Active structure in the eastern Sagami Bay

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The Sagami Trough marks the boundary between three plates: the Philippine Sea Plate, the North American Plate, and the Pacific Plate. Large-scale earthquakes have occurred repeatedly in this area and an accretionary prism was well developed around the Miura and the southern Boso peninsulas. The collision of the Izu-Bonin arc with the Honshu Arc and highly oblique convergence between the Philippine Sea Plate and the North American Plate yielded very complicated geological history in this area. The objective of this study is to reveal the distribution of faults in order to elucidate the tectonics of the area.

In this study, distributions of faults and deformation structures of the eastern Sagami Bay are described based on IZANAGI backscattering image and seismic profiles. In 1995, IZANAGI sidescan sonar imagery was obtained in this area by ORI, Univ. Tokyo. In 2005, we conducted dense single-channel seismic survey in the same area during the KY05-06 cruise using R/V KAIYO of JAMSTEC. This survey provided very clear structural images down to 1 second beneath the seafloor in two-way travel time in this area. Faults developing in this area formed by an accretionary prism are interpreted as a reverse fault. In this area, biggest reverse faults were identified along the southwest side of Okinoyama bank chain. Tilting reflectors in the piggyback basin behind the Miura and Misaki knolls suggest Okinoyama bank chain uplifted by these faults motions. These faults correspond to the Sagami tectonic line (Kimura, 1979).