

Spatial and temporal distribution of NO₃-N in river waters in Shimosa Upland, Chiba Prefecture

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NO₃-N in the environmental water has been increasing in many places in the world because of human activity, especially by agriculture. Upland regions in Chiba prefecture is extensive crop area and much amount of NO₃-N is expected to add in hydrologic cycle. Observation of surface water for NO₃-N concentration was made in 2008 at different seasons, and examined for spatial distribution and time changes in NO₃-N concentration.

NO₃-N concentration is high in late spring (May), and low in autumn or winter. This implies the mechanism of hydrologic cycle in upland watershed, however, the subject remains as future research.

Changes in NO₃-N concentration is characterized by series of land use and topography. Succession of i) Residential area - paddy field, ii) crop field - paddy field is possible in view of land use. Succession of i) upland with gently sloping plane - valley bottom, ii) upland - valley head - valley bottom are classified in view of topography. At residential site of upland, NO₃-N is low, and increase to some point. This increase means the outflow of groundwater with high NO₃-N concentration. At valley head, groundwater with high NO₃-N is directly discharged to valley bottom. This explains the high NO₃-N at the most upper sampling point near valley head. The pattern of land use and topography can be the clue to estimate NO₃-N concentration of river waters.

Overall NO₃-N concentration in upland watershed is rather high, and exceed environmental standard at some point. This means that the upland is the pool of NO₃-N, however, groundwater is the water in the region. The water should be conserved for safe life of local residents. NO₃-N monitoring of environmental water should be done continuously.