

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. You desire to make good a true course of 279°. The variation is 8°W, magnetic compass deviation is 3°E, and gyrocompass error is 1°E. A north-northwesterly wind produces 3° leeway. What is the course to steer per standard magnetic compass (psc) to make the true course good?
- A. 290°psc
 - B. 284°psc
 - C. 287°psc
 - D. 281°psc

Correct answer: C

2. You are plotting a running fix. The LOP to be run forward is an arc from a radar range, what technique should be used?
- A. The position of the object observed should be advanced to the new time and a new arc swung using the radius of the old arc.
 - B. The arc should be converted into a straight line using offsets and then run forward.
 - C. The distance between LOP's should be added to the radar range and a new arc swung.
 - D. An arc should never be run forward.

Correct answer: A

3. Which statement about gyrocompass error is TRUE?
- A. Any error shown by a gyro repeater will be the same as the error of the master compass.
 - B. The amount of the error and the sign will generally be the same on all headings.
 - C. Any error will remain constant unless the compass is stopped and restarted.
 - D. The sign (E or W) of the error will change with different headings of the ship.

Correct answer: B

4. Which information is found in the chart title?
- A. Edition date
 - B. Number of the chart
 - C. Variation information
 - D. Survey information

Correct answer: D

5. Which describes a line of position derived by radar range from an identified point on a coast?
- A. Arc
 - B. Straight line
 - C. A line parallel to the coast
 - D. Parabola

Correct answer: A

6. What do the numbers on isobars indicate?

- A. Temperature
- B. Rain in inches
- C. Barometric pressure
- D. Wind speed

Correct answer: C

7. Which agency publishes the Light Lists?

- A. United States Coast Guard
- B. Army Corps of Engineers
- C. Oceanographic Office
- D. National Ocean Service

Correct answer: A

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

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

Correct answer: A

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

Correct answer: C

10. The climate of the eastern coast of the Gulf of America _____.

- A. varies from warm to subtropical
- B. has a Mediterranean type of climate
- C. has an east coast marine type of climate
- D. is humid and subtropical throughout the year

Correct answer: A

11. 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 $352^{\circ}T$, and the variation is $4^{\circ}W$. If the heading of your vessel at the time of the sighting is 359° per standard magnetic compass, what is the correct deviation?

- A. $3^{\circ}W$
- B. $7^{\circ}E$
- C. $11^{\circ}E$
- D. $11^{\circ}W$

Correct answer: A

12. 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

13. When observing a rapid rise in barometric pressure, what may you expect?

- A. Clearing weather, possibly accompanied by high winds
- B. Heavy rain or severe thundershowers
- C. Clear weather with no wind, but the possibility of rain or snow within 24 hours
- D. Deteriorating weather with rain or snow

Correct answer: A

14. What will act to dissipate fog?

- A. Downslope motion of an air mass along a coast
- B. Rain that is warmer than air
- C. Advection of warm air over a colder surface
- D. Upwelling cold water

Correct answer: A

15. Which cloud commonly produces a halo about the Sun or Moon?

- A. Altostratus
- B. Cirrocumulus
- C. Altocumulus
- D. Cirrostratus

Correct answer: D

16. Your vessel is on a course of $343^{\circ}T$ at 14 knots.

At 2156 a light bears $320.5^{\circ}T$, and at 2217 the light bears $298^{\circ}T$.

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

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

Correct answer: C

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

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

Correct answer: A

18. The compass rose on a nautical chart indicates both variation and which other information?

- A. Compass error
- B. Annual rate of variation change
- C. Annual rate of precession change
- D. Deviation

Correct answer: B

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

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

Correct answer: B

20. How are buoys which mark isolated dangers painted?

- A. Alternating green and white bands
- B. Alternating red and black bands
- C. Alternating green and black bands
- D. Alternating red and white stripes

Correct answer: B

21. Where would you expect to find climatological and meteorological tables for the Gulf Coast area?

- A. Only at the National Weather Service office
- B. In the back of Coast Pilot #5
- C. In the publication entitled Radio Aids to Navigation
- D. In any Coast Pilot volume

Correct answer: B

22. Your vessel is steering 096°T at 17 knots. At 1847 a light bears 057°T, and at 1916 the same light bears 033°T. What will be your distance off abeam?

