



Classification and Possible Causes of the Freaque Waves Occurred in Taiwanese Coastal Ocean

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Freaque waves occur frequently in Taiwanese coastal ocean. This study collected and confirmed the media reported freaque wave events since 2000. There were 90 shipwrecks struck by extreme large waves or freaque waves from 2003 to 2014. In addition, 284 events of people swept into the sea from the coasts by freaque waves were recorded from 2000 to 2014. More than 950 persons in total were dead or injured for the past 15 years. This study classifies these cases according to their possible causes and the weather conditions of that time. It is found the probability of the events occurred during storm (typhoon) period is less than 15%. Most of the events occur in ordinary sea states. Analysis on the data from in-situ measurements that close to the event locations shows the average significant wave height is 1.46m. This study uses this threshold and long-term observations on sea states to present the navigation risk of ships in Taiwanese sea. In addition, it was found the typhoon generated swell is one of the causes to trigger the giant coastal freaque waves, experiences learning from the events occurred in typhoon Haiyan in 2013 (16 persons were swept into sea), typhoon Prapiroon in 2012 (3 persons and 2 cars were swept into sea), typhoon Neoguri in 2014 (7 persons were swept) and typhoon Vongfong in 2014 (1 motorcyclist was swept). Those typhoon swell induced coastal freaque wave is the worst case because they always occur with good weather conditions. Analysis on the field data shows the swell direction is a crucial factor for the coastal freaque wave occurrence.