

Mass transport process in Seto Inland Sea catchment

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The objective of this research is to confirm the mass transport process in Seto Inland Sea. Previous studies had been indicated significant nutrient load by groundwater as well as larger nitrate emission by river.

1) We conducted the river runoff measurement and nutrient load monitoring at 15 coastal catchments in the various season with the extraction of topographic parameter from the topographic map. We found that water convergence degree of catchment (Wc) controlled the river runoff. In addition, we suggest that this relationship is able to distinguish the discharge path in a catchment to river runoff and groundwater type. The catchment with high Wc has the property, such as deep valley, wide width, or large area. Such catchment is the river runoff type. Because nitrate load is depended by river runoff, such classification is important. The relationship between the Wc and runoff varied in various seasons. These were related to monthly rainfall. The runoff in the catchment with high Wc increased with the monthly rainfall, as compared with that with low Wc. We suggested the effect of topography and rainfall on nitrate transport in coastal catchment

2) Our research area are mainly three catchments. Those were composed of one urban area, Takehara city, and two rural area, Shimo-Kamagari and Shiranui. Shiranui is in Kumamoto prefecture with annual rainfall of 2000mm, and the others are in Hiroshima prefecture with that of 1100mm. Mixing with sea water were confirmed in coastal hyporheic zone of all sites, using Cl- tracer. In Takehara, groundwater flow of both directions was observed in the hyporheic zone around the estuarine. Nitrate concentration in groundwater was very low in the hyporheic zone of all sites. This indicated that no nitrate load is from shallow groundwater to sea in these sites. We could confirm the nitrate elimination in coastal hyporheic zones.