High-resolution acoustic indices of Atlantic herring (Clupea harengus) paving the way for inclusion of migration patterns in management considerations of herring in ICES Divisions IIIa and SD 22-24

Herring catches in the Western Baltic, Kattegat and Skagerrak consist of a mixture of stocks; the two predominant stocks are the spring-spawning Western Baltic herring stock and the North Sea autumn-spawning herring (NSAS), and the mixing follows an age- and season-dependent pattern with high variability. The management is currently based on a single TAC and all catches are split into stock components prior to the single stock-assessment process. Given the complexity, knowledge of the magnitude of the mixing would improve the ability to perform sound forecasts of the herring stocks in the area. Thus a high-resolution stock-segregated survey index is highly warranted. Since 1991, DTU-Aqua have been acoustically monitoring herring in Skagerrak and Kattegat, ICES Division IIIa, as a part of the international acoustic survey for herring in the North Sea and adjacent waters. For the years 2006–2011 the two major herring stocks have been separated in the abundance estimate based on a combination of otolith microstructure and otolith shape. The abundance estimates by ICES rectangles have been used to describe the yearly geographical distribution of the herring stocks separately by age groups, mean length, and mean weight during June–July. This time-series (2006–2011) when analysed as a whole, gives a general picture of the distribution of the two herring stocks in Skagerrak and Kattegat during June–July and can ultimately be used as input to a description of the migration pattern for the two herring stocks.

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