

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

Master or Mate Less than 200 Gross Registered Tons

Q342 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. sub-refraction  
B. ducting  
C. a submerged submarine  
D. ionospheric skip waves

Correct answer: B

2. Which instrument is used to measure the relative humidity of the air?

A. A spectrometer  
B. A barograph  
C. A hygrometer  
D. A hydrometer

Correct answer: C

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

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

Correct answer: C

4. 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. Gusting winds shifting to the northwest with thunderstorms  
C. Light, southerly winds; high humidity and possibly fog  
D. Scattered clouds with light to moderate southeasterly winds and possibly fog

Correct answer: B

5. 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. 315 yards  
B. 480 yards  
C. 640 yards  
D. 143 yards

Correct answer: C

6. In the U.S. Aids to Navigation System, what do red and green horizontally-banded buoys mark?
- A. Channels for shallow draft vessels
  - B. Junctions or bifurcations
  - C. General anchorage areas
  - D. Fishing grounds

Correct answer: B

7. On 14 October 2023, you will be docking at the Southern Branch Elizabeth River, VA at the second high tide. The berth is located between NOAA reference tidal station #8638660 and subordinate station #8639348. What time (LST) will you be docking? See illustration D063NG.
- A. 2159
  - B. 2102
  - C. 2053
  - D. 2057

Correct answer: D

8. Which light characteristic may be used on a special mark?
- A. Occulting
  - B. Quick flashing
  - C. Flashing
  - D. Equal interval

Correct answer: C

9. When using GPS, how many theoretical position lines are required for a three-dimensional fix?
- A. 1
  - B. 2
  - C. 3
  - D. 4

Correct answer: D

10. In which source could you find the number of a chart for a certain geographic area?
- A. American Practical Navigator
  - B. Chart No. 1
  - C. Catalog of Charts
  - D. Pub.117 Radio Navigational Aids

Correct answer: C

11. 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

12. Deviation in a compass is caused by which of the following?

- A. The earth's magnetic field
- B. The influence of the magnetic materials of the vessel
- C. The vessel's geographic position
- D. The vessel's heading

Correct answer: B

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

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

Correct answer: C

14. While on a course of  $321^{\circ}\text{T}$ , a light bears  $7^{\circ}$  on the starboard bow at a distance of 9.7 miles. What course should you steer to pass 3.5 miles abeam of the light leaving it to starboard?

- A.  $307^{\circ}\text{T}$
- B.  $303^{\circ}\text{T}$
- C.  $300^{\circ}\text{T}$
- D.  $297^{\circ}\text{T}$

Correct answer: A

15. When outbound from a U.S. port, what does a buoy displaying a flashing red light indicate?

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

Correct answer: C

16. Which publication contains information on navigation regulations, landmarks, channels, anchorages, tides, currents, and clearances of bridges for Chesapeake Bay?

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

Correct answer: A

17. 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. show a red light if lighted
- C. have the upper band red
- D. All of the above

Correct answer: D

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Illustrations: 3

18. Which is a characteristic of warm air masses?

- A. Good visibility
- B. Heavy precipitation
- C. Stratiform clouds
- D. Turbulence within the mass

Correct answer: C

19. A general chart intended for coastwise navigation outside of outlying reefs can have which scale?

- A. not more than 1:25,000
- B. 1:50,000
- C. 1:1,000,000
- D. 1:200,000

Correct answer: D

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

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

Correct answer: D

21. You are steaming in a westerly direction along the Gulf Coast. You see ahead of you a lighted buoy showing a red isophase light. Which action should you take?

- A. Alter course to starboard and leave the buoy to port.
- B. Alter course and leave the buoy nearby on either side.
- C. Alter course and pass the buoy well off on either side.
- D. Alter course to port and leave the buoy to starboard.

Correct answer: D

22. The Light List shows that a navigational light has a nominal range of 6 miles and a height above water of 18 feet (5.5 meters). Your height of eye is 47 feet (14.3 meters) and the visibility is 1.5 miles. At what approximate range will you first sight the light?

