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movement and amplification; 3.1.1 Why is the tidal wave amplified or damped? 3.1.2 Derivation of the tidal damping equation 3.1.3 Application of the derived formula to observations; 3.1.4 Conclusions; 3.2 Tidal wave propagation; 3.2.1 The relation between tidal damping and wave celerity; 3.2.2 Theory of wave propagation; 3.2.3 Empirical verification in the Schelde and Incomati estuaries; 3.2.4 The wave celerity according to Mazure; 3.2.5 Conclusion; 3.3 Effect of river discharge and other higher order effects on tidal damping; 3.3.1 Which higher order effects are important; 3.3.2 Incorporating river discharge into the derivation of the Celerity equation 3.3.3 Incorporating river discharge into the derivation of the Damping equation 3.3.4 Application to the Schelde-estuary; 3.3.5 Conclusion; 3.4 The influence of climate change and human interference on estuaries; 4 Mixing in alluvial estuaries; 4.1 Types of mixing, their relative importance, and interaction; 4.2 Gravitational circulation; 4.3 Mixing by the tide; 4.4 Residual circulation through flood and ebb channels; 4.5 The decomposition method and why it is not very useful; 4.6 Longitudinal effective dispersion; 4.7 Van den burgh's equation; 4.7.1 The physical meaning of Van den Burgh's K 4.7.2 Correspondence with other methods 4.8 General equation for longitudinal dispersion; 5 Salt intrusion in alluvial estuaries; 5.1 Types of salt intrusion and shapes of salt intrusion curves; 5.2 Salt balance equations; 5.3 Influence of rainfall and evaporation; 5.4 Time scales and conditions for steady state; 5.5 Predictive model for steady state; 5.5.1 Expressions for HWS, LWS, and TA; 5.5.2 Empirical relations for the predictive model; 5.5.3 The predictive model compared to other methods; 5.6 Unsteady state model; 5.6.1 System response time; 5.6.2 Unsteady state dispersion 5.6.3 Application of the unsteady state model

Sommario/riassunto

The book describes an integrated theory that links estuary shape to tidal hydraulics, tidal mixing and salt intrusion. The shape of an alluvial estuary is characterised by exponentially varying width and the absence of bottom slope. This topography is closely related to tidal parameters, hydraulic parameters and parameters that describe 1-dimensional mixing and salt intrusion. Starting from the fundamental equations for conservation of mass and momentum, analytical equations are derived that relate the topography to tidal parameters (tidal excursion, phase lag, tidal damping, tidal amplificati
