

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. A mooring buoy, if lighted, shows which color light?

- A. Any color except red or green
- B. Yellow
- C. White
- D. Blue

Correct answer: C

2. If the current and wind are in the same direction, what does the sea surface represent concern the true wind speed?

- A. The appearance of the sea surface does not change
- B. It appears higher than actually exists
- C. It appears less than actually exists
- D. It appears at the correct speed

Correct answer: C

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

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

Correct answer: B

4. Which table is NOT found in the U.S. Coast Pilots?

- A. Meteorological table
- B. Coastwise distance table
- C. Luminous range table
- D. Climatological table

Correct answer: C

5. The Light List shows a lighted aid to navigation on the left bank. This means that the light can be seen on the port side of a vessel under which condition?

- A. The vessel is proceeding from seaward
- B. The vessel is crossing the river
- C. The vessel is descending the river
- D. The vessel is ascending the river

Correct answer: C

6. What volume of the Coast Guard Light List is used for the Mississippi River system?

- A. II
- B. V
- C. I
- D. IV

Correct answer: B

7. Which term is used to express the maximum distance at which a light may be seen under existing visibility conditions?

- A. Geographic range
- B. Nominal range
- C. Luminous range
- D. Charted range

Correct answer: C

8. Under the U.S. Aids to Navigation System used on the Western Rivers, which is TRUE of the aids to navigation lights on the right descending bank?

- A. They can only be green lights
- B. They are white or green lights
- C. They can only be white lights
- D. They are white or red lights

Correct answer: B

9. Discounting slip, if your vessel is turning RPM for 10 knots and making good a speed of 10 knots, which is TRUE of the current?

- A. It is with you at 2 knots
- B. It is with you at 10 knots
- C. It is slack
- D. It is against you at 10 knots

Correct answer: C

10. How do preferred channel buoys indicate the preferred channel to transit?

- A. The location of the buoy in the channel junction
- B. The buoy's light rhythms
- C. The color of their top band
- D. Odd or even numbers

Correct answer: C

11. Entering a harbor, you take a bearing on a range and get 338° per gyrocompass (pgc). The true bearing from the chart is 340° T. Variation for the area is 14° E. Your course is 329° per standard magnetic compass (psc) and 338° pgc. What is the deviation on this heading?

- A. 3° E
- B. 3° W
- C. 5° E
- D. 5° W

Correct answer: B

12. On 9 November 2023 at 0330, 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"? See illustration D058NG.

- A. 0.1kts at 280° T
- B. 0.3kts at 335° T
- C. 0.1kts at 104° T
- D. 0.3kts at 172° T

Correct answer: A

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

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

Correct answer: A

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

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

Correct answer: D

15. Under the IALA-B Buoyage System, when entering from seaward, a buoy that should be left to port will be which color?

- A. Red
- B. Black
- C. Yellow
- D. Green

Correct answer: D

16. When does a Doppler speed log indicate speed over ground?

- A. At all times
- B. When sensing the bottom in depths of less than 600 feet
- C. The unit can only sense speed over ground when there is no current
- D. When the unit is in the volume reverberation mode

Correct answer: B

17. Which term is used to describe the small differences between the heights of two successive high tides or two low tides, in a tidal day?

- A. Solar tides
- B. Semidiurnal tides
- C. Mixed tides
- D. Diurnal tides

Correct answer: B

18. When using GPS without Selective Availability, what can you expect your horizontal accuracy to be of the unit?

- A. 3 meters
- B. 20 meters
- C. 100 meters
- D. 200 meters

Correct answer: B

19. How many high waters usually occur each day on the East Coast of the United States?

- A. One
- B. Two
- C. Three
- D. Four

Correct answer: B

20. Which is TRUE concerning privately maintained aids to navigation included in the Light List?

- A. They are painted white and must use a white light if lighted
- B. They must conform to the standards of the U.S. Aids to Navigation System
- C. They must be conspicuously marked by a signboard with the words "PRIVATE AID"
- D. Not permitted in or along first-class waterways and may be authorized for second- and third-class waterways

Correct answer: B

21. Which symbol represents a 10-fathom curve?

- A. _____
- B. _____ · _____ · _____ · _____
- C.
- D. ... _____ ... _____

Correct answer: B

22. The term "flood current" refers to that time when the water _____.

- A. is moving towards the ocean
- B. level is not changing
- C. is flowing towards the land
- D. level is rising because of heavy rains

Correct answer: C

23. You are steaming on a course of $198^{\circ}T$ at 18.5 knots. At 0316 you observe a lighthouse bearing $235^{\circ}T$. At 0348 the lighthouse bears $259^{\circ}T$. What is your distance off at the second bearing?

