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Notes on the Coast of the United States

by A. D. Bache, Sup'dt U.S.C. Survey.

Section III.

Delaware Bay.

Coast of Delaware, Maryland & Virginia

(from Cape Henlopen to Cape Henry.)

Chesapeake Bay.

(including Shoals, Inlets, Sounds, Bays, Islands,)
Harbors & Roads

(With 15 Maps.)

June 1861.

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Note — These Memoirs were prepared by
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National Oceanic and Atmospheric Administration

Notes on the Coast of the United States

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Delaware Bay

(Chart A.)

Delaware Bay enters the Atlantic between Cape May in New Jersey, and Cape Henlopen in Delaware, in about Latitude 38.° 50' north.

The land near the entrance is low and, as the views upon the Chart show, has no remarkably characteristic features.

Coming from the Northward and eastward the so called five fathom shoal, which in fact has but thirteen feet least water upon it, is the chief danger. The Light boat is nearly three nautical miles S.E.½ S. from the shoalest part of the bank.

Congress Hall Hotel is the most conspicuous object in approaching Cape May from the northward and eastward.

The main Channel lies on the Henlopen side of the Bay, and the ground is much broken on the Cape May side.

Cape May channel through the overfalls has nineteen and a half feet least water.

The Delaware Breakwater is just outside of Cape Henlopen Behind it is anchorage in from eleven feet to four fathoms

Sailing Directions

To enter the Bay from the Eastward through the Main ship channel, The Light Boat near 5 fathom Bank bearing North, distant 1 mile, steer for Henlopen Light House W. by S, the soundings on the line varying from 7 to 9 fathoms.

When they deepen to 10 fathoms or over, Henlopen Light House 3½ miles distant, steer N. W. to bring Henlopen Light

House and the Beacon on the Cape in range, being careful, particularly in light winds, and on the flood, which sets to the Wd., not to cross much to the West of the range, the Shears being near. Steer up the bay on this range, course N ¼ W. with Brandywine Light House directly ahead, passing a third of a mile to the Eastward of the Buoy of the Brown, soundings shoaling gradually from 15 to 8 fathoms, until 1 mile from Brandywine Light House; then steer for the Light Boat near Cross Ledge, passing Brandywine Light House half a mile to the Westward.

Bound into Breakwater Harbor, from the Southward.

Pass the Hen and Chickens at a safe distance (2 miles from the shore), then haul into the shore, keeping as close to Cape Henlopen, which is bold, as convenient.— From the Eastward. — Bring Henlopen Light House to bear W. by S. and stand in.

Enter the harbor at either end or between the Breakwater and Ice Breaker, according to the wind and tide, and to the berth selected. Do not anchor in the Gap: the best anchorage is close to the main work, Breakwater Light House bearing N. by W. The holding ground is excellent in every part of the harbor.

Chains and anchors can be procured on the Breakwater, and ships stores generally at the town of Lewes.

To enter the Bay by the Coasters or Cape May Channel.

Run along the land in about 5 fathoms, or 1½ miles from the shore, passing outside of Eph's Shoal; when Congress

Hall bears North, bring the Buoy off Cape May (No 1.) ahead, and steer for it (W. by N. ½ N.), leaving it close on starboard hand in passing. If wishing to pass through Ricord's Channel, from Buoy No 1 steer N.W. ¾ W for Buoy no. 4 (on the Southern Spit of Crow Shoal) leaving it on starboard hand at a short distance; then steer N.N.W. Westerly for Buoy No. 5. (in the middle of Ricord's Channel), which pass on either hand, and haul up N.W. ½ W. Westerly for Buoy No 6. (in western entrance of Ricord's Channel) which pass on either hand, and steer W. ½ N. entering the main ship channel between the Buoy of the Brown and the Light Boat near Brandywine Shoal.

To pass through the Through Channel to Breakwater When abreast of Buoy No 1, stand W. ¾ N. towards Buoy No. 3 (on S.E. Spit of Mummy Shoal) keeping it open on the port bow a point, and gradually hauling up for it: when up with No 3. leave it on the starboard hand, and steer S.W. by S. for No 2 (on Southern edge of the Round or E.N.E. Shoal), which leave close on board on starboard hand and continue on S.W. by S. for Breakwater.

If intending to cross the Flats, after passing Buoy No 1. on the starboard hand, haul along the land (N.) until abreast of Town Bank, when steer N.W. by W. ½ W. on the Flood, and N.W. ½ W. on the Ebb, which crosses in 9 feet and brings out near Light Boat No 2 in Main ship channel.

Charts nos. 1. 2. 3, Delaware Bay and River, 80.$\frac{1}{000}$, are marked A. B. C. and Preliminary Chart of Delaware and Chesapeake Bays, on a small scale, 400.$\frac{1}{000}$, marked D. give a general idea of the entrance to the Bay and of its approaches.

Light Houses.

Cape May Light House (of 1847) in Latitude 38°.55'.48". Longitude (west of Greenwich observatory) 74°.57'.57". Time 4h.59m.51s.8. is a revolving light and revolves once in 3 minutes. It is 80 feet above sea level and is visible at the distance of 14.4 nautical miles.

Cape Henlopen Light House is in Latitude 38°46'36" Longitude (W. of Greenwich) 75°.05'.25" - Time 5h.00m.21s.7. - is a fixed light 160 feet above sea level and visible at the distance of 18.6 nautical miles.

Beacon Light on Cape Henlopen in Latitude 38°47'.22" - Longitude 75°.05'.31". - Time 5h.00m.22s. (W. of Greenwich) it is a fixed Light, 40 feet above sea level and can be seen at the distance of 11.5 nautical miles.

Beacon Light on Breakwater is 130 feet from the West end of the work in Latitude 38°.47'.51". - Longitude (west of Greenwich) 75°.06'.50" - Time 5h.00m.27s.3. - this is a fixed Light, 56 feet above the level of the sea and can be seen at the distance of 12.8 nautical miles -

Variation of the Magnetic needle

At Cape Henlopen (1861.) 3°.16'. West.

Tides and Currents,

A complete tide table is given upon Chart A.

The interval between the moon's passage on the Meridian and high water is 8 hours - The mean rise and fall of the tides is 3.5. feet.

— For Currents see Memoir on Tides and Currents by A. D. Bache.

Coast of Delaware, Maryland, & Virginia.

(From Cape Henlopen to Cape Henry)

Chart D.

The Hen and Chickens is a wing shoal extending oblique-ly about S.S.E. three miles from Cape Henlopen (see Chart D.) with a narrow passage between it and the land, at the north end of the shoal near the Cape.

Through the passage seventeen feet can be carried. - Two miles is a safe distance from the Cape - The bottom is quite irregular between Delaware and Chesa-peake Bays. A line twelve miles from shore passes in from seven to fifteen fathoms water. In general the depths are less towards the bays, but in latitude 38°-06' just north of Green Run Inlet there are but seven fathoms. This line passes about six miles outside of Fenwick's Shoal; five and a quarter outside of Isle of Wight Shoal; ten miles outside of Little Gull Bank; eight and a half outside of Great Gull Bank; five and a

half outside of Winter Quarter Shoal; seven and a quarter outside of Black Fish Bank; seven and three quarters outside of the outer part of Chincoteague Shoal; five and a quarter outside of Smith's Island Shoal; and seven and a quarter outside of Shark Shoal. — A line eight and a half miles broad off shore passes in from six and a half to thirteen and a half fathoms, and generally in about nine to eleven fathoms, approaching within about two miles of Isle of Wight Shoal, Winter Quarter Shoal and Black Fish Bank. — The shoalest parts of the line are off the approaches to the bays and east of Green Run Inlet.

— Shoals — The most southerly point of Hen and Chickens Shoal, latitude 38° 45' N. is distant one mile and one eighth from land, and has thirteen feet water upon it. The least water is five feet

Fenwick's Shoal, latitude 38° 27' N. with fifteen feet on it, is a small shoal five and a half miles from the shore and surrounded by 4, 5¾, 7½, 10¼ and 9 fathoms. — Midway between it and the next shoal to be named, there is a spot with 3½ fathoms on it.

Isle of Wight Shoal, latitude 38° 23' N. with 18 feet on it, is a small shoal six miles and a half from shore and surrounded by 4, 6, 4¾, and 10¾ fathoms. — In latitude 38° 17' 30. N. 6 miles S by E ¼ E. from Isle of Wight Shoal is a Shoal spot with but four and three quarter fathoms on it, with 7, 10, & 12 fathoms around

Little Gull Bank about a mile and a half long in a N.E. and S.W. diection has the least water near the

southerly end in latitude 38° 17.' north.

Great Gull Bank has nothing less than three and three quarter fathoms upon it — It is in Latitude - 38.° 15.' N.

In latitude 38° 04' N. lies Lee's Shoal about a mile long with three and a half fathoms on it, lying nine miles and a half E by N. from Green Run Inlet, and eight miles N.E. ¾ N. from Winter Quarter Shoal; and another with four fathoms on it lies half way between this and Green Run Inlet-

Winter Quarter Shoal, with twelve feet on the N. end, latitude 37.° 58.' N. is six miles and a half from shore, curved, and about a mile in length.

