

Spatial distribution of dissolved iron in stream water and soil water in wetland and forested catchments in Russia

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Concentration of dissolved iron (Fe) was investigated in catchments of the Amur river in Russia. The relationships between Fe concentration and topography/vegetation of the watershed were examined. The water samples including stream and soil waters were collected at about 20 sites in July and September 2006. The samples were then analyzed for dissolved iron, dissolved organic carbon (DOC), ferrous iron, and so on.

Dissolved Fe concentration in stream water was high (1 to 5 mg/L) in wetland (peatland) area and low (less than 0.5 mg/L) in forested area. Dissolved Fe concentration in stream water showed a negative correlation with altitude, suggesting that topographic factor plays an important role in dissolution of Fe.

Fe concentration in soil water was also high (10 to 30 mg/L) in wetland soil and low (less than 0.5 mg/L) in forested soil. Although there was a positive correlation between Fe concentrations in soil water and stream water, the concentration levels of Fe in stream water were less than those in soil water.

Chemical form of dissolved Fe was mainly organic-complexed form and ferrous iron was found at insignificant concentration for most samples. Dissolved Fe concentration in stream water showed a strong positive correlation with DOC concentration in stream water, suggesting that dissolved Fe was organic-Fe complex. The molar ratio of DOC to Fe was about 51.3.

These results suggest that wetland is important area as the source of Fe and that dissolved Fe is probably organic-complexed form. To make DOC concentration linked with its catchment characteristics can be an important issue for further research.

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