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# 考虑采砂影响的鄱阳湖丰水期悬浮泥沙浓度模拟*

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**摘　要**: 针对受采砂活动影响显著的鄱阳湖高浑浊水体,结合数值模拟和遥感技术,利用已有的鄱阳湖采砂区遥感监测结果,在构建的鄱阳湖水动力-悬浮泥沙输移模型中添加泥沙点源,对2011年7月1－31日采砂影响下的鄱阳湖丰水期悬浮泥沙浓度进行数值模拟. 利用悬浮泥沙浓度实测数据和MODIS影像反演结果对模拟结果的有效验证表明,考虑采砂影响后,悬浮泥沙浓度模拟值与实测值具有强相关关系,确定性系数为0.831,均方根误差为15.5 mg/L,悬浮泥沙浓度空间分布趋势与遥感反演结果基本一致. 模拟结果显示,采砂活动对鄱阳湖南部主湖区、河流入湖口影响较小,其主要影响由南向北,经棠荫以西和松门山岛以北航道、入江水道延伸到湖口区域,是鄱阳湖北湖区高浑浊水体形成的重要原因.
**关键词**: 数值模拟;悬浮泥沙;遥感;Delft3D;鄱阳湖

## Numerical simulation of suspended sediment concentration in Lake Poyang during flood season considering dredging activities

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**Abstract**: Numerical simulation and remote sensing are used in suspended sediment concentration simulation during flood season in Lake Poyang, in which water turbidity is highly affected by dredging activities. With the aid of Landsat ETM+ images, the location of main dredging areas and ships are detected. Several sediment point sources are added in dredging areas in the Delft3D model to simulate the suspended sediment concentration including the effects of dredging of Lake Poyang from July 1, 2011 to July 31, 2011. Taking *in-situ* data and suspended sediment concentration retrieved from MODIS images as validation data, there is a good consistence between the simulating and validating results, with $R^2$ of 0.831, a root-mean-square error of 15.5 mg/L and a consistent spatial pattern of suspended sediment concentration compared with suspended sediment concentration retrieved from MODIS images. It also shows less dredging effects in the southern main lake and river inlets but more in the northern from channel in the west of Tangyin and the north of Songmen Mountain, water-way in the northern and the lake outlet, which is one of the main reasons

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