

Multi-decadal changes in spawning ground use in Northeast Arctic haddock: Climate or Harvest induced?

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Over the last decades, a northward shift in spawning ground use has been reported for Northeast Arctic (NEA) cod. This shift has been attributed to either climate warming or demographic size truncation caused by disproportional removal of large individuals by harvesting. The relative importance of these two mechanisms in driving the northward shift in cod spawning is debated. NEA haddock belongs to a species closely related to cod and have a life history similar to NEA cod. In particular, NEA haddock undergo a similar spawning migration as NEA cod and has also been intensely harvest several decades. Here we examine changes in NEA haddock spawning location; also to shed further light on the NEA cod controversy. We analyse data on haddock eggs from the Russian ichthyoplankton survey covering 35 years from 1959-1993. By combining this data set with a hydro-dynamical particle-tracking model for haddock eggs we link observations of eggs with different haddock spawning grounds estimate trends in spawning intensity across the different spawning grounds. Harvesting pressure and sea temperature is compared with the estimated spawning intensity across the spawning grounds to enhance the understanding of the possible cause of decadal variations in spawning in these migratory fish.

Keywords: Haddock, Spawning, Harvesting, Climate warming

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