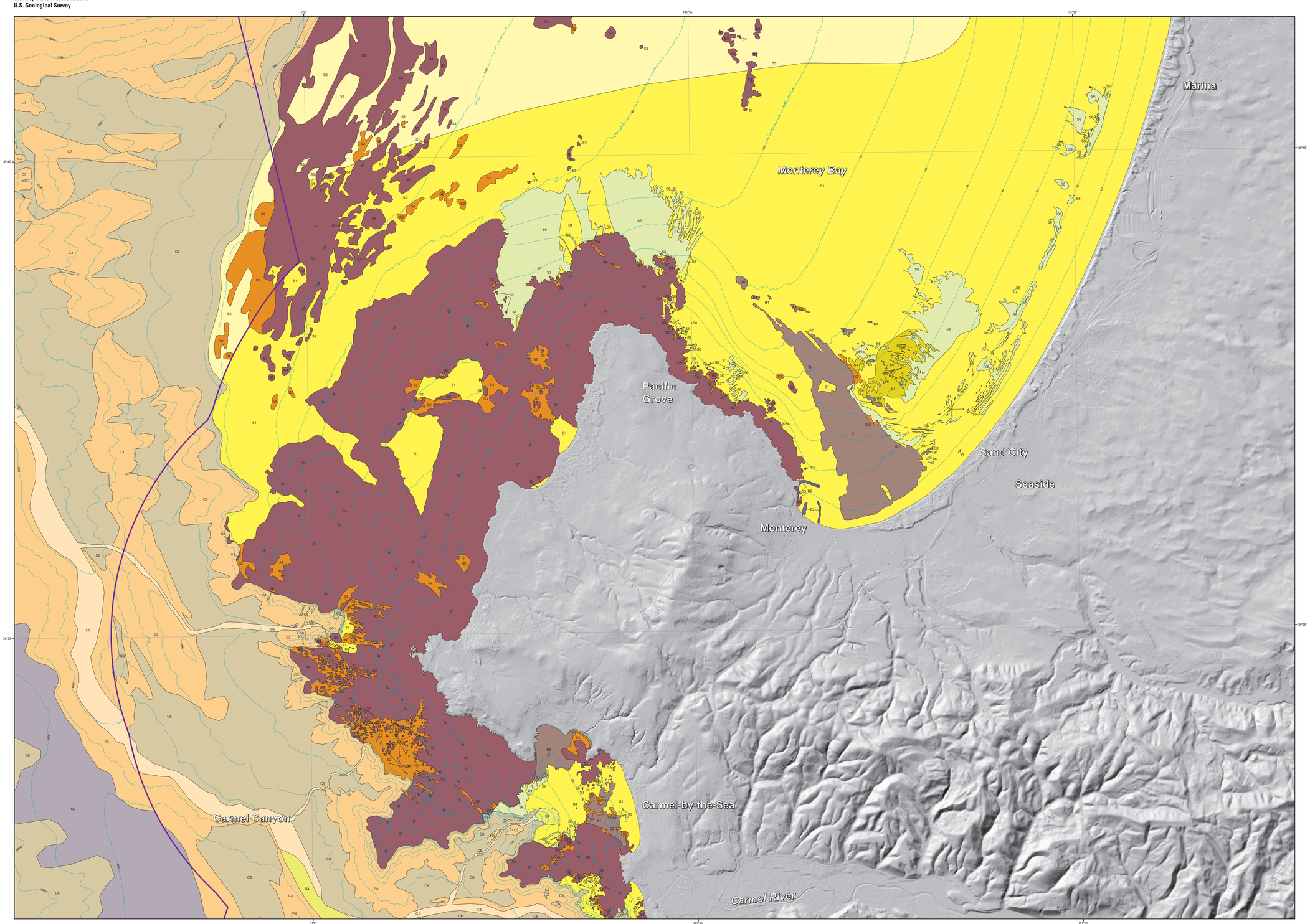
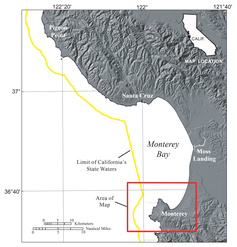
U.S. Department of the Interior
U.S. Geological Survey

Open-File Report 2016–1110
Sheet 7 of 10
Pamphlet accompanies map





DESCRIPTION OF MAP UNITS

EMBAYMENT/BAY

- **B1** Transform Continental Margin. Embayment/Bay. Rock Outcrop. Bedrock. Hard Substrate Induration. Centuries Persistence
- **B2** Transform Continental Margin. Embayment/Bay. Wharf. Decades Persistence

CONTINENTAL/ISLAND SHELF

- **S1** Transform Continental Margin. Continental/Island Shelf. Ripples. Medium Sand. Soft Substrate Induration. Decades Persistence
- **S2** Transform Continental Margin. Continental/Island Shelf. Ripples. Rock Outcrop. Medium Sand. Bedrock. Mixed Substrate Induration. Years Persistence
- **S3** Transform Continental Margin. Continental/Island Shelf. Rock Outcrop. Bedrock. Hard Substrate Induration. Centuries Persistence
- **S4** Transform Continental Margin. Continental/Island Shelf. Sandy Gravel. Soft Substrate Induration. Decades Persistence
- **S5** Transform Continental Margin. Continental/Island Shelf. Sandy Silt-Clay. Soft Substrate Induration. Decades Persistence
- **S6** Transform Continental Margin. Continental/Island Shelf. Scour Depression. Gravelly Sand. Soft Substrate Induration. Decades Persistence
- **S7** Transform Continental Margin. Continental/Island Shelf. Slope. Gravelly Muddy Sand. Soft Substrate Induration. Centuries Persistence
- **S8** Transform Continental Margin. Continental/Island Shelf. Wave Built Terrace. Gravelly Muddy Sand. Soft Substrate Induration. Centuries Persistence