- A. 9.9 miles
- B. 11.4 miles
- C. 11.9 miles
- D. 10.7 miles

Correct answer: B

23. How may a spherical buoy be identified?

- A. It may be green
- B. It may be lettered
- C. It may be red
- D. It may be numbered

Correct answer: B

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

Correct answer: C

25. Under the Uniform State Waterway Marking System how is a mooring buoy painted?

- A. Yellow
- B. Any color that does not conflict with the lateral system
- C. White with a green top
- D. White with a blue band

Correct answer: D

26. When do neap tides occur?

- A. When the Sun, Moon, and Earth are nearly in line, regardless of alignment order
- B. Only when the Sun and Moon are on the same sides of the Earth and are nearly in line
- C. When the Sun and Moon are at approximately 90° to each other, as seen from the Earth
- D. At the start of spring, when the Sun is nearly over the equator

Correct answer: C

27. Barometer readings in weather reports are given in terms of pressure at which reference location?

- A. The broadcasting station
- B. The weather station
- C. Sea level
- D. Washington, D.C.

Correct answer: C

28. You are underway and intend to make good a course of 040°T. You experience a current with a set and drift of 190°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°T?

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

Correct answer: B

29. On a working copy of a weather map what color is the line that represents a stationary front?

- A. Alternating red and blue
- B. Purple
- C. Red
- D. Blue

Correct answer: A

30. Which refers to the period at high or low tide during which there is no change in the height of the water?

- A. Stand of the tide
- B. Plane of the tide
- C. Range of the tide
- D. Reversing of the tide

Correct answer: A

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

Correct answer: A

32. Which is a weekly publication advising mariners of important matters affecting navigational safety?

- A. Notice to Mariners
- B. Sailing Directions
- C. Light List
- D. Coast Pilot

Correct answer: A

33. 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 Coast Pilot
- C. Radio Aids to Navigation (PUB 117)
- D. The Light List

Correct answer: C

34. Which radar control is used to reduce sea return at close ranges?

- A. Fast time constant
- B. Sensitivity time control
- C. Gain control
- D. Pulse length control

Correct answer: B

35. Which is TRUE of a sea breeze?

- A. A wind that blows towards the sea at night
- B. A wind that blows towards an island during the day
- C. A wind caused by cold air descending a coastal incline
- D. A wind caused by the distant approach of a hurricane

Correct answer: B

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

Correct answer: C

37. With respect to failure warnings and status indications, GPS receivers should provide, at a minimum,

_____.

- A. a cross-track error alarm
- B. a warning of loss of position
- C. an indication of a change in satellite configuration
- D. an alarm if engine speed is suddenly reduced

Correct answer: B

38. Which term is given to magnetism which is present only when the material is under the influence of an external field?

- A. Residual magnetism
- B. Permanent magnetism
- C. Terrestrial magnetism
- D. Induced magnetism

Correct answer: D

39. A current moving across a lock entrance toward the river or toward the dam is known by which term?

- A. Lockwash
- B. Outdraft
- C. Cutoff
- D. Springpool

Correct answer: B

40. Which agency maintains federal aids to navigation?

- A. Coast Guard
- B. Maritime Administration
- C. Corps of Engineers
- D. National Ocean Service

Correct answer: A

41. 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 $178^{\circ}T$, and the variation is $9^{\circ}W$. If the heading of your vessel at the time of the sighting is 180° per standard magnetic compass, what is the deviation?

- A. $2^{\circ}E$
- B. $2^{\circ}W$
- C. $7^{\circ}E$
- D. $7^{\circ}W$

Correct answer: C

42. You are on course 277°T and take a relative bearing of a lighthouse of 045°. What is the true bearing to the lighthouse?

