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Inferring the annual, seasonal and spatial distributions of marine species from combined research and commercial vessels' catch rates

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The complexity of the ecosystem approach to fisheries involves taking into account a set of components and their interactions, starting with fishermen and the exploited resource. The objective of this study is to analyse at fine scale the annual, seasonal and spatial distributions of several species in the Eastern English Channel (EEC). On the one hand, data obtained by scientific surveys are not available all year through, but are considered to provide consistent abundance indices across years and space. On the other hand, on-board commercial data do cover the whole year, but generally provide a biased perception of stock abundance. We determined the spatial and monthly dynamics of fish distributions in the EEC by combining data from scientific survey and commercial vessels. Considering the scientific survey as a repository, commercial CPUEs were standardized using a delta-glm model and then compared with survey-based fish distribution using the Local Index of Collocation. Consistency between survey data and commercial data is significant for half of the 19 tested species, and notably for red gurnard, whiting, cod and dab, and allow reconstructing spatial and seasonal abundance fluctuations for these species. For the other species, the results were inconclusive, mainly due to poor survey coverage and/or to particular aspects of the species biology. Combining both commercial and scientific data allows us to obtain fine seasonal distribution patterns of a high number of species, and constitutes a breakthrough in this gap of knowledge at moderate cost.

Keywords: spatial distribution, seasonality, commercial data, survey data, Eastern English Channel

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