



Minimum Elevation: Custom Reference System 1983 North American Datum 1983  
Longitude of center of mass: 70°19' W; Latitude of true scale: 41°19' N  
This map is not intended for navigational purposes.

SCALE 1:80,000  
ONE CENTIMETER ON THE MAP REPRESENTS 800 METERS ON THE SEA FLOOR  
1 KILOMETER  
1 NAUTICAL MILE  
CONTOUR INTERVALS: METERS  
BROWN CONTOURS REPRESENT TOPOGRAPHIC LINES  
DATA FROM NOAA CHARTS

**SEA FLOOR TERRAIN RUGGEDNESS INDEX**  
Rough intervals are not shown on map  
Interval: 30 to 100 cm (10-cm increments)  
Interval: 1 to 2 m (50-cm increments)  
Interval: 2 to 6 m (100-cm increments)

Colors represent the average change in elevation, in centimeters, between a central area (a 15 x 15-m pixel) and the eight pixels that surround it. The filter calculates the mean of the TRM value of each pixel and its eight neighboring pixels in a three-pixel by three-pixel grid that includes the 3 x 3 m area 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 ruggedness intervals. The filter calculates the mean of the TRM value of each pixel and its eight neighboring pixels in a three-pixel by three-pixel grid that includes the 3 x 3 m area 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.

**Sheet 3.—Sea floor ruggedness in the >30- to 100-centimeter range and sun-illuminated topography.**  
**MAP D.—SEA FLOOR RUGGEDNESS IN THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY REGION**  
By  
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2005  
Sea Floor Image Maps Showing Topography, Sun-Illuminated Topography, Backscatter Intensity, Ruggedness, Slope, and the Distribution of Boulder Ridges and Bedrock Outcrops in the Stellwagen Bank National Marine Sanctuary Region off Boston, Massachusetts  
Page C. Valentine, editor

