

BEACH EROSION COMMISSION

OF THE

STATE OF NEW JERSEY

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1950

REPORT
TO
GOVERNOR ALFRED E. DRISCOLL
AND THE
LEGISLATURE
OF THE
STATE OF NEW JERSEY
ON THE
PROTECTION AND PRESERVATION OF THE NEW JERSEY
BEACHES AND SHOREFRONT

BY THE
STATE BEACH EROSION COMMISSION

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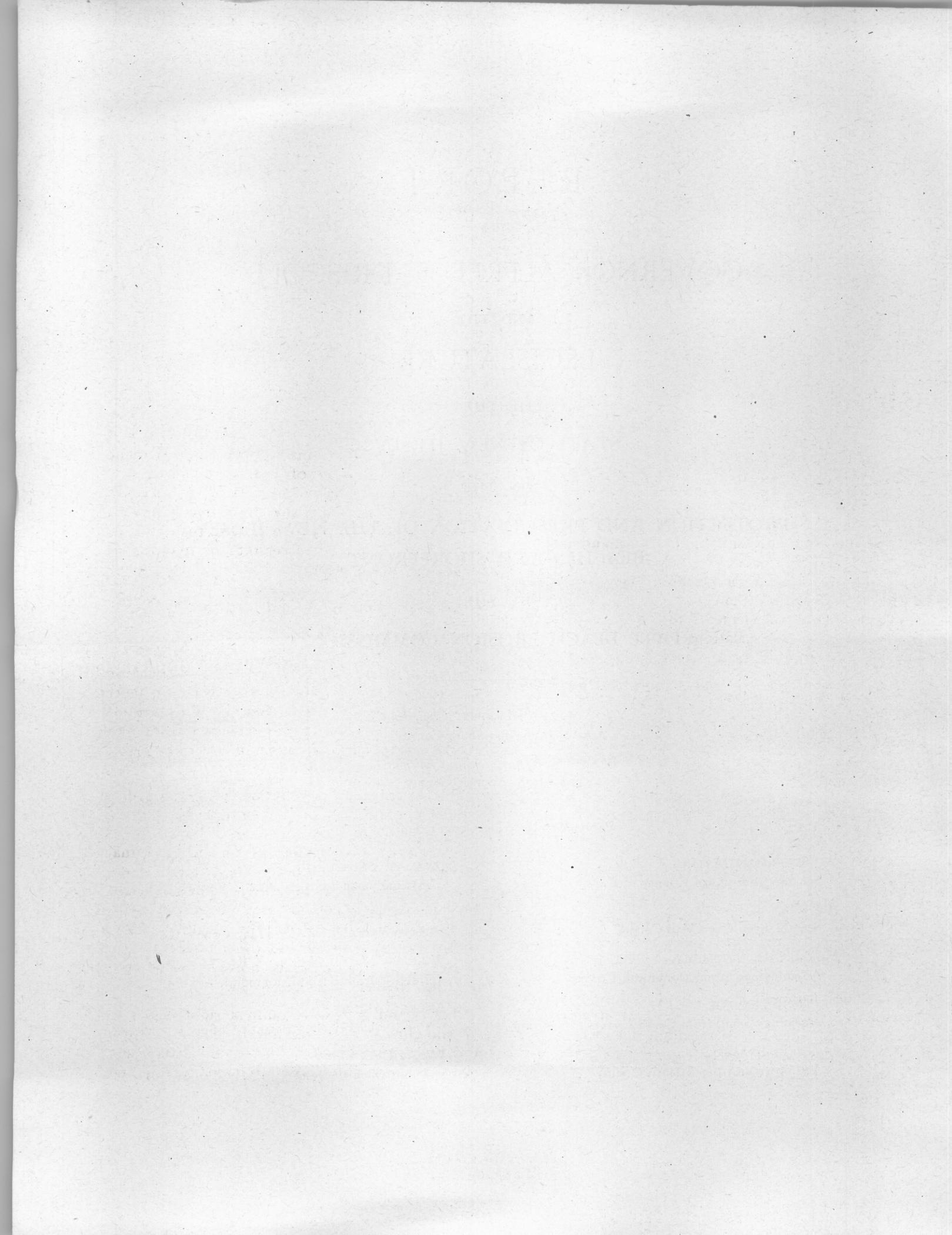
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STATE OF NEW JERSEY
BEACH EROSION COMMISSION



JANUARY, 1950.

To Governor Alfred E. Driscoll, and the Legislature of the State of New Jersey:

This report is submitted in conformity with Chapter No. 14, Laws of 1949, which created the State Beach Erosion Commission and authorized it to investigate and study the subject of the protection and preservation of the beaches and shorefront of the State from erosion and other damage from the elements and to report its findings and recommendations to the Governor and the Legislature of New Jersey.

The Commission under authority of Joint Resolution No. 9, Laws of 1948, began work as a temporary body in 1948 and submitted its first report on January 17, 1949. This second report is being submitted as a continuation and elaboration of the 1949 report. Repetition of material and discussion has been avoided as much as possible. The policy of objective and fundamental investigation for the purpose of independent viewpoint and judgment has been continued.