This is a highly dangerous shoal, as the soundings change suddenly, and it lies directly in the track of vessels. The sea breaks upon it in heavy weather.

Black Fish Banks with three and a quarter and three and three quarter fathoms extend N.E. and S.W. about four miles and a half in the general direction of the shore, and about five to six miles from it.

- Two miles S.E. of Black Fish Banks is a Spot of four fathoms.

Chincoteague Shoals on the N.E. side of Chincoteague Inlet extend from the shore to the distance of two miles and three quarters, and have nine and twelve feet at that distance.

A Shoal with twelve feet water on it lies S.S.E. distant three miles and three quarters from Assateague Light House – Another with nine feet water on it lies S. by E. distant four miles and a quarter from the Light House.

Another with nine feet water on it lies S. ¼ E distant three miles and three quarters from the Light House.

Ship Shoals adjoin and extend directly out from Fishing Point, and as it is almost always breaking there, they can easily be seen.

In latitude 37.° 32' N., and six miles S.E. by E from Wachapreague inlet is Almy's Shoal four miles & a half long running E.N.E. and W.S.W. with three and a half fathoms on the West end, four miles from shore, and four and a half fathoms on the East end.

Smith's Island Shoal with three and a quarter fathoms on it, is in latitude 37.° 06'. N. distant five miles and a quarter from Smith's Island Shore.

Shark Shoal, with seventeen feet on it, is in Latitude 37.° 05'. N., about four miles and a quarter from Smiths Island shore.

– Bottoms –

The character of the bottom presents nothing of special interest. It is of sand, generally of different colors, with broken shells. Mud and clay are rare –

Inlets.

Rehoboth bay and Indian River inlets are closed under ordinary circumstances.—

Green Run inlet between Fenwick's and Assateague island, and in latitude 38°. 03'. 30". N. is accessible only to boats. It leads into Assateague bay.—

Chincoteaque inlet (see Chart E.) between Assateague and Assawaman islands, is in latitude 37°. 53'. N. with eight feet on the bar. This entrance leads into Chincoteague bay and is difficult. (see Chart)

Sargathy inlet between Assawaman and Metomkin islands has no entrance except for small boats.

Metomkin inlet (see Chart F.) between Metomkin and Cedar islands in latitude 37°. 41'. N. has eight feet at its entrance. This leads into Metomkin bay.

Wachapreague inlet (see Chart F.) between Cedar and Paramore's island is in latitude 37°. 35'. N. and has eight feet on the bar with deep water inside.

Little Mochipongo inlet between Paramore's island and Hog island is in latitude 37°. 28'. N. and has eight feet on the bar. It leads into Broad Water bay.

Great Mochipongo inlet (see Chart F.) between Hog island and Prout's island is in latitude 37°. 22'. N. has thirteen feet on the bar and deep water inside.

Sand Shoal inlet (see Chart) leading in past the South end of Sand Shoal island and between it and Bone

island has eleven feet water on the bar
Ship Shoal inlet (see Chart) between Ship Shoal island and Myrtle island, about five miles to the southward of the last named, has only eight feet on the bar –

Sounds and Bays.

Beginning at Delaware Bay, the following Sounds and Bays occur, passing towards the Chesapeake.
– Rehoboth Bay and Indian River inlet, also in fact a Bay, the outlets of which are generally closed. —
Little Assawaman Bay, Big Assawaman Bay, and St. Martin's Bay lie behind the northen part of Fenwick's island.
Sinepuxent Bay, a broad sheet of water not navigable except by boats, and ten miles long.
Chincoteague Bay, connecting with Sinepuxent bay behind Assateague island,
Metomkin Bay behind Metomkin island,
Broad Water behind Paramore's and Hog island,
and Magothy Bay behind Monckhorn island.

There is a continuous boat passage from the upper end of Fenwick's island to Cape Charles through the connections between these several bays.

The names of the sand strips or islands which lie along the coast seperated from the Main

by the bays past refered to, are the following.

Fenwick's Island a narrow strip about thirty miles in total length, but liable to be cut through at several points.

Assateague Island and behind it Chincoteague Isl'd forming the eastern shores of Chincoteague bay.

Wallop's Island on the south side of Chincoteague inlet.

Assawaman and Metomkin Islands forming the eastern shore of Metomkin bay.

Cedar Island between Metomkin and Wachapreague inlets.

Paramore's and Hog Island forming the eastern shore of Broad Water bay.

Prout's Island and Sand Shoal Island between Mochipongo inlet and Sand Shoal inlet

Bone Island, Wreck, Ship Shoal, Myrtle, and Smith's Island, and behind the last

Monckhorn Island forming the eastern shore of Magothy bay.

Fisherman's Island is quite small and lies in the immediate vicinity of Cape Charles.

Light Houses

Assateague Light House. About two miles from south west point of Assateague island (Virginia).

Fixed. Visible fourteen nautical miles. White.

Height eighty feet.

Hog Island Light House on west point of Hog island, Great Mochipongo inlet (Virginia).

Fixed, visible thirteen nautical miles,

Height Sixty feet.

Cape Charles Light House. Near New Inlet on the North East end of Smith's island (Cape Charles)

Revolving in 1 m. 30 sec.

Visible fourteen nautical miles. White.

Height Sixty nine feet.

Cape Henry Light House. on south side of main entrance to Chesapeake bay.

Fixed, visible seventeen and a half nautical miles white, Height One hundred and twenty nine feet.

It is uncertain which of these Lights are now in operation. Their Latitudes and Longitudes are given below—

			(west of Greenwich)		h. m. s.
Assateague L. H—	Lat.	37° 54′ 36″	Long.	75° 21′ 04″	Time 5. 01. 24
Hog Island L. H—	"	37° 23′ 17″	"	75° 41′ 35″	" 5. 02. 46. 3.
Smith's Island L. H—	"	37° 07′ 48″	"	75° 52′ 12″	" 5. 03. 28. 8.
Cape Henry L. H—	"	36° 55′ 29″	"	76° 00′ 12″	" 5. 04. 00. 8.

Variation of the Magnetic Needle

At Cape Henlopen – (1861)	———	3.° 16′	West
" Assateague L.H.	" ———	2.° 31′	"
" Cape Charles	" ———	1.° 47′	"
" Cape Henry	" ———	1.° 40′	"

Tides.

Chincoteague Inlet.

Rise of higest tide observed, above mean low water		3.6 feet
Fall of lowest " " below " " "		0.7. "
Mean rise and fall of tides	———	2.5. "
" " " Spring tides	———	4.3. "
" " " Neap tides	———	0.5 "

Sand Shoal Inlet

		H. M.
Corrected Establishment	———	VII. XXXIII.
Mean rise and fall of tides	———	4.6 feet

Ship Shoal Inlet

	H. M.
Corrected Establishment	VII. XXV.
Mean rise and fall of tides	3.7 feet

Currents.

In the vicinity of Assateague Island the general direction of the current is to the Southward and Westward.

Entrance to Chesapeake Bay.

The entrance to Chesapeake bay (see Chart G) is at right angles to the general direction of the bay, and in a general way, to the Coast line.

The land at the Northern entrance is broken into islands, while that to the South is clear.

Cape Charles is inside of the Northern entrance and Cape Henry bounds the Southern.

It is eleven miles and a half from Cape Charles to Cape Henry, nine and three quarters from Fisherman's Island; nine and a third from the Isaacs; and eleven and a half from the S.W. point of Smith's Island to Cape Henry — The Northern half of the entrance is broken ground, the three fathom curve being broken by deep passages, one of which forms the North Channel through which twenty one feet may be carried with a very narrow channel, or fifteen feet by more conveniently crossing Nautilus Shoal.

The four fathom curve is continuous to within two and three quarter miles of Cape Henlopen, the main ship channel passing between the part of this curve connected with the Middle ground on the North, and Cape Henlopen on the South.

Through this channel five fathoms can be carried into Hampton Roads.

From Cape Henry to the eighteen feet curve of the Middle Ground or Outer Middle, is five and a half miles.

The False Approach is north of the Middle Ground and is blocked by three fathoms and three quarters between the Middle Ground and the Shoal North of it; the slaw between the eighteen feet curves of these Shoals is but a third of a mile in width.

The Bottoms in the vicinity of the entrance are not characteristic but in general consist of sand of various colors and degrees of fineness, with occasional blue Mud.

Sailing Directions.

To enter Chesapeake Bay by Cape Henry Channel.

Bring Cape Henry Light House to bear from W. by S. to W. N. W. and stand for it – Between these bearings there is not less than five and a half fathoms.

The channel between Cape Henry and the Middle Ground is about four and a half miles wide.

Large class vessels working in or out must beware of the three and a half fathom Shoal lying three and a half miles Northward and Eastward of Cape Henry Light House – Keep the lead going after striking twelve fathoms – The beach from the Light House Southerly must not be approached nearer than a mile.

