

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

### Apprentice Mate Steersman

#### Q420 Navigation General – Great Lakes and Inland

#### (Sample Examination)

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

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

Correct answer: B

2. Which would be the characteristic of an occulting light?
- A. 5 sec. flash, 5 sec. eclipse
  - B. 4 sec. flash, 2 sec. eclipse, 3 sec. flash, 2 sec. eclipse
  - C. 1 sec. flash, 2 sec. eclipse, 1 sec. flash, 5 sec. eclipse
  - D. 6 sec. flash, 6 sec. eclipse

Correct answer: B

3. Where can information about the direction and velocity of rotary tidal currents be found?
- A. Tide Tables
  - B. Mariner's Guide
  - C. Nautical Almanac
  - D. Tidal Current Tables

Correct answer: D

4. When entering a channel from seaward, which is TRUE concerning the numbers on buoys?
- A. They are marked in 6 inch figures with retro-reflective material
  - B. The numbers increase with the even numbers to starboard
  - C. The numbers decrease with the odd numbers to starboard
  - D. The numbers are the same as their Light List number

Correct answer: B

5. While your vessel is proceeding down a channel you notice a range of lights in line with your vessel's mast. If your vessel is on course 001° per gyrocompass and the charted value of the range of lights is 359°T, what is the gyro compass error?
- A. 2°W
  - B. 2°E
  - C. 1°E
  - D. 1°W

Correct answer: A

6. Lines drawn through points on the Earth having the same atmospheric pressure are known by which term?
- A. Isobars
  - B. Seismics
  - C. Isothermal
  - D. Millibars

Correct answer: A

7. In North America, which direction do the majority of the weather systems move?
- A. From east to west
  - B. From west to east
  - C. From north to south
  - D. From south to north

Correct answer: B

8. What is characteristic of an isophase light?
- A. 4 sec. flash, 2 sec. eclipse, 3 sec. flash, 2 sec. eclipse
  - B. 2 sec. flash, 5 sec. eclipse
  - C. 6 sec. flash, 3 sec. eclipse
  - D. 1 sec. flash, 1 sec. eclipse

Correct answer: D

9. What will a buoy marking a wreck show?
- A. A continuous quick white light and may be numbered
  - B. An occulting green light and may be lettered
  - C. A white light FL (2) and a topmark of 2 black spheres
  - D. A yellow light and will be numbered

Correct answer: C

10. Which term is used for a position obtained by applying ONLY your vessel's course and speed to a known position?
- A. Probable position
  - B. Fix
  - C. Dead-reckoning position
  - D. Running fix

Correct answer: C

11. The Light List shows that a navigational light has a nominal range of 15 miles and a height above water of 40 feet (12.2 meters). Your height of eye is 25 feet (7.6 meters) and the visibility is 5 miles. At about what range will you FIRST sight the light?
- A. 6.2 miles
  - B. 9.5 miles
  - C. 12.9 miles
  - D. 14.2 miles

Correct answer: B

12. Which statement(s) is/are TRUE concerning radio equipment on towing vessels of 26 feet or more in length?
- A. The vessel must have a ship-radio-station license issued by the FCC.
  - B. Each radio operator must hold an FCC-issued restricted operator's license, or higher.
  - C. Maintain a continuous listening watch on VHF channel 16 and the bridge-to-bridge channel.
  - D. All of the above.