- A. 16.3 miles
- B. 15.8 miles
- C. 14.8 miles
- D. 15.3 miles

Correct answer: C

24. What is the relative bearing of an object on the starboard beam?

- A. 045°
- B. 090°
- C. 075°
- D. 060°

Correct answer: B

25. 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. A "blue norther"
- B. Southerly winds with steady rain; fog or overcast
- C. Light winds from the northeast with clear skies
- D. Strong, gusting winds from the northwest with thundershowers

Correct answer: B

26. Which of the following is the most accurate method of determining gyrocompass error while underway?

- A. Determining from the chart the course made good between celestial fixes
- B. Comparing the gyro heading with the magnetic compass heading
- C. It cannot be determined accurately at sea due to drift of unknown currents.
- D. Comparing the gyro azimuth of a celestial body with the computed azimuth of the body

Correct answer: D

27. The true course between two points is 106° . Your gyrocompass has an error of 2°E and you make an allowance of 2° leeway for a south wind. What gyro course should be steered to make the true course good?

- A. 106°pgc
- B. 102°pgc
- C. 108°pgc
- D. 104°pgc

Correct answer: A

28. You are steering 019°T , and a light is picked up dead ahead at a distance of 11.6 miles at 0216. You change course to pass the light 3 miles off abeam to port. If you are making 14 knots, what is your ETA at the position 3 miles off the light?

- A. 0258
- B. 0304
- C. 0307
- D. 0301

Correct answer: B

29. Which corrector will compensate for the deviation which is maximum on intercardinal compass headings?

- A. Flinders bar
- B. Fore-and-aft magnets
- C. Quadrantal spheres
- D. Transverse magnets

Correct answer: C

30. On a weather map, what does a large letter "H" indicate?

- A. A high-pressure area with warm, moist air, and inclement weather
- B. A heavy squall line is imminent near the "H"
- C. A high-pressure area with cool, dry air, and fair weather
- D. Horse latitudes, with rough seas and strong winds

Correct answer: C

31. In the U.S. Aids to Navigation System, what do red and green horizontally-banded buoys mark?

- A. Fishing grounds
- B. Channels for shallow draft vessels
- C. Junctions or bifurcations
- D. General anchorage areas

Correct answer: C

32. In regions near the poles, how are the winds generally described?

- A. Westerlies
- B. Northerlies
- C. Easterlies
- D. Southerlies

Correct answer: C

33. You are on course 344°T and take a relative bearing of a lighthouse of 090° . What is the true bearing to the lighthouse?

- A. 016°
- B. 074°
- C. 254°
- D. 270°

Correct answer: B

34. On a transpacific voyage, you receive a message from your vessel's operators saying that your vessel has been consigned to voluntary Naval Cooperation and Guidance for Shipping (NCAGS). Where can further information be located?

- A. the International Code of Signals (PUB 102)
- B. The Light List
- C. Radio Aids to Navigation (PUB 117)
- D. the Coast Pilot

Correct answer: C

35. You are underway on course 328°T when you sight a buoy broad on your port bow. Which would indicate that you are in the best navigable water?

- A. The buoy exhibits a light with the characteristic of VQ(3)5s
- B. The buoy is a western quadrant buoy
- C. The buoy has a topmark of two cones with points down
- D. The buoy is painted yellow on the top half and black on the bottom

Correct answer: A

36. The winds of the "roaring forties" are strongest near which latitude?

- A. 50°N
- B. 40°N
- C. 50°S
- D. 40°S

Correct answer: C

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

Correct answer: B

38. What indicates a dual-purpose buoy?

- A. Red buoy with a horizontal yellow band
- B. Red and white vertically-striped buoy with a vertical yellow stripe
- C. Green buoy with a yellow square
- D. Red and white vertically-striped buoy with a red spherical topmark

Correct answer: C

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

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

Correct answer: C

40. A psychrometer has two thermometers that provide dry bulb and wet bulb temperatures. What can be determined by comparing these two temperature readings with a set of tables?

