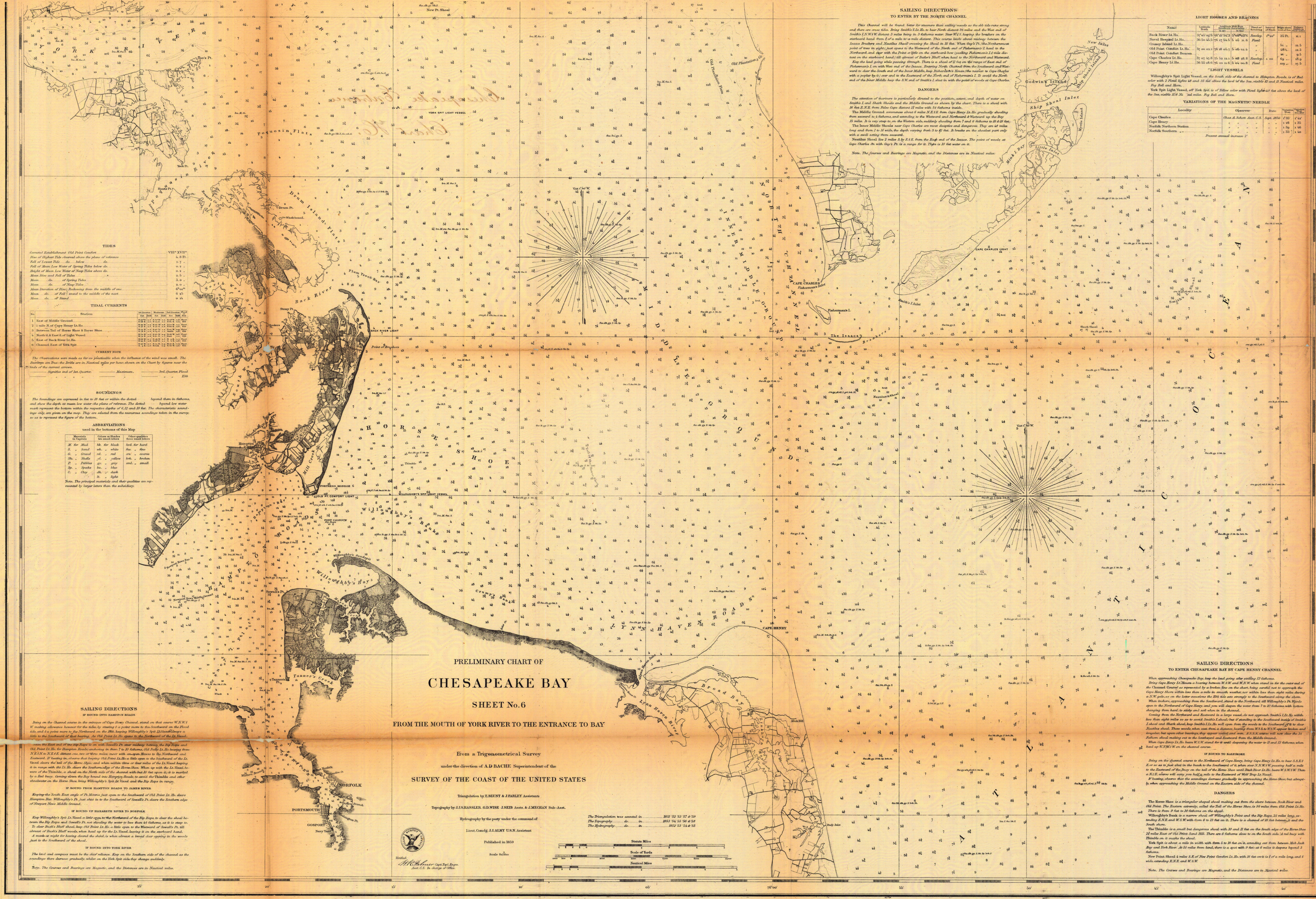

TIDES

Corrected Establishment Old Point Comfort	VIII^H XVII^M
Rise of Highest Tide observed above the plane of reference	4.8 Ft.
Fall of Lowest Tide ... do ... below ... do.	1.7 "
Fall of Mean Low Water of Spring Tides below do.	0.2 "
Height of Mean Low Water of Neap Tides above do.	0.2 "
Mean Rise and Fall of Tides	2.5 "
Mean ... do ... of Spring Tides	3.0 "
Mean ... do ... of Neap Tides	2.0 "
Mean Duration of Rise } Reckoning from the middle of one	6h 01m
Mean ... do ... of Fall } stand to the middle of the next	6 25
Mean ... do ... of Stand	0 14

