A brief history of ERSEM and ERSEM-BFM

The European Regional Seas Ecosystem Model (ERSEM I) was first developed in the early 1990s as part of an EU-MAST project (CT90-0021) by Job Baretta, Piet Ruardij and Hanneke Baretta-Becker (Netherlands Institute for Sea Research ), Wolfgang Ebenhӧh and Cora Kӧhlmeier (Carl von Ossietzky University), Jerry Blackford and Philip Radford (Plymouth Marine Laboratory), Hermann Lenhart, Gunther Radach and Jan Backhaus (Institut für Meereskunde (Hamburg), Ramiro Varela and Antonio Cuzado (Center of Advanced Studies Blanes, Spain), E. Koch Rasmussen (Ecological Modelling Center at Danish Hydraulic Institute, HorsHolm, Denmark), Andy Bryant, Niall Broekhuizen, and Mike Heath (University of Aberdeen), and Bill Gurne (University of Strathclyde ,Glasgow).

The first ERSEM implementation was a box model programmed in FORTRAN77 in the software environment SESAME, and could be used for a single box or applied to a linked set of ICES boxes in the North Sea. The model was further developed as ERSEM II in EU-MAST project MAS2-CT92-0032-C, which included refinement in the spatial boxes.

In the early 2000s, Marcello Vichi re-coded ERSEM in Fortran95, following a flux-based approach to solve the equations. This new version was named Biogeochemical Flux Model (BFM), and coupled to the 3D hydrodynamics model GETM. This implementation was tailored for mediterranean and ocean applications.

In parallel, Piet Ruardij modified BFM to include processes relevant for temperate shelf seas, in collaboration with Cefas. Johan van der Molen added a sediment resuspension model to improve the light-climate simulations. This version is called ERSEM-BFM, and was used for model applications in the 2010s.

The version available in this repository is newly coupled to a more recent version of GETM, and was created by Johan van der Molen. In creating this coupling, a substantial number of bug fixes was included.

Other ERSEM versions

In the 2000s, PML and Proudman Oceanographic Laboratory (POL) in Liverpool coupled ERSEM II to POLCOMS and later to NEMO. In the early 2010s, PML made a new implementation of ERSEM II around the generic coupler FABM (FABM-ERSEM).

In the early 2020s, INGV, Bologna made a FABM-compatible version of BFM.