Memoir IV.
This copy to be kept in Office of Assist. in charge

(No 19.)

8

Notes on the Coast of the United States

by A. D. Bache, Supt U. S. C. Survey.

6111
6 S
No. 2732.
Shelf 173
Case

Section IV.
Coast of North Carolina.

(With Maps.)

RAREBOOK
VK
982
.N8
B3
1861

October. 1861.

Note – This Memoir was prepared by Prof. A. D. Bache, Superintendent, and Capt. C. P. Patterson, Hydrog. Inspector U. S. Coast Survey.

National Oceanic and Atmospheric Administration

Notes on the Coast of the United States

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages
Faded or light ink
Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library, the Office of Coast Survey, NOS and the NOAA Climate Database Modernization Program. This project includes the imaging of the full text of each document. To view the original documents, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or www.reference@nodc.noaa.gov.

LASON
Imaging Contractor
12200 Kiln Court
Beltsville, MD 20704-1387
April 20, 2004

This Book is the Property of the
U. S. COAST AND GEODETIC SURVEY,
and must be carried on Book Inventory
if not returned before the Expiration
of the Calendar Year.

General Index to Contents of Memoir on the Coast of North Carolina.

	Page
1. General Remarks	1
2. Coast Sand Strip	3
3. Inlets, Entrances and Coast Harbors	5
4. Sounds and their Tributaries	16
5. Coast and Off-Shore Soundings	40
6. Tides	46
7. Winds	47
8. Currents	52
9. Gulf Stream (see pamphlet annexed)	"
10. Lights and Beacons	53
11. Fresh Water	61
12. Magnetic Variations on the Atlantic Coast between Virginia and Florida --	63

Note The Courses and Bearings herein stated are Magnetic.

The distances are in Nautical Miles, unless otherwise stated.

General Remarks

A strip of sand from ¼ mile to 2 miles in width separates the ocean which washes this Coast from interior Sounds of greater or less width. Those extensive sheets of water constituting Albemarle and Pamplico Sounds and their branches, and the smaller sounds of Core, Bogue, Topsail, Masonboro', Myrtle, Middle, &c. &c., are inside of this strip, which alone keeps the ocean from encroachment, and which, under the influence of currents, waves and winds, is gradually disappearing, and unless assisted will disappear from above the water and constitute dangerous shoals below it, which will in many cases be out of sight of land. These sounds receive the rivers of North Carolina, generally sluggish in their lower portions, and reaching to the mountains many hundred miles from the Coast. The length of this strip of sand is 283 nautical miles from the boundary of the States of Virginia and North Carolina, in Lat. 36° 33', to that of North and South Carolina, in Lat. 33° 50', — the direct distance between these two points being 208 miles.

Near the upper and lower portions of this length the sounds die out, as it were, Currituck Sound extending but 10 or 12 miles above the Northern

boundary, and Myrtle Sound closing just above Cape Fear. From Cape Fear to the southern boundary the place of the narrow sounds is occupied by marshes and slues.

This portion of the coast has undergone more positive recorded changes within the geographical period than any other, — the inlets through which the vessels of the early adventurers passed into the sounds having been entirely obliterated, high sand hills of rugged outline occupying their places, and cedar forests and marshes having alike been buried beneath the traveling sand.

The outer or ocean side of this sand strip has a more or less steep beach, rising sometimes quite abruptly to a range of sand hills from the height of high water to some twenty feet and even more above that line, protected generally by a coarse beach grass. Within this is dry and soft sand, moved easily by the wind. There is on the sound side a border of marsh. The traveling sand covers this, and the outcrop of the marsh turf on the seashore shows the gradual progress of the sea inward. A few spots of the old cedar woods remain, still growing though disappearing gradually and certainly.

Coast Sand Strip.

From the coast opposite to the city of Norfolk, there is a continuous sand beach, generally firm and constituting a good hard road, to Oregon Inlet, 70 nautical miles from Cape Henry. The portion from Old Currituck Inlet to the former Nag's Head Inlet was called Bodies Island, and that name is still applied, without close definition, to the peninsula from about Nag's Head to Oregon Inlet, 10 miles further on.— From this inlet, the strip changes its general direction from S.S.E. to S. by W. to Cape Hatteras, a distance of 25 miles. At this point its direction forms nearly a right angle with that to the northward, running W. by S., 10 miles to Hatteras Inlet. This portion of the strip is known as Chicamicomico Bank.

From Hatteras Inlet to Ocracoke Inlet it has a S.W. by W. direction, with a distance of 15 miles.—

Thence it runs S.W. to Cape Lookout, a distance of 40 miles to its extreme point.— To the Westward of Cape Lookout 3 miles above it, the shore takes a W.N.W. direction for 8 miles to Beaufort Entrance.—

From Beaufort Entrance the general direction of the strip is W. by S., with a distance of 22 miles.

From Bogue Inlet it runs about S.W. by W., 12 miles

to New River Inlet, — thence it turns gradually in direction to S. by W., 48 miles to New Inlet Cape Fear River, including in that distance the several small inlets of Stump, New Topsail, Rich, Barren, and Masonboro, all unimportant.

From Cape Fear River this strip still continues with its previous character, to the boundary, about 30 miles to the westward, separating however from the ocean, instead of sounds, narrow marshes intersected by slues. —

The several changes in direction of the coast at the various Capes cause current actions, producing the dangerous shoals which extend outwards from the Capes Hatteras, Lookout and Fear.

Inlets, Entrances and Coast Harbors.

	Page
Oregon Inlet	7
New Inlet	8
Loggerhead Inlet	"
Hatteras Cove	"
Hatteras Inlet	"
Ocracoke Inlet	"
Old Topsail, or Beaufort, Inlet	9
(Fort Macon, Beaufort City and Moorehead City)	"
Cape Lookout Bight	10
New River Inlet Bogue Inlet	" & 36.
Entrances to Cape Fear River	"
Cape Fear River	11
(Smithville)	12
(Wilmington)	13
(Slackwater Navigation)	"
Small Inlets W. of Cape Fear Entrance	14
	15

Inlets, Entrances and Coast Harbors.

These inlets are usually formed during violent storms, which change suddenly and very considerably the level of the broad interior sounds. They are kept open by the tidal currents of the ocean.

The confluence of the ocean waters and those of the sounds produces on the exterior a bar, and on the interior a more shoal one, termed a bulkhead, between which two obstacles there is a deep channel scooped out.— The outer bar is generally of soft sand, easily moved, and while carrying as a rule a depth which varies only within certain limits, shifts its position readily and according to laws which require more close study and observation than have yet been bestowed upon them, to trace their progress and changes with precision. The points or spits projecting from one or both sides of the inlets overlap, the progress being generally southward, the bar shoals, the channel closes, to break out again to the northward,— and to go through a series of rapid or slow changes, going through their variations in weeks or years, according to circumstances.

The currents through these inlets caused by the tides and varied by the winds, are more or less violent, but as the body of water which can enter the

inlets is small compared with the body of the water of the sound into which it is passing, the current soon exhausts itself, and even the tide wave soon ceases to be propagated, and the rise and fall of the ocean tide has but a limited extension within these sounds. When the currents cease to be capable of moving sand in their ordinary tidal ebb and flow, the bulkhead is formed by deposit. Where the space between the bar and bulkhead affords sticky bottom there is good anchorage, often well sheltered against the prevailing winds, — which are N.E., N.W., S.W., and S.E.

The most northerly of the Inlets from the Atlantic is now Oregon Inlet, which opened during a hurricane in September 1846, and derives its name from the passage of a small steamer of that name through it not long after its formation.

It has a shifting bar on the outside, over which 8 feet may be carried, and a bulkhead at the entrance into the Sound, over which 5 feet may be carried.— As is usual with all small inlets, the intervening space is deep. (see Chart B).

This inlet opens into the N.E. corner of Pamplico Sound, just to the southward of Roanoke Island. It is about 230 Yards in width.

Hatteras Inlet - (additional Note) The Chart of November 1861 shows two Channels, one (the Western) with scant 14 feet, and the other (the Eastern) with 12 feet over the Bar, and $6\frac{3}{4}$ feet over the Bulkhead, with good anchor-age under the East Point of the Inlet, in from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms water -

The next inlet, 8 ¾ miles south of Oregon Inlet, is that at present called New Inlet (see Chart B) — of this no hydrographic survey has as yet been made by the Coast Survey — it is said that between 6 and 7 feet water can be carried through the channel, but this depth depends very much upon the influence of the winds. — The average width of this inlet, in 1852, was 670 yards.

The next inlet, proceeding south, is known as Loggerhead Inlet — it is 3½ miles south of New Inlet. Its outline is shown on Chart B, but no hydrographic survey has yet been made of it by the Coast Survey. — It has probably more water than Oregon Inlet.

Hatteras Cove. — To the westward and under the lee of Cape Hatteras an anchorage may be found affording protection from all winds except those from the southward and west, being exposed from S. to W.N.W.

Hatteras Inlet, — 11 miles W. by S. ½ S. of the Cape Lt. House, is a valuable harbor of refuge (Charts B & H). The bar, in 1857, had 19 feet water upon it, and the inlet a width of ¾ mile, with a channel 250 yards wide. — An anchorage in 13 feet is well protected under the East point of the inlet. — (See Note opposite) The channel over the bulkhead has 7 feet water.

Ocracoke Inlet (see Charts B & I) is 17 miles to the south and west of Hatteras Inlet. In 1857, there was 10 feet water on the bar, and an anchorage inside in 19 feet water in Wallico's Channel. The width of the inlet is nearly ¾ mile, and the width of the channel about 270 yds.

Old Topsail or Beaufort Inlet (see Charts K, K' (1857)(1862)) is an excellent entrance leading into Bogue Sound, 8 miles to the westward of Cape Lookout.

The depth on the bar has changed but little within 50 years, though its position is a shifting one, and even the number of channels does not remain constant.

For Sailing Directions, in 1857, see Chart K, to which it may be well to apply the rule of a southward movement of the channel. See also Chart K' for Survey of 1862 The entrance is over one mile wide, with a channel 250 yards in width.

The depth on the bar is 18 feet, deepening to 3¼ fathoms, and shoaling again to 15 feet, half a mile inside the bar.— The main channel leads close in to the west point of Shackleford Banks.— There is a 7 feet channel leading close in to the beach of Bogue Bank, and close in to Fort Macon.— Back of the Fort is a Light House, the light of which has been extinguished by the secessionists. The bay is capacious, though in general shoal.

Fort Macon can be approached with 4 fathoms water on a N.N.E. bearing, within 1½ mile, and the west point of Shackleford Banks with the same depth within 1 mile between the bearings of N. and N.N.E.

Two miles to the westward of Fort Macon, 4 fathoms can be taken within ½ mile of the beach.—

The distance from Fort Macon to Beaufort City is

1½ miles, and to Shepherd's Point (Moorehead City,) the terminus of the railroad, 2 miles. From the west end of the Shackleford Banks to Beaufort the distance is 2 miles. — Moorehead City is connected with the town of Newbern, 36 miles distant, by a railroad, which continues on through Goldsboro', 95 miles distant, on the Wilmington and Weldon Railroad, to Raleigh, 48 miles beyond: thus connecting with the railroad system of the State. — It is connected with Beaufort by a steam-ferry.

Cape Lookout Bight is a cove to the westward of Cape Lookout, with good anchorage in from 3 to 5 fathoms water, with the Light House bearing E. N. E. to N. E., from ⅜ to ½ mile distant from the beach, protected from all winds from N. W. round by North and East to South. (See Chart K)

Bogue Inlet see page 36.

New River Inlet is a narrow, crooked and shallow entrance, leading into Stump Sound and New River, about 34 miles to the westward of Beaufort. Its average width is not over 100 yards, and the depth of water on the bar is but 3¾ feet. (See Chart I).

There are a number of small inlets into the several small sounds between Bogue Inlet and Cape Fear River, of which no hydrographic surveys have been

made by the Coast Survey. — They are all said to be quite shallow, and one or two nearly bare at low water. Several of them, however, are used by the small coasters for the local trade.

The Entrances to Cape Fear River (see Chart XI) are separated by Smith's Island, together with the marshes and flats extending from it: — the south point of this island is Cape Fear.

The main entrance is to the westward of Cape Fear, and New Inlet is to the northward.

Both of these entrances have undergone since 1851, and probably are still undergoing great changes; — the old main channel has been almost entirely closed at the bar, and the western channel now passes the main trade of the river. Over the bar of this channel 10 feet can be taken at low water, but only 8 feet over the Rip abreast of Fort Caswell, on the east end of Oak Island. — This entrance is 1¼ mile wide from Bald Head Point to Fort Caswell. — Both the western bar and the Rip change frequently with the weather. The channel over the latter is at all times very narrow.

Over the bar of New Inlet but 8 feet can be carried at low water. This entrance is nearly ¾ ths of a mile wide, but the channel narrows on the bar, and abreast of Zeek's Island, to 100 yards. — One mile S.W. from

Zeek's Island is a bulkhead, with but 9 feet water upon it.

There is a Light House back of Bald Head Point, and one also on Federal Point, but the lights have been extinguished by the secessionists.

Cape Fear River, – from near Federal Point to Wilmington. (see chart N.) –

From Federal Point to Wilmington the distance is 17 miles, and the direction nearly North and South, with a very direct and clearly defined channel through the series of deep holes, and over the bars which separate them, and between the extensive shoals spreading from the banks. – The width of the river abreast of Federal Point, including the marsh islands and oyster beds, is nearly 2 miles.

From this width it gradually decreases to less than 200 yards at Wilmington. – The deep holes range from 3 to 6 fathoms, and the least water on any of the bars is 9 feet, on the bar above Campbell or Big Island. The channel has an average width of ¼ mile below the mouth of Brunswick River, at the lower end of Eagle Island, above which it narrows with the river. – Brunswick River joins the northwest branch about 3 miles above Wilmington, and, it is said, 8 or 10 feet water can be carried through it. –

The northwest branch from Wilmington to the separation with the Brunswick River has a depth varying from 3 to 9 fathoms. It is very crooked, and but 150 yards wide. This branch is said to be navigable for many miles, and even at Fayetteville, 100 miles from Wilmington, for boats of large size.

On the west side of the river are many rice plantatoons, — the east side to Wilmington is generally covered with pine forest.

The western entrance to Cape Fear River is defended by Fort Caswell, situated on the west point of the entrance.

Smithville, a small town of a few hundred inhabitants, and the County seat of Brunswick Co., occupying the site of old Fort Johnston, is situated 1½ mile above Fort Caswell, upon a fine site, fronting the sea, and is considered one of the most healthy places in the State, being used as a summer resort by the inhabitants of Wilmington.

Wilmington, the principal commercial port of North Carolina, is situated on the east side of Cape Fear River, at the junction of the N. E. and N. W. branches, 21 miles above Fort Caswell, and 17 miles above Federal Point, and is the County seat of New Hanover Co., and the most wealthy and populous town in the State, although its

situation is not considered very healthy.

It is the terminus of, 1st., the Wilmington and Weldon Railroad, — 2nd., the Wilmington and Manchester Railroad, connecting with all the South Carolina railroads, — and 3rd., of the Wilmington, Charlotte and Rutherford Railroad, in North Carolina.

It is distant by the 1st. road, — from Weldon, 162 statute miles, and from Goldsboro', 85 miles. — By the 2nd. road, from Kingsville, S. Car., 171 miles, from Florence, S. Car., 107 miles, and from Whitesville, N. Car., 44 miles, — and from Charleston, S. Car. by Florence and the North Eastern S. Car. Railroad, 209 miles. —

By the 3rd. road, from Moss Neck, to which point only it is finished, 87 miles.

<u>Slackwater Navigation</u>. — For many years, an extensive system has been in progress of execution for the improvement of the navigation of the Cape Fear and Deep Rivers.

It is understood that the head of navigation to which these works extend is at Hancock's Mills on Deep River, 100 miles above Fayetteville, and 200 miles above Wilmington, and that the proposed line of improvement has been pronounced by competent engineering authority to be available

for opening abundant and valuable sources of profit in the pine forests and coal and iron region of the interior of the State.

From Cape Fear Entrance to the southern boundary of the State, a distance of about 30 miles, there are several small inlets, with small streams, which find their way to the ocean through the sluces intersecting the narrow marshes along the coast.

These streams have their rise in a great interior swamp, called Green Swamp, and the inlets are used only by very small coasters for the local trade.

Sounds and their Tributaries.

	Page
Albemarle Sound (Charts D & E.)	17
North River	18
Pasquotank River	19
Little River	21
Perquimons River	"
Yeopim River	"
Edenton Bay	22
Bull's Bay	"
Scuppernong River	"
Alligator River	23
Chowan River	24
Roanoke River	25
Currituck Sound (Charts A. D. & G.)	27
Croatan Sound (Charts A. & D.)	29
Roanoke Sound (Charts A. & D.)	30
Pamplico Sound (Charts A. & B.)	31
Pamplico River (and Tar River)	32
Pungo River	33
Neuse River	"
Trent River	34
Bay River	"
Core Sound (Charts A.)	35
Bogue Sound (Charts A. & K.)	36

Sounds and their Tributaries.

