

## **Variations in fluid chemistry among twenty high-temperature hydrothermal vent sites in the Okinawa Trough**

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The development of acoustic-based detection of hydrothermal activity [Nakamura et al. 2015, *Geochem. J.* 49: 579 -596] drastically improved the efficiency of locating new vent sites, with over twenty vent sites being discovered to date within the Okinawa Trough [e.g. Miyazaki et al. 2014, *R. Soc. open sci.* 4: 171570]. Although general characteristics of fluid chemistry are similar among these sites, several geochemical parameters, such as the carbon isotope ratio of methane, exhibit notable variations. These variations suggest diverse fluid-sediment interactions under the seafloor high-temperature condition, and we present a conceptual model for describing such diversity from viewpoints of geology and chemistry.