Beach preservation and shorefront protection along the New Jersey coastline must be viewed as both a physical and a financial problem represented on one hand by protective structures and work and on the other by investment of State and local funds. From investigation it is very apparent that a substantial amount of work has been done with a corresponding investment. It is clear, also, that further work must be carried out for which funds must be provided.

In broad outline, this report seeks better and wider understanding of coast protection as a subject and as a problem by setting forth the extent and cost of existing protective work; by describing essential future work and the estimated cost thereof; and by discussing the question of financing future work.

Coast Protection Work and Structures:

To aid understanding of the term "Coast Protection," it is necessary to consider briefly the kinds of work, structures, and construction materials used. Probably they warrant more elaborate treatment than given here since current practice is the fruit of the extensive work and resulting experience carried on in New Jersey over more than thirty years.

Bulkheads and seawalls are built along and parallel to the shoreline where it is necessary to place a barrier between the ocean or bays and the improvements and buildings on the marginal upland. Timber bulkheads are familiar structures on most of the beaches. The Seabright Seawall, which is built of rough quarry stone, is an excellent example of its type. Bulkheads and walls of steel sheeting and concrete are also in existence. These materials, however, have been used less frequently in recent years.

Jetties and groins are built at right angles to the shoreline so as to trap and hold sand to form and build up a beach. The terms "Jetty" and "Groin" commonly appear interchangeable and

differ only in that a jetty usually means a heavier, more substantial structure built of quarry stone and a groin generally is built entirely of timber. The first stone jetties were built in New Jersey during the twenties. Their excellent service records have contributed to the popularity today of this type of construction. The shorefront municipalities almost unanimously appear to consider that the high degree of permanence warrants the initial cost which is larger than for other materials.

Combination timber and stone jetties provide suitable economy over all-stone jetties at some locations. The inner and inshore of the low water line is built as a timber groin. Being driven within the existing beach, the timber section is less exposed to wave action thus reducing the danger of being torn apart or floated out. The seaward end outshore of the low water line is built of stone and is capable of receiving the brunt of ocean waves without losing its integrity or ability as a protective structure.



Stone Jetty under construction at Ocean City

Creating or aiding beaches by pumping in sand has been accepted as standard coast protection practice in New Jersey for many years. The relationship between substantial beaches and shore protection has been well recognized. The demand for beach fill is divided into two principal classes. Some municipalities require extra sand to supplement the natural supply. Others, lacking funds or wishing to protect less valuable beach fronts, look upon beachfilling as economical and expedient. Not all municipalities desire or need an extra sand supply. It appears that in each case the benefits will be weighed and

a decision made suitable to the municipality. It is possible that the need for additional beach recreation areas will be a decisive factor as well as the desire for immediate creation of protective beaches.



Quarry stones used to build Stone Jetties and Seawalls

Physical Concept of Coast Protection:

The most northerly New Jersey beaches border along Raritan and Sandy Hook Bays for 19.2 miles in Middlesex and Monmouth Counties. The oceanfront beaches extend from Sandy Hook to Cape May for a total length of 114.2 miles in Monmouth, Ocean, Atlantic, and Cape May Counties. The Delaware Bay beachfronts at the south end of the State total 52.5 miles in Cape May and Cumberland Counties. The total length of beachfront in New Jersey is estimated at 185.9 miles.

Examination of these beaches was made by ground inspection and by obtaining aerial pictures. The latter assured greater coverage of the shoreline and correlated well with ground observations. Some of these aerial pictures are used to illustrate this report.

Coast protection structures have been built along 59.7 miles or 32% of the total beach front. Protective structures exist on all parts of the Monmouth County Bay and Ocean frontages; at a number of localities in Ocean County; along most of the ocean front in Atlantic and Cape May Counties; and at several Delaware Bay locations in Cape May and Cumberland Counties.

These structures are located in 39 of the 63 shorefront municipalities. The extent to which each of these municipalities is securely protected varies in direct ratio to the completion status and condition of the existing work. In all cases, work has been carried forward as far as available State and local funds would permit. Generally, in all of these municipalities the future work consists of complementing and strengthening the existing structures and repairing older structures which have given 20 to 40 years of service.



Combination Timber and Stone Jetty at Sea Girt. Timber Groin Section is used inshore with Stone Jetty construction at Seaward end

In addition to the beaches now partly protected, consideration must be given to the frontages not now protected where erosion has become an important problem. The frontage requiring coast protection work today is estimated at 77.5 miles in length or 42% of the total beachfront.

The extent to which work has been carried out to date may be realized by considering that the present investment in coast protection structures and work along the ocean and bay beachfronts is estimated at \$30,000,000. Included in this figure is the total cost of the State-municipal co-operative work from 1940 to date which

totals \$8,566,593.37. Of the total investment, it is estimated that 25% was made by the State and the remainder was provided locally. Of the \$8,566,593.37 spent since 1940, \$5,178,671.38 or 60% was contributed by the State and \$3,387,921.99 or 40% locally. A tabulation of these funds by municipalities is printed elsewhere in this report.



