

Computational aspects of fish migration models

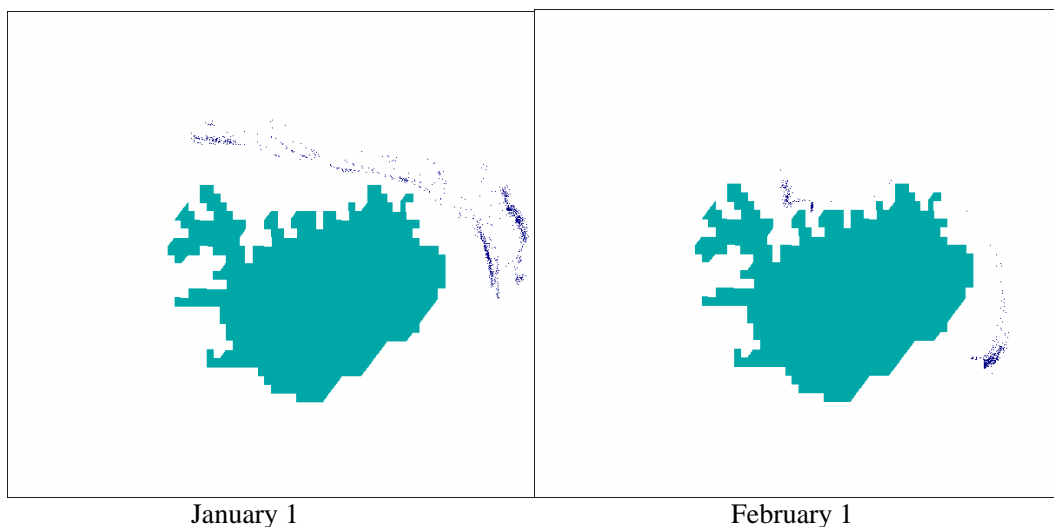
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Abstract

We describe some different types of computational models for migration patterns of pelagic fish. These models are the result of a research project directed by Kjartan G. Magnússon at the Science Institute, University of Iceland, from 2000 until 2004. The modelling was guided by the migration behaviour of capelin both in the Barents Sea and in the seas around Iceland, but the main motivation was to assess what factors had to be taken into account so that these models could reflect the migration behaviour, be computationally effective, and could be incorporated into larger models of fish stock assessment.

This talk focuses mainly on the computational aspects of these models. We describe how a finite element approach, where the seas are divided into small triangular elements, provides an effective basis for the computational solution, both for particle models where the fish schools are simulated by a collection of particles, and for continuous models where they are described by a continuous density function. We also describe briefly how the models may be incorporated into more general stock assessment models.



Model calculations of possible migration patterns for capelin