When inshore to the Southward and Eastward standing to the Northward till Willoughby's Point woods ranges with, or opens to the Northward of Cape Henry, deepens the water into Cape Henry Channel, and the bottom changes from hard to sticky and soft.

Approaching from the Northward and Eastward inshore, after passing Smith's Island Light House keep it well open with the woods to the Southward, keeping in not less than three and a quarter fathoms to avoid Nautilus Shoal.

Vessels making the land to the Southward of Cape Henry during a strong North Wester should not approach it nearer than eight miles, as the ebb tide then sets strong to the Southward along shore. Stretch well off on the Port tacks, and bring Cape Henry to bear West.

The woods of Smith's Island appear broken and uneven from a distance seaward when bearing from W½N. to W½S. - with other bearings they appear even and solid

If bound into Hampton Roads, bring Cape Henry Light House to bear South distant one and a half miles, and steer W.N.W½W keeping Willoughby's Light Boat a little on the Port bow. - If the tide is running flood steer a half point more to the Southward, if ebb half a point more to the Northward, as Old Point Light House opens to the Northward of the Light Boat change course

gradually for the Light House leaving the Light Boat two or three ships lengths to the Southward — When the E. end of Rip-Raps is on with Sewall's Point steer midway between the Rip Raps and Old Point Light House for Hampton Roads, and anchor in from Seven to ten fathoms, Old Point Light House bearing from N.E. ½ N. to N.E. ½ E distant one two or three miles. Moor with open hawse to the Northward and Eastward.

Keping Old Point Light House a little open to the Southward of the Light Boat, clears the Tail of the Horse Shoe, and when within three or four miles of the Light Boat Keping it in range with the Light House, carries clear of the Southern edge of the Horse Shoe.

When beating in the neighbourhood of the Light Boat, beware of the Thimble on the opposite side of the Channel, bearing from it North by East and North North East, from Old Point Light House East by North, and Old Point Comfort Sand Hill East.

— If bound to Baltimore bring Cape Henry Light House to bear South South East half East distant two miles, or just shut in the beach to the Southward of it.

Steer North North West half West till Back River Light House bears South West by West, then a North quarter East course will clear Wolf Trap Light Boat — The soundings decrease gradually in approaching the Horse Shoe, but change suddenly on the West side of the Middle Ground

If bound into York River the lead and compass must be the principal guides. – Keep the Port hand going in, as on that side the soundings decrease gradually, but it is steep to on the side of York Spit.

– To enter by the North Channel. – It is better for Steamers than sailing vessels, as the ebb tide runs strong and there are cross tides. Bring Smith's Island Light House to bear North, distant three and a half miles and the West end of Smith's Island North West half West, distant three miles being in three fathoms water. Steer West one quarter South, keeping the breakers on the Starboard hand from three quarters to one mile distant. This course leads midway between the Isaacs Breakers and Nautilus Shoal crossing fifteen feet. When Guy's Point (the Northernmost point of trees in sight) just opens to the Westward of the North end of Fisherman's Island haul to the Northward and steer with the Point a little on the Starboard bow (passing Fisherman's Island a quarter of a mile distant on Starboard hand) 'til abreast of Butler's Bluff, when haul to the Northward and Westward. Keep the lead going while passing through.

There is a Shoal of Eleven feet on the range of East end of Fisherman's Island on with West end of the Isaacs. Entering North Channel from the Southward and Westward to clear the South end of the Inner Middle, keep Richardson's House (the nearest

to Cape Charles with a poplar near it) over and to the Eastward of the North end of Fisherman's Island.

To avoid the North end of the Inner Middle keep the South West end of Smith's Island shut in with the point of woods at Cape Charles.

Light Houses

Cape Charles Light House. Near New Inlet, on the North East end of Smith's Island (Cape Charles)

Revolving in 1m. 30s. Visible fourteen nautical miles. White. Height Sixty nine feet.

Cape Henry Light House. On the South side of main entrance to Chesapeake bay (Virginia.)

It is a Fixed light; White; Visible seventeen and a half nautical miles. Height one hundred and twenty nine feet.

Willoughby Spit Light vessel. North side of Willoughby Spit and on South side of Channel into Hampton Roads, Two Fixed lights, one on each mast. Visible eleven nautical miles. Red. Height thirty five and forty eight feet - Fog Bell -

Old Point Comfort Light House. North side of entrance to Hampton Roads. Virginia.

- Fixed. Visible eleven nautical miles -

Height forty eight feet - Fog Bell -

Old Point Comfort Beacon Light. On the South west point of Old Point Comfort.
- Fixed. Visible five nautical miles.
- Black. Height twenty one feet.
— This is a small beacon light to guide vessels to anchorage inside of Hampton Bar —

Craney Island Light Vessel On west side of Channel near the mouth of Elizabeth River, off Craney Island.
- Fixed - Visible ten nautical miles,
- Lead color. Height thirty three feet - Fog bell -

Hospital Wharf Harbor of Norfolk and Portsmouth - Fixed — White —

Latitudes & Longitudes.

	Latitude	Long. W. of Greenwich	Time.
Cape Charles Light House	37°.07'.48"	75°.52'.12"	h. m. s. 5.3.28.
Cape Henry " "	36°.55'.29"	76°.00'.11"	5.4.00
Old Pt Comfort " "	37°.00'.02"	76°.18'.06"	5.5.12
New Pt Comfort " "	37.17'.59"	76°.16'.22"	5.5.5.

— It is not known whether these lights are now in operation or not —

The Variation of the Magnectic Needle

At Cape Charles - (1861) ——— 1°.47'. West
" Cape Henry - (1861) 1°.40'. "

Tidal Currents

Outside of the bay the set of the ebb is seaward, and of the flood towards the nearest shore; Inside the set may easily be anticipated by the figure of the adjacent shores and of the bay generally.

The Drift is generally less than a mile an hour - The particulars at the different Current stations two of which are outside of the bay, one in the main channel at the entrance, and seven inside, are given in the annexed table.

No	Station	1st Quarter Set	1st Quarter Drift	Maximum Set	Maximum Drift	3d Quarter Set	3d Quarter Drift	Flood or Ebb
1.	Near Shark Shoal	S. 72° W.	0.1	West	0.2	N. 76° W.	0.1	Flood
		N. 45° E.	0.2	N. 63° E.	0.2	N. 60° E.	0.2	Ebb
2.	East of Middle Ground	N. 50° W.	0.3	N. 30° W.	0.4	N. 45° W.	0.3	Flood
		N. 58° E.	0.5	N. 72° E.	0.7	N. 81° E.	0.4	Ebb
3.	1¼ mile N. of Cape Henry St. H.	N. 40° W	0.4	N. 45° W	0.8	N. 50° W	0.7	Flood
		S. 73° E.	0.3	S. 78° E.	0.8	N. 80° E.	0.3	Ebb
4.	Lynn Haven Roads	West	0.5	N. 72° W.	1.1	N. 54° W	0.6	Flood
		N. 72° E.	0.4	East	1.2	S. 27° E.	0.8	Ebb
5.	Betw. Tail of Horse Shoe & Horse S.	N. 72° W.	0.8	N. 45° W.	1.2	N. 27° W	0.9	Flood
		S. 78° E.	0.8	S. 59° E.	1.2	South	0.6	Ebb
6.	N'd and E'd of Light Boat	N. 54° W.	0.6	N. 63° W.	0.9	N. 45° W.	0.6	Flood
		N. 72 E.	0.6	S. 81° E	1.7	East.	1.0	Ebb
7.	Betw. Old Pt and Rip-Raps	S. 81° W.	1.2	S. 72° W	1.9	S. 72 W.	1.2	Flood
		N. 81° E.	1.1	N. 45° E.	1.7	N. 47° E	0.9	Ebb
8.	East of Back R. St. House	N. 36° W	0.7	N. 18° W	1.5	N. 9° E.	1.2	Flood
		S. 40° E.	0.8	S. 18° E	1.1	S. 4° E	0.6	Ebb
9.	Tail of York Spit	West	0.4	N. 23° W	0.7	N. 5° W	0.5	Flood
		S. 45° E	0.6	South	0.8	S. 13° W	0.3	Ebb
10.	Channel East of York Spit	N. 45° W.	0.3	N. 12° E	0.9	N. 27° E	0.4	Flood
		S. 9° E	0.8	South	0.9	S. 30° W.	0.5	Ebb

Note The observations were made as far as practicable when the influence of the wind was small. The bearings are true

The drifts are in nautical miles shown on the chart by figures near the ends of the current arrows.

Chesapeake Bay.

(Charts H to M, both inclusive, & Chart G.)

Lies between the parallels of 36° 54'. N. latitude, and 39.° 54' N. and between Longitude 75° 52' W. from Greenwich and 76° 33'. W. – The longest line of the bay is nearly North and South.