- A. 1.5 miles
- B. 2.0 miles
- C. 6.0 miles
- D. 12.7 miles

Correct answer: B

23. Some lights used as aids to marine navigation have a red sector to indicate a danger area. The limits of a colored sector of a light are listed in the Light List in which of the following manners?
- A. Geographical positions outlining the area of the sector
  - B. True bearings as observed from the ship toward the light
  - C. An outline of the area of the sector
  - D. True bearings as observed from the light toward the ship

Correct answer: B

24. You desire to make good a true course of  $203^\circ$ . The variation is  $19^\circ\text{E}$ , magnetic compass deviation is  $2^\circ\text{W}$ , and gyrocompass error is  $1^\circ\text{E}$ . A westerly wind produces a  $3^\circ$  leeway. What is the course to steer per standard magnetic compass to make the true course good?
- A.  $183^\circ\text{psc}$
  - B.  $210^\circ\text{psc}$
  - C.  $223^\circ\text{psc}$
  - D.  $189^\circ\text{psc}$

Correct answer: D

25. You are underway on course  $215^\circ\text{T}$  at 12 knots. The current is  $000^\circ\text{T}$  at 2.3 knots. What is the course made good?
- A.  $209^\circ\text{T}$
  - B.  $217^\circ\text{T}$
  - C.  $222^\circ\text{T}$
  - D.  $232^\circ\text{T}$

Correct answer: C

26. Geographic range is the maximum distance at which a light may be seen under which conditions?
- A. Existing visibility conditions, limited only by the intensity of the light
  - B. Existing visibility conditions, limited only by the curvature of the Earth
  - C. Permitting visibility conditions, limited only by the curvature of the Earth
  - D. Permitting visibility conditions, limited only by interference from background lighting

Correct answer: C

27. 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  $196^\circ\text{T}$ , and the variation is  $7^\circ\text{E}$ . If the heading of your vessel at the time of the sighting is  $192^\circ$  per standard magnetic compass, what is the deviation?
- A.  $3^\circ\text{E}$
  - B.  $3^\circ\text{W}$
  - C.  $4^\circ\text{E}$
  - D.  $4^\circ\text{W}$

Correct answer: B

28. What color is a triangular daymark?

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

Correct answer: B

29. You are steering 143°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

30. Which of the following should be done when crossing the magnetic equator?

- A. Heeling magnet should be inverted
- B. The quadrantal spheres should be rotated 180°
- C. Flinders bar should be inverted
- D. Flinders bar should be moved to the opposite side of the binnacle

Correct answer: A

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

Correct answer: A

32. What indicates a dual-purpose buoy?

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

Correct answer: C

33. In both regions of the IALA buoyage system, which topmark shown in illustration D022NG below is used on a special mark?

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

Correct answer: D

34. 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. Bar magnets in the binnacle
- B. The heeling magnet
- C. Quadrantal soft iron spheres
- D. The Flinders bar

Correct answer: D

35. Which datum is used for soundings on charts of the East Coast of the United States?

- A. Mean lower low water
- B. Half tide level
- C. Mean lowest low water
- D. Mean low water springs

Correct answer: A

36. What causes deviation in a magnetic compass?

- A. The changes in the earth's magnetic field
- B. A nearby magnetic land mass or mineral deposits
- C. The magnetic influence inherent to that particular vessel
- D. The magnetic lines of force not coinciding with the lines of longitude

Correct answer: C

37. You are upbound approaching a lock and dam and see two green lights in a vertical line. What does this indicate?

- A. The downstream end of the land wall
- B. The downstream end of an intermediate wall
- C. A double lockage is in progress
- D. The navigable pass of a fixed weir dam

Correct answer: B

38. On 10 November 2023 at 2030, 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. 2.1kts at 335°T
- B. 2.1kts at 172°T
- C. 0.4kts at 104°T
- D. 0.4kts at 280°T

Correct answer: C

39. Your vessel is on a course of 358°T at 19 knots.

At 0316 a light bears 024.5°T, and at 0334 the light bears 043°T.

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

- A. 0355, 6.2 miles
- B. 0352, 5.7 miles
- C. 0359, 7.1 miles
- D. 0403, 8.0 miles

Correct answer: B

40. Which term is used to describe the wind speed and direction observed from a moving vessel?

- A. The apparent wind
- B. The coordinate wind
- C. The true wind
- D. The anemometer wind

Correct answer: A

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

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

Correct answer: C

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

Correct answer: C

43. When operated over a muddy bottom, a fathometer may indicate which of the following?

- A. A zero depth reading
- B. A shallow depth reading
- C. No depth reading
- D. Two depth readings

Correct answer: D

44. Some lights used as aids to marine navigation have a red sector to indicate a danger area. How are the limits of a colored sector of light listed in the Light List?

