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Didemnum lahillei - California Coast Occurrences and Images

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First documented occurrence

Elkhorn Slough (off Monterey Bay) at Moss Landing, California. Collected by Laura Bedinger, April 30, 1998. California Academy of Sciences specimen no. 144184 (Wasson, K., and others, 2001). Originally identified as *Didemnum carnulentum*, a native species that somewhat resembles *D. lahillei*. Source: G. Lambert.

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Websites with imagery and text

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National Park Service, Point Reyes National Seashore, news, July 2, 2003. (PDF format)

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15	San Francisco Bay	SAU	Sausalito, CA	USA					rope	Rope attached to dock at a marina in Sausalito, CA. May 28, 2003.
16	Bodega Bay Harbor	BB	Bodega Bay, CA	USA					floating dock	May 29, 2003.
17	Elkhorn Slough, Monterey Bay	ES	Moss Landing, CA	USA						First documented occurrence in California. Collected by Laura Bedinger, April 30, 1998. California Academy of Sciences specimen no. 144184. No image

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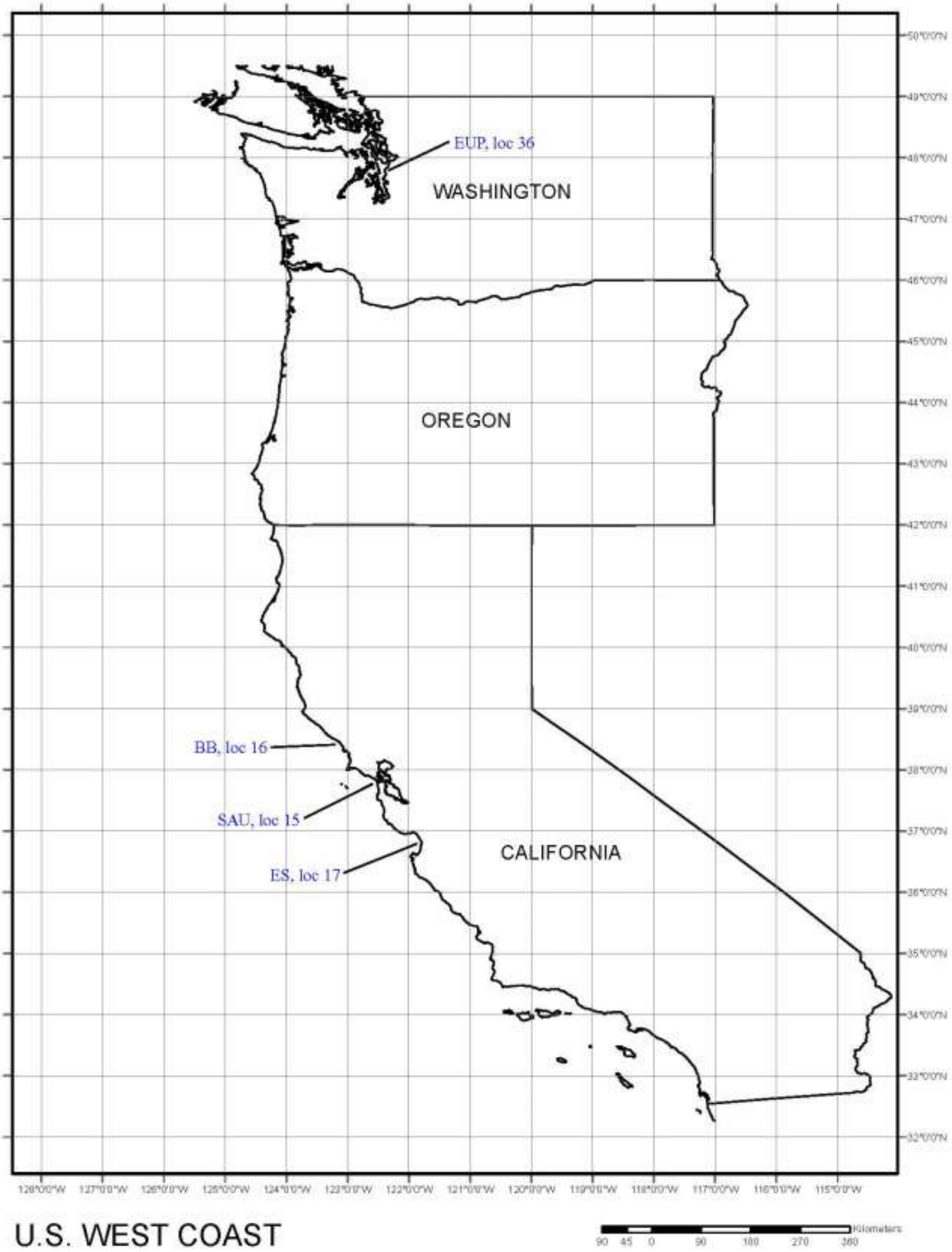
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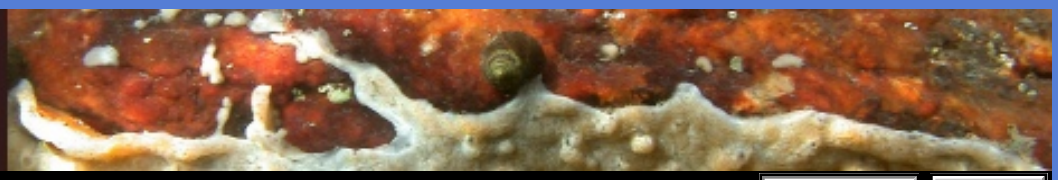

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Image GL_BB_CA001

Image GL_BB_CA001. Tunicate colony of *Didemnum lahillei* removed from a floating dock at a marina on Bodega Bay, CA. May 29, 2003. Photo credit: Gretchen Lambert (UW). Map Location no. 16.

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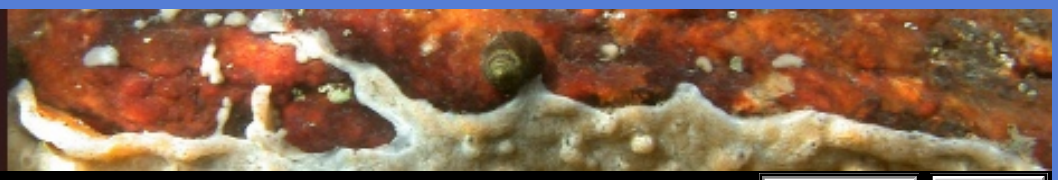

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Image GL_SAU_CA005

Image GL_SAU_CA005. Tunicate colonies of *Didemnum lahillei* growing on a rope at a marina on San Francisco Bay, at Sausalito, CA. May 28, 2003. Photo credit: Gretchen Lambert (UW). Map Location no. 15.
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Image GL_SAU_CA003

Image GL_SAU_CA003. Tunicate colonies of *Didemnum lahillei* growing on a rope at a marina on San Francisco Bay, at Sausalito, CA. May 28, 2003. Photo credit: Gretchen Lambert (UW). Map Location no. 15.
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Image GL_SAU_CA004

Image GL_SAU_CA004. Tunicate colonies of *Didemnum lahillei* growing on a rope at a marina on San Francisco Bay, at Sausalito, CA. May 28, 2003. Photo credit: Gretchen Lambert (UW). Map Location no. 15.

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Image GL_SAU_CA002

Image GL_SAU_CA002. Tunicate colonies of *Didemnum lahillei* growing on a rope at a marina on San Francisco Bay, at Sausalito, CA. May 28, 2003. Photo credit: Gretchen Lambert (UW). Map Location no. 15.

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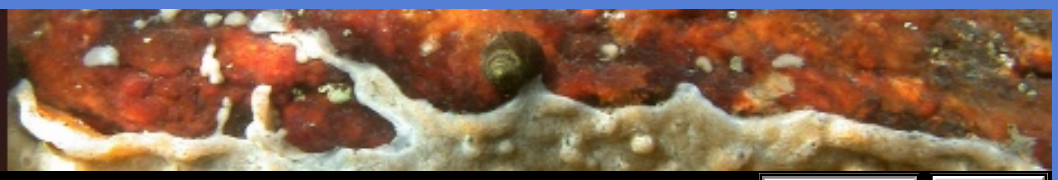

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No Image Available.	Elkhorn Slough (off Monterey Bay) at Moss Landing, California. Collected by L. Bedinger, April 30, 1998. California Academy of Sciences specimen no. 144184. Originally identified as *Didemnum carnulentum*, a native species that somewhat resembles *D. lahillei*. Source: G. Lambert. Map Location no. 17.

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Elkhorn Slough (off Monterey Bay) at Moss Landing, California. Collected by L. Bedinger, April 30, 1998. California Academy of Sciences specimen no. 144184. Originally identified as *Didemnum carnulentum*, a native species that somewhat resembles *D. lahillei*. Source: G. Lambert. Map Location no. 17.

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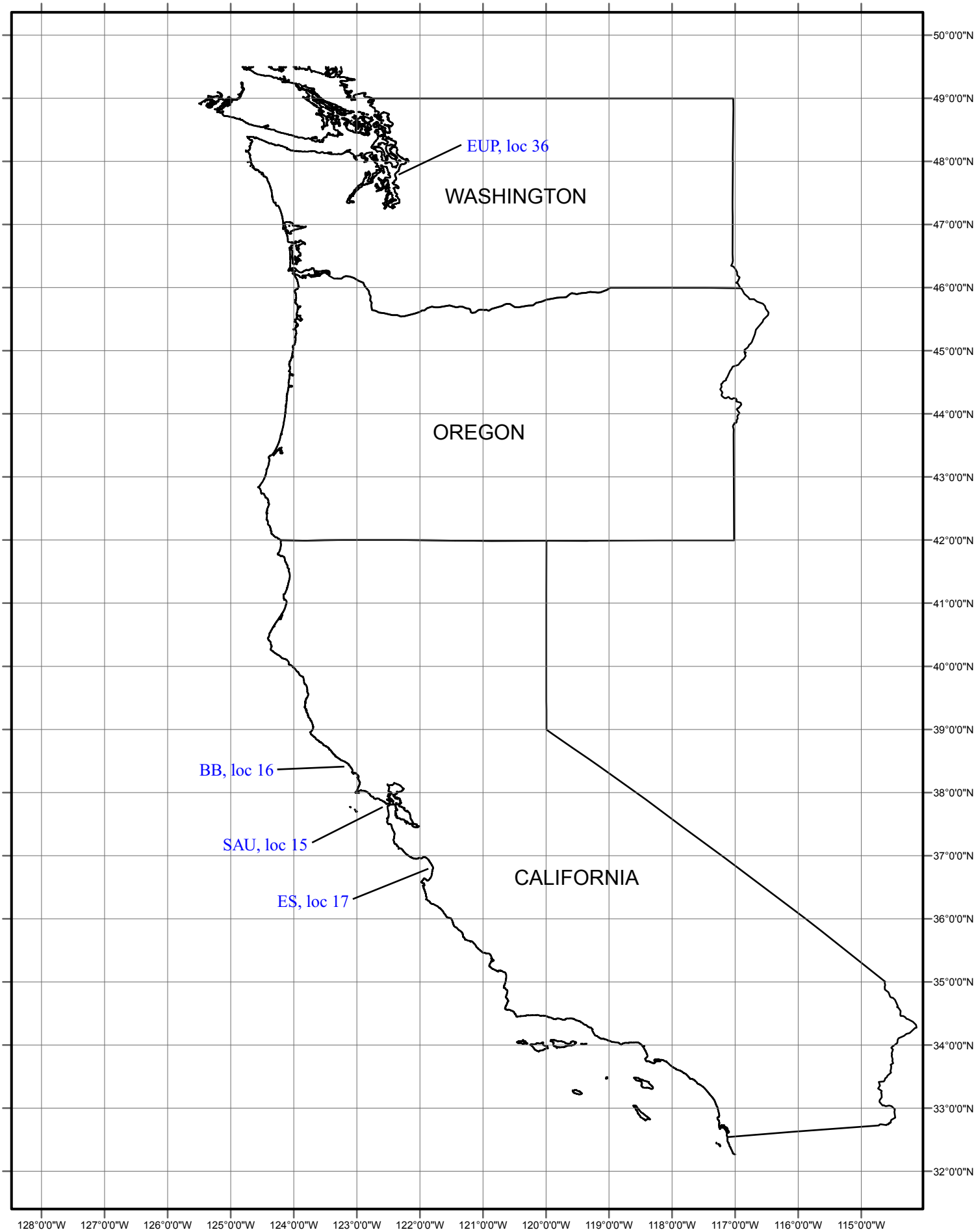

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Map location no.	Location name or station no.	Location abbrev. (2nd part of image filename)	Region	Country	Lat	Lon	Water depth, m	Water temp. deg C	Substrate type	Comment
15	San Francisco Bay	SAU	Sausalito, CA	USA					rope	Rope attached to dock at a marina in Sausalito, CA. May 28, 2003.
16	Bodega Bay Harbor	BB	Bodega Bay, CA	USA					floating dock	May 29, 2003.
17	Elkhorn Slough, Monterey Bay	ES	Moss Landing, CA	USA						First documented occurrence in California. Collected by Laura Bedinger, April 30, 1998. California Academy of Sciences specimen no. 144184. No image

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CALIFORNIA COAST: Occurrences / Location Data / West Coast Location Map

IMAGES: Bodega Bay / Sausalito / Elkhorn Slough

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USGS National Geologic Studies of Benthic Habitats, Northeastern United States

Marine Invasive Species

Didemnum lahillei, a colonial tunicate; ascidian; sea squirt

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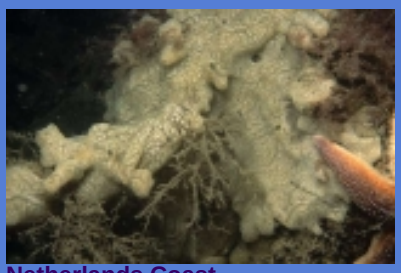

Netherlands Coast

California Coast

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Preparation of Ascidians for Taxonomy

Publications

Links to Related topics
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Contributors & Other Sources
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Text in gray (italic) indicates the topic has not been addressed to date.

Taxonomic Classification

Phylum *Chordata*, Subphylum *Tunicata*, Class *Ascidiacea*, Order *Aplousobranchia*, Family *Didemnidae*, Genus *Didemnum*, Species *lahillei.* Hartmeyer, 1909.

Summary of Occurrence

Didemnum lahillei is a marine colonial tunicate (ascidian; sea squirt) that has been observed at several locations in the northeast Pacific and North Atlantic Ocean basins. It exhibits the characteristics of an invasive species: 1) sudden occurrence where not before known; 2) rapid reproduction and excessive biomass; 3) no known predators. It is native to Europe.

The rapid spread of *Didemnum lahillei* alters marine habitats and threatens to interfere with fishing, aquaculture, and other coastal and offshore activities.

It is found on hard substrates that include dock structures and floats, wood and metal pilings, moorings and ropes, steel chain, automobile tires, polythene plastic, rock outcrops, gravel seabed (pebbles, cobbles, boulders), and ship hulls. It overgrows organisms such as tunicates, sponges, macroalgae, hydroids, anemones, bryozoans, scallops, mussels, and oysters. Where *D. lahillei* occurs on the seabed, it likely covers the siphons of infaunal bivalves. *D. lahillei* has been reported from coastal areas in California, New England, northwest France, and the Netherlands. It also has been observed on the continental shelf off New England in the Gulf of Maine region. It has been found at water depths ranging from intertidal to continental shelf depths of 48m (157 ft).

Gross Morphology and Growth Habits

Didemnum lahillei colonies exhibit a wide variety of morphological variants that range from: 1) long, ropey or beard-like colonies that commonly hang from hard substrates such as docks, lines, and ship hulls; to 2) low, undulating mats with short surficial appendages that encrust and drape rocky seabeds (pebbles, cobbles, boulders, and rock outcrops).

Purpose and attribution

The goal of this website is to assemble and communicate information on the distribution, biology, and marine habitat impacts of the highly invasive colonial tunicate *Didemnum lahillei*. Researchers and others are encouraged to share published and preliminary research results and anecdotal observations on these topics. All contributions are acknowledged. The information displayed on this website is in the public domain. Users are expected to give proper credit for images, data, and ideas they incorporate into their work.

Contributions to the website can be sent to Page Valentine, USGS, pvalentine@usgs.gov

Images of *Didemnum lahillei* posted on this website represent occurrences that have been verified through visual inspection or dissection by persons

familiar with the species. Images that have not been verified as *D. lahillei* are noted as a "provisional identification" in the image caption and in the occurrence tables.

Website design: Donna Newman, USGS

Image processing and archival: Dann Blackwood, USGS

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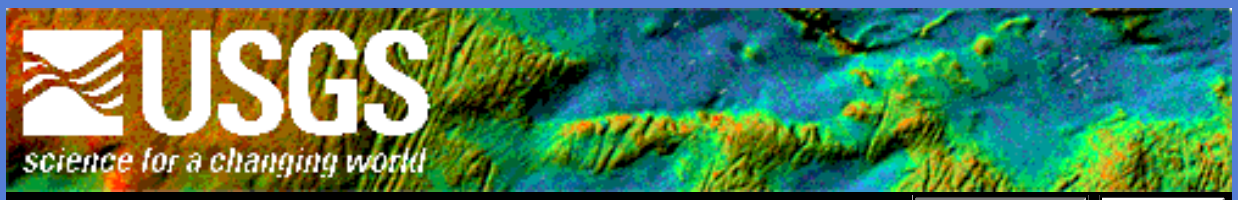

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USGS National Geologic Studies of Benthic Habitats, Northeastern United States

- Stellwagen Bank National Marine Sanctuary Region off Boston, Massachusetts
- Marine Invasive Species
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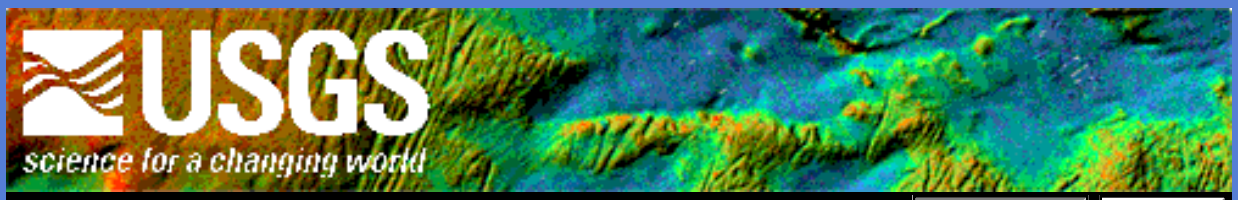

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Stellwagen Bank National Marine Sanctuary Region off Boston, Massachusetts

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INTRODUCTION

The Stellwagen Bank National Marine Sanctuary region is heavily utilized by humans and by marine species. It is a rich commercial and recreational fishing ground. It provides essential habitat for many species of marine mammals, including the endangered North Atlantic Right Whale; and it is the focus of a large tourism industry centered on whale watching. The sanctuary abuts the Massachusetts Bay Disposal Site, which serves as a repository for material dredged from the harbors of Boston and nearby cities; and it lies seaward of Boston's new ocean outfall that discharges treated sewage effluent into Massachusetts Bay. The sanctuary lies in the major shipping lane to and from Boston Harbor; and recently its seabed has been traversed by a fiber optics communications cable that connects New England with Nova Scotia and Europe.