These form the great hydrographic feature of this coast, affording a system of interior and safe navigation unequalled upon our Atlantic Coast.

The two great main sounds are Pamplico and Albemarle, — from which branch the subordinate sounds of Currituck, Roanoke, Croatan and Core, with many smaller ones under the name of rivers.

Besides these, a chain of smaller sounds gradually dying out into narrow marshes intersected by slues, stretches along the whole coast southward from the head of Core Sound abreast of Cape Lookout. — These are known as Bogue, Topsail, Middle, Masonboro', Myrtle, &c.

Albemarle Sound (see Charts D. and E.) has a general direction of E. by N. and W. by S., between the latitudes of 35° 55' and 36° 10' and longitudes 75° 45' and 76° 40', and is separated from the ocean to the eastward by the narrow strip of sand to the northward of Bodies Island. —

Its length is 45 miles, with a breadth at its eastern end of 11 miles, narrowing to 3 and 4 at its western end between Bull and Edenton Bays, —

and has an average depth of 16 and 17 feet, covering about 300 square miles.

Its navigation is generally clear, — the only dangers being shoals extending out from several points from ½ to 1½ miles, leaving a clear, broad channel. — At its head it receives the waters of the Roanoke River, from the westward, at its S.W. corner, and the Chowan River, from the northward, at its N.W. corner. — On the North side several arms called rivers, make out from the Sound to the northward and westward, from 2 to 12 miles, receiving at their heads small streams.

The names of these, beginning at the eastward, are, North, Pasquotank, Little, Perquimons, Geopim, and Edenton Bay. — Of these the Pasquotank is the most important, both from its size and as being the outlet of a system of inland navigation, connecting it with the town of Norfolk.

On the South side of the Sound are Alligator and Scuppernong rivers.

The bottom of the Sound is, generally, blue mud, except upon the bars and shoals, where it is hard sand.

North River (see Chart D.) extends in a general N.N.W. direction, from the N.E. corner of the Sound for 10 miles, — the lower half of which has

an average width of 2 miles, and the upper closing in rapidly to 1 mile and then to ½ a mile. —
The lower part has an average depth, free from shoals, of 10 feet, — but across the mouth is a narrow bar, over which but 7 feet can be carried. —
The upper end of this river, (see Chart A), connects through the South end of Coanjock Bay with the South end of Cedar Bay, small bays on the west side of Currituck Sound, and thence with the upper end of Currituck Sound by the Albemarle and Chesapeake Canal, — through which 6 feet can be taken, and possibly 8 feet. The length of this portion of the canal is nearly 6 miles.

Pasquotank River (see Charts D and E) lies just to the westward of North River, and extends as an arm of the Sound, in a N. W. general direction, with irregular shores, for 15 miles to Elizabeth City, situated on its west, or right bank, and where it receives the river proper, a crooked, narrow, but deep stream. — At its mouth, between Wade's Point on the west, and Pocoson Point on the east, it is 2¾ miles wide, gradually narrowing to 1 mile between Cobb's and Anson's Points, 1½ mile below Elizabeth City. — At the City it is less than 200 yards wide, with a depth of from 5 to 6½ fathoms. —

The average depth of the river is 11 feet, with a bottom of soft blue mud, except on the shoals, which extend in no case over ½ a mile from the shore. — From Wade's Point, a narrow hard sand spit, with from 6 to 9 feet water upon it, extends off E. by N. for nearly 4 miles, leaving a channel between its end and the east shore, of ¾ mile in width and 13 feet in depth.

Near the east end of this spit is a screw-pile Light House, called Wade's Point Lt. House.

Above Elizabeth City, the river runs with a very crooked course, in a general N.W. direction, sometimes not over 50 yards in width, rising, with many branches, in the Dismal Swamp. — About 17 miles above the City, it is joined by the Dismal Swamp Canal, which with a length of about 20 miles, joins the West branch of the Elizabeth River, 4 or 5 miles from Norfolk. This Canal is said to be in bad condition, with small locks; — the depth through is about 6 feet. A feeder connects this canal with Lake Drummond, which lake is connected with Suffolk, at the head of Nansemond River, by the Jericho Canal, 8 miles long. — Suffolk is connected with Norfolk, 17 miles distant, by railroad. — From Elizabeth City to Norfolk, a distance of 44 miles (Statute), there is a stage-road.

Little River (see Chart E), lies 7 miles to the westward of, and parallel with, the Pasquotank. As an arm of the Sound it extends 7 miles to the village of Nironton, on its last or left bank, where it receives the river proper, a small stream rising in the southern part of the Dismal Swamp, and mixing its head waters with those of the Perquimons. — Below Nironton it has an average depth of 9 feet, with soft blue mud. — It is ¼ mile wide at the mouth, and gradually contracts to about 350 yards at Nironton.

Perquimons River (see Chart E), lies directly to the westward of Little River, separated from it by Durant's Neck, — and runs in a N. W. by W. direction from the Sound 11 miles to the town of Hertford, situated on the west bank, where the river proper joins the arm. — It has an average width of 1 mile, which it retains to within 1 mile of Hertford, where it suddenly contracts to 200 yards. — There is no bar to this river, and 11 feet can be carried up within 2 miles of the town, and 9 feet to it. — Above the town the river is narrow and crooked, having its sources a few miles distant in the lower end of the Dismal Swamp.

Yeopim River (see Chart E), is a small arm of the Sound, 5 miles to the westward of Perquimons

River, — 5 miles long in a W.N.W. direction from its mouth, — about ¼ mile wide, — with a depth of 6 feet. — At its head it separates into two small streams running North and South-west.

Edenton Bay (see Chart E.), is an arm of the Sound, in its N.W. corner just below the mouth of the Chowan River. — It is nearly 3 miles wide at its mouth, — running North 2 miles, contracting to ½ mile at its head, where the town of Edenton is situated. — 12 feet can be taken within ½ mile of the town, but only 6 feet to the wharves. — A small stream flows in from the Northward and Westward, and empties into the bay just to the Westward of the town.

Bull's Bay (see Chart E.), is an indentation on the South Shore of the Sound, nearly opposite the Perquimons River, — with a breadth of nearly 4 miles, and running in 2 miles. — In its southwest corner it receives two small creeks, into the mouths of which 7 and 8 feet can be taken. — In the middle of the bay there is 18 feet water, sticky bottom. — In its S.E. corner it receives the celebrated

Scuppernong River. (see Chart E.) A small, narrow and crooked stream, about 16 miles long, flowing in from the southward, and having its rise in Lake Phelps, 3 or 4 miles across. — 4 miles

from its mouth, on its East or right bank is situated the town of Columbia, where it is crossed by a bridge. To this point 7½ feet water can be carried.

Alligator River (see Chart D), the largest of the arms of this Sound, lies on the South side opposite the Pasquotank river. — As an arm of the Sound it runs nearly due South for 20 miles, when it suddenly contracts in width, receiving the river proper, which turns at right angles to the westward. — It is 3 miles wide at its mouth, which width it keeps on an average to within 6 miles of the bend, above which distance it gradually narrows to 1 mile. — Across the mouth is a bar, with 10 feet water upon it, which depth can be taken 14 miles above the bar, and 9 feet to the bend. — With the exception of a shoal opposite Sand's Point, with 6½ feet, — and another close in between Laurel and Bay Points, it is perfectly clear, and 8 and 9 feet can be carried within a few yards of the shores. — Just at the bend, the river from the westward contracts to ¼ mile in width, and runs to the Westward for 6 miles, when it suddenly turns at right angles again, running to the Southward, and separating into several branches having their sources in Alligator Lake and Swamp. — Several small

creeks empty into this river, and there is a small canal, 2 miles long, connecting the main southern branch with the great Mattimuskeet Lake (14 miles long and 4 miles broad), which is again connected by a canal, 4 miles long, with Juniper Bay in Pamplico Sound, lying about 20 miles N. W. from Ocracoke Inlet.

