

U.S.C.G. Merchant Marine Exam

Mate of Unlimited Tonnage

Q310 Navigation General – Great Lakes and Inland

(Sample Examination)

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

1. Your radar indicates a target; however, there is no visible object at the point indicated. A large mountain, approximately 50 miles away on the same bearing as the target, is breaking the horizon. You should suspect the radar target is caused by _____.
- A. ducting
 - B. ionospheric skip waves
 - C. sub-refraction
 - D. a submerged submarine

Correct answer: A

2. You are underway on course 241°T at a speed of 18.2 knots. You sight a daymark bearing 241°T at a radar range of 3.9 miles at 1006. If you change course at 1009, what is the course to steer to leave the daymark abeam to starboard at 1.0 mile?
- A. 260°T
 - B. 257°T
 - C. 222°T
 - D. 218°T

Correct answer: C

3. Under the U.S. Aids to Navigation System, what does a lighted buoy with a spherical topmark mark indicate?
- A. The position of underwater cables
 - B. The port side of the channel
 - C. A hazard to navigation
 - D. Safe water

Correct answer: D

4. 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 shallow water
 - D. In deep water

Correct answer: A

5. What is typical of warm front weather conditions?
- A. A wind shift from southwest to northwest
 - B. Steady precipitation
 - C. Scattered cumulus clouds
 - D. An increase in pressure

Correct answer: B

6. Which theoretical minimum number of measurements from satellites does a GPS receiver need in order to provide an exact three-dimensional position?
- A. Five
 - B. Four
 - C. Three
 - D. Two

Correct answer: B

7. Charts should be corrected by using information published in which text?
- A. Light List
 - B. Notice to Mariners
 - C. Coast Pilot
 - D. American Practical Navigator

Correct answer: B

8. When a light is first seen on the horizon it will disappear again if the height of eye is immediately lowered several feet. When the eye is raised to its former height the light will again be visible. Which term is given to this process?
- A. Raising a light
 - B. Bobbing a light
 - C. Obscuring a light
 - D. Checking a light

Correct answer: B

9. Information about the pilotage available at Miami harbor may best be obtained from which publication?
- A. Pilot Chart
 - B. Sailing Directions
 - C. United States Coast Pilot
 - D. World Port Index

Correct answer: C

10. What natural feature is responsible for the rather even climate found on the Florida peninsula throughout the year?
- A. The cool waters of the Sargasso Sea
 - B. The Bermuda high
 - C. The Gulf Stream
 - D. Strong masses of continental air

Correct answer: C

11. 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. By starting the compass with the spin axis in a north/south position
- B. The rotation of the Earth (Earth rate) automatically aligns the gyroscope with north, except for speed errors
- C. By mechanically or electrically applying forces to precess the gyroscope
- D. By taking advantage of the property of gyroscopic inertia

Correct answer: C

12. Which statement(s) is/are TRUE concerning radio equipment on towing vessels of 26 feet or more in length?

- A. Maintain a continuous listening watch on VHF channel 16 and the bridge-to-bridge channel.
- B. Each radio operator must hold an FCC-issued restricted operator's license, or higher.
- C. The vessel must have a ship-radio-station license issued by the FCC.
- D. All of the above.

Correct answer: D

13. Your vessel is proceeding up a channel, and you see a pair of range lights that are in line dead ahead. The chart indicates that the direction of this pair of lights is $343^{\circ}T$, and the variation is 5° west. If the heading of your vessel at the time of the sighting is 344° per standard magnetic compass, what is the correct deviation?

- A. $1^{\circ}E$
- B. $1^{\circ}W$
- C. $4^{\circ}E$
- D. $4^{\circ}W$

Correct answer: C

14. All persons or vessels within the lock area, including the lock approach channels, come under the authority of which person?

- A. The dockmaster
- B. The lockmaster
- C. The lock foreman
- D. The dock captain

Correct answer: B

15. The National Geospatial-Intelligence Agency (formerly the National Imagery and Mapping Agency) would produce a chart of the coast of which area?

- A. Alaska
- B. Canada
- C. Puerto Rico
- D. Hawaii

Correct answer: B

16. A vessel crossing a river on the Western Rivers, must keep out of the way of which power-driven vessel?

- A. A power-driven vessel ascending the river without a tow
- B. A power-driven vessel ascending the river with a tow
- C. A power-driven vessel descending the river with a tow
- D. All of the above

Correct answer: D

17. The symbol which appears beside a light on a chart reads "Gp Fl R (2) 10 sec 160 ft 19M". Which characteristic describes the light?

- A. Its distinguishing number is "19M".
- B. It is visible 10 miles.
- C. It has a radar reflector.
- D. None of the above

Correct answer: D

18. You are on course 222°T and take a relative bearing of a lighthouse of 025°. What is the true bearing to the lighthouse?

- A. 197°
- B. 315°
- C. 247°
- D. 335°

Correct answer: C

19. Which item in illustration D034NG below shows an occulting light?

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

Correct answer: B

20. Which Zone of Confidence (ZOC) shows a full area search was NOT achieved and depth anomalies may be expected?

- A. ZOC A2
- B. ZOC B
- C. ZOC C
- D. ZOC U

Correct answer: C

- 21.** When a buoy is in position only during a certain period of the year, where may the dates when the buoy is in position be found?
- A. Light List
 - B. On the chart
 - C. Coast Pilot
 - D. Notice to Mariners

Correct answer: A

- 22.** You sight a buoy fitted with a double-sphere topmark. If sighted at night, what color and light sequence would you expect to see?
- A. A flashing red light showing a group of three flashes
 - B. A quick-flashing green light
 - C. A quick-flashing red light
 - D. A flashing white light showing a group of two flashes

Correct answer: D

- 23.** Which is TRUE of mean high water?
- A. It is used to indicate the shoreline where there is a large tidal fluctuation
 - B. It is used as the reference plane for bottom contour lines
 - C. It is used as the sounding datum for rivers, lakes, etc. regulated by locks
 - D. It is used as the reference for soundings on the Gulf coast of the U.S.

Correct answer: A

- 24.** What is a characteristic of cardinal marks?
- A. Square or triangular topmarks
 - B. Number-letter combinations for identification
 - C. Vertical stripes
 - D. Light rhythms indicating directional orientation

Correct answer: D

- 25.** While upbound through Memphis, the weather report on the TV news indicates that a cold front will cross western Kentucky and Tennessee the next morning. What weather should accompany this front?
- A. Light, southerly winds; high humidity and possibly fog
 - B. Gusting winds shifting to the northwest with thunderstorms
 - C. Scattered clouds with light to moderate southeasterly winds and possibly fog
 - D. Overcast with steady, light rain or drizzle

Correct answer: B

- 26.** Lighted white and orange buoys must show which color light?
- A. Alternating yellow and white
 - B. Red
 - C. White
 - D. Orange

Correct answer: C

27. Which is TRUE concerning compass error?

- A. Compass error is the sum of variation and deviation
- B. Compass error is variation plus compass course
- C. Compass error is equal to deviation minus variation
- D. Compass error is the difference between true and magnetic heading

Correct answer: A

28. You are on course 180° T and take a relative bearing of a lighthouse of 225° . What is the true bearing of the lighthouse?

- A. 180°
- B. 270°
- C. 135°
- D. 045°

Correct answer: D

29. What is a system of reservoirs and connecting tubes in a gyro compass called?

- A. The rotor
- B. The spider element
- C. The gyrotron
- D. The mercury ballistics

Correct answer: D

30. Your ship is entering port from sea, and you sight a pair of range lights. When in line, they bear 315° per standard magnetic compass. The chart shows that the range bearing is 312° T, and that variation is 6° W. What is the deviation of your compass at the time of the sighting?

- A. 3° E
- B. 3° W
- C. 9° E
- D. 9° W

Correct answer: A

31. Which is TRUE if the compass heading and the magnetic heading are the same?

- A. There is something wrong with the compass
- B. The compass is being influenced by nearby metals
- C. There is no deviation on that heading
- D. The deviation has been offset by the variation

Correct answer: C

32. White and orange buoys, if lighted, show which color light?

- A. White
- B. Alternating yellow and white
- C. Orange
- D. Red

Correct answer: A

33. Which is TRUE of a nun buoy in the IALA Region B system of buoyage?

- A. It will be cylindrical in shape
- B. It will be green in color
- C. It will be left to port when entering from seaward
- D. It will have an even number

Correct answer: D

34. Radar makes the most accurate determination of the _____.

- A. size of a target
- B. distance to a target
- C. direction of a target
- D. shape of a target

Correct answer: B

35. Information about the direction and velocity of rotary tidal currents can be found in which publication?

- A. Tide Tables
- B. Nautical Almanac
- C. Mariner's Guide
- D. Tidal Current Tables

Correct answer: D

36. Which position includes the effects of wind and current?

- A. Dead reckoning position
- B. Leeway position
- C. Estimated position
- D. Set position

Correct answer: C

37. Your vessel is on a course of 126°T at 17 knots.

At 0251 a light bears 099.5°T, and at 0313 the light bears 081°T.

