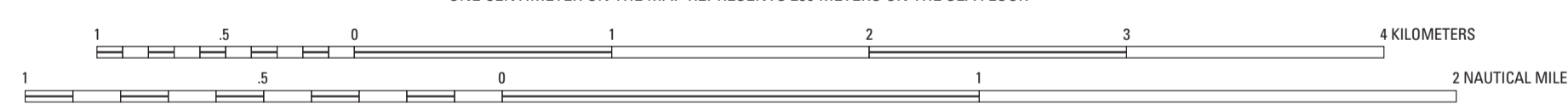
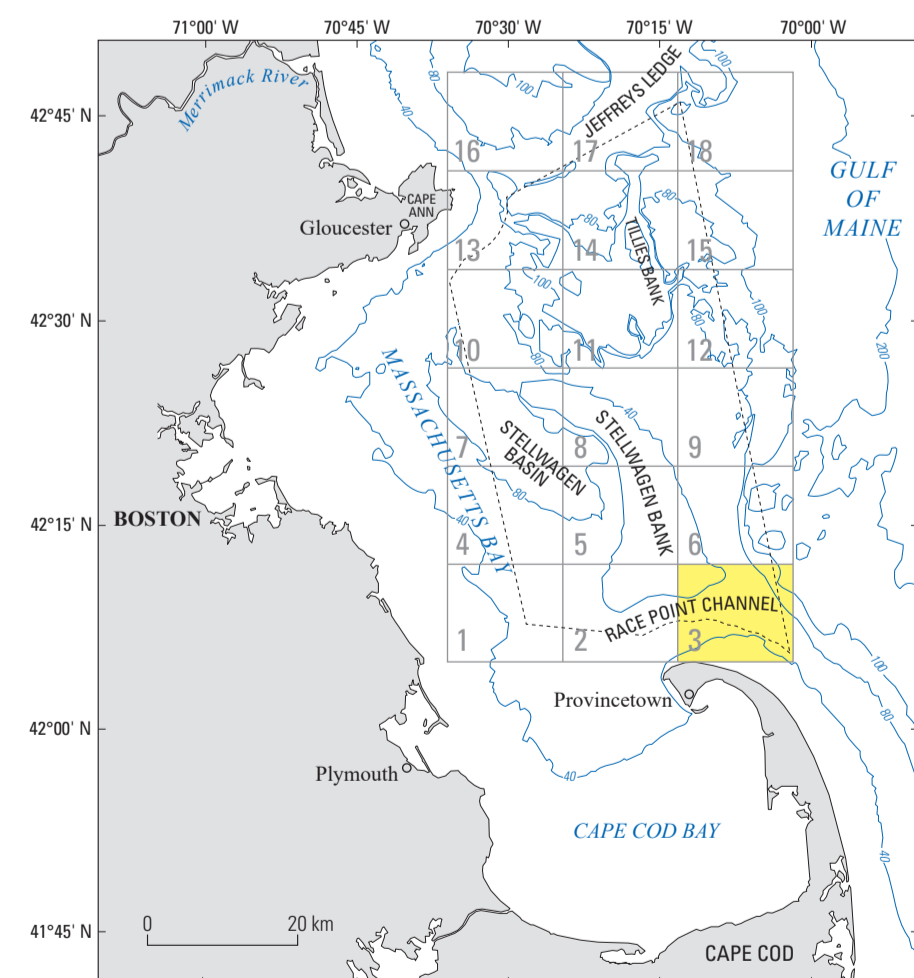


Map projection
Geoidetic Reference System 1980, North American Datum of 1983
Longitude of central meridian 70°19' W; latitude of true scale 41°38' N
False easting 0 m; false northing 0 m
This map is not intended for navigational purposes