Wave-broken Timber Groin at Manasquan

Geographical Groupings of Municipalities:

To permit easier concept of physical conditions along the 185.9 miles of beachfront, the shoreline may be divided and considered under 12 geographical groupings or units. The description and exposition of these 12 units is as follows:

1. *Raritan—Sandy Hook Bays:*

Middlesex County

1:01 Madison Township

Monmouth County

1:02 Matawan Township

1:03 Keyport Township

1:04 Union Beach Borough

1:05 Keansburg Borough

1:06 Middletown Township

1:07 Atlantic Highlands Borough

1:08 Highlands Borough

These beachfronts form the southerly flank of the sea approaches to the Raritan River and the Kills west of Staten Island. They feel the influence of the ocean and are subject to peculiarly violent wave attack and extremely high tides during easterly storms. Sandy Hook Peninsula functions as a barrier against the ocean for a limited extent at the easterly end of Sandy Hook Bay. Timber bulkheads and short groins are the principal protective structures now in use. There

are a few short stone jetties. Future work is viewed as the repair and replacement of timber groins some of which have given lengthy service; conversion of existing groins at important locations into jetties by adding stone at the outer end; maintenance and extension of timber bulkheads; and beachfilling at many localities to provide a broader zone of beach protection.



Inshore view of Stone Seawall at Seabright

2. Monmouth County Oceanfront:

Monmouth County

- 2:01 Seabright Borough
- 2:02 Monmouth Beach Borough
- 2:03 Long Branch City
- 2:04 Deal Borough
- 2:05 Allenhurst Borough
- 2:06 Ocean Township
- 2:07 Asbury Park City
- 2:08 Neptune Township
- 2:09 Bradley Beach Borough
- 2:10 Avon-by-the-Sea Borough
- 2:11 Belmar Borough
- 2:12 Spring Lake Borough
- 2:13 Sea Girt Borough
- 2:14 Manasquan Borough

From Sandy Hook to Manasquan Inlet the mainland of the State itself faces the ocean. From Manasquan Inlet south to Cold Spring Inlet at Cape May, the oceanfront is composed of narrow peninsulas and islands which are the barriers between the open sea and the bays and thoroughfares of the State Inland Waterways. Only at Cape May is the mainland again exposed to the

ocean. The Monmouth County oceanfront differs also in the steep slope of its beaches into the ocean depths. The general high ground elevation rearward of the beaches further creates the extensive oceanfront bluffs usually described as headlands. The abrupt exposed face to the ocean and the greater water depths near the shore have set the scene for severe damage and erosion due to unusually heavy wave attack. The entire State oceanfront has experienced and is subject to erosion. Efforts to hold and control erosion is therefore widespread, but the greatest concentration of work and investment has been along the Monmouth County oceanfront. In keeping with the physical exposure and the strength of ocean attack, existing bulkheads and jetties are of heavy design and large quarry stone has been employed extensively in seawalls, bulkhead frontal cribs, and jetties.



Keansburg beachfront is typical in Raritan-Sandy Hook Bay frontage

Fairchild Aerial Surveys, Inc.

All 14 municipalities have built coast protection structures to protect their frontage. Each municipality has a definite plan of protection which represents the ultimate goal of security. The degree of completion in each municipality varies. While substantial progress has been made in each instance, the present status represents the extent to which State and local funds have been available for such work. It should be noted that the work as planned and executed has been well co-ordinated between adjacent municipalities.

The future work being contemplated consists of adding new bulkheads and jetties to round out and complete the basic pattern of protection; maintenance of older structures; completing existing structures which could not be financed in full during initial construction; and providing beachfill material to supplement the natural supply.

3. Northern Ocean County:

Ocean County

- 3:01 Point Pleasant Beach Borough
- 3:02 Bayhead Borough
- 3:03 Mantoloking Borough
- 3:04 Brick Township
- 3:05 Dover Township
- 3:06 Lavallette Borough
- 3:07 Seaside Heights Borough
- 3:08 Seaside Park Borough
- 3:09 Island Beach Borough



Typical jetty-built beach at Long Branch contrasted with unprotected beach at right

Fairchild Aerial Surveys, Inc.

With the exception of Point Pleasant Beach, which may be considered mainland frontage, the municipalities between Manasquan Inlet and Barnegat Inlet are located along a narrow coastal barrier strip or peninsula lying between the ocean and Barnegat Bay. While recession of the shoreline due to erosion has been noticed, protective work has been undertaken only by the older settled municipalities. For the past several years both the permanent and summer populations

have been growing at an accelerated rate from Point Pleasant Beach to Seaside Park. Island Beach, which is the southernmost municipality, has a small population in relation to its frontage and area, and remains relatively unchanged. The major part of Island Beach is in a natural state and may be reserved in the future as a Federal or State park.



