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Noble-gas geochemistry is known to change in response to the terrigenous fluid emission triggered by major seismic events, as observed, for instance, in the recent case of the Tohoku-Oki earthquake occurred in 2011. Therefore, characterizing the terrigenous fluid emission in tectonically active regions is a prerequisite to understand future geochemical changes.

In the present contribution we report the results of the noble-gas and carbon isotope measurements conducted in water and sediment samples collected along the Nankai Trough using the ROV HyperDolphin during RV Natsushima cruises NT13-08 and NT14-07.

In general, sediment cores acquired at active cold seeps at the splay fault off shore Kumano are characterized by the presence of crustal He and the respective He concentration gradients are highly variable. Sediment cores collected at shallower water depths show relatively low He concentration gradients and high ³He/⁴He ratios suggesting the presence of mantle He.

The fluid transport dynamics in the investigated area are discussed in the light of the new insights provided by the spatial distribution of the fluxes and the isotope signature of terrigenous He provided by the present study.

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