For some sixty two nautical miles it is in the State of Virginia, and for one hundred more in Maryland, the parts of the State upon its shores being designated as the eastern and western shores – The average width of the main bay from shore to shore is ten miles and a half; the greatest width in about latitude 37° 41.' N., at the entrance to Pocomoke Sound, is twenty two miles, and its least width in about latitude 39.° N. from Sandy Point to Kent Island, is about four miles and a half.

The main bay is an arm of the Sea remarkably uniform in depth from South to North, the tributaries not throwing in so much water as to disturb the general regimen. The average depth across the bay at the entrance is four and a half fathoms, and just above the Patapsco the same. At this locality the depth changes decidedly. The average depth from the mouth to

North of the Patapsco off Pool's Island is nearly five fathoms the greatest depth in the line of deepest water from Cape Henry to Bodkin Pt is twenty three fathoms close over to the bank on the eastern shore, and the least depth is five fathoms and a half, eastward of the end of York Spit. in about mid Channel.

The line of best Water is traced on Chart D., and the Chart dispenses with the necessity for sailing directions in these notes –

Above Pool's Island the deepest Channel is that into Elk River through which nine feet can be carried to Frenchtown; The next into North East River through which seven feet can be carried into Charlestown below Elkton, and the next into the Susquehanna through which six feet can be carried to Perry'sville opposite to Havre de Grace.

The dangers are generally attached to the shores of the bay. Those in the lower part have already been enumerated.

Dangers.

In the lower part of the Bay, not connected with the shores by shoal water, are the Inner Middle, and Outer Middle with eleven feet;
The Tail of the Horse Shoe with seventeen feet least water – The Ten Feet and Twelve Feet Shoals –
New Point Shoal with sixteen feet water lies four

miles S.E. of New Point Comfort Lt. House.

Wolf Trap Shoals near the western shore in latitude 37°23' N. with eleven, thirteen, and fourteen feet, and

Smith's Pt. Shoal with six feet.

Opposite the mouth of the Potomac and towards the islands separating Tangier Sound from the bay are extended Shoals with sixteen feet least water.

The bottom is much broken between the Magothy's River and Bodkin Pt. at the entrance of the Patapsco the Shoals having as little as eight feet on them and extending well out into the bay.

A Middle Ground north of the Patapsco and South of Pool's Island occupies a large part of the bay and has as little as six, seven, and eight feet on different parts of it.

Above this the depth of the bay diminished rapidly. The Shoals connected with the shores are the following;

Nautilus Shoal two miles S by E. ½ E from the East end of The Isaacs. there is ten feet water on it. The point of woods at Cape Charles on with Guy's Point is range for it.

Willoughby's Bank is a narrow shoal off Willoughby's Point and the Rip-Raps, three and

a quarter miles long extending E.N.E. and W.S.W. with from six to thirteen feet of water upon it.

There is a channel of eighteen feet between it and the South shore, extending to within a mile of the Rip-Raps, but not running through the bank.

The Horse Shoe, a triangular shaped Shoal makes out from the shore between Back River and Old Point. The eastern extremity of it called the Tail of the Horse Shoe, nine miles and a half E¼N. from Old Pt Sight H. has seventeen feet water upon it. On the shoal the depth is from nine to eighteen feet—

Drum Island Flats are a continuation northward, of the bank along the shore, of which the Horse Shoe is the southern end, and they connect to the northward with the

Poquosin Flats, off the mouth of Poquosin River, which last have but one foot of water two miles from shore. Their average breadth from the shore is about three miles.

York Spit extends nearly eight miles S.E. from the north point of the mouth of York River, and has but nine feet water on the end, with only five feet at one place about midway in the Spit.

From New Pt Comfort to Cherry Pt at the mouth of the Piankatank River a bank runs along the

shore extending S.E. off Near Point Comfort nearly two miles, with twelve feet upon it, narrowing to only half a mile just below the Wolf Trap Shoals with seven feet; widening out at the

Wolf Trap Spit to two miles and a half with twelve feet; narrowing to one mile below Cherry Point and running out two miles N.N.E. of that point. This bank is separated by a narrow channel into the Piankatank from a Spit which makes out one mile and a half to the eastward, from Sting Ray Point.

Rappahannock Spit extends S.E by E. four miles from Windmill Pt. It is two miles wide at the shore, and runs to a point.

To the Northward of Fleet's bay, the bank extends two miles from the shore with fourteen feet water, and seven miles to the Northward of Windmill Pt the bank extends off from the shore three miles to the eastward with fourteen feet water.

This bank continues nearly parallel with the western shore of the bay up to Fleet's Pt. where the depth is but seven feet, one mile from the Island which makes out from the Point, and two miles from the main shore to the westward. The bank to the Northward of the point extends out nearly two miles with fifteen feet. It thens runs rapidly

in narrowing to half a mile in width and extends two miles N. E. from Smith's Point with twelve feet on the end.

It then follows the shore within a mile into the Potomac river.

On the eastern shore of Virginia, the first Shoals after entering the bay connected with the shore are

The Old Plantation Flats extending out two miles with thirteen feet water, ten miles above Cape Charles. Six miles from Cape Charles is the mouth of a four fathom channel which leads for three miles into the middle of these flats. Six miles above the flats the bank narrows to half a mile, but gradually widens out to three miles from the shore at the entrance of Pocomoke Sound

A Shoal four miles long extends S.W. from the Light House at the point separating the entrances of Pocomoke and Tangier Sounds. The depth near its middle is eleven feet.

A dangerous Shoal extends N. S. W. nearly five miles from the lower end of Tangier island, with from eleven to fifteen feet near the outer edge. — The bank, of which this Shoal forms the lower end, runs to the Northward with a width of from two to three miles from the islands that separate Tangier Sound from the bay.

Off South Marsh island the bank extends four miles being separated by a channel of three and a half fathoms, from a large detached Shoal abreast of the mouth

of the Potomac river. Nearly the whole western edge of this bank for twenty miles is very ragged and broken, and dangerous of approach, particularly abreast and just northward of the Potomac.

From the Potomac northward, on the western shore for forty five miles, the bank extends on an aver-age half a mile from shore and is steep to, until it reaches Holland's Point where it runs out N.N.E. a mile and three quarters with nine feet water.

Off Horse Shoe Pt: a shoal extends S.E by E. two miles with thirteen feet water, and two miles from the same point N.E. there is but six feet. —

Off Thomas's Pt; a shoal extends two miles S.E. by E. with eight feet water. —

Off Tully's Pt. there is but six feet one mile in a S.E by E. direction. —

A Shoal extends out E.S.E. one mile and three quar-ters from Annapolis Light House with fifteen feet water, joining the bank which runs along the shore with an average width of one mile, and connecting with the broken ground below Bodkin Pt. and with the flats at and above the mouth of the Patapsco.

Off the middle of Hooper's Island on the eastern shore of the bay, the bank makes to the Westward over three miles, but narrows to half a mile as it rounds the South point of the islands into Honga

River.

Off Barren Island the bank is one mile wide with eight and nine feet water on the edge and dropping suddenly into from ten to twenty fathoms. The bank then runs parallel to the shore with an average width of one mile until off the point at Hudson River where it widens to the westward to two miles with fourteen fathoms steep to, and running to the northward from the point three miles, forming the Spit at the west side of the Hudson River.

Off Sharp's Island a Shoal makes to the southward two miles, forming the lower end of a bank that runs to the northward, passing one mile and a half to the westward of the islands connecting it with the islands to the northward, and joining the Shoal which sets off one mile and a half to the westward of Poplar island, with nine feet water.

Off the South end of Kent Island a Shoal makes out one mile with five and seven feet water, and passes on in a bank of that width along the whole length of the island forming a Spit N.E. ½ N. two miles long at the North end of the island. The Channel is steep to this bank with from eight to eighteen fathoms water.

Off Swan Point opposite Bodkin Pt. a Shoal makes off to the westward two miles, with twelve feet, and the channel steep to with from five and a half to eleven fathoms.

Islands.

Fisherman's Island and the Isaacs lie south west from Smith's Island on the north side of the entrance of the Chesapeake. They are low sand islands.

The Islands in the Chesapeake Bay are generally on the eastern shore, but those at the entrances to York River, to the Rankatank, and the Potomac, with Hart's, Miller's, Spry's, Pool's and Spesutie Islands are exceptions.

The principal islands on the eastern shore of the Bay are Watt's, Tangier and Fox Islands, belonging to Virginia, and Smith's, Holland's, Long Island, Bloodworth's, Hooper's Barren Island, James Island, Sharp's, Poplar and Kent Island, belonging to the State of Maryland.

- Kent Island is connected with the Main by a cause -way.-

Watt's Island, Little Fox Island and Great Fox Island belong to a chain of islands separating Pocomoke Sound from Tangier Sound.

- Tangier Island separates the entrance to Tangier Sound from Chesapeake Bay, it is about six miles in length North and South - A cluster of islands opposite the mouth of the Potomac is connected with Tangier Island by shoals.-

Then come South Marsh and Bloodworth's Island which complete the chain of islands which separate

Tangier Sound from the Chesapeake.

— Hooper's Island lies to the N.W. of Bloodworth's Island and separates Honga River from the Bay.

— Barren Island lies to the N.W. of Hooper's Island and separates Tar Bay from the Chesapeake.

— Sharp's Island lies off the mouth of the Choptank River - latitude 37°. 37'. - long 76°. 22'.

— Poplar Island lies north of Sharp's Island in latitude 37°. 46'. Long. 76°. 22'.

— Kent Island is bounded by Chester River on the North, Eastern Bay on the South and the Chesapeake on the West. It is the largest island in the Chesapeake.

— East Neck Island is situated near the mouth of Chester River, at the terminus of a long peninsula stretching out from the main land from the North.

— Pool's Island is situated near the middle of the Bay on the western edge of the channel off the mouth of Gunpowder River -

— On the west shore above the mouth of the Severn River are found Gibson's Island at the mouth of the Magothy River, - Hart's Island and Miller's Island off the mouth of Back River, - Spry's Island at the mouth of Gunpowder River, and Spesutie Island opposite the mouth of Elk River.

Harbors.

Vessels may anchor any where in the Chesapeake, and in case of heavy weather there are numerous anchorages on both sides under the lea of the points and shoals, or in the mouths of the rivers and inlets.

On the West Shore, the entrances to York River, the Rappahannock, the Potomac and Patuxent afford places of refuge for the largest vessels, and on the East shore, under the lea of Cape Charles, Pocomake and Tangier Sounds, the mouth of Honga River, the mouth of the Choptank and Hudson Rivers, and Eastern Bay, afford harbors in which secure anchorages may be found, while smaller vessels may take advantage of numerous other safe anchorages on both shores.

Pocomoke and Tangier Sounds are large bodies of water on the Eastern Shore separated from the Bay by a chain of islands.

Deep water may be carried quite within the mouths of these Sounds with plenty of Sea room.

Shoals

Western Shore commencing at Old Point Comfort

Horse Shoe. Extending out to the Eastward and Northward of Old Point Comfort, has the shape of an equilateral triangle. The outer angle projecting

towards the entrance of the Chesapeake to the distance of seven and a quarter miles. The base of the Shoal being the shore line between Old Point and the Light House near Back River.

The Shoal has seventeen feet of water near the Eastern point, with three and a half and four fathoms around it. The greatest depth of water on it is from nine to fifteen feet. At the Light House it is one and a half miles wide and thence runs into the

- Poquosin Flats which extends along the shore to the mouth of York River. They have from two to six feet of water on them to the distance of one and a half to two miles, with twelve and fourteen feet on the outer edge of the Shoal, and four fathoms outside at the distance of three and a half miles from shore. The entrance to Back River has eight feet of water and the entrance to the Flats ten feet.

- York Spit lies between the entrance channels of York River and Mob Jack Bay.

This Spit extends down into the Bay in a S.E. direction seven miles from land. It is nearly a mile wide at the S.E. extremity and three miles wide at the point of land at the entrance of York River.

The water near the S.E. extremity of the Spit has a depth of nine feet. Six and a quarter fathoms are found in the entrance to York River on the West,

and four and a quarter fathoms in the entrance to Mob Jack Bay on the East. The general depth on the Spit is variable, from six to fifteen feet, as shown by the Chart.

A detached Shoal lies off the entrance to Mob Jack Bay, having sixteen feet water four miles S. E. of New Point Comfort.

— New Point Comfort An irregular Shoal makes out from New Point Comfort in a S. E. and E. direction, to the distance of one and three quarter miles, forming the Northern Spit of the entrance to Mob Jack Bay. It has twelve feet of water upon it, with four and three quarter and four fathoms around it. The extremity of this Spit lies directly N. of of the extremity of York Spit. The distance between the extremities of the two Spits being five miles.

— From New Point Comfort to the Mouth of the Rappahannock. The direction of the Shoal from New Point Comfort to the mouth of the Rappahannock is N. by E. for six miles - then N. by W. eleven miles - A Shoal extends along the entire line of this Shore - widening out to two miles at the turn of the shore line to the W. of it. At this point there are two detached Shoals having from eleven to fourteen feet of water two and a half miles from the land.

— Wolf trap. The Shoal along the Shore between New Point Comfort and the mouth of the Rappahannock has but Six feet of water on it at three fourths of a mile from land, and from eight to Seventeen feet, as one be

seen from the Chart, along the outer edge at a distance of one and a half and two miles from land. Not less than three and a half fathoms can be carried all along from New Point Comfort to the mouth of the Rappahannock, at a distance of three miles from land.

— Entrance to the Piankatank. Thirteen feet can be carried into the Piankatank river just below the mouth of the Rappahannock, and four and three quarter fathom into the mouth of the Rappahannock.

— Windmill Point. A shoal similar to the York Spit shoal extends boldly out into the Bay from Windmill Point in a S.E. direction to the distance of a little more than four miles. It comes to a sharp angle in fifteen feet of water with five and seven fathoms around it on the N. and South. It is about two miles wide at Windmill Point, the North and South lines of the shore being regular and meeting at its extremity.

— From Windmill Pt. to Smith's Point. The distance from Windmill Pt to Smith's Pt. in a direct line is a little over sixteen miles. The shore line for twelve miles above Windmill Point is much cut up and broken by inlets and creeks, and falls back from the line joining Windmill and Smith's Points from two to three miles.

An irregular shoal extends the whole distance between these Points. The point of greatest projection of the shoal is seven miles from Windmill Point. A line

drawn from Windmill Point touching the edge of this part of the Shoal will pass two miles outside of Smith's Point, cutting the extremity of the Shoal which makes out from Smith's Point. Outside of this line there are from five to six fathoms all along. at several places between these points from three and a half to four fathoms can be carried within a half mile of the Shore by the inlets, but the depth along the edge of the Shoal is in many places only seven and eight feet.

__ Smith's Point. South of Smith's Point for three or four miles the shore line is unbroken, and the Shoal but a half mile wide. A projection occurs in the Shoal four miles south of the point where there is only fifteen feet at a mile and a half from shore.

Smith's Point is the South Point of the entrance to the Potomac. Here the shore line takes a sudden turn to the North West, and a Shoal makes out all around the Point to the distance of two miles, having eleven and twelve feet of water on the outer edge of the Shoal, but deep water everywhere beyond three miles. A small detached Shoal lies two and a half miles from the Light House on the Point South of E.

Vessels should keep three or four miles out from Smith's Point if the Light is not visible, until two or three miles past it before changing course to enter the Potomac.

— Point Lookout. Point Lookout lies North by West from Smith's Point, distant ten miles, and forms the north part of the entrance to the Potomac.

A sharp pointed shoal makes out from Pt. Lookout directly South, to the distance of three fourths of a mile having seventeen feet at its extremity and Six and seven fathoms around it.

— From Point Lookout to Cedar Point. The shore line from Point Lookout to Cedar Point, a distance of fifteen and three quarter miles, has a general direction of North by West. along which the shoals are narrow and regular, following the direction of the shore line and sloping rapid ly from it. From three and a half to five fathoms can be found everywhere beyond three fourths of a mile from the shore.

— Entrance to the Patuxent. The Patuxent river enters the bay above Cedar Point, the shoals being nar-row and confined to the shores on both sides.

From Cedar Point to Cove Point across the mouth of the Patuxent the distance is five and a quarter miles.

— From Cove Point to Holland's Point.

From Cove Point the shore trends N.W. for nine miles and then North. The distance to Holland's Point is twenty one and three quarter miles. The shore line is regular - the depth all along beyond the distance of three fourths of a mile being from four and a half to

five and six fathoms

__Holland's Point. At Holland's Point the shoal along shore widens to one mile and the depth of water on it from Hollands Point to Thomas' Point is less.

A Buoy marks the extreme projection of the shoal about halfway between these points. Another Buoy two and three quarter miles to the Eastward marks the Eastern edge of the channel.

The Shoal at the mouths of West and South rivers extends out from one to two miles, having but five and six feet of water at the outer edge.

__Thomas' Point. A shoal makes out from Thomas' Point to the S. E., bending to the South, to the distance of One and a quarter miles with eight feet of water at its extremity. It is marked by a Buoy.

__Mouth of the Severn. From Thomas' Point to Annapolis, after passing the Buoy off Thomas' Point, three and a quarter fathoms may be found beyond one mile from shore to within one mile of the Light House

__From the mouth of the Severn to Bodkin Point the western limits of the channel are marked by Buoys, one off the Light House at the mouth of the Severn, distant two miles. Another off Sandy Point and a third halfway between Sandy Point and Bodkin Point. At Bodkin Point the south shore of

the entrance to the Patapsco river commences.

__Mouth of the Patapsco. The shoals about the mouth of the Patapsco extend out to the distance of three or four miles, and detached from the main shoals are found numerous small knolls or lumps.

The water upon these shoals has a variable depth which can only be safely ascertained by reference to the enlarged chart of the vicinity.

