

# CHAPTER 1

## INTRODUCTION

### 1.1 General

Recently, coastal area has played important role to the development of Thailand. This includes industrial and military uses, ports and protection against natural disasters as well as environmental protection. Therefore understanding the coastal process is the requirement for planning, designing and constructing, which is beneficial to the management and the maintenance in the future.

To study coastal process, the most important and essential factor is wave. Since the real mechanism of wave is very complicate therefore before going deeply into the real phenomena, the regular wave must be well understood. In the surf zone, when waves propagate to the near shore zone, wave profiles are steepen and then eventually break. Once the waves start to break, energy flux from offshore is dissipated to turbulence and heat. Then causes the decreasing of wave height toward the shore. The rate of energy dissipation of breaking waves is an essential requirement for predicting wave height, sediment transport and beach deformation.

At present, many researchers try to develop the model to estimate the rate of the energy dissipation in order to obtain the most accurate predicted wave height. Due to the complication of the wave breaking mechanism, most of the dissipation formulas have to be based on empirical or semi-empirical formula calibrated from the experimental data. In order to make the models reliable, it is necessary to calibrate and verify the models against wide range and large amount of data. In this study, a total of 508 cases obtained from 14 sources of published experimental results have been used. These experimental results contain different bottom conditions and different size of wave flume scale. The purpose of this study is to develop a dissipation model in order to improve the accuracy of the wave height prediction.

### 1.2 Objective and Scope of the Study

1. To study regular wave transformation across shore due to the dissipation of the energy in the surf zone.
2. To study the development of the previous dissipation models.
3. To examine the accuracy of the previous dissipation models by using root mean square relative error ( $ER$ ).
4. To develop the dissipation model based on the comparison results, then calibrate and verify the present model with a large amount of data which consist of various beach conditions and wave flume scales.

5. To develop the computer program to predict wave height transformation across shore by using Visual basic Version 6.0.
6. This study focuses on wave transformation on cross-shore direction.
7. Published experimental results are used to calibrate and verify the dissipation models. The data consists of 4 beach conditions, which are plane beach, barred beach, stepped beach and sandy beach and 2 wave flume scales, which are small scale and large scale wave flume.