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Chart D

U.S. COAST SURVEY

A.D. BACHE Supdt.

PRELIMINARY CHART OF DELAWARE AND CHESAPEAKE BAYS AND THE SEA COAST FROM CAPE HENLOPEN TO CAPE CHARLES

Electrotype Copy No. 1 by G. Mathier U.S.C.S.

TIDES

Corrected Establishment	Cape May Lim-Rock	Nelson's River	New Castle	Delaware Breakwater	Old Point Comfort	Point Lookout	Annapolis	Rockhaven Light	Baltimore Jackson-shoal
Rise of Highest Tide observed above the plane of reference	VIII° 6. 8ft.	XI° 8. 1ft.	XI° 11.1° 6. 4ft.	XI° 10° 6. 4ft.	VII° 10° 4. 8ft.	VII° 10° 2. 6ft.	VII° 11° 3. 8ft.	VI° 11° 3. 4ft.	VII° 11° 3. 8ft.
Fall of Lowest Tide do. below do.	1. 4.	0. 9.	2. 3.	1. 0.	1. 7.	1. 8.	2. 4.	1. 6.	2. 2.
Fall of Mean Low Water at Spring Tides below do.	0. 5.	0. 4.	0. 0.	0. 0.	0. 3.	0. 4.	0. 3.	0. 4.	0. 2.
Height of do. of Neap Tides above do.	0. 1.	0. 6.	0. 2.	0. 1.	0. 3.	0. 4.	0. 1.	0. 1.	0. 2.
Mean Rise and Fall of Tides	4. 8.	5. 9.	6. 5.	3. 3.	2. 5.	1. 8.	0. 9.	1. 9.	1. 3.
Mean do. of Spring Tides	6. 0.	6. 9.	6. 9.	3. 4.	2. 9.	1. 0.	1. 3.	1. 3.	1. 5.
Mean do. of Neap Tides	4. 3.	5. 0.	6. 6.	3. 0.	2. 0.	0. 7.	0. 8.	0. 8.	0. 9.
Mean Duration of Rise	6h 1m 0s	6h 0m 0s	5h 46m 0s	6h 5m 0s	6h 0m 0s	5h 59m 0s	6h 1m 0s	6h 2m 0s	5h 54m 0s
Mean do. of Fall	6h 15m 0s	6h 1m 0s	6h 13m 0s	6h 16m 0s	6h 10m 0s	6h 10m 0s	6h 5m 0s	6h 3m 0s	6h 33m 0s
Mean do. of Stand	0h 20m 0s		0h 0m 0s	0h 0m 0s	0h 0m 0s	0h 30m 0s	0h 34m 0s	0h 40m 0s	

The Triangulation was executed by A.D. Bache Supdt. E. Blunt, J. Ferguson, J.W. Werner, F.H. Gerdes, J. Farley, J.E. Johnstone Capt. U.S. Topl. Engrs. & T.J. Page Lieut. U.S.N. Assists between 1839 & 1853

The Topography was executed by F.H. Gerdes, A.L.S. Heander, H.L. Whiting, G.D. Wise, K.R.D. Cutts Assists. & J.B. Glück, J.C. Nelson, J. Salb, & S.A. Wainwright Sub-Assists between 1841 & 1854

The Hydrography was executed by the parties of Lieuts. T.R. Gedney, G.S. Blake, C.H.M. Blair, G.M. Bache, S.P. Lee, R.F. Kennedy, R. Bache, J.F. Missy, R. Wainwright, & W.P.M. Arthur U.S.N. Assists between 1841 & 1854

The Magnetic observations were made by T.J. Lee, Capt. U.S. Topl. Engrs. J.E. Hilgard, C.A. Schott, J. Houston. & J. Locke in 1845 & 7 & 53 & 55.

SAILING DIRECTIONS

To enter Delaware Bay from the Eastward. *The Light Boat* near 5 fm. Bank, bearing North, dist. 1 mile, *steer for Henlopen Lt. W by S (S.5.6 W.)* Soundings varying from 7 to 9 fms. When they deepen to 10 fms. or over *Henlopen Lt. 3 miles dist. steer N.W. (S.45 W.)* to bring *Henlopen Lt. & the Buoy on the Cape in range*, being careful, particularly in light winds & on the Flood, which sets to the Westward, not to *move to the Westward of the range*, the Shoals being near. *Tow up the Bay on this range* which passes to the Eastward of the Buoy of the Brower's soundings shoaling gradually from 15 to 8 fms. till *Brandywine Shoal Lt. Hse. bears N.N.W. (N.25 W.)*, when *steer for it passing about a 1 mile to the Westward.*

Bound into Breakwater Harbor from the Southward. *Pass Rev. & Delaware at a mid distance 2 miles from shore. Shoal hand in. Inserting close to Cape Henlopen which is bold. Pass the Eastward of Henlopen Lt. Hse. to bear W by S (S.5 W.) and stand in. Enter the Harbor at either end, or between the Breakwater and Ice breaker, anchoring to the wind and tide. Do not anchor in the Cupola but anchor eye & close to the main work. Breakwater Lt. Hse. bearing N by W (N.15 W.) Holding ground good in all parts of the Harbor.*

