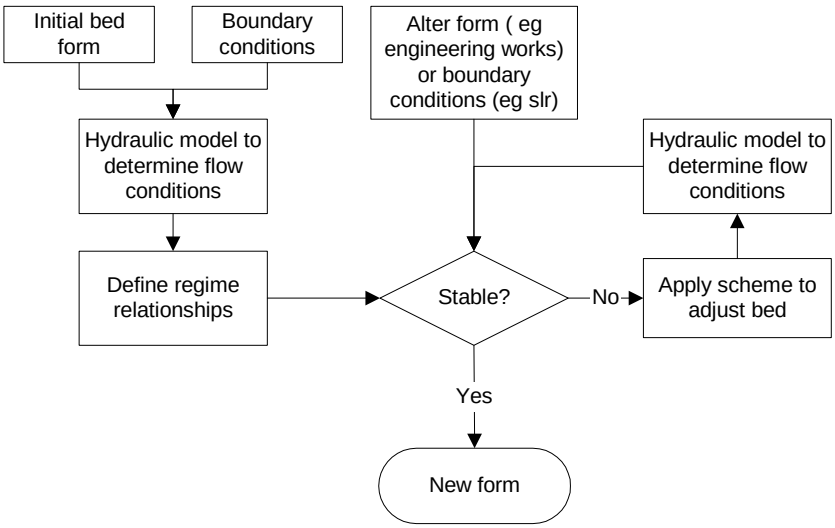
COUPLED HYDRAULIC AND REGIME RELATIONSHIPS

This sub-set of hybrid models are perhaps both the simplest and most well developed. They make use of some form of regime relationships (see Regime relationships) linked to a hydraulic model by some scheme to update the estuary bed, Figure 1 (Gerritsen *et al*. 1990; O'Connor *et al*. 1990; Spearman, 1995; van de Kreeke, 1996; Tzanetatou, 2000).

Figure 1 - Flow diagram for operation of a regime model



In most cases, the hydraulic model has been 1-dimensional, allowing long-term simulations to be readily undertaken. Regime modelling tools have been used to investigate the long-term implications of sea level rise, engineering changes and managed retreat by Spearman *et al* (1998), Pethick (2002) and in Paper 21 of the EMPHASYS Report. A similar approach has been adopted for the modelling of an outer delta (de Vriend *et al*. 1994), again using the sort of regime relationships summarised in table in the section on Regime relationships. Readily available versions of this type of model include HYMORF from HR Wallingford and *E*st*R*eg from ABPmer.

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