

U.S.C.G. Merchant Marine Exam

Master of Unlimited Tonnage

Q304 Navigation General – Great Lakes and Inland

(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions.

1. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships foghorn 5.5 seconds after the signal was sounded. What is the distance to the shore?
- A. 3450 ft (1052 meters)
 - B. 3825 ft (1166 meters)
 - C. 2475 ft (754 meters)
 - D. 3072 ft (936 meters)

Correct answer: D

2. Information about direction and velocity of rotary tidal currents for a Port on the Atlantic coast of the United States can be found in which publication?
- A. Tidal Current Tables
 - B. Mariner's Guide
 - C. Tide Tables
 - D. Nautical Almanac

Correct answer: A

3. Which of the following compensates for errors introduced when a vessel heels over?
- A. The Flinders bar
 - B. Magnets placed in trays inside the binnacle
 - C. A single vertical magnet beneath the compass
 - D. The soft iron spheres on the arms of the binnacle

Correct answer: C

4. You are underway and pass by a lighthouse. Its light, which was white since you first sighted it, changes to red. What does this indicate?
- A. It is the identifying light characteristic of the lighthouse
 - B. That you have entered an area of shoal water or other hazard
 - C. The lighthouse has lost power and has switched to emergency lighting
 - D. The light is characterized as alternately flashing

Correct answer: B

5. Sometimes foreign charts are reproduced by NGA. On such a chart a wire dragged (swept) area may be shown in purple or which other color?
- A. Magenta
 - B. Red
 - C. Yellow
 - D. Green

Correct answer: D

6. When entering from seaward, what does a buoy displaying a single-flashing red light indicate?
- A. The starboard side of the channel
 - B. A wreck to be left on the vessel's port side
 - C. A sharp turn in the channel to the right
 - D. A junction with the preferred channel to the left

Correct answer: A

7. While upbound through Memphis, the weather report on TV news indicates that a warm front is stationary over Kentucky - Missouri - Tennessee areas. What weather conditions should you expect?
- A. Strong, gusting winds from the northwest with thundershowers
 - B. A "blue norther"
 - C. Southerly winds with steady rain; fog or overcast
 - D. Light winds from the northeast with clear skies

Correct answer: C

8. You are underway on course 163°T at a speed of 15.8 knots. You sight a buoy bearing 161°T at a radar range of 5.5 miles at 1319. If you change course at 1325, what is the course to steer to leave the buoy abeam to starboard at 1.0 mile?
- A. 145°T
 - B. 148°T
 - C. 151°T
 - D. 175°T

Correct answer: A

9. Geographic range is the maximum distance at which a light may be seen under which conditions?
- A. Permitting visibility conditions, limited only by the curvature of the Earth
 - B. Existing visibility conditions, limited only by the curvature of the Earth
 - C. Permitting visibility conditions, limited only by interference from background lighting
 - D. Existing visibility conditions, limited only by the intensity of the light

Correct answer: A

10. The National Oceanic and Atmospheric Administration publishes which item?
- A. Coast Pilots
 - B. Sailing Directions
 - C. Pilot charts
 - D. Light Lists

Correct answer: A

11. What color is a triangular daymark?
- A. Green
 - B. Green and white
 - C. Red
 - D. Red and white

Correct answer: C

- 12.** In which situation is the light characteristic of composite group flashing (2 + 1) used in the Aids to Navigation System on the Western Rivers?
- A. Only to identify the right descending bank
 - B. On preferred-channel buoys
 - C. On daymarks with no lateral significance
 - D. Only to identify the left descending bank

Correct answer: B

- 13.** Two navigational hazards are located near to each other, but each is marked by an individual cardinal buoyage system. How are the buoys of one cardinal system identified from the other system?
- A. The differing light colors
 - B. One system having odd numbers while the other system has even numbers
 - C. One system using horizontal bands while the other system uses vertical stripes
 - D. The difference in the periods of the light

Correct answer: D

- 14.** Which light signal indicates that you may approach the lock?
- A. Flashing red
 - B. Flashing amber
 - C. Steady amber
 - D. Steady green

Correct answer: B

- 15.** The spin axis of a gyroscope tends to remain fixed in space in the direction in which it is started. How does this gyroscope become north seeking so that it can be used as a compass?
- A. The rotation of the Earth (Earth rate) automatically aligns the gyroscope with north, except for speed errors
 - B. By taking advantage of the property of gyroscopic inertia
 - C. By mechanically or electrically applying forces to precess the gyroscope
 - D. By starting the compass with the spin axis in a north/south position