House undermined by waves at Long Branch

The increase in population generally in the other municipalities will probably produce a growing local concern about shoreline changes due to erosion and awaken municipal responsibility for the preservation of the beaches and shorefront. In considering possible future work throughout the State, it is necessary to omit this frontage until the desires of these municipalities become clearer.

4. Southern Ocean County:

Ocean County

- 4:01 Barnegat Light Borough
- 4:02 Harvey Cedars Borough
- 4:03 Surf City Borough
- 4:04 Ship Bottom Borough
- 4:05 Long Beach Borough
- 4:06 Beach Haven Borough

The oceanfront between Barnegat Inlet and Little Egg Inlet, is occupied largely by the first of the principal oceanfront islands, Long Beach Island. A second smaller island to the south, Tucker Beach, between Beach Haven Inlet and Little Egg Inlet, is uninhabited and has been

eroding at a rapid rate for some years. The 6 municipalities on Long Beach Island also have been experiencing marked increases in permanent and summer populations. Concern about erosion is felt in these municipalities and protective work has been done in all of them. Former lack of population and consequent smaller municipal income retarded the carrying out of needed work. The recent growth and development are correcting these conditions so that much greater construction activity can be forecast.

The work executed thus far is based on long range planning which will become more evident as additional work is carried out. An interesting feature of protective work on Long Beach Island is the extent to which dune preservation and beachfill are regarded as fundamental work. The island is fortunate in having many miles of natural dunes and the rearward bays as sources of sand. Unfortunately short-sighted developers have leveled many dunes to fill in building lots. This creates a future problem for the home owners. For the near future, in addition to the dune preservation, the municipalities plan to concentrate on strategically located major jetties and on caring for the most severe localized erosion problems.



Asbury Park's famous mile of beachfront built by the four jetties at right

Fairchild Aerial Surveys, Inc.

5. Brigantine Island:

Atlantic County

- 5:01 Galloway Township
- 5:02 Brigantine City

The northern oceanfront of Atlantic County between Little Egg Inlet and Absecon Inlet is

occupied by several islands the largest of which is Brigantine Island. The smaller islands to the north of this island are not inhabited and so are not being considered in this survey. The city of Brigantine includes all of Brigantine Island but only the southerly half of the oceanfront is developed enough for erosion losses to be important. Funds for protective work have been small, but the results have been good although the groins and bulkheads have not been too substantial. Improved municipal income is anticipated for the future which will permit building planned permanent jetties in addition to groins and bulkheads along the 3 miles of developed beachfront.



Sand accumulation by jetty under construction at Asbury Park

Asbury Park Press

6. Absecon Island:

Atlantic County

- 6:01 Atlantic City
- 6:02 Ventnor City
- 6:03 Margate City
- 6:04 Longport Borough

Absecon Island lies between Absecon Inlet and Great Egg Inlet. The four municipalities which occupy it, Atlantic City, Ventnor City, Margate City, and Longport Borough, represent the greatest concentration of population and development along the New Jersey coast. This entire frontage is subject to erosion. Land loss has been particularly noticeable at both ends adjacent to the inlets.

Large sums have been spent for the protective structures which exist and function today. The work has been done in keeping with the high

value of the beachfronts. The structure designs and materials have been selected for greatest degree of service. The most recent work was the construction of a series of jetties along the inlet frontage of Atlantic City and beachfill placement along both the inlet and northerly oceanfront. Atlantic City has in immediate prospect the construction of several jetties along the northerly oceanfront. These jetties will supplement the existing protection near the inlet and the effect of the ocean piers and older jetties which protect the central beachfront.

While the need exists, only a small amount of work has been done for a number of years in the other three municipalities. The next two municipalities, Ventnor and Margate, have concentrated of late on maintenance of older structures. It is expected that both will desire major reconstruction of existing jetties within a short time. Longport at the south end of the island has made heavy investments in protective structures. It plans additional work on a limited scale at this time although the frontage at Great Egg Inlet is in an extremely serious state. In addition to Atlantic City, the other three municipalities are considering beachfilling to complement bulkheads and jetties.



Beaches controlled by jetties in Avon-Bradley Beach frontage

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7. Ocean City:

Cape May County

7:01 Ocean City

Ocean City occupies the large island lying between Great Egg Inlet and Corson Inlet. The

city proper is at the northerly end which is also the location of the most advanced erosion. Protective structures cover a long frontage. Construction of an additional jetty has just been completed near Little Egg Inlet at the scene of recent rapid erosion. In the near future, a new jetty at the inlet will be started to form the northerly terminus of the oceanfront. Future work will consist of extending existing jetties and placing an extensive beachfill along the northerly beaches.



Jetty-built beaches in Manasquan and Sea Girt

Fairchild Aerial Surveys, Inc.

8. Sea Isle City Vicinity:

Cape May County

8:01 Upper Township

8:02 Sea Isle City

Strathmere, a locality in Upper Township, is at the north end of the island lying between Corson Inlet and Townsend Inlet. Sea Isle City is the principal municipality on this island. Erosion at Strathmere appears unchecked despite numerous bulkheads and groins along the populated frontage. Work has been planned and, it is assumed, will be executed over a period of years to accommodate the local budget.

Sea Isle City requires protection along its entire frontage. In many instances the existing bulkheads and jetties on which the municipality depends for defense against ocean attack, require major repair or reconstruction. This work was planned several years ago but only a small part could be financed. The beachfront has been eroded to such an extent, however, that a substantial part of the work has become urgent.

9. Avalon—Stone Harbor:

Cape May County

- 9:01 Avalon Borough
- 9:02 Stone Harbor Borough

Avalon is at the north end and Stone Harbor is at the south end of the island between Townsend Inlet and Hereford Inlet. Extensive property losses have occurred at the north end of Avalon at Townsend Inlet. The results of existing protective structures have been good but not sufficient for the security of this shorefront. Planned work is being delayed pending financing. The rate of erosion makes this locality one of the critical cases.



Beach and land held by jetties at Beach Haven may be compared with deep erosion in foreground

Fairchild Aerial Surveys, Inc.

Stone Harbor is experiencing erosion along its whole frontage with the most serious conditions at its southerly end. Protective structures have been built, but require maintenance and in the case of most jetties, reconstruction. A project for jetties at the south end is scheduled for com-

pletion in the near future. Other planned work includes in addition to jetty reconstruction, the adding of complementary jetties and an over-all beachfilling project.

10. Wildwood Vicinity:

Cape May County

- 10:01 North Wildwood City
- 10:02 Wildwood City
- 10:03 Wildwood Crest Borough

The island between Hereford Inlet and Cold Spring Inlet is occupied by North Wildwood, Wildwood, and Wildwood Crest. North Wildwood is in serious condition. Work is now being planned for the near future, but complete coverage will have to be spread to accommodate financing. Wildwood in recent times has been concerned about erosion at its northerly end. It is expected that corrective measures will be taken in the near future. Wildwood Crest has sufficient protective beach and requires no foreseeable work.

11. Cape May Oceanfront:

Cape May County

- 11:01 Cape May City
- 11:02 Cape May Point Borough

Cape May City and the borough of Cape May Point are the two municipalities which lie between Cold Spring Inlet and Delaware Bay. As pointed out earlier, this frontage is considered part of the mainland although much lower in general elevation than the Monmouth County headland. The beaches along this frontage were famous prior to the completion of Cold Spring Inlet jetties in 1909. Thereafter the beaches narrowed and receded because the normal movement of sand into the beaches from the north had been cut-off. The ensuing investment in bulkhead and jetty protection reached large figures.

Both municipalities require reconstruction of existing bulkheads and jetties, additional jetties to complement those now in use, and beachfill to supplement the natural supply. The problem of financing weighs heavily in planning future work.

12. Delaware Bay:

Cape May County

- 12:01 Lower Township
- 12:02 Middle Township
- 12:03 Dennis Township

Cumberland County

- 12:04 Maurice River Township
- 12:05 Commercial Township
- 12:06 Downe Township
- 12:07 Lawrence Township
- 12:08 Fairfield Township
- 12:09 Greenwich Township

The shorefront forming the easterly side of Delaware Bay is not heavily populated except in a few localities. For this reason the frontage to be protected is small in comparison to the total length of 52.5 miles. Intense storms peculiar to

the Delaware Bay region have cut sharply into the shorefront and leveled the natural dunes. Protective structures have been built with good results. Future work at the populated localities consists of bulkhead and groin construction and beachfilling. The latter is proposed both to create depth of protection and to promote dunes. Low municipal incomes makes financing a particular problem.

Data Summary:

The following table summarizes data for each geographical grouping giving the total length of beachfront, the length of frontage now protected, the total length of beachfront requiring further work, and the estimated probable cost of essential future work.

Unit No.	Beach Front Designation	Municipalities Included	Total Frontage-Miles	Frontage Now Being Protected-Miles	Frontage Requiring Protection-Miles	Estimated Cost Future Protection-Dollars
1.	Raritan-Sandy Hook Bays	Madison Township to High-lands	19.2	12.2	7.1	\$960,000
2.	Monmouth County Oceanfront	Seabright to Manasquan	20.7	20.7	20.7	12,093,000
3.	Northern Ocean County	Point Pleasant Beach to Barnegat Inlet	23.3	0.6	0.0
4.	Southern Ocean County	Barnegat Light to Little Egg Inlet	18.6	3.2	15.0	875,000
5.	Brigantine Island	Galloway Township and Brigantine	9.8	2.1	3.0	100,000
6.	Absecon Island	Atlantic City to Longport	9.1	9.1	9.1	6,950,000
7.	Ocean City	Ocean City	7.6	3.9	3.9	1,000,000
8.	Sea Isle City Vicinity	Upper Township and Sea Isle City	6.9	1.6	3.5	1,365,000
9.	Avalon-Stone Harbor	Avalon and Stone Harbor	7.6	2.1	3.0	1,220,000
10.	Wildwood Vicinity	North Wildwood to Wildwood Crest	6.4	0.0	2.0	850,000
11.	Cape May Oceanfront	Cape May City to Cape May Point	4.2	3.4	4.2	1,750,000
12.	Delaware Bay	Cape May Point to Greenwich Township	52.5	0.9	6.0	470,000
<i>Totals</i>			185.9	59.7	77.5	\$27,633,000

The estimated cost of needed protection totals \$27,633,000. This estimate is considered as a reasonable approximation of the probable cost of future coast protection classed as very essential.

