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## Fine-scale structures as spots of increased fish concentration in the open ocean

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Oceanic Lagrangian Coherent Structures have been shown to deeply influence the distribution of primary producers and, at the other extreme of the trophic web, top predators. However, the relationship between these structures and intermediate trophic levels is much more obscure. In this work we contribute to address this knowledge gap by comparing acoustic measurements of mesopelagic fish concentrations to satellite-derived fine-scale Lagrangian Coherent Structures in the open ocean. The results demonstrate that higher fish concentrations occur more frequently over stronger Lagrangian Coherent Structures. Quantile regression analyses reveal that Lagrangian Coherent Structures represent a limiting condition for high fish concentrations. Therefore, while the presence of a fine-scale feature does not imply a concomitant fish assembly, increased fish densities are more likely to be observed over these structures. Finally, we discuss a model representing fish movement along Lagrangian features, and specifically built for mid trophic levels. Even though it was not possible to validate it with the available data, its results, obtained with realistic parameters, are consistent with the observations. These findings may help to integrate intermediate trophic levels in trophic models, which can ultimately support management and conservation policies.