

## U.S.C.G. Merchant Marine Exam

Mate Less than 500-1600 Gross Registered Tons

Q329 Navigation General – Great Lakes and Inland

(Sample Examination)

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

1. 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. Red
- B. Magenta
- C. Yellow
- D. Green

Correct answer: D

2. A magnetic compass card is marked in how many degrees?

- A. 90
- B. 180
- C. 360
- D. 400

Correct answer: C

3. What does the symbol shown in illustration D033NG below indicate on a chart?

- A. A red and white can buoy
- B. A can buoy with a rotating white light
- C. A sunken vessel marked by a buoy
- D. A safe water beacon

Correct answer: D

4. The Light List indicates that a dayboard is a type TR-SY. Which action should you take?

- A. Leave it to port when southbound on the Atlantic portions of the ICW
- B. Pass it close aboard on either side
- C. Expect a daymark with no lateral significance
- D. Look for a dayboard of type TR-TY to form a range

Correct answer: A

5. How is an occluded front represented on a weather map?

- A. An alternate red and blue line
- B. A purple line
- C. A blue line
- D. A dashed blue line

Correct answer: B

6. You are steaming southward along the west coast of the United States when you encounter a buoy showing a flashing red light. Which is TRUE concerning the buoy?
- A. The buoy can be on either side well clear
  - B. The buoy should be left on the vessel's starboard side
  - C. The buoy can remain on either side close aboard
  - D. The buoy should be left on the vessel's port side

Correct answer: D

7. Which term defines the difference between the heights of low and high tides?
- A. The depth of tide
  - B. Tidal range
  - C. Tidal distance
  - D. Tidal period

Correct answer: B

8. Which scale is considered a harbor chart?
- A. 1:150,000
  - B. not less than 1:500,000
  - C. not more than 1:25,000
  - D. 1:35,000

Correct answer: D

9. What is the basic principle of the magnetic compass?
- A. Magnetic materials of the same polarity repel each other and those of opposite polarity attract.
  - B. Magnetic meridians connect points of equal magnetic variation.
  - C. The Earth's magnetic lines of force are parallel to the surface of the Earth.
  - D. The compass needle(s) will, when properly compensated, lie parallel to the isogonic lines of the Earth.

Correct answer: A

10. You are underway on course 215°T while turning for an engine speed of 12 knots. The current is 000°T at 2.3 knots. What is the speed being made good?
- A. 8.5 knots
  - B. 10.2 knots
  - C. 10.9 knots
  - D. 11.2 knots

Correct answer: B

11. Which radar control reduces weak echoes out to a limited distance from the ship?
- A. The brilliance control
  - B. The fast time constant (differentiator)
  - C. The receiver gain control
  - D. The sensitivity time control (sea-clutter control)

Correct answer: D

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

- A. You should leave the buoy on your port hand.
- B. This buoy marks the end of the ICW in that geographic area.
- C. The yellow square is in error and it should be a yellow triangle.
- D. The yellow is retro-reflective material used to assist in sighting the buoy at night.

Correct answer: A

13. A special mark (yellow buoy), if lighted, may exhibit which light rhythm?

- A. Equal interval
- B. Morse "A"
- C. Occulting
- D. Flashing

Correct answer: D

14. 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

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

Correct answer: A

16. What is the relative bearing of an object broad on the port bow?

- A. 315°
- B. 330°
- C. 345°
- D. 360°

Correct answer: A

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

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

Correct answer: C

18. A drawbridge may use visual signals to acknowledge a vessel's request to open the draw. Which signal indicates that the draw will NOT be opened immediately?

- A. A fixed red light
- B. A flashing white light
- C. A flashing amber light
- D. A white flag raised and lowered vertically

Correct answer: A

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

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

Correct answer: A

20. 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"? See illustration D058NG.

