

Variability and mixing of the Kuroshio and impact on ecosystem and fisheries

*Ichiro Yasuda¹, Takahiro Tanaka¹, Haruka Nishikawa²

1. Atmosphere and Ocean Research Institute, The University of Tokyo, 2. JAMSTEC

The Kuroshio is spawning and nursery grounds of many kinds of fish and sustains world-largest fishing grounds around Japan, although nutrient (especially nitrate) is depleted in the subtropical North Pacific. Nutrient supply process peculiar to the Kuroshio could sustain the Kuroshio ecosystem. Decadal to inter-decadal variability of the Kuroshio also has a tremendous impact on ecosystem and fisheries, especially for the Japanese sardine (*Sardinops melanostictus*). In the period from large sardine population to declining phase during 1980s and 1990s, sardine recruitment is related to the variability from winter to spring in the frontal zone just north of the Kuroshio axis, where vertical mixing and nitrate upward flux are enhanced. We review research on the sardine variability including recent phase of the growing population and nutrient supply by enhanced vertical mixing on the basis of recent observations performed along the Kuroshio under the Japanese 5-year project “Ocean Mixing Processes: Impact on Biogeochemistry, Climate and Ecosystem (OMIX)” .

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