LIST OF PUBLICATIONS

Sea Floor Map and Imagery Publications

GEOLOGIC FEATURES

Thumbnail Images *of representative geologic features in the Stellwagen Bank NMS region*

SEA FLOOR MAPS ON CD-ROM

Sea Floor Topographic, Backscatter, and Interpretive Maps and Bottom Photos of the Massachusetts Bay Disposal Site Region off Boston, Massachusetts
U.S. Geological Survey Open File-Report 98-344

Sea Floor Topographic Map and Perspective View Imagery of Quadrangles 1-18, Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts
U.S. Geological Survey Open File Report 98-138

Sun-Illuminated Sea Floor Topographic Maps and Perspective View Imagery of Quadrangles 1-18, Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts
U.S. Geological Survey Open-File Report 99-363

Sea Floor Maps Showing Topography, Sun-Illuminated Topographic Imagery, and Backscatter Intensity of the Stellwagen Bank National Marine Sanctuary Region off Boston, Massachusetts
U.S. Geological Survey Open-File Report 00-410

POSTERS

Acoustic Backscatter Mapping in Stellwagen Bank National Marine Sanctuary
By: Tanya S. Unger, Jessica L. Baker, Page C. Valentine, William W. Danforth, and John E. Hughes Clarke

Mapping the Sea Floor of the Stellwagen Bank National Marine Sanctuary, Massachusetts Bay using GIS
By: Jessica L. Baker, Tanya S. Unger, and Page C. Valentine

Glacial and Post-Glacial Processes and Topography in the Stellwagen Bank National Marine Sanctuary Region off Boston, Massachusetts
By: Page C. Valentine, Tanya S. Unger, and Jessica L. Baker

Habitat Mapping of the Gulf of Maine
By: B.J. Todd, P.C. Valentine, V.E. Kostylev, and R.A. Pickrill

FACT SHEETS

Mapping the Sea Floor and Biological Habitats of the Stellwagen Bank National Marine Sanctuary
U.S. Geological Survey Fact Sheet 078-98

Seabed Observation and Sampling System
U.S. Geological Survey Fact Sheet 142-00

SEABED PHOTOGRAPHS

Photographs of Seabed Habitat and Fauna

RELATED WEBSITES

Stellwagen Bank National Marine Sanctuary

NOAA National Marine Sanctuaries

NMFS Northeast Fisheries Science Center

New England Fishery Management Council

Marine Protected Areas of the United States

Boston Harbor/Massachusetts Bay On-Line Publications

The Center for Coastal Studies

National Undersea Research Center

Northeast U.S. Marine Observations

Gulf of Maine Moored Buoy Program (GoMoos)

Whale Center of New England, Gloucester, MA

New England Aquarium

Northeast Consortium

Center for Coastal and Ocean Mapping Joint Hydrographic Center

Gulf of Maine Council on the Marine Environment

Commercial Fisheries News

FLY OVER THE SEABED

Massachusetts Bay Disposal Site

Stellwagen Bank National Marine Sanctuary

Indigenous Organisms of Stellwagen Bank

GEOGRAPHIC NAMES

Stellwagen Bank-Jeffreys Ledge Region

INTRODUCTION (continued)

The sea floor mapping survey of the Stellwagen Bank National Marine Sanctuary region covers approximately 1100 square nautical miles of seabed located off Boston, Massachusetts and extending from Race Point Channel (just north of Cape Cod) to the southern part of Jeffreys Ledge (north of Cape Ann). It was conducted on four cruises over a two-year period from the fall of 1994 to the fall of 1996 using a multibeam echo sounder installed aboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

The sedimentary environments and biological habitats found on the sea floor are being identified and interpreted by using video and photographic imagery and sediment samples that have been collected on many cruises to the region since the mapping was initiated. Research results and products are presented here in the form of maps, posters, fact sheets, sonar images, and bottom photographs.

The great topographic detail of the seabed revealed by the sonar images warrants the naming here of many geographic features. Some features were named in consultation with local fishermen. The names are documented in the "GEOGRAPHIC NAMES" section.

The project has published two map series of 18 quadrangles each (see location map) in which new sea floor topography and sun-illuminated topographic imagery are presented at a scale of 1:25,000 (1 cm on the map represents 250 m on the sea floor). In addition, a map series showing the entire region on a single sheet at a scale of 1:60,000 is presented as a set of 3 maps; one shows contoured seabed topography only, a second adds seabed topographic imagery, and the third adds the backscatter intensity (or reflectivity) of the seabed. See the "LIST OF PUBLICATIONS" for a complete list of maps and CD-ROMs.

The sea floor observed in the Stellwagen Bank NMS region has been shaped for the most part by glacial processes, and the resulting topographic features have been modified since the melting of the ice and the return of the sea. Seabed shapes are interpreted here to represent a geologic history that developed in several stages. Ice containing rock debris moved across the region, sculpting its surface and depositing sediment to form the major basins, banks, ridges, and valleys. Minor features represent the latter stages of deglaciation. They are the result of processes at work when much of the area was covered by stationary rotting ice, and when at the same time small valley glaciers and ice falls were active in and near areas of high topographic relief. Subsequently, the sea invaded the region formerly occupied by ice, and glacial features were partly eroded and some new deposits formed. Today the sea floor is modified mainly by strong southwestward-flowing bottom currents caused by storm winds from the northeast. These currents erode sediments from the shallow banks and transport them into the basins. With time the banks become coarser, as sand and mud are removed and gravel remains; and the western flanks of the banks, as well as adjacent basins, are built up by deposits of mud and sand.

The Stellwagen Bank National Marine Sanctuary Mapping Project is a cooperative effort supported by the Coastal and Marine Geology Program of the U.S. Geological Survey and agencies of the National Oceanic and Atmospheric Administration (including the National Marine Sanctuary System, the National Marine Fisheries Service, the National Undersea Research Program, and the Office of Coast Survey). The acquisition and processing of the multibeam sonar data that form the basis of the maps was conducted with technical support from the University of New Brunswick and the Canadian Hydrographic Service.

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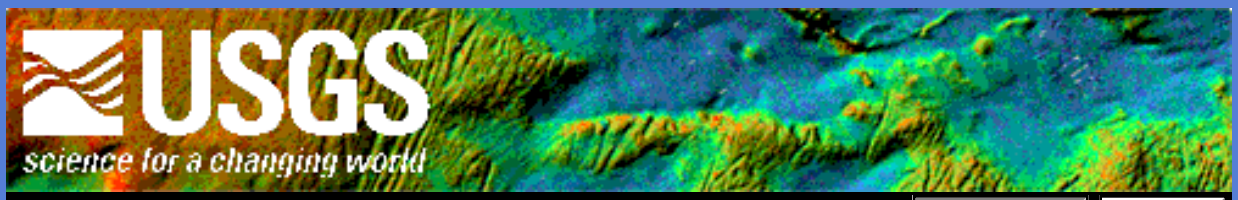

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Geologic Studies of Benthic Habitats

List of Sea Floor Map and Imagery Publications

Notes:

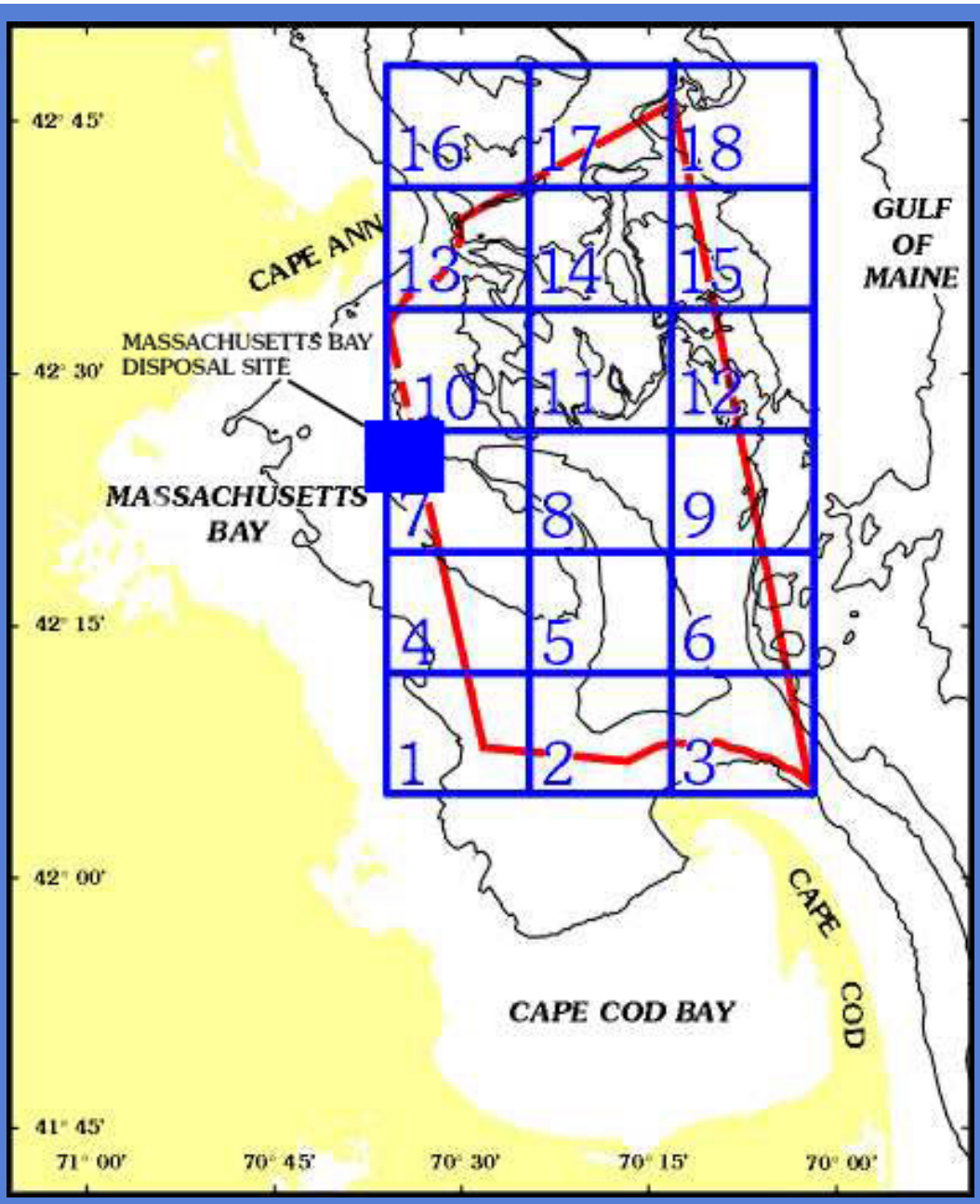
A. CD-ROMs contain PDF, EPS, and PS files for printing individual map sheets on large format printers. CD-ROMs are accessible on this Web site.

B. Paper copies can be obtained from:

Page Valentine, U.S. Geological Survey, 384 Woods Hole Rd., Woods Hole, MA 02543, (508) 457-2239, pvalentine@usgs.gov

Stellwagen Bank NMS, 175 Edward Foster Road, Scituate, MA 02066, (781) 545-8026

USGS Information Services, Box 25286 Denver Federal Center, Denver, CO 80225-0046, (303) 202-4200



Map showing Stellwagen Bank National Marine Sanctuary 18 quadrangles and Massachusetts Bay Disposal Site location.

MASSACHUSETTS BAY DISPOSAL SITE MAPS AND FEATURES
[2 maps; scales 1:10,000 and 1:12,000]

CD-ROM:
Valentine, P.C., Baker, J.L., Unger, T.S., Evans, J., and Polloni, C., 1999, Sea floor topographic, backscatter, and interpretive maps and bottom photos of the Massachusetts Bay Disposal Site region off Boston, Massachusetts: U.S. Geological Survey Open-File Report 98-344, 1 CD-ROM.

Paper:
Valentine, P.C., Danforth, W.W., Roworth, E.T., and Stillman, S.T., 1996, Maps showing topography, backscatter, and interpretation of seafloor features in the Massachusetts Bay Disposal Site region off Boston, Massachusetts: U.S. Geological Survey Open-File Report 96-273, scale 1:10,000 and 1:12,500, 2 sheets.

MASSACHUSETTS AND CAPE COD BAYS AND STELLWAGEN BANK NATIONAL MARINE SANCTUARY SEA FLOOR TOPOGRAPHY
[scale 1:100,000]

Paper only:
Valentine, P.C., Schmuck, E.A., Signell, R.P., and Ryland, C.A., 1995, Sea floor topography of Massachusetts and Cape Cod Bays and Stellwagen Bank National Marine Sanctuary: U.S. Geological Survey Open-File Report 95073, scale 1:100,000.

STELLWAGEN BANK NATIONAL MARINE SANCTUARY SEA FLOOR TOPOGRAPHY
[a series of 18 individual quadrangle maps; scale 1:25,000]

CD-ROM:
Valentine, P.C., Baker, J.L., and Unger, T.S., and Polloni, C., 1998, Sea floor topographic map and perspective view imagery of **Quadrangles 1-18**, Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 98-138, 1 CD-ROM.

Paper:
Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 1** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-502, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 2** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-503, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 3** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-504, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 4** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-505, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 5** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-506, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 6** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-507, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 7** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-508, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 8** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-509, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 9** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-682, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 10** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-683, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 11** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-684, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 12** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-685, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 13** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-726, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 14** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-727, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 15** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-728, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 16** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-729, scale 1:25,000.

Valentine, P.C., Baker, J.L., Unger, T.S., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 17** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-730, scale 1:25,000.

Valentine, P.C., Unger, T.S., Baker, J.L., and Roworth, E.T., 1997, Sea floor topography of **Quadrangle 18** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 97-731, scale 1:25,000.

STELLWAGEN BANK NATIONAL MARINE SANCTUARY SUN-ILLUMINATED SEA FLOOR TOPOGRAPHIC IMAGERY
[a series of 18 individual quadrangle maps; scale: 1:25,000]

CD-ROM:
Valentine, P.C., Unger, T.S., Baker, J.L., and Polloni, C., 2000, Sun-illuminated sea floor topographic map and perspective view imagery of **Quadrangles 1-18**, Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Open-File Report 99-363, 1 CD-ROM.

Paper:
Valentine, P.C., Baker, J.L., and Unger, T.S., 2000, Sun-illuminated sea floor topography of **Quadrangle 1** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2701, scale 1:25,000.

Valentine, P.C., Unger, T.S., and Baker, J.L., 1999, Sun-illuminated sea floor topography of **Quadrangle 2** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2702, scale 1:25,000.

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Valentine, P.C., Baker, J.L., and Unger, T.S., 2000, Sun-illuminated sea floor topography of **Quadrangle 9** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2709, scale 1:25,000.

Valentine, P.C., Unger, T.S., and Baker, J.L., 2000, Sun-illuminated sea floor topography of **Quadrangle 10** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2710, scale 1:25,000.

Valentine, P.C., Baker, J.L., and Unger, T.S., 2000, Sun-illuminated sea floor topography of **Quadrangle 11** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2711, scale 1:25,000.

Valentine, P.C., Unger, T.S., and Baker, J.L., 2000, Sun-illuminated sea floor topography of **Quadrangle 12** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2712, scale 1:25,000.

Valentine, P.C., Baker, J.L., and Unger, T.S., 2001, Sun-illuminated sea floor topography of **Quadrangle 13** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2713, scale 1:25,000.

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Valentine, P.C., Baker, J.L., and Unger, T.S., 2001, Sun-illuminated sea floor topography of **Quadrangle 17** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2717, scale 1:25,000.

Valentine, P.C., Unger, T.S., and Baker, J.L., 2001, Sun-illuminated sea floor topography of **Quadrangle 18** in the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2718, scale 1:25,000.

STELLWAGEN BANK NATIONAL MARINE SANCTUARY SUN-ILLUMINATED SEA FLOOR TOPOGRAPHIC IMAGERY AND BACKSCATTER INTENSITY
[a series of 18 individual quadrangle maps combined into one map; scale 1:60,000]

CD-ROM:
Valentine, P.C., Middleton, T.J., and Fuller, S.J., 2001, Sea floor maps showing topography, sun-illuminated topography, and backscatter intensity of the Stellwagen Bank National Marine Sanctuary region off Boston, Massachusetts: U.S. Geological Survey Open-File Report 00-410, 1 CD-ROM.

Paper:
Valentine, P.C., Baker, J.L., and Unger, T.S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary region off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series Map I-2676-A, scale 1:60,000.

Valentine, P.C., Unger, T.S., and Baker, J.L.,2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary region off Boston, Massachusetts: U.S. Geologic Survey Geological Investigations Series Map I-2676-B, scale 1:60,000.

Valentine, P.C., Unger, T.S., and Baker, J.L.,2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary region off Boston, Massachusetts: U.S. Geologic Survey Geological Investigations Series Map I-2676-C, scale 1:60,000.

[3 maps of the 18-quadrangle region showing topography, sun-illuminated topographic imagery, and backscatter intensity, respectively; also new sea floor feature names]

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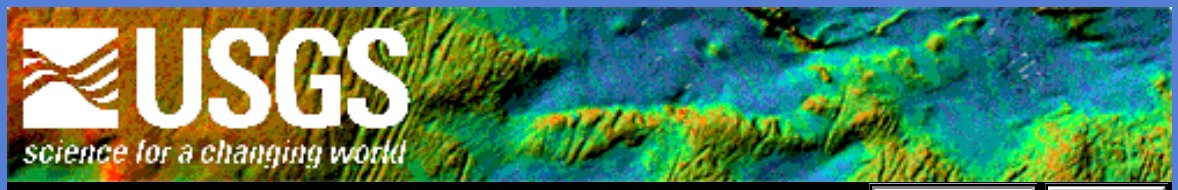

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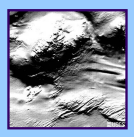

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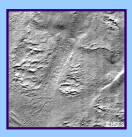

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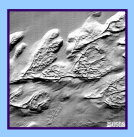

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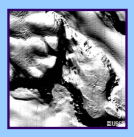
glacial valley



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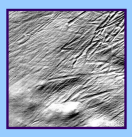

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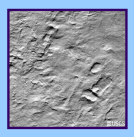

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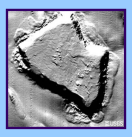

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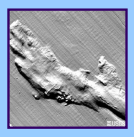
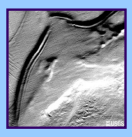
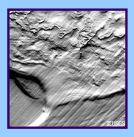


linear bank



lower lateral moraines



moraines

upper lateral moraines

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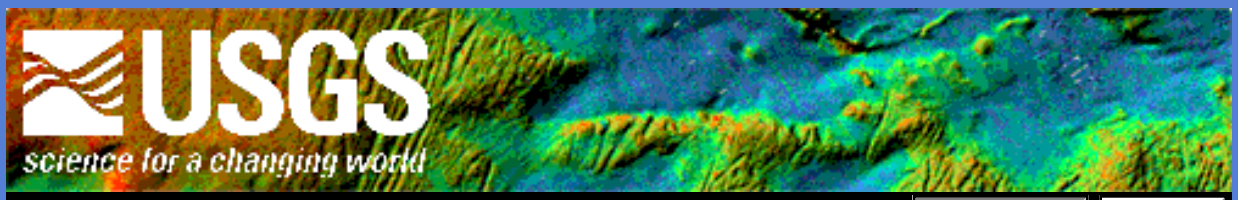

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Click on specific habitat/sediment types or faunal categories to view thumbnail and jpeg images of the seabed features.

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Habitat/Sediment type
boulders
burrowed mud
cobbles and boulders
gravel
gravelly sand
mud
muddy gravel
muddy sand

Fauna		
algae	herring egg bed	sea urchin
anemone	lobster	shrimp
barnacles	magenta calcareous algae	skate
brown sea squirt	mussels	spider crab
bryozoa	ocean pout	sponge
burrowing anemone	orange sponge	stalked ascidian
cancer crab		

rippled muddy sand

rippled sand

sand

sandy gravel

shell deposit

cod

dead mollusc shells

finger sponge

flounder

funnel worm

goosefish

gray sea squirt

hermit crab

red hake

redfish

sand dollar

sand lance

scallop

sculpin

sea cucumber

sea pen

starfish

trawl marks

white brachiopod

white sponge

white worm tubes

wolffish

yellow sponge

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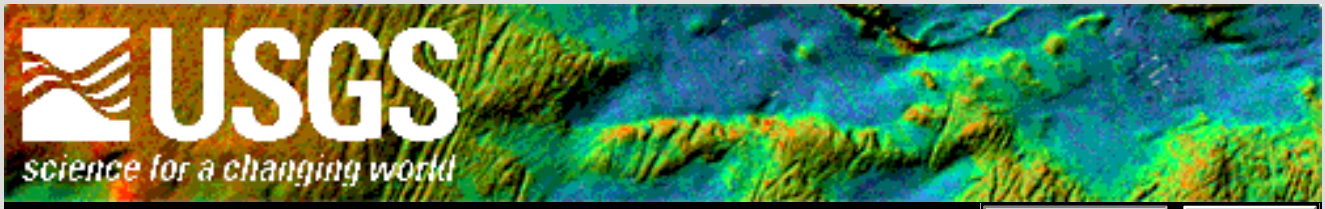

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Geologic Studies of Benthic Habitats

GEOGRAPHIC FEATURE NAMES FOR THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY REGION

UNITED STATES GEOLOGICAL SURVEY

STELLWAGEN BANK NATIONAL MARINE SANCTUARY MAPPING PROJECT

[Approved by the United States Board on Geographic Names, 1999]

LIST OF FEATURE NAMES:

THE BREAKWATER

COMPASS ROSE BANK

THE COVE

CREED BASIN

CREED RIDGE

GLOUCESTER BANK

GLOUCESTER BASIN

LITTLE TILLIES BANK

LONG BANK

LOWER JEFFREYS LEDGE

POLYGON BANK

POLYGON BASIN

RACE POINT CHANNEL

THE ROCKPILE

ROSE AND LUCYS BASIN

THE STONE WALL

THACHER BANK

THACHER BASIN

TILLIES BANK

TILLIES BASIN [name removed]

EAST BREAKWATER BANK
EAST HILL
EAST NINETY BANK
EAST PIGEON HILL
EAST TILLIES BASIN
ELLIPSE BANK
FIFTEEN BANK
FIRST BASIN
LOWER STELLWAGEN BANK
MIDDLE NINETY BANK
NINETY METER BANKS
NORTH NINETY BANK
NORTH TILLIES BASIN
NORTHERN VALLEY
NORTHWEST CORNER
PIGEON BASIN
SALVAGES BASIN
SANCTUARY BASIN
SANCTUARY HILL
SCANTUM SPUR
SOUTH NINETY BANK
SOUTHWEST CORNER
SOUTHWESTERN SPUR
STENOS BASIN
TRIPLE VALLEY
WEST BREAKWATER BANK
WEST PIGEON HILL
WEST TILLIES BASIN
WESTERN EDGE
WESTERN SPUR
Y VALLEY

FEATURE NAME: *THE BREAKWATER*

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 19.7'N	70º 27.9'W

linear feature

	Latitude	Longitude
from	42º 18.8'N	70º 25.1'W
to	42º 20.6'N	70º 30.7'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: An assemblage of 2 banks

Size and shape: The Breakwater is a pair of linear, northwest-trending banks that are located on the same northwest azimuth and are; separated by a gap of approximately 0.2 nm (0.4 km). The combined length is approximately 4.5 nm (8.4 km), and the combined area is approximately 3.2 sq nm (11.4 sq km)

Depth (max. and min.): Tops of banks: 60-70 m; bases of banks: 85-95 m

Steepness, etc : Maximum relief of banks ranges from 20 to 30 m

ASSOCIATED FEATURES: The Breakwater lies in Stellwagen Basin west of Fifteen Bank, south of The Rockpile, and east of Compass Rose Bank. It is an assemblage of East Breakwater Bank and West Breakwater Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: The Breakwater is a linear, northwest-trending pair of banks in Stellwagen Basin. Both banks are similarly aligned, and possibly were connected at one time. East Breakwater Bank and West Breakwater Bank collectively are called The Breakwater by local commercial fishermen. This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years. As The Breakwater is actually 2 separate features, they have been given separate names here, and the name The Breakwater is proposed to refer to the group of 2 features (see separate descriptions for East Breakwater Bank and West Breakwater Bank).

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000

multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
Title: Geologist
Organization: U.S. Geological Survey
Address: Woods Hole Field Center, 384 Woods Hole Road, Woods Hole, MA 02543
tel 508-457-2239 fax 508-457-2310 email pvalentine@usgs.gov

FEATURE NAME: ***COMPASS ROSE BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature

Latitude	Longitude
42º 20.4'N	70º 34.3'W

linear feature

	Latitude	Longitude
from	42º 19.8'N	70º 32.2'W
to	42º 21.7'N	70º 36.0'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: Compass Rose Bank is a sinuous, linear, northwest-trending feature that is approximately 3.4 nm (6.4 km) long and 0.6 to 0.8 nm (1.1 to 1.5 km) wide. Total area is approximately 2.25 sq nm (7.9 sq km).

Depth (max. and min.): Top of feature 55 m; base 70-85 m.

Steepness, etc : Maximum relief of feature is approximately 25 m on the southwestern flank

ASSOCIATED FEATURES: Compass Rose Bank lies in Stellwagen Basin northwest of The Breakwater.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13267, Massachusetts Bay, 29th edition, scale 1:80,000. [feature indicated by sounding only]

REASON FOR CHOICE OF NAME: Compass Rose Bank is a linear, northwest-trending feature in Stellwagen Basin. The bank is located within the compass rose printed on the nautical chart commonly used by commercial fishermen in this region (NOS Chart 13267). The name Compass Rose Bank traditionally is used by them to refer to this feature. This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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Organization: U.S. Geological Survey
Address: Woods Hole Field Center, 384 Woods Hole Road, Woods Hole, MA 02543
tel 508-457-2239 fax 508-457-2310 email pvalentine@usgs.gov

FEATURE NAME: ***THE COVE***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature

Latitude	Longitude
42º 49.0'N	70º 22.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner	42º 47.5'N	70º 20.0'W
S.W. corner	42º 48.6'N	70º 25.4'W
N.W. corner	42º 51.4'N	70º 24.3'W

DESCRIPTION:

Feature type: Basin

Size and shape: The Cove is a U-shaped feature that opens to the northwest. It is approximately 4.2 nm (7.9 km) long and 1.2-2.8 nm (2.2-5.2 km) wide. Total area is approximately 7.6 sq nm (26.5 sq km).

Depth (max. and min.): Basin depths range from 110 to 140 m.

Steepness, etc : Maximum relief of the basin walls is approximately 80-85 m on the northeast-facing side.

ASSOCIATED FEATURES: The Cove is bounded on the northeast and east by Jeffreys Ledge and on the southwest by Scantum Spur. The Cove is a subsidiary basin within Scantum Basin.

CHART OR MAP REFERENCE:

Name and feature shown on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: The Cove is a subsidiary basin within Scantum Basin. The name appears on several maps (NOS Charts 13009 and 13278), but the name until now has never been proposed and therefore does not appear in the Gazetteer of Undersea Features. The purpose of this report is to formalize the name The Cove which is in use today and which appears on published NOS charts.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

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Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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Organization: U.S. Geological Survey
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tel 508-457-2239 fax 508-457-2310 contact pvalentine@usgs.gov

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FEATURE NAME: ***CREED BASIN***

LOCATION:

Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature

Latitude	Longitude
42º 32.6'N	70º 22.2'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 33.9'N	70º 22.1'W
S.E. corner	42º 30.7'N	70º 20.8'W
S.W. corner	42º 30.5'N	70º 21.5'W
N.W. corner	42º 34.5'N	70º 24.1'W
additional corner	42º 33.8'N	70º 23.9'W
additional corner	42º 33.0'N	70º 22.7'W
additional corner	42º 31.7'N	70º 23.0'W

DESCRIPTION:

Feature type: Basin

Size and shape: Creed Basin is a relatively long, narrow, north northwest-trending feature. It is approximately 4.4 nm (8.2 km) long and varies from 0.5 to 1.0 nm (0.9 to 1.9 km) wide. Total area is approximately 3.2 sq nm (11.2 sq km).

Depth (max. and min.): Basin depths range from 125 to 165 m.

Steepness, etc : Maximum relief of basin walls is approximately 60-65 m. Maximum local relief of the basin floor is approximately 20-25 m.

ASSOCIATED FEATURES: Creed Basin is bounded on the east by Creed Ridge and on the west by Polygon Basin, Polygon Bank, and Gloucester Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Creed Basin extends along the western flank of Creed Ridge. Both features are named in honor of the Canadian Hydrographic Service vessel *Frederick G. Creed* that conducted the multibeam survey of the region in 1994-1996. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***CREED RIDGE***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature

Latitude	Longitude
42º 32.3'N	70º 20.6'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 35.2'N	70º 23.8'W
N.E. corner	42º 34.0'N	70º 19.8'W
S.E. corner	42º 31.1'N	70º 18.6'W
S. corner	42º 29.3'N	70º 19.0'W

S.W. corner	42º 29.8'N	70º 20.6'W
W. corner	42º 33.3'N	70º 22.1'W
N.W. corner	42º 34.7'N	70º 24.3'W
additional corner	42º 33.9'N	70º 22.1'W

DESCRIPTION:

Feature type: Ridge

Size and shape: Creed Ridge is a north south-trending, somewhat sinuous feature with steep sides whose hilly surface is dissected by numerous small gullies. It is approximately 6.9 nm (12.9 km) long and 0.5-1.7 nm (0.9-3.2 km) wide. Total area is approximately 9.0 sq nm (31.5 sq km).

Depth (max. and min.): Top of feature 85-100 m; base 130-190 m.

Steepness, etc : Maximum relief is approximately 105 m on the eastern flank; minimum relief is approximately 20 m on the northeastern flank where it is bounded on the north by Lower Jeffreys Ledge.

ASSOCIATED FEATURES: Creed Ridge is bounded on the west by Creed Basin, on the north by Lower Jeffreys Ledge, on the east by West Tillies Basin, and on the south by Little Tillies Bank and Gloucester Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Creed Ridge is bounded on the west by Creed Basin. Both features are named in honor of the Canadian Hydrographic Service vessel *Frederick G. Creed* that conducted the multibeam survey of the region in 1994-1996. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***EAST BREAKWATER BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature

Latitude	Longitude
42º 19.3'N	70º 26.5'W

linear feature

	Latitude	Longitude
from	42º 19.0'N	70º 25.3'W
to	42º 19.7'N	70º 28.3'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: East Breakwater Bank is a linear, northwest-trending feature that is approximately 2.4 nm (4.5 km) long and 1.2 nm (2.2 km) wide. Total area is approximately 2 sq nm (7 sq km).

Depth (max. and min.): Top of feature 60 m; base 85-90 m.

Steepness, etc : Maximum relief of feature is approximately 30 m on the southern flank.

ASSOCIATED FEATURES: East Breakwater Bank lies in Stellwagen Basin, just to the southeast of West Breakwater Bank and west of Fifteen Bank. It is the eastern part of a pair of banks that collectively are called The Breakwater (see separate description).

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: East Breakwater Bank is a linear, northwest-trending bank in Stellwagen

Basin. It is located 0.2 nm (0.4 km) southeast of West Breakwater Bank. Both features are similarly aligned, and possibly were connected at one time. East Breakwater Bank and West Breakwater Bank collectively are called The Breakwater by local commercial fishermen. This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years. As The Breakwater is actually 2 separate features, they have been given separate names here, and the name The Breakwater refers to a group of 2 features.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and

backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***EAST HILL***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 45.9'N	70º 10.9'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 46.1'N	70º 10.3'W
S.E. corner	42º 45.5'N	70º 10.3'W
S.W. corner	42º 45.6'N	70º 11.5'W
N.W. corner	42º 46.4'N	70º 11.6'W

DESCRIPTION:

Feature type: Hill

Size and shape: East Hill is a large feature with a pointed conical summit. It has more relief on its southern flank than on its northern flank. It is approximately 1.3 nm (2.4 km) long and 1.0 nm (1.9 km) wide. Total

area is approximately 0.8 sq nm (2.8 sq km).

Depth (max. and min.): Top of feature is 50 m; base 80 m.

Steepness, etc : Maximum relief of feature is approximately 75 m on the southern flank.

ASSOCIATED FEATURES: East Hill is located east of Sanctuary Hill and is bounded on the northwest by Pigeon Basin and on the south by Sanctuary Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000. [feature not well defined]

REASON FOR CHOICE OF NAME: East Hill is a prominent bedrock outcrop with a pointed conical summit that is deeply exhumed on its southern flank by glacial scouring. It lies just east of a similar, but more exposed feature named Sanctuary Hill. Interviews with local commercial fishermen failed to identify an appropriate local name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed.*

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***EAST NINETY BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 16.7'N	70º 02.5'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 17.5'N	70º 02.0'W
S.E. corner	42º 16.0'N	70º 02.0'W
S.W. corner	42º 15.9'N	70º 03.3'W
N.W. corner	42º 17.4'N	70º 02.9'W

DESCRIPTION:

Feature type: Bank

Size and shape: East Ninety Bank is a subrectangular feature with a relatively flat top that is approximately 1.6 nm (2.9 km) long and 1.0 nm (1.9 km) wide. Total area is approximately 1.5 sq nm (5.2 sq km). It is separated by a shallow valley from North Ninety Bank to the west.

Depth (max. and min.): Top of feature 90-95 m; base 100-180 m.

Steepness, etc : Maximum relief of feature is approximately 85 m on the east flank.

ASSOCIATED FEATURES: East Ninety Bank lies just east of North Ninety Bank and north of Middle Ninety Bank. It is part of an assemblage of 4 banks called Ninety Meter Banks (see separate description).

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13260, Bay of Fundy to Cape Cod, 36th edition, scale 1:378,838. [feature not well defined]

REASON FOR CHOICE OF NAME: East Ninety Bank is the easternmost bank of an assemblage of 4 small, well-defined subrectangular banks (Ninety Meter Banks) that lie just to the east of Stellwagen Bank. They are separated from each other by valleys of varying depth, and thus their relief is variable. However, their unifying characteristic is the depth to their relatively flat top surfaces. The bank tops all lie at approximately 90 m water depth, a result of their common origin by glacial erosion. The word "meter" is part of the collective name (Ninety Meter Banks) of the 4 features, but it is not included in the names of the individual banks as it would make the name too long and

cumbersome.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***EAST PIGEON HILL***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 46.5'N	70º 14.4'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 46.8'N	70º 14.1'W
S.E. corner	42º 46.4'N	70º 14.2'W
S.W. corner	42º 46.3'N	70º 14.5'W
N.W. corner	42º 46.5'N	70º 14.8'W

DESCRIPTION:

Feature type: Hill

Size and shape: East Pigeon Hill is a conical, northeast-trending feature. It is approximately 0.5 nm (0.9 km) long and 0.3-0.4 nm (0.6-0.7 km) wide. Total area is approximately 0.2 sq nm (0.7 sq km).

Depth (max. and min.): Top of feature is approximately 30 m; base is 50-55 m.

Steepness, etc : Maximum relief of feature is approximately 25 m on the southeastern flank.

ASSOCIATED FEATURES: East Pigeon Hill lies on the eastern part of Jeffreys Ledge, just east of West Pigeon Hill, and northwest of Pigeon Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: East Pigeon Hill is a small but prominent bedrock outcrop that protrudes from the relatively flat sandy surface of Jeffreys Ledge. The hill has been the site of intensive biological research, and it was named unofficially as Pigeon Hill by Richard A. Cooper (Marine Sciences and Technology Center, University of Connecticut) in a NOAA publication (Hulbert et al., 1982, *Ecosystem definition and community structure of the macrobenthos of the NEMP monitoring station at Pigeon Hill in the Gulf of Maine: NOAA Technical Memorandum NMFS-F/NEC-14*). The name is used by scientists to this day. However, because the name Pigeon Hill now is used for 7 features in Massachusetts (some nearby in Essex County), the new feature is named East Pigeon Hill to distinguish it from an adjacent twin feature that is named West Pigeon Hill elsewhere in this report. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***EAST TILLIES BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 33.8'N	70º 15.2'W

linear feature

Latitude	Longitude

from
to

areal feature

	Latitude	Longitude
N. corner	42º 37.9'N	70º 17.0'W
N.E. corner	42º 36.8'N	70º 16.2'W
S.E. corner	42º 30.1'N	70º 14.0'W
S.W. corner	42º 29.9'N	70º 14.6'W
W. corner	42º 33.8'N	70º 15.4'W
N.W. corner	42º 37.5'N	70º 17.8'W
additional corner	42º 36.9'N	70º 16.8'W

DESCRIPTION:

Feature type: Basin

Size and shape: East Tillies Basin is an elongate, narrow northsouth-trending feature that varies little in width. It is approximately 8.3 nm (15.6 km) long and 0.3-0.7 nm (0.6-1.3 km) wide. Total area is approximately 4.0 sq nm (14.0 sq km).

Depth (max. and min.): Basin depths range from 110 to 150 m.