- A. atmospheric pressure
- B. wind speed
- C. wind chill factor
- D. relative humidity and dew point

Correct answer: D

41. In IALA Region B, entering from sea, how would a daymark on the port side of the channel be indicated on a chart?

- A. A red triangle with the letter R
- B. A white square with the letters GR
- C. A green square with the letter G
- D. A white triangle with the letters RG

Correct answer: C

42. Which item in illustration D034NG below shows a fixed and flashing light?

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

Correct answer: A

43. Under the U.S. Aids to Navigation System, which category is a yellow buoy?

- A. A cardinal mark
- B. A safe water buoy
- C. A junction buoy
- D. A special mark

Correct answer: D

44. A vessel crossing a river on the Western Rivers has the right of way over _____.

- A. vessels ascending the river
- B. all vessels ascending and descending the river
- C. vessels descending the river
- D. None of the above

Correct answer: D

45. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 3 1/2 seconds after the signal was sounded. What is the distance to the shore?

- A. 640 yards
- B. 315 yards
- C. 143 yards
- D. 480 yards

Correct answer: A

46. Which piece of navigational safety equipment is NOT required on towing vessels over 12 meters in length, provided that the vessel remains within the navigable waters of the U.S.?

- A. VHF-FM radio(s)
- B. Searchlight
- C. GPS receiver
- D. Charts or maps of the areas to be transited

Correct answer: C

47. Which navigational mark may only be lettered?

- A. A spherical buoy
- B. An unlighted, green, can buoy
- C. A red buoy
- D. A port side day-shape

Correct answer: A

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

Correct answer: C

49. The climate of the northern coast of the Gulf of America is _____.
- A. an east coast marine type of climate
 - B. humid and subtropical throughout the year
 - C. variable from warm to subtropical
 - D. a warm marine type of climate

Correct answer: D

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

Correct answer: A

51. Which agency maintains federal aids to navigation?
- A. Maritime Administration
 - B. National Ocean Service
 - C. Corps of Engineers
 - D. Coast Guard

Correct answer: D

52. You are plotting a running fix in an area where there is a determinable current. How should this current be treated in determining the position?
- A. The current should be ignored.
 - B. The set should be applied to the second bearing.
 - C. The drift should be added to the ship's speed.
 - D. The course and speed made good should be determined and used to advance the LOP.

Correct answer: D

53. Under the Uniform State Waterway Marking System how is a mooring buoy painted?
- A. Any color that does not conflict with the lateral system
 - B. White with a blue band
 - C. Yellow
 - D. White with a green top

Correct answer: B

54. You sight a spar buoy with the topmark shown in illustration D027NG below. You must take which of the following actions?

- A. Pass to the east of the buoy
- B. Pass to the south of the buoy
- C. Pass to the north of the buoy
- D. Keep well clear of the buoy and pass on either side

Correct answer: D

55. Which is a feature of a special daymark?

- A. A yellow diamond
- B. A red-and-white octagon
- C. A green square
- D. A daymark with a yellow stripe on it

Correct answer: A

56. The chart indicates the variation was $3^{\circ}45'W$ in 1988, and the annual change is decreasing 6'. If you use the chart in 1991 how much variation should you apply?

- A. $3^{\circ}27'W$
- B. $3^{\circ}27'E$
- C. $4^{\circ}03'W$
- D. $4^{\circ}03'E$

Correct answer: A

57. What can be expected with the presence of stratus clouds and a dying wind?

- A. Clearing skies
- B. Heavy rain
- C. Heavy snow
- D. Thick fog

Correct answer: D

58. The greater the pressure difference between a high and a low-pressure center, the _____.

- A. dryer the air mass will be
- B. warmer the temperature will be
- C. greater the force of the wind will be
- D. cooler the temperature will be

Correct answer: C

59. 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 $009^\circ T$ and the variation to be $15^\circ W$. If the ship's course is $026^\circ psc$, what is the deviation for the present heading?

- A. $2^\circ W$
- B. $2^\circ E$
- C. $1^\circ W$
- D. $1^\circ E$

Correct answer: A

60. What is the reaction of a gyrocompass to an applied force known as?

- A. Gravity effect
- B. Earth rate
- C. Gyroscopic inertia
- D. Precession

Correct answer: D

61. On 2 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? See illustration D056NG.

- A. 1436
- B. 2157
- C. 2057
- D. 2150

Correct answer: C

62. In most cases, the direction of the apparent wind lies between the bow and which reference point?

- A. The true north
- B. The direction of the true wind
- C. The beam on the lee side
- D. The beam on the windward side

Correct answer: B

63. Your radar displays your ship off center. As you proceed on your course, your ship's marker moves on the PPI scope while echoes from land masses remain stationary. What is this display called?

