

Paleo-tsunami records at the Ryukyu Islands based on the distribution of boulders

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The Ryukyu Islands, Japan extend approximately 1000 km northeast to southwest along the Ryukyu Trench between Taiwan and Kyushu, Japan. Most of the islands and islets of the Ryukyu Islands are rimmed by fringing reefs. It is well known that the 1771 Meiwa Tsunami devastated at the Sakishima Islands, southwestern end of the Ryukyu Islands. The tsunami run-up height is estimated up to 30 m and it caused approx. 12,000 deaths. On the other hand, there are no historical records of huge tsunamis in the Okinawa and Amami Islands, north from the Sakishima Islands. One of the issues to study the geological record of paleo-tsunamis at the Ryukyu Islands is the preservation of the sandy tsunami deposits since the islands are located in the subtropical area. Moreover, terrestrial sedimentary layer is thin and not allow us to know the long record of the paleo-tsunamis. On the other hand, there are numerous boulders that are composed of corals and carbonate rocks at the coasts of the Ryukyu Islands. Based on the geological study and hydrodynamic analyses, boulders at the coastal zone of the Sakishima Islands are interpreted as the tsunami origin, while only boulders deposited by the storm waves are observed in the Okinawa and Amami Islands (Goto et al., 2010). According to the ¹⁴C dating, some of the tsunami boulders at the Sakishima Islands were deposited by the 1771 Meiwa Tsunami, while the others were deposited prior to this event (e.g. Araoka et al., 2010). This in turn suggests that such coralline boulder deposits are useful to investigate the tsunami recurrence interval at the subtropical area instead of the sandy tsunami deposits. Moreover, absence of the tsunami boulders at Okinawa and Amami Islands shows striking contrast to the Sakishima Islands. The results may imply that large tsunamigenic earthquakes were heterogeneously occurred among the Ryukyu Islands.