

## D2.1.1 Inventory Report



European Commission  
Contract Nr. B4-3301/2001/329175/MAR/B3

IGN France International  
Paris, 31 July 2002

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## FOREWORD

*The preparation of this report has been undertaken as part of Work Package 2 "EUROPEAN LEVEL DATABASE DESIGN AND IMPLEMENTATION" of EUROSION, a project contracted by the European Commission to a consortium led by the Dutch National Institute for Coast and Sea (RIKZ), for the period 2002 – 2004.*

*The following people have contributed to 1<sup>st</sup> and final draft version of this Work Package 2 deliverable : the Inventory.*

- *Hervé Pichon (WP2 leader, IGN FI Project Responsible): Coordination, Writin, Final editing.*
- *Nicolas Rolland (WP2 leader assistant, IGN FI Project Responsible): Coordination, Reading.*
- *Nadège Orlova (WP2 quality assistant, IGN FI, GIS Engineer): Assessing, Editing and Reading.*
- *Stéphane Lombardo (Team Leader, RIKZ): WP2.4.2 and WP2.7 Contribution, Reading.*

## CHAPTER I - METHODOLOGY FOR THE INVENTORY

*This chapter describes the methodology used for inventorying sources of existing Europe-wide datasets, and assessing their consistency with EUROSION terms of references. In particular, the concepts and criteria used to guide this inventory are presented, as well as the strategy for data acquisition and provision. These concepts and criteria are fully compliant with EUROSION Inception Report.*

### I.1. Terms of References : Technical Specifications

A significant part of EUROSION budget is dedicated to inventory, collect and properly integrate relevant Europe-wide data for assessing coastal erosion status and trends throughout Europe and to highlight vulnerability of some local areas to coastal erosion processes and risks of flooding (Work Package 2). This objective is achieved through the development of a Europe-wide GIS database.

In line with the Terms of References (ToR), this database shall be consistent with the following specifications.

#### ***I.1.1. Data format type***

- Geo-coded vector and raster data (GIS)

#### ***I.1.2. Data delivery format***

- Arc/Info export format (.e00) for vector data
- ARC/INFO GRID and BIL for raster data

#### ***I.1.3. Geographic system of representation***

- Reference Ellipsoid IAG GRS80
- Horizontal Reference System : European Terrestrial Reference System 89 (ETRS89)
- Vertical Reference System : based on the European Vertical Reference System 89 (EVRS) upon its representation EVRF2000.
- At this point, no map projection is specified.

#### ***I.1.4. Accuracy tolerance for the geographical data***

- Compliant with the scale 1:100.000
- Planimetric tolerance (Root Mean Square radial error) maximum 20m
- Altimetric tolerance maximum 15m

#### ***I.1.5. Metadata standards***

Metadata standard to be used in the scope of the EUROSION project shall be TC211/ISO 19115 (*cf. D2.3.2. Metadata Standards Analysis and Catalogue Interoperability Study*)

#### ***I.1.6. Geographical extent***

Table 1 summarizes the 22 countries including in the geographical coverage. 13 of them belong to the UE while 9 are applicant countries.

Table 1 - List of EUROSION considered countries

<b><i>EU countries</i></b>	<b><i>EU applicant countries</i></b>
Belgium	Bulgaria
Denmark	Cyprus
Finland	Estonia
France	Latvia
Germany	Lithuania
Greece	Malta
Ireland	Poland
Italy	Romania
The Netherlands	Slovenia
Portugal	
Spain	
Sweden	
United Kingdom	
<b><i>13 countries</i></b>	<b><i>9 countries</i></b>

#### ***1.1.7. Geographical area of interest***

Coastal terrestrial strip including the littoral communes (administratives units) located at less than 10 km from the shoreline, plus coastal water strip from the shoreline to the outer limit of the continental shelf.

## **1.2. Definitions**

In this report, a clear distinction between *Layers* and *Themes* is made. A *Theme*, for example *Hydrography and Infrastructure*, may finally feature several *Layers* - for example *Watershed boundaries, Rivers, Infrastructure* - depending on the results of the inventory. For practical reasons, the themes considered in this report slightly differ from the database description provided in pages 12-13 of EUROSION Inception Report.

#### ***1.2.1. Database thematical structure***

The European Coastal Erosion database is expected to include 15 different themes, as detailed in Table 2.

