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4.6 Modeling estuarine depth and cross section4.7 Graphical display; 4.8 Model validation; Part III: Tides in Estuaries; 5 Estuarine tides; 5.1 Introduction; 5.2 Background information; 5.3 A brief history of tidal theory; 5.4 Equilibrium theory of tides; 5.5 Harmonic analysis of tides; 5.6 Harmonic terms; 5.7 Spring-neap variations; 5.8 Tides in estuaries; 5.9 Summary; 6 Modeling tides; 6.1 Introduction; 6.2 Background information; 6.3 Controlling tidal inputs; 6.4 Modeling spring-neap amplitudes; 6.5 Modeling M4 amplitudes; 6.6 Modeling the tidal wave 6.7 Graphical display of the spring-neap cycle6.8 Model validation; Part IV: Currents Inestuaries; 7 Estuarine currents; 7.1 Introduction; 7.2 Background information; 7.3 Flow descriptors; 7.4 The Reynolds experiment and turbulence; 7.5 The Reynolds, Froude, and Richardson numbers; 7.6 Estuarine mixing parameters; 7.7 Stratification number, St; 7.8 Progressive and standing tidal waves; 7.9 Discharge relationships; 7.10 Summary; 8 Modeling Currents; 8.1 Introduction; 8.2 Background information; 8.3 Modeling upstream volume changes; 8.4 Modeling the tidal flow; 8.5 Modeling the freshwater flow
8.6 Modeling the total flow8.7Graphical display of the flow; 8.8 Model validation; Part V: The Temperatureand Salinity of Estuaries; 9 Estuarine temperature and salinity; 9.1 Introduction; 9.2 Background information; 9.3 Temperature; 9.4 Salinity; 9.5 Advection and diffusion; 9.6 The Gaussian distribution; 9.7 Estuarine temperatures; 9.8 Estuarine salinities; 9.9 Summary; 10 Modeling temperature and salinity; 10.1 Introduction; 10.2 Background information; 10.3 Modeling a Gaussian process; 10.4 The temperature distribution; 10.5 Displaying the temperature distribution
10.6 The salinity distribution

Sommario/riassunto

Estuaries are complex and fascinating natural environments, where constantly changing water depths generate rapidly reversing currents and transport vast quantities of salt, heat, and sediment on a daily basis. Estuaries: Monitoring and Modeling the Physical System examines these processes, offering extensive information about the geological evolution of estuaries, and details of bathymetry, tides, currents, salt and heat, and suspended sediment. By carefully building a working computer model which accurately emulates the complexities inherent in estuaries, students learn quickly