Integrated ecosystem model of Icelandic waters

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Knowledge about ecosystem dynamics, species interactions and human influences is essential before implementing ecosystem based fisheries management. One way to try to understand such a complex ecosystem is to build an ecosystem model that integrates physical, chemical, ecological and anthropogenic processes. This has been done for the marine ecosystem around Iceland using the Atlantis modelling framework. We present the design and parameterization of the model, which includes a biophysical and a fisheries model. The model is in three dimensional layout and covers an area of 1,600,000 km^2 that has been divided into 36 active boxes and each box can have up to seven layers including a sediment layer. A hydrodynamic model (CODE) has been built for this area and is used as basis for the oceanography in the Atlantis model, which subsequently controls the advection of plankton and nutrients. The biological model has 52 functional groups: 25 are vertebrates with some at a species level, 16 invertebrates, 6 primary producers, 2 bacteria and 3 detritus groups. The Atlantis model also incorporates a fisheries model which includes 11 fishing fleets all with its one characteristics such as selectivity, target species and by-catch. The aim is to produce a realistic model of the ecosystem that can be used for scenario testing and for management strategy evaluation.

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