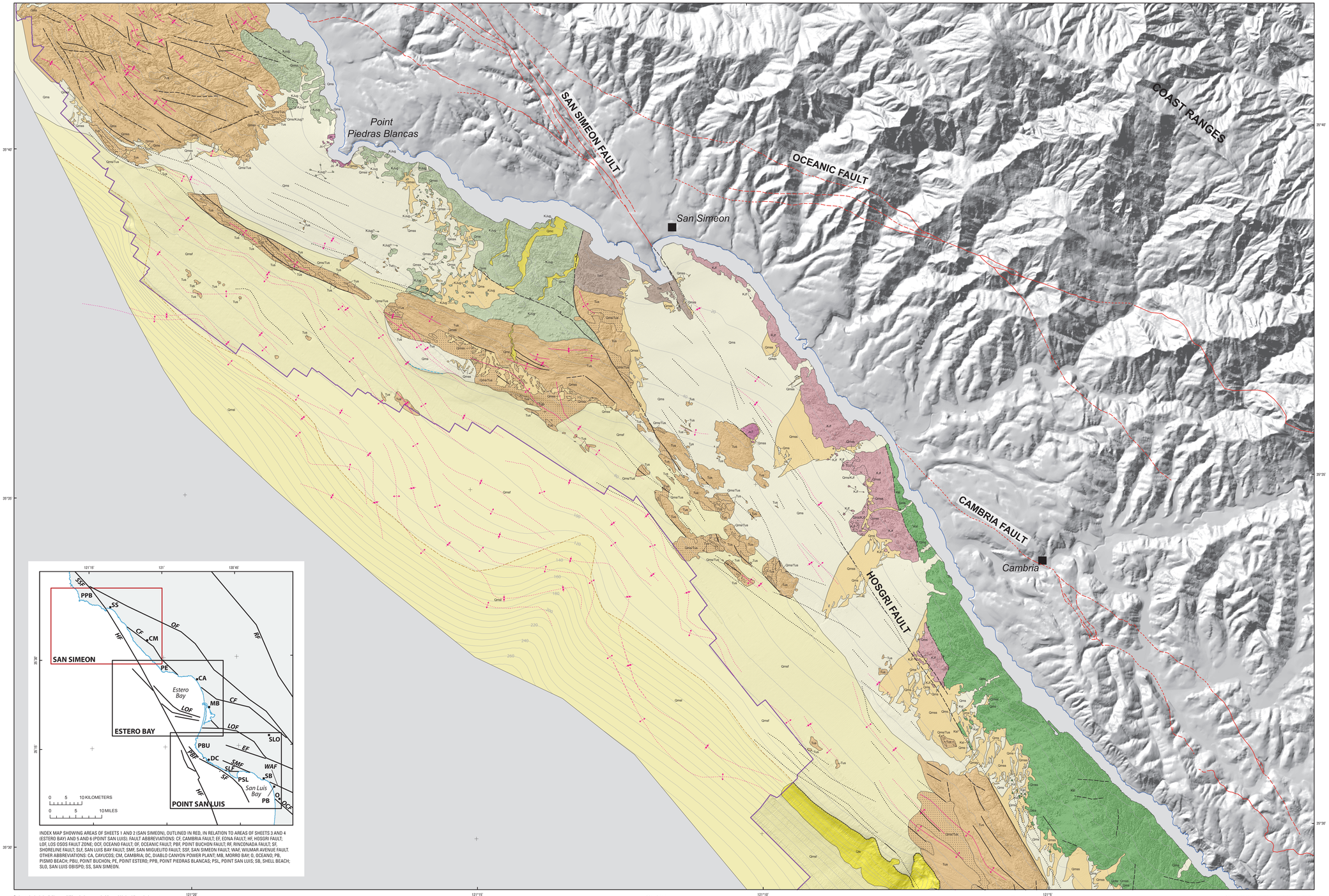
U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 3327
Sheet 1 of 6
Pamphlet accompanies map