Correct answer: C

- 16.** Which of the buoys listed below could be used to mark an anchorage?
- A. Yellow buoy lettered "N"
 - B. White buoy numbered "3"
 - C. White buoy with orange bands
 - D. White buoy with a green top

Correct answer: A

17. When operated over a muddy bottom, a fathometer may indicate which of the following?

- A. A shallow depth reading
- B. Two depth readings
- C. No depth reading
- D. A zero-depth reading

Correct answer: B

18. Fog generally clears when the _____.

- A. wind speed increases
- B. wind direction changes
- C. temperature increases
- D. All of the above

Correct answer: D

19. You take a bearing of 086° of a lighthouse. What bearing of another object would give the best fix?

- A. 000°
- B. 066°
- C. 112°
- D. 271°

Correct answer: A

20. What is the primary source of the earth's weather?

- A. The moon
- B. The solar system
- C. The oceans
- D. The sun

Correct answer: D

21. Which winds have the greatest effect on the set, drift, and depth of the equatorial currents?

- A. The horse latitudes
- B. The trade winds
- C. The doldrums
- D. The prevailing westerlies

Correct answer: B

22. A towing vessel is NOT required to be fitted with radar if it is _____.

- A. under 65 feet in length
- B. used exclusively on the Western Rivers
- C. used solely for assistance towing
- D. pushing ahead

Correct answer: C

23. While proceeding up a channel on course 010° per gyrocompass, you notice a pair of range lights in alignment with the masts of your vessel when viewed forward. A check of the chart shows the range to be 009°T and the variation to be 15°W. If the ship's course is 026°psc, what is the deviation for the present heading?

- A. 2°W
- B. 2°E
- C. 1°W
- D. 1°E

Correct answer: A

24. Magnets in the binnacles of magnetic compasses are used to reduce which effect?

- A. Local attraction
- B. Variation
- C. Deviation
- D. Static build-up

Correct answer: C

25. Which topmark shown in illustration D023NG below identifies an isolated danger?

- A. A
- B. B
- C. C
- D. D

Correct answer: B

26. How can you follow the approach of a dangerous cyclonic storm?

- A. Review the Coast Pilot or Sailing Directions
- B. By monitoring the change in the sea temperature
- C. By a newspaper, a weather map, a weather fax, or a weather forecast
- D. Utilizing the National Weather Service Observing Handbook No.1, Marine Surface Observations

Correct answer: C

27. Your vessel is on a course of 343°T at 14 knots.

At 2156 a light bears 320.5°T, and at 2217 the light bears 298°T.

At what time and distance off will your vessel be when abeam of the light?

- A. 2235, 4.3 miles
- B. 2232, 3.4 miles
- C. 2241, 6.9 miles
- D. 2228, 4.9 miles

Correct answer: B

28. Under the IALA Buoyage Systems, which is TRUE of safe water marks?

- A. They may show a composite group-flashing, Fl(2 + 1), red light
- B. They must show a composite group-flashing, Fl(2 + 1), green light
- C. They may show a quick-flashing, Q(9)15s, white light
- D. They may show a white Morse (A) light

Correct answer: D

29. Which radar control reduces weak echoes out to a limited distance from the ship?

- A. The receiver gain control
- B. The brilliance control
- C. The fast time constant (differentiator)
- D. The sensitivity time control (sea-clutter control)

Correct answer: D

30. Your vessel is proceeding up a channel, and you see a pair of range lights that are in line ahead. The chart indicates that the direction of this pair of lights is 147°T, and the variation is 5°E. If the heading of your vessel at the time of the sighting is 148° per standard magnetic compass, what is the correct deviation?