- A. Off center
- B. Stabilized
- C. True motion
- D. Head up

Correct answer: C

64. You are underway and intend to make good a course of $040^{\circ}T$. You experience a current with a set and drift of $190^{\circ}T$ at 1.4 knots, and a northwest wind produces a leeway of 3° . You adjust your course to compensate for the current and leeway, while maintaining an engine speed of 10 knots. What will be your speed made good over your intended course of $040^{\circ}T$?

- A. 7.8 knots
- B. 8.8 knots
- C. 9.8 knots
- D. 11.0 knots

Correct answer: B

65. Which describes a line of position derived by radar range from an identified point on a coast?

- A. A line parallel to the coast
- B. Parabola
- C. Straight line
- D. Arc

Correct answer: D

66. What should you apply to a fathometer reading to determine the depth of water?

- A. Subtract the sea water correction.
- B. Add the draft of the vessel.
- C. Subtract the draft of the vessel.
- D. Add the sea water correction.

Correct answer: B

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

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

Correct answer: D

68. When approaching a lock entrance, which flashing light is the visual signal displayed when a single lock is ready for entrance?

- A. An amber light
- B. A green light
- C. A white light
- D. A red light

Correct answer: B

69. In the Northern Hemisphere, when the center of a high-pressure system is due east of your position, you can expect winds from which direction?

