

Home > Journal > Earth & Environmental Sciences > JWARP

[Indexing](#) [View Papers](#) [Aims & Scope](#) [Editorial Board](#) [Guideline](#) [Article Processing Charges](#)

JWARP > Vol.1 No.1, May 2009

OPEN ACCESS

3D Water Environment Simulation for North Jiangsu Offshore Sea Based on EFDC

PDF (Size: 883KB) PP. 41-47 DOI: 10.4236/jwarp.2009.11007

Author(s)

Feng LUO, Ruijie LI

ABSTRACT

The underwater topography in the offshore sea area of north Jiangsu is complicated, including the middle radial sand ridges and northern Haizhou bay underwater shoal. Therefore, it forms special marine dynamic conditions and typical shoal wetland ecosystem. Previous researches of these sea areas were mainly focused on the forms of morphogenesis and the characteristic of conformation of sand ridges. Few studies have done on three dimensional hydrodynamic and water quality simulation. This paper introduced EFDC (Environmental Fluid Dynamics Code) to study the tidal current fields, dilution and diffusion of the sewage outlet near Yangkou Port. Comparison between computation results and the observed data indicates that this model could reasonably simulate hydrodynamic fields. Based on the computed tidal current field, the distributions of COD concentration were simulated. The range of contamination diffusion derived from sewage outlet was very limited, and the influence range of sewage came to the maximum when ebb slacks in neap tide period.

KEYWORDS

EFDC, Water Quality, Radial Sand Ridges, Numerical Simulation

Cite this paper

F. LUO and R. LI, "3D Water Environment Simulation for North Jiangsu Offshore Sea Based on EFDC," *Journal of Water Resource and Protection*, Vol. 1 No. 1, 2009, pp. 41-47. doi: 10.4236/jwarp.2009.11007.

References

- [1] Y. Wang, "Radiative sandy ridge field on continental shelf of the Yellow Sea," China Environmental Science Press, 2002.
- [2] Y. L. Zhu, Y. X. Yan, and H. C. Xue, "Hydromechanics for the formation and development of radial sandbanks (I)-Plane characteristics of tidal flow," *Science in China*, 28(5), pp. 403-410 (in Chinese), 1998.
- [3] J. M. Hamrick, "A user's manual for the Environmental Fluid Dynamics Computer Code (EFDC)," The College of William and Mary, Virginia Institute of Marine Science, Special Report, 1996.
- [4] G. L. Mellor and T. Yamada, "Development of a turbulence closure model for geophysical fluid problems," *Reviews of Geophysics and Space Physics*, 20, pp. 851-875, 1982.
- [5] C. F. Cerco and T. M. Cole, "Three-dimensional eutrophication model of Chesapeake Bay," Main Report, Technical Report EL-94-4, Vol. 1, U. S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS, May 1994.
- [6] K. Park, A. Y. Kuo, J. Shen, and J. M. Hamrick, "A three-dimensional hydrodynamic-eutrophication model (HEM3D): description of water quality and sediment processes submodels," The College of William and Mary, Virginia Institute of Marine Science, Special Report 327, pp. 113, 1995.
- [7] F. Luo, R. J. Li, and Y. X. Zhu, "Calculation of hydrodynamic characteristics and sewage diffusion of radial sand ridges in special submarine relief," *Proceedings of the 4th International Conference on Asian and Pacific Coasts*, Nanjing, China, pp. 2041-2050, 2007.

- [Open Special Issues](#)
- [Published Special Issues](#)
- [Special Issues Guideline](#)

[JWARP Subscription](#)

[Most popular papers in JWARP](#)

[About JWARP News](#)

[Frequently Asked Questions](#)

[Recommend to Peers](#)

[Recommend to Library](#)

[Contact Us](#)

Downloads: 402,258

Visits: 1,010,255

[Sponsors, Associates, and Links >>](#)

- [8] F. Luo, R. J. Li, Y. X. Zhu, and J. J. Cao, " Numerical simulation of the tidal currents and the contamination diffusion near xiaoyangkou in radial sand ridges area of the yellow sea," International Symposium on Environmental Science and Technology, Beijing, China, pp. 764-770, 2007.
- [9] Y. F. Li, X. D. Zhu, X. Q. Zou, et al., " Water quality characteristics and ocean-land integrated cybernetics of coastal wetlands in Jiangsu Province," Environmental Pollution and its Prevention and Control, 26(5), pp. 348-351, 2004.