- A. 038°
- B. 232°
- C. 315°
- D. 322°

Correct answer: D

43. Which defines a light's luminous range?

- A. The average distance of visibility of the light
- B. The maximum distance at which a light may be seen in clear weather
- C. The maximum distance at which a light may be seen considering the height of the light and the height of the observer
- D. The maximum distance at which a light may be seen under existing visibility conditions

Correct answer: D

44. 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

45. What are the colors of a mid-channel daymark?

- A. Green and white
- B. Red and white
- C. Green and red
- D. Black and red

Correct answer: B

46. What does the period of a lighted aid to navigation refer to?

- A. The official date of construction or establishment
- B. The length of time between flashes of the light
- C. The time required for the light to complete each cycle
- D. The time required for the longest flash of each cycle

Correct answer: C

47. What is an advantage of the magnetic compass aboard vessels?

- A. All points on the compass rose are readily visible.
- B. Compass error is negligible at or near the earth's magnetic poles.
- C. It is reliable due to its essential simplicity.
- D. It does not have to be checked as often.

Correct answer: C

48. Vessels regularly navigating Ohio and Mississippi rivers above Cairo, Illinois, and their tributaries, shall at all times have on board a copy of _____.

- A. U.S. Coast Pilot
- B. U.S. Army Corps of Engineers Navigation Regulations (Blue Book)
- C. Tide Tables
- D. Sailing Directions

Correct answer: B

49. Which item is NOT associated with cumulonimbus clouds?

- A. Steady rainfall
- B. Tornadoes or waterspouts
- C. Thunderstorms
- D. Hailstorms

Correct answer: A

50. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 5.5 seconds after the signal was sounded. What is the distance to the shore?

- A. 3450 ft (1052 meters)
- B. 2475 ft (754 meters)
- C. 3072 ft (936 meters)
- D. 3825 ft (1166 meters)

Correct answer: C

51. Which installed equipment on a towing vessel must be tested and logged when a new Master assumes command?

- A. Internal communications, including sound-powered telephones
- B. Vessel control alarms
- C. Navigational lights and search lights
- D. All of the above must be tested

Correct answer: D

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

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

Correct answer: A

53. What do clearance gauges at bridges indicate?

- A. The height of the tide
- B. The depth of water under the bridge
- C. The charted vertical clearance at mean low water
- D. The distance from the water to low steel of the bridge

Correct answer: D

54. When entering from seaward, what does a buoy displaying a single-flashing red light indicate?

- A. A wreck to be left on the vessel's port side
- B. The starboard side of the channel
- C. A junction with the preferred channel to the left
- D. A sharp turn in the channel to the right

Correct answer: B

55. On a nautical chart, what does the inner ring of a compass rose indicate?

- A. Compass error
- B. Deviation
- C. Magnetic directions
- D. True directions

Correct answer: C

56. 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. Bobbing a light
- B. Obscuring a light
- C. Raising a light
- D. Checking a light

Correct answer: A

57. 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

58. What do chart legends printed in capital letters indicate about the associated landmark?

- A. The landmark has a radio transmitter
- B. It is a government facility or station
- C. The landmark is conspicuous
- D. The landmark is inconspicuous

Correct answer: C

59. Your vessel is making way through the water at a speed of 12 knots. Your vessel traveled 30 nautical miles in 2 hours 20 minutes. What current are you experiencing?

- A. A head current with a drift of 0.4 knots
- B. A following current with a drift of 0.9 knots
- C. A head current with a drift of 0.9 knot
- D. A following current with a drift of 0.4 knot

Correct answer: D

60. On 3 October 2023, you will be docking at the Dundalk Marine terminals in Baltimore, MD at the first 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. 1508
- B. 0812
- C. 1430
- D. 0856

Correct answer: D

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

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

Correct answer: A

62. Yellow lights may appear on which buoys?

- A. Vertically-striped buoys
- B. Spherical buoys
- C. Special marks
- D. Horizontally-banded buoys