SCALE 1:25 000
ONE CENTIMETER ON THE MAP REPRESENTS 250 METERS ON THE SEA FLOOR



CONTOURS SHOW SEALED DEPTH BELOW DATUM; CONTOUR INTERVAL 5 METERS
ADDITIONAL 1-METER CONTOURS INCLUDED TO SHOW BOTTOM ROUGHNESS
DATUM MEAN LOWER LOW WATER



Location Map. Map showing the location of quadrangle 3 (highlighted in yellow) of the Stellwagen Bank National Marine Sanctuary region offshore of Boston, Massachusetts. The numbered grid indicates the quadrangles of the U.S. Geological Survey multibeam sonar substrate-mapping project. The dashed line represents the Stellwagen Bank National Marine Sanctuary boundary. Bathymetric contours are labeled in meters and the contour interval is variable. Figure modified from Valentine and Cross (2024d).

DESCRIPTION OF MAP UNITS

- [Grain-size categories are given in mean weight percents. Weight percent values were rounded and may not add up to 100 or other summed values, for example, sand, 88 (fgS, 69; cgS, 20). For differences between substrates and an explanation of characters used in their names, see the section "Description of Map Units (Substrates)" and table 3 (in pamphlet). For more information on the sediment textural properties of all identified substrates, see tables 6 and 7 (in pamphlet) and Valentine and Cross (2026b). The southernmost part of the map area was not mapped because multibeam sonar data were not collected there.]
- A1_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 30 to 60 m. Grain-size categories: mud, <1; sand, 94 (fgS, 2; cgS, 92); gravel, 6 (G₁, 6; G₂, <1)
 - A2_l_cgS** Immobile, coarse-grained sand—Water depth range of the mapped substrate: ~55 to 80 m. Grain-size categories: mud, 1; sand, 98 (fgS, 10; cgS, 88); gravel, 2 (G₁, 2; G₂, 0)
 - C_i_cbG** Immobile, cobble, boulder gravel—Water depth range of the mapped substrate: >25 to 87 m
 - E_l_cgS** Immobile, coarse-grained sand—Water depth range of the mapped substrate: 75 to 80 m. Substrate E is not represented by any samples in quadrangle 3, and it is interpreted to be a short extension (1.5 km) of substrate E from the adjoining quadrangle 6 to the north (Valentine and Gallea, 2015)
 - F_l_cgS/pcbG** Immobile, coarse-grained sand; partial veneer on pebble, cobble, boulder gravel—Water depth range of the mapped substrate: 85 to 115 m. Upper layer grain-size categories: mud, 5; sand, 56 (fgS, 40; cgS, 16); gravel, 39 (G₁, 15; G₂, 24)
 - G1_i_mfgS** Immobile, muddy, fine-grained sand—Water depth range of the mapped substrate: 70 to 135 m. Grain-size categories: mud, 6; sand, 88 (fgS, 69; cgS, 20); gravel, 6 (G₁, 3; G₂, 3)
 - Y_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 60 to 63 m. Grain-size categories: mud, 3; sand, 96 (fgS, 36; cgS, 60); gravel, 1 (G₁, 1; G₂, 0)

- Z_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 43 to 62 m. Grain-size categories: mud, 1; sand, 97 (fgS, 5; cgS, 91); gravel, 3 (G₁, 2; G₂, 0)
- AB_r_fgS** Rippled, fine-grained sand—Water depth range of the mapped substrate: ~49 to 55 m. Substrate AB is not represented by any samples in quadrangle 3, and it is interpreted to be a short extension of substrate AB from the adjoining quadrangle 2 to the west (Valentine and Cross, 2024c)
- AC_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 59 to 60 m. Grain-size categories: mud, 2; sand, 98 (fgS, 12; cgS, 86); gravel, <1 (G₁, <1; G₂, 0)
- AG_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: ~50 to ~60 m. Substrate AG is not represented by any samples in quadrangle 3, and it is interpreted to be a short extension of substrate AG from the adjoining quadrangle 2 to the west (Valentine and Cross, 2024c)
- AI_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 43 to 55 m. Grain-size categories: mud, 9; sand, 88 (fgS, 29; cgS, 59); gravel, 10 (G₁, 6; G₂, 5)
- AJ_l_cgS** Immobile, coarse-grained sand—Water depth range of the mapped substrate: 110 to 111 m. Grain-size categories: mud, 9; sand, 88 (fgS, 29; cgS, 59); gravel, 3 (G₁, 3; G₂, 0)
- AK_l_cgS/pcbG** Immobile, coarse-grained sand; partial veneer on pebble, cobble, boulder gravel—Water depth range of the mapped substrate: 55 to 61 m. Upper layer grain-size categories: mud, 2; sand, 84 (fgS, 12; cgS, 72); gravel, 13 (G₁, 5; G₂, 9)
- AL_r_cgS/i_pcG** Rippled, gravely, coarse-grained sand; partial veneer on immobile, pebble, cobble gravel—Water depth range of the mapped substrate: 45 to 53 m. Upper layer grain-size categories: mud, <1; sand, 56 (fgS, 17; cgS, 39); gravel, 44 (G₁, 5; G₂, 39)
- AM_l_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 40 to 64 m. Grain-size categories: mud, 1; sand, 98 (fgS, 4; cgS, 94); gravel, 1 (G₁, 1; G₂, <1)

- AN_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 45 to 50 m. Grain-size categories: mud, <1; sand, 99 (fgS, 32; cgS, 67); gravel, 1 (G₁, 1; G₂, 0)
 - AO_r_cgS** Rippled, coarse-grained sand—Water depth range of the mapped substrate: 28 to 55 m. Grain-size categories: mud, 1; sand, 97 (fgS, 3; cgS, 94); gravel, 2 (G₁, 2; G₂, 1)
 - AP_r_cgS/i_pcB** Rippled, coarse-grained sand; partial veneer on immobile, pebble, cobble, boulder gravel—Water depth range of the mapped substrate: 30 to 51 m. Upper layer grain-size categories: mud, <1; sand, 92 (fgS, 3; cgS, 89); gravel, 8 (G₁, 5; G₂, 3)
 - AQ_r_fgS** Rippled, fine-grained sand—Water depth range of the mapped substrate: 50 to 61 m. Grain-size categories: mud, 3; sand, 96 (fgS, 62; cgS, 34); gravel, 1 (G₁, <1; G₂, <1)
- EXPLANATION OF MAP SYMBOLS**
[Magenta circle and magenta square symbols show the locations of sample stations where sediment samples were collected or the locations of ends of video drifts if no sediment was collected]
- Video transect**—Line shows the ship's drift path during videography of the seabed. Still photographs were collected during some video drifts. Some drifts are too short to be shown at this scale
 - Station location of mapped substrate**—Data from these stations were used to map the extents of substrates. See Valentine and Cross (2026b) for data on these stations
 - Station location of unmapped substrate**—Data from these stations represent substrate A3 that occurs as scattered deposits within other mapped substrates and could not be mapped as coherent units. See Valentine and Cross (2026b) for data on these stations
 - Numbered boxes around clusters of stations**—Boxes 1 to 6 are drawn to surround clusters of stations which are too closely spaced to be labeled at this scale. See Valentine and Cross (2026b) for data on these stations

Sheet 1.—Seabed geology and station data types
Map D.—Distribution of Geologic Substrates

Seabed Maps Showing Topography, Ruggedness, Backscatter Intensity, Sediment Mobility, and the Distribution of Geologic Substrates in Quadrangle 3 of the Stellwagen Bank National Marine Sanctuary Region Offshore of Boston, Massachusetts

By
Page C. Valentine and VeeAnn A. Cross
2026

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For sale by U.S. Geological Survey, Box 25286, Denver Federal Center, Denver, CO 80225
https://store.usgs.gov/store/product/1-488-ASR-USGS/11-688-074-0747
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