Comparing the estimated present investment of \$30,000,000 with the estimated cost of required future protection at \$27,633,000, it would appear that the half-way mark has been reached and past. Actually the progress to date is greater. The investment to date represents in greater part the costs of years past when the dollar value of work was smaller than today. The estimated cost of future protection is based on current prices.

The work done under the State-municipal program and the municipal projects that preceded it, have established the pattern for the protection of the State shoreline. As funds become available, the work can be extended and carried out to completion. The success of the existing work and the experience and knowledge thus gained assure the security of New Jersey's beaches and shorefront in the future.



Jetties and Ocean Piers protect the "Worlds Playground" at Atlantic City. Beach was restored by filling in 1948.

Fairchild Aerial Surveys, Inc.

Beachfilling:

Beachfilling and dune building by transporting and placing sand is part of the essential work at many locations. In this connection, the suggestion has been made that the municipalities along the oceanfront from Point Pleasant Beach south to Cape May City might obtain beachfill from the

inland waterways. They are located on narrow peninsulas or islands lying between the ocean and the rearward bays and thoroughfares. The distances across these marginal lands are small enough to pump from bay to ocean with reasonable costs.



Ocean City has been building jetties along this beachfront starting at left. Final jetties are proposed at upper right and beachfilling along entire frontage

Fairchild Aerial Surveys, Inc.

In particular it is proposed that the State inland waterway and the proposed Federal intracoastal waterway be considered as sources of beach material. These channels are located rearward of these municipalities but vary from place to place in distance from the beachfronts. Materials dredged from these channels could be placed on the beachfronts if reasonable economy and proper apportionment of costs between coast protection and navigation can be achieved.

In dredging waterway channels for navigation only, every effort is made to achieve the lowest cost. Since the distance the dredged material is pumped is a cost factor, the disposal areas are as near the channel as possible. Where the material is pumped to a beachfront, the distance beyond the nearest disposal area must be charged to coast protection. Where the State and Federal channels are immediately rearward of the municipalities, the extra charge would be small and would probably be considered a reasonable investment. On the other hand, where these channels are at great distances, the extra charge might be excessive. In the latter case, normal recourse would be to dredge from the nearest available waterway at lower cost.

Again considering the apportionment of costs between navigation and coast protection, beach filling usually involves the uniform distribution of sand along the beach-front being protected. The cost of this work as coast protection would be additive to the extra charge for additional pumping distance.

After careful consideration, it is believed that in the majority of cases, it will be more economical to obtain sand for beachfill from the nearest waterway rather than attempt to arrange joint benefits from a channel dredging project.

It might be well to think about the possible benefits to navigation from waterway dredging for beachfill material. In Ocean, Atlantic, and Cape May Counties, this could be in the form of channel and harbor improvements on the bayside of the municipalities. In Monmouth County, enlargement of channels and anchorage areas in the Shrewsbury, Shark and Manasquan Rivers would be in order. In some instances, the advantages to navigation might lead to cost sharing.

Off shore dumping of sand in the ocean has received serious attention with the hope that the sand would move in upon the beaches. Material dredged from Ambrose Channel by hopper dredge has been dumped one-half mile off Long Branch in 38 feet of water. Dredged material from Absecon Inlet Channel has been deposited in the same manner about one-half mile off Atlantic City in 25 feet of water. Results at both locations were negative.



Storm damage and debris at Ocean City

Coast Protection Financing:

Planning of coast protection construction requires simultaneous attention to the financing of the work. Under the current procedures, the State would appropriate one-half of the \$27,633,000 estimated cost of essential work or the sum of \$13,816,500. The sponsoring municipalities would provide in total an equal sum. The State-municipal projects are sponsored by the individual municipality which must furnish a portion of the construction cost as specified in each annual State appropriation law. State aid for such projects is available only to municipalities able to provide the required sponsor's share of the construction work.



Undermined houses at Ocean City

The ability to provide sponsoring funds varies among the municipalities. Some can provide the funds in two to three years; others can raise the funds but only over a longer period of time; and some cannot appropriate any funds within a foreseeable time. It appears that in most cases a period of several years will be required to raise the necessary funds. It is important that this period be as short as possible. Unprotected or partly protected shorefronts are recognized as open invitations to erosion and damage from storm-driven waves and currents.