Correct answer: D

13. You are steering  $143^{\circ}T$ , and a light is picked up dead ahead at a distance of 18.2 miles at 2006. You change course to pass the light 5.5 miles off abeam to port. If you are making 14.5 knots, what is your ETA at a position 5.5 miles off the light?
- A. 2115
  - B. 2118
  - C. 2121
  - D. 2124

Correct answer: B

14. On 9 November 2023 at 1130, you are inbound at Charleston Harbor Entrance Buoy "10" (ACT6611). Your vessel will transit 15nm and make good 10.0 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. 0.5kts at  $335^{\circ}T$
  - B. 0.2kts at  $104^{\circ}T$
  - C. 0.5kts at  $172^{\circ}T$
  - D. 0.2kts at  $280^{\circ}T$

Correct answer: A

15. How should a vessel spotted at  $45^{\circ}$  relative be reported?
- A. 4 points forward of starboard bow
  - B. 4 points abaft the starboard beam
  - C. On the starboard beam
  - D. Broad on the starboard bow

Correct answer: D

16. What will a veering wind do?

- A. Vary in strength constantly and unpredictably
- B. Change direction in a clockwise manner in the Northern Hemisphere
- C. Circulate about a high-pressure center in a clockwise manner in the Southern Hemisphere
- D. Circulate about a low-pressure center in a counterclockwise manner in the Northern Hemisphere

Correct answer: B

17. Relative humidity is the percentage of water vapor that is in the air as compared to the maximum amount it can hold at \_\_\_\_\_.

- A. a specific wing speed
- B. a specific temperature
- C. any time
- D. a specific barometric pressure

Correct answer: B

18. Which symbol represents a 10-fathom curve?

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

Correct answer: A

19. While on a course of 283°pgc, a light bears 10° on the port bow at a distance of 8.3 miles. What course should you steer to pass 3.5 miles abeam of the light leaving it to port?

- A. 289°pgc
- B. 294°pgc
- C. 298°pgc
- D. 302°pgc

Correct answer: C

20. 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. Diurnal tides
- C. Mixed tides
- D. Semidiurnal tides

Correct answer: D

21. A sailing chart could have which scale?

- A. Less than 1:25,000
- B. 1:35,000
- C. 1:100,000
- D. 1:700,000

Correct answer: D

22. A green buoy has a yellow triangle on it. What type of buoy is this?

- A. This buoy that is off-station and is marked to warn mariners of its wrong position
- B. This is an information or regulatory buoy that has lateral significance
- C. It is a buoy that was set in error and will be replaced with a red nun buoy
- D. It is a dual-purpose marker used where the ICW and other waterways coincide

Correct answer: D

23. The true course between two points is  $337^\circ$ . Your gyrocompass has an error of  $3^\circ\text{E}$  and you make an allowance of  $5^\circ$  leeway for a west wind. Which gyro course should be steered to make the true course good?

- A.  $339^\circ\text{pgc}$
- B.  $329^\circ\text{pgc}$
- C.  $345^\circ\text{pgc}$
- D.  $335^\circ\text{pgc}$

Correct answer: B

24. You are on course  $312^\circ\text{T}$ . To check the speed of your vessel you should observe a celestial body on which bearing?

- A.  $000^\circ$
- B.  $090^\circ$
- C.  $222^\circ$
- D.  $312^\circ$

Correct answer: D

25. A cardinal mark showing an uninterrupted quick-flashing white light indicates the deepest water is located in which quadrant?

- A. The north quadrant of the mark
- B. The east quadrant of the mark
- C. The south quadrant of the mark
- D. The west quadrant of the mark

Correct answer: A

26. On 4 October 2023, you will be docking at the Redwood Marine Terminal in Eureka, CA at the second high 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. 1433
- B. 1504
- C. 1459
- D. 1450

Correct answer: D

27. Prevailing winds between 30°N and 60°N latitude are from which direction?

- A. West
- B. East
- C. North
- D. South

Correct answer: A

28. Considering the general circulation of the atmosphere, what is the name given to the wind system between latitudes 30°N and 60°N?

- A. Northeast Trades
- B. Trade winds
- C. Southeasterlies
- D. Prevailing Westerlies

Correct answer: D

29. Which towing vessel(s) is/are exempt from carrying radar?

- A. A vessel used solely for pollution response or assistance towing.
- B. A vessel exempted, in writing, by the Captain of the Port.
- C. A vessel used solely in a limited area, such as a barge fleeting area.
- D. All of the above

Correct answer: D

30. What publication has information on the climate, distances, navigation regulations, outstanding landmarks, channels and anchorages of Long Island Sound?

