

EXPLORATION NOTES Seamounts



Aboard E/V Nautilus Part II: Welcome to the Octocone

Expedition: [Central California National Marine Sanctuary \(NA 122\)](#)



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What do you call a group of octopuses?

In the control van on Exploration Vessel (E/V) *Nautilus*, we're talking about nouns for groups of animals. A pod of dolphins. A murder of crows. A parade of elephants. A conspiracy of lemurs.

"Anyone know what a group of octopuses is called?" I ask. A quick Google search yields mixed results. One list refers to them as a "consortium." Another result states they are solitary animals that live in a den for their entire lives. The site claims you won't find them in a group in nature.

Tonight, we will prove that last statement to be quite wrong.

Exploring the Octocone

We are exploring a small volcanic cone near Davidson Seamount off the coast of Monterey Bay, California. Remnants of underwater volcanoes exist throughout the world's ocean, but this particular one holds a special phenomenon.

A large group of octopuses were first discovered in the "octopus garden" near Davidson Seamount in 2018. The species, *Muusoctopus robustus* is a common species, but to find so many together is unusual. Today, the team has returned to a spot nearby, which scientists aptly named the "octocone."

It takes roughly two and a half hours for remotely operated vehicles (ROVs) *Argus* and *Hercules* to descend to the seafloor depth of 3,400 meters (a little more than two miles). They are equipped with video cameras that record our observations.

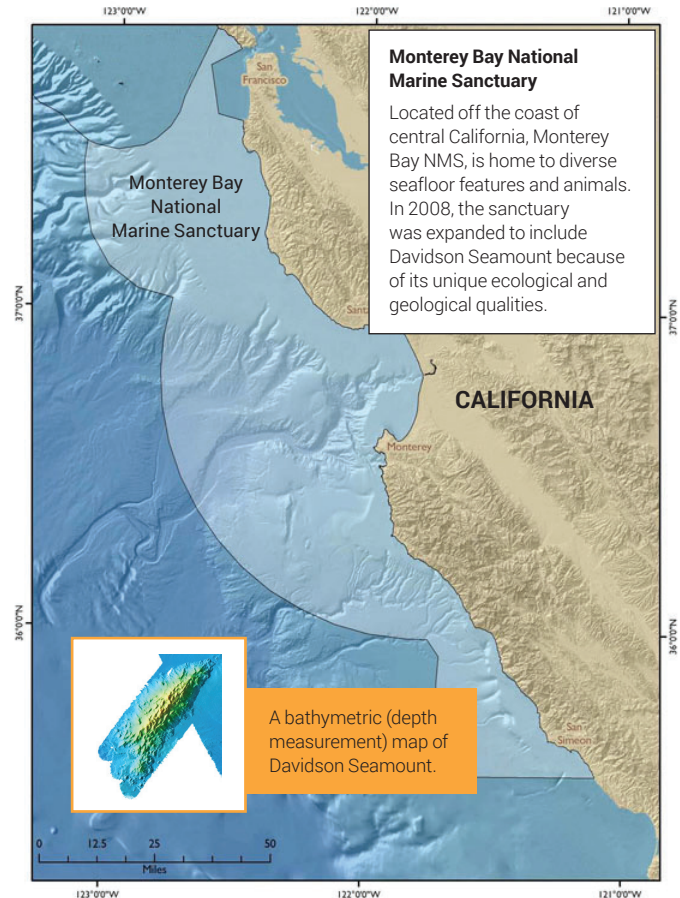
We gradually make our way up the volcanic cone, spotting more and more octopuses as we go. I count a dozen within the first few minutes. Some are balled up and some have their arms extended.



A cluster of white, oblong octopus eggs was observed during the dive. If you look carefully, eye spots are visible on some of them. A newly hatched octopus is just above the red shrimp in the lower left corner.
Image adapted from Ocean Exploration Trust.



The control room aboard E/V *Nautilus* serves as the mission control room for undersea exploration. *Image courtesy of Ocean Exploration Trust.*



Davidson Seamount is found off the central coast of California, in the Monterey Bay National Marine Sanctuary. *Map courtesy of Monterey Bay National Marine Sanctuary.*



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Exploring the Octocone cont.

Then a tiny translucent (almost clear) hatchling floats into view. It still has a little sack attached to its body, indicating it just hatched a few hours before. This hatchling is evidence of the reason we're here – to discover why octopuses come to this spot to lay their eggs.