Correct answer: C

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

Correct answer: B

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

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

Correct answer: C

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

Correct answer: D

66. When entering from seaward, what does a buoy displaying a composite group (2+1) flashing red light indicate?

- A. The starboard side of the secondary channel
- B. A junction with the preferred channel to the left
- C. A wreck to be left on the vessel's port side
- D. A sharp turn in the preferred channel to the right

Correct answer: B

67. On 10 November 2023 at 0630, 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? See illustration D058NG.

- A. 0.4kts at 104°T
- B. 1.3kts at 172°T
- C. 1.3kts at 335°T
- D. 1.8kts at 172°T

Correct answer: B

68. Which would you expect to see on a lighted preferred-channel buoy?

- A. A yellow light
- B. A Morse (A) white light
- C. A fixed red light
- D. A composite group-flashing light

Correct answer: D

69. In the U.S. Aids to Navigation System on the Western Rivers, a preferred channel buoy to be left to port while proceeding downstream will _____.

- A. have a characteristic of composite group flashing if lighted
- B. have the upper band red
- C. show a red light if lighted
- D. All of the above

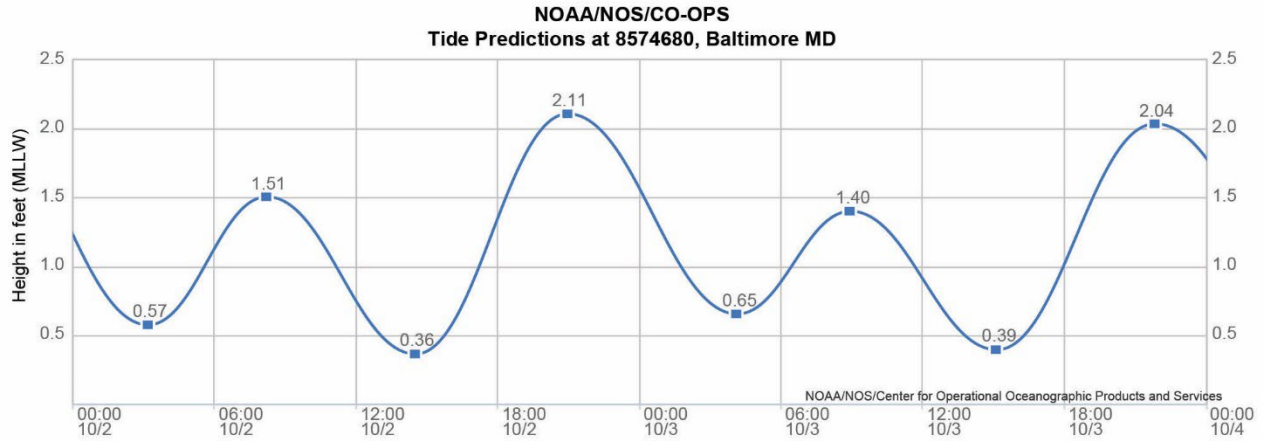
Correct answer: D

Q310 Navigation General-Great Lakes and Inland
U.S.C.G. Merchant Marine Exam
Mate of Unlimited Tonnage
Illustrations: 2

70. 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 difference in the periods of the light
 - B. One system having odd numbers while the other system has even numbers
 - C. The differing light colors
 - D. One system using horizontal bands while the other system uses vertical stripes

