

Sanctuary Ecologically Significant Area (SESA)

SESA 12: Sur Platform

Description

SESA 12 covers the southwest side of Sur Platform and is adjacent to the Point Sur State Marine Conservation Area (SMCA). It contains a mix of hard (32%) and soft bottom in the shelf, shelf break and upper slope depth zones and heads of Sur Canyon. This SESA has the second highest habitat richness (11 habitats) and intermediate habitat diversity (index=4.17). Groundfish survey trawls over the shelf and shelf break have captured a few sea pens and a fish fauna of intermediate richness and diversity, but sampling effort is low. Surveys to characterize benthic habitats and communities (using camera sled, submersible, and ROVs) have occurred at many locations in shelf and shelf break habitats. Additional research at this site includes oceanographic monitoring, seabird and mammal surveys, marine debris surveys, and a trawling impact study. The upwelling zone at Point Sur overlaps the southern part of the SESA; upwelled water may be advected northwest through the SESA. Intermediate levels of primary productivity are observed. This SESA includes foraging hotspots for leatherback sea turtle, Ashy Storm-Petrel, and marine mammals (e.g., Dall's porpoise, dolphins, sea lions, blue whale, humpback whale). Seabird density is greater over Sur Platform compared to the surrounding area. This SESA is located within MBNMS, and research activities may require a permit (http://montereybay.noaa.gov/resourcepro/permit/permits_need.html).

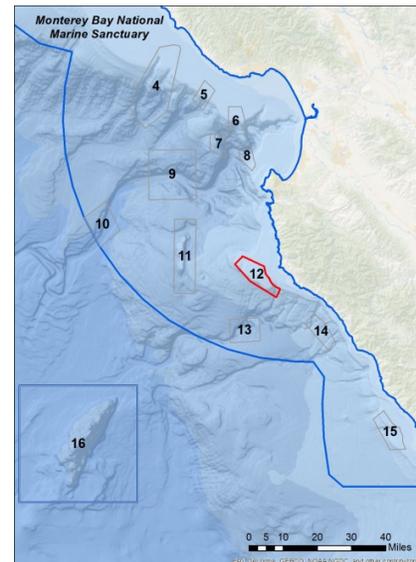


Figure 1. The location of SESA 12 and twelve additional SESAs in Monterey Bay National Marine Sanctuary. Credit: Chad King/MBNMS.

Resource Management Issues

SESA 12 has been used as commercial fishing grounds and also contains proposed demersal fishes conservation area.

- NPS cable
- Adjacent to State MPA: Point Sur SMCA
- Commercial bottom trawling
- Adjacent to commercial benthic fixed gear
- Rockfish Conservation Area (trawl)
- Essential Fish Habitat (EFH) Conservation Area
- EFH bottom trawl closure proposed (2013)
- Recreational fishing
- Adjacent to commercial shipping lane
- Wildlife viewing
- Leatherback sea turtle critical habitat
- Lost fishing gear survey (2011)

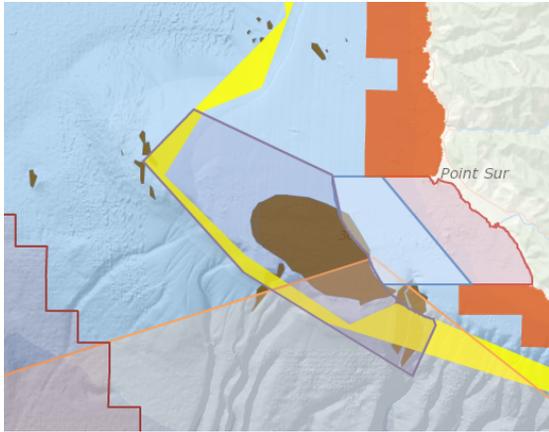


Figure 2. Close-up map of SESA 12. Grey border=SESA boundary; yellow=Rockfish Conservation Area; light orange border=EFH Conservation Area; orange=commercial benthic fixed gear dominant use; light blue=State MPA; red border=dominant commercial shipping lane. Source: SESAs Interactive Map, <http://sanctuarymonitoring.org/maps/sesa/>.