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

Correct answer: D

21. 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

22. When do neap tides occur?

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

Correct answer: A

23. Which is TRUE when using the radar for navigation?

- A. When using two radar ranges for a fix, the objects of the ranges should be close to reciprocal bearings
- B. The best fix is obtained by using a tangent bearing and a range
- C. When using ranges, the most rapidly changing range should be measured first
- D. When crossing a radar range of one object with the visual bearing of a second object, the two objects should be  $80^\circ$  to  $110^\circ$  apart

Correct answer: C

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

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

Correct answer: D

25. You plot a fix using three lines of position and find they intersect in a triangle. You should plot the position of the vessel \_\_\_\_\_.

- A. in the geometric center of the triangle
- B. on the line of position from the nearest object, between the other two lines of position
- C. anywhere in the triangle
- D. outside of the triangle

Correct answer: A

26. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 6 seconds after the signal was sounded. What is the distance to the shore?

- A. 1200 yards
- B. 1100 yards
- C. 900 yards
- D. 1000 yards

Correct answer: B

27. 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. The lighthouse has lost power and has switched to emergency lighting
- B. That you have entered an area of shoal water or other hazard
- C. The light is characterized as alternately flashing
- D. It is the identifying light characteristic of the lighthouse

Correct answer: B

28. You have replaced the chart paper in the course recorder. Which statement is TRUE?

- A. Adjust the chart paper to indicate GMT
- B. Test the electrical gain to the thermograph pens
- C. Set the zone pen to the far right of the paper
- D. Line the course pen up on 0 degree mark

Correct answer: A

29. What does a white buoy with a blue band signify?

- A. Marking a restricted area
- B. A mooring buoy
- C. An isolated danger mark
- D. A hydrographic data collection buoy

Correct answer: B

30. As you enter a U.S. channel from seaward, which is TRUE concerning the numbers on the buoys?

- A. decrease with the can buoys being even numbered
- B. increase with the can buoys being even numbered
- C. increase with the can buoys being odd numbered
- D. increase in channels going to the north or west, and decrease in channels going to the south or east

Correct answer: C

31. A position that is obtained by applying estimated current and wind to your vessel's course and speed is a(n) \_\_\_\_\_.

- A. estimated position
- B. dead reckoning position
- C. fix
- D. None of the above

Correct answer: A

32. The climate of the eastern coast of the Gulf of America \_\_\_\_\_.

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

Correct answer: D

33. While proceeding downriver (descending) you sight a red diamond-shaped panel with small, red reflector squares in each corner on the left bank. Under the U.S. Aids to Navigation System on the Western Rivers what does this daymark indicate?

- A. It indicates a cable crossing
- B. It is a crossing daymark
- C. It is a passing daymark
- D. It is a special purpose signal

Correct answer: B

34. Which term defines the paths of intended travel between three or more points?

- A. Course
- B. Course over the ground
- C. Bearing
- D. Track

Correct answer: D

35. 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. Overcast with steady, light rain or drizzle
- B. Light, southerly winds; high humidity and possibly fog
- C. Scattered clouds with light to moderate southeasterly winds and possibly fog
- D. Gusting winds shifting to the northwest with thunderstorms

Correct answer: D

36. Which is TRUE concerning Hot air?

- A. Hot air holds more moisture than cold air
- B. The moisture content of air is independent of air temperature
- C. Hot air retains the same amount of moisture as cold air
- D. Hot air holds less moisture than cold air

Correct answer: A

37. Which symbol represents a 2-fathom curve?

- A. \_\_\_\_ . \_\_\_\_ . \_\_\_\_ .
- B. .. .. . .
- C. -- -- --
- D. .. \_\_\_\_ .. \_\_\_\_ .. \_\_\_\_

Correct answer: B



38. Which is TRUE of a dead reckoning (DR) plot?

- A. It may be started at an assumed position
- B. It is most useful when in sight of land
- C. It must be plotted using magnetic courses
- D. It ignores the effect of surface currents

Correct answer: D

39. To find the specific phase characteristic of a lighthouse on a sound of the United States you would use which reference?

