Seventh Framework Programme Theme 6 Environment

Collaborative Project (Large-scale Integrating Project)

Project no. **212085**

Project acronym: **MEECE**

Project title: **Marine Ecosystem Evolution in a Changing Environment**

D1.2 Initial conditions, boundary conditions and forcing functions

Due date of deliverable: 31.08.09
Actual submission date: 25.06.09; **updated November 2010**
Organisation name of lead contractor for this deliverable: CNRS

Start date of project: 01.09.08 Duration: 48 months

Project Coordinator: Icarus Allen, Plymouth Marine Laboratory

Project co-funded by the European Commission within the Seventh Framework Programme, Theme 6 Environment		
Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants (including the Commission)	
RE	Restricted to a group specified by the consortium (including the Commission)	
CO	Confidential, only for members of the consortium (including the Commission)	

D1.2 Initial conditions, boundary conditions and forcing functions

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A. Global Modelling with IPSL-CM4-PISCES to provide initial and boundary conditions to the regional modellers

The PICSES global model will provide the regional models with initial conditions / forcing fields / boundary conditions for physical environment variables, saturation state related to CaCO3, nutrients concentrations and plankton biomass for past and future climate scenarios.

A crucial forcing function for regional models which is often poorly defined are the land derived inputs. We will compile a MEECE relevant database of fluvial inputs of freshwater, nutrients, alkalinity and organics from important European rivers from existing databases (e.g. Waterbase, FRIEND).

The following time slices and conditions have been agreed and defined .

A1. Scenario and Time-slices:

Scenario: A1B
Time-slices: 1980-2000 and 2080-2100 (optional: 2030-2050)

For 1980-2000, the choice has been made to use the global simulation LU20C2
For 2080-2100, the choice has been made to use the global simulation LUA1B2

A2. Physical Variables (forcing, initial conditions, boundary conditions):

(Provided through the IPSL website: http://mc2.ipsl.jussieu.fr)

Simulation LU20C2:
High Frequency Output, Atmospheric Variables:
Monthly means Output, Oceanic Variables:

Simulation LUA1B2:
High Frequency Output, Atmospheric Variables:
Monthly means Output, Oceanic Variables:

2.1 For the atmospheric variables (high frequency):

List of variables:

u	Zonal wind (at different pressure levels)		m/s
u10m	Zonal wind at 10m		m/s
v	Meridional wind (at different pressure levels)	m/s	
v10m	Meriodinal Wind at 10m m/s		m/s
t2m	Temperature 2m		K
t	Temperature (at different pressure levels)		K
q	Specific humidity (at different pressure levels)	kg/kg	
q2m	Specific humidity 2m		kg/kg
slp	Sea Level Pressure		Pa
psol	Surface Pressure		Pa
precip	Total Precipitation		kg/(s*m2)

cldt	Total cloudiness	no unit
LWdownOR	LWdown. at surface	W/m2
SWdownOR	SWdn at surface	W/m2

Provided on a dods server:

1980-2000:
http://dods.extra.cea.fr/data/p86denv/IPSLCM4_v2/LU20C2/ATM/Analyse/TS_HF

2080-2100:
http://dods.extra.cea.fr/data/p86denv/IPSLCM4_v2/LUA1B2/ATM/Analyse/TS_HF/

2.2 For the oceanic variables (monthly)

List of variables:
TEMP
SALT

(see README file for units)

Monthly mean on the original ORCA2 grid.

Provided on a dods server: http://dods.extra.cea.fr/data/p48bopp/MEECE/IPSL/

A3. Biogeochemical variables (initial and boundary conditions):

List of variables:
Alk,
DIC,
Nutrients (NO3, PO4, Si, Fer, NH4),
Dissolved Organic Carbon
O2

(see README file for units)

Monthly mean on the original ORCA2 grid.

Provided on a dods server: http://dods.extra.cea.fr/data/p48bopp/MEECE/IPSL_PISCES/

For any questions / remarks: please contact Laurent Bopp Laurent.Bopp@lsce.ipsl.fr

B. MEECE relevant riverine databases and MEECE dataportal

A crucial forcing function for regional models which is often poorly defined is the land derived input. We have compiled a MEECE relevant meta-database of fluvial inputs of freshwater, nutrients, alkalinity and organics from important European rivers from existing databases. In addition to providing the latest information for contemporary and hind-cast models, the datasets will be used to guide the MEECE model scenario testing, these perturbation envelopes will be determined from a synthesis of climate model and observational data relevant to the ranges of river discharge. A dedicated MEECE dataportal has been set up and is online available (http://www.meece-dataportal.info/). The dataportal

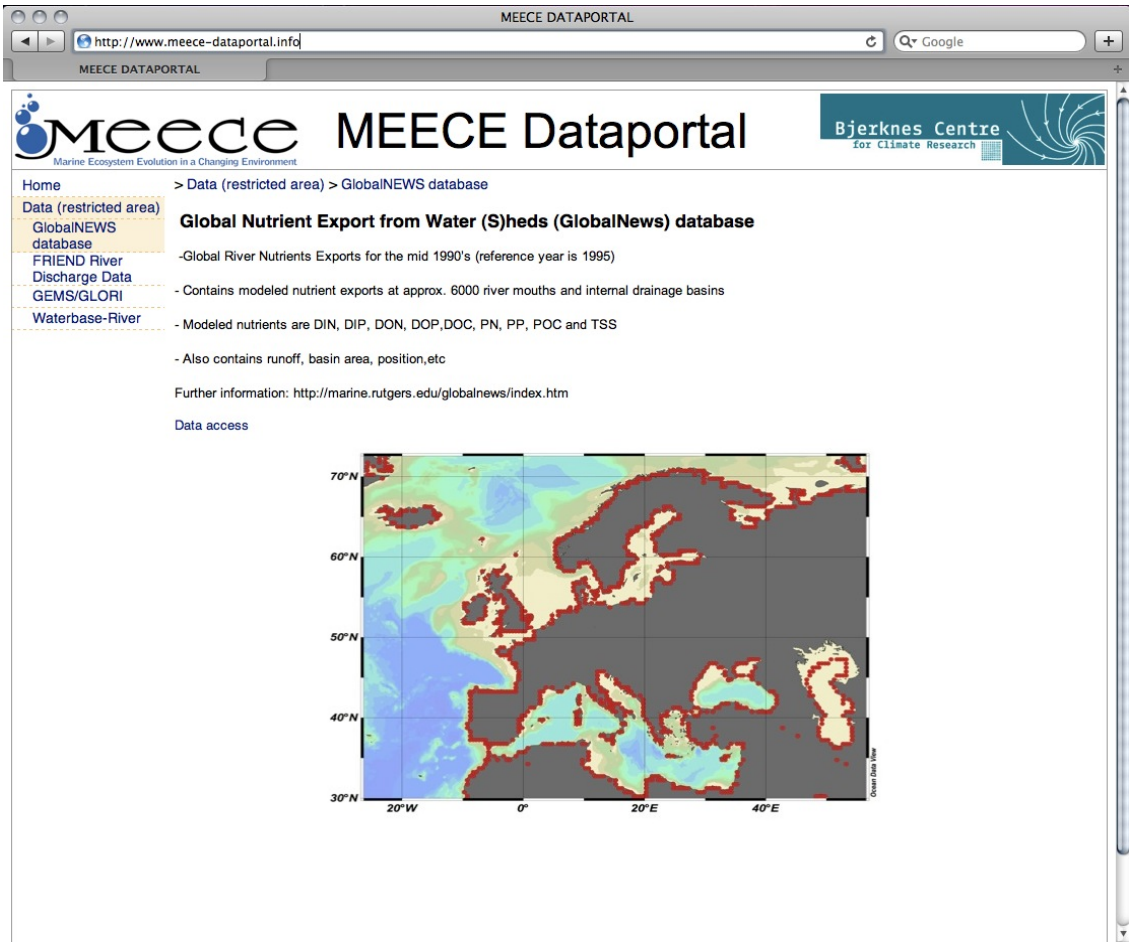
gives access to different databases that are being used to compile the MEECE database as described in T1.2 of WP1.

