

## Initial evolution of Kumano Knoll No.8 examined by the AUV Urashima's SBP system

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AUV (Autonomous Underwater Vehicle) Urashima is installed deep sea type sidescan sonar (SSS) and subbottom profiler (SBP) systems. The SBP system is greatly available to interpret detailed geologic structure at shallow depth. On the research cruise YK06-08 in July 2006, high resolution acoustic survey was carried out by AUV Urashima in Kumano mud volcanoes. One of the targets, Kumano Knoll No.8, has been thought as a relatively young mud volcano due to its height of only 40 m. By the previously operated dive of Shinkai 6500 (the cruise YK06-03), it was found that there are marked carbonate outcrops and large depression on the knoll.

As a result of SSS survey, distribution of the carbonate outcrops of high back-scattering intensity was identified, and shape of the depression was briefly determined by lineaments in intensity variation. By the SBP survey, detailed geologic structure of the Kumano Knoll No.8 was clarified. The knoll is covered with stratified sediments which extend toward the surrounding trough sediments, although mud volcanoes generally show non-stratified or transparent feature within the mud volcanic bodies. It implies that intrusive clastic body has lifted up the trough sediments from the below and that the cover sediments have remained without suffering obvious deformation. Thus, the knoll is considered as to be still at initial stage of evolution of mud volcanism. Faults developing in the uplifted cover sediments indicate that the depression observed by the Shinkai 6500 is a partial subsidence of the top of the knoll. The intrusive body develops mainly in the western part of the knoll, and the exposed part of the intrusive on the seafloor proved corresponding to the carbonate outcrops.

The uplifted cover sediments on the Kumano Knoll No.8 can be divided into upper and lower beds. While the upper bed shows constant thickness, the lower bed indicates the greater thickness to the center of the knoll. This implies a scenario that 1) a gentle subsidence occurred while the lower bed deposition, 2) the knoll has been uplifted since the upper bed started deposition, and 3) the new depression occurred at the top of the knoll.