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Multi-beam sonar and echosounder to study schooling behaviour and predator-prey interactions of marine animals

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During the last decades the technological developments and improved spatial and temporal resolution in hydro-acoustics, have made it possible to study schooling and aggregation behaviour of fish and predator-prey interactions in considerable detail. Hydro-acoustic methodology have thus revealed new and interesting scientific findings on animal behaviour and ecology previously difficult to observe and document from the marine environment. A fundamental challenge is still to be able to track individual fish within a school or animal aggregation at the same time as we observe the collective movements. The spatial resolution of hydro-acoustics is usually not sufficient enough to track individual fish within dense aggregations. Under-lying mechanisms and motivations of individual animals swimming in aggregations are needed, in order to improve our understanding and predictability of collective behaviour. Improved post-processing programs for quantitative analysis of multi-beam sonar data are also needed. High-resolution underwater cameras, Crittercam-technology and individual tagging will offer complementary data sources to our understanding of detailed behaviour of marine animals. I will present synoptic ecological studies using multi-beam sonar and echosounder on schooling behaviour and predator-prey interactions including fish, seabirds and marine mammals.