



## **Sediment transport capacity under the river–tide interaction in the Changjiang Estuary**

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Sediment transport capacity is a fundamental parameter in sediment transport theory and its accurate calculation is important from both theoretical and engineering viewpoints. The capacity of sediment transport has been studied extensively by many researchers in the last decades. Nevertheless, the underlying mechanism behind sediment transport capacity in estuaries remains poorly understood. The current study aims to explore the impact of the river-tide interaction on sediment transport and establish a formula of sediment transport capacity under the river-tide interaction. The impact of the river-tide interaction on the hydrodynamics and sediment dynamics in the Changjiang Estuary is analyzed, a practical method for describing the variation in tide-runoff ratio is established, and a formula of sediment transport capacity considering the impact of river-tide interaction is proposed by introducing the tide-runoff ratio. The new method bridges the gap between two well-known sediment transport capacity methods by considering the variation in the index  $a$  for the gravitational term and overcomes the drawback of distinguishing flood/dry season or spring/ebb tide in the calculation of estuarine sediment transport. A large amount of flow and sediment data obtained from the Changjiang Estuary were collected to verify the proposed formula. The effect of salt-fresh water mixture and morphological evolution on sediment transport capacity of the Changjiang Estuary were discussed.