Table 2 - Description of the different themes to be integrated

Themes (alphabetically sorted)	EUROSION Layer Code
Administrative Boundaries and Shoreline	
Terrestrial Boundaries	WP2.5.1
Maritime Boundaries	WP2.5.2
Shoreline	WP2.5.3
Bathymetry	WP2.4.2
Elevation	WP2.4.1
Geology, Geomorphology, Sedimentology and Evolutionary Trends	WP2.6.x
Hydrodynamics & Sea level	WP2.7.x
Meteorology and Climate Change	WP2.7.x
Hydrography, Infrastructure	WP2.5.4
Land cover	
Land cover 90	WP2.9.1
Land cover changes since 1975	WP2.9.2
Satellite images	WP2.9.3
High ecological value areas	WP2.11
Laws and decrees	WP2.10

### ***1.2.2. Definition of the Coastal/Littoral Area of Interest***

While various definitions of the coastal zone - in terms of distance from the shoreline - can be found in the literature, none of them gives entire satisfaction. Considering the specific problem of coastal erosion, the consortium proposes a pragmatic approach.

To define the ***Littoral Area of Interest (LAI)***, we shall first determine an official coastline, then precise terrestrial and maritime part concerned. Regarding the terms of reference, the terrestrial part must include the littoral communes (administratives units) at least and the water strip shall stretch from the shoreline to the outer limit of the continental shelf.

#### ***1.2.2.1. Adoption of an official coastline for EUROSION***

There are no unique coastline and coastal zone definitions for Europe. In some countries the coastline is an administrative limit, which may be offshore, in others it is a physical limit, which may vary as sea levels fluctuate. So as a consistent coastal zone could be defined for the study, the EUROSION project will make its official coastline the one provided in the GISCO database. Those has been derived from SABE product and validated through either local or global projects such as CORINE LAND COVER, LaCoast, etc. Chapter 2 - Results of the inventory - gives characteristics of the EUROSION official shoreline.

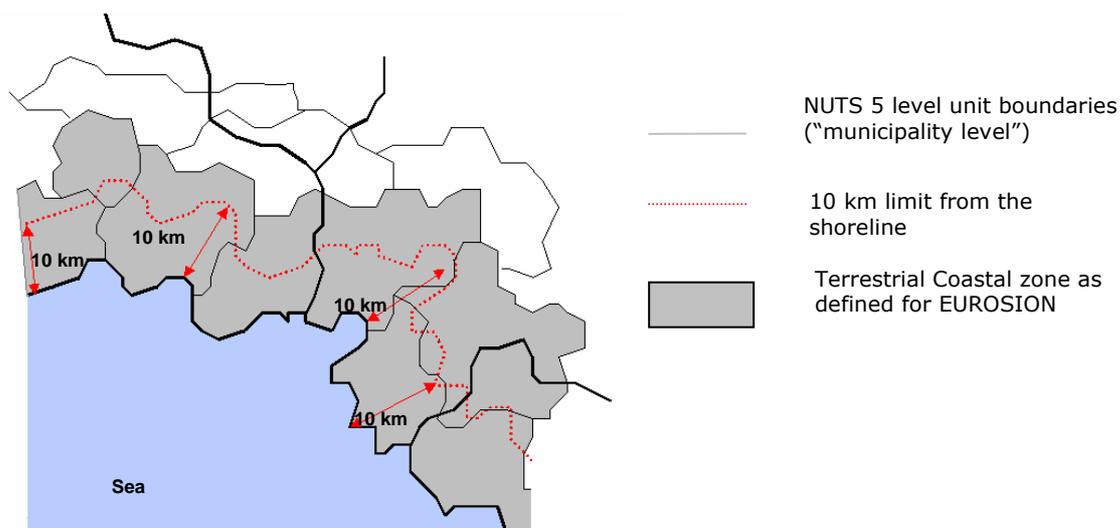
#### ***1.2.2.2. Terrestrial limit of the LAI***

##### *Global Rule*

For the terrestrial part, the NUTS<sup>1</sup> 5 level administrative units located, partly or entirely, at less than 10 km from the shoreline will be taken into account. NUTS 5 level units corresponds to *Commune, Gemeinde, Ward, or Termino Municipal* according to the country considered. NUTS 5 level units may be exceptionally replaced by sub-national level units for those countries whose NUTS 5 level units covers a too large areas (e.g. "parishes" for Sweden) - Figure 1.

**Figure 1 - Territorial littoral zone as defined for EUROSION project**

<sup>1</sup> NUTS : Nomenclature des Unités Territoriales Statistiques  
cf. Chapter 2 – Administratives Boundaries - SABE



### Improvement

For lowlands subject to the risk of flooding (e.g. The Netherlands), the 10 km limit will be extended. This extended limit will be defined by a contour line of a specific altitude (for example 10 meters or 20 meters) to be decided together with the European Topic Centre for Terrestrial Environment (ETC/TE). This contour line will be derived from a Digital Terrain Model (see p. 53)

### 1.2.2.3. Maritime limit of the LAI

As for the maritime part the project extends the maritime claims of European states to the outer limit of the continental shelf. The inventory of Administrative Maritime Boundaries (described later in the chapter 2) also mentions databases containing marine limits like territorial sea, EEZ, Fishery Zones, etc.