As we near the top of the cone, we encounter a group of at least a dozen octopuses. Most of them appear to be upside down, with their arms wrapped backwards around their heads. For this particular genus, this inverted shape is characteristic of brooding behavior (i.e., mothers are protecting their eggs).

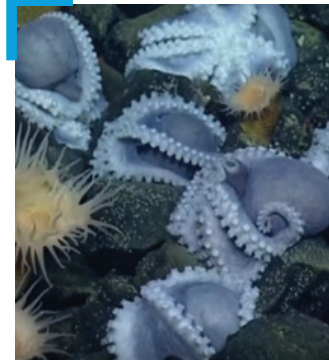
What makes this place so special?

Scientists believe it may have something to do with geophysics. The whole area around Davidson Seamount is volcanic. Hydrothermal seeps release warm water from inside the seamount through dispersed cracks in the mountain side. The theory is that seawater percolates through the porous rocks of the seamount, traveling through channels hundreds of meters below the seafloor. "Water gets pushed through these pressure gradients like toothpaste through a tube," says Chief Scientist Chad King. "Think about how the water is getting that much closer to Earth's hot mantle. If it's pushed a hundred meters down into the rock, how warm does it get? Is it boiling?"

By the time water seeps out of the cracks, it is not that warm. Our temperature readings are 7-9° Celsius (45-48° Fahrenheit), warmer than the surrounding near-freezing temperatures. Where the warmer water meets cold water, it creates a "shimmering" effect. This is similar to heat radiating off a blacktop parking lot on a hot day. A stronger shimmer indicates higher flow rates or greater temperature differences.

"Something in their evolution has caused octopuses to go to these warm spots, but why?" This is the main question driving Chad's curiosity and research.

Chad believes there are other locations along the California coast where octopuses gather at warm water seeps. The challenge, however, is finding them. "These seamounts are so deep and so complex," Chad says. "In such a harsh environment, it's going to take a lot of hard work to answer these questions."



Female *Muusoctopus robustus* octopuses protect their eggs by positioning themselves with their arms wrapped upwards towards their heads. Image courtesy of Ocean Exploration Trust.



Our first octopus encounter on this expedition was with a *Muusoctopus robustus* with its arms outstretched. Image courtesy of Ocean Exploration Trust.



ROV *Hercules* takes a temperature reading with its mechanical arm of shimmering, warm water near a brooding octopus. Image adapted from Ocean Exploration Trust.

Where the warmer water meets cold water, it creates a "shimmering" effect. This is similar to heat radiating off a blacktop parking lot on a hot day. A stronger shimmer indicates higher flow rates or greater temperature differences.

Video courtesy of Ocean Exploration Trust.



Many octopuses were tucked into rocks near shimmering seeps. More than 2,000 octopuses were observed on this expedition. Image courtesy of Ocean Exploration Trust.

Original blog: <https://nautiluslive.org/blog/2020/10/29/aboard-ev-nautilus-part-ii-welcome-octocone>
Expedition: <https://nautiluslive.org/cruise/NA122>
Explorer (bio): <https://nautiluslive.org/people/marley-parker>
E/V Nautilus control room (image): <https://nautiluslive.org/3Rgkkm2>
Davidson Seamount (map): <https://montereybay.noaa.gov/materials/mappages/davidsonmap.html>
Davidson Seamount (Wikipedia entry): https://en.wikipedia.org/wiki/Davidson_Seamount
Octopus eggs (image): <https://nautiluslive.org/resource/oviparous-ocean-animals-babies-eggs?>
Female *Muusoctopus robustus* octopuses (image): <https://nautiluslive.org/blog/2020/10/03/oasis-deep-exploring-central-californias-national-marine-sanctuaries>
Muusoctopus robustus (image): <https://nautiluslive.org/blog/2020/10/29/aboard-ev-nautilus-part-ii-welcome-octocone>
ROV *Hercules*: <https://nautiluslive.org/video/2020/10/27/octopus-wonderland-return-davidson-seamount>
Octopus Wonderland (video): <https://nautiluslive.org/video/2020/10/27/octopus-wonderland-return-davidson-seamount>
Welcome to the Octocone (image): <https://nautiluslive.org/blog/2020/10/29/aboard-ev-nautilus-part-ii-welcome-octocone>