

环境工程 地理学

崇启大桥建成后流场变化及溢油的数值模拟

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摘要 应用三维河口海岸海洋数值模式ECOM, 加入油膜计算模块, 研究长江河口北支崇启大桥建成前后水域流场的变化和主跨航道处溢油事故发生后油膜面积、厚度的变化和漂移轨迹. 结果表明, 大桥建成后对流场的影响主要在桥洞和桥墩处, 其余地方随离桥距离的增加而减小. 在主跨处, 流速最大增大了约48 cm/s, 桥墩处流速减小, 而局部地形的改变也减小了南岸上游点的流速, 并改变了靠近南岸点的流向. 在东南风4 m/s情况下, 大潮落潮时油膜随落潮流向北支口下游漂移, 面积扩大, 厚度减小, 至第6 h油膜已扩散至北支口门; 涨潮时油膜随涨潮流沿北支北侧向上游漂移, 至第6 h到达新春沙中段. 此外, 风向的变化对油膜漂移轨迹和污染程度影响十分明显.

关键词 [崇启大桥](#); [数值模拟](#); [流场变化](#); [油膜漂移扩散](#)

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Numerical simulation of current change and diffusion of oilfilm after the Chongqi bridge construction(Chinese)

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Abstract

Using the 3-D estuarine coastal and ocean numerical model ECOM in the north branch of Changjiang estuary, combined with oil film drift and diffusion module, the current change due to Chongqi bridge project, and the area, thickness, trace of oil film were studied after the oil spill accident happened at the sea-route in waterway. The results of model calculation showed that the main influence on current concentrated on bridge hollow and piers after bridge construction. The current was less influenced as the distance from the bridge increases. The current speed increased about 48 cm/s on the waterway and reduces on the piers. In the case of southeast wind with 4 m/s, with ebb tidal current the oil film drifted to downriver area of north branch during spring tide. To the 6 hr. oil film diffused to the mouth of north branch. During flood tide, to the 6 hr. oil film reached to the middle of Xinchunsha. Moreover, the change of wind speed and direction has a significantly influence on the oil film trajectory and pollution extent in the port.

Key words [Chongqi bridge](#) [numerical simulation](#) [current change](#) [drift and diffusion of oil film](#)

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