TIDAL CURRENTS

No.	Station	1st. Quarter Set	1st. Quarter Drift	Maximum Set	Maximum Drift	3rd. Quarter Set	3rd. Quarter Drift	Flood or Ebb
1	East of Middle Ground	N. 50° W. N. 58 E.	0.3 0.5	N. 30° W. N. 72 E.	0.4 0.7	N. 45° W. N. 81 E.	0.3 0.4	Flood Ebb
2	1 mile N. of Cape Henry Lt. Ho.	N. 40 W. S. 73 E.	0.4 0.3	N. 45 W. S. 78 E.	0.8 0.8	N. 50 W. N. 80 E.	0.7 0.3	Flood Ebb
3	Between Tail of Horse Shoe & Horse Shoe	N. 72 W. S. 78 E.	0.8 0.8	N. 45 W. S. 59 E.	1.2 1.2	N. 27 W. South	0.9 0.6	Flood Ebb
4	North'd. & East'd. of Light Vessel	N. 54 W. N. 72 E.	0.6 0.6	N. 63 W. S. 81 E.	0.9 1.7	N. 45 W. East	0.6 1.0	Flood Ebb
5	East of Back River Lt. Ho.	N. 36 W. S. 40 E.	0.7 0.8	N. 18 W. S. 18 E.	1.5 1.1	N. 9 E. S. 4 E.	1.2 0.6	Flood Ebb
6	Channel East of York Spit	N. 45 W. S. 9 E.	0.3 0.8	N. 12 E. South	0.9 0.9	N. 27 E. S. 30 W.	0.4 0.5	Flood Ebb

CURRENT 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 per hour, shown on the Chart by figures near the ends of the current arrows.

——— *Signifies end of 1st. Quarter,* ——— *Maximum,* ——— *3rd. Quarter, Flood*
——— " " " " ——— " ——— " " *Ebb*

SOUNDINGS

The Soundings are expressed in feet to 18 feet or within the dotted beyond them in fathoms, and show the depth at mean low water the plane of reference. The dotted beyond low water mark represent the bottom within the respective depths of 6, 12 and 18 feet. The characteristic soundings only, are given on the map. They are selected from the numerous soundings taken in the survey, so as to represent the figure of the bottom.

ABBREVIATIONS
used in the bottoms of this Map

Materials in Capitals	Colors or Shades two small letters	Other qualities three small letters
M. for Mud	bk. for black	hrd. for hard
S. " Sand	wh. " white	fne. " fine
G. " Gravel	rd. " red	crs. " coarse
Sh. " Shells	yl. " yellow	brk. " broken
P. " Pebbles	gy. " grey	sml. " small
Sp. " Specks	bu. " blue	
C. " Clay	dk. " dark	
	lt. " light	

Note. *The principal materials and their qualities are represented by larger letters than the subsidiary.*

SAILING DIRECTIONS

IF BOUND INTO HAMPTON ROADS

Being on the Channel course in the entrance of Cape Henry Channel, stand on that course W.N.W.½W. making allowance however for the tides, by steering ¼ a point more to the Southward on the Flood tide, and ¼ a point more to the Northward on the Ebb, keeping Willoughby's Spit Lt. Vessel always a little to the Southward of that bearing. As Old Point Lt. Ho. opens to the Northward of the Lt. Vessel, ... When the East end of the Rip Raps is on with Sewall's Pt. steer midway between the Rip Raps and Old Point Lt. Ho. for Hampton Roads; anchoring in from 7 to 10 fathoms, Old Point Lt. Ho. bearing from N.E.¼N. to N.E.¼E. distant one, two or three miles; moor with an open Hawse to the Northward and Eastward. If beating in, observe that keeping Old Point Lt. Ho. a little open to the Southward of the Lt. Vessel clears the tail of the Horse Shoe; and when within three or four miles of the Lt. Vessel keeping it in range with the Lt. Ho. clears the Southern edge of the Horse Shoe. When up with the Lt. Vessel beware of the Thimble, a shoal on the North side of the channel with but 10 feet upon it; it is marked by a Red buoy. Coming down the Bay bound into Hampton Roads, to avoid the Thimble and other shoal water on the Horse Shoe, bring Willoughby's Spit Lt. Vessel and the Rip Raps in range.

