

TEMPERATE FLATFISH SPECIES MOVE TO DEEPER WATER TO AVOID THE INCREASED SUMMER TEMPERATURE IN COASTAL WATERS OF THE NORTH SEA

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Changes in spatial distribution in a variety of fish species have been related to recent increase in temperature. In the North Sea, both a pole ward shift and a shift to deeper water have been observed. Here we report the results of a comparative study of the changes in distribution of three flatfish species as recorded in the annual bottom trawl surveys carried out in the North Sea in late summer since 1985. The distribution was related to the bottom temperature estimated by a calibrated hydrodynamic model. We analysed the distributed in relation to temperature at the time of the survey as well as with the maximum bottom temperature at the trawl position. Our study showed that the boreal species plaice, *Pleuronectes platessa*, and dab *Limanda limanda* moved to deeper water and maintained the temperature, while the Lusitanian sole *Solea solea* experienced an increase in temperature while maintaining its depth distribution. The response differed between the size classes reflecting the preference for higher temperature of the smaller size classes. The results lend support for a direct response of the fish to the maximum temperature which occurred before the time of the data collection.