- A. True bearings as observed from the light toward a vessel
- B. Geographical positions outlining the area of the sector
- C. Bearings given in the Light List are always magnetic
- D. True bearings as observed from a vessel toward the light

Correct answer: D

45. 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 maximum vapor content the air is capable of holding at 70 degrees
- D. The ratio of the actual vapor content at the current temperature to the air's vapor holding capability

Correct answer: D

46. Which is TRUE concerning Spring tides?

- A. Spring Tides have lows lower than normal and highs higher than normal
- B. Spring Tides only occur in the spring of the year
- C. Spring Tides have lows higher than normal and highs lower than normal
- D. Spring Tides are always unpredictable

Correct answer: A

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

Correct answer: C

48. Which is used to mark the draw span of a floating drawbridge?

- A. Two white lights
- B. A flashing blue lights
- C. A yellow diamond
- D. Three red lights on each side of the draw

Correct answer: C

49. Which meteorological feature controls the climate of the Gulf of America and the coastal area during late spring and summer?

- A. The Bermuda High
- B. Tropical cyclones
- C. The doldrums
- D. The horse latitudes

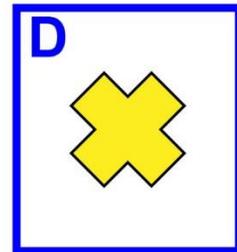
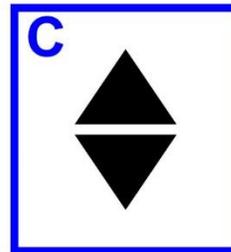
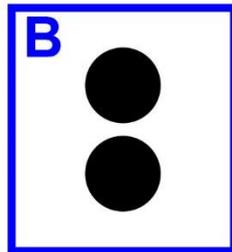
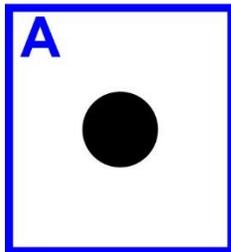
Correct answer: A