- A. South to west
- B. North to east
- C. South to east
- D. North to west

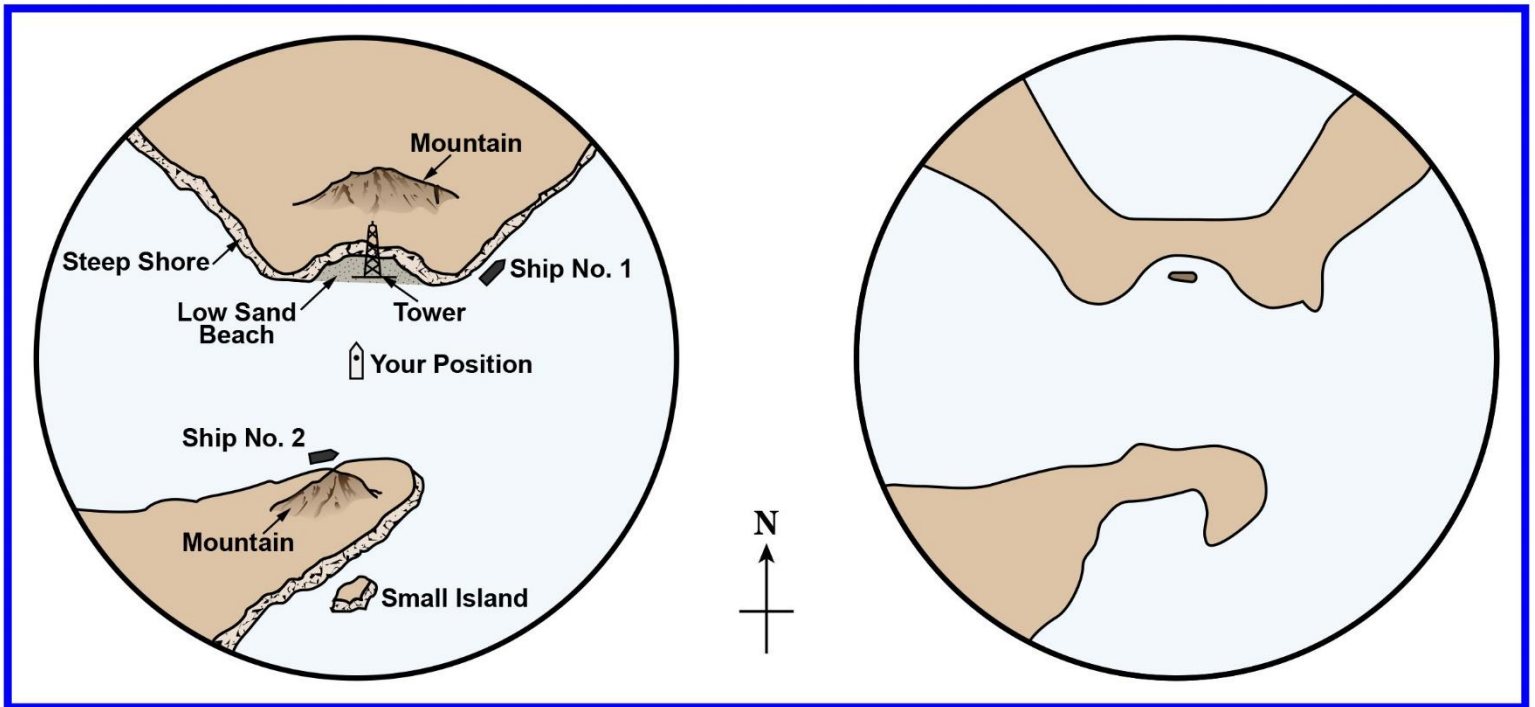
Correct answer: C

70. The velocity of a rotary tidal current will increase when the Moon is at which phase?

- A. At perigee
- B. Full
- C. New
- D. All of the above

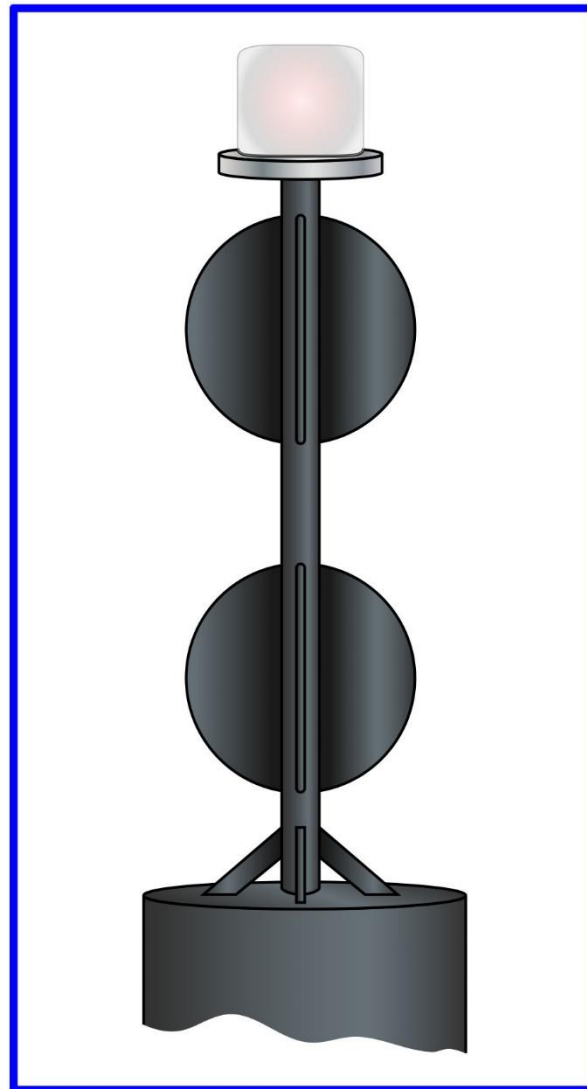
Correct answer: D

D011NG



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D027NG



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D034NG

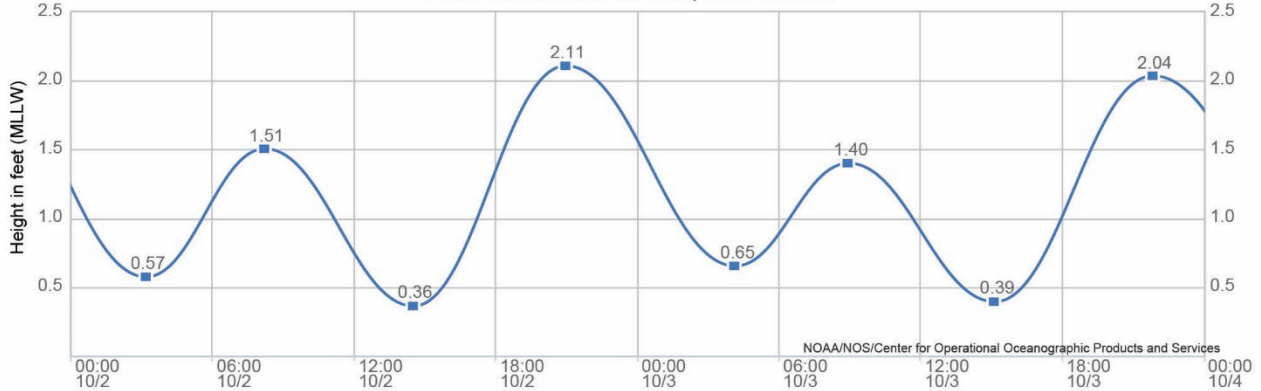


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Abbreviations and Terms, 10 edition