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

Correct answer: C

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

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

Correct answer: C

32. In modern fathometers, what produces the sonic or ultrasonic sound waves?

- A. A transceiver
- B. A transducer
- C. An amplifier
- D. A generator

Correct answer: B

33. The vertical component of the Earth's magnetic field causes induced magnetism in vertical soft iron. This changes with latitude. What corrects for this coefficient of the deviation?
- A. The heeling magnet
  - B. The Flinders bar
  - C. Quadrantal soft iron spheres
  - D. Bar magnets in the binnacle

Correct answer: B

34. What causes compass deviation?
- A. Misalignment of the compass
  - B. A dirty compass housing
  - C. Magnetism from the earth's magnetic field
  - D. Magnetism within the vessel

Correct answer: D

35. You are a watchstanding mate and have come to the bridge to relieve the watch. After reviewing the chart and having been briefed by the off-going mate, you are now ready to affect the relief. Which of the following is exemplary of the statement that would officially transfer the watch?
- A. The mate being relieved says, "All in apparent good order, course 068° per gyro, 075° per standard."
  - B. You say to the mate going off watch, "I relieve you, course 321° per gyro, 316° per standard."
  - C. You say to the mate going off watch, "Destination New York, course 283°, speed 16 knots."
  - D. The mate being relieved says, "You now have the watch, course 147°, speed 15 knots."

Correct answer: B

36. At 0000 you fix your position and change course to 090°T. At 0030 you again fix your position and it is 0.5 mile east of your DR. Which statement is TRUE?
- A. You should alter course to the right to regain the track line.
  - B. The drift is 0.5 knot.
  - C. The current is perpendicular to your track line.
  - D. The current is easterly.

Correct answer: D

37. What does a Doppler log in the bottom return mode indicate?
- A. The depth of the water
  - B. The speed over the ground
  - C. The velocity of the current
  - D. The bottom characteristics

Correct answer: B



38. What color lights do lighted information markers display?

- A. White lights
- B. Green lights
- C. Yellow lights
- D. Red lights

Correct answer: A

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. The Light List indicates that a dayboard is a type KGW. You should take which action?

- A. Pass it close aboard on either side
- B. Look for a green and white diamond
- C. Look for another daymark to form the range
- D. Leave it to port when southbound on the Atlantic Coast ICW

Correct answer: C

41. Which term is given to the mechanical lifting of air by the upslope slant of the terrain?

- A. Convective lifting
- B. Advective lifting
- C. Vertical lifting
- D. Topographic lifting

Correct answer: D

42. The National Oceanic and Atmospheric Administration publishes which item?

- A. Coast Pilots
- B. Pilot charts
- C. Sailing Directions
- D. Light Lists

Correct answer: A

43. When using the ARPA in heavy rain, which action should you take?

- A. Increase the STC setting to reduce close-in spurious signals.
- B. Increase the radar gain to pick up weak echoes through the rain.
- C. Navigate as though the effective range of the radar has been reduced.
- D. Increase the range of the inner and outer guard rings.

Correct answer: C

44. As you enter a U.S. channel from seaward, which is TRUE concerning the numbers on the buoys?
- A. increase with the can buoys being even numbered
  - B. decrease with the can buoys being even numbered
  - C. increase in channels going to the north or west, and decrease in channels going to the south or east
  - D. increase with the can buoys being odd numbered

Correct answer: D

45. 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. It cannot be determined accurately at sea due to drift of unknown currents.
  - C. Comparing the gyro heading with the magnetic compass heading
  - D. Comparing the gyro azimuth of a celestial body with the computed azimuth of the body

