Our understanding of processes at a particular site, post facto, has improved vastly. However, prediction of future shorelines, in any given situation, at best remains a hazardous guess except in a few well defined situations. In many cases therefore, simple modeling based on inundation and the Bruun Rule are used for predicting long-term trends (Kana et al., 1984). The problem seems to lie with the fact that our ability to predict sediment motion along the coastline under a changing wave climate on a long-term basis remains rudimentary, and is in fact the subject of major ongoing research effort in coastal engineering. It may take an additional decade or two before confidence in long-term prediction reaches acceptable levels. A part of the difficulty is not so much with relating hydrodynamic forcing to sediment motion, as with synoptic data necessary to obtain reliable (hindcast) hydrodynamic (currents, waves, winds) information. Furthermore, structures interrupt sediment motion. Modeling of sediment-structure interaction is still under research, although some useful modeling work has been done in this context (Kraus, 1983).

In the subject of estuarine mouth or inlet response to changing oceanographic conditions, much more work has been done on sandy inlets than on inlets where the material is fine-grained. In general, simplified description of inlet response can be examined by considering inlet hydraulics as characterized by the repletion coefficient concept (Keulegan, 1967) and inlet sedimentary response via O'Brien's (1969) equilibrium relationship for inlet stability.

The repletion coefficient, K, is defined as

$$K = \frac{A_c}{a_o \sigma A_b} \left(\frac{2ga_o}{F}\right)^{1/2} \tag{10.1}$$

where $A_c$ = inlet flow area, $A_b$ = bay area, $\sigma$ = tidal frequency, $a_o$ = tidal amplitude in the sea, g = acceleration due to gravity and F = impedance. F accounts for bottom resistance in the channel as well as head losses associated with flow entrance and exit (Keulegan, 1967; Mehta and Özsoy, 1978). Sea level rise will influence several terms, including $A_c$ (increase), $A_b$ (increase, unless bay is bounded by vertical walls), $a_o$ (increase) and F (decrease). Typically, the overall effect will be an increase in K, which means easier flow admittance or better repletion.