Living Marine Resources & Uses

Table 1. Species known to occur within SESA 12: Sur Platform.

<p>Invertebrates</p>	<ul style="list-style-type: none"> -sponges† (Porifera), e.g., barrel, flat, and foliose sponges -pink branching hydrocoral† (<i>Stylaster norvigicus</i>) -anemones (Actiniara), e.g., white-plumed anemone (<i>Metridium farcimen</i>), strawberry anemone (<i>Corynactis californica</i>) -soft corals† (Alyconacea), e.g., gorgonians -sea pens† (Pennatulacea), e.g., <i>Halipteris californica</i>, Subselliflorae, Pennatulidae, Virgulariidae -octopi (Cephalopoda) -crabs, e.g., galatheid crabs (Galatheidae), decorator crab (<i>Loxorhynchus crispatus</i>), cancer crab (<i>Cancer</i> spp.) -brachiopods† (Brachiopoda), e.g., <i>Laqueus californicus</i> -sea lilies (Crinoidea), e.g., <i>Florometra serratissima</i> -sea stars (Asteroidea), e.g., sunflower star (<i>Pycnopodia</i> sp. or <i>Rathbunaster</i> sp.), vermilion sea star (<i>Mediaster aequalis</i>), sand star (<i>Luidia</i> sp.) -basket star (<i>Gorgonocephalus eucnemis</i>) -sea cucumbers (Holothuroidea) -tubeworms (Polychaeta) <p>(CSUMB/MBNMS video, stills; Graiff 2008; MBARI VARS imagery; NMFS West Coast Bottom Trawl Groundfish Survey)</p>
<p>Fishes</p>	<ul style="list-style-type: none"> -rockfishes (<i>Sebastes</i> spp.), e.g., Blue, Greenstriped, Canary⁴, Bocaccio⁴, Olive, Yellowtail, Speckled, Widow, Starry, China -Kelp Greenling (<i>Hexagrammos decagrammus</i>) -Lingcod (<i>Ophiodon elongatus</i>) -Pink Seaperch (<i>Zalembuis rosaceus</i>) -Stripefin Ronquil (<i>Rathbunella allenii</i>) -Blackeye Goby (<i>Rhinogobiops nicholsii</i>) -Petrale Sole⁴ (<i>Eopsetta jordani</i>) -Rex Sole (<i>Glyptocephalus zachirus</i>) -Ocean Sunfish (<i>Mola mola</i>) <p>(CSUMB/MBNMS videos, stills; MBNMS 2013)</p> <p><i>Within adjacent MPA:</i></p> <ul style="list-style-type: none"> -rockfishes (<i>Sebastes</i> spp.), e.g., Squarespot, Yellowtail, Bocaccio⁴, Halfbanded, Pygmy, Greenstriped, Bank <p>(Starr 2006)</p>

Marine birds	-Northern Fulmar (<i>Fulmarus glacialis</i>) -Sooty Shearwater (<i>Puffinus griseus</i>) -Ashy Storm-Petrel ³ (<i>Oceanodroma homochroa</i>) -Brandt's Cormorant (<i>Phalacrocorax penicillatus</i>) -California Gull (<i>Larus californicus</i>), Western Gull (<i>L. occidentalis</i>) -Black-legged Kittiwake (<i>Rissa tridactyla</i>) -Common Murre (<i>Uria aalge</i>) -Cassin's Auklet ³ (<i>Ptychoramphus aleuticus</i>) -Rhinoceros Auklet (<i>Cerorhinea monocerata</i>) (Ainley et al. 2012)
Marine mammals	-blue whale ¹ (<i>Balaenoptera musculus</i>) -humpback whale ¹ (<i>Megaptera novaeangliae</i>) -gray whale (<i>Eschrichtius robustus</i>) -dolphins (Odontoceti), e.g., Risso's dolphin (<i>Grampus griseus</i>), Pacific white-sided dolphin (<i>Lagenorhynchus obliquidens</i>), Dall's porpoise (<i>Phocoenoides dalli</i>) -Northern elephant seal (<i>Mirounga angustirostris</i>) -sea lions (Otariinae), e.g., Stellar sea lion ² (<i>Eumetopias jubatus</i>), California sea lion (<i>Zalophus californianus</i>) (NOAA, 2003)
Marine reptiles	-leatherback sea turtle ¹ (<i>Dermochelys coriacea</i>) (NOAA, 2003)