__From the Mouth of the Patapsco to Havre de Grace. the shoals extend in some places across the Bay.

The whole of the Western shore is bordered by a wide shoal and the shore line much broken. The deposits of the rivers entering the upper part of the Bay have filled up its head, leaving only a narrow channel along the east shore, along which may be carried three and a quarter fathoms. The channel extends to Grove Point on the East shore, about ten miles from Havre de Grace

Eastern Shore

(Commencing at Cape Charles)

The shoals in the vicinity of Cape Charles extend around the Cape in the form of concentric circles with a radius of five and six miles for the outer shoals.

The outer circle comprises the Nautilus Shoal on the South and South East, and the Middle Ground

on the South West, and West.

The Nautilus Shoal is connected with the land.

Ten feet is the least depth on it. Its outer edge is five miles from Cape Charles, and three miles and a half from the S.W. extremity of Smiths Island. The Shoal is partially detached and is separated from the Middle Ground by an intermediate Shoal with twelve and fourteen feet of water upon it, but with passages having three fathoms and a quarter between it and Nautilus Shoal, on the East and the Middle Ground on the West.

The Middle Ground, commences on a line joining Cape Charles and Cape Henry, at a point half way between the Capes or five and a half miles from either. It is a narrow Shoal extending to the West and N. West, nearly in the arc of a Circle around Cape Charles, the N. Western extremity lying North of West from the Cape and distant six miles and a half.

The depth of water on the South part of the Shoal is thirteen feet, with four and a quarter, six and a quarter and nine and a quarter fathoms around it.

The depth near the N. West extremity is sixteen feet Deep water is found outside of the Shoal on the West.

Between the Middle Ground and Horse Shoe Shoal there is a small irregular detached Shoal with seventeen feet of water upon it, two miles from the extremity of the Horse Shoe to the Eastward with three

and a half and four and a half fathoms around it.

— Inner Middle. Two detached shoals occur between Cape Charles and the Middle Ground directly west of the Cape. The least depth of water upon that nearest the Cape is three feet, and upon the second fifteen feet. A deep channel however runs between these shoals and the Cape, by which three and a quarter fathoms may be carried out by the west end of Nautilus Shoal or fifteen feet across it.

— From Cape Charles to Pocomoke Sound, thirty six miles, the shore is quite bold and the shoals connected with the shore slope rapidly into the Bay. Beyond the distance of two miles, three fathoms and a half are found all along; within this distance the bottom slopes gradually up to the shore line.

From a distance of about ten miles North of the Cape the East shore retreats gradually into Pocomoke Sound.

— Entrances to Pocomoke and Tangier Sounds:

Between the entrances to Pocomoke and Tangier sounds, with channels on each side entering these sounds, a shoal extends to the S.W. to a distance of five miles from the Light House This shoal has eighteen feet of water at its extremity and ten and eleven feet three miles from the Light House

— West Point of entrance to Tangier Sound.

A dangerous shoal makes out from the West Point

of the entrance to Tangier Sound extending to a distance of four miles and a half from the point in a South West direction.

This shoal has a rectangular shape with an irregular projection at the South West angle.

The depth at the extremity of the shoal is fifteen feet and it has eleven, twelve, thirteen and fourteen feet around the edges, with five and a quarter and Six fathoms just outside.

From Pocomoke Sound to a point opposite the mouth of the Patuxent.

The Eastern shore of the Bay along this distance of thirty five or forty miles, is formed by detached islands, which separate Tangier Sound from Chesapeake Bay.

While the Western shore of the Bay opposite these islands is bold, the Eastern shore is low, and the Shoals extend far out into the Bay, with numerous spurs running out from the main shoal and knolls or lumps detached from it.

A dangerous detached shoal very irregular in shape and five or six miles long lies opposite the mouth of the Potomac, with a channel to the eastward of it carrying three fathoms and a half.

The least depth upon this shoal is thirteen feet near its Southern extremity.

It extends out about seven miles from the Eastern Shore.

The main shoal along the islands, becomes narrower towards the entrance to Honga River, but widens again above the mouth of that river into regular flats extending along the Eastern Shore to a point opposite Cove Point.

These flats extend out from two to three miles from the islands separating Honga River from the Bay.

This flat has in some places only eight and nine feet upon its edge, but the deepest water of the Channel lies a little outside of the flats, at a distance of about four miles from the East Shore.

The East Shore from the vicinity of Cove Point, the entrance to Choptank River is bold, the shoal sloping rapidly and extending out to a distance of less than a mile from land.

— Choptank and Hudson Rivers enter the Bay south of Sharp's Island.

From Hudson River to the mouth of Chester River above Annapolis, the Eastern Shore is broken up by numerous islands, creeks, and shoals, which cover a region twelve or fourteen miles wide and thirty miles in length

The Choptank River has a wide entrance and four fathoms and a half can be carried in to the dis-

-tance of seven miles.

— Sharp's Island and Poplar Island.

The principal projections of the Shoals into the Bay are at Sharp's Island and Poplar Island. The shoals extend out about half a mile from these islands and are marked by Buoys.

— Kent Island. The shore of Kent Island is bold, and the deepest channel passes within a mile of the shore.

The extremity of the Shoal at the South end of the island is marked by a Buoy.

On the North end of Kent Island the Shoal extends into the mouth of Chester River to the North East two miles and its extremity is marked by a Buoy.

The Shoal on the Northern side of the entrance project into the Channel of the Bay about two miles it has twelve feet of water at its western edge.

Above this Shoal as far as Elk River the Channel follows close in to the Eastern shore.

— The character of this part of the Bay is described in the descriptions for the West Shore. —

Lights, Beacons and Buoys.

Lights, Beacons, Buoys, and Day Marks, arranged in regular order as they are passed by vessels entering, to mark the Channd in Chesapeake Bay from the Capes of Virginia to Havre de Grace, Maryland.

— Cape Charles Light House: White - Revolving light Tower, Sixty nine feet. —

— Buoy of the "Lower Middle". Red - No 2 - Iron Buoy of the first class - Cape Henry Light House bears South West a quarter West - Outer end of Smith's Island woods North half East - This Buoy is on the South West part of Lower Middle Ground, entrance to the Bay. - In 21 feet -

— Light House on Cape Henry. White - a Fixed white Light, on white Tower one hundred and twenty nine feet above sea level - The Buoy on tail of Horse Shoe bears North West three quarters North - This Light is situated on the South side of entrance to Chesapeake Bay, Virginia

— Buoy on Tail of "Horse Shoe" - Black - A second class iron can Buoy on which is painted in large white letters - "Horse Shoe" — Cape Henry Light House bears South East three quarters South - Black River Point, North West by West a half West - Highland on Willoughby's West a half South. — This Buoy is placed near the tail of the Horse Shoe in twenty eight feet -

Leaving it on the Port hand, vessels can haul up for the Bay Channel all clear. Vessels bound into Hamp-

-ton Roads must be careful to leave it on the Starboard hand.
It is planted in twenty eight feet, hard bottom.

— Buoy on the elbow of "Upper Middle". — Red - No 4 -

A second class iron nun Buoy, on which is painted in large white letters, "Upper Middle" — Cape Henry Light House bears South by East three quarters East. — Mouth of Fishermen's East by North a half North. — Back River Light House, West. — Old Point bluff West by South a half South. —

This Buoy marks the most dangerous part of the "Middle Ground" for vessels of large draught. But a short distance to the Eastward of it is only eighteen feet of water; soundings abrupt. After passing it on the Starboard hand, you can shape your course up the Bay. In coming down the Bay it serves as a guide, when left on the Port hand, for trimming around the Middle Ground. It is planted in forty two feet, sand and mud bottom.

— Buoy of the "Upper Middle" — Red - No 6.

This is a Nun Buoy - planted in twenty one feet.

— Light House on Back River Point. —

A flashing white light, on a white Tower about thirty five feet above sea level; visible about Ten miles.

The Buoy on the elbow of the Upper Middle bears East. —

This Light is located on the South side of entrance to Back River, Virginia, and on the West side of Chesapeake Bay. — Flashes every fifteen seconds. —

— Light Vessel on York Spit.

Cream color – with two Masts and one Light and Fog Bell. This Light vessel is moored off the end of York Spit, in four to five fathoms water, West side of Chesapeake Bay. —

— Light House on Inner Point of Point of Shoals, entrance to Cherrystone Creek.

Light on top of dwelling; – built on Iron screw piles, with Fog Bell – This Light is located on the inner point of the Point of Shoals, off Cherrystone, and East side of Chesapeake Bay. —

— Buoy off the outer Point of Shoals off Cherrystone

– No. 2 – A second class iron nun Buoy, numbered on four sides. — Cherrystone bluff bears North East by N. a quarter North. — Fisher's house, North East three quarters East. — Coast Survey tripod on Tazewell, East one quarter South. —

This Buoy is planted in twelve feet, hard bottom. It is the turning point of the Point of Shoals, about four hundred yards off. Vessels entering or leaving Cherrystone Inlet will clear the Shoal by giving this Buoy a berth to the North East. —

— Buoy on East end of "New Point Shoals".

