

Comprehensive and quantitative assessment of nitrate dynamics in two contrasting rivers along the Sea of Japan by using nitrate dual isotopes

*Ryo Sugimoto¹, Tomoko Tsuboi¹, Motoko Fujita²

1. Faculty of Marine Biosciences, Fukui Prefectural University, 2. Center for Southeast Asian Studies, Kyoto University

The Kita and Minami Rivers are non-urbanized adjacent rivers which are located in the central Japan facing to the Sea of Japan. Recent deposition rates of atmospheric nitrogen onto the two river basins are serious. However, export ratios and their seasonality of atmospheric nitrate versus microbial nitrate from forest soils to streams have not yet been quantified. Furthermore, influence of local nitrogen sources and internal biogeochemical processes are still unclear. To elucidate the influence of watershed properties and atmospheric N deposition on nitrate dynamics in two basins, we have conducted seasonal synoptic surveys by using the dual isotopes of nitrate. Nitrogen and oxygen isotopes of nitrate showed that nitrate remineralized through nitrification in the forest soil was likely dominant source in both basins from the stream to downstream waters. Moreover, net mass balance calculations showed nitrate supplied from the forest occupied large amounts of nitrate outflows from the two basins to the coastal sea.

Keywords: Nitrate, Stable isotopes, Nitrogen saturation, Land-sea interaction