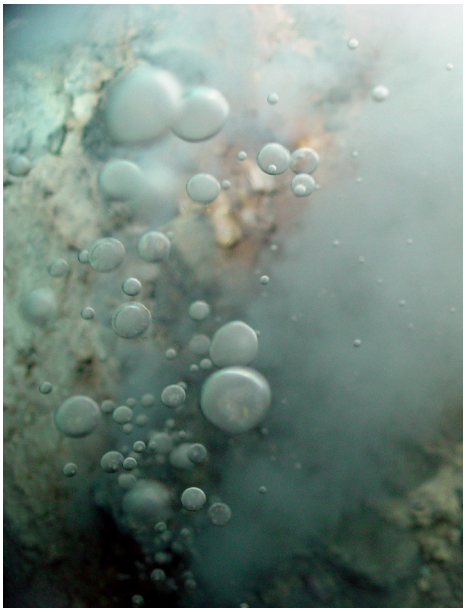
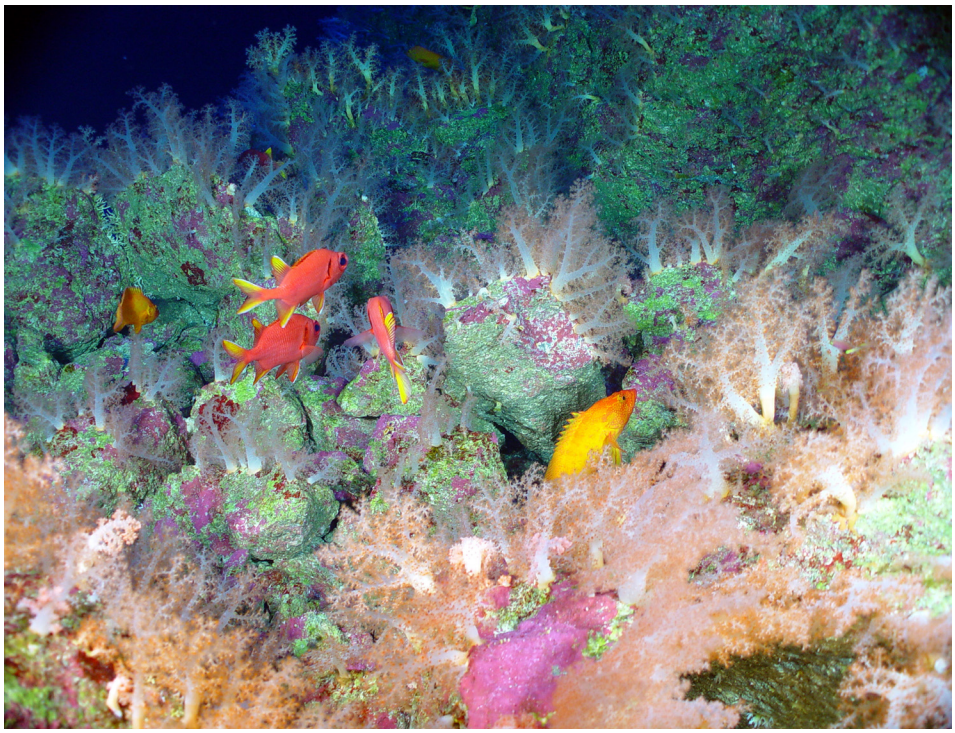
U.S. Fish & Wildlife Service

Marianas Trench Marine National Monument

The Marianas Trench Marine National Monument consists of approximately 95,216 square miles of submerged lands and waters of the Mariana Archipelago. It includes three units: the Islands Unit, the waters and submerged lands of the three northernmost Mariana Islands; the Volcanic Unit, the submerged lands within 1 nautical mile of 21 designated volcanic sites; and the Trench Unit, the submerged lands extending from the northern limit of the Exclusive Economic Zone of the United States in the Commonwealth of the Northern Mariana Islands (CNMI) to the southern limit of the Exclusive Economic Zone of the United States in the Territory of Guam. No waters are included in the Volcanic and Trench Units, and CNMI maintains all authority for managing the three islands within the Islands Unit (Farallon de Pajaros or Uracas, Maug, and Asuncion) above the mean low water line.