A graphic layer will encompass vector maritime boundaries but will be also mentioned the basic maritime conventions texts defining these lines, so as users can rely on.

Table 3 - Maritime claims of some EU member states (source consolidated)

State	Territorial sea (nautical miles, n.m.)	Contiguous zone (n.m.)	Exclusive Economic Zone (n.m.)	Fishery Zone (n.m.)	Continental Shelf
Belgium	12	24	< 200 nm		
Denmark	12		200		200m
Finland	12			12	
France	12	24	200	Specific zones	200m
Germany	12	< 24 nm	< 200 nm		200m
Greece	6				
Ireland	12		200 nm	200	200m
Italy	12				
Netherlands	12			200	200m
Portugal	12	24	200		200m
Spain	12	24	200	Specific zones	200m
Sweden	12				
UK	12		200 nm	200	200m

#### ***1.2.2.4. Islands' integration issue***

As for the insular part distinction shall be done between islands close to the shoreline and ultra-peripheral islands (French *DOMs*, Canary Islands, Azores, Madeira). One of the inventory efforts was to study which territories were present or not in the found datasets (Percentages of coverage per country are shown in Annex). Essential conclusions are:

Amongst five representative data sets can be observed that the presence of islands may vary, depending on the product. This is due mainly to:

- non homogeneous sources of data, e.g. satellite images interpretation vs. vector cartographic database harmonization
- various purposes of the datasets, e.g. drawing administrative boundaries vs. establishing land cover
- rules for defining islands were not identic, e.g. perimeter greater than 500m vs. area exceeds 1 sq.km

The consortium therefore will adopt the following global rule:

- ✓ While updating a database the existing islands will be kept and updated as well.
- ✓ While proceeding to an extension of the existitng data set, the islands to be considered must comply the EUROSION island's definition.

#### ***EUROSION islands' definition***

Official definition coming from EUROSTAT.

Islands to be considered are those which :

- area exceeds 1 sq.km
- population exceed 50 inhabitants
- remote of more than one kilometer from continental territories.

#### ***1.2.3. Geographical extent***

Following the Inception Report's vision, the consortium will not collect data on overseas territories but will make instead a strong effort on accessing countries for which a minimum coverage of 20% of the coastlengths is requested.

Due to heterogeneity of the different data sources to be integrated within EUROSION project, the consortium can not guarantee the strictly identical geographical extent for all themes.

All the geographical extents and/or restrictions for each dataset are described in detail in the inventory sheets of the chapter 2.

**CHAPTER II - RESULTS OF THE INVENTORY**

*This chapter presents the results of the inventory which has been carried out for Work Package 2 "European Level Database Design and Implementation". The methodology of the inventory has been described in the previous chapter. Each Theme is described according to its content, technical characteristics, geographical extent, and access conditions (including price)*

**II Description of the presentation of the results**

For all themes mentioned in Chapter 1 - Table 2, the results are presented theme by theme with the following plan :

**Theme**

**II-1. THEME NAME (ex: ADMINISTRATIVE BOUNDARIES)**

*Relevance of the Theme for EUROSION*

- Abstract, context
- *What is this Theme intended to ?*
- ...

*List of Data sets inventoried*

- *What data sets has been searched ?*
- *What those data sets can be used for ?*
- *List of the data sets inventoried + access to the data set*

**(Meta-) data set**

II-X.y. (Meta-) Data Set Name   

Meaning:

-  DATA SET to be integrated into the database
-  METADATA SET or Metadata on data to be created and inserted into the database
-  DATA SET to be used for quality purposes (quality cross checking)

*Scope and Contents*

Short Description of the inventoried (meta-) data set

*Main characteristics*

- Coordinates
- Quality
- Structure and geometry
- Resolution/Scale

*Copyright and accessibility*

*Geographical Extent and Restrictions*

As for describing the Geographical Extent and show which countries, territories or islands are not covered by the inventoried dataset, acronyms will be used that refers to the countries quoted in the Table below.