Some municipalities have urged that the State ease the local situation by assuming a larger share of the costs. This share has been proposed as 70% or 90%. To aid those municipalities incapable of raising sponsor's funds, it has been suggested that they be permitted to contribute services and equipment for doing work in lieu of cash. Should the State assume a larger share of construction costs and, in some instances, agree

to accept services in lieu of cash as the sponsor's share, it would seem unfair to give aid on other than equal basis to all municipalities.



Wave action at Ocean City

The broadest proposal has been that the State undertake to carry out the needed protective work in the shortest possible time by initially financing the entire work and arranging that each municipality reimburse the State for the sponsor's share of costs over a period suitable to each municipality. It is pointed out that many municipalities report greatly increased recreational activity and improved business after completion of coast protection work, and reimbursement of the sponsor's share by the least able municipalities would be greatly assured by the impetus given local business through the restoration of the beachfronts.

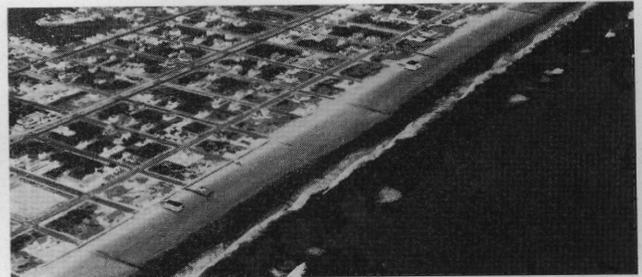


Narrow beach held by old jetties at Sea Isle City

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Since this report was prepared prior to the adoption of many municipal 1950 budgets, it is impossible to estimate with finality the amount of municipal funds which will be available to sponsor coast protection work during 1950. As

of this writing, 18 municipalities have reported amounts available which totalled \$1,563,400. If the State would pay 70% of the cost of coast protection work, this sum would sponsor a total work program costing \$5,211,333 of which the State's share would be \$3,647,933.



Narrow flat beach at Stone Harbor

Fairchild Aerial Surveys, Inc.

Seeking Federal financial aid under existing laws and procedures has received attention. The general feeling is that the concept of coast protection expressed by Federal laws will have to be re-designed before Federal financial aid can become a practical possibility as present procedures lean too heavily on policies developed to meet navigation and flood control problems. Municipalities anxious to complete partly built protective works cite the hazards of long delay versus the uncertainties of Federal aid. It is pointed out that New Jersey pioneered in coast protection work so that its laws and policies today are the result of actual experience in solving all phases of the problem and it seems essential that Federal laws be patterned to fit the New Jersey viewpoint.



Eroded beaches at North Wildwood

Fairchild Aerial Surveys, Inc.

The amount of annual State appropriation for coast protection work is too small to permit orderly and rapid construction of needed shore protection. For example the current appropriation totals \$469,000. The appropriation from general State funds was \$250,000. The remaining \$219,000 was a windfall from escheated Court funds.

Coast protection warrants prominent standing in the general State budget. Since State revenues are considered general funds not earmarked as to source or use, and are appropriated annually for State functions deemed essential, coast protection must receive recognition befitting a modern-day problem of grave interest to the people and the government of New Jersey.

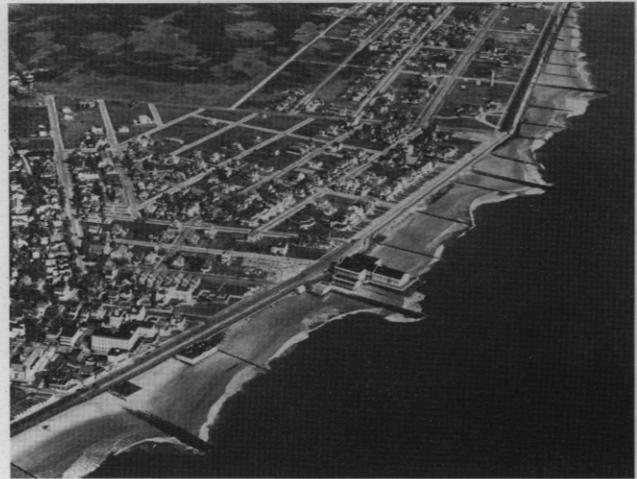


Houses at North Wildwood exposed by beach losses

The interest of the people is exemplified by the ever-growing summer population along the shore; by the mounting demand for more and larger shore-bound highways; and by the widespread building of homes in the shore areas. These are more than symbols of shorefront development and use. They are the guide-posts to even greater expansion and values in the shore areas. They are a reflection and a part of the social and business life throughout the State.

The Recreation Industry, the name given shorefront business and recreational activity, is popularly said to be founded on the State's priceless natural assets of sand, sea, and sunshine. Its motivating credo of a better, fuller, healthier life for the people of New Jersey is symbolic of the social and business life of today. It is not only recognized as the greatest service industry in New Jersey, but also as the major industry in

gross income as well as for its wide ramifications into diversified industrial life and business throughout the State.