The Chowan River empties into the N. W. corner of Albemarle Sound, and is formed by the united waters of the Meherrin, Nottoway, and Blackwater Rivers, – all having their rise in the State of Virginia, and flowing in a general S. E. direction; the united streams of the two last joining that of the first about 30 or 35 miles above Edenton, and 4 or 5 miles above the town of Winton, the County town of Hertford Co., on the west bank. – For 10 or 15 miles above Edenton, this river is but the extension of the Sound, being 2½ miles wide at its mouth, and gradually diminishing in width, in the above distance, to ½ a mile. – This river and Meherrin are navigable for the Sound vessels to Murfreesboro', a town on the west bank of the latter, 12 or 15 miles above its junction, or between 45 or 50 miles above Edenton. – Above this point it is navigable for nearly 15 miles to the crossing of the Norfolk and Weldon (Seaboard and Roanoke) Railroad, for

light-draught steamboats.— This crossing is about 12 miles by the railroad from its junction, at Weldon, with the Wilmington, Weldon and Petersburg Railroad.—

About 10 miles above the mouth of the Meherrin, the Nottoway and Blackwater unite.— Both of these rivers are navigable for light-draught steamboats to the crossings of the Norfolk and Weldon (Seaboard and Roanoke) Railroad, about 12 miles above their junction.— The crossing of the Blackwater is called Franklin Depôt, which is 37 (statute) miles from Norfolk,— 20 statute miles from Suffolk,— 43 (statute) miles from Weldon,— and 6 (statute) miles from the Nottoway crossing.

<u>The Roanoke River</u> is the largest river of North Carolina, and runs in a general E.S.E. course, but, before emptying in Albemarle Sound, which it does in its S.W. corner, directly below the mouth of the Chowan and opposite Edenton Bay, it makes a long, crooked bend below the latitude of Albemarle Sound, and flows into it from a S.W. direction, with many mouths, through extensive swamps.— Each of these mouths has a separate name, the principal one retaining that of Roanoke, and is the most eastern. It is about 350 yards wide, and quite deep after passing the bar at its mouth.—

A light-vessel, anchored $\frac{3}{4}$ mile due north from the mouth, formerly marked the channel.

The portion of the Sound receiving these mouths is a small indentation called Batchelor's Bay. — This river is navigable for the Sound vessels, of from 45 to 50 tons, to Halifax, situated on its west bank, at the first rapids, about 75 miles above its mouth, and which is a station on the Weldon and Wilmington Railroad, 8 miles (statute) from Weldon, 10 from Enfield, and 70 from Goldsboro', the crossing of the North Carolina (Newbern and Beaufort) Railroad. — The town of Plymouth is situated on the right or east bank of the Roanoke, about 6 miles from its mouth. — A road leads to Mackay's Creek, 4 miles to the Eastward of the river's mouth, which is connected with Edenton by a ferry. — A stage-road connects Edenton with Washington on the Pamplico River, 35 miles distant. — Williamston is another small town on the right bank of the river, about 30 miles by the river above Plymouth, but is connected with it by a road only 22 miles (statute) long.

The country around the Sound is low, with great tracts occupied by marshes. — The hard lands are well cultivated, and the shores are quite thickly settled, particularly the north shore.

Currituck Sound (see Charts A, D and G), is a long, narrow sheet of water, with irregular shores and many small islands, lying at right angles to Albemarle Sound, and connecting with it, from the North, at its east end.— Its general direction is W.N.W. and S.S.E., with a length of over 40 miles, extending to within 13 miles of Cape Henry and Lynnhaven Bay, with an average width of nearly 3 miles.— In places the channel between the marshy islands does not exceed ½ a mile, across which extend flats with not over 3 and 4 feet water upon them.— This Sound is separated from the ocean by the narrow strip of sand before described, and which in places is not ½ a mile across.

The average depth of the channel in this Sound is about 5 feet, and a bar stretches across its mouth upon which there is but 5½ feet water.— Near the middle of the west side of the Sound, about 22 miles from its South end, are the two small bays called Cedar Bay and Coanjock Bay, 2 and 4 miles long,— the first outside of, and connecting with, the last.— Across the head of the latter passes the southern portion of the Chesapeake and Albemarle Canal, connecting the head of the former with Albemarle Sound, through the North ~~Landing~~ River.— The north end of Currituck Sound

separates into two arms, one continuing along the beach, called Back Bay, which has but from 3 to 5 feet water, and the other to the westward, being the broad mouth of North Landing River, which is 1½ mile wide at its junction with the Sound, tapering, in a distance of 5½ miles, to 100 yards.— From the end of the canal in Cedar Bay through Currituck Sound to this point, a distance of about 16 statute miles, 5½ feet water can be carried in ordinary stages of the water.— The Chesapeake and Albemarle Canal Co. intended to dredge this portion of their route to 8 feet in depth:— it is not known if this has been done.— Above the point where this river contracts to 100 yards in width, it is a narrow, crooked, but deep stream, with a N.N.W. direction.— About 2 miles above this point Pungo Bridge crosses it.— 8 or 10 miles up, the Virginia section of the Chesapeake and Albemarle Canal, 8½ statute miles long, through the great Bridge Swamp, leads from it to the S.W. branch of the Elizabeth River, 12 miles above Norfolk. At its junction with this river is the only lock on the route. It is 220 feet long and 40 feet wide in the clear, and will pass vessels drawing 8 feet water and propellers of 500 tons— its lift is but 2 or 3 feet.— The Company intended to form a continuous channel

with a depth of 8 feet from the Albemarle to the Chesapeake, and the work was nearly completed in 1858. — The route is as follows, — commencing in North Carolina at the mouth of North River in Albemarle Sound, the line extends up that river to the canal; thence through the canal to Currituck Sound; thence northerly through Currituck Sound, and up the North Landing River to the Virginia section of the canal; thence through the canal in a westerly direction to the Southwest branch of Elizabeth River in the vicinity of Norfolk.

Croatan Sound (see Charts A and D), is comparatively a small sheet of water, extending from the east end of Albemarle Sound in a S.S.E. direction, the greater portion being that sheet of water lying between Roanoke Island on the east and the mainland from Caroon's Point to below the Roanoke Marshes on the west, connecting Albemarle Sound with Pamplico Sound from the west corner of its North end. — Its length is about 12 miles, and its average width about 2 miles. The main channel from Albemarle to Pamplico Sounds runs through it. The Southern end of this channel is quite deep, — but through the northern part no more than 9 feet can be taken. There are several knolls, with

but from 4 to 5 feet water upon them in this part of the channel, and Fulker's Shoal lies mid-way between Redstone Point and Pork Point, the channel running close along its eastern edge, where it is steep to, with 13 feet water. — Near the north end of this Sound is Croatan Lighthouse, off Caroon's Point, — and near its south end is Roanoke Marshes Light-House, on the east side and about mid-way of the narrow channel connecting Pamplico and Croatan Sounds. — Both of these are screw-pile structures.

Roanoke Sound (see Charts A & D,) is a smaller sheet of water than Croatan Sound, and lies between Roanoke Island on the west, which separates it from Croatan Sound, and Bodies Island on the east, separating it from the ocean. — It is about 10 or 12 miles long N.N.W. and S.S.E., with an average breadth of 1½ miles, being much contracted in the middle by a group of Marsh islands setting off from Bodies Island. — A very narrow crooked channel leads through this Sound from Pamplico to Albemarle Sounds, through which 6½ feet water can be taken.

Oregon Inlet from the ocean enters the north end of Pamplico Sound at its junction with the south end of Roanoke Sound. This Inlet, as also

New Inlet and Loggerhead Inlet are described under the head of "Inlets", pages 7 & 8.

Pamplico Sound (see Charts A and B) is by far the largest of these extensive sheets of water, — but as the work of the Coast Survey has as yet only partially extended over it, it is not so well known as Albemarle Sound. — Its length is about 70 miles, in a general N.E. and S.W. direction, with an average breadth of 15 miles, and covers an area of over 1000 square miles. It is separated from the ocean by a part of the strip of sand before described, Cape Hatteras forming the prominent point.

With the ocean it communicates through Oregon Inlet, New Inlet, and Loggerhead Inlet, to the north of Cape Hatteras, — and through Hatteras Inlet and Ocracoke Inlet to the southward of that Cape. — The average depth of this Sound is from 2½ to 3 fathoms, but it is obstructed by many long and extensive shoals, which reduces the depth which can be carried through the length of the Sound to 11 feet.

The chief of these obstructions is Bluff (or Bluff Point) Shoal, a narrow bulkhead which stretches across from Bluff Point on the mainland opposite Ocracoke Inlet, to Royal Shoals at the Inlet. The N.W. Point Royal Shoal Light-House is a guide for the channel over this shoal.

