Interannual variation in the activity of biological pump in the northwestern North Pacific.

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It is considered that the environmental variation with global warming has occurred in the oceans. We have measured ^{234}Th and particulate organic carbon (POC) in surface layer in the Western Subarctic Gyre of North Pacific since 1997. ^{234}Th is a valuable tracer for studying the rates of particle-associated scavenging processes and the subsequent particle export from the euphotic zone. POC flux estimated from ^{234}Th and new production estimated from seasonal variation in nutrient tend to decrease interannually in this region. In addition, alkalinity and the ratio of drawdown of Si to N also show a decreasing trend. Therefore, we assumed that the efficiency of biological pump and ecosystem of phytoplankton in surface layer had changed interannually for the past one decade in the Western Subarctic Gyre.