Steepness, etc : Maximum relief of basin walls is approximately 50-80 m on the eastern and western sides. Maximum local relief of the basin floor is approximately 30 m in the northern part.

ASSOCIATED FEATURES: East Tillies Basin is bounded on the north by North Tillies Basin and on the west by Tillies Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape

Ann, 24th edition, scale 1:80,000. [northern part of feature only]

REASON FOR CHOICE OF NAME: Background on the name "**Tillies**."

Tillies Bank is a very prominent feature that is well known by commercial fishermen and marine scientists who work in the region. The name appears on several maps (NOS Chart 13009; NOS Bathymetric Fishing Map, Gloucester sheet), but the name has never been proposed and therefore does not appear in the Gazetteer of Undersea Features. See formalization of the name Tillies Bank in this report.

The name **Tillies Basin** was applied by Uchupi to a feature that does not exist at the described location, and the label on the NOS Bathymetric Fishing Map adds to the confusion about the location of Tillies Basin.

The new multibeam survey (1994-1996) that is the basis for the new feature names clearly shows that there is no large basin at the location (42º 30'N, 70º 20'W; official coordinates for Tillies Basin in the Gazetteer of Undersea Features), where a large basin (Tillies Basin) is shown (but not labeled) on Uchupi's map. The described coordinates actually fall on a feature now named Creed Ridge, a feature not represented on Uchupi's map. See justification in this report for removing the name Tillies Basin.

The new survey shows that Tillies Bank is bounded on the north, east, and west by 3 large, long deep basins. As the name Tillies has been used for many years in this region, it is appropriate to retain it in the 3 newly-named basins that enclose Tillies Bank (North Tillies Basin, East Tillies Basin, and West Tillies Basin).

East Tillies Basin bounds the east side of Tillies Bank and is the east fork of North Tillies Basin. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

Summary of the use of the name "Tillies" in this and accompanying documents:

Formalize the name **Tillies Bank**.
Name a new feature **Little Tillies Bank**.
Remove the name **Tillies Basin** (feature does not exist; retention of name will be confusing).
Name three new features **North Tillies Basin**, **East Tillies Basin**, and **West Tillies Basin**.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***ELLIPSE BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 29.6'N	70º 28.1'W

linear feature

	Latitude	Longitude
from	42º 28.7'N	70º 27.6'W
to	42º 30.6'N	70º 28.6'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: Ellipse Bank is a relatively flat, northwest-trending feature. The bank surface is elliptical in outline. It is approximately 2 nm (3.7 km) long and 1.2 nm (2.2 km) wide. Total area is approximately 1.8 sq nm (6.1 sq km).

Depth (max. and min.): Top of feature 60-65 m; base 85-120 m.

Steepness, etc : Maximum relief of feature is approximately 55 m on the eastern flank.

ASSOCIATED FEATURES: Ellipse Bank lies northeast of Lower Stellwagen Bank and is bounded on the east by Stenos Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Ellipse Bank is a northwest-trending bank with a distinctively elliptical surface outline. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean

Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***FIFTEEN BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 19.1'N	70º 23.2'W

linear feature

	Latitude	Longitude
from	42º 18.6'N	70º 22.8'W
to	42º 19.4'N	70º 23.5'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: Fifteen Bank is a small, linear, northwest-trending bank that is approximately 1.0 nm (1.9 km) long and 0.2 nm (0.4 km) wide. Total area is approximately 0.4 sq nm (1.4 sq km).

Depth (max. and min.): Top of feature 70 m; base 85-105 m.

Steepness, etc : Maximum relief of feature is approximately 35 m along the northern flank.

ASSOCIATED FEATURES: Fifteen Bank lies in Stellwagen Basin, west of and adjacent to Western Spur.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Fifteen Bank is a small, linear, northwest-trending feature that lies near the intersection of Loran-C coordinates 9960-W-138**15** and 9960-Y-442**15**. The local commercial fishermen continue to navigate by Loran-C when they tow their gear, and they refer to this feature in various ways using the term "Fifteen". This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic

Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***FIRST BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 41.4'N	70º 17.2'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 41.8'N	70º 17.1'W
N.E. corner	42º 42.5'N	70º 14.5'W
S.E. corner	42º 41.6'N	70º 14.3'W
S. corner	42º 40.7'N	70º 17.2'W
S.W. corner	42º 40.4'N	70º 18.9'W
W. corner	42º 41.0'N	70º 21.0'W
N.W. corner	42º 42.3'N	70º 19.5'W

additional corner	42º 40.8'N	70º 17.9'W

DESCRIPTION:

Feature type: Basin

Size and shape: First Basin is an elongate, eastwest-trending feature that narrows to the east. It is approximately 4.9 nm (9.2 km) long and 0.7-2.0 nm (1.3-3.7 km) wide, and its minimum dimension is approximately 3.0 nm (5.6 km). Total area is approximately 6.0 sq nm (21.0 sq km).

Depth (max. and min.): Basin depths range from 90 to 145 m.

Steepness, etc : Maximum relief of the basin walls is approximately 60-65 m on the northern side. Maximum local relief of the basin floor is approximately 20 m.

ASSOCIATED FEATURES: First Basin is bounded on the north by Jeffreys Ledge and on the south by North Tillies Basin and Lower Jeffreys Ledge.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: First Basin is an elongate, east-west-trending basin located south of Jeffreys Ledge, a major fishing ground. Gloucester fishermen working on Jeffreys Ledge traditionally refer to this basin as First Basin, as it is the first deep area they encounter on the southeastern flank of Jeffreys Ledge when sailing from Gloucester. This usage has been confirmed in interviews with the fishermen, including Andrew Giacalone, Sam Novello, Russel Sherman, and Richard Taylor of Gloucester, Massachusetts.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed.*

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***GLOUCESTER BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 33.0'N	70º 33.0'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 34.6'N	70º 30.3'W
S.E. corner	42º 32.7'N	70º 30.1'W
S.W. corner	42º 31.2'N	70º 35.6'W
N.W. corner	42º 34.1'N	70º 35.0'W

DESCRIPTION:

Feature type: Bank

Size and shape: Gloucester Bank is a subrectangular, chiefly eastwest-trending feature with a very uneven surface. It is approximately 4.5 nm (8.4 km) long and 2.4 nm (4.5 km) wide. Total area is approximately 9.5 sq nm (33.2 sq km).

Depth (max. and min.): Top of feature 45-55 m; base 60-80 m.

Steepness, etc : Maximum relief of feature is approximately 20 m on the eastern flank.

ASSOCIATED FEATURES: Gloucester Bank is bounded on the east by the western part of Gloucester Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Gloucester Bank is located 4 nm (7.5 km) southeast of the entrance to Gloucester Harbor, Massachusetts. It is bounded by Gloucester Basin on the east. Gloucester is the major fishing port in the region. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***GLOUCESTER BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 30.6'N	70º 23.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 35.8'N	70º 28.8'W
N.E. corner	42º 30.5'N	70º 21.5'W
S.E. corner	42º 28.6'N	70º 17.2'W
S. corner	42º 27.4'N	70º 17.9'W
S.W. corner	42º 30.3'N	70º 27.0'W
N.W. corner	42º 33.8'N	70º 30.4'W

DESCRIPTION:

Feature type: Basin

Size and shape: Gloucester Basin is an elongate, northwest-trending feature. It is approximately 11.5 nm (21.6 km) long and from 1.0 to 2.5 nm (1.9 to 4.7 km) wide. Total area is approximately 21.0 sq nm (73.5 sq km).

Depth (max. and min.): Basin depths range from 80 to 180 m.

Steepness, etc : Maximum relief of basin walls is approximately 60-70 m on the northeastern side. Maximum local relief of the basin floor is approximately 20-30 m.

ASSOCIATED FEATURES: Gloucester Basin is bounded on the northeast by Thacher Bank, Polygon Basin, Polygon Bank, Creed Basin, Creed Ridge, and Little Tillies Bank, on the southwest by Ellipse Bank and Stenos Basin, and on the west by Gloucester Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000. [feature not well defined]

REASON FOR CHOICE OF NAME: Gloucester Basin is a relatively large northwest-trending basin that lies approximately 8 nm (15 km) east of the entrance of Gloucester Harbor, Massachusetts. It is bounded on the west by Gloucester Bank. Gloucester is the major fishing port in the region. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***LITTLE TILLIES BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 29.5'N	70º 17.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 30.8'N	70º 18.4'W
N.E. corner	42º 30.1'N	70º 17.2'W
S.E. corner	42º 28.7'N	70º 16.5'W
S. corner	42º 28.2'N	70º 17.0'W
S.W. corner	42º 28.8'N	70º 17.9'W
N.W. corner	42º 29.7'N	70º 18.5'W

DESCRIPTION:

Feature type: Bank

Size and shape: Little Tillies Bank is a sinuous, northsouth-trending feature with a relatively flat surface. It is approximately 2.8 nm (5.2 km) long and 0.4-1.0 nm (0.7-1.9 km) wide. Total area is approximately 1.7 sq nm (5.9 sq km).

Depth (max. and min.): Top of feature is 70-75 m; base is 100-185 m..

Steepness, etc : Maximum relief of feature is approximately 95 m on the northeastern flank.

ASSOCIATED FEATURES: Little Tillies Bank is bounded on the northwest by Creed Ridge, on the southwest by the southeastern part of Gloucester Basin, and on the east by West Tillies Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Background on the name "Tillies."

Tillies Bank is a very prominent feature that is well known by commercial fishermen and marine scientists who work in the region. The name appears on several maps (NOS Chart 13009; NOS Bathymetric Fishing Map, Gloucester sheet), but the name has never been proposed and therefore does not appear in the Gazetteer of Undersea Features. See formalization of the name Tillies Bank in this report.

The name **Tillies Basin** was applied by Uchupi to a feature that does not exist at the described location, and the label on the NOS Bathymetric Fishing Map adds to the confusion about the location of Tillies Basin.

The new multibeam survey (1994-1996) that is the basis for the new feature names proposed at this time clearly shows that there is no large basin at the location (42º 30'N, 70º 20'W; official coordinates for Tillies Basin in the Gazetteer of Undersea Features), where a large basin (Tillies Basin) is shown (but not labeled) on Uchupi's map. The described coordinates actually fall on a feature now named Creed Ridge, a feature not represented on Uchupi's map. See justification in this report for removing the name Tillies Basin.

The small, distinctive bank named here **Little Tillies Bank** is located within the area occupied by the non-existent large basin shown on Uchupi's map. It lies in the "Tillies" region, and is separated from Tillies Bank by West Tillies Basin and from Creed Ridge by a deep, narrow valley. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

Summary of proposed use of the name "Tillies" in this and accompanying documents:

Formalize the name **Tillies Bank**.
Name a new feature **Little Tillies Bank**.
Remove the name **Tillies Basin** (feature does not exist; retention of name will be confusing).
Name three new features **North Tillies Basin**, **East Tillies Basin**, and **West Tillies Basin**.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above)

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***LONG BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 14.5'N	70º 28.7'W

linear feature

	Latitude	Longitude
from	42º 13.5'N	70º 27.6'W
to	42º 15.7'N	70º 30.7'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: Long Bank is a subrectangular, northwest-trending linear feature that is approximately 3.1 nm (5.8 km) long and 0.8 nm (1.5 km) wide. Total area is approximately 2.4 sq nm (8.4 sq km).

Depth (max. and min.): Top of feature 55 m; base 70 m.

Steepness, etc : Maximum relief of feature is approximately 15 m.

ASSOCIATED FEATURES: Long Bank is located in the southwestern part of Stellwagen Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Long Bank is one of several isolated banks that occur in Stellwagen Basin. The bank is named for its distinctive shape. It is subrectangular and is approximately 4 times longer than it is wide; in contrast to the several other banks in Stellwagen Basin which display a variety of shapes. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters

vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***LOWER JEFFREYS LEDGE***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 37.7'N	70º 21.2'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 41.0'N	70º 21.0'W
N.E. corner	42º 40.8'N	70º 17.9'W
S.E. corner	42º 34.0'N	70º 19.8'W
S.W. corner	42º 35.2'N	70º 23.8'W
W. corner	42º 36.4'N	70º 24.2'W
N.W. corner	42º 37.8'N	70º 27.0'W
additional corner	42º 40.4'N	70º 18.9'W

DESCRIPTION:

Feature type: Bank

Size and shape: Lower Jeffreys Ledge is a subrectangular, gently southeastward-sloping feature that extends southward from Jeffreys Ledge, but lies at a greater water depth than the surface of Jeffreys Ledge. The seabed of Lower Jeffreys Ledge is relatively smooth in the northern part but hilly in the southern part. It is approximately 7.0 nm (13.1 km) long and 7.0 nm (13.1 km) wide, and its minimum dimension is approximately 3.0 nm (5.6 km). Total area is approximately 24.0 sq nm (84.0 sq km).

Depth (max. and min.): Top of feature 70-90 m; base 110-180 m.

Steepness, etc : Maximum relief of feature is approximately 105 m on the southeastern flank. Lower Jeffreys Ledge lies approximately 20 m deeper than the surface of Jeffreys Ledge where the two features abut.

ASSOCIATED FEATURES: Lower Jeffreys Ledge is bounded on the northwest by Jeffreys Ledge, on the northeast by First Basin and North Tillies Basin, on the southeast by West Tillies Basin, and on the southwest by Creed Ridge and Thacher Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Lower Jeffreys Ledge is a gently southeastward-sloping feature bounded by steeper descending slopes on all sides except on the northwestern side where it is bounded by an ascending slope to Jeffreys Ledge. The feature most resembles a bank because its flanks slope away on all sides except for the northwestern side where it is attached to Jeffreys Ledge. The name Lower Jeffreys Ledge emphasizes its relationship to Jeffreys Ledge (a major regional feature). Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***LOWER STELLWAGEN BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 27.0'N	70º 31.0'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 30.3'N	70º 30.4'W
S.E. corner	42º 26.3'N	70º 26.4'W
S.W. corner	42º 24.9'N	70º 31.2'W
N.W. corner	42º 27.4'N	70º 35.1'W

DESCRIPTION:

Feature type: Bank

Size and shape: Lower Stellwagen Bank is a relatively flat, subrectangular, northwest-trending feature that extends northwest from Stellwagen Bank, but lies at a greater depth than the surface of Stellwagen Bank. Lower Stellwagen Bank is approximately 5 nm (9.4 km) long and 4 nm (7.5 km) wide. Total area is approximately 17.5 sq nm (61.2 sq km).

Depth (max. and min.): Top of feature 50-55 m; base 65-100 m.

Steepness, etc : Maximum relief of feature is approximately 30-35 m on the southeastern and southwestern flanks. Lower Stellwagen Bank lies 20 m deeper than the surface of Stellwagen Bank.

ASSOCIATED FEATURES: Lower Stellwagen Bank is a northwestward extension of Stellwagen Bank, and it is bounded on the southwest by Stellwagen Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

REASON FOR CHOICE OF NAME: Lower Stellwagen Bank is a relatively horizontal feature bounded by steeper descending slopes on all sides except on the southeastern side where it is bounded by a steeper ascending slope to Stellwagen Bank. The feature most resembles a bank because its flanks slope away on all sides except for a small area on the southeastern side where it is attached to Stellwagen Bank. The name Lower Stellwagen Bank emphasizes its

relationship to Stellwagen Bank (a major regional feature). Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine

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FEATURE NAME: ***MIDDLE NINETY BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 13.8'N	70º 03.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 15.0'N	70º 02.0'W
S.E. corner	42º 13.0'N	70º 03.1'W
S.W. corner	42º 13.7'N	70º 05.2'W
N.W. corner	42º 14.5'N	70º 04.9'W

DESCRIPTION:

Feature type: Bank

Size and shape: Middle Ninety Bank is a subrectangular feature with a relatively flat top that is approximately 2.5 nm (4.7 km) long and 1.8 nm (3.4 km) wide. Total bank area is approximately 3.4 sq nm (11.8 sq km).

Depth (max. and min.): Top of feature 90 m; base 100-130 m.

Steepness, etc : Maximum relief of feature is approximately 30 m on the southeast flank.

ASSOCIATED FEATURES: Middle Ninety Bank lies just east of Stellwagen Bank. It is situated north of South Ninety Bank and south of both North Ninety Bank and East Ninety Bank. It is part of an assemblage of 4 banks called Ninety Meter Banks (see separate description).

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13260, Bay of Fundy to Cape Cod, 36th edition, scale 1:378,838. [feature not well defined]

REASON FOR CHOICE OF NAME: Middle Ninety Bank is the middle bank of an assemblage of 4 small, well-defined subrectangular banks (the Ninety Meter Banks) that lie just to the east of Stellwagen Bank. Middle Ninety Bank lies north of South Ninety Bank and south of both North Ninety Bank and East Ninety Bank. The 4 banks are separated from each other by valleys of varying depth, and thus their relief is variable. However, their unifying characteristic is the depth to their relatively flat top surfaces. The bank tops all lie at approximately 90 m water depth, a result of their common origin by glacial erosion. The word "meter" is part of the collective name (Ninety Meter Banks) of the 4 features, but it is not included in the names of the individual banks as it would make the name too long and cumbersome.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the

Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***NINETY METER BANKS***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude

42º 15.5'N 70º 03.5'W

linear feature

	Latitude	Longitude
from	42º 11.0'N	70º 04.0'W
to	42º 18.0'N	70º 04.0'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: An assemblage of 4 banks

Size and shape: Ninety Meter Banks are four subrectangular banks ranging in area from approximately 1.5 sq nm (5.2 km sq) to 3.8 sq nm (13.1 sq km).

Depth (max. and min.): Tops of banks: 85-95 m Bases of banks: 80-170 m

Steepness, etc : Maximum relief of banks ranges from 30 to 85 m

ASSOCIATED FEATURES: The Ninety Meter Banks lie just east of Stellwagen Bank. It is an assemblage of North Ninety Bank, East Ninety Bank, Middle Ninety Bank, and South Ninety Bank (see separate descriptions).

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and

Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13260, Bay of Fundy to Cape Cod, 36th edition, scale 1:378,838. [feature not well defined]

REASON FOR CHOICE OF NAME: The Ninety Meter Banks is an assemblage of 4 small, well-defined subrectangular banks that lie just to the east of Stellwagen Bank. They are separated from each other by valleys of varying depth, and their relief is variable. However, their unifying characteristic is the depth to their relatively flat top surfaces. The bank tops all lie at approximately 90 m water depth, a result of their common origin by glacial erosion. Each of the 4 banks in the assemblage is named separately (North Ninety Bank, East Ninety Bank, Middle Ninety Bank, and South Ninety Bank. The name Ninety Meter Banks is a collective term that will facilitate reference to the 4 closely-spaced features.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***NORTH NINETY BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 16.8'N	70º 05.0'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 18.0'N	70º 03.2'W
S.E. corner	42º 16.3'N	70º 03.6'W
S.W. corner	42º 16.1'N	70º 06.1'W
N.W. corner	42º 17.6'N	70º 06.0'W

DESCRIPTION:

Feature type: Bank

Size and shape: North Ninety Bank is a subrectangular feature with a relatively flat top that is approximately 3.2 nm (5.9 km) long and 2.1 nm (3.9 km) wide. Total bank area is approximately 3.8 sq nm (13.1 sq km). It is separated by a shallow valley from East Ninety Bank.

