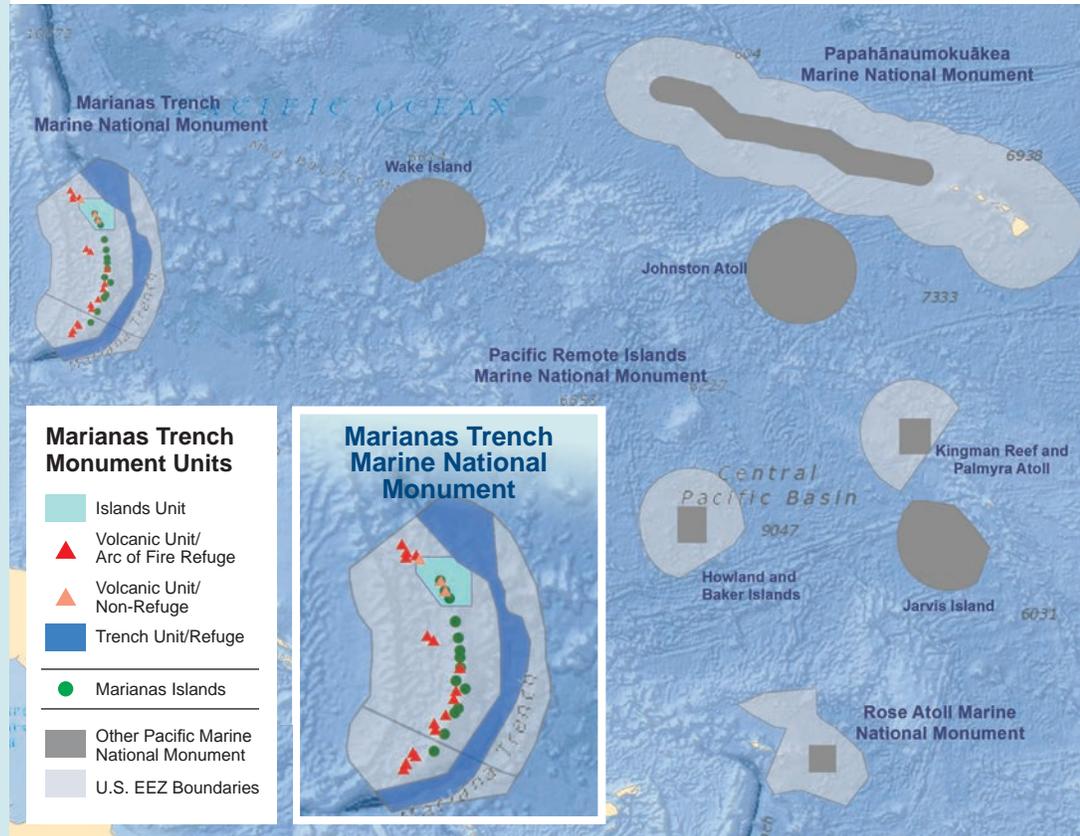




NOAA FISHERIES

Pacific Islands Regional Office

Marianas Trench Marine National Monument



Located in the Mariana Archipelago east of the Philippines, the Marianas Trench Marine National Monument includes approximately 96,000 square miles of submerged lands and waters. This unique place is made up of three units:

1. The Islands Unit, which includes the waters and submerged lands of the three northernmost Mariana Islands of Farallon de Pajaros (also known as Uracus), Maug, and Asuncion
2. The Volcanic Unit/Arc of Fire Refuge, which includes the submerged lands within 1 nautical mile of 21 designated volcanic sites
3. The Trench Unit/Refuge, which encompasses the submerged lands extending from the northern limit of the Exclusive Economic Zone (EEZ) in the Commonwealth of the Northern Mariana Islands (CNMI) to the southern limit of the EEZ of the United States in the Territory of Guam

The waters above the seafloor in the Volcanic and Trench Units are not included in the Monument and the CNMI Government maintains all authority for managing the terrestrial environment of the three islands within the Islands Unit.