Correct answer: D

46. 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  $283^{\circ}T$ , and the variation is  $13^{\circ}E$ . If the heading of your vessel at the time of the sighting is  $278^{\circ}$  per standard compass, what is the deviation?
- A.  $5^{\circ}E$
  - B.  $5^{\circ}W$
  - C.  $8^{\circ}E$
  - D.  $8^{\circ}W$

Correct answer: D

47. Which symbol represents a 2-fathom curve?
- A. - - - -
  - B. . . . . .
  - C. \_\_\_\_\_ . \_\_\_\_\_ . \_\_\_\_\_ .
  - D. .. \_\_\_\_\_ .. \_\_\_\_\_ .. \_\_\_\_\_

Correct answer: B

48. Which statement about radio navigational warnings is TRUE?
- A. The topics for warnings included in HYDROLANTS, HYDROPACS, and NAVAREA warnings are the same.
  - B. The United States is responsible for NAVAREA warnings in the North Atlantic north of  $7^{\circ}N$ , and west of  $15^{\circ}W$ .
  - C. Long range radio navigational warnings are usually broadcast by radiotelephone, radiotelegraph, and radio-teletypewriter.
  - D. NAVAREA warnings concern only coastal navigation and inland navigation in large bays or sounds such as Puget Sound.

Correct answer: A

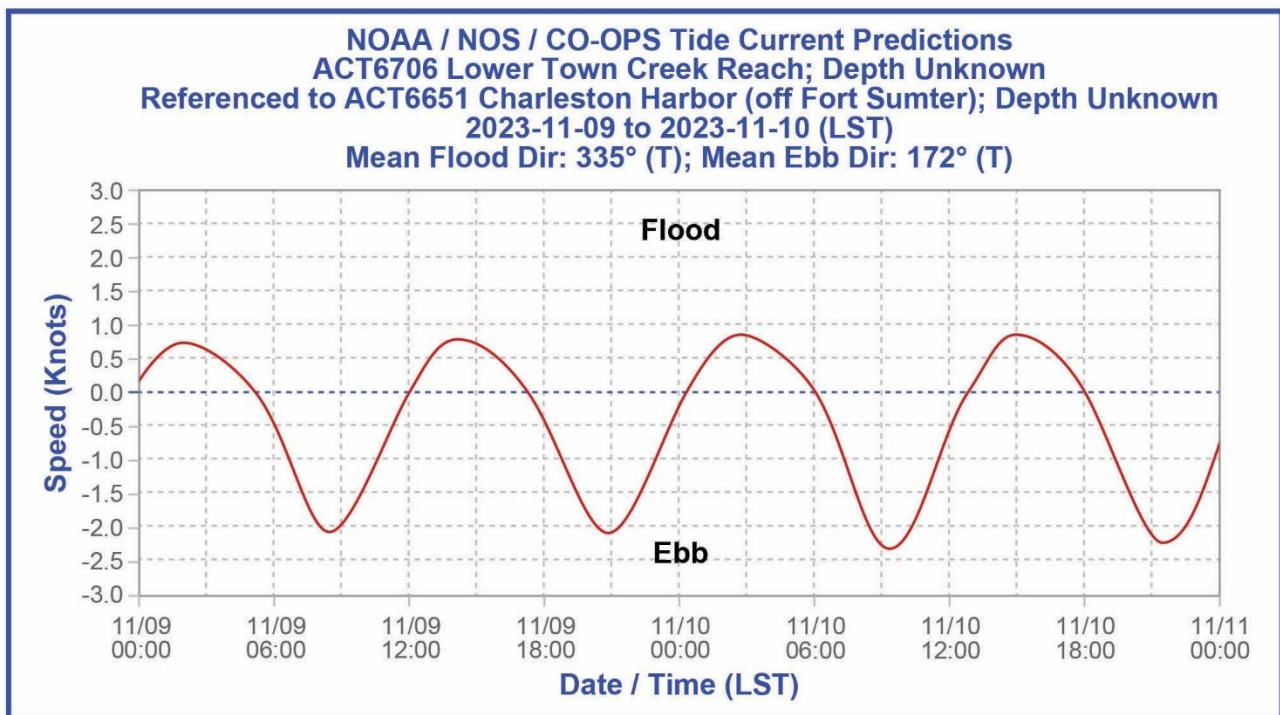
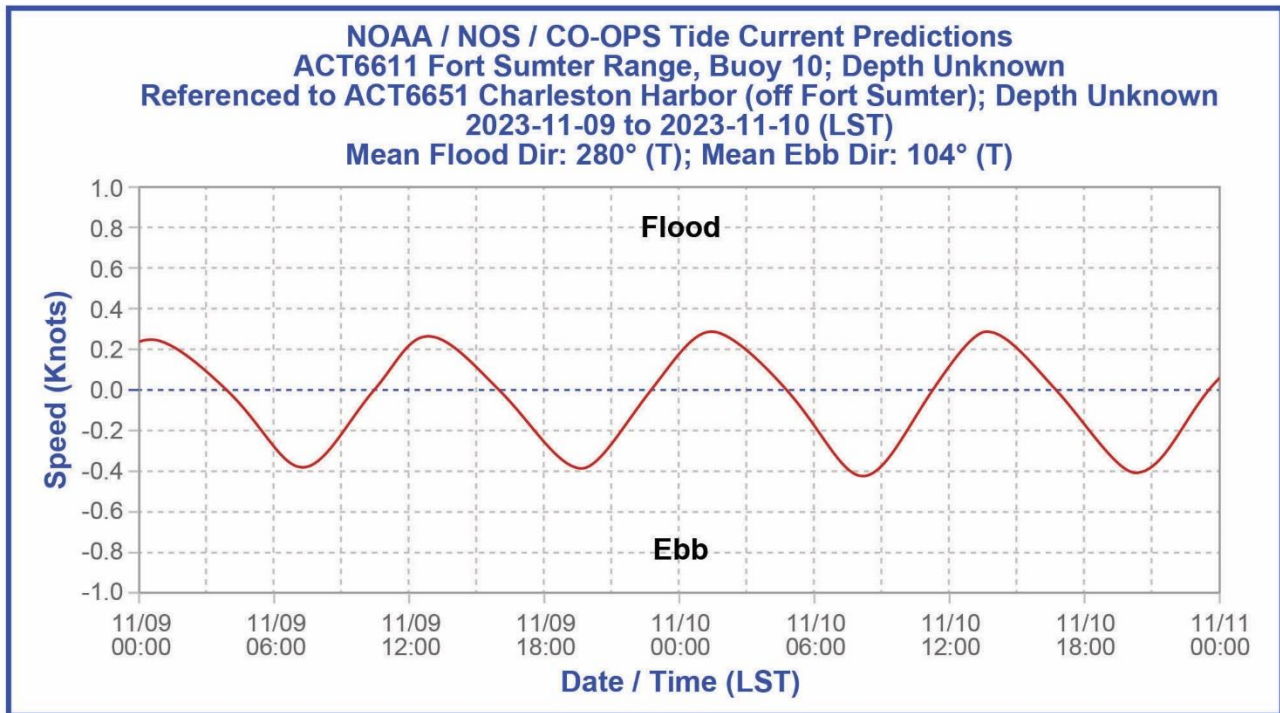
49. You wish to make good a course of  $035^{\circ}\text{T}$  while turning for an engine speed of 12 knots. The set is  $340^{\circ}\text{T}$ , and the drift is 2 knots. What course should you steer?
- A.  $027^{\circ}\text{T}$
  - B.  $037^{\circ}\text{T}$
  - C.  $044^{\circ}\text{T}$
  - D.  $054^{\circ}\text{T}$

