

Sedimentation and modern hydrothermal cycles

**AMY GARTMAN¹, JACOB TIDWELL², KATLIN
ADAMCZYK¹ AND JAYCEE FAVELA¹**

¹U.S. Geological Survey

²University of Colorado, Boulder

Investigations of hydrothermal sediments from diverse environments reveals that these precipitates vary significantly in their extent, composition, and rates and processes of accumulation. Although hydrothermal systems can result in the formation of seafloor massive sulfide deposits (SMS), the equivalency of “hydrothermal systems” with SMS both overrepresents the discovered prevalence of SMS in the modern oceans, and underrepresents the diversity of existing and potential mineral precipitates at modern hydrothermal systems.

At hydrothermal vents, metal sulfides, oxide, and silicates may all occur as both primary and alteration minerals. Mechanisms of alteration include infilling of pore space by low temperature hydrothermal fluids, dissolution-reprecipitation reactions by low temperature hydrothermal fluids, dissolution-reprecipitation reactions by seawater, and physical alteration, such as by earthquakes or mass wasting events. Solid state alteration reactions may also occur when precipitates are heated after emplacement. This work will present geochemical and mineralogical results from diverse hydrothermal systems to examine how hydrothermal sediments are locally preserved, and to evaluate the variability of rates and processes of mineralization.