- A. U.S. Coast Pilot
- B. Light List
- C. Nautical Chart Catalog
- D. American Practical Navigator

Correct answer: B

40. What is the name of the region of high pressure extending around the Earth at about 35°N latitude?

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

Correct answer: B

41. On 4 October 2023, you will be docking at the Redwood Marine Terminal in Eureka, CA at the first low tide. The berth is located between NOAA reference tidal station #9418767 and subordinate station #9418801. What time (LST) will you be docking? See illustration D062NG.

- A. 0828
- B. 2150
- C. 0836
- D. 0841

Correct answer: C

42. While on a course of 019°pgc, a light bears 14° on the port bow at a distance of 15.3 miles. What course should you steer to pass 1.5 miles abeam of the light, leaving it to port?

- A. 013°pgc
- B. 015°pgc
- C. 011°pgc
- D. 006°pgc

Correct answer: C

43. What is a lighted safe water mark fitted with to aid in its identification?

- A. Red and white retroreflective material
- B. A sequential number
- C. A red and white octagon
- D. A spherical topmark

Correct answer: D

44. An orange and white buoy indicating a vessel-exclusion area will be marked with what symbol?

- A. Diamond with a cross
- B. Circle
- C. Square
- D. Open-faced diamond

Correct answer: A

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

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

Correct answer: C

46. What agency of the U.S. Government issues charts of U.S. waters and Coast Pilots?

- A. National Oceanic and Atmospheric Administration
- B. U.S. Coast Guard
- C. National Imagery and Mapping Agency
- D. U.S. Naval Observatory

Correct answer: A

47. If the current and wind are in the same direction, what does the sea surface represent concerning 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

48. Which defines the term relative humidity?

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

Correct answer: D

49. Which time meridian is used for tide computations in New York Harbor?

- A. 82°30'W
- B. 75°00'W
- C. 52°30'W
- D. 60°00'W

Correct answer: B

50. In which publication could you find information concerning the minimum lighting required for bridges on U.S. waters?

- A. Mississippi River Systems Light List
- B. Code of Federal Regulations
- C. Chart No. 1.
- D. Notice to Mariners

Correct answer: B

51. If your vessel were proceeding up river (ascending), how is the port side of the channel marked according to the U. S. Aids to Navigation System on the Western Rivers?

- A. Red can buoys
- B. Red nun buoys
- C. Green can buoys
- D. Green nun buoys

Correct answer: C

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

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

Correct answer: B

53. Your vessel is leaving New York harbor in dense fog. As the vessel slowly proceeds toward sea, you sight a green can buoy on the starboard bow. Which action should you take?

- A. Turn hard right to get back into the channel.
- B. Stand on, leaving the buoy to your starboard.
- C. Stop and fix your position.
- D. Pass the buoy close to, leaving it to your port.

Correct answer: B

54. Which is TRUE concerning the flow of air around an anticyclone in the Southern Hemisphere?

- A. Air flows in a counterclockwise and outward direction
- B. Air flows in a clockwise and outward direction
- C. Air flows in a clockwise and inward direction
- D. Air flows in a counterclockwise and inward direction

Correct answer: A

55. In the IALA Maritime Buoyage System, what is a red and white vertically-striped buoy used to indicate?

- A. A special mark not primarily used for navigation
- B. Safe water
- C. Isolated danger
- D. Preferred channel

Correct answer: B

56. By what means are indications of the master gyrocompass sent to remote repeaters?

- A. by transmitter
- B. by phantom element
- C. by follow-up system
- D. by azimuth motor

Correct answer: A

57. In the Northern Hemisphere, an observer at point II in illustration D014NG below, should experience a wind shift from what direction?

- A. southwest, clockwise to northwest
- B. northeast, clockwise to west-southwest
- C. east, counterclockwise to south-southwest
- D. northeast, counterclockwise to northwest

Correct answer: A

58. What do widely spaced isobars on a weather map indicate?

- A. Gentle breezes
- B. Ice, snow or frozen rain
- C. The probability of tornados
- D. High winds

Correct answer: A

59. While on a course of 349°T, a light bears 13° on the starboard bow at a distance of 10.8 miles. What course should you steer to pass 2.5 miles abeam of the light leaving it to starboard?

