



Sheet 1.—Sea floor topography in shaded relief view, with sea floor depth in color and as topographic contours.

### SHADED RELIEF, SEA FLOOR TOPOGRAPHY, AND BACKSCATTER INTENSITY OF MASSACHUSETTS BAY AND THE STELLWAGEN BANK REGION OFFSHORE OF BOSTON, MASSACHUSETTS

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#### DISCUSSION

##### Introduction

These maps show the sea floor topography and backscatter intensity of the region offshore of Boston, Mass., at a scale of 1:25,000. Sheet 1 shows sea floor topography in shaded relief view, with sea floor depth in color and as topographic contours. Sheet 2 shows sea floor topography in shaded relief view, with backscatter intensity superimposed in color. Both sheets show unsmoothed contours at selected intervals. The maps are based on multibeam echo-sounder data collected on four cruises conducted between 1994 and 2003 and 1998. Additional sea floor bathymetry from the National Geophysical Data Center (NGDC) Coastal Relief Model and contour topography from the U.S. Geological Survey (USGS) Digital Elevation Model DEM are also included. The maps combine multibeam echo-sounder data collected as part of the Stellwagen Bank National Marine Sanctuary map series (Butman and others, 2003, 2003a) and the contiguous western Massachusetts Bay map series (Butman and others, 2003a). For a more detailed description of seabed features, see the maps at a scale of 1:25,000 for quadrangles 1-18 in the Stellwagen Bank National Marine Sanctuary map series and quadrangles 1 and 2 in the western Massachusetts Bay map series (see location map on page 1).

The multibeam echo-sounder surveys were conducted aboard the Frederick G. Coe, a NOAA Eminent Endeavor Sea Grant vessel. A Simrad EK60 echosounder EM 1000 Multibeam Echo Sounder 955 kHz/400 kHz was used to acquire these data. The data are presented at a resolution of 30 m/row and 1 and 10 m/pixel on sheet 2.

The shaded relief image (sheet 1), colored according to water depth, was created by vertically exaggerating the topography four times and then artificially flattening the relief by a light cosine positioned 45 degrees above the horizon from an azimuth of 300 degrees. To improve the dynamic range in the image, the first 100 meters values below 150 were set to 0, values between 150 and 200 were stretched between 0 and 255, and values above 200 were set to 255. In the resulting image, topographic features appear enhanced by strong illumination on the north-facing slopes and by shadow cast on south-facing slopes. The image also accentuates small features that could not be shown effectively by contours alone at this scale. The water depth, using a color scale from orange (shallow) to violet (deep), is superimposed.

The onshore topography on sheets 1 and 2 from the USGS DEM data downloaded from <http://edc.srs.gov/species/edc/contour/ndb/ndb.html> at a resolution of 30 m/pixel. The data were resampled from the individual quadrangle to remove edge-matching problems. 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