

Monterey Bay National Marine Sanctuary

Ecological Characterization of Davidson Seamount

Management Issue

The unique habitat and organisms associated with the Davidson Seamount need to be characterized and studied to assess management needs for resource protection.

Description

Studies indicate that seamounts function as deep-sea “islands” of localized species distributions, dominated by suspension feeders (e.g., corals) that grow on rock in an otherwise flat, low biomass, sediment-covered abyssal plain. The Monterey Bay National Marine Sanctuary (MBNMS or Sanctuary) needs to increase understanding of the Davidson Seamount through habitat characterization and the study of ecological processes so that the sensitive and long-lived species found there can be protected. Human threats include bio-prospecting, cumulative impacts from research collecting of long-lived species, new or unknown forms of seafloor disturbance, new technologies to harvest from the seabed, ocean acidification, and marine debris/dumping. To assess the potential impacts of such threats on Davidson Seamount habitats and animals, research is needed on temporal changes in the biological community associated with Davidson Seamount; on the taxonomy and natural history of Seamount species; on the age structure of coral communities and their suitability to restore more impacted Sanctuary habitats; on how mid-water and surface-water species use areas above the seamount; and on the ecological links between the seamount and other habitats of the Sanctuary.



Bubble gum coral (Paragorgia arborea) on the Davidson Seamount at 1310 meters. Image credit: NOAA/MBARI

Questions and Information Needs

- 1) Are there temporal changes in the biologic community living on or near the Davidson Seamount?
- 2) What is the taxonomy and natural history of described or rare species found on the seamount?
- 3) What is the age structure of the coral community living on the Davidson Seamount, and can these corals be used to restore historical coral populations in more impacted areas of the Sanctuary?
- 4) Which species use mid-water and sea surface areas above the seamount?
- 5) What are the oceanographic conditions, including pH, and how do they influence regional ecology?
- 6) What is the historical role of the seamount in mapping, fishing, whaling, and research? How does the Davidson Seamount historically and geologically relate to other seamounts?
- 7) Are there ecological links between the seamount and other habitats of the Sanctuary (e.g., migration pathways and nutrient transport)?
- 8) How do Davidson Seamount explorations further our understanding of basic seamount ecology?
- 9) Determine and implement the necessary monitoring to assess the condition of water quality at Davidson Seamount.

Updated: 12/01/2017

For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>

Scientific Approach and Actions

- Conduct regular biologic surveys of habitats associated with the Davidson Seamount
- Conduct deepwater coral ageing and restoration studies
- Understand links with Sanctuary's coastal areas

Potential Key Partners and Information Sources

Monterey Bay Aquarium Research Institute, Moss Landing Marine Labs, Monterey Bay Aquarium, National Centers for Coastal Ocean Science, National Evolutionary Synthesis Center, National Marine Fisheries Service

Management Support Products

- Geological, biological and ecological characterization
- Site characterization document

Planned Use of Products and Actions

- Implement resource protection plan
- Increase understanding through characterization and ecological process studies
- Develop education programs and visitor center displays

Program References

MBNMS Management Plan

- Davidson Seamount Action Plan, Strategy DS-1, DS-2

MBNMS Condition Report

- Are specific or multiple stressors, including changing oceanographic and atmospheric conditions, affecting water quality? (Question 1)
- What is the eutrophic condition of sanctuary waters and how is it changing? (Question 2)
- Do sanctuary waters pose risks to human health? (Question 3)
- What are the levels of human activities that may influence water quality and how are they changing? (Question 4)
- What is the abundance and distribution of major habitat types and how is it changing? (Question 5)
- What is the condition of biologically-structured habitats and how is it changing? (Question 6)
- What are the contaminant concentrations in sanctuary habitats and how are they changing? (Question 7)
- What are the levels of human activities that may influence habitat quality and how are they changing? (Question 8)
- What is the status of biodiversity and how is it Changing? (Question 9)
- What is the status of non-indigenous species and how is it changing? (Question 11)
- What is the status of key species and how is it changing? (Question 12)
- What is the condition or health of key species and how is it changing? (Question 13)
- What are the levels of human activities that may influence living resource quality and how are they changing? (Question 14)

ONMS Performance Measures

- Davidson Seamount is adequately characterized
- Develop education and outreach opportunities about the seamount at visitor centers and a series of media products related to its incorporation into MBNMS



Location of Davidson Seamount relative to the Monterey Bay National Marine Sanctuary. Map credit: MBNMS/SIMoN

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