

# Blue mud from the Earth's mantle

## Mariana serpentinite mud volcanism: a window into subduction zone processes

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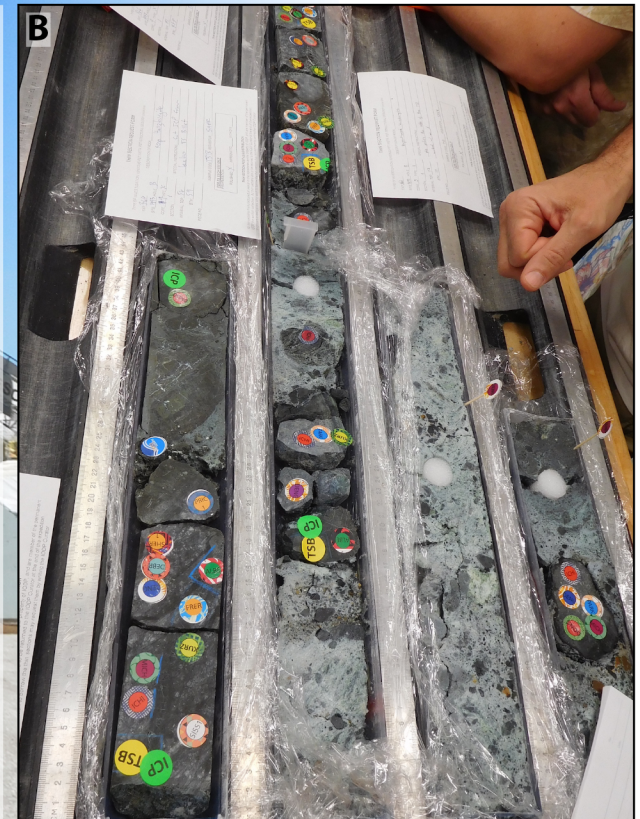
Blue mud is erupted at several serpentinite mud volcanoes in the Mariana forearc. Not far from the famous Mariana trench, deep-seated faulting in the Philippine plate allows fluids—which have been released from the subducted Pacific plate—to rise to the surface. During ascent, the fluids react with mantle rocks of the overlying plate and form serpentine-rich lithologies. Together with the fluids some of this serpentinite is carried towards the seafloor, where it is erupted as the fine-ground blue mud carrying clasts of various sizes. This process formed, over millions of years, large mud volcanoes up to 50 km across and 2.5 km in height. During the ongoing IODP Expedition 366 aboard D/V *JOIDES Resolution*, we are drilling into three of these serpentinite mud volcanoes.

Studying fluids, mud, and rock clasts erupted at the mud volcanoes provides an unique opportunity to gain insight into geological and geochemical processes as well as into the deep subsurface biosphere of subduction zones. In my post-cruise research, I will study clasts of serpentinitised mantle rock. My focus will be on petrological, geochemical, and textural aspects of water-rock interactions between the subduction slab and the seafloor.

And perhaps I can even contribute to one of the most obvious questions: Why is the mud blue?



**A** The blue serpentinite mud is hidden below a layer of brown pelagic sediments.



**B** Clasts of mantle rock are as well erupted at the mud volcanoes. Here, they get sampled by the shipboard scientists.