INDEX MAP SHOWING AREAS OF SHEETS 1 AND 2 (SAN SIMEON), OUTLINED IN RED, IN RELATION TO AREAS OF SHEETS 3 AND 4 (ESTERO BAY) AND 5 AND 6 (POINT SAN LUIS). FAULT ABBREVIATIONS: CF, CAMBRIA FAULT; EF, EDNA FAULT; HF, HOSGRI FAULT; LOF, LOS OSOS FAULT ZONE; OCF, OCEANIC FAULT; OF, OCEANIC FAULT; PBF, POINT BUCHON FAULT; RF, RINCONADA FAULT; SF, SHORELINE FAULT; SLF, SAN LUIS BAY FAULT; SMF, SAN MIGUELITO FAULT; SSF, SAN SIMEON FAULT; WAF, WILMAR AVENUE FAULT. OTHER ABBREVIATIONS: CA, CAYUCOS; CM, CAMBRIA; DC, DIABLO CANYON POWER PLANT; MB, MORRO BAY; O, OCEANO; PB, PISMO BEACH; PBU, POINT BUCHON; PE, POINT ESTERO; PPB, POINT PIEDRAS BLANCAS; PSL, POINT SAN LUIS; SB, SHELL BEACH; SLO, SAN LUIS OBISPO; SS, SAN SIMEON.

Bathymetric shaded-relief imagery (10X vertical exaggeration) from gridded multibeam bathymetry acquired, processed, archived, and distributed by California State University, Monterey Bay, Seafloor Mapping Lab (CSUMB) and by U.S. Geological Survey (Hartwell and others, 2013)

Bathymetric contours derived from gridded multibeam bathymetry (CSUMB), 1/3 arc-second NOAA Tsunami Inundation DEM (Friday and others, 2011), and regional 3 arc-second NOAA DEM (National Oceanic and Atmospheric Administration National Geophysical Data Center, 2011)

Elevation data from U.S. Geological Survey National Elevation Database (1/3 arc-second); sun illumination from northwest (315°) at 45° above horizon

Universal Transverse Mercator projection, Zone 10N

NOT INTENDED FOR NAVIGATIONAL USE

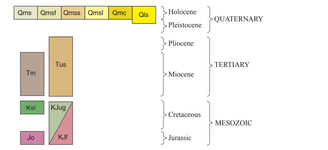
13°
APPROXIMATE MEAN DECLINATION, 2015

SCALE 1:35 000
1 0 1 MILE
1/2 0 1 KILOMETER
BATHYMETRIC CONTOUR INTERVAL 10 METERS
ONE MILE = 0.869 NAUTICAL MILES

CALIF.
MAP LOCATION

Offshore geology and geomorphology mapped by Janet T. Watt and Samuel Y. Johnson, 2010-2013. Onshore faults from Quaternary fault and fold database U.S. Geological Survey and California Geological Survey, 2010)
GIS database and digital cartography by Janet T. Watt, Stephen R. Hartwell, and Theresa Fregoso
Edited by Taryn A. Lindquist
Manuscript approved for publication April 14, 2015

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

[Note that composite units (gray-stippled areas) are designated on map by composite label indicating both overlying sediment cover and lower (older) unit, separated by slash (for example, Qms/Tus indicates that thin sheet of Qms overlies Tus)]

Qms — **Marine nearshore and shelf deposits (Holocene)**—Mostly sand; ripples common

Qmsf — **Fine-grained marine nearshore and shelf deposits (Holocene)**—Predominantly mud to muddy sand

Qmss — **Marine shelf sorted bedforms (Holocene)**—Inferred to be coarse sand and possibly gravel; found as single depressions or in fields of depressions interspersed with elevated shelf sediments (unit Qms). Although no direct camera observations of these bedforms were made in map area, their composition is inferred from similar features directly observed elsewhere on California shelf

Qmsl — **Marine slope deposits (Holocene)**—Sand and mud; found offshore of shelf break (more than about 80 m deep) on seaward-dipping (6°–8°) surface

Qmc — **Marine channel deposits (Holocene)**—Predominantly coarse sand; characterized by high backscatter