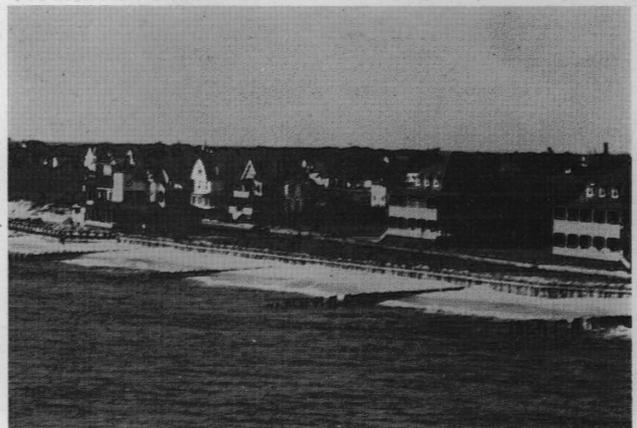


Jetty-held beach at Cape May City

Fairchild Aerial Surveys, Inc.

The Recreation Industry serves also as an important vehicle through which income is derived by the State Government to care for its many needed functions such as aid to school districts and municipalities.

The continued prosperity of the Recreation Industry admittedly depends upon the existence and usability of the beaches and shorefront. The preservation of these physical assets in first class condition is essential to the welfare of the people of New Jersey.



Precarious beachfront at Cape May Point

RECOMMENDATIONS

In conclusion, the following recommendations are offered for consideration and it is urged that they be added to the existing body of State policy by enactment into law.

1. The State of New Jersey should pay 70% of the cost of all coast protection work. Where the municipality undertakes work with its own forces, the State would compute services and equipment use by the municipality as all or part of the municipalities 30% share of the construction cost and contribute the State's 70% share in cash for the work.
2. The State of New Jersey should undertake to expedite the construction of essential coast protection work along the shorefront of the State by providing all of the initial construction funds and arranging for reimbursement to the State of 30% of the construction cost by each municipality on terms suited to the financial situation of such municipality. The work to be done and the terms and conditions of municipal reimbursement to the State shall be satisfactory to the municipality, the State Beach Erosion Commission, the State Department of Conservation and Economic Development, and the State Department of the Treasury. The appropriation to effectuate this policy should be not less than \$5,000,000.
3. The annual State appropriation for coast protection work shall be in a single fund and not more than 10% thereof shall be available

for the repair and maintenance of coast protection work executed since 1940 under State-municipal co-operative projects. The cost of such repairs and maintenance shall be borne in full by the State. All expenses incurred by the State in the planning and supervision of coast protection work not otherwise appropriated shall be paid from the State coast protection fund and shall not be chargeable to any municipality.

4. The Congress of the United States should be asked to amend present Federal laws and procedures so as to make Federal financial aid for coast protection more directly and quickly available to the shorefront counties and municipalities, which now are in need of immediate financial aid to carry out urgent work.
5. By amendment of existing law, the shorefront along Raritan and Sandy Hook Bays in Middlesex and Monmouth Counties should be included as eligible for State coast protection aid.

Respectfully submitted,

J. STANLEY HERBERT, *Chairman*
FRANK S. FARLEY, *Vice-Chairman*
A. PAUL KING, *Secretary*
W. STEELMAN MATHIS
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MERRILL H. THOMPSON
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ANDREW HENRY
WALTER A. KEPPLER

SUMMARY STATEMENT OF FUNDS SPENT ON STATE-MUNICIPAL CO-OPERATIVE COAST
PROTECTION PROJECTS 1940-1949

<i>Municipality</i>	<i>State Funds</i>	<i>Local Funds</i>
Middletown Township	\$69,114.89	\$40,053.09
Sea Bright Borough and Monmouth County	346,787.97	346,787.97
Long Branch City	2,459,254.85	1,370,576.14
Deal Borough	209,498.42	190,039.45
Allenhurst Borough	31,447.53	13,477.52
Asbury Park City	67,788.42	67,788.42
Neptune Township	45,175.78	45,175.78
Bradley Beach Borough	88,373.09	67,712.42
Avon-by-the-Sea Borough	229,883.23	13,349.78
Belmar Borough	110,727.02	18,020.69
Sea Girt Borough	306,018.15	81,172.84
Manasquan Borough	48,371.63	32,247.76
Long Beach Township	89,967.46	89,967.46
Beach Haven Borough	34,815.82	34,815.83
Brigantine City	4,400.00	4,400.00
Atlantic City	514,551.31	514,551.31
Ocean City	226,588.66	204,207.97
Sea Isle City	7,093.00	7,093.00
Stone Harbor Borough	27,391.71	11,739.30
Cape May City	214,737.36	214,737.37
Cape May Point Borough	46,685.08	20,007.89
Sub-totals	\$5,178,671.38	\$3,387,921.99
Grand Total	\$5,178,671.38	\$8,566,593.37