Another extensive shoal stretches off nearly S.E. from Brant Island, between the mouths of the Neuse and Pamplico rivers, for nearly 12 miles, the point of which was formerly marked by a Light-vessel.— Long Shoal makes out to the eastward across the Sound from Long Shoal Point in the northern end of the Sound. There was formerly a Light-vessel located about 3 miles from Long Point, to mark the channel over the shoal, through which there is 11 feet water.— From Bluff Point Shoal to Croatan Sound the least water in the channel is 3½ fathoms, except over Long Point Shoal.— The main Tributaries of this Sound are Pamplico and Neuse rivers.

Pamplico River is properly an arm of the Sound, stretching W.N.W. from the North corner of its west end, and is the estuary of Tar River, being that part of it below Washington, a town on its north bank, 35 miles above its mouth.— At its mouth it is 6 miles wide, gradually narrowing to ¼ mile just above Washington at the mouth of the Tar.— There is a depth of water to Washington sufficient for any vessels navigating the Sound.— The Tar River runs in a general S.E. by E. course, with a length of about 180 miles, and is navigable for steamboats of light draught to Tarboro', on the west side of the river,

50 miles above Washington.

Pungo River is a crooked sheet of water, receiving many Creeks, and empties into the Pamplico River from the northward, just above its mouth.— It is 2½ miles wide at its mouth, and runs up, tapering to 100 yards in a distance of 20 miles, into the great Alligator Swamp.— Washington is connected with Newbern, 35 miles distant, by a mail-stage road, as also with Grenville on the Tar River, 25 miles distant.

Neuse River rises in the Northern part of N. Carolina, and, flowing through a very crooked channel for nearly 300 miles, flows into a large estuary, which at a distance of 20 miles from Pamplico Sound turns at right angles, and empties into its S. W. corner, with a N. E. direction.— This river is nearly 6 miles wide at its mouth, gradually contracting to ¼ mile about 40 miles above it, and just above the junction of the Trent.— Newbern, the most important town in this section of the State, is situated on the S. W. bank of the Neuse, at the junction of the Trent, which flows into the Neuse from the westward.— Newbern was long the Capital of the State. It is well built, and is the centre of a large trade, and is more healthy than most places in the State so near the seaboard.— It is connected with Beaufort, 38 statute miles distant, by railroad to Moorehead

City, and also by a canal 2 miles long joining Clubfoot Creek, a branch of the Neuse, 20 miles below Newbern, with Harlow Creek, a branch of Newport River, 2 miles above Beaufort, — the distance through being 35 miles. — It is also connected with Goldsboro', 59 statute miles distant by the extension of the same railroad.

Trent River is a short stream, 35 or 40 miles long, flowing in from the westward. — At Newbern, the Neuse is 1½ mile, and the Trent ¾ mile wide. — The Neuse is navigable for all the Sound vessels for 12 miles above Newbern, and for light-draught steamers for over 100 miles.

Bay River is a short, broad river, flowing from the westward into Pamplico Sound, between the Pamplico and Neuse rivers. — It is 2 miles broad at its mouth, and is 8 miles long, receiving many small creeks, as do all the estuaries of this Sound, as well as the Sound itself on its N. W. shore.

The whole of the mainland around all the preceding Sounds is low and flat, with great marshes occupying vast tracts, cut up by many small streams, and containing many lakes of various sizes. —

The principal of these marshes are Dismal Swamp between Norfolk City and Albemarle Sound, and the

much larger Alligator Swamp, occupying nearly the whole of the neck between Albemarle and Pamplico Sounds.— Along the rivers and shores of the sounds there is much cultivated land, supporting a large population, particularly along the northern shore of Albemarle Sound.—

Core Sound (Chart A) is a long narrow sheet of water, stretching S.W. from the South corner of Pamplico Sound, for 25 miles to Cape Lookout, and there makes nearly a right angle to the westward for 6 miles to Beaufort Harbor, with an average width of 2 miles.— It is separated from the ocean by the sand strip before described, and is much obstructed by shoals, the principal of which are, Harbor Island Bar at its North East end, (formerly marked by a Light-vessel) over which but 5 feet can be carried:— Drum Shoal, 3 miles from Harbor Island, with 5½ feet water upon it.— Piney Point Shoal near the middle of the length of the Sound, with 3½ feet water.— and Bell's Point Shoal 4 miles to the Northward and Eastward of Shell Point, at the head of the Sound, with 4½ feet water upon it.

These depths are from a survey made under the direction of the Bureau of Topographical Engineers, in 1837, since which, it is understood, the depth of water over these bars has been increased artificially, to 7 or 8 feet.

(Charts A & K.)

Bogue Sound is a long, narrow sheet of water, varying in breadth from ¼ mile to 2 miles, extending from Beaufort Harbor on the East to New River Inlet on the west, a distance of 34 miles. It is separated from the ocean by the narrow strip of Coast sand, through which are several small inlets, the principal one being Bogue Inlet, 22 miles west of Beaufort and opposite the mouth of White Oak River, a small river some 20 miles long, flowing in from the northward.— The village of Swansboro' lies opposite Bogue Inlet, and schooners of light draught (4 or 5 feet) can go up to it. The whole of this sound is shoal, with many marshy islands and flats.— The depth of water on the bar of Bogue Inlet is variable, 4 or 5 feet may generally be carried, and sometimes even 7 feet.— From Beaufort to Bogue Inlet but 3½ feet can be carried at highwater, but the depth is generally much less than this:— from Bogue Inlet to New River Inlet no more water is to be found than that sufficient for a pilot-boat. The whole of the great neck of land lying between the Neuse and Trent Rivers on the North, and Core and Bogue Sounds on the south, with New River on the West, is almost an entire marsh, containing many small lakes, and intersected by many small streams.— Along the sounds and rivers there is some hard land, which is well cultivated and settled.

From New River Inlet to within 2 or 3 miles of New Inlet Cape Fear River, there extends a narrow chain of, so-called, sounds, over 40 miles in length,

and never exceeding 2 miles in breadth, including the marshes.

The names of these are Stump, Topsail, Middle, Masonboro', and Myrtle, which receive many small streams having their rise in the Holly Shelter Swamp, lying between the N.E. Cape Fear River and these sounds.

The term "Sound" used in reference to these localities, applies to an intricate combination of shallow creeks, narrow channels, and broken marshes, running with an average width of 1¼ miles, parallel with the outer coast, and separated from it by narrow ranges of sand hills.— The marshes which compose the greater part of these sounds are very intricate and difficult of access, being in many places overflowed at half tide, miry and full of quicksands.— The sandy barriers within the limits above stated have been pierced in five places by heavy gales. Of these small inlets so formed, New Topsail, Masonboro', Rich, and Barren, are much resorted to for shelter by small coasters,— a draught of 4 or 5 feet water may be carried in, but this depth is uncertain and often changing,— Channels lead from these inlets up to the mainland navigable for small craft, with 3 or 4 feet water.

The New River Navigation Company undertook to make

that river navigable to Jacksonville for vessels of 6 or 8 feet draught.

The general character of the country is the same as on the other sounds south of the Pamplico, but the mainland is more thickly inhabited, particularly upon the slope of from 10 to 20 feet in height which runs along nearly the whole length of the inner edge of the swamps. The principal settlements are at Masonboro', at the mouth of Hewlet's Creek, - and at Wrightsville, 2 miles to the northward and eastward on Bradley's Creek. - Both of these places lie nearly opposite Masonboro' Inlet, 15 miles to the northward of New Inlet, Cape Fear River. — Channels for Coasters connect both of these localities with Masonboro' Inlet, - and stage-roads connect them with Wilmington, 8 or 10 miles distant, and with all the settlements along the sounds NorthEastwardly to Snead's Ferry, on New River, 8 miles above its mouth, and also Southwardly to Federal Point.

The first 10 miles, out from Wilmington, of the road to Snead's Ferry (about 50 miles distant) is a plank-road, — the adjacent country is piney-barren, interspersed with swamps and clearings.

From the vicinity of the head of Myrtle Sound a good road leads to the town of Wilmington, parallel with (and in some places debouching on)

the Cape Fear River.

From Cape Fear River to Little River, the southern limit of the Coast of North Carolina, a distance of about 30 miles, Sounds of precisely the same character as these before described run between these limits, ceasing abruptly at Little River, being nowhere over 1 mile in breadth, and at places not over ¼ mile. There are several small inlets from the ocean, the principal being Lockwood's Folly Inlet, 10 miles west of Cape Fear River,— Shallotte Inlet, 7 miles beyond,— and Little River Inlet. Each of these lies opposite the mouth of a small river, having the same name, not over 10 miles in length, and having their sources in the Great Green Swamp, which occupies the larger portion of the County of Brunswick.— These rivers spread to nearly ½ a mile in width just before discharging into the Sounds, which they do over great mud-flats, nearly bare at low-water.

