

The effect of small impoundments on nutrient transport in a suburban watershed

Yuta Shimizu^{1*}, Shin-ichi Onodera¹, Koki Onishi¹, Mitsuyo Saito², Masashi Yoshikawa¹

¹Graduate School of Integrated and Arts Sciences, Hiroshima University, ²Center for marine environmental studies, Ehime University

There are small impoundments on streams such like weir in the worldwide. In spite of large number of them, the effect of those on nutrients retention is little understood. The objective of this study is to confirm effect of small impoundments on nutrient transport on a catchment scale. Seasonal variation of DN:Cl- ratio which indicates that the ratio increased in summer season and decreased in winter season was confirmed at impoundments. The result of relationship between residence time and difference of concentration of nitrate indicates that greater decrease of nitrate confirmed when it has relatively long residence time. Especially, attenuation of nitrate would start from 2 days of residence time, which is shorter than days that large impoundment start from 8-10 days. Therefore, it is suggested that small impoundments are more effective for nitrate attenuation than large ones. In contrast, the relationship with difference of concentration of DN shows that there is a possibility that the large impoundment could be changed from sink to source. However, small impoundment is easy to maintain itself than large reservoir as dams, by dredging of sediment and removal of colonies of phytoplankton. For conservation of water environment in watersheds which are loaded anthropogenic nitrogen, the small impoundments should be used as places for purification of nitrogen in meaning of a kind of reservoir operation.

Keywords: small impoundment, residence time, nitrogen removal, Yamato River