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

- A. 0327, 4.4 miles
- B. 0351, 7.4 miles
- C. 0335, 6.2 miles
- D. 0345, 6.8 miles

Correct answer: C

38. What does a steep barometric gradient indicate?

- A. Light winds
- B. Calms
- C. Precipitation
- D. Strong winds

Correct answer: D

39. Under the U.S. Aids to Navigation System on the Western Rivers, which is TRUE of a preferred channel buoy?

- A. It shall be solid red
- B. It shall be horizontally-banded red and green
- C. It shall be vertically-striped red and white
- D. It shall be solid green

Correct answer: B

40. 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 course and speed made good should be determined and used to advance the LOP.
- B. The drift should be added to the ship's speed.
- C. The current should be ignored.
- D. The set should be applied to the second bearing.

Correct answer: A

41. Which defines the term relative humidity?

- A. The maximum vapor content the air is capable of holding
- B. The relation of the moisture content of the air to barometric pressure
- C. The ratio of the actual vapor content at the current temperature to the air's vapor holding capability
- D. The maximum vapor content the air is capable of holding at 70 degrees

Correct answer: C

42. Fog forms when the air temperature is at or below _____.

- A. 32°F
- B. the dry bulb temperature
- C. the wet bulb temperature
- D. the dew point

Correct answer: D

43. In United States waters, a buoy having red and white vertical stripes if lighted, it will have which light characteristic?

- A. Morse (A)
- B. Quick flashing
- C. Interrupted quick flashing
- D. Group occulting

Correct answer: A

44. You will be advised of any hazardous areas due to the fallout of a nuclear explosive by a message with which code word?

- A. NUCLEAR
- B. FALLOUT
- C. MERWARN
- D. FALLWARN

Correct answer: C

45. What happens to the barometric pressure after a cold front passes?

- A. Drops, and the temperature rises
- B. Drops, and the temperature drops
- C. Rises, and the temperature drops
- D. Rises, and the temperature rises

Correct answer: C

46. Buoys which mark dredging areas are painted which color?

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

Correct answer: C

47. You are planning to enter an unfamiliar U.S. port. Which publication provides information about channel depths, dangers, obstructions, anchorages, and marine facilities available in that port?

- A. Sailing Directions
- B. Notice to Mariners
- C. American Practical Navigator
- D. Coast Pilot

Correct answer: D

48. What describes a flood current?

- A. Horizontal movement of the water toward the land after low tide
- B. Horizontal movement of the water away from the land following high tide
- C. Horizontal movement of the water toward the land after high tide
- D. Horizontal movement of the water away from the land following low tide

Correct answer: A

49. On 2 October 2023, you will be docking at the Dundalk Marine terminals in Baltimore, MD at the second low 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. 1434
- B. 1428
- C. 1430
- D. 1436

Correct answer: A

50. Which statement concerning current is TRUE?

- A. The distance between a simultaneous DR position and fix is equal to the drift of the current.
- B. Current can be determined by measuring the direction and distance between simultaneous EP and DR positions.
- C. After the current is determined, it should not be used for further plotting because it is an unknown variable.
- D. The drift of the current should be averaged out on a one-hour basis.

Correct answer: D

51. Which type of cloud is the classic "thunderhead"?

- A. Cirrus
- B. Altostratus
- C. Stratus
- D. Cumulonimbus

Correct answer: D

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

Correct answer: C

53. You are steering 154° per gyrocompass. The wind is northeast by east, causing 4° leeway. The gyro error is 3° east, variation is 11° west, and deviation is 7° E. What is the true course made good?

- A. 151° T
- B. 158° T
- C. 164° T
- D. 161° T

Correct answer: D

54. Which term refers to the direction a current is flowing?

- A. Set
- B. Drift
- C. Vector direction
- D. Stand

Correct answer: A

55. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 4 seconds after the signal was sounded. What is the distance to the shore?