From Brandywine Lt. Hse. to Cross Ledge Lt. Boat. Course on the Flood is N.N.W. (N.25 W.) On the Ebb N.N.W. (N.25 W.) *Leave the Lt. Boat to the Westward, keep ahead & embrace the course to the Buoy on the Middle Ground, 3 miles. These courses carry about mid channel between the Playground & Cross Ledge. From the Buoy on the middle to Brandywine Shoal Bar, the Tower Cape the Lower of two small insulated clumps of trees on the Western shore, bearing S.W. (S.45 W.) the course is N.W. (N.35 W.) On the Flood and S.W. with Brown Rock Buoy to Intersection the two buoys Brandywine Shoal Bar, Brown Rock Buoy to Intersection the two buoys Big South the course is N.N.W. (N.25 W.) between Brandywine Shoal & Lt. Hse. & Lightness Pt. there is 24 fms. the shallest water in channel way. From the Gape to the Two Patch. From Lookout Tree bearing South, to give Sharp Pt. Bar a good berth, steer for Fort Penn Turn in little to the Westward. If Ranty Id. Lt. (for 11 miles, or till a house on the Delaware shore, with two poplars near it, bears S.W by W. (S.5 W.) then the course is N.E by E. (N.E.) to Leaningborough Pt. bearing East.*

For further directions, see Chart of Delaware Bay and River Scale 20,000

NOTE

The Courses and Bearing without the brackets are Magnetic, those within are True. The distances are in Nautical miles. The soundings are expressed in feet to 18 feet, or within the dotted surface, beyond it in fathoms, and show the depth at mean low water, the plane of reference. 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.

SAILING DIRECTIONS

To enter Chesapeake Bay by Cape Henry Channel. *Bring Cape Henry Lt. Hse. to bear from W by S to W.N.W. and stand, for it. Between these bearings there is not less than 5½ fms. The channel between Cape Henry and the Middle Ground is about 4½ miles wide. Large clean vessels working in or out must beware of the 3½ fms. shoal lying 3½ miles Northeast & Eastward of Cape Henry Lt. Hse. Keep the lead going after stridding 12 fms. The beach from the Lt. Hse. Southerly must not be approached nearer than a mile. When inshore to the Southward & Eastward, standing to the Northwest, till Willoughby's Pt. winds range with, or opens to the Northward of Cape Henry, deepen the water into Cape Henry Channel, and after passing Smith's Id. Lt. Hse. keep it well open with the woods to the Southward, bearing in not less than 3½ fms. to avoid Nantiko Shoal. Vessels making the land to the Southward of Cape Henry during a strong North Wester, should not approach it nearer than 3 miles, as the ebb tide than sets strong to the Southward, along the shore. Stretch well off on the Port tacks and bring Cape Henry to bear West. The woods of Smith's Id. appear broken and uneven from a distance seaward, when bearing from W.N.W. to W.S.S. with other bearings they appear even and solid.*

If bound into Hampton Roads. Bring Cape Henry Lt. Hse. to bear S. dist. one mile, and steer N.N.W. (N.W.) keeping Willoughby's Lt. Boat a little on the Port bow. If the tide is running flood, steer a point more to the Southward, if ebb 1 point more to the Northward. As Old Pt. Lt. Hse. opens to the Northward of the Lt. Boat change courses gradually for the Lt. Hse. leaving the Lt. Boat two or three ships lengths to the Southward. When the E. end of Rip Raps is on with Sewells Pt. steer midway between the Rip Raps and Old Pt. Lt. Hse. for Hampton Roads and anchor in from 7 to 10 fms. Old Pt. Lt. Hse. bearing from N.S.E. to N.E.E.E. dist. one or two or three miles. Moor with open hawse to the Northwest & Eastward.

If bound to Baltimore. Bring Cape Henry Lt. Hse. to bear S.S.E. (S.on 2 miles or just shut in the beach to the Southward, of it. Steer N.N.W. (N.W.) will touch Lt. Hse. bears S.W by W. When at N.E. course will clear Wolf Trap Lt. Boat, and carrie clear to Smiths Pt. Lt. Boat, leaving Windmill Pt. Lt. Boat on the Port hand. From Smiths Pt. Lt. Boat bearing West, dist. 1 Mile, to Pt. Lookout bearing West, dist. 4 miles the course is N.W.(N. from thence steer S. by W. (W. to Cove Pt. Lt. Hse. bearing West dist. 11 miles. From this bearing, change course to W.S.W. (S.W.) to Lower Lt. Hse. Poplar Id. steer W by S. from Poplar Id. steer W by S. to Lower Upper 5 fm. Bank Buoy then a N.N.W. (N.W.) course beside to Entrance Buoy near the mouth of the Patapsco River.

Abbreviations used in the bottoms of this Map

Materials in Capitals	Colors or Shades (colors on small letters)	Lines or qualities (lines on small letters)
M. for Mud	bk. for black	hrd. for hard
S. „ Sand	wh. „ white	sft. „ soft
G. „ Gravel	rd. „ red	blu. „ blue
Sh. „ Shells	yl. „ yellow	crs. „ coarse
F. „ Fishes	gr. „ grey	stk. „ sticky
Sp. „ Spouts	bns. „ brown	brk. „ broken
C. „ Clay	dk. „ dark	sml. „ small
	lt. „ light	
	br. „ brown	

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

Name and Locality	Latitude	Longitude West from Greenwich Time
Cape Henlopen Light House	38° 46' 55"	75° 06' 19"
Egg Island Light House	39° 10' 31"	75° 26' 36"
Reedy Island Light House	39° 30' 00"	75° 35' 45"
Assateague Light House	38° 22' 55"	75° 0' 44"
Cape Henry Light House	36° 55' 19"	76° 00' 12"
Smith's Point Light House	37° 55' 15"	76° 13' 55"
Sharp's Island Light House	38° 30' 44"	76° 12' 55"
Poole's Island Light House	39° 17' 42"	76° 15' 40"

Statute Miles

Nautical Miles

Scale of Yards

Engd. by J.E.N. Throop & A. Kondrup & R. Ogilvie

Engd. & Prd. by A. Boschke