

GEOGRAPHIC RANGE TABLE

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer at sea level. It is necessary to add to the distance for the height of any object the distance corresponding to the height of the observer's eye above sea level.

Distances of visibility for objects of various elevations above sea level.

| Height | | Distance Nautical Miles (NM) | Distance Statute Miles (SM) | Height | | Distance Nautical Miles (NM) | Distance Statute Miles (SM) | Height | | Distance Nautical Miles (NM) | Distance Statute Miles (SM) |
|--------|--------|------------------------------|-----------------------------|--------|--------|------------------------------|-----------------------------|--------|--------|------------------------------|-----------------------------|
| Feet | Meters | | | Feet | Meters | | | Feet | Meters | | |
| 5 | 1.5 | 2.6 | 3.0 | 70 | 21.3 | 9.8 | 11.3 | 250 | 76.2 | 18.5 | 21.3 |
| 10 | 3.1 | 3.7 | 4.3 | 75 | 22.9 | 10.1 | 11.7 | 300 | 91.4 | 20.3 | 23.3 |
| 15 | 4.6 | 4.5 | 5.2 | 80 | 24.4 | 10.5 | 12.0 | 350 | 106.7 | 21.9 | 25.2 |
| 20 | 6.1 | 5.2 | 6.0 | 85 | 25.9 | 10.8 | 12.4 | 400 | 121.9 | 23.4 | 26.9 |
| 25 | 7.6 | 5.9 | 6.7 | 90 | 27.4 | 11.1 | 12.8 | 450 | 137.2 | 24.8 | 28.6 |
| 30 | 9.1 | 6.4 | 7.4 | 95 | 29.0 | 11.4 | 13.1 | 500 | 152.4 | 26.2 | 30.1 |
| 35 | 10.7 | 6.9 | 8.0 | 100 | 30.5 | 11.7 | 13.5 | 550 | 167.6 | 27.4 | 31.6 |
| 40 | 12.2 | 7.4 | 8.5 | 110 | 33.5 | 12.3 | 14.1 | 600 | 182.9 | 28.7 | 33.0 |
| 45 | 13.7 | 7.8 | 9.0 | 120 | 36.6 | 12.8 | 14.7 | 650 | 198.1 | 29.8 | 34.3 |
| 50 | 15.2 | 8.3 | 9.5 | 130 | 39.6 | 13.3 | 15.4 | 700 | 213.4 | 31.0 | 35.6 |
| 55 | 16.8 | 8.7 | 10.0 | 140 | 42.7 | 13.8 | 15.9 | 800 | 243.8 | 33.1 | 38.1 |
| 60 | 18.3 | 9.1 | 10.4 | 150 | 45.7 | 14.3 | 16.5 | 900 | 274.3 | 35.1 | 40.4 |
| 65 | 19.8 | 9.4 | 10.9 | 200 | 61.0 | 19.0 | 16.5 | 1000 | 304.8 | 37.0 | 42.6 |

Example: Determine the geographic visibility of an object, with a height above water of 65 feet, for an observer with a height of eye of 35 feet. Enter above table:

| | | |
|--------------------------------|---------|---------------|
| Height of object | 65 feet | 9.4 NM |
| Height of observer | 35 feet | <u>6.9 NM</u> |
| Computed geographic visibility | | 16.3 NM |

Introduction

The Geographic Range Table is found in the Light Lists & Coast Pilot reference material in the USCG exam room. There is a Geographic Range Table found in the “Blue” pages located in the front part of the book, Block Island Sound, East Long Island Sound area, pg. XXXIII. There is a second table found in the “Yellow” latter section of the book, Chesapeake Bay area. Each Light List book have these tables.

There is a digital copy of Light Lists & Coast Pilot in the MA Resource folder for you to use. Geographic Range questions can be found on the Navigation General and Chart Plot sections of the deck license exam.

The table is used to “estimate” the visual sighting of an object based on its physical height above the sea level and the height above sea level where the viewer is standing. The Geographic Range table only takes into account the curvature of the Earth.

To solve, the student enters the table with the known height (Feet or Meters) of a navigation aid. Then, compares the navigation aid height to the corresponding nautical mile (NM) distance it can be seen, as listed in the table. Be careful to read the table correctly as per the question.