Data access is password protected and limited to MEECE partners due to intellectual property rights as demanded by data originators of the different databases.
Please use the following login information to get access to the password protected site of the dataportal:

User name: MEECE
Password: *Please contact Jessica Heard at jessh@pml.ac.uk for a password*

Through this data portal, MEECE partners have access to the databases of GlobalNEWS, FRIEND river discharge database, GEMS/GLORI and Waterbase-River – detailed information is provided below. The database development will run throughout the MEECE project period responding to new data-archaeological finds and to the growing needs of the MEECE modelling community. Furthermore the EU project SESAME has been invited to collaborate and share relevant databases.

In addition to the present access to the datasets identified in this document. By month 20 all data will be merged in a single dataset and digitally available. This MEECE relevant database will be made available via a MEECE data warehouse which will be set up by month 22 2010. The MEECE data warehouse will be a state-of-the-art online tool that will allow queries of the MEECE database by area, time and parameters.



Screenshot of the MEECE dataportal

B1. Global Nutrient Export from Water (S)heds (GlobalNews) database

Summary/source: GlobalNEWS is a database of global river nutrients exports data with the reference

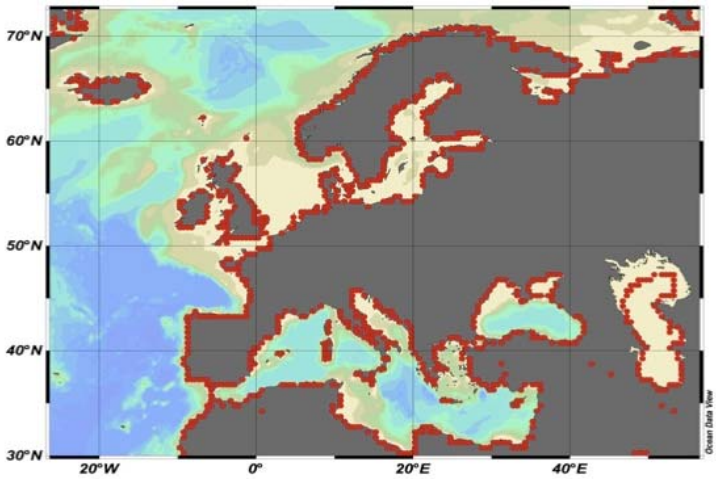
year 1995. It contains modeled nutrient exports at approx. 6000 river mouths and internal drainage basins. For further information please visit http://marine.rutgers.edu/globalnews/index.htm

Parameters/variables: Modeled nutrients DIN, DIP, DON, DOP, DOC, PN, PP, POC and TSS; runoff, geographical information

Format: Data is available as a GIS shape file and as an Excel spreadsheet along with metadata.

Data access: Data access is limited to MEECE partners.

http://www.meece-dataportal.info/front_content.php?idcat=506&lang=24



Overview of the GlobalNEWS database of modeled nutrients

B2. Flow Regimes from International Experimental and Network Data (FRIEND River Discharge data)