- A. 1°E
- B. 1°W
- C. 6°E
- D. 6°W

Correct answer: D

31. What does a white buoy with an orange circle marked on it indicate?

- A. A mooring buoy
- B. Danger
- C. Operating restrictions are in effect
- D. Vessels are excluded from the area

Correct answer: C

32. What is the definition of height of tide?

- A. The vertical distance from the tidal datum to the level of the water at any time
- B. The vertical distance from the surface of the water to the ocean floor
- C. The vertical difference between a datum plane and the ocean bottom
- D. The vertical difference between the heights of low and high water

Correct answer: A

33. In the Northern Hemisphere, what do winds veering sharply to the west or northwest with increasing speed indicate?

- A. A low-pressure center is approaching
- B. A high-pressure center has passed
- C. A cold front has passed
- D. A stationary front exists

Correct answer: C

34. Which publication lists Class I and II private aids to navigation in or along navigable waters of the United States?

- A. List of Private Aids
- B. Aids to Navigation Manual
- C. Light List
- D. Sailing Directions

Correct answer: C

35. When entering a channel from seaward, which is TRUE concerning the numbers on buoys?

- A. The numbers are the same as their Light List number
- B. They are marked in 6-inch figures with retro-reflective material
- C. The numbers increase with the even numbers to starboard
- D. The numbers decrease with the odd numbers to starboard

Correct answer: C

36. Which term defines the difference between the heights of low and high tide?

- A. Tidal Distance
- B. Tidal depth
- C. Tidal Period
- D. Tidal range

Correct answer: D

37. If the current and wind are in opposite directions, what does the sea surface indicate?

- A. The surface indicates a greatly reduced wind speed
- B. The surface indicates a lower wind speed than what really exists
- C. The surface indicates a higher wind speed than what really exists
- D. The surface does not change, each cancels the other

Correct answer: C

38. What does a Doppler log in the bottom return mode indicate?

- A. The speed over the ground
- B. The depth of the water
- C. The bottom characteristics
- D. The velocity of the current

Correct answer: A

39. The datum from which the predicted heights of tides are reckoned in the tide tables is the same as that used for the charts of the locality. The depression of the datum below mean sea level for Hampton Roads, Virginia is _____.

- A. between -.7 and +.5 feet
- B. 1.2 feet
- C. 4.1 feet
- D. between 1.9 and 3.2 feet

Correct answer: B

- 40.** You will be advised of any hazardous areas due to the fallout of a nuclear explosive by a message with which code word?
- A. MERWARN
 - B. FALLOUT
 - C. NUCLEAR
 - D. FALLWARN

Correct answer: A

- 41.** If you are the Master of a towing vessel who's only working radar no longer functions, what must you do?
- A. Notify the Officer in Charge of Marine Inspection (OCMI) if you cannot repair it within 48 hours.
 - B. Anchor the vessel until it is repaired.
 - C. Notify the Captain of the Port (COTP) if you cannot repair it within 96 hours.
 - D. Moor the vessel until it is repaired.

Correct answer: C

- 42.** You are taking bearings on two known objects ashore. The BEST fix is obtained when the angle between the lines of position is _____.
- A. 60°
 - B. 30°
 - C. 90°
 - D. 45°

Correct answer: C

- 43.** Which nautical charts are intended for coastwise navigation outside of outlying reefs and shoals?
- A. Approach charts
 - B. General charts
 - C. Coastal charts
 - D. Sailing charts

Correct answer: B

- 44.** On 3 October 2023, you will be docking at the Dundalk Marine terminals in Baltimore, MD at the second high tide. The berth is located between NOAA reference tidal station #8574680 and subordinate station #8574821. What time (LST) will you be docking? Illustration D056NG
- A. 2150
 - B. 2057
 - C. 2050
 - D. 1957

Correct answer: A

45. White lights may be found on which buoys?

- A. Special purpose buoys
- B. Information and regulatory buoys
- C. Preferred channel buoys
- D. Numbered buoys

Correct answer: B

46. You are sailing south on the Intracoastal Waterway (ICW) when you sight a green can buoy with a yellow square painted on it. Which of the following is TRUE?

- A. The yellow square is retro-reflective material used to assist in sighting the buoy at night.
- B. You should pass the buoy close aboard on either side.
- C. The buoy marks the end of the ICW in that area.
- D. You should leave the buoy to port.

Correct answer: D

47. Which measurement uses mean high water as the reference plane?

- A. Heights above water of land features such as lights
- B. Soundings on the East and West Coasts
- C. Water depths on the East Coast only
- D. All vertical measurements on charts

Correct answer: A

48. The velocity of the apparent wind can be less than the true wind and from the same direction, if certain conditions are present. One condition is that the _____.

- A. ship's speed is more than the true wind velocity
- B. true wind is from dead astern
- C. true wind is on the beam
- D. true wind is from dead ahead

Correct answer: B

49. Which term describes a tow that is properly aligned to pass through a narrow opening between two bridge piers or any other critical navigational maneuver?