Correct answer: A

D056NG

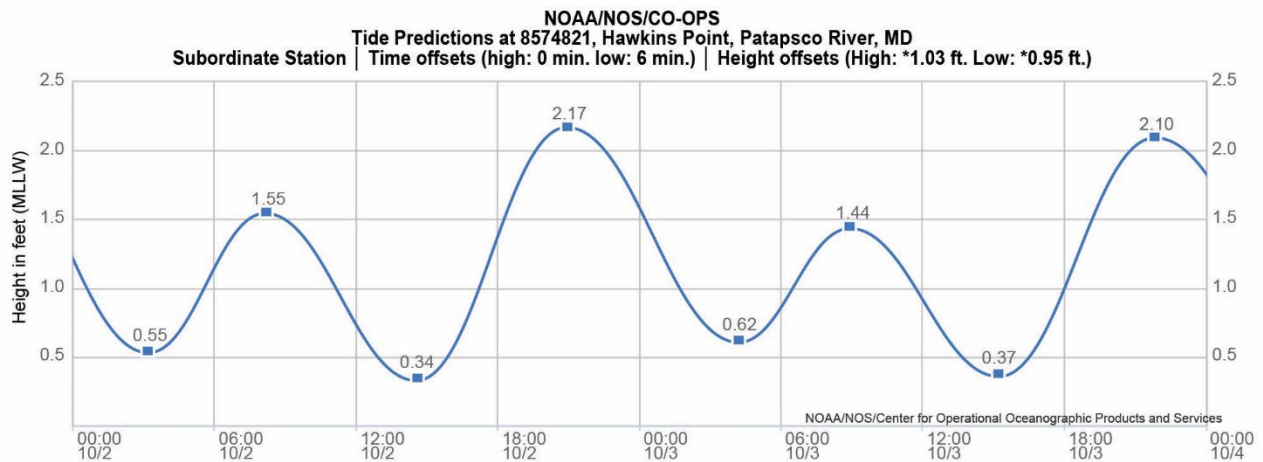


Station Name: Baltimore, MD
Action: Daily
Product: Tide Predictions
Start Date & Time: 2023/10/2 00:00
End Date & Time: 2023/10/3 23:59

