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Identifying and classifying pollution hotspots to guide watershed management in a large agricultural multiuse watershed

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Large reservoirs are important source of water for domestic, agricultural and industrial use. Reservoir hydrology and water quality are central to the provisioning of these services and both are largely determined by the upstream watershed. Improved watershed management can be achieved by classifying sub watersheds by intensity and type of pollution threat and developing targeted management measures. In this study, we established an evaluation system based on 17 factors representing point and non-point source pollutant potential and environmental carrying capacity that are likely to affect water quality in the Dahuofang reservoir and watershed in northeastern China. We used entropy-based methods to rank 118 sub watersheds by potential pollution threat and clustered sub watersheds according to potential pollution type. As expected non-point source pollution is the most serious factor affecting water quality across the larger watershed, however combining ranking and clustering analyses allowed us to suggest specific areas for prioritized watershed management (in particular two sub watersheds with the greatest pollution potential) as well as to recommend conservation of current practices in other less vulnerable locations (91 small watersheds with low pollution potential). Finally, we identified the factor most likely to be influencing water quality for each of the 118 sub watersheds and suggest adaptive control measures for each location. These results provide a scientific basis for improving watershed management and sustainability for the Dahuofang reservoir as well as a framework for identifying threats and prioritizing management in the watersheds of large reservoirs around the world.

Biography

Fangli Su has completed her PhD and Postdoctoral studies from Shenyang Agricultural University. She is the Vice-Director of Liaoning Shuangtai Estuary Wetland Station, a national Ecological observation & research station. She has published more than 30 papers and serving as an Editorial Board Member of repute.

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