IF BOUND FROM HAMPTON ROADS TO JAMES RIVER

Keeping the South East angle of Ft. Monroe just open to the Southward of Old Point Lt. Ho. clears Hampton Bar. Willoughby's Pt. just shut in to the Southward of Sewall's Pt. clears the Southern edge of Newport News Middle Ground.

IF BOUND UP ELIZABETH RIVER TO NORFOLK

Keep Willoughby's Spit Lt. Vessel a little open to the Northward of the Rip Raps, to clear the shoal between the Rip Raps and Sewall's Pt. not shoaling the water to less than 4½ fathoms, as it is steep to. To clear Bush's Bluff shoal, keep Old Point Lt. Ho. a little open to the Westward of Sewall's Pt. till abreast of Bush's Bluff woods, when haul up for the Lt. Vessel, leaving it on the starboard hand. A mark at night for having cleared the shoal, is when abreast a broad clear opening in the woods just to the Southward of the shoal.

IF BOUND INTO YORK RIVER

The lead and compass must be the chief reliance. Keep on the Southern side of the channel as the soundings there decrease gradually, whilst on the York Spit side they change suddenly.

Note. *The Courses and Bearings are Magnetic, and the Distances are in Nautical miles.*

SAILING DIRECTIONS
TO ENTER BY THE NORTH CHANNEL

This Channel will be found better for steamers than sailing vessels as the ebb tide runs strong and there are cross tides. Bring Smith's I. Lt. Ho. to bear North distant 3¼ miles and the West end of Smith's I. N.W.¼W. distant 3 miles being in 3 fathoms water. Steer W.¼S. keeping the breakers on the starboard hand from ½ of a mile to a mile distant. This course leads about midway between the Isaacs Breakers and Nautilus Shoal crossing the Shoal in 15 feet. When Guy's Pt. (the Northernmost point of trees in sight) just opens to the Westward of the North end of Fisherman's I. haul to the Northward, and steer with the Point a little on the starboard bow (passing Fisherman's I. ¼ mile distant on the starboard hand) till abreast of Butler's Bluff, when haul to the Northward and Westward. Keep the lead going while passing through. There is a shoal of 11 feet on the range of East end of Fisherman's I. 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 by it) over and to the Eastward of the North end of Fisherman's I. To avoid the North end of the Inner Middle keep the S.W. end of Smith's I. shut in with the point of woods at Cape Charles.

DANGERS

The attention of mariners is particularly directed to the position, extent, and depth of water on Smith's I. and Shark Shoals and the Middle Ground as shown by the chart. There is a shoal with 16 feet E.N.E. from False Cape distant 1½ miles with 5¼ fathoms inside.

The Middle Ground *commences about 6 miles N.E.¼E. from Cape Henry Lt. Ho. gradually shoaling from seaward to 4 fathoms, and extending to the Westward and Northward & Westward up the Bay 15 miles. It is very steep to on the Western side, suddenly shoaling from 7 and 6 fathoms to 18 & 16 feet.*

The Inner Middle Shoals *near Cape Charles are most deceptive and dangerous. They are 4¼ miles long and from 1 to 1¼ wide, the depth varying from 3 to 12 feet. It breaks on the shoalest part only with a swell setting from seaward.*

Nautilus Shoal *lies 2 miles S. by E.¼E. from the East end of the Isaacs. The point of woods at Cape Charles on with Guy's Pt. is a range for it. There is 10 feet water on it.*

Note. *The Courses and Bearings are Magnetic, and the Distances are in Nautical miles.*

LIGHT HOUSES AND BEACONS

Name	Latitude North	Longitude West from Greenwich Observatory In arc	Longitude West from Greenwich Observatory In time	Fixed or Revolving	Interval of Flash	Height above level of Sea	Distance visible in Naut. miles
Back River Lt. Ho.	37° 05' 09".6	76° 15' 54".3	5h 05m 03s.6	Revolvg.	1m 20s	35 Ft.	11.1
Naval Hospital Lt. Ho.	36 50 45.5	76 17 54.5	5 05 11.6	Fixed			
Craney Island Lt. Ho.				"		51 "	12.5
Old Point Comfort Lt. Ho.	37 00 02.1	76 18 05.7	5 05 12.4	"		48 "	12.3
Old Point Comfort Beacon				"		21 "	9.5
Cape Charles Lt. Ho.	37 07 47.8	75 52 12.1	5 03 28.8	Revolvg.	1 00	69 "	13.9
Cape Henry Lt. Ho.	36 55 28.6	76 00 11.6	5 04 00.8	Fixed		129 "	17.5

