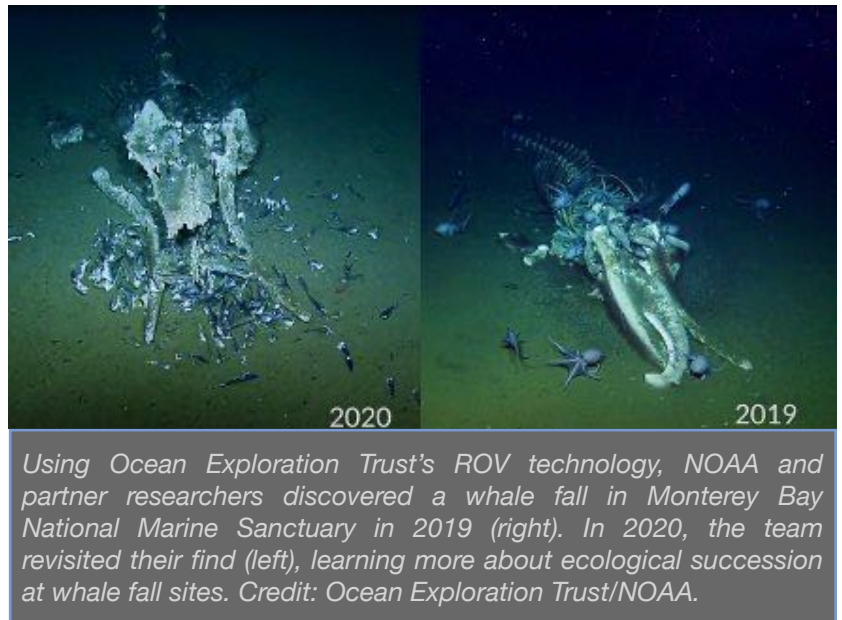


## Office of National Marine Sanctuaries

NOAA's Office of National Marine Sanctuaries serves as the trustee for a network of underwater parks encompassing more than 600,000 square miles of marine and Great Lakes waters. The network includes a system of 14 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments. The system works with diverse partners and stakeholders to promote responsible, sustainable ocean uses that ensure the health of our most valued ocean places. The Office of National Marine Sanctuaries also leads the National Marine Protected Areas Center, the nation's hub for building innovative partnerships and tools to protect our special ocean. In addition, ONMS staff conduct and support research and monitoring programs tailored to the information needs of each sanctuary. Below are four highlighted scientific projects by ONMS researchers and their partners.

### Telepresence Science Missions in National Marine Sanctuaries

Increasingly, science missions in NOAA's National Marine Sanctuaries invite the public aboard through remote access. In 2020, ONMS invited the public to participate in science missions facilitated through the use of underwater exploration systems. Using ship-to-shore technology, scientists led remotely operated vehicle exploration at Cordell Bank, Greater Farallones, Monterey Bay, and Flower Garden Banks National Marine Sanctuaries. In addition, other missions have taken place at Stellwagen Bank, Olympic Coast, and Channel Islands sanctuaries. Students and the public participated in dozens of virtual, interactive sessions as well as live feeds of the exploration and sample collection. In total, more than 1.3 million people viewed the videos. The objectives included exploring deep-sea canyon and coral communities, assessing changes over time at octopus brooding areas and the sites of decomposing whale carcasses, and surveying biological and archaeological features of shipwrecks. These missions were made possible through partnerships with groups including the Global Foundation for Ocean Exploration, Ocean Exploration Trust, and Woods Hole Oceanographic Institution.



**FY20 Accomplishment(s):** The discovery of a whalefall in the middle phases of successional degradation was a rare encounter, and a highlight of an exploration mission in Monterey Bay National Marine Sanctuary.

