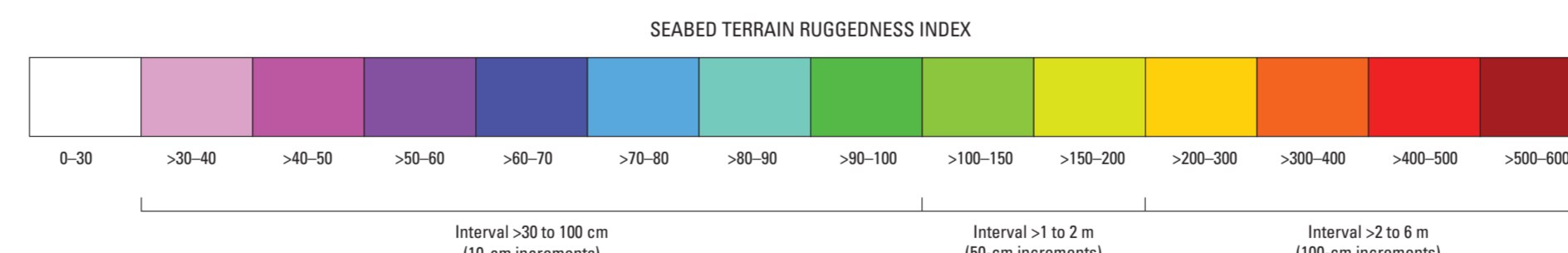


Mercator projection  
Geodetic Reference System 1980; North American Datum of 1983  
Longitude of central meridian 70°19' W; latitude of true scale 41°39' N  
False easting 0 m; false northing 0 m  
This map is not intended for navigational purposes



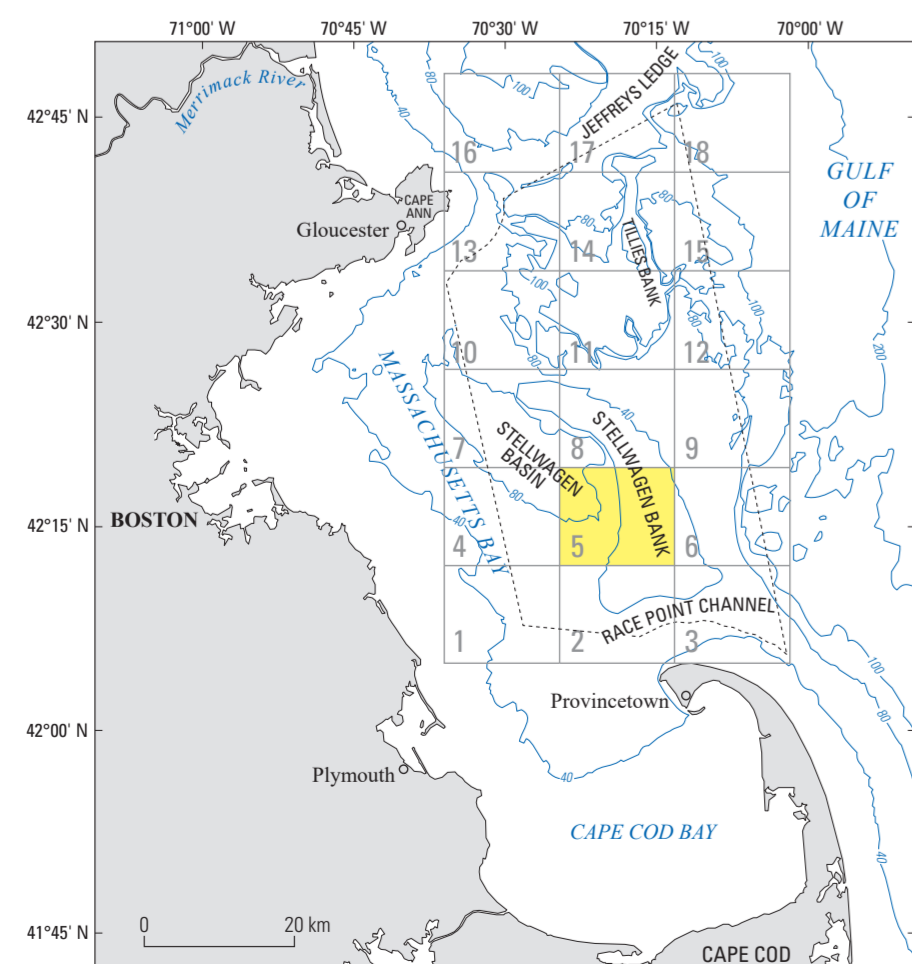
CONTOURS SHOW SEABED DEPTH BELOW DATUM; CONTOUR INTERVAL 5 METERS  
ADDITIONAL 1-METER CONTOURS INCLUDED TO SHOW BOTTOM ROUGHNESS  
DATUM MEAN LOWER LOW WATER



Colors represent the average change in elevation, in centimeters (cm), between a central area (13-meter [m] pixel) and the surrounding eight pixels (total area analyzed is three pixels by three pixels, or 29 × 29 m in size). For example, on the map, blue represents central pixels having an average elevation change of >70 to 80 cm with respect to their surrounding eight-pixel areas. Note the elevation-change increments in the color scale vary from 10 cm to 50 cm to 100 cm. A filter was applied to the ruggedness index image to smooth the boundaries between the mapped increments. The filter calculated the mean of the seabed terrain ruggedness index (TRI) value of each pixel and its eight neighboring pixels in a three-pixel by three-pixel grid that measures 39 × 39 m.

This index represents the range of seabed ruggedness observed in the Stellwagen Bank National Marine Sanctuary region. In quadrangle 5, seabed ruggedness ranges from 0-30 to >200-300 cm.

See the section "Map A. Sun-Illuminated Topography and Boulder Ridges" (in pamphlet) for an explanation of topographic contour intervals.



**Location Map.** Map showing the location of quadrangle 5 (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. Base from Valentine and Gallea (2015).

## Map B.—Seabed Ruggedness

### Seabed Maps Showing Topography, Ruggedness, Backscatter Intensity, Sediment Mobility, and the Distribution of Geologic Substrates in Quadrangle 5 of the Stellwagen Bank National Marine Sanctuary Region Offshore of Boston, Massachusetts

By  
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2024

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