Presidential Proclamation 8335 established the Marianas Trench Marine National Monument in January 2009 and assigned management responsibility to the Secretary of the Interior, in consultation with the Secretary of Commerce. The Interior Secretary placed the Mariana Trench and Volcanic Units within the National Wildlife Refuge System, and delegated his management responsibility to the Fish and Wildlife Service.





Soft corals and tropical fish at the summit of East Diamante volcano, nicknamed by scientists as the "Aquarium."

The Secretary of Commerce, through the National Oceanic and Atmospheric Administration, has primary management responsibility for fishery-related activities in the waters of the Islands Unit.

The Proclamation also requires the Secretaries to establish a Mariana Monument Advisory Council to provide advice and recommendations on the development of management plans and management of the monument. The Council is to include at a minimum three officials of the CNMI government and one representative each from the Department of Defense and the U.S. Coast Guard.

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.

Champagne bubbles of carbon dioxide from the Champagne vent at NW Eifuku volcano.

The Mariana Trench is the deepest point on Earth, deeper than the height of Mount Everest above sea level. It is five times longer than the Grand Canyon and includes some 50,532,102 acres of virtually unknown characteristics.

The Volcanic Unit – an arc of undersea mud volcanoes and thermal vents – supports unusual life forms in some of the harshest conditions imaginable. Here species survive in the midst of hydrothermal vents that produce highly acidic and boiling water.

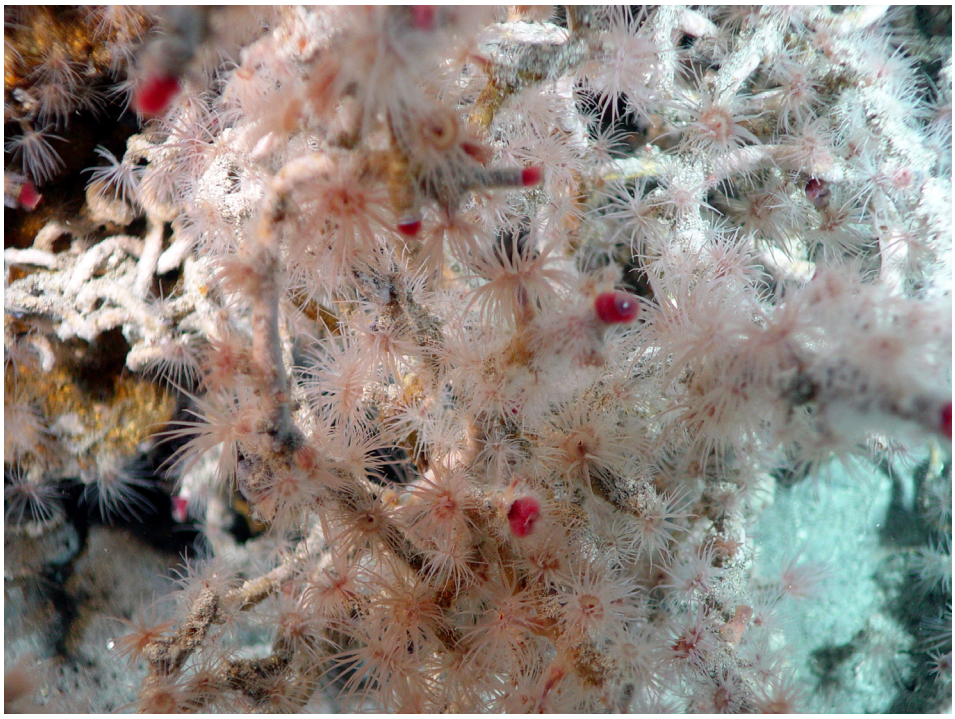
The Champagne vent, found at the NW Eifuku volcano, produces almost pure liquid carbon dioxide, one of only two known sites in the world. A pool of liquid sulfur at the Daikoku submarine volcano is unique in all the world. The only other known location of molten sulfur is on Io, a moon of the planet of Jupiter.

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 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, including more than 300 species, higher than any other U.S. reef area.