– Black – A second class iron can Buoy, on which is painted in large white letters, "New Point Shoal". —

The Light House on New Point bears North West three

quarters West. — Back River point, South by West. Joe's point, West by South half South. — Buoy off S. East Spit making out from New Point, N. West half North.

— These are dangerous Shoals for vessels of heavy draught — They are two in number, close together, covering a space of a mile and a third in length and a mile in width; the depth of water on them is eighteen, seventeen, and sixteen feet. — On the Eastern end, off which the Buoy is planted, the soundings change suddenly from five and a quarter fathoms into seventeen feet. — They lie off the entrance to Mobjack Bay, where vessels make harbor in stormy weather. —

— The Buoy is planted in twenty and a half feet hard bottom. —

— Buoy off S. E. Bar off New Point Comfort.

— Black — No 1 — A second class iron can Buoy. —

The Light House on New Point bears North West by West Light vessel at Wolf Trap, North East by North a quarter North. — Guinn's Island bluff, North. — and Red Buoy on South West Spit, off New Point, (Mobjack Bay) North West by West a half West. —

This Buoy is planted in twenty seven feet hard bottom. — A West by South course from the Buoy will carry you, in twenty one feet water, into the entrance of Mobjack Bay. —

— Light House on New Point Comfort.

A Fixed white Light on a white Tower, fifty two feet

above sea level; visible about eleven miles.

The Buoy on South East Bar, off New Point Comfort bears South East by East.

This Light is situated about Eighteen miles north of Old Point Comfort, on the West side of Chesapeake Bay. ——

— Light Vessel off Wolf Trap.

- Lead color - Two masts and two Lights - with Fog Bell - The Buoy on South East Bar off New Point Comfort bears South West by South a quarter South.

This Light vessel is stationed on the East side of Wolf Trap Shoal in about thirty six feet water. —

— Light House on Stingray Point Shoal.

This is a Fixed Red Light on a screw pile structure with Fog Horn.

- This Light marks the dividing Point between the Peanketank and Rappahannock Rivers. ——

— Light Vessel off Windmill Point.

- Straw color - Two masts and one light, with Fog Bell The Wolf Trap Light vessel bears South half East. Smith's Point Light vessel North half East

This Light Vessel is stationed on the S.E. point of the Windmill Point Shoal, north side of the Rappahannock River, Virginia, and west side of Chesapeake Bay.

— Light House off Pungoteague. - Authorized to be built.

— Light Vessel off Smith's Point.

Lead color. Two Masts and Two Lights; with Fog Bell.

This Light vessel is stationed on the South East point of the Shoal making out from Smith's Point, entrance to the Potomac River, and West side of Chesapeake Bay.

- Smith's Point Light House bears West by North half N.

— Light House on Point Lookout.

A Fixed white Light on a small white Tower on top of Keeper's dwelling, about thirty seven feet above sea level; visible about ten miles.

The Buoy on end of Spit off George's Island, Potomac River, bears North West by West a quarter West.

This Light is situated on the North side of entrance to the Potomac River, West side of Chesapeake Bay.

— Light House on Fog Point.

A Fixed white Light on a small white Tower on top of Keeper's dwelling, about thirty feet above sea level; visible about ten miles.

This Light is situated on the North West end of Smith's
- 's Island, South side of Kedge's Straits and East side of Chesapeake Bay, opposite the mouth of the Potomac

— Light House on Cove Point.

A Fixed white Light varied by flashes, on a white Tower about Fifty Six feet above Sea level; visible about eleven miles. — Fog Bell rung by machinery.

This Light is situated about four miles to the Northward

of the entrance to Patuxent River, West side of Chesapeake Bay.

— Light House on Sharp's Island. —

A Fixed white Light on a small white Tower on top of Keeper's dwelling, about Forty one feet above sea level; visible about ten and a half miles.

This Light is situated on the North end of Sharp's Isl'd entrance to Choptank River, Maryland, east side of Chesapeake Bay.

— Buoy off Thomas' Point. —

A Spar Buoy, thirty two feet. — Black - No 15. —

Thomas' Point Light House bears North West half N.

Lower Sister Bluff South West half South.

The Buoy is planted in twenty three feet, hard bottom. This Shoal makes well out from Thomas' Point. Vessels should never go inside of the Buoy. The Soundings Shoal rapidly.

— Light House on Thomas' Point. —

A Fixed white Light on a white Tower, Sixty three feet above Sea level; visible about twelve miles.

The Buoy off Thomas' Point bears South East half E.

This Light is situated on the South side of entrance to Annapolis Roads, West side of Chesapeake Bay.

— Buoy off Tally's Point.

A Spar Buoy, thirty feet — Black - No 1.

Thomas Point bears South West half South — Tally's Pt

West North West. — Greenbury Point North North West. —
This Buoy is planted in Eighteen feet, hard bottom;
— oyster beds all around it —
The Bar makes off some distance from Tally's Point.
— This Buoy is intended as a guide to vessels going into
Annapolis Roads. —

— Buoy off Hackett's Point. —

A Spar Buoy, twenty five feet — Red — No. 2. —
— Thomas' Point bears South South West — Greenbury's Point
West North West. — Hackett's Point North by East. —
— This Buoy is planted in fifteen feet, hard bottom. —
— This Buoy is intended as a guide to vessels going into
Annapolis Roads. In going in there, leave it on the
Starboard hand; going up the Bay leave it on the Port
hand. —

— Buoy off Sandy Point. —

A Spar Buoy, thirty two feet. Black — No. 17.
The Dwelling House on Sandy Point, bears West half
North. — Light House on Thomas' Point, South South
West.
— The Buoy is planted in twenty one feet, hard bottom
— The Shoal makes out some distance from Sandy Pt

— Light House on Sandy Point. —

A Flashing Light on Keeper's Dwelling — Red —
(Light exhibited 1st. of October 1858)

Buoy off Magothy.

A Spar Buoy, twenty one feet. Black. No 19.
Bodkin Light House bears North West by North half North. Lower Magothy Bluff, South West by West a half West.

This Buoy points out the Shoal off Magothy; is planted in twelve and a half feet, hard bottom, and is intended as a guide into Bodkin Swash.

Buoy off Belvidere Shoal.

A Spar Buoy, twenty feet. Red. No 20.
Love Point bears South East half East. Sandy Pt. South three quarters East.

This Buoy is planted in ten feet, hard bottom, and is intended as a guide to vessels going into Bodkin Swash. This is a dangerous Shoal. Vessels bound up the Swash channel should take care to leave the Buoy on the Starboard hand; bound up the Bay, leave it on the Port hand.

Buoy on Lower Five Fathom Bank

An Iron Can Buoy of the second class in Summer, (a Spar Buoy in Winter,) Black and White perpendicular striped.

Sandy Point bears South West half South
Bodkin Point North West half West
Swan Point North East by North

This Buoy is planted in thirty feet, soft dark blue

mud.- It is intended as a guide for vessels going into the Patapsco River. —

— Buoy on Upper Five Fathom Bank. —

An Iron can Buoy of the second class, in Summer, (a Spar Buoy in Winter) with Black and white perpendicular stripes.

Bodkin Light House bears West by North — North Point, North West — Pool's Island, North N. East. This Buoy is planted in thirty feet, soft dark blue mud. It is intended as a guide for vessels going into Patapsco River. —

— Buoy off Nine-foot Knoll. —

A Spar Buoy, twenty one feet. - Black - No 1. Bodkin Light House bears West by South. — North Point, North West by West. — Swan Point, E. by North. —

This Buoy is planted in fifteen feet, hard sand, and is intended as a guide for vessels going into the Patapsco River. —

— Buoy off Swan Point, or Entrance Buoy, called by some Mouth of the River -

An Iron Can Buoy, first class, in Summer (a Spar Buoy in Winter) - Red - No 2. —

Bodkin Light House bears West by South — North Point, North West by West a half West. — This Buoy is planted in twenty five feet, very soft

bottom and is intended as a guide for vessels going into Patapsco River. —

— Buoy on Sixteen foot Ridge, or Knoll Buoy.

A Spar Buoy twenty six feet – Red and Black stripes –

– Bodkin Light House bears West South West —

– North Point, North West by West a half West —

– Pool's Island, North East by North. —

– This Buoy is planted in twenty two feet, soft mud, and points out the Knoll, and may be passed on either hand, It is intended as a guide for vessels bound into the Patapsco River. —

— Buoy on Man of War Shoal.

A Spar Buoy, twenty six feet. – Red – no 2

– Bodkin Light House bears South West by West —

North Point West N. West — Pool's Isld N. East by N.

– This Buoy is planted in soft muddy bottom. 18 feet.

