

Tectonic History of the Noto Peninsula and its relation to the 2007 Noto Peninsula Earthquake

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The Noto Peninsula was a plateau surrounded by deep rift basins during the opening of Japan Sea in early Miocene. The plateau is underlain by volcanic rocks and there were small rift basins oriented in E-W to ENE-WSW direction. In late Miocene, N-S compressional stress increased and caused reverse faults and folds trending in E-W to ENE-WSW direction. They were formed mainly in the rifts formed in early Miocene. In late Pliocene, E-W compression started to deform the Japan Islands. The main contractional deformation occurred in the eastern margin of the Japan Sea during Quaternary, while small reverse faults and folds have been growing in and around the Noto Peninsula. The faults and folds tend to align along a zone forming contraction zones. The 2007 Noto Peninsula earthquake occurred along one of the NE-SW trending reverse faults in the contracting zone, which has grown mainly in Quaternary. Seismic profiles indicate that the fault is a SE dipping reverse fault and aftershock distribution agrees with the fault geometry shown by geologic data. In the contracting zone of reverse faults and folds, the 1993 Noto Peninsula earthquake (M 6.6) occurred. The relation between the contraction zone defined by geologic structure and long term seismicity should be studied to improve the prospect of potential areas of future earthquakes.