(Nautical mile (NM) or Statute miles (SM)).

If unable to locate the height of a navigation aid, go to the index, find the ID number then look up as per Description of Columns found on page V.

USCG Navigation General (Near Coastal) Question 221 What is the approximate geographic range of Fenwick Island Light, Delaware, if your height of eye is 37 feet (11.6 meters)? Refer to “Reprints from the LIGHT LISTS AND COAST PILOTS”.

- 1 Before going to Geographic Range Table, the student must use the “yellow pages” in Light List to find Height of Fenwick Island Light. Index page 367 in the printed book (digital .pdf page 256). find the light’s index number 205.
- 2 Then using the light’s index number 205, look up the light’s information found on page 3 (digital .pdf pg. 224) of the yellow pages. Column 5 lists the height of light. Fenwick Island Light height is 83 Feet.

| Height | | Distance Nautical Miles (NM) | Distance Statute Miles (SM) | Height | | Distance Nautical Miles (NM) | Distance Statute Miles (SM) | Height | | Distance Nautical Miles (NM) | Distance Statute Miles (SM) |
|--------|--------|------------------------------|-----------------------------|--------|--------|------------------------------|-----------------------------|--------|--------|------------------------------|-----------------------------|
| Feet | Meters | | | Feet | Meters | | | Feet | Meters | | |
| 5 | 1.5 | 2.6 | 3.0 | 70 | 21.3 | 9.8 | 11.3 | 250 | 76.2 | 18.5 | 21.3 |
| 10 | 3.1 | 3.7 | 4.3 | 75 | 22.9 | 10.1 | 11.7 | 300 | 91.4 | 20.3 | 23.3 |
| 15 | 4.6 | 4.5 | 5.2 | 80 | 24.4 | 10.5 | 12.0 | 350 | 106.7 | 21.9 | 25.2 |
| 20 | 6.1 | 5.2 | 6.0 | 85 | 25.9 | 10.8 | 12.4 | 400 | 121.9 | 23.4 | 26.9 |
| 25 | 7.6 | 5.9 | 6.7 | 90 | 27.4 | 11.1 | 12.8 | 450 | 137.2 | 24.8 | 28.6 |
| 30 | 9.1 | 6.4 | 7.4 | 95 | 29.0 | 11.4 | 13.1 | 500 | 152.4 | 26.2 | 30.1 |
| 35 | 10.7 | 6.9 | 8.0 | 100 | 30.5 | 11.7 | 13.5 | 550 | 167.6 | 27.4 | 31.6 |
| 40 | 12.2 | 7.4 | 8.5 | 110 | 33.5 | 12.3 | 14.1 | 600 | 182.9 | 28.7 | 33.0 |
| 45 | 13.7 | 7.8 | 9.0 | 120 | 36.6 | 12.8 | 14.7 | 650 | 198.1 | 29.8 | 34.3 |
| 50 | 15.2 | 8.3 | 9.5 | 130 | 39.6 | 13.3 | 15.4 | 700 | 213.4 | 31.0 | 35.6 |
| 55 | 16.8 | 8.7 | 10.0 | 140 | 42.7 | 13.8 | 15.9 | 800 | 243.8 | 33.1 | 38.1 |
| 60 | 18.3 | 9.1 | 10.4 | 150 | 45.7 | 14.3 | 16.5 | 900 | 274.3 | 35.1 | 40.4 |
| 65 | 19.8 | 9.4 | 10.9 | 200 | 61.0 | 19.0 | 16.5 | 1000 | 304.8 | 37.0 | 42.6 |

Geographic Range Chart, pg. XXXIII Light Lists & Coast Pilot, in the resources folder on the flash drive.

- 3 Now use the Geographic Range Table (as above to solve the question. (If heights fall between exact numbers in table, slight interpolation can be done.) Note: If student can’t locate an index number for a particular light, the most common error is they are looking in the wrong index table. Recheck the physical location of the light. Verify if it is near New York or Virginia, then use appropriate “Blue” or “Yellow” table.

Height of Eye 37ft..... 7.1 NM
Height of Light 83ft.....10.7 NM +
 Estimate Geographic Range: 17.8 NM

Answer: 17.8 Nautical Miles