

EGU2020-12410

<https://doi.org/10.5194/egusphere-egu2020-12410>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



## Numerical Model of the 1771 Meiwa tsunami and the influence of the reef

**Marine Le Gal** and Satoshi Mitarai

Okinawa Institute of Science and Technology (OIST), Marine Biophysics Unit

In 1771, a major tsunami event hit the Yaeyama Islands (Japan) and particularly Ishigaki Island, where 30m run-ups were estimated. As with many other Pacific Islands, Ishigaki Island is surrounded by a reef. Interactions between tsunami waves and reefs have generally been analyzed with idealized models and studies focusing on a specific reef are rare. It has been shown that the influence of the reef is two-fold : it can either amplify or buffer waves. For the particular 1771 event, this influence is still unknown and the present study aims to identify it. Several numerical models were developed using the 2D Nonlinear Shallow Water model of the Telemac system. First, a reference model was build, simulating the real event with an accurate reef representation. Then, altered bathymetry models were generated and compared to the reference model. In our simulations, overall, the reef protected the coast with a 12,5% decrease of the water depth at the shoreline. However channels, disrupting the continuity of the reef, strongly amplified inundations on the nearby coast, with up to 40% increase of the water depth at the shoreline. To go further, this results could provide inside to better manage the coast for future events.