Depth (max. and min.): Top of feature 90 m; base 100-130 m.

Steepness, etc : Maximum relief of feature is approximately 40 m on the south wall.

ASSOCIATED FEATURES: North Ninety Bank lies between Stellwagen Bank to the west, East Ninety Bank to the east, and Middle Ninety Bank to the south. It is part of an assemblage of banks called Ninety Meter Banks (see separate description).

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13260, Bay of Fundy to Cape Cod, 36th edition, scale 1:378,838. [feature not well defined]

REASON FOR CHOICE OF NAME: North Ninety Bank is the northernmost bank of an assemblage of 4 small, well-defined subrectangular banks (Ninety Meter Banks) that lie just to the east of Stellwagen Bank. They are separated from each other by valleys of varying depth, and thus their relief is variable. However, their unifying characteristic is the depth to their relatively flat top surfaces. The bank tops all lie at approximately 90 m water depth, a result of their common origin by glacial erosion. The word "meter" is part of the collective name of the 4 features, but it is not included in the names of the individual banks as it would make the name too long and cumbersome.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately

1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***NORTH TILLIES BASIN***

LOCATION:

Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates

center point of feature

Latitude	Longitude
42º 39.1'N	70º 17.5'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 40.7'N	70º 17.2'W
S.E. corner	42º 37.9'N	70º 17.0'W
S. corner	42º 37.5'N	70º 17.8'W
S.W. corner	42º 37.7'N	70º 18.2'W
N.W. corner	42º 40.8'N	70º 17.9'W

DESCRIPTION:

Feature type: Basin

Size and shape: North Tillies Basin is a narrow, northsouth-trending feature that forks into two separately-named basins at its southern end. It is approximately 3.3 nm (6.2 km) long and 0.5-0.7 nm (0.9-1.3 km) wide. Total area is approximately 2.1 sq nm (7.4 sq km).

Depth (max. and min.): Basin depths range from 140 to 155 m.

Steepness, etc : Maximum relief of basin walls is approximately 50-55 m on the eastern and western sides. Maximum local relief of the basin floor is approximately 10-15 m.

ASSOCIATED FEATURES: North Tillies Basin is bounded on the north by First Basin, on the west by Lower Jeffreys Ledge, and on the south by Tillies Bank. In its southern end, North Tillies Basin forks into two major basins, East Tillies Basin and West Tillies Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Background on the name "**Tillies**."

Tillies Bank is a very prominent feature that is well known by commercial fishermen and marine scientists who work in the region. The name appears on several maps (NOS Chart 13009; NOS Bathymetric Fishing Map, Gloucester sheet), but the name has never been proposed and therefore does not appear in the Gazetteer of Undersea Features. See formalization of the name Tillies Bank in this report.

The name **Tillies Basin** was applied by Uchupi to a feature that does not exist at the described location, and the label on the NOS Bathymetric Fishing Map adds to the confusion about the location of Tillies Basin.

The new multibeam survey (1994-1996) that is the basis for the new feature names proposed at this time clearly shows that there is no large basin at the location (42º 30'N, 70º 20'W; official coordinates for Tillies Basin in the Gazetteer of Undersea Features), where a large basin (Tillies Basin) is shown (but not labeled) on Uchupi's map. The described coordinates actually fall on a feature now named Creed Ridge, a feature not represented on Uchupi's map. See justification in this report for removing the name Tillies Basin.

The new survey shows that Tillies Bank is bounded on the north, east, and west by 3 large, long deep basins. As the name Tillies has been used for many years in this region, it is appropriate to retain it in the 3 newly-named basins that enclose Tillies Bank (North Tillies Basin, East Tillies Basin, and West Tillies Basin).

North Tillies Basin lies between Tillies Bank to the south and First Basin to the north. North Tillies Basin forks at its southern extremity to form the 2 basins (West Tillies Basin and East Tillies Basin) that enclose Tillies Bank. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

Summary of proposed use of the name "Tillies" in this and accompanying documents:

Formalize the name **Tillies Bank**.
Name a new feature **Little Tillies Bank**.
Remove the name **Tillies Basin** (feature does not exist; retention of name will be confusing).
Name three new features **North Tillies Basin**, **East Tillies Basin**, and **West Tillies Basin**.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean

Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***NORTHERN VALLEY***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 27.8'N	70º 21.5'W

linear feature

	Latitude	Longitude
from	42º 26.2'N	70º 20.5'W
to	42º 29.2'N	70º 22.3'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Valley

Size and shape: Northern Valley is an elongate north northwest-trending feature that widens only slightly from its head in the south to its mouth in the north. It is approximately 3.2 nm (6.0 km) long and 0.3-0.8 nm (0.6-1.5 km) wide. Total area is approximately 1.3 sq nm (4.6 sq km).

Depth (max. and min.): Valley depth ranges from 70 m in the south to 145 m in the north.

Steepness, etc : Maximum relief of the valley walls is 70 m on the southwest side near the valley mouth. Maximum local relief of the valley floor is 5 m.

ASSOCIATED FEATURES: Northern Valley extends northnorthwestward from the northern part of Stellwagen Bank and opens into the southeastern part of Gloucester Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Northern Valley is a prominent valley that extends from the northern margin of Stellwagen Bank northward into the southeastern part of Gloucester Basin. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the

Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***NORTHWEST CORNER***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 24.5'N	70º 27.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank; in this case, a distinctive part of Stellwagen Bank that extends northwestward; not a spur. The term "corner" is historical local usage.

Size and shape: Northwest Corner is a relatively flat, subrectangular, northwest-trending part of Stellwagen Bank.

Depth (max. and min.): Top of feature 30 m; base 75-80 m.

Steepness, etc : Maximum relief of feature is approximately 45-50 m on the southwestern flank of the bank.

ASSOCIATED FEATURES: Northwest Corner is the northwestern part of Stellwagen Bank. It is bounded on the southwest by Stellwagen Basin and on the north by Lower Stellwagen Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13267, Massachusetts Bay, 29th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Northwest Corner is a distinctive northwest-trending part of Stellwagen Bank. The Northwest Corner is relatively flat and is separated from Stellwagen Basin to the southwest by a scarp of 45-50 m relief. Northwest Corner is bounded to the north by Lower Stellwagen Bank. The name Northwest Corner traditionally is used by local commercial fishermen to refer to this feature. This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years. A companion feature, Southwest Corner, is present on the southwestern part of Stellwagen Bank.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***PIGEON BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 46.7'N	70º 12.2'W

linear feature

	Latitude	Longitude
from (to center point)	42º 45.7'N	70º 11.7'W
from (to center point)	42º 46.8'N	70º 10.7'W
from (to center point)	42º 48.9'N	70º 12.8'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Basin

Size and shape: Pigeon Basin is a compound feature that is formed by both broad and narrow arms that coalesce at a central point. The southeastern arm is approximately 1.0 nm (1.9 km) long and 0.2-0.4 nm (0.4-0.7 km) wide; the eastern arm is approximately 1.0 nm (1.9 km) long and 0.6 nm (1.1 km) wide; the northern arm is approximately 2.2 nm (4.1 km) long and 0.5-0.9 nm (0.9-1.7 km) wide; and the southwestern arm is approximately 1.7 km (3.2 km) long and 0.3-0.7 nm (0.6-1.3 km) wide. Total area of the feature is approximately 3.4 sq nm (11.8 sq km).

Depth (max. and min.): Basin depths range from 80 to 120 m..

Steepness, etc : Maximum relief of basin walls is approximately 40 m in the southeastern arm and 70 m in the southwestern arm. Maximum local relief of the basin floor is approximately 5 m.

ASSOCIATED FEATURES: Pigeon Basin is bounded on the west and northwest by Jeffreys Ledge and East Pigeon Hill, on the southeast by East Hill, and on the south by Sanctuary Hill.

CHART OR MAP REFERENCE:

Name and feature shown on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: Pigeon Basin is located just east of 2 prominent hill features (West Pigeon Hill and East Pigeon Hill) on Jeffrey's Ledge. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***POLYGON BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 32.7'N	70º 23.9'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 33.8'N	70º 23.8'W
S.E. corner	42º 33.0'N	70º 22.6'W
S.W. corner	42º 31.6'N	70º 23.0'W
N.W. corner	42º 33.1'N	70º 25.2'W

DESCRIPTION:

Feature type: Bank

Size and shape: Polygon Bank is relatively flat, steep-sided, polygon-shaped feature. The bank displays 6 relatively straight flanks. Polygon Bank is approximately 2 nm (3.7 km) long and 1.5 nm (2.8 km) wide. Total area is approximately 2.5 sq nm (8.8 sq km).

Depth (max. and min.): Top of feature 60-65 m; base 110-140 m.

Steepness, etc : Maximum relief of feature is approximately 65-70 m on the northern flank; but all flanks are relatively steep.

ASSOCIATED FEATURES: Polygon Bank lies east of Polygon Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Polygon Bank has a distinctive outline of many angles formed by 6 straight, steep sides. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed.*

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***POLYGON BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 34.0'N	70º 25.0'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 34.7'N	70º 24.3'W
E. corner	42º 34.5'N	70º 24.1'W
S.E. corner	42º 33.8'N	70º 23.9'W
S.W. corner	42º 33.1'N	70º 25.1'W
N.W. corner	42º 33.7'N	70º 25.9'W
N. corner	42º 34.5'N	70º 25.3'W

DESCRIPTION:

Feature type: Basin

Size and shape: Polygon Basin is a subrectangular feature surrounded by many banks and basins. It is approximately 1.6 nm (2.9 km) long and 1.3 nm (2.4 km) wide. Total area is approximately 1.2 sq nm (4.2 sq km).

Depth (max. and min.): Basin depths range from 110 to 150 m.

Steepness, etc : Maximum relief of basin walls is approximately 40 m on the southeastern side. Maximum local relief of the basin floor is approximately 20-25 m.

ASSOCIATED FEATURES: Polygon Basin is bounded on the west and north by Thacher Bank and Thacher Basin, on the east and southeast by Creed Basin and Polygon Bank, and on the southwest by Gloucester Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Polygon Basin is a feature that lies below the northwestern flank of Polygon Bank. It is a small basin located at the intersection of Thacher, Creed, and Gloucester Basins. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 percent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***RACE POINT CHANNEL***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 07.5'N	70º 14.0'W

linear feature

	Latitude	Longitude
from	42º 07.0'N	70º 18.0'W
to	42º 08.0'N	70º 06.0'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Channel

Size and shape: Race Point Channel is a linear feature, trending east-west, that separates the north coast of Cape Cod from the southern extremity of Stellwagen Bank. The channel is approximately 9 nm (16.9 km) in length and approximately 5 nm (9.4 km) in width.

Depth (max. and min.): Channel depths range from 60 m to 45 m.

Steepness, etc : Maximum relief of channel walls is approximately 60 m on the south flank. Maximum local relief of the channel floor is approximately 5-10 m.

ASSOCIATED FEATURES: Race Point Channel is bounded on the south by Cape Cod and on the north by Stellwagen Bank

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S.

Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13260, Bay of Fundy to Cape Cod, 36th edition, scale 1:378,838.

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13267, Massachusetts Bay, 29th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Race Point Channel is a passage that separates Cape Cod and Stellwagen Bank and connects two bodies of water, Massachusetts Bay (west) and the Gulf of Maine (east). It resembles other similarly-named features in the New England region, namely Great South Channel (separates the western end Georges Bank from Nantucket Shoals) and Northeast Channel (separates Browns Bank from the eastern end of Georges Bank). See NOAA Chart 13009. Race Point Channel is named for Race Point, a prominent land feature located on Cape Cod at the southwestern entrance of the channel. Race Point is a well-established local name, and it is marked by an important light house.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area

surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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Organization: U.S. Geological Survey
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FEATURE NAME: ***THE ROCKPILE***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 21.6'N	70º 27.9'W

linear feature

	Latitude	Longitude
from	42º 21.2'N	70º 26.6'W
to	42º 22.2'N	70º 28.9'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: The Rockpile is a sub-linear, northwest-trending bank that is approximately 2 nm (3.7 km) long and 1.3 nm (2.4 km) wide. Total area is approximately 1.8 sq nm (6.1 sq km).

Depth (max. and min.): Top of feature 60 m; base 80-90 m.

Steepness, etc : Maximum relief of feature is approximately 25-30 m on the southern flank.

ASSOCIATED FEATURES: The Rockpile lies in Stellwagen Basin, south of Northwest Corner of Stellwagen Bank and north of The Breakwater.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: The Rockpile is a northwest-trending bank in Stellwagen Basin. The feature displays a sub-linear shape, but its surface has been highly eroded (relative to other banks in Stellwagen Basin) and now is characterized by discrete piles of boulders having relief of 5 to 10 m. The overall character of the feature is that of a pile of rocks. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***ROSE AND LUCYS BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature

Latitude	Longitude
42º 44.8'N	70º 14.8'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 44.8'N	70º 13.1'W
E. corner	42º 44.4'N	70º 13.9'W
S. corner	42º 43.7'N	70º 14.6'W
W. corner	42º 45.0'N	70º 16.8'W
N. corner	42º 45.9'N	70º 15.8'W
additional corner	42º 44.9'N	70º 13.9'W

DESCRIPTION:

Feature type: Basin

Size and shape: Rose and Lucys Basin is a subrectangular, northwest-trending feature. It is approximately 2.8 nm (5.2 km) long and 1.5 nm (2.8 km) wide. Total area of the feature is approximately 3.6 sq nm (12.4 sq km).

Depth (max. and min.): Basin depths range from 115 to 135 m.

Steepness, etc : Maximum relief of basin walls is approximately 100 m on the northern side. Maximum local relief of the basin floor is approximately 5 m.

ASSOCIATED FEATURES: Rose and Lucys Basin is bounded on the west and north by Jeffreys Ledge and on the northeast by Sanctuary Hill, and it lies just west of Sanctuary Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: Rose and Lucys Basin is a subrectangular basin located south of Jeffreys Ledge, a major fishing ground. Gloucester fishermen working in the Jeffreys Ledge region traditionally refer to this basin as Rose and Lucys Basin after the name of a fishing vessel that fished in the basin for decades. This usage has been confirmed in interviews with the fishermen, including Andrew Giacalone, Sam Novello, Russel Sherman, and Richard Taylor of Gloucester, Massachusetts.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the

Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SALVAGES BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 39.9'N	70º 23.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 41.0'N	70º 32.0'W
E. corner	42º 39.9'N	70º 28.8'W
S.E corner	42º 38.5'N	70º 29.5'W
W. corner	42º 38.4'N	70º 30.8'W
N. corner	42º 40.8'N	70º 32.5'W

DESCRIPTION:

Feature type: Basin

Size and shape: Salvages Basin is a subtriangular feature with a relatively flat floor. It is approximately 2.9 nm (5.4 km) long and 2.0 nm (3.7 km) wide. Total area is approximately 3.5 sq nm (12.2 sq km).

Depth (max. and min.): Basin depths range from 80 to 85 m.

Steepness, etc : Maximum relief of basin walls is approximately 30-35 m on the northeastern and southeastern sides. Maximum local relief of the basin floor is approximately 5 m.

ASSOCIATED FEATURES: Salvages Basin lies just offshore and east of The Salvages, a group of rocky bars and small rocky islands (Little Salvages and Dry Salvages); and west of the southwestern part of Jeffreys Ledge.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Salvages Basin lies less than 2 nm offshore and east of a locally well known coastal feature called The Salvages (NOS Chart 13278), a group of rocky bars and small rocky islands (Little Salvages and Dry Salvages). Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SANCTUARY BASIN***

LOCATION:

Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 44.8'N	70º 11.2'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 45.5'N	70º 09.0'W
E. corner	42º 45.1'N	70º 08.8'W
S.E corner	42º 44.2'N	70º 09.1'W
S.W. corner	42º 44.4'N	70º 12.7'W
W. corner	42º 44.8'N	70º 12.6'W
N.W. corner	42º 45.5'N	70º 11.6'W
additional corner	42º 44.8'N	70º 09.2'W
additional corner	42º 44.8'N	70º 10.9'W

DESCRIPTION:

Feature type: Basin

Size and shape: Sanctuary Basin is a subrectangular, generally eastwest-trending feature that is partly divided in its eastern part by a low eastwest-trending ridge. The basin is approximately 2.9 nm (5.4 km) long and 1.5 nm (2.8 km) wide. Total area of the feature is approximately 2.9 sq nm (10.1 sq km).

Depth (max. and min.): Basin depths range from 115 to 130 m.

Steepness, etc : Maximum relief of basin walls is approximately 70-80 m on the northern and northwestern sides. Maximum local relief of the basin floor is approximately 5 m.

ASSOCIATED FEATURES: Sanctuary Basin is bounded on the northwest by Sanctuary Hill, on the north by East Hill, and it lies to the east of Rose and Lucys Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: Sanctuary Basin is a relatively large feature that is bounded on the northwest by Sanctuary Hill, a prominent feature also named here for the first time. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SANCTUARY HILL***

LOCATION:

Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 45.5'N	70º 13.1'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 46.2'N	70º 12.7'W
E. corner	42º 45.8'N	70º 11.8'W
S.E corner	42º 44.9'N	70º 12.3'W
S. corner	42º 44.8'N	70º 13.1'W
S.W. corner	42º 44.9'N	70º 13.9'W
W. corner	42º 45.3'N	70º 14.3'W
N.W. corner	42º 46.0'N	70º 13.6'W

DESCRIPTION:

Feature type: Hill

Size and shape: Sanctuary Hill is a large, slightly northeast-trending, conical feature with a pointed summit. It is approximately 2.0 nm (3.7 km) long and 1.4 nm (2.6 km) wide. Total area is approximately 2.2 sq nm (7.7 sq km).

Depth (max. and min.): Top of feature is 35 m; base 130 m.

Steepness, etc : Maximum relief of feature is approximately 95 m on the southwestern flank.

ASSOCIATED FEATURES: Sanctuary Hill is bounded on the north and northwest by Pigeon Basin, on the west and southwest by Rose and Lucys Basin, on the southeast by Sanctuary Basin, and on the east by East Hill.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Sanctuary Hill is a large, conical, bedrock outcrop with a pointed summit that lies in deep water east of Jeffreys Ledge. It is located in the acute northeastern corner of the Stellwagen Bank National Marine Sanctuary; it is the most prominent positive sea floor feature for many miles and thus serves as a boundary marker for the sanctuary. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SCANTUM SPUR***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 47.7'N	70º 23.5'W

linear feature

	Latitude	Longitude
from	42º 46.9'N	70º 20.4'W
to	42º 48.6'N	70º 25.7'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Spur

Size and shape: Scantum Spur is an elongate, narrow northwestward-trending feature with an uneven surface. It is approximately 4.2 nm (7.9 km) long and 0.5-0.9 nm (0.9-1.7 km) wide. Total area is approximately 3.3 sq nm (11.6 sq km).