Special Status Species: Endangered¹, Threatened², Birds of Conservation Concern³, Overfished⁴; Biogenic habitat†

Diverse or productive communities:

- moderate primary productivity
- low krill production
- marine bird and mammal high diversity

Migration, breeding, or foraging areas:

- Dall's porpoise, sea lions, dolphins, blue whale, and humpback whale (ESI, Environmental Sensitivity Index)
- Cassin's Auklet (ESI)
- 20% in leatherback sea turtle principal foraging area, 100% in leatherback sea turtle NMFS critical habitat

Research

SIMoN projects:

Archival of Midwater and Benthic Survey Data at Moss Landing Marine Laboratories (1972-2013)

http://www.sanctuariesimon.org/projects/project_info.php?projectID=100170

CSCAPE: Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem (2005-07)

<http://sanctuariesimon.org/projects/100273/cscape%3a--collaborative-survey-of-cetacean-abundance-and-the-pelagic-ecosystem>

Deepwater Characterization and Baseline Monitoring in the Monterey Bay National Marine Sanctuary (2009-current)

<http://sanctuarymonitoring.org/projects/100373/deepwater-characterization-and-baseline-monitoring-in-the-monterey-bay-national-marine-sanctuary>

Marine Protected Area Monitoring and Shelf Characterization in Monterey Bay National Marine Sanctuary (2007-09)

<http://sanctuariesimon.org/projects/100320/marine-protected-area-monitoring-and-shelf-characterization-in-monterey-bay-national-marine-sanctuary->

Monitoring whales by Cascadia Research Collective (1991-current)

<http://sanctuarymonitoring.org/projects/100152/monitoring-whales-by-cascadia-research-collective>

Sea Turtle Restoration Project: Leatherback Watch Program (2010-current)

<http://sanctuarymonitoring.org/projects/100395/sea-turtle-restoration-project%3a-leatherback-watch-program->

Structure of Populations, Levels of Abundance and Status of Humpbacks (SPLASH) (2004-current)

<http://sanctuarymonitoring.org/projects/100224/structure-of-populations%2c-levels-of-abundance-and-status-of-humpbacks-%28splash%29>

Tracking Black-footed Albatross Movements and Conservation (2004-08)

<http://sanctuariesimon.org/projects/100305/tracking-black-footed-albatross-movements-and-conservation>

Tagging of Pacific Predators (TOPP) (2000-current)

<http://sanctuarymonitoring.org/projects/100137/tagging-of-pacific-predators-%28topp%29>

Underwater Behavior of Large Whales Using Suction-cup Attached Tags (2000-current)

<http://sanctuarymonitoring.org/projects/100153/underwater-behavior-of-large-whales-using-suction-cup-attached-tags>

usSEABED: A USGS Pacific Coast Offshore Surficial Sediment Data and Mapping Project (2005-current)

<http://sanctuarymonitoring.org/projects/100247/usseabed%3a-a-usgs-pacific-coast-offshore-surficial-sediment-data-and-mapping-project>

Monitoring stations and/or data collection instruments:

- CDIP buoy (stations 157)
- NMFS West Coast Bottom Trawl Groundfish Survey

MBNMS research:

- CSUMB shelf characterization 2007-2011

Science Needs & Research Questions

Bottom Trawling: Habitat and Species Recovery

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_extraction_trawling.pdf

- Which habitats are sensitive to bottom trawling?

Habitat Characterization of the Continental Shelf

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_characterization.pdf

- What are the distribution and abundance of organisms and habitats on the continental shelf?

Habitat Characterization of the Continental Slope

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_characterization_slope.pdf

- What are the distribution and abundance of organisms and habitats on the continental slope?
- How do corals and chemosynthetic communities on the continental slope provide biogenic habitat for other species?

Human Health - Harmful Algal Blooms

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_habs.pdf

- How do HABs affect local species populations?

