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Defining fishing spatial strategies from VMS data: Insights from the world's largest monospecific fishery

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Abstract

Understanding the spatiotemporal behavior of fishermen at the fleet scale is key for defining effective strategies for fisheries management. Here we classify the spatial patterns exhibited by fishing trip trajectories in the world's largest monospecific fishery, the Peruvian anchovy fishery. Our goal is to identify spatial strategies and their possible changes over 2000–2009. The data comprise more than 350,000 fishing trips, recorded using a vessel monitoring system. On-board observers monitored a small fraction of those trips (>2000), providing data for inferring the type of activity (fishing, searching, and cruising) from the position records, for use in a state-space model. Each fishing trip was characterized by its duration, maximum distance to the coast, geographical extension, and time spent fishing, searching and cruising. Using clustering techniques, we identified four types of fishing trips, associated with differences in management among regions, fleet segments, and skippers' behavior. The methodology could be used to investigate fishing spatial strategies using VMS trajectories in other fisheries.

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