Effect of Extremes Wave on a mitigate type of the French West Indies coast, with a low cost modeling

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Most of the situation (period) of extreme wave on the coast of the Lesser Antilles Arc are provoked by the presence near the coast of strong depression (storm or hurrican). Strong wind and height waves are produced by this depressions. The second cause of extreme wave is provoked by the strong anti-cyclonic circulation on the North Atlantic Ocean. This wind regime are in the most part of time occurred during the months of October to January. Long fetch and very long wave are produced by this particular wind regime.

In this both type of wave generation, the waves are propagated on the coat of the Lesser Antilles Arc by a favorable bathymetry. The most part of the observations and the studies are done by ourselves for the coast of the French West Indies (MARTINIQUE 61°W 14°N and GUADELOUPE Island 61°W 16°N)

Most part of the event of extreme waves, have a very short period of variation. Very calm sea state could be alternate with a strong disrupt sea state in lesser than 2 hour. The prediction of this type of event have to be done in a very short time to have a really risk evaluation.

One of the first particularity of the coast of this island of the FWI is the great variability of the type of coast. Different type of coast are observed on a very short length . The particularity of this coast is the proportion of sand, rock and coral. All of this component give different answer in presence of big waves. Theirs proportion modified the slop of the coast and the bottom roughness. The wave dissipation area and surfing zone are modified by the repartition of the different coast's material (sand, rock, coral etc..).

In the case of a prediction of sea state, the variability of the type of coast give many difficulty to make a good prediction with a low cost of calculation. To improve the prediction of extreme wave in case of emergency. The method of sea wave prediction have been changed to use lesser accuracy bathymetry. The different type of coast are classified and characterized by a roughness parameter and a wave rate of dissipation.

In this presentation, the result of this type of prediction will present, in different real cases. The prediction will compare with the spot observation. The choose of the parameters used to characterize the extreme wave in emergency case will be discuss. We'll conclude about the validity of the type of prediction in the particular type of coast of this island in emergency case.