

# Past methane seep phenomena on the bank in the west of the Kuroshima Knoll, off Yaeyama Islands

# Hideaki Machiyama[1]; Hiroyuki Yamamoto[2]; Narumi Takahashi[3]; Wonn Soh[4]

[1] DSR/IFREE, JAMSTEC; [2] Marine Ecosystem, JAMSTEC; [3] IFREE, JAMSTEC; [4] JAMSTEC

The Kuroshima Knoll is located about 26 km south of Ishigaki Island in the South Ryukyu Arc. Chemosynthetic communities and cold seep carbonates were found on the top of the knoll. Dead and living chemosynthetic communities, such as *Calyptogena* and *Bathymodiolus*, widely occur on the eastern top of the knoll. Many carbonates, such as chimneys and nodules, were also found in or near dead *Calyptogena* colonies. The distribution of chemosynthetic communities and carbonates is limited in the east and west direction. Moreover, more than 15 gas venting sites accompanied with living *Bathymodiolus* colony were discovered on the eastern top of the knoll. The result of carbon and oxygen isotopic analysis of the cold seep carbonates suggests that cold seep probably originated from the dissociation of gas hydrate.

Single channel seismic reflection survey, carried out at the Kuroshima knoll in January, 2002, shows the following characteristics:

1) Topographical high from the Kuroshima Knoll to the Hateruma Island consists of an anticline with E-W axis. On the other hand, the submarine canyon of northern side of the knoll corresponds to a syncline with E-W axis.

2) The Kuroshima Knoll consists of six seismic stratigraphic units including an acoustic basement.

3) Many faults and fractures are developed on the top of the knoll. A free gas zone is probably present beneath the gas venting site.

On the other hand, the similar seismic characteristics are also found in the bank of western side of the Kuroshima Knoll. Therefore, it is supposed that cold seeps and chemosynthetic communities occur on the top of the bank.

In January, 2002, the survey using JAMSTEC deep-tow camera system (KY05-01) was carried out on the bank in the west of the Kuroshima Knoll. The result of camera observation shows the following evidences:

1) No deposits are found on the most of the bank top.

2) Recent calcareous sediments, such as foraminiferal sand, are locally deposited.

3) Numerous cold seep carbonates including chimneys, nodules, and massive types were discovered on the topographical high in the western part of the bank. Thus, this evidence suggests that the active methane seeps are present in the past.

In this presentation, we report the discussion of these carbonate formation and show the data of deep-tow side scan sonar.