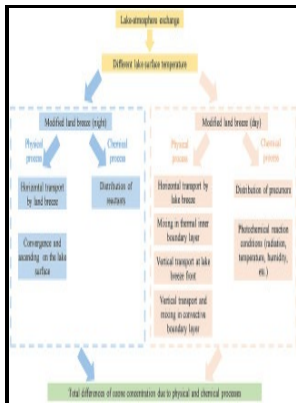


Numerical modelling of vertical circulation in lakes and estuaries

University of Birmingham - Numerical Modeling of Estuarine Circulation in the Geum River Estuary, Korea



Description: -

-numerical modelling of vertical circulation in lakes and estuaries

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Notes: Thesis (Ph.D.) - University of Birmingham, Dept of Civil Engineering.

This edition was published in 1985



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Tags: #Modeling #Influence #of #Stratification #on #Lateral #Circulation #in #a #Stratified #Estuary #in: #Journal #of #Physical #Oceanography #Volume #39 #Issue #9 # (2009)

Assessment of a three

Stratification suppresses lateral circulation during neap tides, and generates a three-layer lateral circulation structure in the water column during stratified ebb.

Transport in the Hudson estuary: A modeling study of estuarine circulation and tidal trapping

The external parameters of the scenario are given in.

Numerical modelling of the Sydney Harbour Estuary, New South Wales: Lateral circulation and asymmetric vertical mixing

The local horizontal coordinates of this transverse section are defined to be positive upstream x axis and positive to the north y axis. During the flood, tidal currents destratify the water column and increase the thickness of the bottom mixed layer. In the lower reaches of the estuary, the grid spacing is approximately 300 m in the along-channel direction and 100 m in the across-channel direction.

Drivers of Residual Estuarine Circulation in Tidally Energetic Estuaries: Straight and Irrotational Channels with Parabolic Cross Section in: Journal of Physical Oceanography Volume 41 Issue 3 (2011)

Response to variations in river flow and to neap-to-spring changes in tidal forcing must await future analyses. Values for the reference scenario are marked with a circle.

The Influence of Lateral Advection on the Residual Estuarine Circulation: A Numerical Modeling Study of the Hudson River Estuary in: Journal of Physical Oceanography Volume 39 Issue 1 (2009)

Because the scaling of the residual estuarine circulation has an inverse dependence on these coefficients, a decrease in their value suggests that there are processes adding to the residual estuarine circulation that are not accounted for in the scaling. Strong stratification suppresses vertical mixing in the deep channel, whereas the shoal above the halocline remains relatively well mixed. In all cases, the spatial correlation between these two terms is positive albeit weak in some cases, indicating that these two mechanisms are inducing a similar sense of shear in the subtidal flow through the estuarine cross section.

Numerical Modelling of Barotropic Circulation Processes

Citation: Journal of Physical Oceanography 41, 3; Sensitivity of a , b longitudinal logarithmic scale and b , d lateral linear scale residual exchange profiles to a , c the Simpson number Si and b , d the unsteadiness number Un as variation of the reference scenario 01. The black curve is local residual profile γU_r .

Numerical Modeling of Estuarine Circulation in the Geum River Estuary, Korea

The scientific approach chosen here, using a two-dimensional cross-sectional plane forced with a constant in time and space salinity gradient, has the strong advantage that high numerical resolution can be obtained at reasonable computational cost, thus minimizing discretization errors. Because both have to balance across the estuary, the baroclinic pressure gradient forcing dominates in deeper water and the barotropic pressure gradient dominates in shallower water. All velocity profiles have zero bottom velocity, which is consistent with the no-slip bottom boundary condition.

Modelling circulation and vertical mixing in estuaries

The TVD numerical scheme offers the best representation of the stratification under high river discharges. The black curve is local residual profile γU_r .

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