From the great prevalence of Swamps, this portion of the coast is but sparsely inhabited.

Coast and Off-shore Soundings.

	Page
General description of Soundings	41
Wimble Shoals	42
Cape Hatteras Shoals	43
Cape Lookout Shoals	44
Frying Pan Shoals	45

Coast and Off-Shore Soundings.

The Soundings (see Chart Q.) along this coast increase in depth from the shore with great regularity, as a general rule, but are broken at four points by shoals projecting several miles from the shore.

These shoals are, 1. Wimble Shoals.— 2. Cape Hatteras Shoals.— 3. Cape Lookout Shoals.— 4. Frying Pan Shoals.— With these exceptions, and the small shoals projecting from the several inlets, the 5 fathoms curve runs within ½ to 1 mile of the beach.— The soundings then gradually increase in depth seaward, the curves of equal depth closing in on Cape Hatteras, and widening from the shore both North and South.— To the Eastward of Cape Hatteras, the 10 fathoms curve is between 4 and 5 miles from the shore, and east of Cape Henry it is from 13 to 15 miles.— To the southward of Hatteras, off Hatteras Inlet, the 10 fathoms curve is 3 miles from the shore.— East of Cape Lookout it is 5 miles distant.— Off New River Inlet, between Capes Lookout and Fear, it is 10 miles distant.— East of New Inlet Cape Fear River it is 12 miles distant.— S.S.W. from West Entrance Cape Fear River, it is 16 miles distant.— It runs in off Little

River Inlet, the southern boundary of the State, to within 8 miles, spreading out again off Winyah Bay, 50 miles below, to 16 miles.— This curve follows the irregularities of the coast and the several shoals,— these are entirely lost in the 100 fathoms curve, which runs with great uniformity along the general trend of the coast, but following the same law of an increasing distance from the shore as it recedes from Hatteras.— E.S.E. from this Cape it is distant 30 miles,— S.E. from Cape Fear it is 48 miles distant.— Off the several Capes the distance between the 100 fathoms and 20 fathoms curve is about 10 miles, the depth increasing rapidly from 20 fathoms.—

To the Northward of Cape Hatteras the 100 fathoms curve runs in a general northerly direction as far as the latitude of Cape Henry, from which it is 70 miles distant.— The 100 fathoms curve, from near Cape Canaveral, in Florida, to latitude 36°, above Hatteras, (see Chart Q,) runs nearly coincident with the axis of the cold wall of the Gulf Stream, the soundings outside into the Stream deepening with great rapidity.

Shoals.

1. Wimble Shoals (Charts B and O,) are a series of ridges lying nearly parallel with the coast, covering

a space 5 miles long by 2 miles broad, with a least depth of 4¼ fathoms,— 6 to 9 fathoms between the ridges, and steep to all round with from 8 to 13 fathoms, the soundings outside being very irregular. — Their North end lies 3 miles south of Loggerhead Inlet, and 4 miles offshore — the south end lies 17 miles to the northward of Cape Hatteras Light-House, and 2 miles offshore, being between the parallels of 35° 31′ and 35° 36′.— These shoals are very dangerous in heavy weather from seaward.—
Formerly there was an inlet to Pamplico Sound abreast these shoals.

2. <u>Hatteras Shoals</u> (Charts B and C,) extend S.E. from Cape Hatteras 8 miles, with least water 9 feet on the outer shoal, and having a greatest width of nearly 3 miles near their outer end, gradually closing in on the Cape.— The two main shoals are called <u>Outer</u> and <u>Diamond</u>, the latter lying 3 miles from the Cape.— Between these two shoals there is a 3 fathoms channel 2 miles wide,— and between Diamond Shoal and the Cape a 3 fathoms channel ¾ mile wide,— and 14 feet can be taken within ¼ mile of the Cape.— <u>Diamond Shoal</u> has least water 12 feet.—
These depths are from a survey made by the Coast

Survey in 1850, since which date the point of the Cape has been much wasted away.— The extreme end of the Shoals, having 14 feet and steep to with 9 fathoms, bears S.E. ½ S. from the Light House, distant 9 miles.

Wimble's Chart of 1738, gives the same general character and direction from the Cape to these shoals, but with a depth of but 3 feet on the Outer and 5 feet on the Diamond Shoal, with 3 fathoms through the inner channel.— The distance of the outer shoal from the point of the Cape he gives as 18 miles, and the point of the Cape he gives as stretching out S.E. from the general line of the Coast to the Northward for 6 miles,— the Coast Survey giving the same point a little to the westward of that line, making it convex to the ocean instead of concave.— The 10 fathoms curve runs within 10 miles S.E. from the Cape.

3. Cape Lookout Shoals (Chart Q,) extend S.S.E. from Cape Lookout Light House 10 miles,— the enclosing 10 fathoms curve being distant in the same direction nearly 20 miles.— There has been no hydrographic survey yet made of these shoals by the Coast Survey.— There are said to be spots in these shoals with but 7 and 9 feet water upon them, for 5 miles S. by E.

from the point of the Cape and 7 miles S. ½ E. from the Light House. — Outside of this distance the least depth is said to be 2½ fathoms. — The sea breaks nearly constantly on these lesser depths. —

The Light House is situated 2 miles N.N.E. from the end of the Cape. —

These shoals form a splendid breakwater, in heavy easterly weather, for the anchorage in Lookout Bight, to the westward of the Cape, and which forms, as it were, an outer harbor for Beaufort.

4. Frying Pan Shoals (Charts M, P, and Q,) lie off Cape Fear, and extend in a general S.E. by S. ½ S. direction, a little convex to the westward for 15 miles, — with 7 and 10 feet water within 4 and 5 miles of the outer end, upon which spots there are nearly constant breakers, as well as for 2½ miles from the Cape, where there are several bare spots. — The average breadth of these shoals is nearly 2 miles, and it is dangerous to attempt to cross them in the calmest weather with over 7 or 8 feet draught. —

Near their outer end, however, there are 3 and 4 fathoms channels through between the knolls, and there was in 1857 a narrow, crooked channel, less than ½ a mile from the Cape, through between the bare knolls, with 10 feet least depth. — The enclosing

10 fathoms curve runs within 22 miles S.E. by S. from the point of the Cape.

By comparing the distances to which the various shoals run from the shore, it will be seen that they follow the same law as the curves of equal depth, increasing from Wimble Shoals to the Frying Pan Shoals, as follows; — Wimble Shoals, 4 miles — Hatteras Shoals, 8 miles — Lookout Shoals, 10 miles — Frying Pan Shoals, 15 miles.

Tides.

See the accompanying Tide Tables for the use of Navigators, prepared from the Coast Survey Observations, by A. D. Bache, Supdt U. S. Coast Survey, with a Map of Approximate Cotidal Lines of the Atlantic Coast. (Chart 5)

Winds

The following remarks "On the effect of Winds in varying the level of the water in Albemarle Sound", by L. F. Pourtales, Assistant in the Coast Survey, form Appendix No. 43, pp 271, 272, of the Coast Survey Report for 1856.

"During the progress of the hydrographic survey of "Albemarle Sound, numerous observations were made of "the height of the water and the force and direction "of the wind, in order to obtain the mean level of the "surface, to be used as a plane of reference for the "reduction of the soundings.

"But before giving the results of the investigation "made to determine the effects of the wind on the "height of the water, it will be useful to say a few "words about the shape and general character of "Albemarle Sound, as far as they have a bearing on "the subject.

"The greatest length of the sound, from the mouth "of Roanoke River to Shellbank Point and Collington's "Island, is about 56 miles; its breadth goes increasing "from West to East, beginning with 3 or 4 miles, "and reaching about 14 at its widest part, opposite

"the mouth of the Pasquotank. The greatest depth
"is only 24 feet, and the average about 20. It is
"pretty uniform, the western end of the sound being,
"however, somewhat deeper than the eastern. The
"direction of the greatest axis of the sound is about W. by S.

"All the rivers falling into the sound on its northern
"shore run in a southeast direction — a characteristic
"feature of the watercourses descending from the eastern
"slope of the Alleghanies — and they all form shallow,
"elongated bays, as nearly all the rivers of this section
"of country do, and as may be seen exemplified in the
"tributaries of Chesapeake bay. Another peculiarity of
"the mouth of the rivers emptying on the north side of
"Albemarle Sound is to have a long point of land or a
"shoal, stretching out from the western side towards the
"east, directly across the mouth. The southern shore
"of the sound is broken by two rivers only, one of them,
"the Alligator River, forming a considerable bay, running
"due north, and opening directly opposite the mouth
"of the Pasquotank.

