

Effects of the offshore barrier against the 2011 Tohoku Earthquake Tsunami and related Recovery Process

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In this study, the effectiveness of an offshore breakwater for the 2011 off the Pacific Coast of Tohoku Earthquake Tsunami was examined by two-dimensional (2D), quasi three-dimensional (quasi-3D) and three-dimensional (3D) numerical models. First, both 3D numerical models were applied to the behavior of tsunami inundation for Kamaishi Bay in Iwate Prefecture where an offshore deep-water breakwater was installed against an assumed tsunami before 2011. The numerical results indicate 20% error of maximum inundation height compared with the post-event tsunami survey on the land. It is found that the offshore breakwater significantly reduced the tsunami height on the land. The reduction of tsunami height on the land gave about 30% tax revenue in comparison with similar locations with or without breakwater. Based on the results the construction and or rebuilding of damaged offshore breakwaters can be considered as a viable option against tsunami particularly in vulnerable areas

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