**Table 4 - List of European countries shared in two groups**

<b>EU</b>	European Union: Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal, Spain, Sweden, United Kingdom
<b>CEEC</b>	Centre East European Countries: Bulgaria, Cyprus, Estonia, Latvia, Lituania, Malta, Poland, Romania, Slovenia

*Summary sheet*

Data & Metadata	
<i>DATA or METADATA SET NAME</i>	
<u>Description of the Dataset :</u> <i>Brief Summary - Vector/Raster - Scale</i>	
<u>Geographical Extent :</u> <i>main announced or checked covered countries</i>	<u>Restrictions :</u> <i>main announced or checked <u>not covered</u> countries</i>
<u>Providing Terms (for EUROSION):</u> <ul style="list-style-type: none"> <li>- <i>purchasing conditions, price</i></li> <li>- <i>data set already licensed to the EC ?</i></li> <li>- <i>further license to be negotiated</i></li> <li>- <i>other</i></li> </ul>	
<u>Dissemination (through EUROSION):</u> <i>Restricted/Agreed/Conditions</i>	
<u>Copyrights issues :</u> <ul style="list-style-type: none"> <li>- <i>single- or server license, mono- or multi-user, ...</i></li> <li>- <i>to negotiate, copyright mentions on outputs...</i></li> </ul>	
EUROSION Work* on Data & Metadata	

*except Stocktaking, Quality Assessment and metadata documenting...		<ul style="list-style-type: none"> <li>- update</li> <li>- metadata</li> <li>- extension</li> <li>- integration only</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<i>EUROSION LAYER NAME</i>		<i>EUROSION LAYER CODE</i>	
<b>Contact</b>			
Name Company Address		e-mail Tel/fax Web	
<u>Related Links :</u>			

***Relevance of Administrative boundaries for coastal erosion***

Administrative boundaries help to determine the appropriate level of action and identify local stakeholders potentially concerned by coastal erosion. It will also provide the geometrical framework for geo-coding some other layers (e.g. laws and decrees, social and economical profiles).

Maritime boundaries are textual informative data which can be used to determine graphical maritime limits of the Area of Interest, to draw up the limits of Exclusive Economic Zones (EEZ) or Claiming National Areas (Territorial Seas)...

Many coastline definitions can be found in the literature that favour one study or the other. Some should be more appropriate but exclusively significant for erosion purposes at the scale of our study. We assume to adopt for the EUROSION official shoreline the most relevant one, which has been employed in well known products such as GISCO, S.A.B.E, CORINE and has been improved as well.

***List of Data sets inventoried***

- Terrestrial Boundaries :
  - Seamless Administrative Boundaries Database (S.A.B.E.)
- Maritime Boundaries :
  - Veridian Global Maritime Boundaries Database (GMBD)
- Shoreline :
  - GISCO (SABE) Coastline
  - World Vector Shoreline
  - SHOM Product : TCIFMS



**Scope and contents**

The Seamless Administrative Boundaries of Europe (SABE) dataset contains all levels of national administrative units from the highest to the lowest for 29 European nations. The lowest level in European Union member states generally corresponds to NUTS 5 (*Nomenclature des Unités Territoriales Statistiques* level 5) as defined by EUROSTAT.

Seamless Administrative Boundaries of Europe are structured digital geographic data relating to the administrative boundaries of Europe, derived from source data provided by the National Mapping Agencies of Europe.

The term "seamless" means that there are no gaps or overlaps between polygons initially derived from different sources.

**NUTS**

The Nomenclature of Territorial Units for Statistics was established by EUROSTAT to provide a single uniform breakdown of territorial units for the production of regional for the European Union. Although the NUTS classification has no legal value per se, it has been used since 1988 in Community legislation.

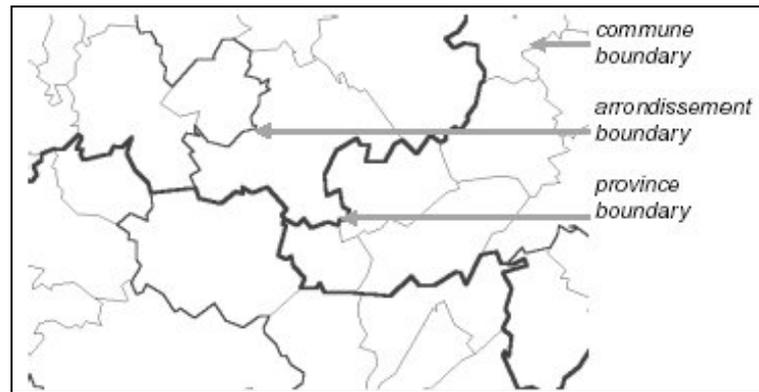
Commonly defined  
NUTS 1 : Major socio-economic regions grouping together Basic regions  
NUTS 2 : Basic regions  
NUTS 3 : Subdivisions of the Basic regions



SABE is a pan european dataset which contains the geometry and semantics of the administrative hierarchies of 29 european countries. Each country has its own specific administrative hierarchy, composed by different number of levels.

