$$\eta = 1.2 \cos^2\left(\frac{\sigma(t-18)}{2}\right) \quad , \quad |t-18| < \frac{T}{2}$$

$$= 0 \quad , \quad |t-18| > T/2 \tag{21}$$

in which T ($\equiv 2\pi/\sigma$) is the total storm duration in hours. The results are presented for three storm durations in Figure 25. For the shortest storm duration (T = 12 hours), the potential volume eroded is approximately 70 m^3/m whereas the computed actual maximum volume eroded is 10 m^3/m. With increasing storm tide duration, the computed actual maximum volume eroded increases. Tripling the storm tide duration to 36 hours doubles the maximum volume eroded to 20 m^3/m. It is noted that this is only approximately 28% of the potential volume eroded, again underscoring the likelihood that most storms will only reach a fraction of their potential erosion limit. This feature also highlights the significance of cumulative effects of sequential storms and of the need to better understand the recovery process (especially the rates), a portion of the cycle not addressed in this project.

Application of Method to Long-Term Beach and Dune Response Simulations

The previous section has described the application of the model to idealized examples of beach and dune response. The model can also be applied to more realistic situations in which the initial beach and dune conditions are specified along with time-varying waves and tides.

Evaluation of Method by Hurricane Eloise Erosion Data - Kriebel carried out an evaluation of the method by comparing erosion computations for Hurricane Eloise (1975) with measurements reported by Chiu (1977). Although the wave and tide conditions were not measured along the beaches of Bay and Walton Counties (Florida) of interest, some tide data were available and wave heights were estimated. Erosion was computed for twenty combinations of dune slope, wave height and peak surge. It was found that the volumetric erosion ranged from 21 to 38 m^3/m compared to average measured values of 18 to 20 m^3/m for Bay and Walton Counties, respectively and an average of 25 m^3/m near the area of peak surge. Although the predicted values are somewhat larger than the observed, Chiu (1977) states that the beaches had started to recover at the time of the post-storm surveys, with approximately 5 m^3/m of sand