Environmental Marine Information System for Europe (EMIS) and Africa (AMIS)

URL: http://emis.jrc.ec.europa.eu/
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Purpose of application

The Environmental Marine Information System for Europe (EMIS) and Africa (AMIS) provides the user community with an appropriate set of bio-physical information, of importance to conduct water quality assessment, resource monitoring and climate change studies in the European Seas and coastal and marine waters around Africa. The system consists of simple and easy-to-use mapping tool applications, created for the publication and dissemination of marine information via the web. It relies on best quality Earth Observation satellite and modeled data to generate indicators for regional diagnostic of the coastal state and analyses of changes in marine ecosystems. The system has basic navigation and interrogation tools with a range of time-series and statistical analysis generated automatically in a format ready for publication / reporting, and enabling decision makers to make full and lasting use of this information.

Geographic extent

European seas (Lat. 30N-66N; Long. 13W-43E)
African window (lat. 50S-40N; Long. 30W-60E)

Target audience

Environmental State agencies, researchers, environmental managers, industries in marine and coastal sectors, consultants, and interested citizens.

Data included (general categories)

Number of data sets: 21 [optical and thermal satellite data; hydrodynamic model outputs (EMIS only); environmental indicators (EMIS only); including 4 optional layers]
Information on:

- Biological features such as chlorophyll biomass and water productivity,
- Physical features such as sea surface temperature and salinity,
- Eutrophication indicators, e.g. oxygen depletion risk index, eutrophication sensitive areas (EMIS)
- Rivers and basin catchments
- Jurisdictional delineations of marine waters.

Distinguishing features

- **Variable selection tools**:

The GIS page contains a series of controls for the selection of the variable to be displayed. Variables are defined on monthly and annual basis over the time-series available. Additional layers can be activated through check boxes.

- **Map Navigation tools and identification of Region of Interest (ROI):**

A list of predefined regions has been inserted to easily visualize the main European basins. ROI can be identified on a single geo-located pixel or rectangular box. A dynamic mask can be applied to restrict the visualization of a variable within a specific range of values.

- **Statistical Analysis tools:**

Three types of statistical analysis can be performed on the selected ROI:
- Basic statistics (min., max., mean values, standard deviation, histogram)
- Spatial analysis (threshold function, correlation)
- Temporal analysis (time-series, inter-annual variability)

Example:

Marine /coastal productivity around Africa (primary production in $gC.m^{-2}.d^{-1}$) as derived from the satellite-based sensor MODIS-A. (extracted and modified from AMIS)
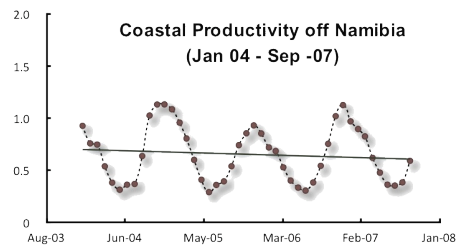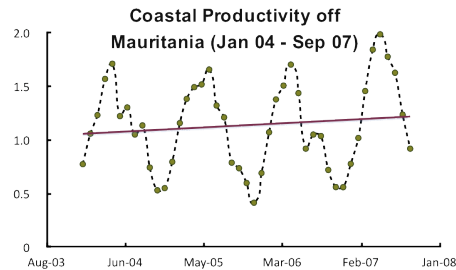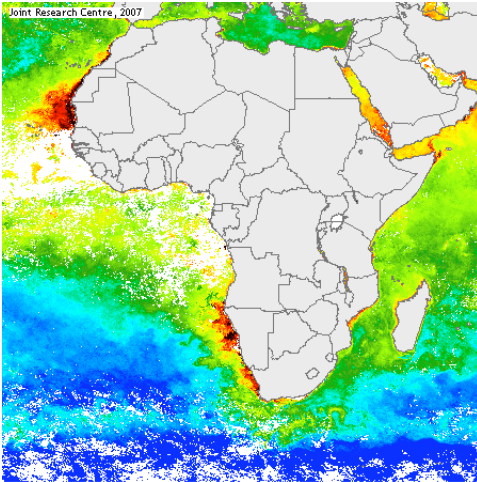
Technology used (web GIS, server, database, content management system?)

The marine information system for Europe is a web-Geographical Information Systems (GIS) based on a UMN MapServer engine (http://mapserver.org/), originally developed for building spatially-enabled internet applications (Vatsavai et al. 2006). It is written in HTML 4.01 Transitional codes, and uses PHP Hypertext Pre-processor tools.

EMIS web GIS support (financial/institutional)

EMIS has been developed at the Joint Research Centre of the European Commission, within the Institute for Environment and Sustainability (IES) in Ispra , Italy. Funding for work on the web GIS comes from the institutional workprogramme of the Global Environment Monitoring Unit of IES.

Challenges encountered
- Ensuring long term technical assistance
- Critical gaps in existing information relevant to coastal and marine issues
- Constantly changing technology
- Constantly evolving web standards
- Link to primary database

Future directions (ongoing and future improvements?)

Planned improvements to the marine web information system include:
- upgrading Mapserver technology,

- adding new data layers and new features,
- updating the existing data base.

Work on EMIS web site is taking several new directions:
- Optimizing statistical analysis and plots
- Exploring options for incorporating more information (e.g. socio-economic, fisheries)
- Re-designing the map display area and navigation tools