Hysteresis paterns of streamwater nitrate concentration in a nitrogen saturated catchment near Tokyo City, Japan

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We made a continuous observation of streamwater chemistry in a small forested catchment, where typical nitrogen saturation has been demonstrated (Yoh et al.2001). Water samples were collected from a small stream with an interval of 8 hours over a year and discharge was monitored automatically every 10 minutes.

The results showed that the NO3- concentration was 70~150µM in winter, and 100~560 µM in summer, which are much higher than those observation in non-polluted site in Japan (Hirose et al.1988) as well as other countries.The discharge concentration relationship in most solutes had clockwise hysteresis, whereas the hysteresis for NO3- was counter-clockwise. Generally, the NO3- concentration showed large diffrences between the increasing and decreasing limbs of the hydrograph for the same instantaneous discharge. This fact suggested that the NO3- accumulation in this catchment was large and that NO3- concentration increased with the increase in discharge and in the discharge decreasing process, NO3- concentration was still high for a several hours. Such a discharge charactoristics suggested that NO3- discharge may largely depend on rain event. We estimated that the budget of NO3- in this watershed from two methods: 1)a calculation using an average concentration and total amount of precipitation and discharge, 2)that from each data of concentration and discharge. The difference in the amount of NO3- discharge and the possible NO3- discharge dynamics will be discussed.