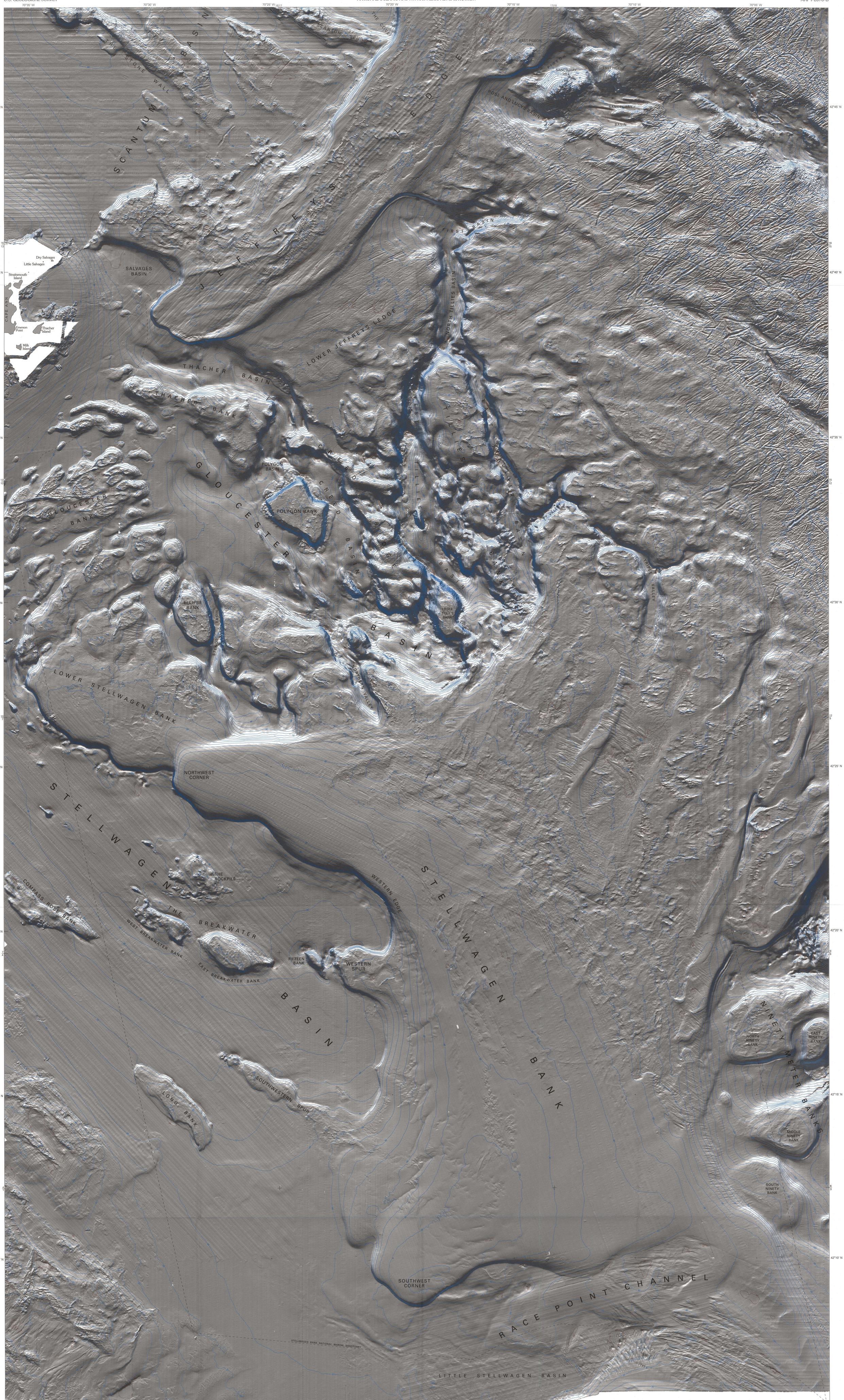
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOLOGIC INVESTIGATIONS SERIES
MAP I–2676–B



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

SCALE 1:60 000

ONE CENTIMETER ON THE MAP REPRESENTS 600 METERS ON THE SEA FLOOR

1 .5 0 1 2 3 4 5 6 7 KILOMETERS

1 .5 0 1 2 3 4 5 NAUTICAL MILES

CONTOUR INTERVAL 5 METERS
BROWN CONTOURS REPRESENT TOPOGRAPHIC LOWS
DATUM MEAN LOWER LOW WATER

SUN-ILLUMINATED SEA FLOOR TOPOGRAPHY OF THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY OFF BOSTON, MASSACHUSETTS

By
Page C. Valentine, Tanya S. Unger, and Jessica L. Baker

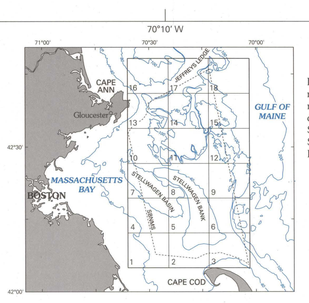
2003

DISCUSSION

The Stellwagen Bank National Marine Sanctuary Mapping Project is a cooperative effort of the U.S. Geological Survey (USGS) and the National Oceanic and Atmospheric Administration, with support from the University of New Brunswick and the Canadian Hydrographic Service. The maps generated from this project are products of a 1994–96 multibeam echo-sounder survey. This map is part of a three-map series; the other two maps, also at 1:60,000 scale, show sea floor topography (USGS Geologic Investigations Series Map I–2676–A) and combined imagery of sun-illuminated sea floor topography and backscatter intensity (Map I–2676–C). Preliminary versions of all three maps are shown on a CD-ROM as USGS Open-File Report 00–410. The project also has published sun-illuminated sea floor topography by quadrangle (see location map) at 1:25,000 scale as USGS Geologic Investigations Series Maps I–2701 (for quadrangle 1) to I–2718 (for quadrangle 18). On this map, the corners of the 18 quadrangles are shown for reference as ticks labelled outside the map edges and as large crossticks within the map area.

The image shown here uses a sun elevation angle of 45 degrees above the horizon from an azimuth of 350 degrees and a vertical exaggeration of four times. Unnatural-looking stripes and patterns oriented parallel or perpendicular to survey tracklines are artifacts of data collection. Major topographic features depicted here were formed by glacial processes. Glacial ice containing rock debris moved across the region, sculpting its surface and depositing sediment to form the large basins, banks, ridges, and valleys. Other features were formed during the latter stages of deglaciation when much of the area was covered by stationary rotting ice, and when small valley glaciers and ice falls were active in and near areas of high relief. The sea invaded the region formerly occupied by ice, and seabed features were partly eroded and some new deposits were formed. Today, the sea floor is modified mainly by strong southwestward-flowing bottom currents, caused by storm winds from the northeast, that erode sediments from the shallow banks. With time, these banks coarsen, as sand and mud are removed and gravel remains, and their western flanks are built up by deposits of mud and sand.

The great topographic detail of the seabed revealed by this survey warranted the naming here of many geographic features. Some features were named in consultation with local fishermen. All names shown have been approved by the U.S. Board on Geographic Names. Information on the process of naming these features is available online at http://woodshole.er.usgs.gov/project-pages/stellwagen/.



Location map outlining the area of this map and showing the 18 quadrangles mapped at scale 1:25,000 (see discussion). Dashed line shows Stellwagen Bank National Marine Sanctuary (SBNMS) boundary. Bathymetric contours in meters.

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