- A. Holding on
- B. In shape
- C. On course
- D. Headed fair

Correct answer: B

50. In the U.S. Aids to Navigation System, lateral aids as seen entering from seaward will display lights with which characteristic?

- A. Quick Flashing
- B. Occulting
- C. Flashing
- D. All of the above

Correct answer: D

51. Which publication should you check for complete information on Puget Sound weather conditions?

- A. Sailing Directions
- B. Light List
- C. Chart of the area
- D. Coast Pilot

Correct answer: D

52. When does a current perpendicular to a vessel's track have the greatest effect on the vessel's course made good?

- A. In deep water
- B. At low vessel speeds
- C. At high vessel speeds
- D. In shallow water

Correct answer: B

53. You are outbound in a buoyed channel on course 015°T. You sight a white light showing a Morse (A) characteristic bearing 359° relative. For safety, which action should you take?

- A. Stay in the channel and leave the buoy to port
- B. Check the chart to see where the marked danger lies in relation to the buoy
- C. Alter course to 000°T and leave the buoy close on the starboard side
- D. Change course to 359°T to pass near to the buoy

Correct answer: A

54. On 10 November 2023 at 0130, you are inbound at Charleston Harbor Entrance Buoy "10" (ACT6611). What is the direction and velocity of the current you are encountering as you pass Buoy "10"? Illustration D058NG

- A. 0.8kts at 172°T
- B. 0.3kts at 104°T
- C. 0.3kts at 280°T
- D. 0.8kts at 335°T

Correct answer: C

55. Your vessel is steering course 027° per standard magnetic compass (psc), variation for the area is 19°W , and deviation is 2°E . The wind is from the north-northwest, producing a 5° leeway. What true course are you making good?

- A. 015°T
- B. 049°T
- C. 044°T
- D. 005°T

Correct answer: A

56. You are underway in a vessel with a draft of 6.0 feet. You are in an area where the charted depth of the water is 4 fathoms. You would expect the depth of water beneath your keel to be approximately _____.

- A. 12 feet
- B. 30 feet
- C. 24 feet
- D. 18 feet

Correct answer: D

57. The nominal range of a light may be accurately defined as the maximum distance at which a light may be seen _____.

- A. with ten miles visibility
- B. under existing visibility conditions
- C. with fifteen miles visibility
- D. under perfect visibility

Correct answer: A

58. The light characteristic of flashing is used in the Aids to Navigation System on the Western Rivers. Which example is required to utilize this characteristic?

- A. Lights marking the left descending bank
- B. Preferred channel buoys
- C. Lights marking the right descending bank
- D. Daymarks with no lateral significance

Correct answer: C

59. Illustration D011NG below represents the geographic location of a vessel and the radar presentation at the same time. Which statement is TRUE?

- A. Ship No. 2 is not detected due to the side lobe effect of radar reflecting from the mountain.
- B. A tangent bearing of the headland to the south-southeast is corrected by subtracting one-half of the beam width.
- C. Small island is not detected due to the multiple echo effect from the mountain.
- D. Ship No. 1 does not appear as an individual target due to the effect of beam width.

Correct answer: D

60. While passing through Memphis, the weather report on the TV news indicates that a cold front is crossing western Kentucky and Tennessee. Tomorrow's weather will be dominated by a high-pressure area. What weather should you expect tomorrow?

- A. Low overcast; mild temperatures with light, steady rain or drizzle
- B. Light, southerly winds; high humidity and possibly fog
- C. Moderate winds from the northwest, clear visibility and cooler temperatures
- D. Scattered clouds with light, southeasterly winds; high humidity and possible fog

Correct answer: C

61. Which is TRUE concerning Light Lists for coastal waters?

- A. They are published every five years and require no correction
- B. They are accurate through NM number on title page and must be corrected
- C. They are published every second year and must be corrected
- D. They are published every year and require no corrections

Correct answer: B

62. Quadrantal error in a gyrocompass has its GREATEST effect on which of the following?

- A. When the vessel is on intercardinal headings
- B. When the vessel is on north or south headings
- C. When the vessel is near the equator
- D. When the vessel is in high latitudes

Correct answer: A

63. While on a course of 321°T, a light bears 7° on the starboard bow at a distance of 9.7 miles. What course should you steer to pass 3.5 miles abeam of the light leaving it to starboard?