"The observations under discussion were — 1st. One
"year's observations in 1847 and 1848, at the Pasquotank
"light-boat, when the height of the water and the
"direction and force of the wind were recorded daily
"at mid-night, and at every hour from 4 o'clock A.M
"to 8 o'clock P.M.

"2nd. Similar observations made at Caroon's Point,
" from May 5, to November 19, 1848.
"3rd. Observations made in Edenton Bay, from May 17,
" to June 13, 1849.

"An examination of the observations soon showed
"that no fluctuation due to a lunar tide exists in
" Albemarle Sound, as might have been anticipated,
" considering the distance and smallness of the commu-
"-nication between the body of water and the ocean.

"The heights of the water, as recorded on the tide-staff,
" were then grouped according to the wind blowing at
"the time of the observation.

"The observations made during the rise of the surface
" were kept separate from those made during the fall.

"The means were then taken, and the following
"tables formed, which are also represented on the
" accompanying diagrams. (Chart R.)

Tables.

Direction of Wind	Pasquotank light boat		Caroon's Point		Edenton Bay	
	Height above Mean	No. of observations	Height above Mean	No. of observations	Height above Mean	No. of observations
	Feet		Feet		Feet	
N.	— 0.19	806	— 0.11	431	— 0.12	35
N.E.	— 0.17	1306	— 0.04	715	— 0.03	58
E.	— 0.10	907	— 0.10	312	0.08	76
S.E.	0.13	843	— 0.01	264	— 0.02	22
S.	0.18	1001	0.15	252	— 0.03	37
S.W.	0.16	1478	0.17	563	0.02	35
W.	0.15	1028	0.21	312	0.05	16
N.W.	— 0.17	1017	— 0.07	437	— 0.04	18

"Thus it will be seen that, at the Pasquotank light-boat, "the North wind depresses the water most, whilst the "South wind gives it its greatest elevation. S.E., S.W., and "W. winds have nearly the same effect as the south wind. "This accords very well with the position of the light boat. "The South wind has the full sweep of the Alligator river "in its greatest length, and of Albemarle sound in its "greatest breadth. The S.E. and S.W. winds have likewise "a large extent of water to act on. The West wind does

"not blow so favourably for this particular station at a first "glance, but it must necessarily have a powerful effect on "the body of Albemarle Sound, which must be felt at the "Pasquotank light boat. The other winds all blow off "shore, and must necessarily depress the water.

"At Caroon's Point the effects of the wind appear quite "anomalous— off-shore winds elevating the surface, whilst "the North Wind, which has all the waters of Currituck "Sound to act upon, produces the greatest depression. "We must look for an explanation in the probable effect "of the winds on the waters of Pamplico Sound, the motions "of which must make themselves felt at Caroon's Point, "through Croatan Sound. Thus, the North wind acts "on Pamplico Sound with great force, and produces a "depression in its northern part, sufficient to draw off "more water from Caroon's Point than Currituck Sound "is able to supply. The South Winds would naturally "have an opposite effect. East and West winds, however, "acting on Albemarle Sound in its <u>greatest</u> dimension, "and on Pamplico Sound in its <u>least</u>, the effects felt "at Caroon's Point ought to be those pertaining to Albemarle "Sound, as the observations indicate.

"The observations in Edenton Bay extend over too short a "period to give very reliable results. They indicate, however, "the greatest elevation of the water as due to the East "wind, as must be the case.

"Observations are wanting to show the effects of rain "or drought, which ought to be well marked, as the "drainage of a large extent of country finds its way "into these waters."

Currents.

In regard to these upon the Coast, there is little known.— The overflow of the Gulf Stream runs close in to the Hatteras Shoals,— and inside this overflow there is said to be a current with a general southerly set, but much influenced by the winds.

Gulf Stream.

(see Sketches T, T' & T")

For the results of the latest discussions of the observations made in the Gulf Stream, see the accompanying printed pamphlet, "Lecture on the Gulf Stream, prepared at the request of the American Association for the Advancement of Science, by A. D. Bache, Superintendent U. S. Coast Survey."

Lights and Beacons.

Lights on Seacoast. — Bodies Island Lt. Ho. — about 32 miles to the northward of Cape Hatteras light, and about 1½ to the south of an inlet. — One light revolving, interval of flash 1 minute and 30 seconds — 90 feet above sea — visible fifteen nautical miles — tower white.

Cape Hatteras Lt. Ho. — about 2 miles north of the southern extremity of the point of the Cape. Dangerous shoals, with 9 feet water over them, lie in a southeasterly direction from the light, at the distance of 9 to 10 nautical miles. The light is a first-order lens, showing 4 flashes and eclipses in every minute. There is a flash of 6 seconds duration, followed by an eclipse of 9 seconds duration, in every 15 seconds of time: — 150 feet above sea — visible twenty nautical miles. — From the base of tower to the height of 70 feet it is colored white, and the remainder red.

Cape Hatteras Beacon. — One-fourth of a mile from the southern extremity of Cape Hatteras point. — One fixed light — 25 feet above sea — visible six nautical miles. An open frame-work structure, surmounted by a lantern, and the whole painted red.

Ocracoke Lt. Ho. — near the entrance to Ocracoke Inlet, about 23½ nautical miles to the southward and westward

of Cape Hatteras. — One fixed light — 75 feet above sea — visible fifteen nautical miles — tower white.

Cape Lookout Lt. Ho. — near the extremity of the Cape. — One fixed light of first-order — 156 feet above sea — visible twenty-two nautical miles — tower red — dwelling-house painted with white and red horizontal stripes.

Bogue Banks Lt. Ho. — at Fort Macon, Beaufort. One fixed light of 4th. order — 50 feet above sea — visible ten nautical miles — tower of brick.

Bogue Banks Beacon — the main light is in rear, and the beacon light of 6th. order is in front of the fort — 30 feet above sea — visible ten nautical miles — of wood. These lights are in range with the outer buoy — the channel changes frequently.

Federal Point Lt. Ho. — on the north side of the New Inlet or North Entrance to Cape Fear River, about 9 miles to the northward of the main-entrance to Cape Fear River, at Bald Head. — One fixed light of 4th. order — 46 feet above sea — visible twelve nautical miles — tower white.

Frying Pan Shoals Lt. Vessel. — in 10 fathoms water, off the end of the Frying Pan Shoals, Off Cape Fear, one mile beyond the outer 18 feet shoal. — This vessel is schooner-rigged; the hull painted yellow, with the words "Frying Pan Shoals" painted in large black letters on each side; lower masts yellow, top masts white — day marks black (one on each mast). — The two lights

(one on each mast) are fired — 40 feet above sea — visible twelve nautical miles. There are also a bell and horn for fog-signal. — Cape Fear (Bald Head) Lt. Ho. bears N.N.W. ½ W., distant about 19 nautical miles; and Federal Point Lt. Ho. bears N. by W., distant about 23 nautical miles from the light-vessel. — The soundings in approaching the Cape Fear Shoals from the eastward are regular; but from the westward irregular. — Masters of vessels of heavy draught, in passing these dangerous shoals, should be careful to get casts of the lead at short intervals of time, and never run into less than 10 fathoms water, if in a steamer, — and 15 to 18 fathoms in a sailing-vessel.

Cape Fear Lt. Ho. — on Bald Head, near the southern or main entrance to Cape Fear River — and is about 4 miles from the pitch of Cape, and about 19 nautical miles distant from 10 to 11 fathoms water off the Frying Pan Shoals. — One fixed light of 3rd. order — 177 feet above sea — visible 16 nautical miles — tower white.

Pamplico Sound Lights. — Royal Shoal Lt. Vessel. — On southwest point of Royal Shoal, 9 miles from Ocracoke Light. — One fixed light — 43 feet above sea — visible ten nautical miles — vessel painted lead-color — also a fog-horn.

N.W. point Royal Shoal Lt. Ho. — An iron screw-pile

structure painted white. — One fixed light of 4th. order varied by flashes — 33 feet above sea — Visible 11 nautical miles — also a fog-horn.

Harbor Island Lt. Vessel — On Harbor Island bar, between Pamplico and Core Sounds — One fixed light — 34 feet above sea — Visible ten nautical miles — Vessel painted red — also a fog-bell and horn.

Brant Island Shoal Lt. Vessel — in southern part of Pamplico Sound — One fixed light — 45 feet above sea — visible eleven nautical miles — Vessel painted straw-color. there are also a fog-bell and horn.

Neuse River Lt. Vessel — Off Marsh Point, at the mouth of Neuse River. — One fixed light — 38 feet above sea — visible eleven nautical miles — Vessel painted lead-color — also a fog-bell and horn.

