of water in the shallowest of sections of quite seven feet. As a matter of fact there is an inside passage reaching southward from Beaufort to Key West, but there are parts of the way where the water does not exceed four feet in depth. However, the fact that there is an intracoastal waterway from Norfolk on to Boston is of the utmost significance, because such an inland navigable span could be turned to great use in view of the fact that Norfolk is the railroad centre that brings to a focus land transportation reaching south and west into some of our richest and most productive States.

Need for Improvement Plain.

It is now plain just why Representative J. Hampton Moore of Pennsylvania urged upon Congress within the past two weeks the need of developing or exploiting those inland waterways that would relieve the drain upon coastwise shipping and permit the withdrawal of a large percentage of those craft from the submarine and mine infested waters lying between the capes of the Chesapeake and the southern approach to the port of New York. This is not the first time that interest has been aroused in this broad matter of utilizing our present inside route. Something like five years ago an exhaustive report was made upon the subject, and indisputable figures were adduced which put convincingly the economic advantages that would result. Indeed it was shown that the money conserved by lessening the hazards incident to exposure to the stormy Atlantic would soon pay for the deepening and widening of existing canals and make it possible for vessels of a draft of twelve feet to move without hindrance all the way from Boston to Norfolk.

New York has especial reason for interest in this matter. As far back as 1906 it was reported that its canals handled annually 3,540,000 tons of freight, and a very considerable portion of this passed to and fro by way of the Raritan Canal feeding north and south between this port and Philadelphia, Wilmington, Baltimore, Newport News and Norfolk. That is to say, from upper New York Bay the passage generally used is by way of the Kill van Kull and Arthur Kill and thence around Great Beds lighthouse to the entrance of Raritan River. This leads to New Brunswick on the Raritan, and from there on to Bordentown through the Delaware and Raritan Canal. From Bordentown the route follows the Delaware River down to Delaware City, at which point the Chesapeake and Delaware Canal is entered and navigated to Chesapeake City. From there on the passage is made by way of Back Creek and Elk River to the head of Chesapeake Bay. Once in Chesapeake Bay the vessels can either pursue their courses straight on to Newport News and Norfolk or be diverted to Baltimore, Washington or Richmond.

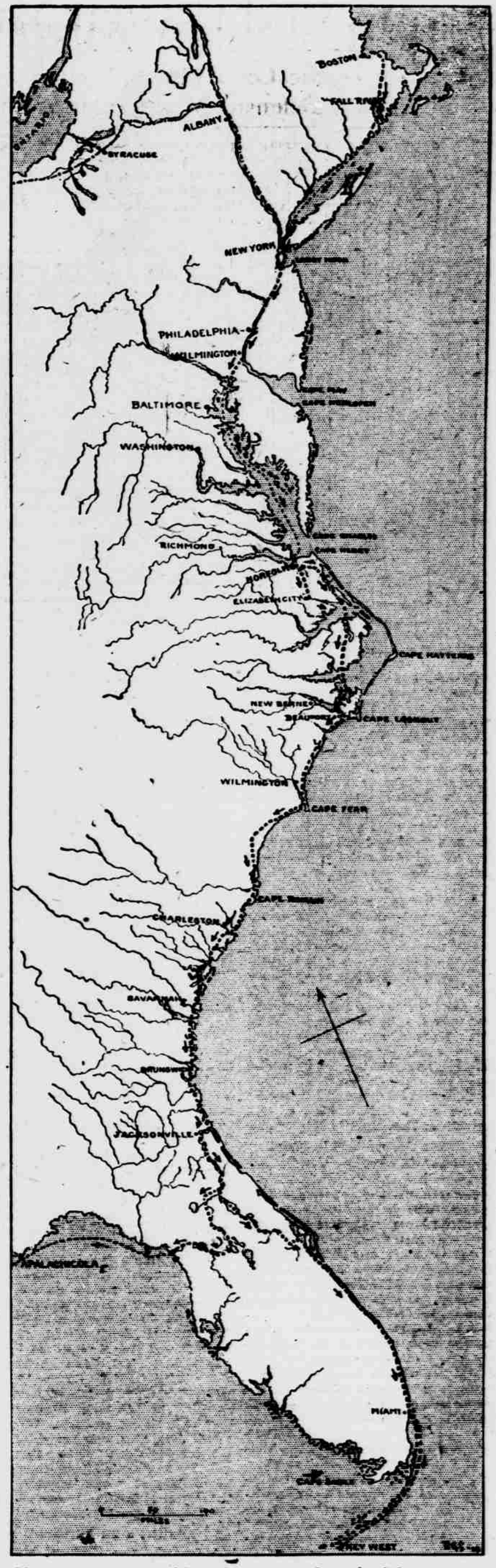
Easy From Norfolk South.

From Norfolk inland water travel can be maintained either via the Dismal Swamp Canal or the Albemarle and Chesapeake Canal, reaching in this way Albemarle Sound, Pamlico Sound and thence to Beaufort. The submarine is only a present menace, but the storm tossed Atlantic has taken its toll both of life and property in the years past which should have brought about the developement of the intracoastal route long ago. Reduced to figures, the sacrifices entailed in sending commodities by the outside passage have been little short of appalling. Data furnished by revised reports of the Life Saving Service, covering only the span between 1900 and 1909, show that during that decade there were 5,715 disasters officially reported. These involved a known loss in shipping amounting to $30,380,915, and an established cargo loss of $10,168,640!