- A. 209 yards
- B. 363 yards
- C. 480 yards
- D. 730 yards

Correct answer: D

56. When a dual-purpose marking is used, how should the mariner following the Intracoastal Waterway be guided?

- A. By the shape of the aid
- B. By the shape of the yellow mark
- C. By the color of the top band
- D. By the color of the aid

Correct answer: B

57. Geographic range is the maximum distance at which a light may be seen under which conditions?

- A. Permitting visibility conditions, limited only by interference from background lighting
- B. Permitting visibility conditions, limited only by the curvature of the Earth
- C. Existing visibility conditions, limited only by the intensity of the light
- D. Existing visibility conditions, limited only by the curvature of the Earth

Correct answer: B

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

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

Correct answer: A

59. Information about currents around Pacific Coast ports of the U.S. can be obtained in which publication?

- A. Ocean Current Tables
- B. Tidal Current Tables
- C. Tide Tables
- D. Nautical Almanac

Correct answer: B

- 60.** In the U.S. Aids to Navigation System, lateral aids as seen entering from seaward will display lights with which characteristic?
- A. Flashing
 - B. Quick Flashing
 - C. Occulting
 - D. All of the above

Correct answer: D

- 61.** The Light List indicates that a dayboard is a type MR. You should take which action?
- A. Look for the other dayboard forming the range
 - B. Look for an all red daymark
 - C. Check to enter the correct channel at this junction daymark
 - D. Leave it on either side

Correct answer: D

- 62.** Which is TRUE of an aneroid barometer?
- A. An instrument in which the pressure of the air is measured
 - B. An instrument that tells which direction a storm is coming from
 - C. An instrument used to measure the speed of wind
 - D. An instrument that is used to measure the height of waves

Correct answer: A

- 63.** If the current and wind are in the same direction, what does the sea surface represent concern the true wind speed?
- A. It appears higher than actually exists
 - B. It appears at the correct speed
 - C. The appearance of the sea surface does not change
 - D. It appears less than actually exists

Correct answer: D

- 64.** You are on course 079°T, speed 11.2 knots. At 0904 you see a daymark bearing 078°T at a range of 4.6. If you change course at 0910 to leave the daymark abeam to starboard at 0.5 mile, at what time will the daymark be abeam?
- A. 0928
 - B. 0935
 - C. 0918
 - D. 0923

Correct answer: A

65. On 10 November 2023 at 2130, you are inbound at Charleston Harbor Entrance Buoy "10" (ACT6611). Your vessel will transit 15nm and make good 12.5 knots to a berth where the nearest tidal current station is ACT6706. What will be the direction and velocity of the current as you approach the dock? Illustration D058NG

- A. 0.4kts at 280°T
- B. 2.0kts at 335°T
- C. 2.0kts at 172°T
- D. 0.4kts at 104°T

Correct answer: C

66. Which causes the wind flow from the horse latitudes to the doldrums to be deflected?

- A. Differing atmospheric pressures
- B. The mid-latitude, semi-permanent high
- C. The prevailing westerlies
- D. The Coriolis force

Correct answer: D

67. If a sound signal is emitted from the oscillator of a fathometer, and two seconds elapse before the returning signal is picked up, what depth of water is indicated?

- A. 1248 fathoms
- B. 1048 fathoms
- C. 1648 fathoms
- D. 824 fathoms

Correct answer: D

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

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

Correct answer: B

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

Correct answer: D

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Illustrations: 3

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

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

Correct answer: B



D034NG



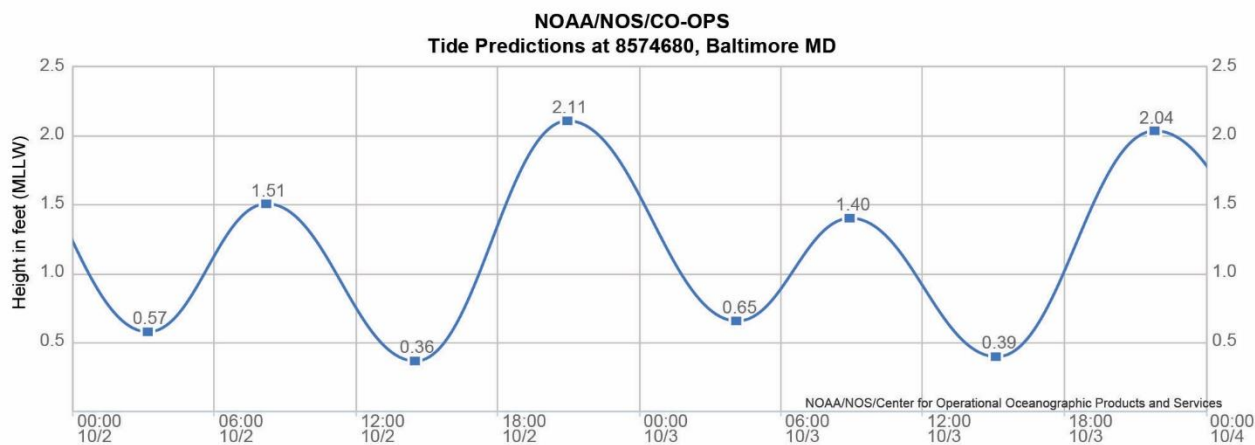
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Abbreviations and Terms, 10 edition

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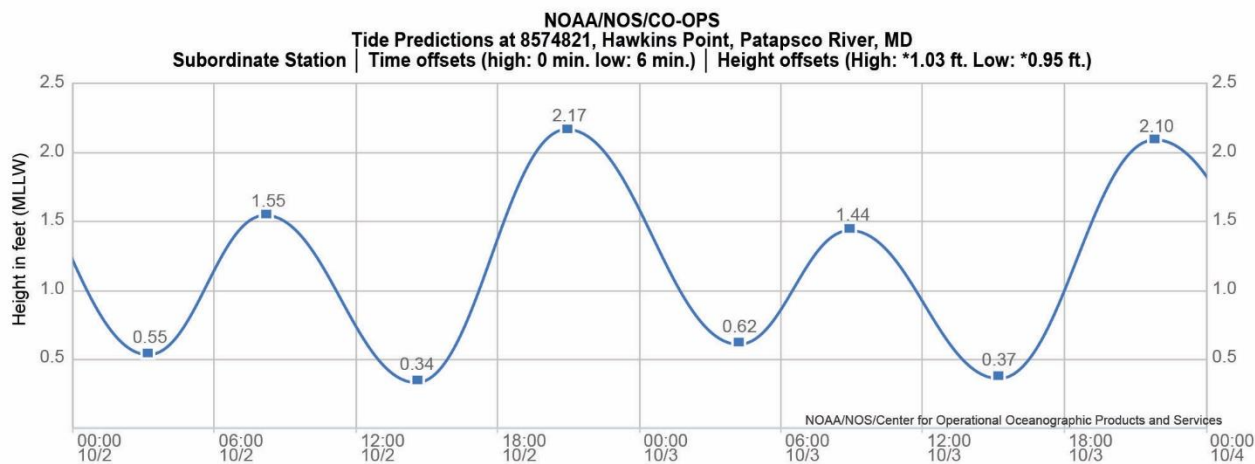


Station Name: Baltimore, MD
Action: Daily
Product: Tide Predictions
Start Date & Time: 2023/10/2 00:00
End Date & Time: 2023/10/3 23:59

