渇水リスク地域における水の再利用と栄養塩濃度空間分布
Water reuse and Spatial distributionof Nutrient in drought risk area, Marugame plain

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Global warming causes climate change in recent years and Japan is no exception. Risk of water shortages is increasing around the West Japan. The annual precipitation in Seto Inland Sea climate area is from 1000 to 1600 mm. Especially, the Kagawa prefecture receives only about 1082 mm of precipitation per a year. This value is the loweat in that area. The people have formed agricultural zone where they do original custom of water use (agriculture ponds and shallow groundwater)for decreasing drought risk. But groundwater contaminated with nitrate nitrogen matters in agricultural zone in Japan. The cause is mainly chemical fertilizer or compost and barnyard manure. In Kagawa prefecture, shallow groundwater is repeatedly used for agriculture. So, nutrient is condensed in shallow groundwater. But, Kagawa prefecture has many agriculture ponds in Japan and nutrient is consumed in agriculture ponds.
However, it doesn’t reveal how is spatial distribution of nutrient in Surface water-groundwater chain system area. So, We confirmed spatial distribution of nutrient and water stable isotope ratio and revealed the effect of too much water use to water environment in this study area, Marugame plain.
The result indicates Kanakura-river in Marugame plain is affected by depuration
Shallow groundwater results show groundwater in upstream area contaminates with nitrate nitrogen by fertilizer, but groundwater in downstream area decrease nitrate nitrogen concentration by denitrification.
Agriculture ponds water’s oxygen isotope ratio and chloride ion concentration
increase from upstream area to downstream area in Marugame plain. This result indicates that agricultural water eveporate. Nutrient balance considering eveporation in pounds show that supply of nutrient is higher than consumption of that in agriculture pounds in upstream area, but agriculture pounds in downstream area show opposite results. It can be said that purificating function of agriculture pounds is valid and the system which controls nutrient flowing to Seto Inland sea.

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