This Buoy must be left on the Starboard hand going into the Patapsco, but on the Port hand going up the Bay. — It is intended as a guide for vessels going up the Patapsco. —

— Rock Range Buoy, called by some, North Point Marks on. –

A Spar Buoy, twenty Six feet – Black and white perpen-

-dicular stripes —

– Bodkin Light House, South West. – North Point, North

West by West a half West — Pool's Island North East a half North. —

This Buoy is planted in eighteen feet, soft muddy bottom can be passed on either hand going into the Patapsco R. or up the Bay. — It is intended as a guide for vessels bound up the Patapsco River —

— Light House on Lower North Point. —

A Fixed white Light on a white Tower, thirty five feet above sea level.

— This Light is situated on North Point, North side of entrance to the Patapsco River.

— Buoy on S. West Bar off Pool's Island.

A Spar Buoy, eighteen feet, Black — No 1 —

The South West point of Pools Island bears North N. East, — North Point, South West by West half West. —

and Swan Point, South half West. —

— This Buoy is planted in twelve feet, hard sandy bottom

— Buoy on Shark's Fin, or S. E. knoll of Pool's Island.

A Spar Buoy, eighteen feet — Red — No. 2. —

The North East end of Pool's Island bears N. West by N. a half North. — South West end of Pool's Island, West by South half South and Wharton's Point North East. —

— This Buoy is planted in ten feet, hard sandy bottom.

— Light House on Pool's Island. —

A Fixed white Light on a white Tower, thirty five feet above sea level; visible about ten miles.

The Buoy off Wharton's Point, bears North East by East.
This Light is situated on the West side of Pool's Island, in Chesapeake Bay, opposite Gunpowder River, Maryland

Buoy on N. E. Bar, off Pool's Island. —

A Spar Buoy, eighteen feet. — Black — No. 3 —
The South West end of Pool's Island, bears West by South a half South. — Wharton's Point, North East a half East.
Swan Point, South by West a quarter West. —
This Buoy is planted in ten feet, hard bottom. —

Buoy off Wharton's Point. —

A Spar Buoy, twenty five feet. — Red — No. 4
High Tree on Wharton's Point, bears South East by South
Point on West side of Still Pond Cove, East by North
Light House on Pool's Island, South West by West.
This Buoy is planted in sixteen feet, hard bottom. —

Light House on Turkey Point. —

A Fixed white Light on a white Tower, sixty five feet above Sea level; visible about thirteen miles.
This Light is situated on the North side of entrance to the Elk River, head of Chesapeake Bay, Maryland

Light House on Fishing Battery. —

A Fixed white Light on a small Tower on Keeper's dwelling (white) about thirty six feet above Sea level and visible about ten miles.
This Light is situated on Fishing or Donoho's Battery, about three miles South of the Light House on Concord

Point, mouth of the Susquehanna River.

— Light House on Concord Point, Havre de Grace.
This is a Fixed white Light on a Tower forty feet above sea level; visible about ten miles. — It is situated on the Port hand of entrance to the Susquehanna River. Md.

- Beacons and Buoys, arranged in regular order as they are passed by vessels entering, to mark the New Channel from Fishing Battery to Havre de Grace.

——— First or Entrance Buoy. — In eight feet, soft bottom
This is a Spar Buoy, Sixteen feet, — Black — No 1.
Plumb Point bears West by South. — Fishing Battery, North by East. — Turkey Point, South East by East.

——— Second Buoy. — In eight feet, soft bottom —
A Spar Buoy, Sixteen feet. — Black — No 3. —
Plumb Point bears West South West. — Fishing Battery East North East and Turkey Point East South East.

——— Third Buoy. — In twelve feet, soft bottom —
A Spar Buoy, eighteen feet — Black. No 5.
Plumb Point, bears South West by South. — Fishing Batty South East by South. — Concord Point, North.

——— Fourth Buoy. — In eleven feet, soft bottom —
A Spar Buoy, eighteen feet — Black. — No 7.
Fishing Battery, bears South. — Concord Point North half West. — Plumb Point South West half South.

——— Fifth Buoy. — In nine feet, soft bottom. —

A Spar Buoy, twenty two feet. — Black - No 9. — Fishing Battery, bears South — Concord Point North by West, and Turkey Point, East by South.

— These Buoys are placed on the Port side of the Channel lately dug out from Fishing Battery to Concord Point. They are placed about three fourths of a mile apart —

Hampton Roads.

(Charts N. and O.)

This important part of Chesapeake Bay is South of of Hampton Bar and Flats and North of Willoughby's Bank, Sewall's Point flats, and Craney Island flats.

Newport News bar, Newport News Middle ground, and Craney Island flats limit the Roads to the North.

This anchorage is protected by Fortress Monroe and Fort Calhoun. From Fortress Monroe to Portsmouth Navy Yard opposite Norfolk, is, by the sailing lines eleven miles and a half.

Willoughby's Spit is steep to the N.W. and the six feet curve extends to a mile and three quarters from Sewall's Pt.

The eighteen feet curve of Craney Island Spit extends North three miles and three quarters from Craney Island. and the Point is steep to. The Six feet curve conforms to the shore line so that there is a very large area with nine

feet or more water upon it.

Ten feet can be carried to a good anchorage in "Willoughby's Bay".

Lynn Haven Inlet leads from the South side of "Lynn Haven Bay", with five feet of water into "Lynn Haven River"

Dangers.

- The Horse Shoe is a triangular shaped shoal making out from the shore between Back River and Old Point. The eastern extremity, called the "Tail of the Horse Shoe", is nine and a half miles from Old Pt. Light House. There is from nine feet to three and a half fathoms on the Shoal.
- Willoughby's Bank is a narrow shoal off Willoughby's Point and the Rip-Raps, two and a quarter miles long, extending East North East and West South West with from six to thirteen feet on it. There is a channel of eighteen feet between it and the South shore.
- The Thimble is a small but dangerous shoal with ten and eleven feet on the South edge of the "Horse Shoe" two and three quarters miles East of "Old Point Sand Hill" There are six fathoms close to on the South side.
- A Red Buoy with Thimble on it marks the Shoal -

Obstructions now exist at the mouth of "Elizabeth River" and nearly in a line joining Sewall's Point with the North end of Craney Island flats; Also in the channel of

Elizabeth River at a point about midway between Fort Norfolk and Craney Island.

Sailing Directions.

Coming down Chesapeake Bay bound into Hampton Roads to avoid the "Thimble" and other shoal water on the "Horse Shoe" bring "Willoughby's" Lt. Boat and the Rip-Raps in range.

If bound from Hampton Roads to James River, keeping the S. E. angle of Fort Monroe just open to the Southward of Old Point Lt House clears Hampton Bar, and the shoal water further up. —— Willoughby's Point just shut in to the Southward of Sewall's Point clears the Southern edge of Newport News Middle Ground. —

If bound up Elizabeth River to Norfolk, keep Willoughby's Lt. Boat a little open to the Northward of the Rip-Raps, to clear the shoal between the Rip Raps and Sewall's Point; keep in not less than Four and a half fathoms, as it is steep to.

To clear Bush's Bluff Shoal keep Old Point Lt. House a little open to the Westward of Sewall's Point till abreast of Bush's Bluff Woods, when haul up for the Light Boat leaving it on the Starboard hand. — A mark at night for having cleared the Shoal is when abreast of the broad clear opening in the woods just to the Southward of it. —

Light Houses.

Old Point Comfort Light House.

North side of entrance to Hampton Roads. Virginia.
- Fixed Light - Visible 11 nautical miles. Height 48 ft.
- Fog Bell -

Old Point Comfort Beacon Light.

On Southwest point of Old Pt Comfort.
- Fixed Light - Visible 5 nautical miles - Black -
- Height 21 feet. — This is a small beacon light to guide vessels to anchorage inside of Hampton Bar —

Craney Island Light Vessel.

On West side of Channel near the mouth of Elizabeth River, off Craney Island.
- Fixed - Visible 10 nautical miles - Lead color -
Height 33 feet. — Fog Bell —

Norfolk Harbor Light House.

On Naval Hospital Wharf - Harbor of Norfolk and Portsmouth.
- Fixed white -

Latitude of Old Pt Comfort Lt. Ho.	37.° 00.' 02.'' 1.
Longitude (W. of Greenwich) " " "	76.° 18.' 05.'' 7.
" in Time " " " "	5.h 5.m 12.s 4.
Variation of Mag: Needle (Sept. 1856.) —	1.° 15.' West.

It is uncertain which of these Lights is now in operation

Tides

Corrected Establishment of Old Point Comfort.	H. VIII. M. XVII.
Rise of Highest Tide observed above the plane of reference	4.8. ft.
Fall of Lowest Tide " below " " "	1.7. "
Fall of Mean Low water, Spring Tides below " "	0.2. "
Height of " " " Neap Tides above " "	0.2. "
Mean Rise and Fall of Tides	2.5. "
Mean " " " " Spring Tides	3.0. "
Mean " " " " Neap "	2.0. "
Mean Duration of Rise } Reckoning from the Middle of one	6 h. 1 m.
Mean " " Fall } stand to the Middle of the next	6 h. 23 m.
Mean " " Stand	0 h. 14 m.

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 "