**Project URL:**

<https://sanctuaries.noaa.gov/earthisblue/wk256-whale-fall.html>

# Octopus Gardens



*Octopus brooding their eggs within a warm water seep near Davidson Seamount in Monterey Bay National Marine Sanctuary. This genus has an unusual upside-down brooding posture. Credit: Ocean Exploration Trust/NOAA.*

After the discovery of a large number of deep-sea octopus brooding their young in 2018, Monterey Bay sanctuary scientists returned to Davidson Seamount with Woods Hole Oceanographic Institution aboard the submersible *Alvin*, Monterey Bay Aquarium Research Institute aboard the R/V *Western Flyer*, and with Ocean Exploration Trust (OET) aboard the E/V *Nautilus*. With *Alvin* dives highlighted on BBC's live television broadcast of "Blue Planet Live," the team confirmed that warm water was venting from the seafloor where octopus were brooding. With OET, the team estimated octopus population size (more than 1,000 individuals), and installed instruments to track temperature, dissolved oxygen, and water chemistry at the warm water seeps harboring the animals.

**FY20 Accomplishment(s):** The project team discovered a second octopus nursery occupying thermal vents on Davidson Seamount, confirming the importance of this protected area to a species not previously known to occur there.

Project URL:

<https://sanctuarysimon.org/2018/11/mbnms-scientists-discover-octopus-gardens-and-film-a-dumbo-squid/>

# Transitioning Science to Protect Right Whales via Corporate Responsibility



*Seven new calves were born to North Atlantic right whales this year. The NOAA Fisheries speed regulation and the Right Whale Corporate Responsibility Project give these calves a better chance at surviving in Stellwagen Bank National Marine Sanctuary. Image credit: NOAA.*

Since 2012, Stellwagen Bank National Marine Sanctuary’s highly regarded “Report Card” has been detailing compliance of vessels with speed restrictions while traversing Right Whale Seasonal Management Areas (SMAs) in the Gulf of Maine. In 2008, NOAA began requiring large ships to slow down to 10 knots or less while passing through SMAs. Some of these areas overlap the sanctuary, which is a critical seasonal feeding area for right, humpback, fin, and minke whales. In these areas, large commercial ships converge to enter the Port of Boston. When ships slow down, any collisions they have with whales have a smaller chance of delivering a lethal strike. In 2018, the project sent report cards to 228 ships and 115 companies, helping them better understand the impacts of their vessel practices. In 2019, 85% of vessels received grades of A or A+ and only 5% receive a grade of F. Report cards were sent to ships and companies in December 2019, to be influential during the 2020 SMA season. Companies that receive an A or A+ grade also receive a certificate recognizing their achievement. This positive reinforcement has been crucial to the success of the project.

**FY20 Accomplishment:** The use of vessel tracking data to assess compliance with speed restriction is now used as a model for numerous other areas where ship speed poses a risk of collision between whales and ships.

**Project URL:**

<https://sanctuaries.noaa.gov/news/jun19/right-whale-corporate-responsibility-project-stellwagen-bank-national-marine-sanctuary.html>

# Wave Glider Transits over 2,500 NM to Survey Soundscape of Papahānaumokuākea Marine National Monument

NOAA's Office of National Marine Sanctuaries, the US Navy, and Jupiter Research Foundation used a wave glider autonomous surface vehicle to collect acoustic recordings, weather and ocean data, and surface and underwater imagery on a 2,500 nautical mile survey in the Papahānaumokuākea Marine National Monument. The SV3 Wave Glider Europa departed Hawai'i Island in January 2020 and spent 67 days transiting the Monument as far as Lisianski Island, covering a distance equivalent to a roundtrip from Washington D.C. to Denver. The wave glider navigated rough winter seas and surveyed 18 banks, shoals and seamounts that had either been unsurveyed in the past or had been under surveyed in the winter season, and documented the first recorded presence of humpbacks at several of these locations.

**FY20 Accomplishment:** The SanctSound Project, a collaboration between NOAA and the U.S. Navy, employed autonomous surface vehicles to collect sound and other data in the winter season in remote areas of largest MPA in the United States and identified previously unknown humpback whale distributions.

**Project URLs:**

<https://sanctuaries.noaa.gov/science/monitoring/sound/>

<https://jupiterfoundation.org/humpacs-1>



*Humpback whale observed during the Humpback Pacific Survey (HUMPACS), which included the Papahānaumokuākea Marine National Monument. Original image has been altered to include the Wave Glider to demonstrate operations. Image credit: Ed Layman, NOAA ONMS; Jupiter Research Foundation.*