Impacts on Whales from Human Uses

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_whale_science.pdf

- What are the spatial and temporal patterns of habitat use of large whales throughout sanctuary waters (both inshore and offshore)?

Socioeconomics and the Human Dimension

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_socioeconomics.pdf

- How do we determine the overall impact of multiple human activities (some with negative and some with positive influence) on Sanctuary resources?

Water Quality Integrated Analyses

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_water_quality.pdf

- Determine and implement the necessary monitoring to assess the condition of water quality in the Sanctuary.

SESAs Interactive Map: <http://sanctuarysimon.org/maps/sesa>

Publically Available Imagery

- CSUMB/MBNMS camera sled and ROV (<http://sep.csUMB.edu/ifame/scid/>)



Figure 3: Rockfish (*Sebastes* sp.) in sponge.

Credit: IfAME/CSUMB/MBNMS

(<http://sep.csUMB.edu/ifame/scid/>).



Figure 4: Basket star, (*Gorgonocephalus eucnemis*).

Credit: IfAME/CSUMB/MBNMS

(<http://sep.csUMB.edu/ifame/scid/>).



Figure 5: Sea star (Class Asteroidea).

Credit: IfAME/CSUMB/MBNMS (<http://sep.csUMB.edu/ifame/scid/>).

SESA Data Layers

Table 2. The 13 SESAs of the MBNMS are comprised of a variety of biological and environmental characteristics that describe unique pelagic and benthic deep sea communities. Listed are a subset of these qualities which include habitat diversity (Shannon-Wiener diversity index); hard substrate area coverage (%); the most common type of habitat; the presence and abundances of corals and sponges, demersal fishes, and marine birds; and the area coverage (%) of upwelling zone within each SESA. Sources: Draft MBNMS report in preparation; SESAs Interactive Map, <http://sanctuarymonitoring.org/maps/sesa/>.

SESA	Habitat diversity (H')	Hard substrate (%)	Primary habitat	Corals & sponges	Demersal fishes	Marine birds	Upwelling zone (%)
4	5.43	8%	Slope 2 soft canyon	yes-high	yes-high	yes-high	yes-50%
5	6.13	19%	Slope 1 Soft Canyon	yes- high	yes-med	yes-med	yes-100%
6	6.62	13%	Shelf Break soft	yes-high	yes-low	yes-med	no
7	3.52	9%	Slope 2 soft canyon	yes-med	yes-high	yes-med	no
8	5.32	33%	Slope 2 soft canyon	yes-med	yes-med	yes-high	no
9	2.34	5%	Slope 2 soft canyon	yes-high	yes-high	yes-low	no
10	3.23	1%	Rise soft canyon	yes-med	not sampled	yes-low	no
11	1.56	16%	Slope 2 soft	yes-med	yes-high	yes-low	no
12	4.17	32%	Shelf hard	yes-med	yes-high	yes-med	yes-50%
13	2.00	0%	Slope 2 soft	yes-low	not sampled	yes-low	no
14	2.41	0%	Slope 1 Soft	yes-med	yes-high	yes-med	yes-50%
15	5.31	18%	Shelf Break soft	yes-med	yes-med	yes-med	yes-25%
16	3.12	73%	Slope 2 hard	yes-high	yes-high	yes-low	no

