Consortium

Partners:

Royal Belgian Institute of Natural Sciences (RBINS), Management Unit of the North Sea Mathematical Models (MUMM), BE [coordinator]

Université Libre de Bruxelles (ULB), Ecologie des Systèmes Aquatiques (ESA), BE

Institut français de recherche pour l'exploitation de la mer (IFREMER), Département Dynamique de l'Environnement Côtier (DYNECO), FR

Université Pierre et Marie Curie (UPMC), Structure et fonctionnement des systèmes hydriques continentaux (SISYPHE/METIS), FR

Institute of Marine Research (IMAR), PT

Collaborators:

Universität Hamburg (UHAM), Department of Informatics Scientific Computing, GE

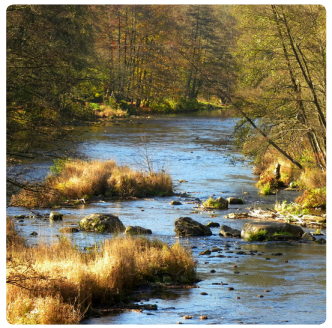
Deltares, NL

Centre for Environment, Fisheries & Aquaculture Science(CEFAS), UK

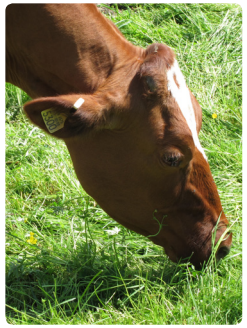
Expected results

This modelling work will allow to scale human vs natural influences in marine eutrophication, and to inform about appropriate future management choices with:

- Innovative ecological indicators.
- Description of eutrophication problems in the North-East Atlantic and their causes.
- Comparison of the current eutrophication status with a "pristine" status.
- Realistic future scenarios for watershed management, and impacts at sea.



EMoSEM's outcome will be transferred to Member States responsible for Water Framework Directive (WFD) and Marine Strategy Framework Directive (MSFD) operations, and to the OSPAR Commission.



Funding

The EMoSEM project (2013-2014) is funded by the Belgian Science Policy Office (BELSPO) and the French Research Agency (ANR) in the frame of the EU-FP7 ERA-NET Seas-era program (http://www.seas-era.eu)

More information

Coordinator:
Geneviève Lacroix, RBINS-MUMM
G.Lacroix@mumm.ac.be

Website: http://www2.mumm.ac.be/emosem/

E-mail: emosem@mumm.ac.be

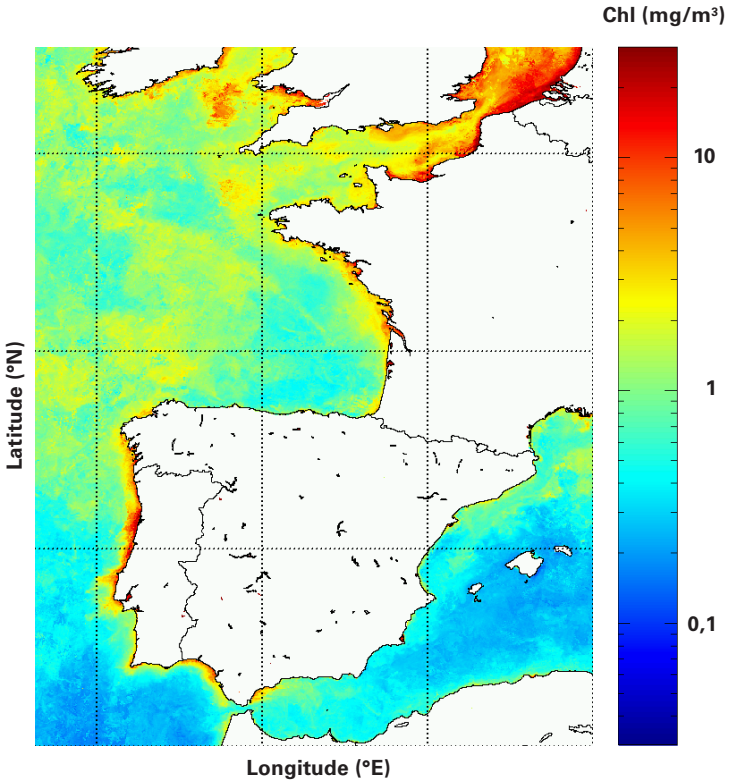
EMoSEM

ECOSYSTEM MODELS as SUPPORT to Eutrophication Management in the North Atlantic Ocean

Towards Integrated Marine Research Strategy and Programmes
EU FP7 ERA-NET Seas-era

Context

A major challenge in EU marine governance is to reach the "good environmental status" (GES) in the North-East Atlantic (NEA). This area is facing several eutrophication problems that have been linked to the growing human pressure in the watershed. Human activity delivers excess nitrogen and phosphorus to the river system that reach the coastal zone after having been processed along the land-ocean aquatic continuum.
Mitigating coastal eutrophication problems needs to identify the major anthropogenic N and P nutrient sources, their transformation paths along their transfer to the coastal sea and the ecological response of the coastal ecosystem to these nutrient alterations.



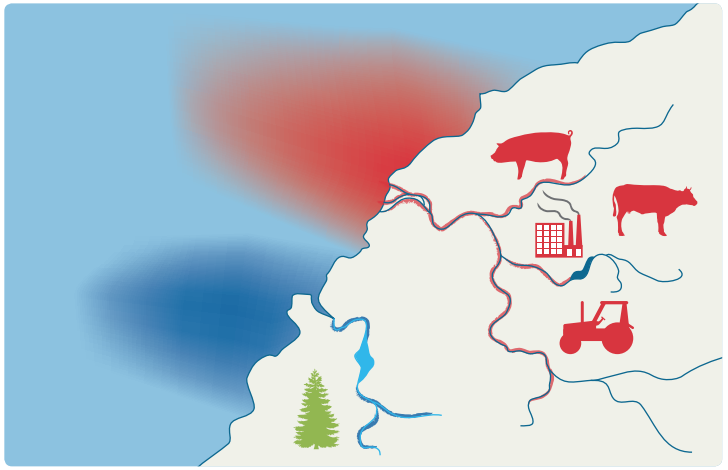
Meris chlorophyll a concentration (percentile 90) in 2011.

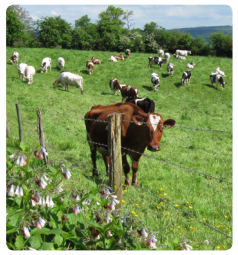
Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM

MarCoast
a GMES Services Network

Objectives

- Suggest innovative ecological indicators to account for Harmful Algal Blooms in the GES definition.
- Estimate the 'GES' target for each coastal zone
- Identify "realistic" scenarios of nutrient reduction in the river watersheds of the North-East Atlantic.
- Assess the impact of the "realistic" scenarios in the sea, and compare to GES requirements.





Methodology

Marine ecological models will be used to track the nutrients in the sea, and trace back their riverine or oceanic sources with the transboundary nutrient transport method.

A generic watershed model will be constructed for the NEA rivers and will be coupled to existing ecological models of specific coastal areas to describe present-day coastal bloom developments.
A pristine-like scenario will be run to scale current coastal eutrophication problems in each coastal zone and identify specific GES targets.
Specific 'tracking methods' will be used to trace the natural vs anthropogenic origin of excess nutrients in specific area.
Diverse "realistic" nutrient reduction scenarios (where different urban wastewater treatments and agricultural practices are combined) will be run and their ecological efficiency will be estimated by comparison with the GES targets.