

having returned to the beach. Thus the maximum eroded volume would be  $30 \text{ m}^3/\text{m}$  compared to a maximum calculated value of  $38 \text{ m}^3/\text{m}$ , a difference of approximately 27%. This reasonably close agreement was considered adequate recognizing the uncertainty in the storm tide employed in the computations; therefore no further calibration of the model was considered warranted. It is of interest that the erosion potential associated with the peak tide is approximately nine times that predicted for the time-varying conditions included in the computations. This again reinforces the fact that most storms in nature cause only a fraction of the potential erosion associated with the maximum conditions in the storm.

Long-Term Simulation - With the model reasonably verified for the Bay and Walton Counties area of Florida, a long-term simulation of beach and dune erosion was carried out. The hurricane wind and pressure fields were idealized in accordance with a representation published by Wilson (1956). The five idealized hurricane parameters

$\Delta p$  = Maximum Pressured Deficit

$R_{\text{max}}$  = Radius to Maximum Winds

$V_F$  = Hurricane System Translational Speed

$\beta$  = Hurricane Translational Direction

$y_F$  = Landfall Point

were selected by a Monte Carlo method in accordance with the historical characteristics of hurricanes in the general area. For each hurricane, the storm tide was calculated using the Bathystrophic Storm Tide Model of Freeman, Baer and Jung (1957). With the time-varying storm tide and wave height calculated, the beach and dune model was applied until maximum erosion was achieved. As the recovery mechanism is not yet understood to a degree for realistic modelling and because hurricanes occur approximately on a biennial basis, the erosion for successive hurricanes was assumed to commence from a fully recovered condition. This is clearly an approximation as the recovery process occurs at several rates of magnitude slower than the erosion process. Study of some recovery stages from severe storms has shown that up to seven years may be required to achieve approximately 90% recovery. The duration required for recovery from milder storms would, of course, be less.