SESA 10: Very Deep Monterey Canyon

Description

SESA 10 includes the deepest section of Monterey Canyon inside MBNMS boundaries and the surrounding soft bottom slope and rise (2,761-3,276 m). Hard substrate is very rare at these depths (only 1% of SESA); it occurs in both slope 2 and rise depths, which adds to the habitat richness (7 habitats) and habitat diversity (index = 3.23) of this SESA. Very little research has occurred in this SESA. There are a few records of structure-forming invertebrates from MBARI ROV surveys. The water over this SESA has relatively low primary productivity and there are no known foraging hotspots although leatherback sea turtles have been spotted. This SESA is located within MBNMS, and research activities may require a permit (http://montereybay.noaa.gov/resourcepro/permit/permits_need.html).

Resource Management Issues

SESA 10 is located in the deepest part of the Monterey submarine canyon within MBNMS. Little biological characterization has been done within this SESA expect for some MBARI ROV surveys.

- Adjacent to Essential Fish Habitat (EFH) Conservation Area
- Commercial shipping lane
- Leatherback sea turtle critical habitat

Figure 1. The location of SESA 10 and twelve additional SESAs in Monterey Bay National Marine Sanctuary. Credit: Chad King/MBNMS.

Figure 2. Close-up map of SESA 10. Grey border=SESA boundary; light orange border=EFH Conservation Area; red border=dominant commercial shipping lane. Dark grey border=MBNMS boundary. Source: SESAs Interactive Map, http://sanctuarymonitoring.org/maps/sesa/.

Updated: 5/3/2016
For more information - http://montereybay.noaa.gov/resourcepro/ebmi/sesa.html
## Living Marine Resources & Uses

Table 1. Species known to occur within SESA 10: Very Deep Monterey Canyon

| Invertebrates | -soft corals† (Alcyonacea)  
|               | -sea pens† (Pennatulacea)  
|               | -sea lilies (Crinoidea)   
|               | -deep sea crabs (Decapoda)  
|               | (MBARI VARS imagery)  |
| Fishes        | Not Sampled  |
| Marine birds  | -Northern Fulmar (Fulmarus glacialis)  
|               | -Leach’s Storm-Petrel (Oceanodroma leucorhoa)  
|               | -California Gull (Larus californicus)  
|               | -Common Murre (Uria aalge)  
|               | -Cassin's Auklet² (Ptychoramphus aleuticus)  
|               | -Rhinoceros Auklet (Cerorhinea monocerata)  
| Marine mammals| -humpback whale¹ (Megaptera novaeangliae)  
|               | -dolphin (Odontoceti), e.g., Northern right-whale dolphin (Lissodelphis borealis)  
|               | -Pacific white-sided dolphin (Lagenorhynchus obliquidens)  
|               | -seals (Phocidae), e.g., harbor seal (Phoca vitulina), Northern elephant seal (Mirounga angustirostris)  
|               | -Northern fur seal (Callorhinus ursinus)  
| Marine reptiles| -leatherback sea turtle¹ (Dermochelys coriacea) (NOAA, 2003)  |

Special Status Species:  
- Endangered¹;  
- Birds of Conservation Concern²;  
- Biogenic habitat†

Diverse or productive communities:  
- low primary productivity  
- low krill production

Migration, breeding, or foraging areas:  
- 20% in leatherback sea turtle NMFS critical habitat

### Research

**SIMoN projects:**

- CSCAPE: Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem (2005-07)  
- MBARI Time Series (MBTS) Program (1992-current)  
- Monitoring whales by Cascadia Research Collective (1991-current)  
- Sea Turtle Restoration Project: Leatherback Watch Program (2010-current)  
  [http://sanctuarymonitoring.org/projects/100395/sea-turtle-restoration-project%3a-leatherback-watch-program](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)  
Tagging of Pacific Predators (TOPP) (2000-current)
http://sanctuarymonitoring.org/projects/100137/tagging-of-pacific-predators-%28topp%29

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

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

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

Nearby:
Midwater Trawl Pre-recruit Survey (1983-current)
http://sanctuarymonitoring.org/projects/100118/midwater-trawl-pre-recruit-survey

Stations and/or data collection instruments: None

MBNMS research:
- CTD profile (NOAA Ship Shimada, 2015)

Science Needs & Research Questions

Habitat Characterization of the Continental Slope
- 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?
- What is the vulnerability of different continental slope habitats and living marine resources, and are some continental slope habitats able to recover from disturbance at different rates than others?

Human Health - Harmful Algal Blooms
- How do HABs affect local species populations?

Impacts on Whales from Human Uses
- What are the spatial and temporal patterns of habitat use of large whales throughout sanctuary waters (both inshore and offshore)?
- What are the environmental and prey characteristics that lead to foraging aggregations that may leave whales vulnerable to disturbance by recreational ocean users?

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

SESAs Interactive Map: http://sanctuarysimon.org/maps/sesa
Publically Available Imagery: little to none


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/.

<table>
<thead>
<tr>
<th>SESA</th>
<th>Habitat diversity ($H'$)</th>
<th>Hard substrate (%)</th>
<th>Primary habitat</th>
<th>Corals &amp; sponges</th>
<th>Demersal fishes</th>
<th>Marine birds</th>
<th>Upwelling zone (%)</th>
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<tr>
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<td>8%</td>
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<td>yes-100%</td>
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Selected Publications


Nearby Studies: