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An integrated regulation of urban water systems: Ideas and practices

Nowadays, how to manage the urban water system is a most interesting topic worldwide, especially in the countries that are facing rapid urbanization where a great amount of money is being invested to improve river water quality and even eliminating river's blackness and foul stench firstly. Based on our practices, factors leading to deterioration of river water quality or improper urban water system, may arise from un-intercepted wastewater discharge, urban drainage overflow due to inappropriate sewage entry into storm drains and low interception capacity on wet-weather days, abnormal low or high influent concentration of waste water treatment plant due to pipe defect associated groundwater infiltration or unexpected untreated industrial wastewater and rainwater entries into sewers, unfavorable river water flowing patterns. Hence, we presented a framework of urban water system and integrated approaches and practices to regulate the water system well. Specifically, we classify the urban water system into urban water drainage system, wastewater treatment plant and river water system. For the urban water drainage system, we emphasize the reduction of pollutant discharge reduction by on-site grey water extraction and reuse, low impact design oriented runoff control, sediment deposition associated high-concentration overflow pollution treatment using the sediment dredging and on-line treatment units and so on. For both urban drainage system and wastewater treatment plant system, we emphasize the detection of sewer or storm water pipe to find the pipe defects locations or inappropriate cross-connected entries using the tracer parameters and therefore correct the malfunctioned pipes. For the river water system, we emphasize the improvement of water flowing patterns by employing natural tidal water energy and artificial hydraulic structures control. We also presented how to depict the detailed components of each sub-system, which is a basis for developing optimized regulating model of urban water system.

Biography

Zuxin Xu has completed her PhD from Hohai University in 1988 and Postdoctoral studies from Tongji University in 1997. She was the Director of Shanghai Environmental Protection Bureau form 2003 to 2007 and Vice Chairman of Science and Technology Commission of Shanghai Municipal People's Government from 2007 to 2016. She is currently the Counselor of Shanghai Municipal People's Government. Her main research interests are integrated catchment management and rehabilitation, urban drainage pollution control, ecological wastewater treatment, hydrodynamics and water quality modeling. She has published more than 200 papers in peer-reviewed journals and international conferences. She has been serving as an Executive Editorial Board Member of *Journal of Hydrodynamics*. She is presently the EXECUTIVE MEMBER of Chinese Society for Environmental Sciences.

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