LIGHT VESSELS

Willoughby's Spit Light Vessel, *on the South side of the channel to Hampton Roads, is of Red color with 2 Fixed lights 48 and 35 feet above the level of the Sea, visible 12 and 11 Nautical miles. Fog Bell and Horn.*

York Spit Light Vessel, *off York Spit, is of Yellow color with Fixed light 40 feet above the level of the Sea, visible 11.6 Nautical miles. Fog Bell and Horn.*

VARIATIONS OF THE MAGNETIC NEEDLE

Locality	Observer	Date	Variation West	Variation West Dec. 1859
Cape Charles	Chas. A. Schott Asst. C.S.	Sept. 1856	1° 35'	1° 42'
Cape Henry	" " " "	" "	1 28	1 35
Norfolk Northern Station	" " " "	" "	1 39	1 46
Norfolk Southern	" " " "	" "	1 33	1 40

Present annual increase 2'

SAILING DIRECTIONS
TO ENTER CHESAPEAKE BAY BY CAPE HENRY CHANNEL

When approaching Chesapeake Bay, keep the lead going after striking 12 fathoms.

Bring Cape Henry Lt. Ho. on a bearing between W.S.W. and W.N.W. when stand in for the outer end of the Channel Course as represented by a broken line on the chart, being careful not to approach the Cape Henry Shore within less than a mile in smooth weather, nor within less than eight miles during a N.W. gale, as on the latter occasions the Ebb tide sets strongly to the Southward along the shore.

When inshore, approaching from the Southward, stand to the Northward, till Willoughby's Pt. Woods open to the Northward of Cape Henry, and you will deepen the water from 7 to 10 fathoms, with bottom changing from hard, to sticky and soft when in the channel.

Coming from the Northward and Eastward in a large vessel, do not approach Smith's I. Lt. Ho. within less than eight miles so as to avoid Smith's I. shoal; but if standing to the Southward inside of Smith's I. shoal and Shark shoal, keep Smith's I. Lt. Ho. well open from the woods to the Southward of it to clear Nautilus shoal. These woods, when seen from a distance, bearing from W.¼S. to W.¼N. appear broken and irregular, but upon other bearings, they appear united and even. A S.S.E. course will now clear the 3½ Fathom shoal making out to the Southward and Eastward from the Middle Ground.

When Cape Henry Lt. Ho. bears W.S.W. stand for it until deepening the water to 11 and 12 fathoms, when haul up W.N.W.¼W. on the channel course.

IF BOUND TO BALTIMORE

Being on the channel course to the Northward of Cape Henry, bring Cape Henry Lt. Ho. to bear S.S.E.¼E. or so as to just shut in the beach to the Southward of it, when steer N.N.W.¼W. passing half a mile to the Eastward of the Buoy on the tail of the Horse Shoe until Back River Lt. Ho. bears W.S.W.¼W. Then a N.¼E. course will carry you half a mile to the Eastward of Wolf Trap Lt. Vessel.

If beating, observe that the soundings decrease gradually in approaching the Horse Shoe; but abruptly, when approaching the Middle Ground on the Eastern side of the channel.

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 9¼ miles from Old Point Lt. Ho. There is from 9 feet to 3¼ fathoms on the shoal.*

Willoughby's Bank *is a narrow shoal off Willoughby's Point and the Rip Raps, 2¼ miles long, extending E.N.E. and W.S.W. with from 6 to 13 feet on it. There is a channel of 18 feet between it and the South shore.*

The Thimble *is a small but dangerous shoal with 10 and 11 feet on the South edge of the Horse Shoe 2¼ miles East of Old Point Sand Hill. There are 6 fathoms close to on the South side. A red buoy with Thimble on it marks the shoal.*

York Spit *is about a mile in width with from 5 to 18 feet on it, extending out from between Mob Jack Bay and York River. At 5¼ miles from land, there is a spot with 9 feet: at 6 miles it deepens beyond 3 fathoms.*

New Point Shoal *4 miles S.E. of New Point Comfort Lt. Ho. with 16 feet on it is ½ of a mile long, and ¼ wide, extending E.N.E. and W.S.W.*

Note. *The Courses and Bearings are Magnetic, and the Distances are in Nautical miles.*

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