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

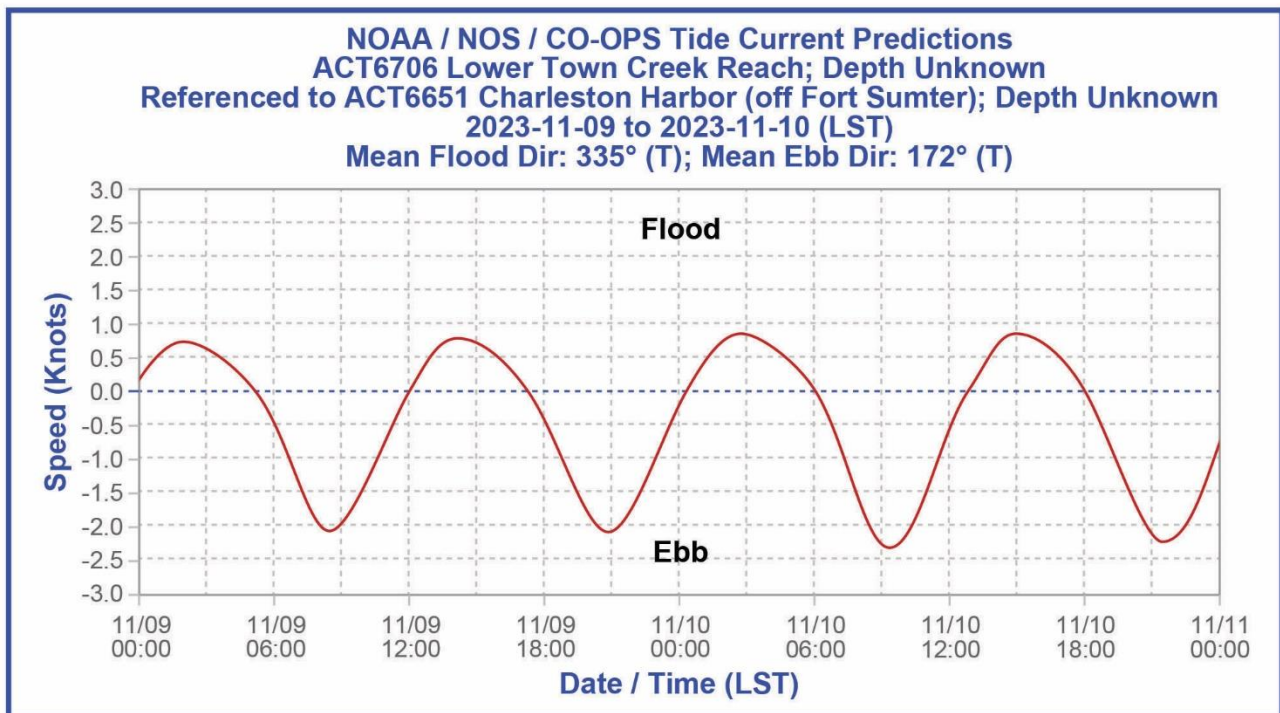
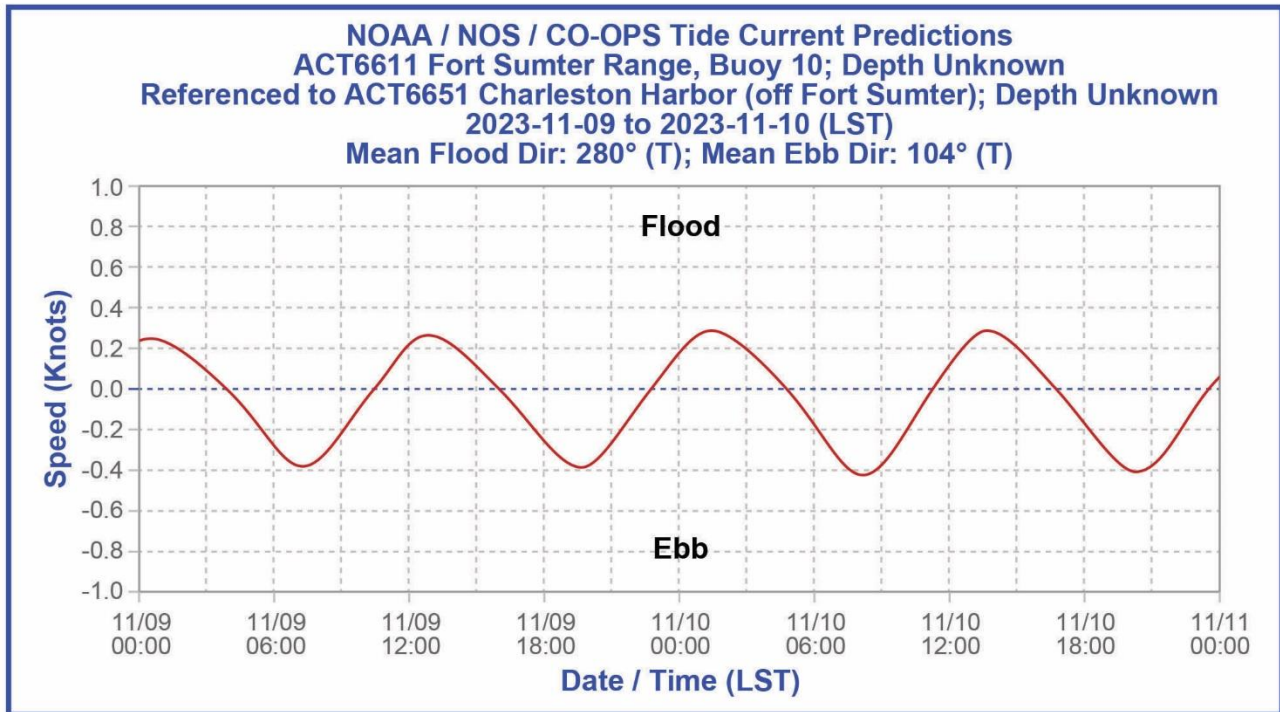
High/Low Tide Prediction Data Listing

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.

Adapted for testing purposes only from National Oceanic and Atmospheric Administration (NOAA)
Tide Predictions,
<https://www.tidesandcurrents.noaa.gov>
Further reproduction prohibited without permission

D058NG



Adapted for testing purposes only from National Oceanic and Atmospheric Administration (NOAA)
Current Predictions,

<https://www.tidesandcurrents.noaa.gov>

Further reproduction prohibited without permission