

Distribution of phosphorus adsorption in surface sediment at a river confluence in Huaihe River basin, China

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Surface sediment at a river confluence may act as sinks or sources, and thus may have a significant effect on contaminant distribution in aquatic systems of the network. The distribution of phosphorus (P) adsorption in surface sediment at a river confluence in Huaihe River basin (China) is characterized by field surveys for one year. The results show that the grain size of surface sediment and the concentration of soluble reactive phosphorus are the most important factors affecting the spatial variability of P in surface sediment. The mixing layer can reduce the difference of SRP concentration and grain size between the two combining flows, and thus influence the distribution of P downstream till the complete mixing of the two flows. The distance of complete mixing can be decreased by the distortion of the mixing layer and the complex bed morphology as they can increase the transverse mixing of the two flows. P enrichment occurs in the mid-stream scour hole where the downwelling flow lies. The downwelling flow may improve the hyporheic exchange and induce more P to be absorbed onto the bed sediment at channel confluences. These results are beneficial to understand and predict the distribution of P adsorption in surface sediment at channel confluences. Some limitations for their application are also discussed.