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Long-term Changes Of Nutrients In River Water

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We studied the long-term changes of the concentrations and forms of nitrogen and phosphorus in river water flowing into the Sea of Harima and the Bisan-Seto, where are located in the eastern part of the Seto Inland Sea, Japan. The data of continuous monitoring plan conducted by Hyogo and Okayama Prefecture since 1970’s and Kagawa Prefecture since 1980’s were collected. The concentrations of nitrogen and phosphorus in the most rivers of Hyogo and Okayama Prefecture indicated a decreasing trend as a whole, when we compared the average concentrations of nitrogen and phosphorus in the last half of 2000’s with those in the 1970’s except for several rivers. Especially, the most of urban rivers, which had been polluted heavily by domestic waste water and industry effluent, have been drastically improved. On the other hand, in the quarter part of rivers in Kagawa Prefecture, the concentrations of nutrients have increased in the last half of 2000’s than the last half of 1980’s. Ammonium nitrogen in total nitrogen remarkably decreased in each river. This shows that nitrification process in a sewage plant works well. A sewage processing in each prefecture has been developed since 1970’s in each prefecture. For instantly, the percentages of treatment on domestic effluent in Hyogo Prefecture is more than 98 %, those in Okayama Prefecture about 69 %, and those in Kagawa Prefecture about 80 %. The precipitation has not shown the increasing trend in Hyogo and Kagawa Prefecture and the decreasing trend in Okayama Prefecture during the period between 1976 and 2011. As a discharge of river is related with precipitation, it may be constant or decreasing in long-term. Therefore, the loadings of nutrients from rivers in the watershed of the Sea of Harima and the Bisan-Seto may decrease. These results due to actual measurement in long-term showed that the loadings of nitrogen and phosphorus from the watershed of the Sea of Harima and Bisan-Seto have been successfully cut by a total amount control for COD, nitrogen, and phosphorus based on Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea.