

## Development of a fish migration model for pelagic species

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The Kuroshio and Oyashio regions in the western North Pacific are important spawning and nursery grounds of various fish species, such as sardine, anchovy and chub mackerel, and also good fishing ground. The environmental conditions affect fish productivity in the regions. For example, in the Pacific stock of Japanese sardine, both of temperature during the larval stage and prey availability during the early juvenile stage are important factors regulating their survival and recruitment processes. Growth rates during the larval and juvenile stages are directly affected by environmental conditions, such as temperature and forage density, playing a key role in survival dynamics. Predation is recognized as the major source of mortality during these stages, although environmental factors are linked to survival potential. Therefore, survival process is controlled by multiple factors. This complexity makes it difficult to understand survival dynamics in relation to environmental fluctuations. In the present study, we tried to develop a fish migration model considering the prey-predator interaction between anchovy (prey) and skipjack tuna (predator) with environmental conditions in the western North Pacific, and discussed the importance of prey-predator interaction as a determinant of fish distributions.

Keywords: fish migration model, anchovy, skipjack tuna, prey-predator interaction