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

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

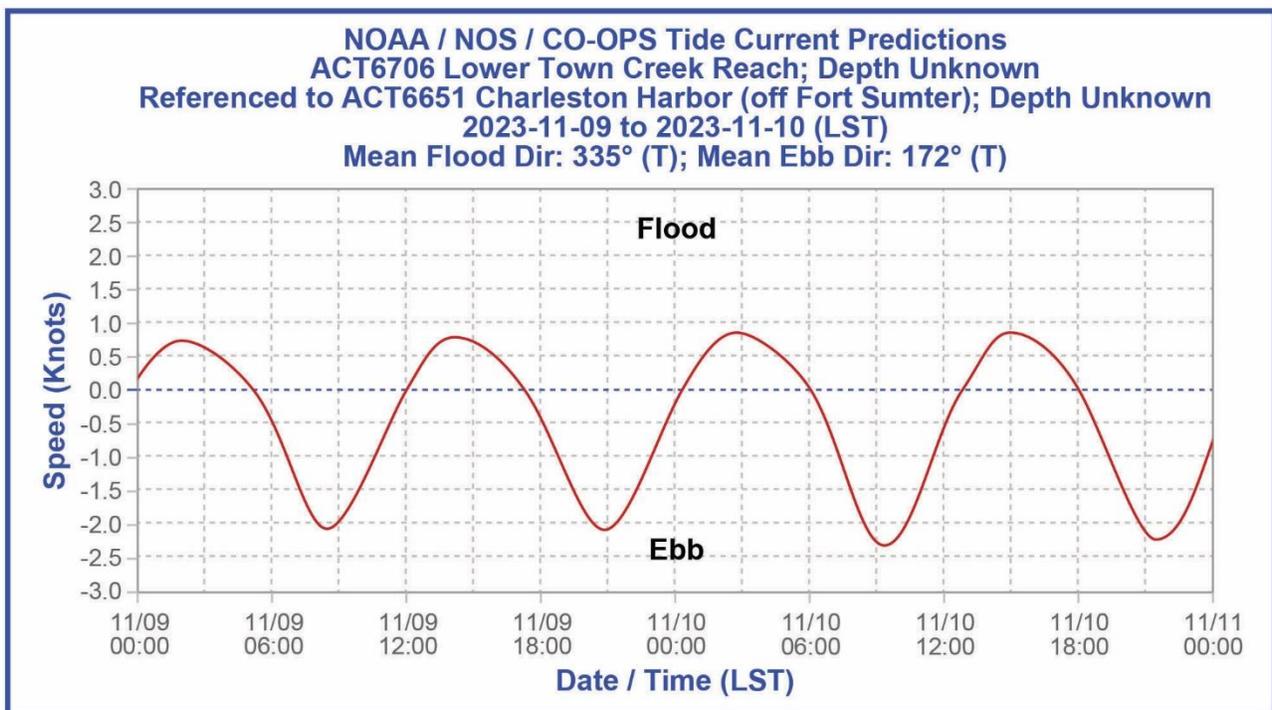
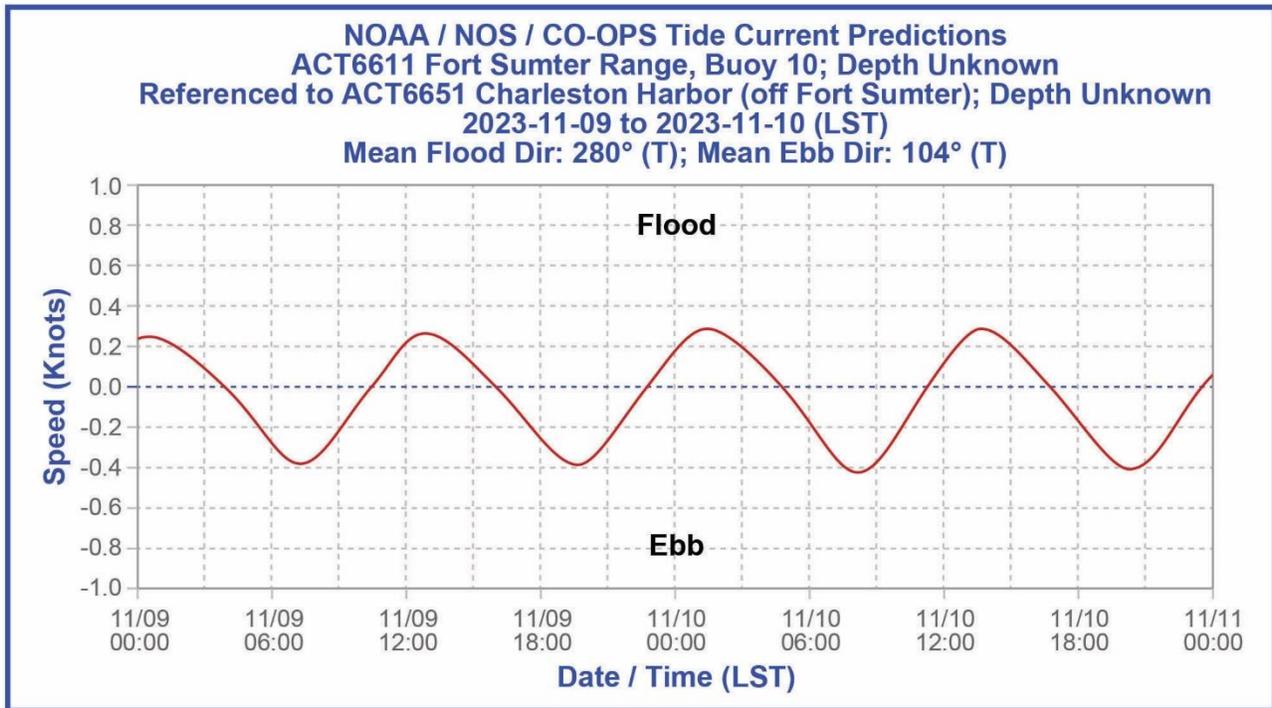
Correct answer: B

