Diurnal variation in fish density estimate during acoustic surveys in relation to spatial distribution and avoidance reaction

The diurnal cycle in density measured during acoustic surveys is difficult to investigate quantitatively from the data set of a single survey because the signal depends mainly on the spatial variability and/or horizontal fish migrations. In order to detect the diurnal cycle in spite of the noise due to spatial variability, several acoustic surveys from different tropical countries were combined, after standardization, into a single data base. A diurnal cycle is observed, with the highest values during the night and the lowest during the day. The transition periods are very short (less than one hour). Different hypotheses relative to fish behaviour or to acoustic biases are discussed. Among these hypotheses the lateral avoidance of schools by day and the diurnal change in patchiness seem predominant. Moreover, owing to the extreme skewness of the density distribution the applicability of the Central Limit Theorem is discussed.

Auteurs du document : Pierre Fréon, Marc Soria, Christian Mullon, François Gerlotto
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