- A. 352°T
- B. 355°T
- C. 346°T
- D. 349°T

Correct answer: D

60. You are underway in the North Sea on course 216°T when you sight a buoy bearing 021° relative. Under the IALA Buoyage System, you are in the best navigable water if the buoy has which of the following characteristics?

- A. Has a double cone topmark with both points up
- B. Has a continuous very quick light
- C. Is horizontally banded yellow, black, yellow
- D. Has a light characteristic of Q(6) + L Fl 15s

Correct answer: D

61. Which of the following is the most useful factor for predicting weather?

- A. The previous reading of the barometer
- B. The present reading of the barometer
- C. The rate and direction of change of barometric readings
- D. The difference in the barometric readings within the past 24 hours

Correct answer: C

62. 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 283°T, and the variation is 13°E. If the heading of your vessel at the time of the sighting is 278° per standard compass, what is the deviation?

- A. 5°E
- B. 5°W
- C. 8°E
- D. 8°W

Correct answer: D

63. You desire to make good a true course of 236°. The variation is 8°E, magnetic compass deviation is 1°E, and gyrocompass error is 3°W. A south-southeasterly wind produces a 1° leeway. What is the course to steer per standard magnetic compass (psc) to make the true course good?

- A. 228°psc
- B. 246°psc
- C. 244°psc
- D. 226°psc

Correct answer: D

64. The Daily Memorandum contains which information?

- A. Water levels at river ports where run-off affects tidal heights
- B. Scheduled vessel arrivals and departures for a 24-hour period
- C. Active weather disturbances such as hurricanes or tropical storms
- D. The latest navigational warnings

Correct answer: D

65. How are buoys which mark isolated dangers painted?

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

Correct answer: C

66. Which defines a light's luminous range?

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

Correct answer: C

67. 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. 1.2 feet
- B. between -.7 and +.5 feet
- C. between 1.9 and 3.2 feet
- D. 4.1 feet

Correct answer: A

68. 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

69. When using a buoy as an aid to navigation which of the following should be considered?

- A. The buoy should be considered to be in the charted position if it has been freshly painted.
- B. The buoy may not be in the charted position.
- C. If the light is flashing the buoy should be considered to be in the charted location.
- D. The buoy should be considered to always be in the charted position.

