

SSS035-15

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A perspective of great earthquakes along the Nankai trough based on newly-made submarine active fault map

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The Nankai trough is a candidate site for the occurrence of large earthquakes of M8 class in near future. The trough has been well studied by many marine geologists, and they have revealed characteristic structure of the plate boundary.

However, fundamental information for prediction of large earthquakes such as the detailed distribution of active faults is not yet well known mainly due to lack of data regarding submarine topography. To make a more precise submarine active fault map along the trough, we have made detailed a submarine topographic maps and images based on 3-second (about 90m) DEM processed from the original data obtained by Japan Coast Guard since 1986 using multi-narrow beam echo sounder. Then we have made stereo-pair copies of topographic images for interpretation of active faults, similar in manner to how we use air-photo stereo sets for inland active faults. The stereo-pairs allow us to rather easily get 3D images and map active faults on the sea bottom as compared to single ordinary topographic maps. We have also prepared anaglyph images from the stereo-pairs for discussion. As mapped by previous works (Research Group for Active Submarine Faults off Tokai; 1999, Tokuyama and others; 2001, Kimura and Kinoshita eds., 2009), there are several trough-parallel north-dipping thrusts.

Among these the Frontal Thrust and associated splay thrusts are predominant active features. We depicted two candidate active faults for recent large historical earthquakes; 1944 Tonankai and 1946 Tokai. The former one extends eastward from off southeast coast of Kii peninsula across Kumano trough for over 100km, and the latter extends eastward from off southeast coast of Kii peninsula across Shionomisaki submarine canyon and along southern foot of Tosabae, and the outer ridge south of Tosa basin until it reaches far off Ashizuri peninsula. The splay fault extends from southeast of Kii peninsula to south of Muroto peninsula does not coincide with source area of either 1944 Tonakai or 1946 Nankai earthquake. Several extensive strike-slip faults extend in Tosa basin. We will discuss about relation between newly-found active faults and large historical earthquakes on presentation.

Keywords: Nankai trough, submarine active fault, large earthquake