Mapping of active and inactive vent fields along the Censtral Spreading Ridge in the North Fiji Basin

JONGUK KIM[1], JUWON SON[1], SANG-JOON PAK[1], JIHYE OH[1], AND SEUNG-KYU SON[1]

[1]Dee-sea and Seabed Mineral Resources Research Center, Korea Institute of Ocean Science & Technology, Busan, Korea (jukim@kiost.ac.kr)

The North Fiji Basin (NFB) is a mature back arc basin with an age of ~12 Ma. Recent volcanism and spreading activity are focused along the Central Spreading Ridge (CSR), A ridge segment more than 800 km long, composed of four main segments, the N160°, N15°, north-south (N-S), and southernmost segments from north to south. Some active and inactive vent sites were discovered along the N15° and N-S segments by previous works in 90's and early 2000's. In 2013 and 2016, we performed two hydrothermal expeditions to investigate hydrothermal activity and related sulfide deposits in the NFB, respectively. Detailed water column survey using CTD/MAPR tows in 2013 cruise revealed new plume signals other than the known vent sites. During the high-resolution mapping and seafloor observation performed by ROV, 42 chimney clusters, consist of more than 300 chimneys, were identified in five targeted areas of plume signals. Occurrence of active vents is well coincide with sites of both NTU and ORP anomalies, especially near the locations of large ORP response. Inactive vents are usually located near the active vents along the same volcanic structures, which imply common origin of their formation. Although no venting can be seen by visual observation at the inactive vents, dispersion of NTU and ORP anomalies in water column suggests that the activity is not extinct; i.e. diffuse flows still persist. Large SMS deposits are formed along the northern rift valley of a neovolcanic dome at the Fiji Triple Junction (FTJ). Occurrence of high-density chimney clusters appears to be bounded to formation of small depression structure at the spreading center which is possibly related to the hydrous, enriched magma composition in the FTJ.