

New applications of hydroacoustic methods for monitoring shallow water aquatic ecosystems: the case of mussel culture grounds



The development of acoustics tools and methods for monitoring anthropized ecosystems represents a new field for the application of acoustics. Monitoring such an environment was not possible with single vertical echo sounders, due to the fact that the artificial structures and the natural targets were not distinguishable. Monitoring data were collected along the French Mediterranean coastline, during five short surveys of mussel culture longline areas. Both the Reson Seabat 6012 multibeam sonar (455 kHz) and the Simrad SR 240 omnidirectional sonar (23.75 kHz) were used for target detection. The former tools allow accurate allocation of the different types of echoes to artefacts, fish schools and scattered fish. The school characteristics collected included morphological, geographical (GPS, school location), and behavioural (connections with the longlines). An acoustic survey undertaken with the same hardware near the study area allowed the comparison of fish schools and the TS distribution of individual fish in the open sea and in the mussel area. These data permitted us to evaluate the ecological impact of a mussel culture on the ecosystem, in a context of

predation behaviour of fish on these longlines. Finally, the acoustic data revealed the configuration of each concession and the level of charge of each line. We discuss the applicability of this technology for in situ real time monitoring for joint management of such ecosystems. The information can allow littoral cooperative management or incorporating it into an ecosystem approach.

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