The submerged caldera at Maug is one of only a few known places in the world where photosynthetic and chemosynthetic communities of life co-exist. The caldera is some 1.5 miles wide and 820 feet deep, an unusual depth for lagoons. The lava dome in the center of the crater rises to within 65 feet of the surface. Hydrothermal vents at about 475 feet in depth along the northeast side of the dome spew acidic water at scalding temperatures near the coral reef that quickly ascends to the sea surface. Thus, coral reefs and microbial mats are spared much of the impact of these plumes and are growing nearby, complete with thriving tropical fish. As ocean acidification increases across the Earth, this caldera offers scientists an opportunity to look into the future and ensure continuation of coral reef communities.

The coral reef ecosystems within the Islands Unit have high numbers of apex predators, larger than anywhere else along the Mariana Archipelago. One site has the highest density of sharks anywhere in the Pacific, even higher than those of the remote islands of the Central Pacific.



Tubeworms (Lamelli brachia) were found at both Kasuga-2 and Daikoku volcanoes.

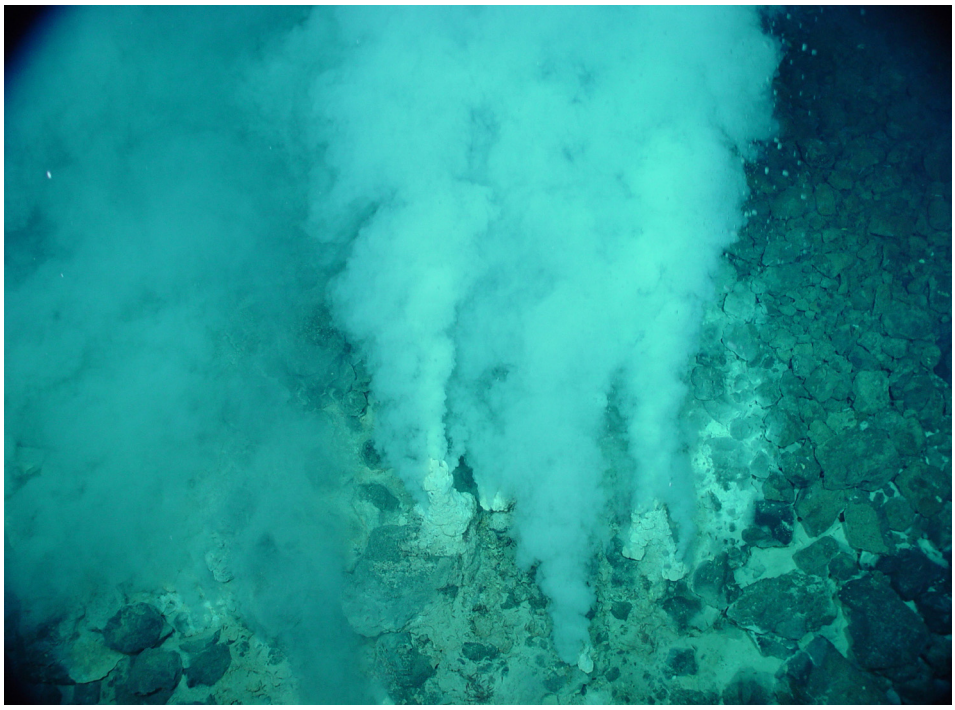
Similarly, these northern islands have the highest large fish biomass in the Mariana Islands. The rare bumphead parrotfish – the largest parrotfish species – thrives in these waters. The species has been depleted throughout much of its range and is included on the IUCN Red List of Threatened Species.

Looking to the Future

Only seven research expeditions have been made to this volcanic region, all since 2003. Another is planned in 2009. 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.

During the coming years, the Fish and Wildlife Service and National Oceanic and Atmospheric Administration will be working with the CNMI government, Department of Defense, Department of State, U.S. Coast Guard, and others to develop a monument management plan.

The plan will provide for public education programs, traditional access by indigenous persons, scientific exploration and research, consideration of recreational fishing if it will not detract from the monument, and programs for monitoring and enforcement. A draft plan will be made available for public review and comment.



White chimneys at the Champagne Vent site at NW Eifuku volcano, more than 1 mile below sea level. The venting fluids were measured at 217°F (103°C); the surrounding water temperature was 36°F (2°C).

All photos courtesy of NOAA, Submarine Ring of Fire 2004 Exploration and NOAA Vents Program