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Bio-physical interactions can shape populations

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Abstract

Bio-physical interactions can shape the structures and dynamics of populations. Open populations are well mixed over hundreds to thousands of kilometres. In contrast, closed populations exchange few individuals through immigration and emigration. The closure of marine and estuarine populations at surprisingly small spatial scales is increasingly being reported. Interactive biological and physical mechanisms determine the spatial scales of population closure. Examples of biological mechanisms include animal behaviour and pelagic larval duration, while physical mechanisms include large and small-scale currents and tides. Multidisciplinary studies are often required to determine the causal mechanisms of population closure. In this presentation I will discuss the results of multidisciplinary studies that have utilized genetic analyses, laboratory and field experiments, and/or biophysical modelling to elucidate the spatial scales separating closed populations, and to identify the factors isolating the populations. I will largely focus on marine and estuarine jellyfish populations.