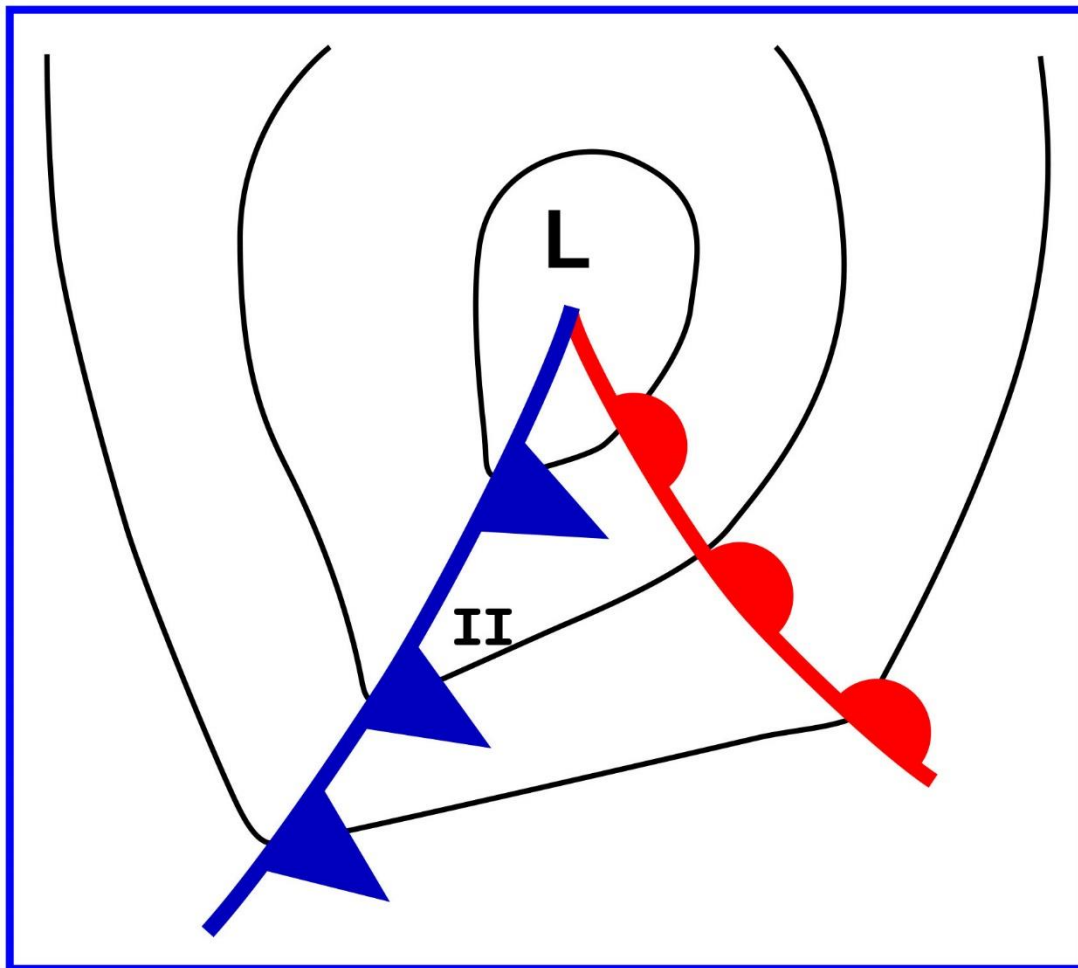
Correct answer: B

70. You are on course  $251^{\circ}$ pgc and  $241^{\circ}$  per magnetic compass, when you observe a range in line bearing  $192^{\circ}$ pgc. The chart indicates that the range is in line on a bearing of  $194^{\circ}$ T. The variation is  $16^{\circ}$ E. What is the deviation of the magnetic compass?

- A.  $2^{\circ}$ E
- B.  $2^{\circ}$ W
- C.  $4^{\circ}$ W
- D.  $10^{\circ}$ W

Correct answer: C

## D014NG



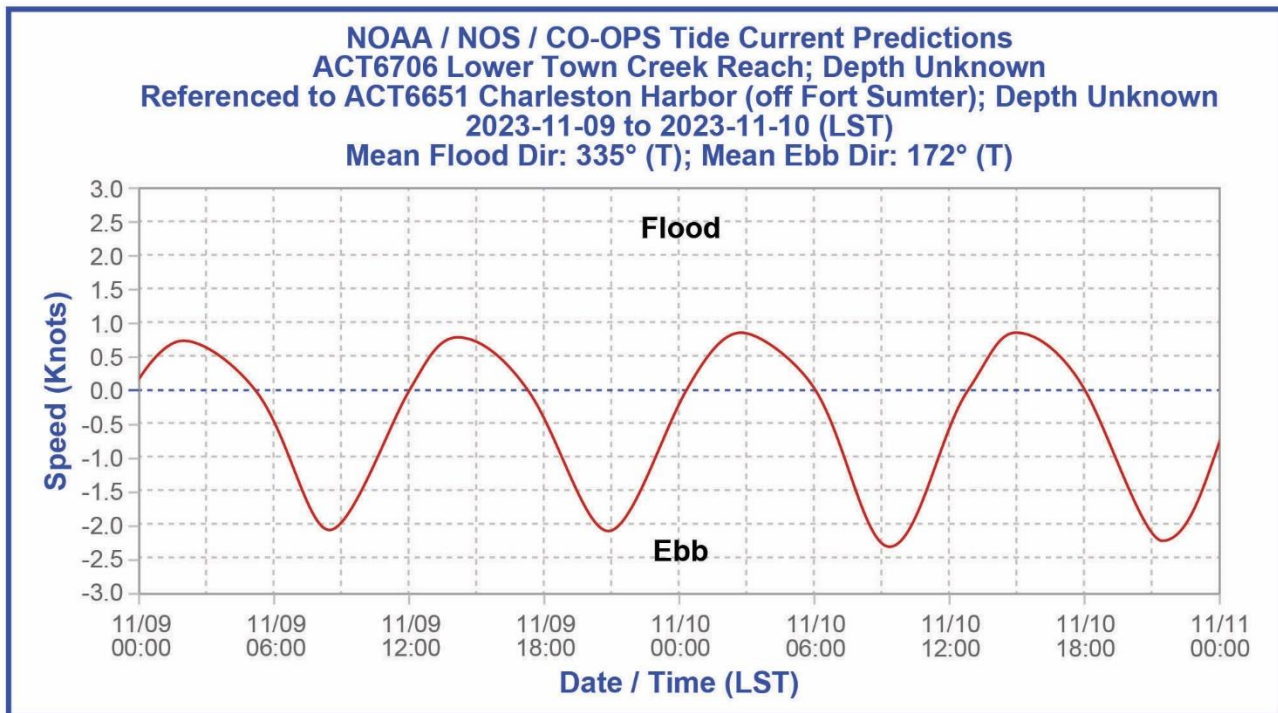
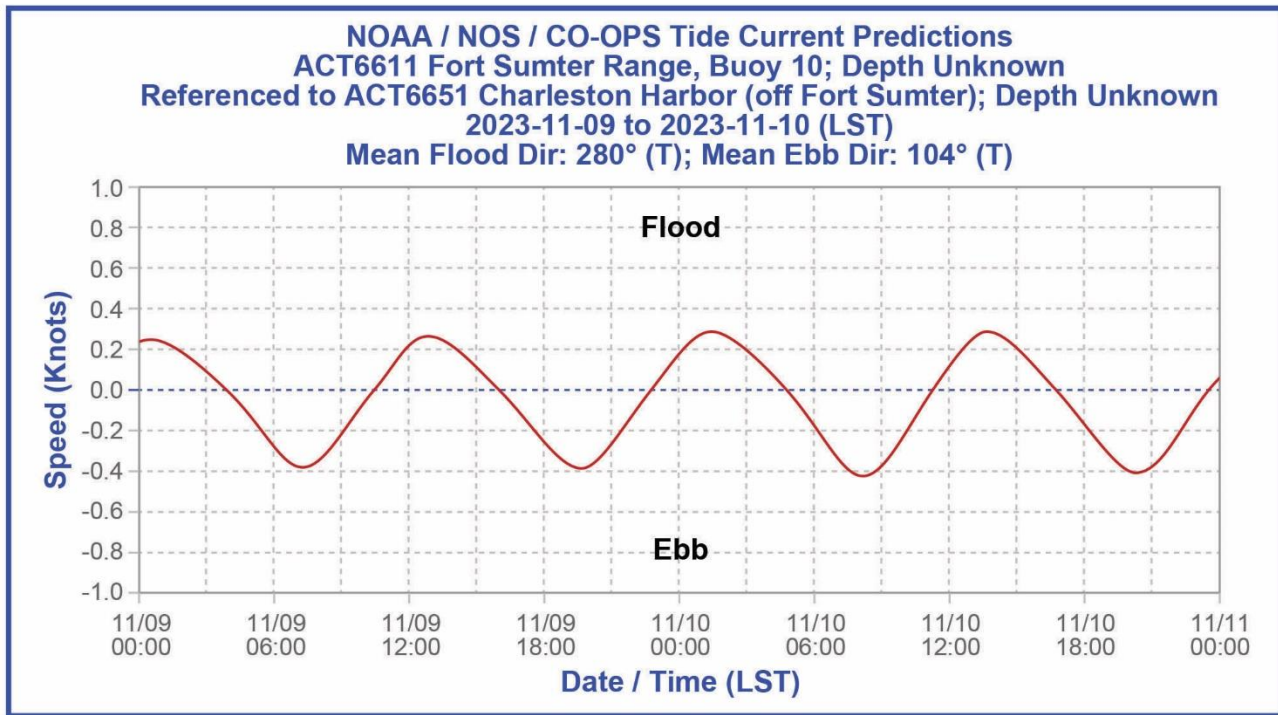