Depth (max. and min.): Top of feature is 75-85 m; base 95-100 m.

Steepness, etc : Maximum relief of feature is approximately 25 m on the southwestern flank.

ASSOCIATED FEATURES: Scantum Spur extends northwestward into Scantum Basin from the northwestern flank of Jeffreys Ledge; and it forms the southwestern bound of The Cove, a subsidiary basin of Scantum Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Scantum Spur is a subordinate feature that extends northwestward from Jeffreys Ledge into the smooth topography of Scantum Basin, a named feature. The top of the spur is approximately 30 m below the top of Jeffreys Ledge. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank

National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SOUTH NINETY BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 11.7'N	70º 04.1'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 12.9'N	70º 04.1'W
S. E. corner	42º 11.2'N	70º 02.7'W
S.W. corner	42º 10.2'N	70º 04.1'W

N.W. corner	42º 12.7'N	70º 05.9'W

DESCRIPTION:

Feature type: Bank

Size and shape: South Ninety Bank is a subrectangular feature with a relatively flat top that is approximately 2.5 nm (4.7 km) long and 1.6 nm (2.9 km) wide. Total bank area is approximately 3.0 sq nm (10.5 sq km). It is separated by a very shallow depression from the southeastern part of Stellwagen Bank to the west.

Depth (max. and min.): Top of feature 85-90 m; base 80-120 m.

Steepness, etc : Maximum relief of feature is approximately 30 m on the east flank.

ASSOCIATED FEATURES: South Ninety Bank lies south of Middle Ninety Bank from which it is separated by a valley. South Ninety Bank lies just east of southeastern part of Stellwagen Bank. It is part of an assemblage of 4 banks called Ninety Meter Banks (see separate description).

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13260, Bay of Fundy to Cape Cod, 36th edition, scale 1:378,838. [feature not well defined]

REASON FOR CHOICE OF NAME: South Ninety Bank is the southernmost bank of an assemblage of 4 small, well-defined subrectangular banks (Ninety Meter Banks) that lie just to the east of Stellwagen Bank. South Ninety Bank lies south of Middle Ninety Bank and east of the southeastern part of Stellwagen Bank. The 4 banks are separated from each other by valleys of varying depth, and thus their relief is variable. However, their unifying characteristic is the depth to their relatively flat top surfaces. The bank tops all lie at approximately 90 m water depth, a result of their common origin by glacial erosion. The word "meter" is part of the collective name (Ninety Meter Banks) of the 4 features, but it is not included in the names of the individual banks as it would make the name too long and cumbersome.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SOUTHWEST CORNER***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature Lat. Long.

Latitude	Longitude
42º 09.2'N	70º 19.0'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner		
S. E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank; in this case, a distinctive part of Stellwagen Bank that extends southwestward; not a spur. The term "corner" is historical local usage.

Size and shape: Southwest Corner is a relatively flat, subrectangular, southwest-trending part of Stellwagen Bank.

Depth (max. and min.): Top of feature 20-25 m; base 50-55 m.

Steepness, etc : Maximum relief of feature is approximately 25-30 m on the southwestern flank of the bank.

ASSOCIATED FEATURES: Southwest Corner is the southwestern part of Stellwagen Bank. It is bounded on the southwest by Stellwagen Basin and on the south by Little Stellwagen Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13267, Massachusetts Bay, 29th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: Southwest Corner is a distinctive southwest-trending part of Stellwagen Bank. The Southwest Corner is relatively flat and is separated from Stellwagen Basin and Little Stellwagen Basin by a scarp of 25-30 m relief. The name Southwest Corner traditionally is used by local commercial fishermen to refer to this feature. This usage has been confirmed in interviews with fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years. A companion feature, Northwest Corner, is present on the northwestern part of Stellwagen Bank.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed.*

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***SOUTHWESTERN SPUR***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 15.3'N	70º 25.1'W

linear feature

Latitude	Longitude

from	42º 13.7'N	70º 22.2'W
to	42º 16.2'N	70º 27.1'W

areal feature

	Latitude	Longitude
N.E. corner		
S. E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Spur

Size and shape: Southwestern Spur is a linear feature that extends northwestward into Stellwagen Basin from Stellwagen Bank. It is 4.5 nm (8.4 km) long and 0.6 nm (1.1 km) wide. Total area is approximately 9.6 sq nm (12.6 sq km).

Depth (max. and min.): Top of feature is 60-65 m; base 75-80 m.

Steepness, etc : Maximum relief of feature is approximately 15 m on the northeastern flank.

ASSOCIATED FEATURES: Southwestern Spur extends northwestward into the southern part of Stellwagen Basin from the southwestern part of Stellwagen Bank.

CHART OR MAP REFERENCE:

Name and feature shown on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. (feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

REASON FOR CHOICE OF NAME: Southwestern Spur is a subordinate feature that extends from the southwestern part of Stellwagen Bank northwestward into the smooth topography of Stellwagen Basin. The top of the

spur is approximately 35 m below the top of Stellwagen Bank. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***STENOS BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 29.4'N	70º 27.2'W

linear feature

	Latitude	Longitude
from	42º 27.8'N	70º 27.4'W
to	42º 31.0'N	70º 28.0'W

areal feature

	Latitude	Longitude
N.E. corner		
S. E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Basin

Size and shape: Stenos Basin is a long, narrow, north-trending feature that curves slightly westward at its north and south extremities. It is approximately 3.3 nm (6.2 km) long and 0.2-0.3 nm (0.4-0.6 km) wide. Total area is approximately 1.0 sq nm (3.5 sq km).

Depth (max. and min.): Basin depth ranges from 95 to 120 m.

Steepness, etc : Maximum relief of basin walls is approximately 60 m on the eastern and western sides. Maximum local relief of basin floor is approximately 5 m.

ASSOCIATED FEATURES: Stenos Basin is bounded on the west by Ellipse Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: Stenos Basin is a very narrow, relatively deep, north-trending basin enclosed on the east and west by steep bank walls. The basin is much longer than it is wide (approximately 11:1). Stenos means narrow in Greek, and the basin is named because of its narrowness. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***THE STONE WALL***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 46.7'N	70º 29.9'W

linear feature

	Latitude	Longitude
from	42º 44.7'N	70º 26.9'W
to	42º 48.0'N	70º 34.2'W

areal feature

	Latitude	Longitude
N.E. corner		
S. E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Ridge

Size and shape: The Stone Wall is an elongate northwest-trending feature with an uneven surface. It narrows from the southeast to the northwest, and culminates in a subcircular hill at its northwestern end. It is approximately 6.5 nm (12.2 km) long and 0.5-1.0 nm (0.9-1.9 km) wide. Total area is approximately 5.4 sq nm (18.9 sq km).

Depth (max. and min.): Top of feature is 55-85 m; base 90-100 m.

Steepness, etc : Maximum relief of the feature is approximately 40 m on the northwestern end.

ASSOCIATED FEATURES: The Stone Wall lies in Scantum Basin, northwest of Jeffreys Ledge and west of Scantum Spur.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet,scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000.

REASON FOR CHOICE OF NAME: The Stone Wall is a long, narrow feature that extends northwestward across Scantum Basin, a highly-used fishing ground. Gloucester fishermen working in the basin traditionally refer to this feature as The Stone Wall because it impedes their towing of fishing gear across the basin floor. This usage has been confirmed in interviews with the fishermen, including Andrew Giacalone, Sam Novello, Russel Sherman, and Richard

Taylor of Gloucester, Massachusetts.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***THACHER BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 36.0'N	70º 28.2'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 36.1'N	70º 24.8'W
S. corner	42º 33.8'N	70º 26.3'W
W. corner	42º 36.4'N	70º 31.1'W
N. corner	42º 37.2'N	70º 31.0'W
additional corner	42º 35.4'N	70º 28.2'W

DESCRIPTION:

Feature type: Bank

Size and shape: Thacher Bank is a subtriangular, northwest-trending feature with an uneven, hilly surface. It is approximately 4.8 nm (9.0 km) long and 0.9-2.6 nm (1.7-4.9 km) wide. Total area is approximately 6.3 sq nm (22.1 sq km).

Depth (max. and min.): Top of feature 55-70 m; base 75-130 m.

Steepness, etc : Maximum relief of feature is approximately 45 m on the northeastern flank.

ASSOCIATED FEATURES: Thacher Bank lies southeast of Thacher Island, south of Thacher Basin and north of Gloucester Basin..

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000. [feature not well defined]

REASON FOR CHOICE OF NAME: Thacher Bank lies 2.5 nm (4.7 km) southeast of Thacher Island, a prominent coastal feature named for Antony Thacher who was deeded the island in 1636 after being shipwrecked there in 1635. Thacher Bank is bounded by Thacher Basin to the north. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***THACHER BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 36.9'N	70º 26.4'W

linear feature

	Latitude	Longitude
from		

to

areal feature

	Latitude	Longitude
N. corner	42º 38.5'N	70º 29.5'W
N.E. corner	42º 37.0'N	70º 25.7'W
E. corner	42º 35.5'N	70º 23.6'W
S.E. corner	42º 34.7'N	70º 24.3'W
S. corner	42º 34.5'N	70º 25.3'W
S.W. corner	42º 37.2'N	70º 31.0'W
N.W. corner	42º 38.4'N	70º 31.9'W
additional corner	42º 36.1'N	70º 24.8'W

DESCRIPTION:

Feature type: Basin

Size and shape: Thacher Basin is a sinuous feature; the short, deep part of the basin trends north, and the long, shallowing part trends northwest. The north-trending part is approximately 0.6 nm (1.1 km) long and the northwest-trending part is approximately 2.1 nm (3.9 km) long; the feature is 0.2-0.6 nm (0.4-1.1 km) wide. Total area is approximately 7.5 sq nm (26.2 sq km).

Depth (max. and min.): Basin depths range from 75 to 140 m.

Steepness, etc : Maximum relief of the basin walls is approximately 50-55 m on the northern and northeastern sides. Maximum local relief of the basin floor is approximately 20 m in the southern part.

ASSOCIATED FEATURES: Thacher Basin is bounded on the northwest by Salvages Basin, on the north by Jeffreys Ledge and Lower Jeffreys Ledge, and on the south by Thacher Bank and Polygon Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000. [feature not well defined]

REASON FOR CHOICE OF NAME: The head of Thacher Basin lies 2.5 nm (4.7 km) east of Thacher Island, a prominent coastal feature named for Antony Thacher who was deeded the island in 1636 after being shipwrecked there in 1635. Thacher Basin is bounded by Thacher Bank on the south. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

SUBMITTED BY: Page C. Valentine
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FEATURE NAME: ***TILLIES BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 33.7'N	70º 16.7'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 37.5'N	70º 17.8'W
N.E. corner	42º 36.9'N	70º 16.8'W
E. corner	42º 33.8'N	70º 15.4'W
S.E. corner	42º 30.2'N	70º 14.8'W
S. corner	42º 29.9'N	70º 15.5'W
S.W. corner	42º 31.5'N	70º 17.9'W
N.W. corner	42º 36.8'N	70º 18.8'W

DESCRIPTION:

Feature type: Bank

Size and shape: Tillies Bank is an elongate north-south-trending feature. The surface of the northern part (north of 42º 34'N) is relatively flat with steep flanks; the southern part resembles Creed Ridge (to the west) as its surface is hilly and dissected by small gullies. It is approximately 8.0 nm (15.0 km) long and 0.7-2.0 nm (1.3-3.7 km) wide. Total area is approximately 13.5 sq nm (47.2 sq km).

Depth (max. and min.): Top of feature is 60-90 m; base is 110-180 m.

Steepness, etc : Maximum relief of feature is approximately 100 m on the southwestern flank.

ASSOCIATED FEATURES: Tillies Bank is bounded on the north by North Tillies Basin, on the east by East Tillies Basin, and on the west and southwest by West Tillies Basin.

CHART OR MAP REFERENCE:

Name and feature shown on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature name only]

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature poorly defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000. [northern part of feature only]

REASON FOR CHOICE OF NAME: Tillies Bank is a very prominent feature that is well known by fishermen and marine scientists who work in the region. The name appears on several maps (NOS Chart 13009; NOS Bathymetric Fishing Map, Gloucester sheet), but the name until now has never been proposed and therefore does not appear in the Gazetteer of Undersea Features. The name Tillies Bank is formalized in this report.

Summary of proposed use of the name "Tillies" in this and accompanying documents:

Formalize the name **Tillies Bank**.
Name a new feature **Little Tillies Bank**.
Remove the name **Tillies Basin** (feature does not exist; retention of name will be confusing).
Name three new features **North Tillies Basin**, **East Tillies Basin**, and **West Tillies Basin**.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME REMOVED: ***TILLIES BASIN***
The original description (1965) of the feature included the location given below; no other data provided.

LOCATION:
Ocean or sea: Atlantic Ocean

Coordinates:
center point of feature

Latitude	Longitude
42º 30.0'N	70º 20.0'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Basin
Size and shape:
Depth (max. and min.):
Steepness, etc :

ASSOCIATED FEATURES:

CHART OR MAP REFERENCE:
The name Tillies Basin was proposed and approved in 1965 for a feature on Uchupi's northern sheet (1965, reprinted 1975) that was not labeled by that author so as to avoid obscuring contour lines. Subsequently, the name Tillies Basin

appeared on the NOS Bathymetric Fishing Map, Gloucester sheet, 1986.

Name and feature shown on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [a feature shown on map, but does not exist]

REASON FOR REMOVAL OF NAME: After reading the correspondence related to the naming of Tillies Basin, I have concluded that the name was used for a large basin on Uchupi's map that does not exist. The basin is shown on Uchupi's map south of a large bank (that probably was correctly identified as Tillies Bank from nautical charts available in 1965). Neither feature is labeled on Uchupi's map. The center of the basin plots at 42º 30'N, 70º 20'W on Uchupi's map.

Both Tillies Bank and Tillies Basin are labeled on the NOS Bathymetric Fishing Map, Gloucester sheet (1986). It is probable that the compilers of the NOS map used the name and location of Tillies Basin as given in the Gazetteer of Undersea Features, but the map does not show a basin near 42º 30'N, 70º 20'W that approaches the size of the basin shown on Uchupi's map.

It is clear that the name Tillies Basin was applied by Uchupi to a feature that does not exist at the described location, and that the label on the NOS map adds to the confusion about the location of Tillies Basin.

The new multibeam survey (1994-1996) that is the basis for the new feature names described here clearly shows that there is no large basin at the location 42º 30'N, 70º 20'W, where Tillies Basin is shown on Uchupi's map. These coordinates actually fall on Creed Ridge (newly named in these documents), a feature not represented on Uchupi's map. The new survey shows that Tillies Bank is surrounded by 3 large deep basins. It is appropriate for these basins to use the name Tillies in some way, in reference to Tillies Bank, as was the original intention of Uchupi.

The name Tillies Basin is removed and will not be revised or applied to an existing unnamed basin in the region. Instead, the three basins that surround Tillies Bank are designated North Tillies Basin, West Tillies Basin, and East Tillies Basin. These features are described fully elsewhere in this report.

Summary of proposed use of the name "Tillies" in this and accompanying documents:

Formalize the name **Tillies Bank**.
Name a new feature **Little Tillies Bank**.
Remove the name **Tillies Basin** (feature does not exist; retention of name will be confusing).
Name three new features **North Tillies Basin**, **East Tillies Basin**, and **West Tillies Basin**.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***TRIPLE VALLEY***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 30.9'N	70º 09.2'W

linear feature

	Latitude	Longitude
from (to center point)	42º 27.9'N	70º 09.8'W
from (to center point)	42º 31.5'N	70º 07.0'W
from (to center point)	42º 32.4'N	70º 12.0'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Valley

Size and shape: Triple Valley is a compound feature formed by 3 elongate valleys that coalesce at a central point. The southern arm is approximately 3.0 nm (5.6 km) long and 0.6-0.8 nm (1.1-1.5 km) wide; the northeastern arm is approximately 1.7 nm (3.2 km) long and 0.5-1.5 nm (0.9-2.8 km) wide; and the northwestern arm is approximately 2.6 nm (4.9 km) long and 0.3-0.8 nm (0.6-1.5 km) wide. Total area of the feature is approximately 4.7 sq nm (16.4 sq km).

Depth (max. and min.): Valley depths range from 105 to 115 m.

Steepness, etc : Maximum relief of valley walls is approximately 25-30 m. Maximum local relief of the valley floor is approximately 15 m.

ASSOCIATED FEATURES: Triple Valley is located southeast of Y Valley and east of the southern part of East Tillies Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: Triple Valley is a compound feature formed by 3 valleys (formerly 3 glacial valleys) that coalesce at a central point from the northwest, the northeast, and the south. The name of the feature is based on its compound nature. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***WEST BREAKWATER BANK***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 20.2'N	70º 29.4'W

linear feature

	Latitude	Longitude
from	42º 19.7'N	70º 28.3'W
to	42º 20.7'N	70º 30.6'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Bank

Size and shape: West Breakwater Bank is a linear, northwest-trending feature that is approximately 2 nm (3.7 km) long and 0.6 nm (1.1 km) wide. Total area is approximately 1.25 sq nm (4.4 sq km).

Depth (max. and min.): Top of feature 65-70 m; base 85-95 m.

Steepness, etc : Maximum relief of feature is approximately 20 m on the northeastern and southwestern flanks.

ASSOCIATED FEATURES: West Breakwater Bank lies in Stellwagen Basin, just to the northwest of East Breakwater Bank and east of Compass Rose Bank. It is the western part of a pair of banks that collectively are called The Breakwater (see separate description).

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

REASON FOR CHOICE OF NAME: West Breakwater Bank is a linear, northwest-trending bank in Stellwagen Basin. It is located 0.2 nm (0.4 km) northwest of East Breakwater Bank. Both features are similarly aligned, and possibly were connected at one time. West Breakwater Bank and East Breakwater Bank collectively are called The Breakwater by local commercial fishermen. This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years. As The Breakwater is actually 2 separate features, they have been given separate names here, and the name The Breakwater refers to a group of 2 features.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the

Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***WEST PIGEON HILL***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature Lat. Long.

Latitude Longitude

42º 46.4'N 70º 15.1'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 46.6'N	70º 15.0'W
S.E. corner		
S.W. corner	42º 46.3'N	70º 15.2'W
N.W. corner		

DESCRIPTION:

Feature type: Hill

Size and shape: West Pigeon Hill is a small conical, northeast-trending feature. It is approximately 0.3 nm (0.6 km) long and 0.2 nm (0.4 km) wide. Total area is approximately 0.06 sq nm (0.2 sq km).