Qls — **Landslide deposits (Holocene and latest Pleistocene)**—May represent various forms of submarine sediment instabilities, including slumps, slides, and collapse depressions. Characterized by hummocky bathymetry and headscarps incised into shelf (unit Qmsf) or slope (unit Qmsl) deposits

Tus — **Sedimentary bedrock (Tertiary)**—Includes sedimentary rocks from the Monterey and Pismo Formations; distinguished on basis of bedding character in shallow seismic-reflection data and (or) multibeam imagery. Stippled areas (composite unit Qms/Tus) indicate where thin sheets of Qms overlie unit

Tm — **Monterey Formation (Miocene)**—Diatomaceous, porcelaneous, and opaline shale; tuffaceous siltstone; and claystone

Kslf — **Unnamed sandstone and interbedded shale (Late Cretaceous)**—Sandstone and interbedded shale and siltstone; mapped in Sam Simeon and Morro Bay areas, in accordance with adjacent onland mapping (Hall, 1973a, 1974). Correlated with the unnamed sandstone and interbedded claystone unit (Kslc), mapped in Point San Luis area (see sheet 5)

KJug — **Unnamed graywacke (Cretaceous and Jurassic)**—Thick-bedded, medium-grained sandstone; also locally present is thinly bedded siltstone that has crossbedding, cross-laminations, and graded bedding. Mapped only in San Simeon area, west of Hosgri–San Simeon Fault Zone at Point Piedras Blancas, in accordance with adjacent onland mapping (Hall, 1976). Stippled areas (composite unit Qms/KJug) indicate where thin sheets of Qms overlie unit

Kjf — **Franciscan Complex (Cretaceous and Jurassic)**—Includes fine- to coarse-grained sandstone, siltstone, and some claystone, as well as mélange. Mélange is mainly composed of sheared claystone that contains exotic clasts of conglomerate, blueschist, schist, greenstone, chert, graywacke, and shale. Stippled areas (composite unit Qms/Kjf) indicate where thin sheets of Qms overlie unit

Jo — **Coast Range ophiolite (Jurassic)**—Includes diabase, basalt, microdiorite, dikes and sills, diorite, and serpentinite. Ophiolite sequences mapped onland at Point Piedras Blancas and Point San Luis (Hall, 1973a, 1976). Serpentinite, which often is faulted and sheared within the Franciscan Complex, is found in lenses along fault zones

EXPLANATION OF MAP SYMBOLS

Contact—Approximately located

Fault (offshore)—Solid where location is certain, dashed where location is inferred, dotted where location is concealed, queried where existence is questionable

Fault (onshore)—Solid where location is certain, long-dashed where location is approximate, short-dashed where location is inferred

Folds—Solid where location is certain, dotted where location is concealed

Antiform

Synform

Monocline

Headscarp of submarine landslide—Sharp, distinct scarp at head of landslide; in places, forms contact between landslide deposits (Qls) and other units. Hachures point downscarp

Shelf break—Boundary between continental shelf and upper slope, mapped on basis of distinct break in slope that is visible in multibeam bathymetry or on seismic-reflection profiles. Forms contact between shelf (Qmsf) and slope (Qmsl) deposits. Coincident with submarine landslide scarps offshore of Cambria

Slope break—Break in slope along top of latest Pleistocene nearshore bar

Boundary of multibeam-bathymetry survey

Area of "no data"—Areas not mapped owing to insufficient high-resolution seafloor mapping data

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SEAFLOOR MAPPING LAB CSU MONTEREY BAY

Coastal Conservancy

CALIFORNIA OCEAN PROTECTION COUNCIL

PG&E

Offshore Geology and Geomorphology of San Simeon Map Area

Offshore Geology and Geomorphology from Point Piedras Blancas to Pismo Beach, San Luis Obispo County, California

By
Janet T. Watt, Samuel Y. Johnson, Stephen R. Hartwell, and Michelle Roberts
2015

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 the same 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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Digital files available at http://dx.doi.org/10.3133/sim3327 or http://pubs.usgs.gov/sim/3327/

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