- A. 300°T
- B. 307°T
- C. 303°T
- D. 297°T

Correct answer: B

64. Which is TRUE of an aneroid barometer?

- A. An instrument that is used to measure the height of waves
- B. An instrument used to measure the speed of wind
- C. An instrument in which the pressure of the air is measured
- D. An instrument that tells which direction a storm is coming from

Correct answer: C

65. The datum from which the predicted heights of tides are reckoned in the tide tables is _____.

- A. given in table three of the tide tables
- B. the highest possible level
- C. the same as that used for the charts of the locality
- D. mean low water

Correct answer: C

66. The direction in which a vessel is steered is the course. The path actually followed is the _____.

- A. track
- B. course over the ground
- C. route
- D. heading

Correct answer: B

67. How are you informed of defects or changes in aids to navigation?

- A. Weekly Notice to Mariners
- B. Local Notice to Mariners
- C. Marine Safety Information Website
- D. All of the above

Correct answer: D

68. Which frontal system occurs when a cold air mass and a warm air mass meet, and there is no horizontal motion of either air mass?

- A. A warm front
- B. An occluded front
- C. A cold front
- D. A stationary front

Correct answer: D

69. Which device maintains a continuous graphic record of the heading of the vessel?

- A. The fathometer
- B. The auto pilot
- C. The AIS system
- D. The course recorder

Correct answer: D

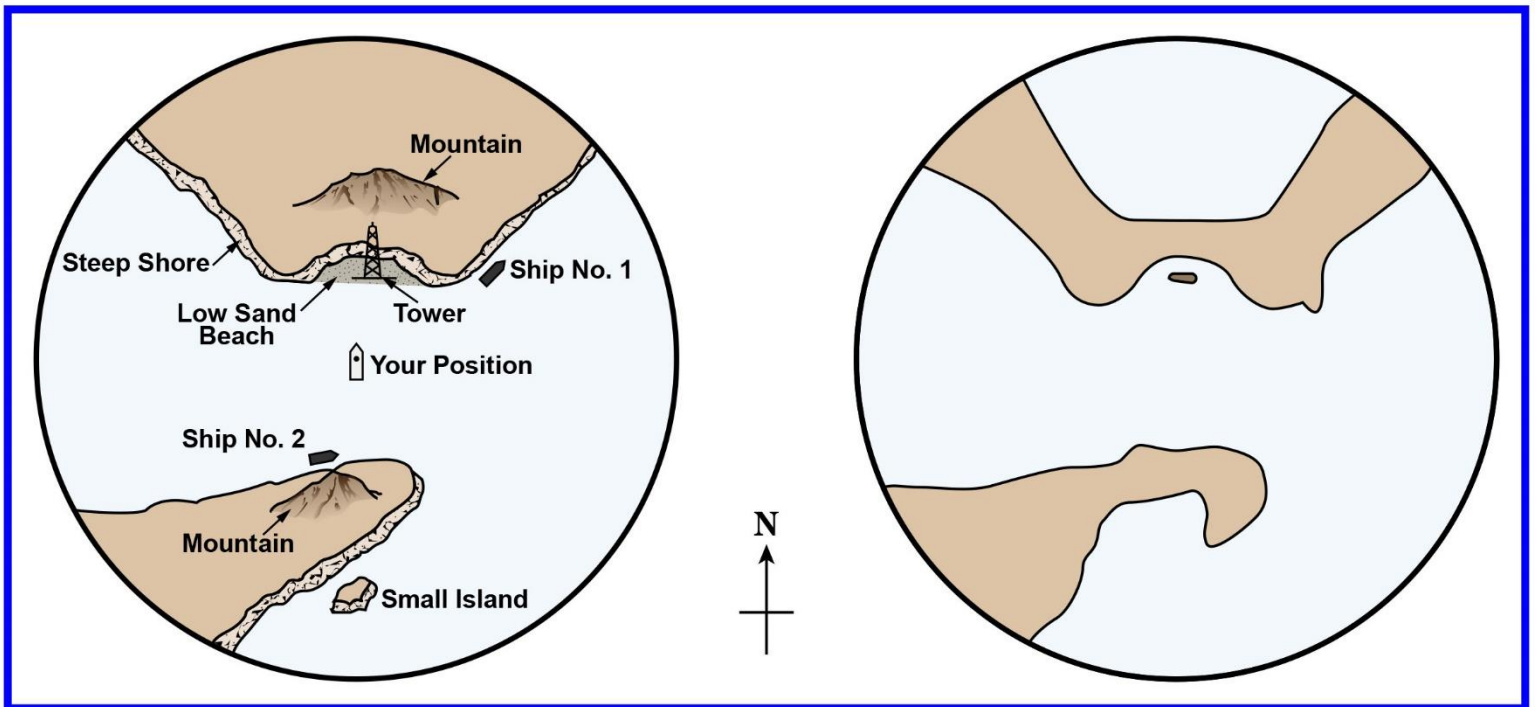
70. When using GPS, how many theoretical position lines are required for a three-dimensional fix?