Selected Publications

- Aiken E, Baruch N, Basset M, Carlson R, Cuzick M, et al., Lindholm J. 2013. Characterization of Demersal Fish Assemblages Within Seven Sanctuary Ecologically Significant Areas in the MBNMS. Poster presentation at Sanctuary Currents Symposium, Seaside, CA. Available at: <http://montereybay.noaa.gov/research/techreports/trmsci4702013.html>
- Aiken E, Esgro M, Knight A, Lindholm J. 2014. Dirty Bottoms: ROV Observations of Marine Debris. Poster presentation at Sanctuary Currents Symposium, Seaside, CA. Available at: <http://montereybay.noaa.gov/research/techreports/traiken2014.html>
- Ainley D, Spear L, Casey J, Ford RG, Gill T, et al. 2012. Chapter 3: Biogeography of Marine Birds. A Biogeographic Assessment off North/Central California. Retrieved from Center for Coastal Monitoring and Assessment (NCCOS), National Ocean Service. <http://ccma.nos.noaa.gov/ecosystems/sanctuaries/california/html/birds/>
- Benson SR, Forney KA, Harvey JT, Carretta JV, Dutton PH. 2007. Abundance, Distribution, and Habitat of Leatherback Turtles (*Dermochelys coriacea*) Off California, 1990– 2003. *Fishery Bulletin*, 105(3): 337-347. Available at: http://aquaticcommons.org/8876/1/benson_Fish_Bull_2007.pdf
<http://montereybay.noaa.gov/research/techreports/trbenson2007.html>.
- Blaine JM. 2011. Population Dynamics and Spatial Distribution of Two Commercially Important Species of Sea Cucumber, *Parastichopus californicus* and *Parastichopus leukothele*, in Deep Central California Waters. M.S. Thesis, Washington State University. 1-46.
- Brown JA, EJ Burton, S De Beukelaer. 2013. The Natural Resources of Monterey Bay National Marine Sanctuary: A Focus on Federal Waters. Marine Sanctuaries Conservation Series ONMS-13-05. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 264 pp. Available at: <http://montereybay.noaa.gov/research/techreports/trbrown2013.html>
- California State University of Monterey Bay (CSUMB). 2005. *Shelf Characterization and Image Display (SCID)*. World Wide Web electronic publication. [<http://sep.csUMB.edu/ifame/scid/>]. Accessed [08/01/15].
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- Collins CA, Garfield N, Rago TA, Rischmiller FW, Carter E. 2000. Mean Structure of the Inshore Countercurrent and California Undercurrent of Point Sur, California. *Deep Sea Research Part II: Topical Studies in Oceanography*, 47(5): 765-782.
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- Engel J and Kvitek R. 1998. Effects of Otter Trawling on a Benthic Community in Monterey Bay National Marine Sanctuary. *Conservation Biology*, 12(6): 1204-1214.
- Graiff KW 2008. The Abundance and Distribution of Megafaunal Marine Invertebrates in Relation to Fishing Intensity Off Central California. Doctoral dissertation, Washington State University.
<http://montereybay.noaa.gov/research/techreports/trgraiff2008.html>
- Greene HG, Maher NM, Paull CK. 2002. Physiography of the Monterey Bay National Marine Sanctuary and Implications About Continental Margin Development. *Marine Geology*, 181(1-3): 55-82.
- Hall RA, Glenn SC. 2011. Internal Tides in Monterey Submarine Canyon. *Journal of Physical Oceanography*, 41(1): 186-204.
- Huggins JG. 2009. Identification, Counts, and Behavior of Demersal Fishes along the Central Coast of California Using a Towed Camera Sled. A Capstone Project, California State University, Monterey Bay. MBNMS Technical Report, 22 pp. Available at: http://sanctuarysimon.org/regional_docs/monitoring_projects/100373_Huggins_2009.pdf
<http://montereybay.noaa.gov/research/techreports/trhuggins2009.html>.

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Kelly M. 2010. Distribution of the Blackeye Goby, *Rhinogobiops nicholsi*, Around Temperate Reefs Along the Central Coast of California. A Capstone Project, California State University, Monterey Bay. MBNMS Technical Report, 21 pp. Available at: http://sanctuariesimon.org/regional_docs/monitoring_projects/100373_Kelly_2010.pdf
<http://montereybay.noaa.gov/research/techreports/trkelly2010.html>.

Leeworthy VR, Jerome D, Schueler K. 2014. Economic Impact of the Commercial Fisheries on Local County Economies from Catch in All California National Marine Sanctuaries 2010, 2011 and 2012. Marine Sanctuaries Conservation Series ONMS-14-03. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 46pp. Available at: <http://montereybay.noaa.gov/research/techreports/trleeworthy2014.html>

MBNMS. Collaborative Groundfish Essential Fish Habitat Proposal: Protecting Groundfish essential Fish Habitat While Balancing Fishing Opportunities in Monterey Bay National Marine Sanctuary, South of Año Nuevo. Monterey, California: Monterey Bay National Marine Sanctuary.

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<http://montereybay.noaa.gov/research/techreports/trwrubel2010.html>.