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D056NG

NOAA/NOS/CO-OPS
Tide Predictions at 8574680, Baltimore MD

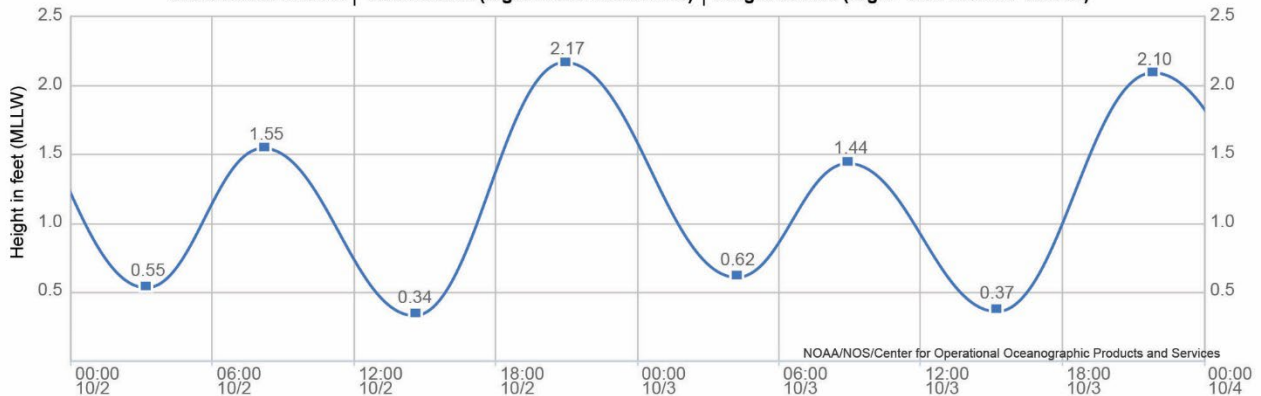


Station Name: Baltimore, MD
Action: Daily
Product: Tide Predictions
Start Date & Time: 2023/10/2 00:00
End Date & Time: 2023/10/3 23:59

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

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

NOAA/NOS/CO-OPS
Tide Predictions at 8574821, Hawkins Point, Patapsco River, MD
Subordinate Station | Time offsets (high: 0 min. low: 6 min.) | Height offsets (High: *1.03 ft. Low: *0.95 ft.)



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

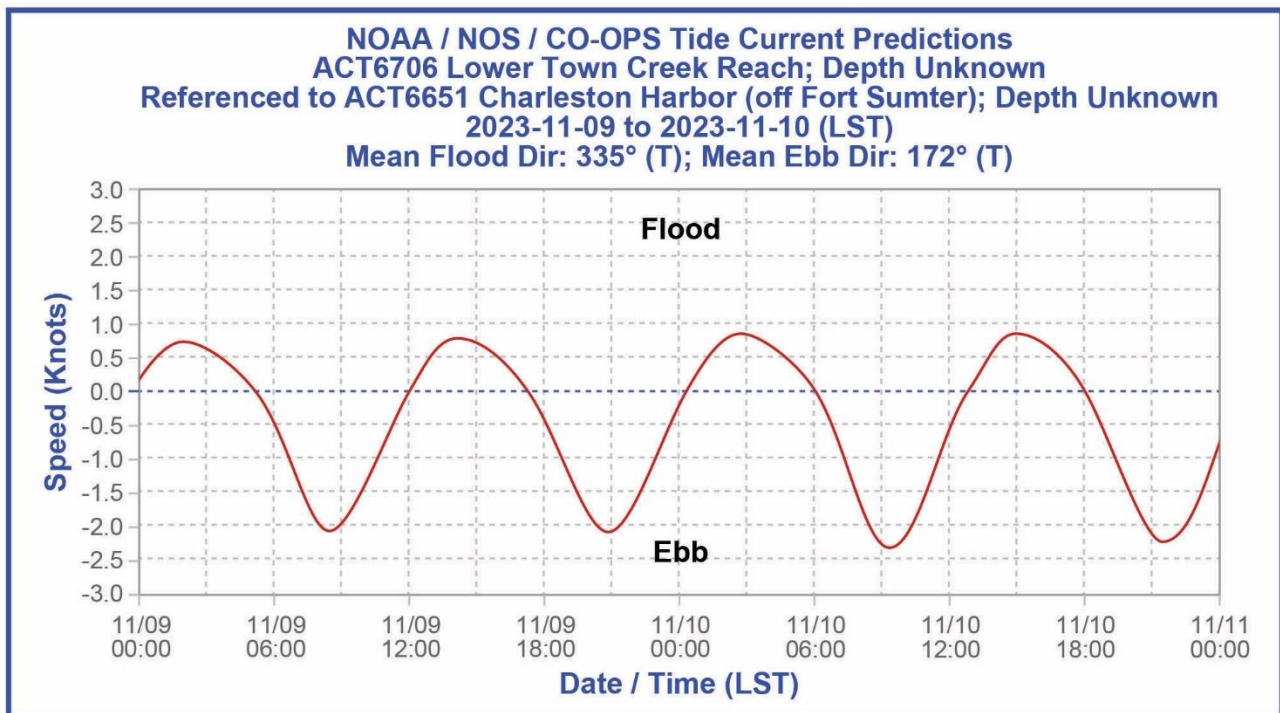
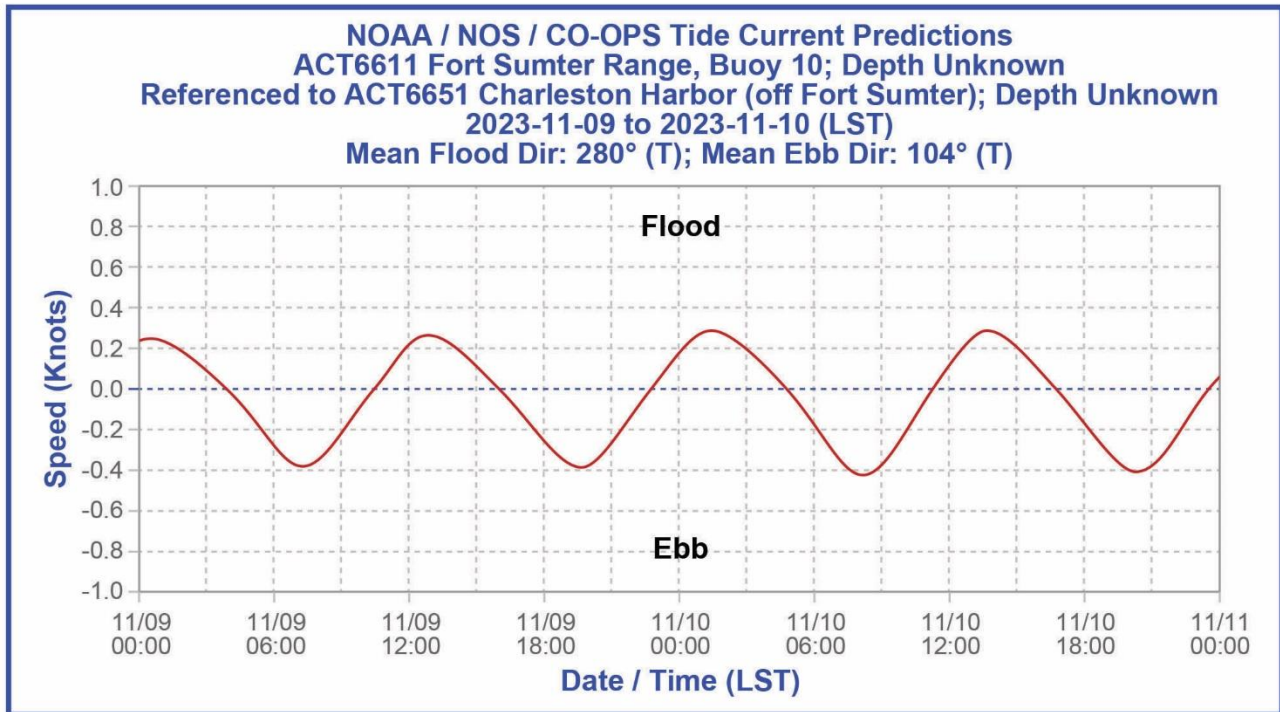
Source: NOAA/NOS/CO-OPS
Prediction Type: Subordinate
Datum: MLLW
Height Units: Feet
Time Zone: LST

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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