

Analysis for Relationship between the Land Use of the Watersheds and the Marine Nutrients in the Rivers using Remote Sensing and GIS (Understanding for each and integrated ecosystem using remote sensing, 6th International Symposium on Integrated Field Science)

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Analysis for Relationship between the Land Use of the Watersheds and the Marine Nutrients in the Rivers using Remote Sensing and GIS

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The main supply of nutrients for the phytoplankton at a coastal ocean is considered river water from land area. The nutrients of river water are influenced by the land use in the basin. Therefore, we studied the relationship between the land use of the river basin and river nutrients.

Study area was the Kitakami River, which lies in northeast of Japan. TERRA / ASTER and LANDSAT / TM data observed from 2000 to 2004 were used to determine the land use at the river basin. The concentration of nitrogen and phosphorous were obtained from the website of Ministry of Environment in Japan and there were 57 sampling points. First, we made land use map of the Kitakami River basin. We classified the land use into 8 classes that were coniferous forest, broad-leaved forest, mixed forest, paddy field, cultivated field or grassland, wasteland or bare soil, urban area and water area. Next, we determined the basin of each sampling point and calculated the rate of land use area in each basin. Finally, we compared the rate of land use area with the concentrations of nitrogen and phosphorous.

There were positive significant correlations between the concentration of nitrogen and the area rate of paddy field in autumn and winter, as well as between the concentration of nitrogen and the area rate of cultivated field or grassland, wasteland or bare soil, and urban area respectively in all seasons. There was a negative significant correlation between the concentration of nitrogen and the area rate of broad-leaved forest. Furthermore, we found positive significant correlation between the concentration of phosphorous and the area rate of paddy field, and also between the concentration of phosphorous and the area rate of cultivated field or grassland, and urban area.

It was supposed that the agricultural area and urban area would increase the river nutrients and the broad-leaved forest would decrease them.