

## **Submarine Explosive Volcanism at Seamounts Offshore Central California and Near-ridge Seamounts off Gorda Ridge**

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Volcaniclastic deposits on and around seamounts provide a record of the temporal evolution of the volcano by including material covered by later eruptions. Contrasting such deposits from mid-Miocene volcanoes offshore central California and near-ridge seamounts, located west of the northern Gorda Ridge, allows evaluation of the effects of lava composition on fragmentation processes. Compositions of the mid-Miocene hyaloclastite and volcanic breccia range from alkalic basalt to mugearite. The near-ridge seamount hyaloclastite and ash deposits are all N-MORB, with most being relatively primitive ( $\text{MgO} > 8\%$ ). Morphologies of glass fragments from both settings are consistent with Strombolian eruptions taking place in water depths  $> 2000$  m. Hyaloclastite from the near-ridge seamounts is monomict with uniformly high sulfur content of the glass. Volcaniclastic deposits from the mid-Miocene volcanoes are more diverse, including monomict turbidite sands and polymict hyaloclastite and breccia, containing glass and lithic fragments, as well as broken crystals. Volatile contents of the glasses are highly variable ( $\text{S} < 100 - 700$  ppm,  $\text{F} \sim 1100 - 1900$  ppm,  $\text{Cl} \sim 450 - 1400$  ppm) suggesting a complex degassing history, probably involving eruption over a range of water depths. Secondary alteration and reworking of the mid-Miocene deposits obscures interpretation of their textural characteristics. However, some of the glass is unaltered and textural features suggest a range of fragmentation processes were operative, including fire-fountaining, explosive and quench granulation, and pyroclastic debris flows.