

Steady state and a singular event observed at the TAG hydrothermal mound by monitoring

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The steady state variability and occasional random event of hydrothermal activity were observed. We deployed several long-term monitoring systems on the TAG hydrothermal mound at the Mid Atlantic Ridge 26 degree N from Aug. 3 to Aug. 23, 1994 and observed environmental changes during this interval by submersible video and still cameras. We measured current direction and velocity, visibility, temperature, and salinity of sea water as well as observed newly formed black smokers by video and still camera system. Heat flow measurement system and an OBSH were also deployed around the central black smoker and newly formed black smokers for more than two weeks.

Steady state change of the temperature, current direction and velocity, visibility and pressure change by hydrophone of the OBSH show a regular semidiurnal periodic variation, which may be caused by ocean, and earth tides.

A singular event occurred during our research at the TAG hydrothermal mound. Small earthquakes beneath the TAG mound were followed by a huge slope failure, which apparently caused by a debris flow, killing swimming eel like fish. A thin bed of the dead shrimps may be related to a nearly simultaneous increase of hot water flux from vent.

These results show us significant change of the hydrothermal system especially event will damage the deep sea biosphere, sometimes extinction of some vent community. However biota will survive again even experienced a large catastrophe and disperse to the vast ocean floor.