Presidential Proclamation 8335 established the Monument in January 2009 and assigned management responsibility to the Secretary of Interior and Secretary Commerce, through the National Oceanic and Atmospheric Administration. The Secretary of Interior placed the Trench and Volcanic Units within the National Wildlife Refuge System and delegated management responsibility to the Fish and Wildlife Service.

**For more information,
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Objects of Scientific Interest

The President established the Monument under the authority of the Antiquities Act of 1906, which protects places of historic or scientific significance. Only recently have scientists visited the realm of the Monument, observing previously unknown biological, chemical, and geological wonders of nature.



Chimneys spewing carbon dioxide from the Champagne Vent at NW Eifuku volcano. Image courtesy of Submarine Ring of Fire 2002, NOAA/OER.

The Mariana Trench is the deepest place on Earth — deeper even than the height of Mount Everest above sea level. It's five times longer than the Grand Canyon and includes some 78,956 square miles of submerged lands that are virtually unknown to people.

The Volcanic Unit/Arc of Fire Refuge includes a series of undersea mud volcanoes and thermal vents that support unusual life forms in some of the harshest conditions on earth. Species are able to survive here despite hydrothermal vents that produce highly acidic and boiling water.

The Champagne vent, found at the NW Eifuku volcano, produces almost pure liquid carbon dioxide (CO₂); it's one of only two known liquid CO₂ sites in the world. A pool of liquid sulfur at the Daikoku submarine volcano is also one of a kind — the only other known location of molten sulfur is on Jupiter's moon Io.

In the Islands Unit, unique reef habitats support marine biological communities dependent on basalt rock foundations,

unlike those throughout the remainder of the Pacific. These reefs and waters are among the most biologically diverse in the Western Pacific and include some of the greatest diversity of seamount and hydrothermal vent life yet discovered. They also contain one of the most diverse collections of stony corals in the Western Pacific.

The submerged caldera (volcanic crater) at Maug is one of only a few known places in the world where [photosynthetic and chemosynthetic](#) communities (those that make food from light and inorganic chemicals, respectively) co-exist. The caldera is approximately 1.5 miles wide and 820 feet deep, with very steep inner walls. In the center of the crater a coral-topped lava dome rises to within 65 feet of the surface, while deep hydrothermal vents along the northeast side of the dome emit low-temperature water that influences the deep-water composition. Shallow warm water and gas vents near the mid-point of the inner East Island have a localized negative impact on the otherwise thriving coral reef system at Maug. Volcanic vents within the caldera provide scientists with an in situ (in the field) laboratory for the changes that will likely occur in coral reef ecosystems from ocean acidification and rising water temperatures associated with global warming.

Elsewhere within the Islands Unit, coral reef ecosystems have high numbers of



The animals at the top of the chimney are deep-sea octocorals or soft corals (Octocorallia: Alcyonacea), and sometimes go by the common name "mushroom coral." Image courtesy of Submarine Ring of Fire 2002, NOAA/OER.



NOAA scientists placing corals mounted on disks into locations with different pH (acidity) and carbonate chemistry to monitor growth at Maug. Photo credit: Open Boat Films/NOAA.

apex predators, larger than anywhere else along the Mariana Archipelago, with one site having the highest density of sharks anywhere in the Pacific. Similarly, these northern islands have the highest large fish biomass (total mass of fish in a given volume) in the Mariana Islands. The rare bumphead parrotfish (the largest parrotfish of this species), lives in these waters

Looking to the Future

This vast and unique area is perhaps the most spectacular part of the Ring of Fire that encircles most of the Pacific Ocean. It has many secrets to yield and many potentially valuable lessons that can benefit the rest of the world. NOAA research expeditions will continue to study and explore this amazing area.

NOAA Fisheries and the U.S. Fish and Wildlife Service are working with the CNMI Government, Department of Defense, Department of State, U.S. Coast Guard, and others to develop a monument management plan and are collaborating for the long-term protection of the Marianas Trench Marine National Monument.