**D033NG**



**RW**  
**“A”**

## D058NG



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

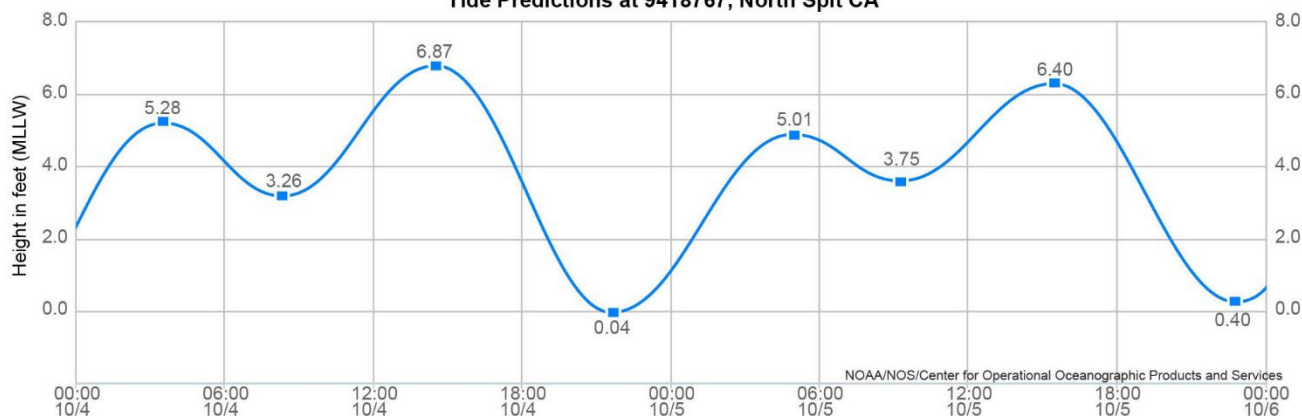
<https://www.tidesandcurrents.noaa.gov>

Further reproduction prohibited without permission

## D062NG

NOAA/NOS/CO-OPS

Tide Predictions at 9418767, North Spit CA



High/Low Tide Prediction Data Listing

Station Name: North Spit, CA  
Action: Daily  
Product: Tide Predictions  
Start Date & Time: 2023/10/4 00:00  
End Date & Time: 2023/10/5 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    |
|------------|-----|-------|--------|-------|--------|-------|--------|-------|--------|
| 2023/10/04 | Wed | 03:38 | 5.28 H | 08:28 | 3.26 L | 14:33 | 6.87 H | 21:47 | 0.04 L |
| 2023/10/05 | Thu | 04:52 | 5.01 H | 09:24 | 3.75 L | 15:25 | 6.40 H | 22:50 | 0.40 L |

NOAA/NOS/CO-OPS

Tide Predictions at 9418801, Eureka CA



High/Low Tide Prediction Data Listing

Station Name: Eureka, CA  
Action: Daily  
Product: Tide Predictions  
Start Date & Time: 2023/10/4 00:00  
End Date & Time: 2023/10/5 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    |
|------------|-----|-------|--------|-------|--------|-------|--------|-------|--------|
| 2023/10/04 | Wed | 04:04 | 5.60 H | 08:41 | 3.36 L | 14:59 | 7.28 H | 22:00 | 0.04 L |
| 2023/10/05 | Thu | 05:18 | 5.31 H | 09:37 | 3.86 L | 15:51 | 6.78 H | 23:03 | 0.41 L |

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