



MARIANA TRENCH MARINE NATIONAL MONUMENT MUD VOLCANOES

WHAT ARE THEY?

BLUE “ MUD

Fall deeply in love with our monument’s plunging underwater landscape, which people call the Grand Canyon of the ocean. Here, underwater volcanoes bubble with blue mud!

DID YOU KNOW?

There are 19 active mud volcanoes can be found parallel to the Mariana Trench!

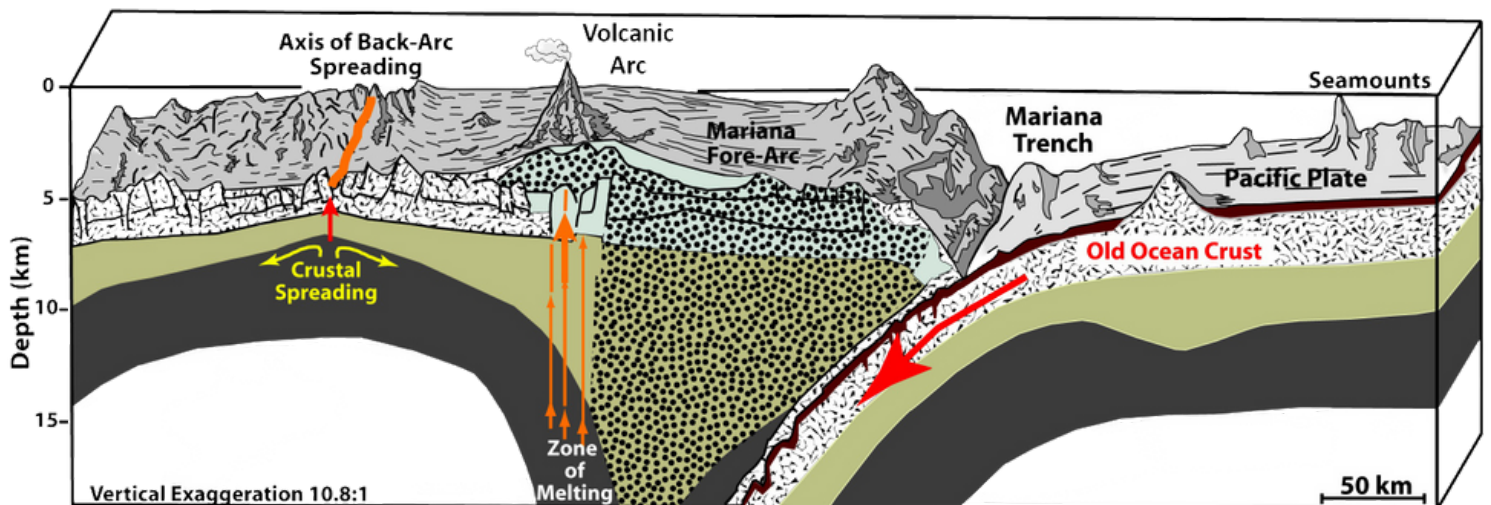


WHAT ARE MUD VOLCANOES?

Mud volcanoes are found around the world, and are commonly produced when a viscous mixture of water and sediment (that we commonly call “mud”) beneath the land or seafloor surface become pressurized and erupts to the surface to form a pool that often is surrounded by a cone similar to the cone we associate with magma volcanoes.

HOW DO THEY FORM?

A different process, however, forms mud volcanoes in the Mariana region. The mud volcanoes here form only in the zone between the trench and the active volcanic arc. This area is called the “forearc” region. Here, movement of tectonic plates brings mantle rocks into contact with seawater. When this happens, numerous chemical reactions occur between fluids driven off of the subducting Pacific Ocean plate and minerals in the mantle rock (a process called serpentinization, producing a new type of rock called serpentinite). Serpentine is less dense than the surrounding mantle rock, and it is very soft so is easily crushed.





There are many faults in the forearc area and fluids from the subducting plate tend to find their way to sea floor springs along the fault planes. When earthquakes occur, the rocks on either side of a moving fault plane grind up the soft serpentinitized rock, thus rising fluids mix with the ground-up rock to form serpentinite mud. When the serpentinite muds ooze out of the fault up to the seafloor they can build large mounds that may be up to 50 km in diameter and 2.6 km high. These serpentinite mud volcanoes produce new habitats for living organisms, but have not been well-explored, so we know very little about mud volcano ecosystems.