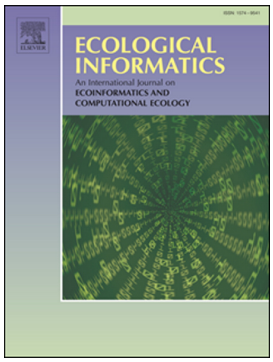

Remote sensing of water quality based on HJ-1A HSI imagery with modified discrete binary particle swarm optimization-partial least squares (MDBPSO-PLS) in inland waters: A case in Weishan Lake

Yin Cao, Yuntao Ye, Hongli Zhao, Yunzhong Jiang, Hao Wang, Yizi Shang, Junfeng Wang

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Remote sensing of water quality based on HJ-1A HSI imagery with modified discrete binary particle swarm optimization-partial least squares (MDBPSO-PLS) in inland waters: A case in Weishan Lake

Yin Cao [a,b], Yuntao Ye[b*], Hongli Zhao[b], Yunzhong Jiang[b], Hao Wang[a,b], Yizi Shang[b], Junfeng Wang[a]

[a]*College of Environmental Science and Engineering, State Environmental Protection Engineering Center for Pollution Treatment and Control in Textile Industry, Donghua University, Shanghai 201620, China;*

[b]*Department of Water Resources, China Institute of Water Resources and Hydropower Research, Beijing 100038, China.*

Abstract: Remote sensing has been recognized as an effective tool to monitor water quality in inland waters. An adaptive model coupled with a modified discrete binary particle swarm optimization algorithm utilizing the catastrophe strategy and partial least squares (MDBPSO-PLS) was developed to retrieve the water quality indexes (chlorophyll a (chl-a), total suspended matter (TSM), and turbidity) in Weishan Lake. Based on the selective bands for water quality retrieval, the proposed MDBPSO algorithm was compared with original DBPSO and Genetic Algorithm (GA) in order to validate the feasibility and efficiency of the proposed algorithm. The comparison results indicated that MDBPSO with the catastrophe strategy could avoid the premature convergence phenomenon of DBPSO algorithm. The hyperspectral data from HJ-1A Hyperspectral Imager (HSI) selected by MDBPSO were utilized to establish the PLS model by correlating the spectral data with measured water quality parameters. Then the established PLS model was compared with the PLS

* Corresponding Authors: Yuntao Ye, Department of Water Resources, China Institute of Water Resources and Hydropower Research, Beijing 100038, China. E-mail: yeyuntao@iwhr.com