

Revisiting the unusual uplift of the Kikai Island at northern Ryukyu Islands, Japan

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After the 2011 Tohoku-oki tsunami, reevaluation of the maximum earthquake and tsunami along the coastal area of Japan is the important issue for the future disaster prevention. In this sense, understanding the historical and pre-historic earthquake and tsunami events is the straightforward way to prepare the future disaster countermeasures. In this study, we evaluated the possible maximum earthquake event at the northern Ryukyu Islands (Amami-Oshima and Kikai Islands), Japan based on the geological and geomorphological evidence and then conducted the numerical modeling of the seismotectonic uplift and tsunami. Kikai Island marks one of the highest uplift rates in the world. Namely, the island was intermittently uplifted about 1-4 m of 1,500-2,000 years interval during the Holocene by the seismic event and the latest one was occurred at about 1,550 years ago (e.g., Webster et al., 1998). On the other hand, there is no evidence of such remarkable uplift at the east coast of the Amami-Oshima Island (approx. 30 km away from the Kikai Island). Moreover, coastal boulders deposited on these islands' reefs were of storm wave origin without any tsunami origin, suggesting no remarkable tsunami was affected to these coasts during past 2,300 years. These evidences can be used as the geological and geomorphological constraints of the seismic event at 1,550 years ago. Our preliminary numerical modeling of the seismotectonic uplift revealed that the above-mentioned constraints were explained reasonably by the high-angle reverse faults rather than the low-angle thrust type fault at the plate boundary.

Keywords: earthquake, uplift, tsunami, Kikai Island