A demonstration model of the North Sea pelagic ecosystem

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Ecosystem models are representations of our understanding of those ecosystems and can be used as analysis tools to reflect on patterns in collected data. Sensitivity and uncertainty analyses after a calibration effort shed light on which parts of the ecosystem are not fully understood or quantified using the data at hand. However, calibration of even a simple ecosystem model is a tedious job. A graphical user interface that immediately visualizes the response of a model to changes in parameters can be a useful tool to get acquainted with the model's behavior and speed up this process.

Here, we present a demonstration model with an intuitive graphical user interface (GUI), written using the Shiny framework of the R Statistical Software. The model is written in Fortran and can be called from an R scripting environment using a wrapper function. In addition, the GUI allows for changing parameters in an interactive manner, enabling the modeler to explore the model's behavior. Parameter sets can be loaded and saved in R data files and made available for use in the standard R scripting environment.

The model with all its accessory functionality is available as an add-on package that can be loaded in R Studio Server sessions of the Blue-Cloud Virtual lab on carbon-plankton dynamics.

Keywords
Modeling; North Sea; Graphical User Interface; Calibration