Correct answer: C

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

Correct answer: C

## D058NG



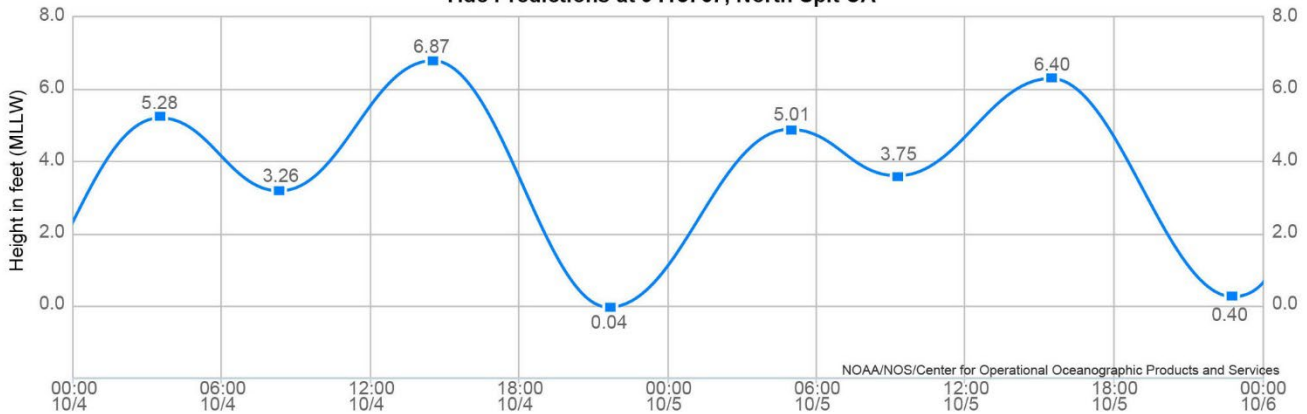
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Current Predictions,

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## D062NG

### NOAA/NOS/CO-OPS Tide Predictions at 9418767, North Spit CA

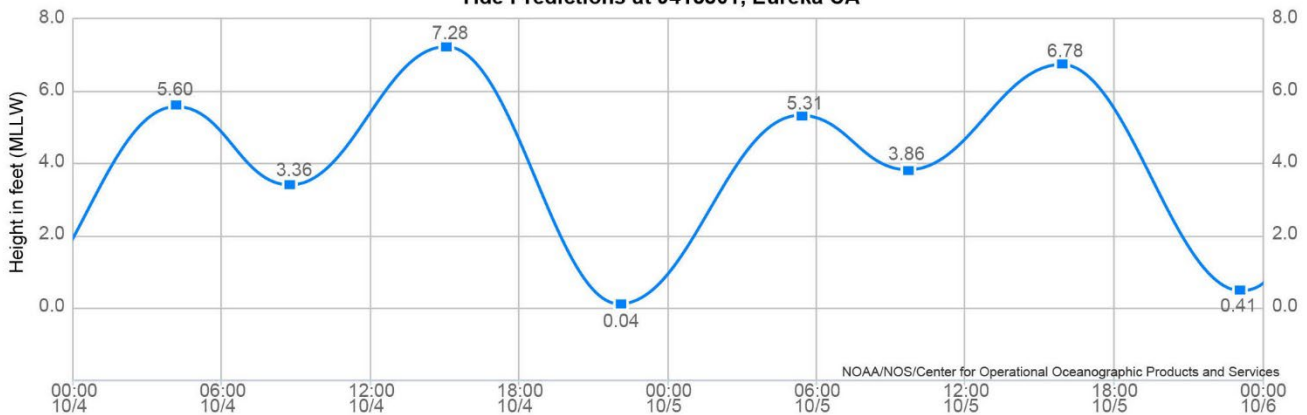


Station Name: North Spit, CA  
Action: Daily  
Product: Tide Predictions  
Start Date & Time: 2023/10/4 00:00  
End Date & Time: 2023/10/5 23:59

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



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.

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