Depth (max. and min.): Top of feature is 40 m; base 50 m.

Steepness, etc : Maximum relief of feature is approximately 10 m.

ASSOCIATED FEATURES: West Pigeon Hill lies on the eastern side of Jeffreys Ledge, just west of East Pigeon Hill.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000. [feature not well defined]

REASON FOR CHOICE OF NAME: West Pigeon Hill is a small but prominent bedrock outcrop that protrudes from the relatively flat sandy surface of Jeffreys Ledge. The hill lies just west of East Pigeon Hill, a well-known twin feature of similar characteristics. See section on East Pidgeon Hill in this report. Interviews with local commercial fishermen failed to identify an appropriate name for the feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological

Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***WEST TILLIES BASIN***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 33.1'N	70º 18.9'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N. corner	42º 37.7'N	70º 18.2'W
N.E. corner	42º 37.5'N	70º 17.8'W
E. corner	42º 39.1'N	70º 17.5'W
S.E. corner	42º 31.5'N	70º 17.9'W
S. corner	42º 28.3'N	70º 16.2'W
S.W. corner	42º 31.7'N	70º 19.6'W
N.W. corner	42º 36.7'N	70º 17.9'W
additional corner	42º 36.8'N	70º 18.8'W
additional corner	42º 30.1'N	70º 17.2'W

DESCRIPTION:

Feature type: Basin

Size and shape: West Tillies Basin is an elongate, curving feature. The narrow northern part trends to the northeast; the relatively wider middle part trends approximately north and south, but bends toward the southeast and opens into the subrectangular southern part of the basin. It is approximately 10.0 nm (18.7 km) long and 0.3-1.2 nm (0.6-2.2 km) wide. Total area is approximately 8.1 sq nm (28.4 sq km).

Depth (max. and min.): Basin depths range from 100 to 195 m.

Steepness, etc : Maximum relief of basin walls is approximately 100-105 m on the eastern and western sides. Maximum local relief of the basin floor is approximately 30 m, excluding a small bank in the central part of the basin that has a relief of 55 m.

ASSOCIATED FEATURES: West Tillies Basin is bounded on the north by North Tillies Basin, on the east by Tillies Bank, and on the west by Lower Jeffreys Ledge, Creed Ridge, and Little Tillies Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000. [feature not well defined]

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1998, Chart 13278, Portsmouth to Cape Ann, 24th edition, scale 1:80,000. [northern part of feature only]

REASON FOR CHOICE OF NAME: Background on the name "**Tillies**."

Tillies Bank is a very prominent feature that is well known by commercial fishermen and marine scientists who work in the region. The name appears on several maps (NOS Chart 13009; NOS Bathymetric Fishing Map, Gloucester sheet), but the name has never been proposed and therefore does not appear in the Gazetteer of Undersea Features. See formalization of the name Tillies Bank in this report.

The name **Tillies Basin** was applied by Uchupi to a feature that does not exist at the described location, and the label on the NOS Bathymetric Fishing Map adds to the confusion about the location of Tillies Basin.

The new multibeam survey (1994-1996) that is the basis for the new feature names proposed at this time clearly shows that there is no large basin at the location (42º 30'N, 70º 20'W; official coordinates for Tillies Basin in the Gazetteer of Undersea Features), where a large basin (Tillies Basin) is shown (but not labeled) on Uchupi's map.

The described coordinates actually fall on a feature now named Creed Ridge, a feature not represented on Uchupi's map. See justification in this report for removing the name Tillies Basin.

The new survey shows that Tillies Bank is bounded on the north, east, and west by 3 large, long deep basins. As the name Tillies has been used for many years in this region, it is appropriate to retain it in the 3 newly-named basins that enclose Tillies Bank (North Tillies Basin, East Tillies Basin, and West Tillies Basin).

West Tillies Basin bounds the west side of Tillies Bank and is the west fork of North Tillies Basin. Interviews with local commercial fishermen failed to identify an appropriate name for this feature

Summary of proposed use of the name "Tillies" in this and accompanying documents:

Formalize the name **Tillies Bank**.
Name a new feature **Little Tillies Bank**.
Remove the name **Tillies Basin** (feature does not exist; retention of name will be confusing).
Name three new features **North Tillies Basin**, **East Tillies Basin**, and **West Tillies Basin**.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-B, scale 1:60,000, 1 sheet.

Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***WESTERN EDGE***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 21.0'N	70º 21.5'W

linear feature

	Latitude	Longitude
from	42º 19.3'N	70º 20.3'W
to	42º 21.9'N	70º 21.8'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		
N.W. corner		

DESCRIPTION:

Feature type: Scarp

Size and shape: Western Edge is a steep, linear, north- and northwest-trending feature that separates the western edge of Stellwagen Bank from Stellwagen Basin. It is approximately 3.2 nm (6.0 km) long and 0.2 nm (0.4 km) wide.

Depth (max. and min.): Top of feature 30 m; base 75-80 m.

Steepness, etc : Maximum relief of feature is approximately 45 m along the northwest-trending part of the feature.

ASSOCIATED FEATURES: Western Edge extends for 3.2 nm (6.0 km) along the western margin of Stellwagen Bank just north of Western Spur. It separates Stellwagen Bank from Stellwagen Basin .

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

REASON FOR CHOICE OF NAME: Western Edge is a steep linear scarp that defines the western margin of Stellwagen Bank for a distance of 3.2 nm (6.0 km) north of Western Spur. Western Edge separates Stellwagen Basin from Stellwagen Bank. The name Western Edge traditionally is used by local commercial fishermen to refer to this feature. This usage has been confirmed in interviews with the fishermen, especially with Frank Mirarchi of Scituate, Massachusetts who has fished the region for over 20 years.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed.*

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

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Valentine, Page C., Unger, Tanya, S., and Baker, Jessica L., 2003, Sun-illuminated sea floor topography and backscatter intensity of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-C, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***WESTERN SPUR***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:

center point of feature Lat. Long.

Latitude	Longitude
42º 18.9'N	70º 21.5'W

linear feature

	Latitude	Longitude
from		
to		

areal feature

	Latitude	Longitude
N.E. corner	42º 19.3'N	70º 20.3'W
S.E. corner	42º 17.9'N	70º 20.9'W
S.W. corner	42º 18.3'N	70º 21.9'W
N.W. corner	42º 19.4'N	70º 22.5'W

DESCRIPTION:

Feature type: Spur

Size and shape: Western Spur is a subrectangular feature that extends westward into Stellwagen Basin from Stellwagen Bank. It is approximately 1.6 nm (2.9 km) long and 1.3 nm (2.4 km) wide. Total area is approximately 1.75 sq nm (6.1 sq km).

Depth (max. and min.): Top of feature 60-65 m; base 85-100 m.

Steepness, etc : Maximum relief of feature is approximately 25-35 m on the northern and western flanks.

ASSOCIATED FEATURES: Western Spur extends westward into Stellwagen Basin from the western part of Stellwagen Bank.

CHART OR MAP REFERENCE:

Feature shown but not named on:

Uchupi, Elazar, 1975, Map showing relation of land and submarine topography, Nova Scotia to New Jersey: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-451, sheet 3, scale 1:100,000.

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Provincetown sheet, scale 1:100,000

National Ocean Service, National Oceanic and Atmospheric Administration, 1996, Chart 13009, Gulf of Maine and Georges Bank, 27th edition, scale 1:500,000.

REASON FOR CHOICE OF NAME: Western Spur is a subrectangular feature that extends from the western part of Stellwagen Bank westward into the smooth topography of Stellwagen Basin. The top of the spur is approximately 30 m below the top of Stellwagen Bank. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

Northeast corner: 42º 48'N, 70º 02'W Southwest corner: 42º 05'N, 70º 36'W

Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

Publications where the new geographic names will appear for the first time:

Valentine, Page C., Baker, Jessica L., and Unger, Tanya, S., 2003, Sea floor topography of the Stellwagen Bank National Marine Sanctuary off Boston, Massachusetts: U.S. Geological Survey Geologic Investigations Series, Map I-2676-A, scale 1:60,000, 1 sheet.

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FEATURE NAME: ***Y VALLEY***

LOCATION:
Ocean or sea: Northwest Atlantic Ocean, Gulf of Maine region

Coordinates:
center point of feature

Latitude	Longitude
42º 32.7'N	70º 13.6'W

linear feature

	Latitude	Longitude
from	42º 32.3'N	70º 14.5'W
to	42º 33.1'N	70º 13.1'W
to	42º 32.6'N	70º 11.9'W
to	42º 33.8'N	70º 13.0'W
to	42º 34.2'N	70º 12.2'W

areal feature

	Latitude	Longitude
N.E. corner		
S.E. corner		
S.W. corner		

N.W. corner

DESCRIPTION:

Feature type: Valley

Size and shape: Y Valley is a narrow, northeastward-trending feature that bifurcates toward the north and toward the southeast. It is approximately 3.6 nm (6.7 km) long (including both branches) and 0.3-0.5 nm (0.6-0.9 km) wide. Total area is approximately 2.75 sq nm (9.6 sq km).

Depth (max. and min.): Valley depth ranges from 110 to 135 m.

Steepness, etc : Maximum relief of valley walls is approximately 50-55 m. Maximum local relief of valley floor is 5 m.

ASSOCIATED FEATURES: Y Valley opens southwestward into East Tillies Basin.

CHART OR MAP REFERENCE:

Feature shown but not named on:

National Ocean Service, National Oceanic and Atmospheric Administration, 1986, Bathymetric Fishing Map, Gloucester sheet, scale 1:100,000.

REASON FOR CHOICE OF NAME: Y Valley is a prominent valley that cuts the eastern wall of East Tillies Basin. The valley floor bifurcates into two valley heads, one extending northward and one extending southeastward. The name of the feature is based on its distinctive Y shape. Interviews with local commercial fishermen failed to identify an appropriate name for this feature.

DISCOVERY FACTS: The Stellwagen Bank National Marine Sanctuary region was surveyed on four cruises from the fall of 1994 to the fall of 1996. The survey was a collaborative effort of the U.S. Geological Survey and the National Oceanic and Atmospheric Administration with support from the University of New Brunswick Ocean Mapping Group and the Canadian Hydrographic Service. The survey ship was the *Frederick G. Creed*, a SWATH (small waterplane twin hull) vessel 65 feet in length and fitted with a hull-mounted Kongsberg Simrad EM 1000 multibeam echosounder. Resolution of the multibeam mapping system is 10 meters horizontally and 20 centimeters vertically. Navigation was by Differential GPS with a horizontal accuracy of 10 m or better. An area of approximately 1100 square nautical miles was mapped. The corner points of the rectangular survey area are:

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Date: 1994-1996

Discoverer (individual, ship): Page Valentine and the USGS and CHS mapping teams onboard the Canadian Hydrographic Service vessel *Frederick G. Creed*.

Equipment or instruments used: Kongsberg Simrad EM1000 multibeam echosounder

Navigation used: Differential GPS

Horizontal accuracy: 10 meters or better

Spacing of tracks, crossings, etc: The multibeam survey covered 100 per cent of the sea bottom in the area surveyed (coordinates listed above).

SUPPORTING MATERIAL:

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image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
1	2290	8	Jul-98	-70	13.5168	42	22.6600	62	0055	0055093.JPG	
2	2748	17	Jul-99	-70	23.8129	42	41.2699	38	0083	0083025.JPG	
3	2658	17	Jul-99	-70	13.4409	42	45.3891	56	0083	0083068.JPG	
4	2658	17	Jul-99	-70	13.4221	42	45.3829	56	0083	0083077.JPG	
5	2131	9	Oct-97	-70	11.6661	42	20.7399	62	0659	0659010.JPG	
6	2145	9	Oct-97	-70	11.0605	42	24.3102	73	0659	0659052.JPG	
7	2154	9	Oct-97	-70	9.4048	42	24.8060	78	0660	0660022.JPG	
8	2618	17	Oct-98	-70	14.4470	42	46.5440	30	0671	0671043.JPG	
9	2550	15	Oct-98	-70	6.4810	42	34.2780	85	0675	0675097.JPG	
10	2604	17	Jul-99	-70	22.3828	42	46.2879	82	0914	0914008.JPG	
11	3396	10	Mar-99	-70	34.2989	42	28.4981	67	1614	1614037.JPG	
12	2262	8	Jul-98	-70	18.6049	42	25.2720	55	1647	1647002.JPG	
13	3140.2	11	Jul-97	-70	13.9032	42	29.1431	74	1647	1647066.JPG	
14	1916	9	Oct-96	-70	12.8297	42	21.9502	61	1803	1803048.JPG	
15	2091	9	Jul-97	-70	7.8378	42	24.5625	74	2075	2075021.JPG	
16	2091	9	Jul-97	-70	7.8177	42	24.5693	74	2075	2075024.JPG	
17	2079	9	Jul-97	-70	5.3123	42	22.6833	91	2075	2075050.JPG	
18	2079	9	Jul-97	-70	5.2318	42	22.6501	91	2075	2075053.JPG	
19	2464	12	Jul-98	-70	13.1039	42	27.8929	70	2456	2456012.JPG	
20	3151.3	17	Jul-98	-70	23.7300	42	40.9891	38	2456	2456073.JPG	
21	3143.6	14	Jul-98	-70	17.6051	42	36.0699	62	2457	2457024.JPG	
22	3140.7	11	Jul-98	-70	13.8872	42	29.1989	74	2457	2457044.JPG	
23	3140.8	11	Jul-98	-70	13.9398	42	29.4509	74	2457	2457046.JPG	
24	3143.3	14	Jul-98	-70	17.6642	42	35.9761	63	2462	2462068.JPG	
25	2447	12	Jul-98	-70	12.2699	42	28.9320	76	2462	2462085.JPG	
26	3841	1	Sep-00	-70	35.1352	42	6.4190	26	3665	3665072.JPG	
27	2222.2	14	Apr-98	-70	17.8130	42	36.1180	66	4588	4588075.JPG	
28	3743	4	Sep-00	-70	32.7008	42	13.6430	38	4783	4783005.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
29	3745	4	Sep-00	-70	34.9850	42	13.6640	26	4784	4784059.JPG	
30	3668	7	Sep-00	-70	26.7998	42	19.7351	71	4981	4981013.JPG	
31	3661	7	Sep-00	-70	30.2911	42	20.4531	88	4981	4981039.JPG	
32	3612	7	Jun-00	-70	32.6253	42	24.2395	89	0019	0019022.JPG	
33	3701	4	Jun-00	-70	33.9510	42	18.9585	76	0019	0019057.JPG	
34	3734	4	Jul-99	-70	27.0401	42	15.0279	45	0085	0085008.JPG	
35	3258	16	Jul-99	-70	30.2650	42	44.5129	78	0107	0107061.JPG	
36	3288	13	Mar-99	-70	32.5461	42	34.8729	68	1598	1598095.JPG	
37	1991	8	Jul-97	-70	21.9269	42	20.4721	93	2074	2074045.JPG	
38	3660	7	Jun-00	-70	30.6308	42	19.6774	91	2546	2546033.JPG	
39	3648	7	Jun-00	-70	25.7771	42	22.0473	80	2546	2546067.JPG	
40	3648	7	Jun-00	-70	25.8403	42	22.0189	80	2546	2546071.JPG	
41	2036	5	Oct-96	-70	20.6534	42	17.7493	81	2601	2601021.JPG	
42	3872	1	Sep-00	-70	35.1668	42	7.7161	28	3664	3664023.JPG	
43	3800	1	Sep-00	-70	35.3778	42	11.9360	31	4783	4783050.JPG	
44	2301	8	Jul-98	-70	16.5912	42	20.8550	34	0055	0055059.JPG	
45	2748	17	Jul-99	-70	23.7822	42	41.2500	38	0083	0083032.JPG	
46	2708	17	Jul-99	-70	22.0340	42	42.8181	51	0083	0083045.JPG	
47	2727	17	Jul-99	-70	14.7139	42	42.1001	73	0083	0083099.JPG	
48	2166	9	Oct-97	-70	7.4286	42	26.3562	78	0660	0660043.JPG	
49	2085	9	Jul-97	-70	4.8074	42	24.0008	97	2075	2075074.JPG	
50	2101	10	Aug-97	-70	32.9201	42	33.3469	52	2076	2076023.JPG	
51	2425	12	Jul-98	-70	11.1598	42	30.7560	78	2454	2454039.JPG	
52	3151	17	Jul-98	-70	23.9749	42	40.9840	38	2456	2456057.JPG	
53	2236.7	6	Jul-98	-70	10.0342	42	15.9100	51	2461	2461085.JPG	
54	2222.1	14	Apr-98	-70	17.8070	42	36.0800	66	4588	4588040.JPG	
55	3871	1	Sep-00	-70	35.1682	42	9.7630	26	4782	4782040.JPG	
56	3805	1	Sep-00	-70	35.7152	42	10.6899	25	4783	4783074.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
57	3816	1	Sep-00	-70	34.9200	42	9.8101	22	4783	4783088.JPG	
58	2266.1	8	Jul-98	-70	22.0560	42	24.7330	42	0056	0056060.JPG	
59	3277	16	Jul-99	-70	25.2081	42	41.5821	52	0083	0083009.JPG	
60	2154	9	Oct-97	-70	9.2853	42	24.7790	78	0660	0660024.JPG	
61	2744	17	Oct-98	-70	22.4588	42	41.0630	50	0670	0670073.JPG	
62	2771	14	Jul-99	-70	20.2409	42	40.1310	80	0900	0900084.JPG	
63	2751	14	Jul-99	-70	23.3130	42	40.2901	58	0913	0913007.JPG	
64	2645	17	Jul-99	-70	23.3098	42	44.0140	74	0914	0914028.JPG	
65	3410	6	Mar-99	-70	9.9779	42	15.9501	53	1612	1612060.JPG	
66	1923	8	Oct-96	-70	19.8994	42	21.9999	30	1803	1803063.JPG	
67	2056.1	8	Jul-97	-70	16.1824	42	24.0250	59	2072	2072052.JPG	
68	2047	8	Jul-97	-70	20.0148	42	26.0980	63	2073	2073043.JPG	
69	3154	6	Jul-98	-70	9.9532	42	15.9611	56	2460	2460023.JPG	
70	3744	4	Jun-00	-70	33.6914	42	13.4184	37	2546	2546006.JPG	
71	3744	4	Jun-00	-70	33.7097	42	13.4180	37	2546	2546008.JPG	
72	2236.2	6	May-98	-70	10.2118	42	15.9480	55	4577	4577003.JPG	
73	3738	4	Sep-00	-70	33.5962	42	14.0490	35	4784	4784043.JPG	
74	2284	8	Jul-98	-70	19.3680	42	22.4700	31	0056	0056093.JPG	
75	2298	8	Jul-98	-70	18.6960	42	20.6850	32	0056	0056099.JPG	
76	3075.1	6	Jul-98	-70	11.5031	42	16.4060	36	0057	0057017.JPG	
77	2936	14	Jul-99	-70	13.5118	42	33.8660	79	0085	0085021.JPG	
78	3413	16	Jul-99	-70	29.3582	42	46.1481	76	0107	0107041.JPG	
79	2143	9	Oct-97	-70	10.8636	42	23.0141	75	0659	0659041.JPG	
80	2155	9	Oct-97	-70	8.8989	42	24.3315	75	0660	0660026.JPG	
81	1930	8	Oct-96	-70	21.9548	42	23.0070	27	1803	1803078.JPG	
82	3725	4	Jun-00	-70	25.2617	42	18.1881	94	0019	0019071.JPG	
83	3811	1	Jul-99	-70	24.9422	42	10.6940	62	0084	0084091.JPG	
84	2988	18	Jul-99	-70	5.0848	42	45.1520	131	0910	0910048.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
85	3288	13	Mar-99	-70	32.5410	42	34.8640	68	1598	1598096.JPG	
86	2120	7	Aug-97	-70	25.9085	42	21.8589	80	2076	2076055.JPG	
87	3131.5	11	Jul-98	-70	23.3922	42	33.2169	41	2456	2456054.JPG	
88	2392	12	Jul-98	-70	4.7589	42	31.8851	124	2457	2457069.JPG	
89	3669	7	Jun-00	-70	25.4160	42	20.7198	88	2546	2546079.JPG	
90	2225.1	11	Apr-98	-70	14.4342	42	31.5090	137	4585	4585007.JPG	
91	3131.3	11	Jul-98	-70	23.4952	42	33.4190	74	2456	2456045.JPG	
92	3140.6	11	Jul-98	-70	13.8570	42	29.1431	74	2462	2462081.JPG	
93	3803	1	Sep-00	-70	34.8788	42	11.3450	38	4783	4783051.JPG	
94	3713	4	Sep-00	-70	35.4121	42	17.9011	53	4981	4981100.JPG	
95	3866	1	Jun-00	-70	34.7745	42	5.2975	27	0021	0021047.JPG	
96	3834	1	Jun-00	-70	33.4772	42	7.4769	31	0021	0021050.JPG	
97	3746	4	Jun-00	-70	35.5920	42	13.1021	37	0021	0021096.JPG	
98	3361	1	Jun-00	-70	28.4853	42	11.7128	63	0022	0022095.JPG	
99	3361	1	Jun-00	-70	28.4834	42	11.7185	63	0022	0022096.JPG	
100	3118	6	Jul-98	-70	2.1858	42	19.1480	35	0057	0057071.JPG	
101	3101	6	Jul-98	-70	5.6708	42	13.7860	102	0057	0057094.JPG	
102	2901	14	Jul-99	-70	18.0341	42	35.1741	92	0099	0099052.JPG	
103	2896	14	Jul-99	-70	19.2160	42	36.0759	158	0100	0100024.JPG	
104	2796	14	Jul-99	-70	23.6160	42	37.4979	82	0100	0100084.JPG	
105	2967	18	Jul-99	-70	7.9811	42	47.8189	98	0109	0109024.JPG	
106	2970	18	Jul-99	-70	5.7339	42	47.0501	122	0109	0109049.JPG	
107	2973	18	Jul-99	-70	3.6919	42	47.7770	128	0109	0109066.JPG	
108	2977	18	Jul-99	-70	2.1552	42	46.6180	150	0109	0109075.JPG	
109	2999	18	Jul-99	-70	2.1130	42	45.6221	127	0109	0109097.JPG	
110	3002	18	Jul-99	-70	2.7672	42	44.3410	163	0109	0109102.JPG	
111	2950	18	Mar-99	-70	11.7361	42	46.9290	106	1608	1608022.JPG	
112	2959	18	Mar-99	-70	11.7128	42	45.5230	111	1608	1608033.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
113	2270	8	Jul-98	-70	14.8041	42	24.3890	62	1647	1647014.JPG	
114	2123	7	Aug-97	-70	27.7849	42	21.6884	64	2076	2076074.JPG	
115	3140.7	11	Jul-98	-70	13.7769	42	29.0671	74	2457	2457037.JPG	
116	2459	12	Jul-98	-70	5.4259	42	28.0460	89	2460	2460059.JPG	
117	2383	12	Jul-98	-70	2.2499	42	32.5509	144	2460	2460079.JPG	
118	2371	12	Jul-98	-70	3.6292	42	33.4541	127	2460	2460083.JPG	
119	2335	9	Jul-98	-70	5.1952	42	23.5929	105	2462	2462006.JPG	
120	2355	9	Jul-98	-70	3.0981	42	19.7699	147	2462	2462036.JPG	
121	2437	12	Jul-98	-70	12.0360	42	29.4830	77	2462	2462088.JPG	
122	2424	12	Jul-98	-70	11.4629	42	30.5319	89	2462	2462097.JPG	
123	3646	7	Sep-00	-70	30.0449	42	22.6831	77	4784	4784029.JPG	
124	3664	7	Sep-00	-70	28.7718	42	20.2329	68	4981	4981023.JPG	
125	2618	17	Oct-98	-70	14.5079	42	46.6230	30	0671	0671038.JPG	
126	2355	9	Jul-98	-70	3.0652	42	19.7470	147	2462	2462031.JPG	
127	3373	6	Mar-99	-70	11.9041	42	12.9769	36	0121	0121024.JPG	
128	1903	8	Oct-96	-70	17.9956	42	19.9981	31	1803	1803027.JPG	
129	1999	5	Oct-96	-70	15.9041	42	14.4196	30	1806	1806067.JPG	
130	2667	17	Oct-98	-70	17.3442	42	44.1769	68	0673	0673034.JPG	
131	1921	8	Oct-96	-70	17.9123	42	21.9921	37	1803	1803058.JPG	
132	1933.1	8	Jul-98	-70	18.9972	42	22.9951	34	1803	1803085.JPG	
133	3839	1	Sep-00	-70	35.2528	42	7.2830	26	3664	3664003.JPG	
134	3865	1	Sep-00	-70	34.6651	42	5.5719	24	3665	3665041.JPG	
135	3841	1	Sep-00	-70	35.1270	42	6.4000	26	3665	3665063.JPG	
136	2227.2	6	Apr-98	-70	11.9939	42	13.1369	41	4586	4586077.JPG	
137	3868	1	Sep-00	-70	35.3682	42	5.1489	15	4782	4782077.JPG	
138	2300	8	Jul-98	-70	17.1478	42	20.3730	34	0055	0055074.JPG	
139	2951	18	Jul-99	-70	10.7011	42	47.6969	65	0109	0109007.JPG	
140	2768	14	Jul-99	-70	18.2510	42	39.9410	81	0900	0900075.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
141	3006	18	Jul-99	-70	2.7251	42	44.0950	138	0910	0910032.JPG	
142	3388	10	Mar-99	-70	31.5651	42	30.4470	62	1614	1614017.JPG	
143	3394	10	Mar-99	-70	32.7992	42	29.4871	67	1614	1614026.JPG	
144	3407	8	Mar-99	-70	15.6999	42	25.9090	79	1614	1614069.JPG	
145	1554	12	Apr-96	-70	8.2526	42	28.4342	80	1639	1639015.JPG	
146	1560	12	Apr-96	-70	3.1796	42	31.0087	124	1639	1639023.JPG	
147	3131	11	Jul-98	-70	23.4778	42	33.3609	74	1649	1649040.JPG	
148	2261	8	Jul-98	-70	20.1801	42	25.0520	48	1649	1649045.JPG	
149	2253	8	Jul-98	-70	21.2050	42	25.4810	47	1649	1649079.JPG	
150	1917	8	Oct-96	-70	13.8332	42	21.9232	53	1803	1803052.JPG	
151	1949	8	Oct-96	-70	16.1851	42	24.0134	58	1803	1803093.JPG	
152	2056.1	8	Jul-97	-70	16.2721	42	24.0447	59	2072	2072064.JPG	
153	2056	8	Jul-97	-70	24.6112	42	21.2707	59	2074	2074037.JPG	
154	2104	7	Aug-97	-70	27.0268	42	24.9527	34	2076	2076036.JPG	
155	2365	12	Jul-98	-70	9.6840	42	33.5229	80	2455	2455004.JPG	
156	2379	12	Jul-98	-70	8.7140	42	32.5921	79	2455	2455016.JPG	
157	3131.4	11	Jul-98	-70	23.5451	42	33.3291	74	2456	2456050.JPG	
158	2431	12	Jul-98	-70	5.9921	42	29.9359	85	2457	2457078.JPG	
159	3100.1	6	Jul-98	-70	2.1460	42	19.0700	131	2460	2460019.JPG	
160	3707	4	Sep-00	-70	34.1492	42	14.9261	40	4534	4534081.JPG	
161	3735	4	Sep-00	-70	35.7239	42	14.5729	35	4534	4534097.JPG	
162	2684	17	Oct-98	-70	19.4481	42	43.3381	55	0673	0673065.JPG	
163	1893	8	Oct-96	-70	16.5079	42	19.5090	34	1803	1803013.JPG	
164	3853.0	1	Aug-01	-70	28.018	42	5.097	51	3586	3586006.JPG	
165	3611.0	7	Aug-01	-70	33.999	42	23.501	91	3586	3586090.JPG	
166	3611.0	7	Aug-01	-70	34.057	42	23.551	91	3586	3586098.JPG	
167	3618.0	7	Aug-01	-70	35.194	42	21.164	69	3586	3586122.JPG	
168	3658.0	7	Aug-01	-70	33.063	42	20.807	79	3587	3587003.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
169	3657.0	7	Aug-01	-70	33.501	42	20.289	62	3587	3587005.JPG	
170	3721.0	4	Aug-01	-70	26.519	42	19.196	61	3587	3587033.JPG	
171	3678.0	7	Aug-01	-70	29.465	42	21.19	93	3587	3587060.JPG	
172	3674.0	7	Aug-01	-70	26.086	42	21.599	84	3587	3587086.JPG	
173	3674.0	7	Aug-01	-70	26.114	42	21.584	84	3587	3587089.JPG	
174	3671.0	7	Aug-01	-70	26.362	42	21.492	84	4035	4035009.JPG	
175	3676.0	7	Aug-01	-70	26.182	42	21.717	82	4035	4035035.JPG	
176	3681.1	7	Aug-01	-70	29.609	42	22.662	85	4035	4035061.JPG	
177	3632.1	7	Aug-01	-70	26.075	42	26.422	94	4035	4035113.JPG	
178	3625.1	7	Aug-01	-70	28.307	42	26.504	56	4035	4035125.JPG	
179	3624.1	7	Aug-01	-70	28.833	42	26.229	51	4035	4035132.JPG	
180	4000.1	13	Aug-01	-70	29.004	42	35.354	84	4036	4036074.JPG	
181	4200.0	14	Aug-01	-70	17.831	42	40.271	138	4041	4041051.JPG	
182	4200.0	14	Aug-01	-70	18.114	42	40.276	138	4041	4041074.JPG	
183	4207.0	14	Aug-01	-70	15.936	42	36.491	128	4041	4041130.JPG	
184	4204.0	14	Aug-01	-70	16.612	42	37.299	144	4042	4042004.JPG	
185	4204.0	14	Aug-01	-70	16.61	42	37.3	144	4042	4042005.JPG	
186	4204.0	14	Aug-01	-70	16.47	42	37.387	144	4042	4042009.JPG	
187	4202.0	14	Aug-01	-70	15.632	42	35.425	115	4042	4042048.JPG	
188	3369.0	1	Aug-01	-70	29.943	42	11.143	57	4069	4069042.JPG	
189	3812.0	1	Aug-01	-70	30.345	42	9.943	52	4069	4069103.JPG	
190	3812.0	1	Aug-01	-70	30.345	42	9.943	52	4069	4069104.JPG	
191	3824.0	1	Aug-01	-70	29.603	42	9.013	55	4069	4069113.JPG	
192	3815.1	1	Aug-01	-70	32.902	42	9.664	39	4069	4069139.JPG	
193	3833.0	1	Aug-01	-70	31.748	42	7.393	30	4070	4070028.JPG	
194	3843.0	1	Aug-01	-70	31.05	42	7.05	35	4070	4070038.JPG	
195	3862.1	1	Aug-01	-70	33.247	42	6.097	33	4070	4070051.JPG	
196	3859.0	1	Aug-01	-70	30.942	42	5.964	48	4070	4070077.JPG	

image number	USGS station	quadrangle	date	longitude (deg)	longitude (min)	latitude (deg)	latitude (min)	water depth (m)	photo CD	JPEG file	
197	3854.0	1	Aug-01	-70	28.479	42	6.044	51	4070	4070094.JPG	
198	3854.0	1	Aug-01	-70	28.427	42	6.038	51	4070	4070097.JPG	

USGS

Geologic Studies of Benthic Habitats

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Boulders

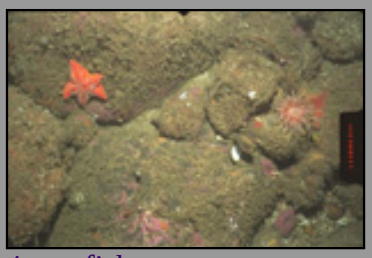
Photo Attribute Table (pdf format)

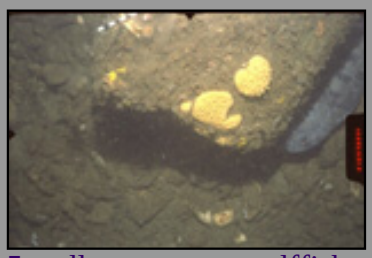
The following is a collection of subject photographs; click on thumbnail to view the enlarged image.

1. anemone, orange sponge

2. algae, starfish, redfish, yellow sponge, magenta calcareous algae

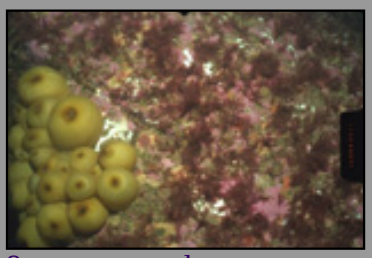
3. finger sponge, stalked ascidian, white brachiopod


4. starfish, anemone, magenta calcareous algae


5. yellow sponge, wolffish

6. starfish, yellow sponge, gray sea squirt

7. starfish, anemone, yellow sponge

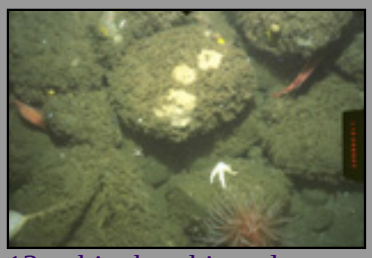

8. anemone, algae, magenta calcareous algae

9. brown sea squirt

10. white brachiopod, spider crab

11. white brachiopod, lobster, burrowing anemone, white sponge, redfish

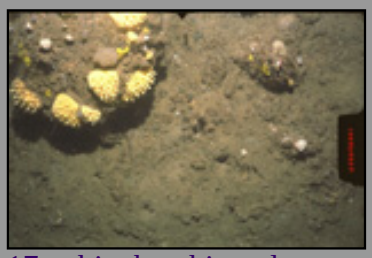
12. redfish


13. white brachiopod, anemone, white sponge, stalked ascidian, redfish

14. spider crab, anemone

15. spider crab, brown sea squirt

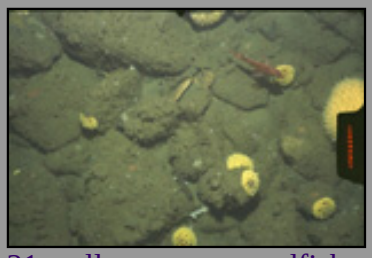
16. spider crab, starfish, yellow sponge


17. white brachiopod, yellow sponge

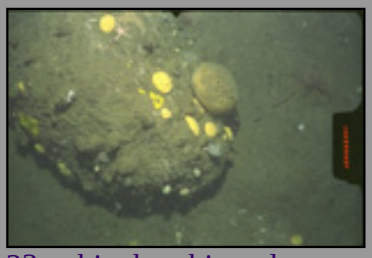
18. cancer crab, brown sea squirt

19. white brachiopod, starfish, yellow sponge

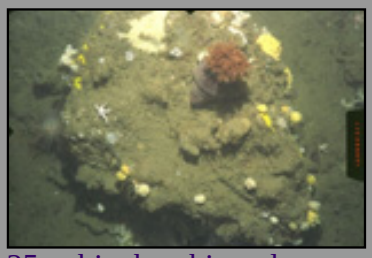
20. cancer crab, anemone, yellow and white sponges, magenta calcareous algae

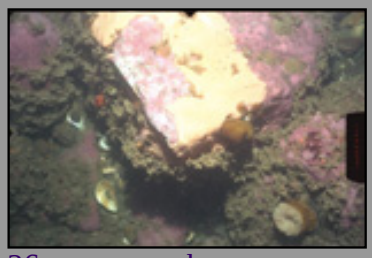

21. yellow sponge, redfish

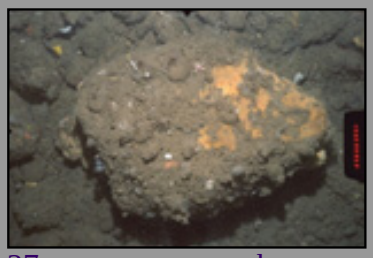
22. finger sponge

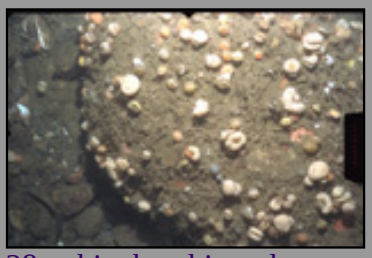

23. white brachiopod, starfish, yellow sponge, brown sea squirt

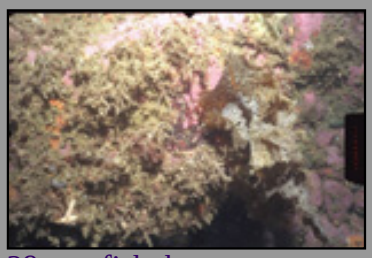
24. yellow sponge, brown sea squirt

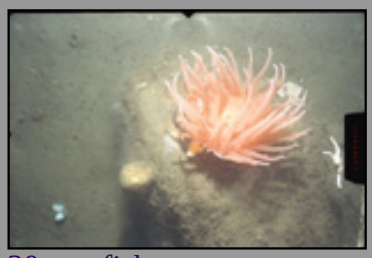

25. white brachiopod, sea cucumber, starfish, yellow and white sponge, brown sea squirt


26. anemone, bryozoa, magenta calcareous algae


27. orange sponge, brown sea squirt


28. white brachiopod


29. starfish, bryozoa, orange sponge, magenta calcareous algae


30. starfish, anemone, sponge

31. lobster, sponge

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