## D022NG



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## D058NG

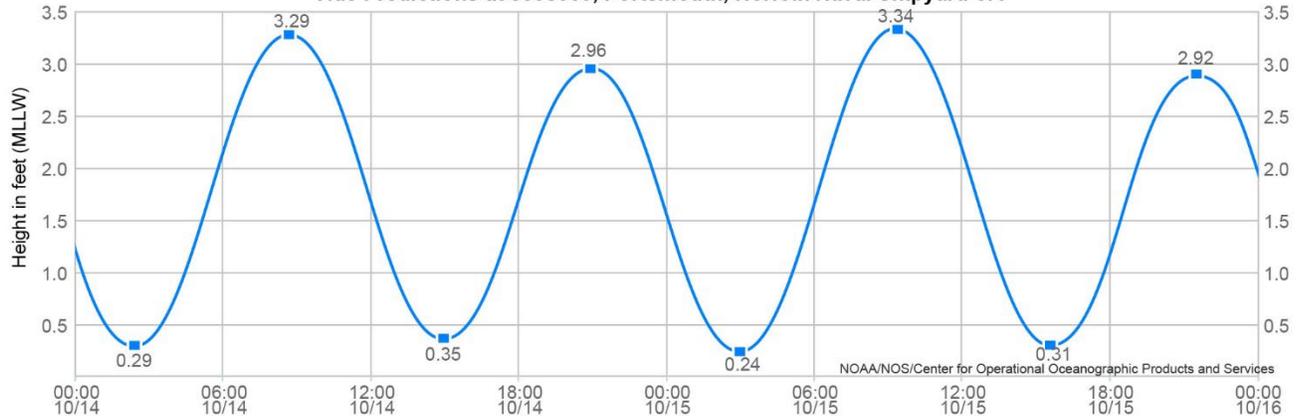


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 Current Predictions,  
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## D063NG

NOAA/NOS/CO-OPS

### Tide Predictions at 8638660, Portsmouth, Norfolk Naval Shipyard VA



High/Low Tide Prediction Data Listing

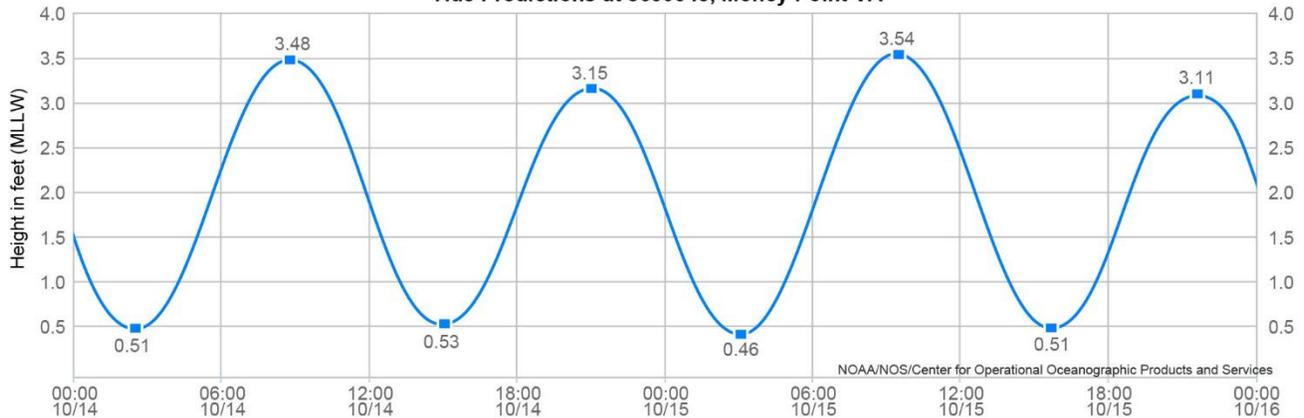
Station Name: Portsmouth, Norfolk Naval Shipyard, VA  
 Action: Daily  
 Product: Tide Predictions  
 Start Date & Time: 2023/10/14 00:00  
 End Date & Time: 2023/10/15 23:59

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
2023/10/14	Sat	02:25	0.29 L	08:40	3.29 H	14:58	0.35 L	20:53	2.96 H
2023/10/15	Sun	03:00	0.24 L	09:17	3.34 H	15:37	0.31 L	21:32	2.92 H

NOAA/NOS/CO-OPS

### Tide Predictions at 8639348, Money Point VA



High/Low Tide Prediction Data Listing

Station Name: Money Point, VA  
 Action: Daily  
 Product: Tide Predictions  
 Start Date & Time: 2023/10/14 00:00  
 End Date & Time: 2023/10/15 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
2023/10/14	Sat	02:25	0.51 L	08:48	3.48 H	15:00	0.53 L	21:02	3.15 H
2023/10/15	Sun	03:01	0.46 L	09:25	3.54 H	15:40	0.51 L	21:40	3.11 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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