The significant part about the foregoing figures is that the combined value of cargoes and craft destroyed during the decade in question—a total of $40,549,555—is in excess of the estimated cost of building one of the most important sections of the proposed improved waterway.

Six years ago Rear Admiral C. S. Sperry had this to say regarding the coastal canal link:

"The inland waterways of the Atlantic coast are an important factor in the national defence in several ways. Not only do they afford a secure passage for certain vessels of the navy, but the sounds, particularly, are an outer line of defence, the ditch of the fortress. Submarines, destroyers and torpedo boats, secure in their smooth waters, and able to pass out through occasional passages, readily defended by mines, can drive off an enemy's fleet and a hostile landing will be impossible.



Map showing system of inland waterways along the Atlantic coast.

"Several times within the last fifteen years torpedo boats drawing from 6½ to 7 feet have made the inland passage from Key West to New York Bay, but with more or less difficulty in the region below Norfolk, and with some damage. Torpedo boats are not large enough to take the sea and to attack an enemy to the best advantage at a distance from the coast, and they have been superseded in the building programme of the Navy Department by destroyers and submarines. In order that the largest destroyers and submarines built or contemplated may pass freely and safely through the canals and passages an ultimate depth of about 14 feet should be considered, and the radius at bends must be very considerable. The torpedo boats which made the inland passage found their greatest obstacle in the sharp bends, and the new destroyers are about 295 feet in length.

"Destroyers and submarines, owing to the fatigue of their crews and to the character of their motive power, can only reach their highest efficiency when operating from a secure and comfortable base, and it is evident that the conditions in this respect are ideal along the greater part of the Atlantic coast if the waterways are adequately improved."

But without looking to the future development of the existing canals that link up certain of our sounds, bays, rivers and important Atlantic seaports, the matter of present interest is the fact that these artificial water routes are to-day susceptible of immediate use provided steps be taken without delay to commandeer craft available for the service and to supplement these rapidly by the building of numerous barges or canal boats.

Considering only the available stretch between New York and Beaufort, N. C., the following table reveals the state of the existing inland water route and covers a stretch of the coast along which, offshore, a tremendous volume of freight is moved to-day by vessels of all sorts:

Distances and Draughts Along the Inland Waterways.

	Distance in knots.	Maximum draught in feet.
From Port of New York to		
South Amboy, N. J.	19	21
New Brunswick, N. J.	29	10
Bordentown, N. J.	68	7
Philadelphia, Pa.	92	7
From Philadelphia, Pa., to		
Delaware City, Del.	35	9
Chesapeake City, Md.	47	9
Baltimore Entrance, Md.	84	9
Baltimore, Md.	94	9
From Baltimore Entrance to		
Annapolis Entrance, Md.	15	30
Patuxent River, Md.	55	30
Cape Lookout, Potomac River	72	30
Old Point Comfort, Va.	135	30
Norfolk, Va.	148	30
From Norfolk, Va., to		
Elizabeth City, N. C.	44	9
Roanoke Marshes Light, N. C.	84	9
Adams Creek, N. C.	164	9
Beaufort or Morehead City, N. C.	181	9
Beaufort Entrance, N. C.	182	9

With such a waterway at our disposal and devoid of any hampering physical conditions, apart from the draught limitation of seven feet, it is evident that we have it in our power to reduce greatly outside traffic and to divert an immense amount of tonnage to channels lying securely beyond the reach of hostile U-boats or the mines which they might plant. As we are aware the majority of the vessels sunk or damaged by the enemy submarines have been of comparatively modest size and of typical coastwise types. The freight carried by these craft could readily be handled by boats that could travel by the intracoastal route.

Most of the Soil Easily Dug.

Further, it is well worth noting that all the seaboard canals running southward from the port of New York traverse territory that is of a sandy or earthy formation, and to deepen and widen these channels would not entail breaking through barriers of rock. That is to say, the problem of improvement to meet a greatly amplified service would involve nothing more complex than simple dredging or excavating, and the facilities for this work could be mustered with little or no delay.

The work would undoubtedly cost more now than would have been the case had the project been undertaken prior to the war, but even so that should not deter us. The following figures were submitted to Congress about five years ago by the United States Army engineers along with estimates covering the entire scheme reaching from Boston south to Key West.

Section.	Cost.
Boston to Narragansett Bay	$40,000,000
Narragansett Bay to Long Island Sound	12,322,000
New York Bay to Delaware River	45,000,000
Delaware River to Chesapeake Bay	12,424,500
Norfolk to Beaufort Inlet	5,400,000
Total	$115,146,500

As will be seen, the New York Bay-Delaware River section is the most expensive part of the project. In a measure this is due to the fact that it involves the purchase of the Chesapeake Canal and its conversion into a sea level route twelve feet deep and having a bottom width of ninety feet, and the intention is to build a lock canal for the Delaware River-New York Bay section which would have the foregoing dimensions but be susceptible of ultimate enlargement to a canal twenty-five feet deep with a bottom width of 125 feet.

By increasing the depth of the Dismal Swamp Canal as it exists to-day it would be possible for vessels of considerable tonnage to traverse landlocked waters all the way from the western end of the New York State Barge Canal down to New York city and thence south to Albemarle Sound, North Carolina. This would put the metropolis in intimate touch with the rich coal and agricultural lands adjacent to the route south from Norfolk, and in turn open protected channels for the water carriage of Northern products of the farm and factory at immensely lowered traffic rates.