- A. 1
- B. 2
- C. 3
- D. 4

Correct answer: D



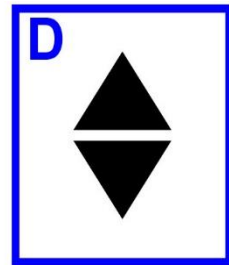
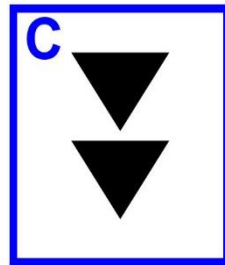
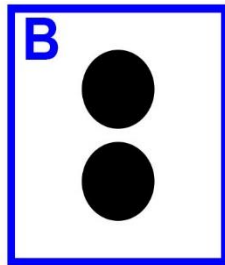
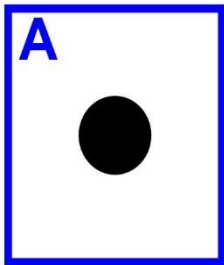
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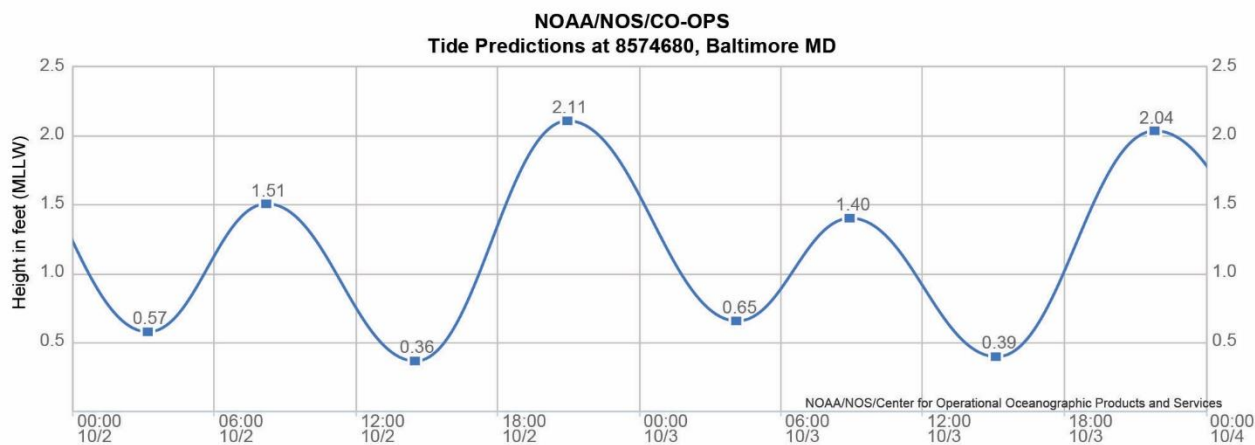
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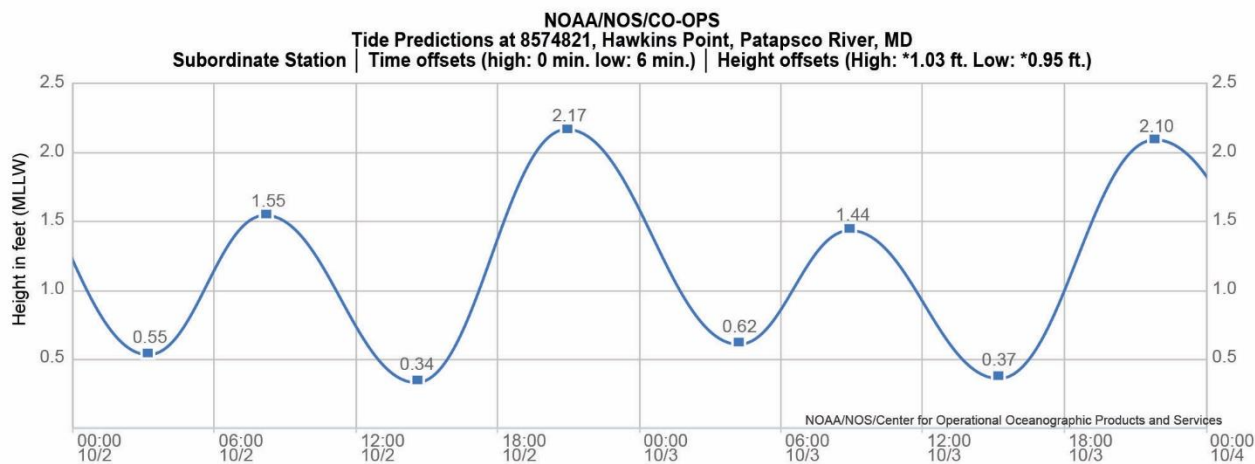


