

Environmental history of living marine resources and fluctuation of fisheries resources

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While about 20-year periodic fluctuation of seawater nutrient and oxygen concentrations synchronous with 18.6-year nodal tide have been observed in the subarctic and subtropical oceans in the North Pacific, fisheries resources around Japan showed 20-year and about three times 50-70 years (sardine, common mackerel, jack mackerel, etc.) fluctuations. There is a possibility that the 18.6-year nodal tide effects on the fisheries resources fluctuations through climate, water mass formation, and prey plankton productions. For comprehensive understandings and high skill predictability of long-term fluctuations of nutrient cycles, marine ecosystems, and fisheries resources, it is important to elucidate the mechanisms of phenomena connected to 18.6-year nodal tide. In 2015, a new project entitled "Ocean mixing processes (OMIX), impact on biogeochemistry, climate and ecosystem" started. As a planning research "Environmental history of living marine resources and fluctuation of fisheries resources" was formed. In this presentation, we will introduce the study plan. We aim to elucidate direct and indirect influences of the long-term fluctuation of ocean mixing processes caused by 18.6-year nodal tide on fisheries resources by high resolution isotope analysis of fish juvenile otoliths and marine ecosystem-fish coupled models.

Keywords: ocean mixing, long term fluctuation, ecosystem model, fish growth-migration model