SUBMARINE CANYON

- **C1** Transform Continental Margin. Submarine Canyon. Ledge. Muddy Sand. Soft Substrate Induration. Stochastic Persistence
- **C2** Transform Continental Margin. Submarine Canyon. Platform. Sandy Silt-Clay. Soft Substrate Induration. Stochastic Persistence
- **C3** Transform Continental Margin. Submarine Canyon. Rock Outcrop. Bedrock. Hard Substrate Induration. Decades Persistence
- **C4** Transform Continental Margin. Submarine Canyon. Megaripples. Sand. Soft Substrate Induration. Stochastic Persistence
- **C5** Transform Continental Margin. Submarine Canyon. Megaripples. Submarine Slide Deposit. Slightly Gravelly Sand. Bedrock. Mixed Substrate Induration. Stochastic Persistence
- **C6** Transform Continental Margin. Submarine Canyon. Submarine Slide Deposit. Sandy Silt-Clay. Bedrock. Mixed Substrate Induration. Stochastic Persistence

EXPLANATION OF MAP SYMBOLS

- **Contact**
- **Area of "no data"**—Areas near shoreline not mapped owing to insufficient high-resolution seafloor mapping data.
- **Limit of California's State Waters**
- 20 **Bathymetric contour (in meters)**—Derived from modified 2- and 5-m-resolution bathymetry grids. Contour intervals: 1–100 m water depth, 10 m; 100–200 m water depth, 50 m; >200 m water depth, 100 m

DISCUSSION

This map shows physical marine benthic habitats in the Offshore of Monterey map area. Marine benthic habitats represent a particular type of water quality, substrate, geomorphology, seafloor process, or any other attribute that may provide a habitat for a specific species or assemblage of organisms. Marine benthic habitats are classified using the Coastal and Marine Ecological Classification Standard (CMECS), developed by representatives from a consortium of Federal agencies. CMECS is the Federal standard for marine habitat characterization (available at https://www.fgdc.gov/standards/projects/FGDC-standards-projects/cmecs-folder/CMECS_Version_06-2012_FINAL.pdf). The standard provides an ecologically relevant structure for biologic-, geologic-, chemical-, and physical-habitat attributes.

This map illustrates the geoform and substrate components of the standard and their distribution in the Offshore of Monterey map area. Geoform components describe the major geomorphic and structural characteristics of the coast and seafloor (that is, the tectonic and physiographic settings and the geological, biogenic, and anthropogenic features). The map was derived from the geologic and geomorphic map of the seafloor (see sheet 10) by translation of the map-unit descriptions into the best-fit values of the CMECS classes. The map also includes a temporal attribute for each unit that indicates time period of persistence, as well as an induration attribute that allows resymbolization of the data-catalog shapefile into a simple map of hard-mixed-soft attributes of Essential Fish Habitat assessment (Greene and Bizzarro, 2003). Table 1 shows the total area (in square meters) of each CMECS class mapped.

REFERENCE CITED

Greene, H.G., and Bizzarro, J.J., 2003, Essential fish habitat characterization and mapping of the California continental margin: Final Report to Pacific States Marine Fisheries Commission, CFDA #11-454, 14 p., available at http://marinehabitat.psmfc.org/files/source_docs/EFH_report_with_Appendices.pdf.

Map-unit label	Area, in square meters
B1	4,785,832
B2	49,947
S1	79,625,410
S2	5,326,584
S3	53,214,811
S4	942,202
S5	18,252,877
S6	8,081,663
S7	5,133
S8	13,423
C1	18,678
C2	8,389,367
C3	38,612,048
C4	569,767
C5	5,082,653
C6	45,648,184

Table 1. Total area, in square meters, of each marine benthic habitat class from Coastal and Marine Ecological Classification Standard mapped in Offshore of Monterey map area.

Onshore elevation data from National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management's Digital Coast (available at http://www.csc.noaa.gov/digitalcoast/data/coastallidar/) and from U.S. Geological Survey's National Elevation Dataset (available at http://ned.usgs.gov/). California's State Waters limit from NOAA Office of Coast Survey.

Universal Transverse Mercator projection, Zone 10N

NOT INTENDED FOR NAVIGATIONAL USE

APPROXIMATE MEAN DECLINATION, 2016

SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
0.5 0 0.5 1 KILOMETER

BATHYMETRIC CONTOUR INTERVALS: 10 METERS, 50 METERS, AND 200 METERS
ONE MILE = 0.869 NAUTICAL MILES

MAP LOCATION

Marine benthic habitats from Coastal and Marine Ecological Classification Standard mapped by Guy R. Cochrane, Stephen R. Hartwell, and Samuel Y. Johnson, 2015. Bathymetric contours by Peter Dartnell, 2015

GIS database and digital cartography by Guy R. Cochrane and Stephen R. Hartwell

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Marine Benthic Habitats from the Coastal and Marine Ecological Classification Standard, Offshore of Monterey Map Area, California

By
Guy R. Cochrane, Stephen R. Hartwell, and Samuel Y. Johnson

2016

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This map was printed on an electronic plotter directly from digital files. Dimensional calibration may vary between electronic plotters and between X and Y directions on any single plotter, and paper may change size due to atmospheric conditions; therefore, scale and proportions may not be true on plots of this map.

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