Station Name: Baltimore, MD
Action: Daily
Product: Tide Predictions
Start Date & Time: 2023/10/2 00:00
End Date & Time: 2023/10/3 23:59

Source: NOAA/NOS/CO-OPS
Prediction Type: Harmonic
Datum: MLLW
Height Units: Feet
Time Zone: LST

High/Low Tide Prediction Data Listing

Date	Day	Time	Hgt	Time	Hgt	Time	Hgt	Time	Hgt
2023/10/02	Mon	03:10	0.57 L	08:12	1.51 H	14:30	0.36 L	20:57	2.11 H
2023/10/03	Tue	04:08	0.65 L	08:56	1.40 H	15:08	0.39 L	21:50	2.04 H



Station Name: Hawkins Point, Patapsco River, MD
Action: Daily
Product: Tide Predictions
Start Date & Time: 2023/10/2 00:00
End Date & Time: 2023/10/3 23:59

Source: NOAA/NOS/CO-OPS
Prediction Type: Subordinate
Datum: MLLW
Height Units: Feet
Time Zone: LST

High/Low Tide Prediction Data Listing

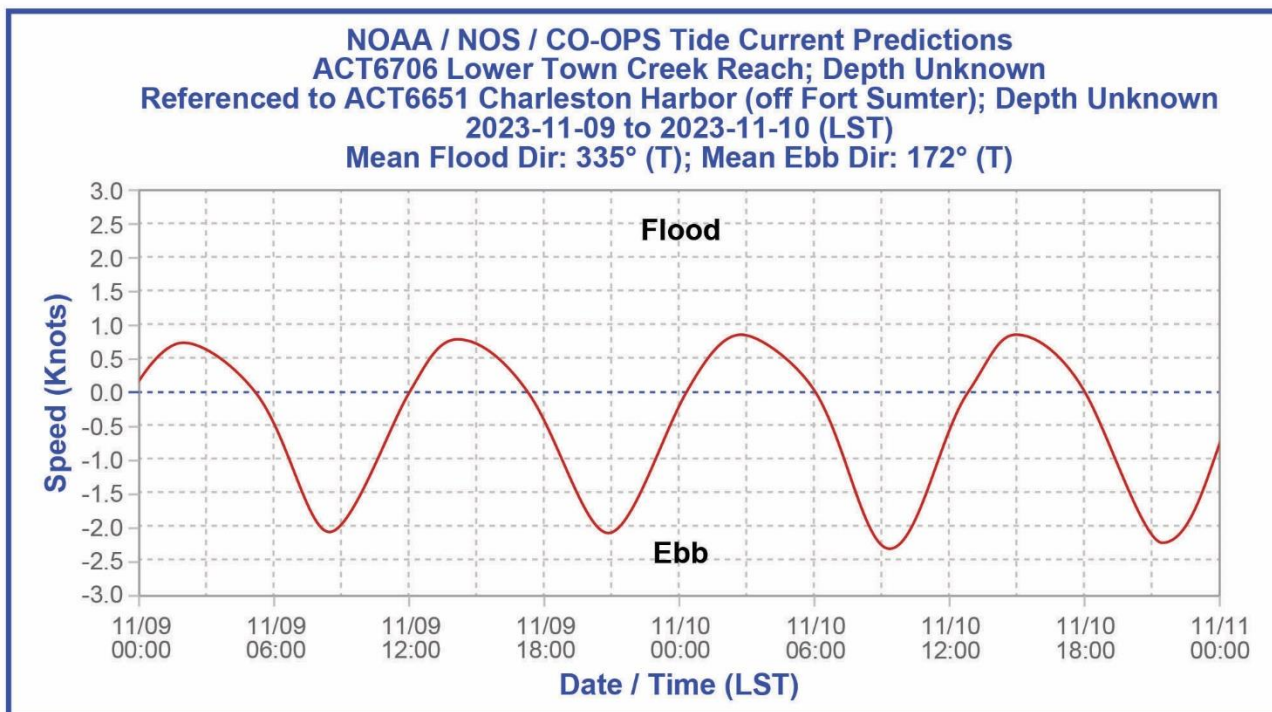
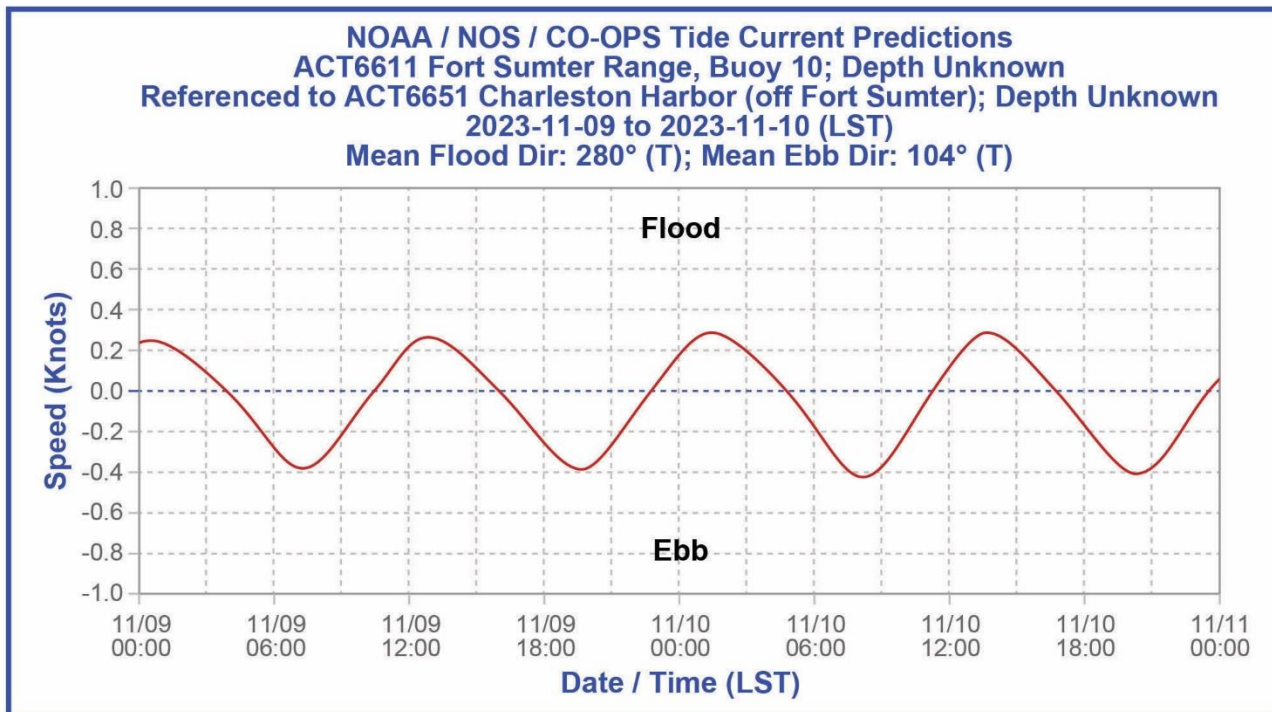
Date	Day	Time	Hgt	Time	Hgt	Time	Hgt	Time	Hgt
2023/10/02	Mon	03:16	0.55 L	08:12	1.55 H	14:36	0.34 L	20:57	2.17 H
2023/10/03	Tue	04:14	0.62 L	08:56	1.44 H	15:14	0.37 L	21:50	2.10 H

Note: The interval is High/Low, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.
Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

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