Pamplico Point Lt. Ho. — On the south side of the entrance to Pamplico River — One fixed light of 5th. order — 37 feet above sea — Visible eleven nautical miles — tower white.

Long Shoal Lt. Vessel — Off last point of Long Shoal. — One fixed light — 46 feet above sea — visible eleven nautical miles — Vessel painted straw-color — also a fog-bell & horn.

Roanoke Marshes Lt. Ho. — An iron screw-pile structure, painted white — On the east side and about midway of the narrow channel connecting Pamplico and Croatan Sounds. One fixed light of 4th. order —

33 feet above sea — visible ten nautical miles — there is also a fog-horn.

Croatan Lt. Ho. — off Caroon's Point, between Pamplico and Albemarle Sounds. A wooden building, with lantern on centre of roof, standing on screw-piles. One fixed light — 37 feet above sea — visible ten nautical miles — also a fog-bell and horn.

Albemarle Sound Lights. — Wade's Point Lt. Ho. — A screw-pile Light-house on the end of Wade's Point Shoal, at the north of Pasquotank River. — One fixed light of 5th. order — 31 feet above sea — visible ten nautical miles — superstructure white, lantern red — also a fog-bell and horn.

Roanoke River Lt. Vessel — near the mouth of the river. One fixed light — 41 feet above sea — visible eleven nautical miles — vessel painted straw-color. There are also a fog-bell and horn.

Cape Fear River Lights. — Oak Island Lights. — two brick towers surrounded by sand hills, — on Oak Island, to the southward of the main channel, — designed to serve as a range for crossing the Oak Island bar. Two fixed lights of the 5th. order — 20 and 30 feet above sea — visible nine nautical miles — towers white — there is also a fog-bell struck by machinery.

Price's Creek Lights — two brick towers, one of them on the keeper's dwelling, — on the west bank of Cape Fear River, near Price's Creek, above Smithville — designed to serve as a range for the channel. — Two fixed lights of the 6th. order — 25 and 35 feet above river — visible nine nautical miles — towers colored white.

Horse-Shoe Shoal Lt. Vessel — to mark Horse-Shoe Shoal, between New Inlet and Price's Creek — to serve as a channel mark. — One fixed light — 43 feet above river — visible sixteen nautical miles — tower colored yellow — also a fog-bell and horn.

Orton's Point Lt. Ho. — On the edge of the marsh, on the west bank of Cape Fear River. — One fixed light of the 6th. order — 25 feet above river — visible nine nautical miles — tower colored white.

Campbell's Island Lt. Ho. — On the lower or southwest corner of Campbell's or Big Island, in the Cape Fear River. One fixed light of 6th. order — 25 feet above river — visible nine nautical miles — tower colored white.

Upper Jetty Range Lights — On the eastern side of Cape Fear River, 3 miles below Wilmington, to serve as a channel range. — The main or front light is on the keeper's dwelling; the beacon is an open frame-work, 800 feet in the rear. — Two fixed lights of 6th. order — 42 and 65 feet above river — visible eight nautical miles — towers colored white.

Latitudes and Longitudes.

		Latitude North			Longitude W. from Greenw. Arc			Time		
Seacoast	Bodies Island Lt. Ho.	35°	47′	16″	75°	31′	43″	5h	02m	05s
	Cape Hatteras Lt. Ho.	35	15	08	75	30	57	5	02	04
	Ocracoke Lt. Ho.	35	06	28	75	58	51	5	03	55
	Cape Lookout Lt. Ho.	34	37	16	76	31	04	5	06	04
	Bogue Banks Lt. Ho.	34	41	43	76	40	00	5	06	40
	Federal Point Lt. Ho.	33	58	04	77	54	53	5	11	40
	Frying Pan Shoals Lt.-vessel	33	35	00	77	50	00	5	11	20
	Cape Fear Lt. Ho.	32	52	19	77	59	49	5	11	59
Pamplico Sound	Royal Shoal Lt.-vessel									
	N.W. Point Royal Shoal Lt. Ho.									
	Harbor Island Lt. vessel									
	Brant Island Shoal Lt.-vessel									
	Neuse River Lt.-vessel									
	Pamplico Point Lt. Ho.	35	19	26	76	31	20	5	06	05
	Long Shoal Lt.-vessel									
	Roanoke Marshes Lt. Ho.	35	48	36	75	41	47	5	02	47
	Croatan Lt. Ho.									

Latitudes and Longitudes (Continued)

		Latitude North			Longitude Wt. from Greenwc. Arc			Time		
Albemarle Sound	Wade's Point Lt. Ho.									
	Roanoke River Lt.-Vessel									
Cape Fear River	Oak Island Lt. Ho.	33	53	24	78	01	36	5	12	06
	Price's Creek Lt. Ho.	33	56	04	77	59	12	5	11	57
	Horse-Shoe Shoal Lt.-Vessel	33	56	17	77	57	26	5	11	50
	Orton's Point Lt. Ho.	34	03	23	77	56	11	5	11	45
	Campbell's Island Lt. Ho.	34	06	57	77	56	03	5	11	44
	Upper Jetty Range Light	34	12	48	77	56	18	5	11	45

Note. It is probable that all of the sea-coast lights, and many of the others, have been recently extinguished, and the buoys removed.

Fresh Water.

The following notes of localities on or near the North Carolina Coast, where fresh water may be procured, are communicated by Assistants and Sub-Assistants of the Coast Survey.

Back Bay – (within the lines of both Virginia and N. Carolina) – the water generally drinkable, and so is that of Currituck Sound, except when winds drive the ocean over the low sand beach.

Croatan Sound – the water is slightly brackish, but is drinkable, especially during strong Northerly winds: – but the water of Roanoke Sound is quite brackish, owing to the proximity of the waters of the ocean through Oregon Inlet.

Albemarle Sound – the water is generally fit for use throughout the sound west of Powell's Point and Caroon's Point.

The Alligator and Pasquotank rivers have good fresh water almost to their mouths, except for the former during a northerly wind. The water is of a light wine color, of excellent keeping quality, similar to that brought to Norfolk by the Dismal Swamp Canal. –

The Chowan and Roanoke and other rivers are doubtless similar to the foregoing.

Rivers of Pamplico Sound:— fresh water is to be found in the Pamplico River at Washington;— in the Neuse River at Newbern;— in the Pungo River at 10 miles up from its mouth;— and in Bay River at 15 miles up from the mouth.

Cape Hatteras— fresh water is to be had by digging in the sand, at the Cove to the southward and westward of the Cape.

Beaufort— fresh water to be had by digging on Shackleford Island between high-water mark and the sand-hills.

Cape Fear— water, not good, is to be had by digging in the sand along the beach north of the Cape.

It may be stated, generally, that water is procurable by digging anywhere in the strip of sand beach forming the ocean coast.

The waters of the chain of narrow sounds behind this strip from Cape Hatteras to Cape Fear are salt and undrinkable— but plenty of good water is to be had in the rivulets and swamp ponds and drains of the mainland, bordering these sounds.

List of observed Magnetic Variations on the Atlantic Coast between Virginia and Florida

The observations are all of recent date, and were made by parties of the U. S. Coast Survey. The Variation has been brought up to Jan. 1, 1860, by means of the known secular change.

The accompanying Map shows the lines of equal Magnetic Variation for the epoch stated.

No.	Locality	Lat.	Long. W. of Grw.	Magnetic Variation 1860
1	Richmond	37° 32′	77° 26′	0° 23′ W.
2	Petersburg	37 14	77 23	0 46 "
3	Cape Charles	37 07	75 58	1 43 "
4	Cape Henry	36 56	76 00	1 36 "
5	Old Point Comfort	37 00	76 18	1 23 "
6	Norfolk	36 51	76 17	1 44 "
7	Shellbanks	36 03	75 44	2 17 "
8	Stevenson's Point	36 06	76 11	2 12 "
9	Bodies Island	35 47	75 32	1 46 "
10	Raleigh	35 47	78 38	0 30 E.
11	Wilmington	34 14	77 56	1 00 "
12	Smithville	33 55	78 01	0 37 "
13	Columbia	34 00	81 02	2 47 "
14	Georgetown	33 22	79 12	1 52 "
15	Breach Inlet	32 46	79 49	1 49 "
16	Edisto, East Base	32 33	80 10	2 30 "
17	Port Royal	32 18	80 38	3 02 "
18	Tybee	32 02	80 51	3 19 "
19	Savannah	32 05	81 05	3 24 "
20	Fernandina	30 41	81 28	3 58 "
21	Macon	32 50	83 38	4 28 "