

Environmental monitoring by fishing boats to predict resource distribution in Ise Bay

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It is important to understand and predict fish behavior to assess the impacts of coastal development on ecosystem or to conduct appropriate fishery management. In order to collect information for understanding fish behavior, we attempted to measure the environmental factors and the distribution of fish simultaneously by using fishing boats. The memory-type sensors were attached to the fishing gear of the small trawling boats in Ise Bay, Japan, through which the water temperature, salinity, and dissolved oxygen were measured as well as position information by GPS. At the same time, fish catch of each haul by trawling were recorded to grasp the fish distribution. The obtained data provides much more information for temporal and spatial distribution of water qualities than conventional monitoring. The relation between the fish density indicated by CPUE (Catch Per Unit Effort) and environmental factors are also analyzed. For example, CPUE of conger eel becomes high at 18-20 °C of water temperature, and around 2 mg/L rather than higher value of dissolved oxygen. These results well explain the location of fishing ground based on the fishermen's experiences, e.g. conger eel tends to gather in marginal areas of hypoxia in summer. The obtained information will be useful to determine the parameters in fish behavior model. We are also trying to predict resource distributions by an artificial neural network using the obtained data.

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