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

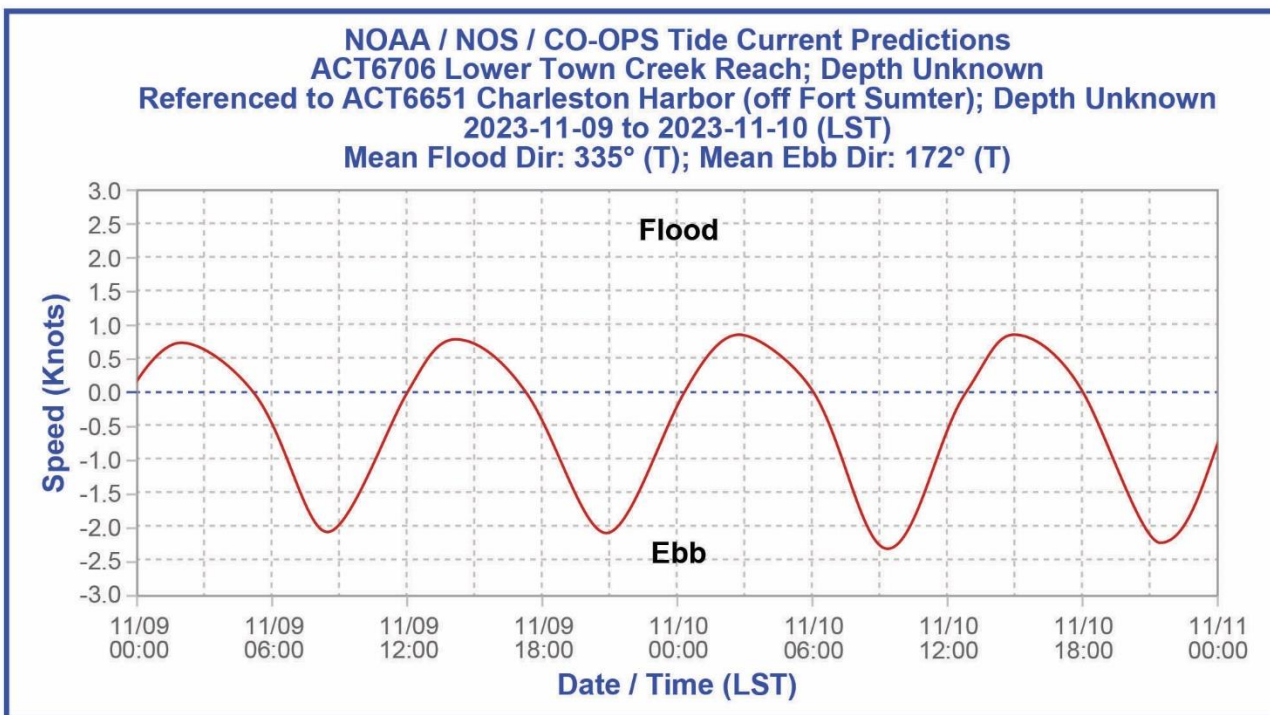
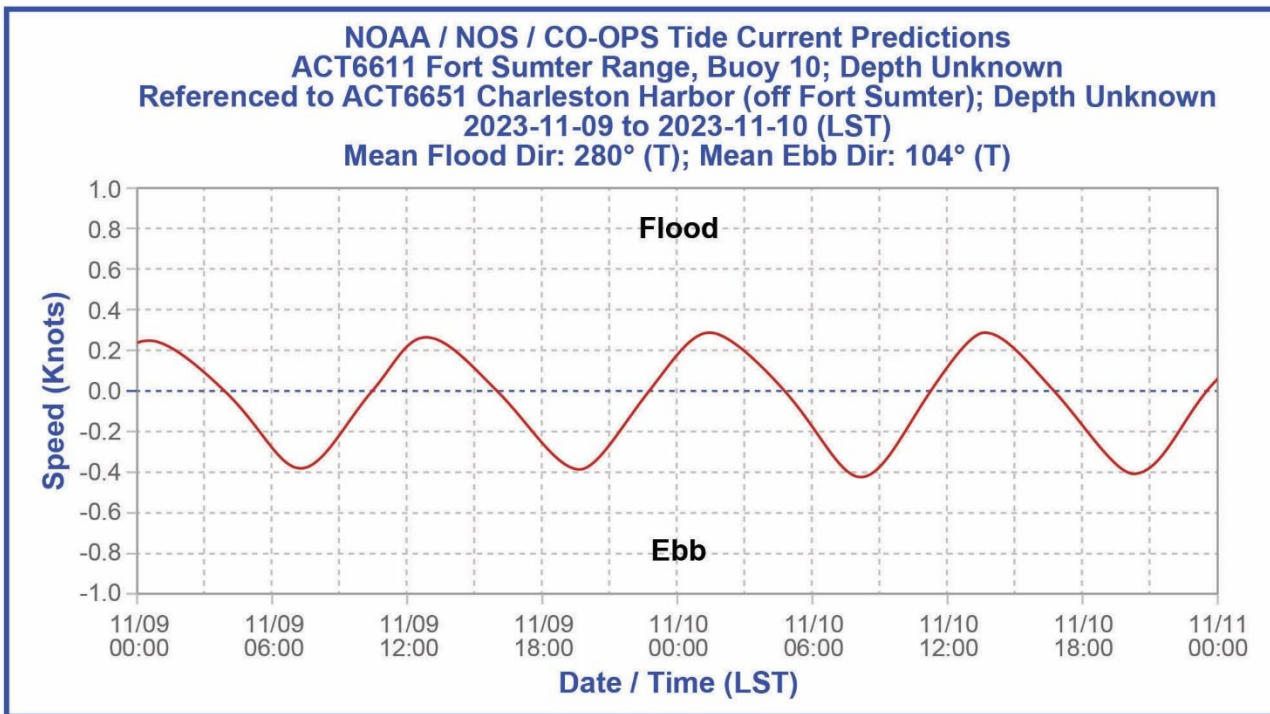
Date	Day	Time	Hgt	Time	Hgt	Time	Hgt	Time	Hgt
2023/10/02	Mon	03:16	0.55 L	08:12	1.55 H	14:36	0.34 L	20:57	2.17 H
2023/10/03	Tue	04:14	0.62 L	08:56	1.44 H	15:14	0.37 L	21:50	2.10 H

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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