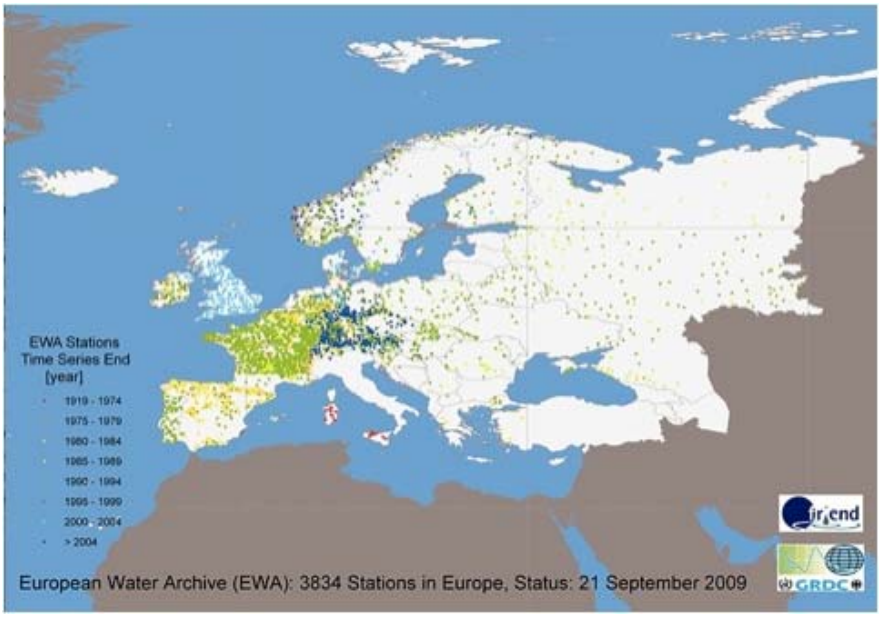
Summary/source: Data is extracted from the European Water Archive (EWA), which is the most comprehensive hydrological archive in Europe. It contains daily flow data and catchment information for about 4000 river gauging stations on 29 countries. For further information please visit http://ne-friend.bafg.de/.

Parameters/variables: Runoff; geographical information

Format: Data is available as a txt file for each station.

Data access: Data access is limited to MEECE partners.

http://www.meece-dataportal.info/front_content.php?idcat=507



Overview of FRIEND River Discharge Data

B3. GEMS/GLORI (Global Register of River Inputs) database

Summary/source: GEMS/GLORI register is a global database compiled by M. Meybeck and A. Ragu in 1996. Unfortunately it has never been officially published but it is available as draft print version. It contains geochemistry data for more than 550 rivers on a global scale. For further information please visit http://iahs.info/redbooks/a243/iahs_243_0003.pdf.

Parameters/variables: carbon parameters (DIC, DOC, TDC, TOC, POC); nutrients (dissolved, particulate, total); major ions

Format: Data is available as a PDF and will be digitalized by month 20 of the MEECE project.

Data access: There are no restrictions to access the data.

http://www.meece-dataportal.info/front_content.php?idcat=508&lang=24

B4. Waterbase-River

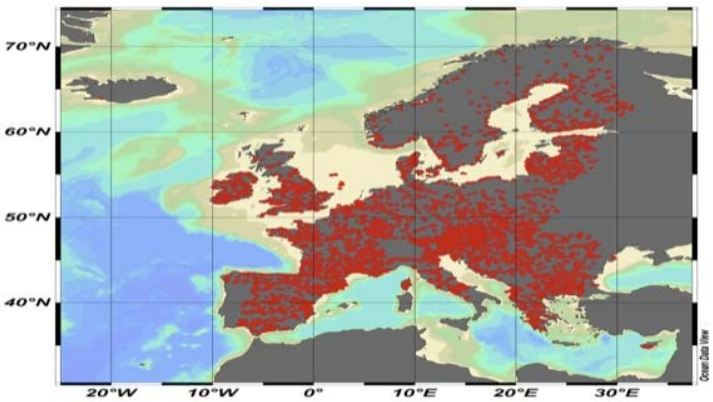
Summary/source: Waterbase-River database consists of approx. 3500 stations which are sub-samples of national data compiled by the European Environment Agency (EEA). Observational data is aggregated annually and seasonally.

Parameters/variables: TOC, pH, O_2, Chl. A, N, NO_2, NO_3, PO_4, etc

Format: Data is available as a Microsoft Access database.

Data access: There are no restrictions to access the data.

http://www.eea.europa.eu/data-and-maps/data/waterbase-rivers-3



Overview of the Waterbase-River stations