SABE mainly comprises:

- Boundaries of administrative units;
- Names of different levels in national administrative units and the relations between them;
- Names and codes of administrative units on the basis of the national nomenclature;
- Location of residences of authorities of the units for the countries (not for all countries);
- Coastline polygons (not for all countries); see also GISCO/SABE coastline.
- Polygons of lakes greater than 400 km<sup>2</sup>.

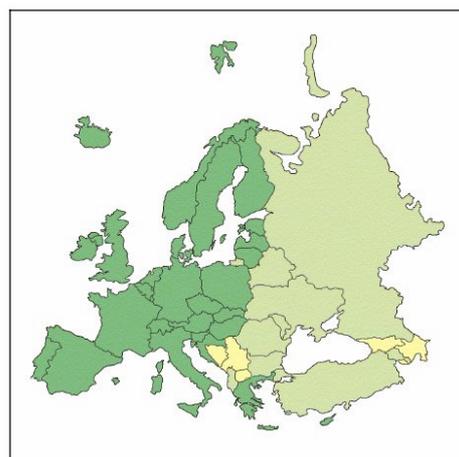


**Figure 2 - Example of SABE administrative boundaries**

***Main characteristics***

- Coordinates. Geographical in degrees (longitude, latitude) with decimal fraction and based on the WGS 84 (ETRS 89) with ellipsoid GRS 80 spatial reference system.
- Quality. The source data are of the best available semantic quality and of the application scale the closest to 1: 50.000 for each country. The contributions have been transformed into a uniform structure and uniform positional reference system, line-filtered to a uniform resolution and are edge matched at international boundaries.
- Structure and geometry. The product for each country consists of information about vector geometry and attributes related to the geometry (except centroids product – label points with attributes only).
- Resolution. The product is available filtered to two different geometric resolutions: (i) 30 metres for applications at 1 : 100.000 scale; (ii) 200 metres for applications at 1 : 1.000.000 scale; (iii) Both products contain the same attributes.

S.A.B.E covers all the UE countries + CEEC except Romania, Bulgaria and Malta.



**Figure 3 - SABE 97 coverage**  
with courtesy of Eurogeographics

***Copyright and accessibility***

The dataset is copyrighted: Licence fees for accessing the complete database is 15.200 Euros. It is possible to buy licences for only one or some countries.

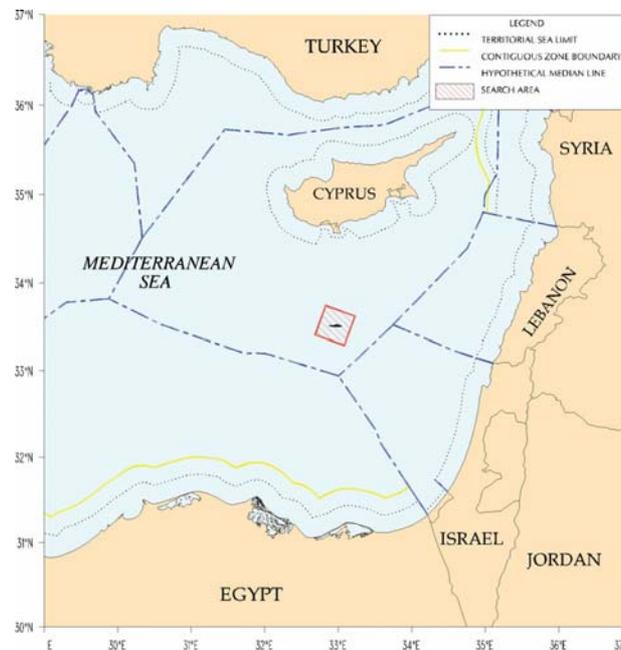
Other databases are derived from SABE – e.g. SABE at scale 1 : 1.000.000, centroids only databases, etc. – and are cheaper.  
 The more licences are bought, the cheaper the licence fees are : up to 10 licences, the fees are 30.400 Euros, up to 50 the licences fees are 45.600 Euros, and so forth.

**Summary sheet**

Data & t		
S.A.B.E.		
<u>Description of the Dataset :</u> Administratives Boundaries Vector data, corresponding to the scale 1 : 100.000 Layers: Boundaries (NUTS), Names and Centroids		
<u>Geographical Extent :</u> All UE countries, CEEC countries	<u>Restrictions :</u> Bulgaria, Romania, Malta	
<u>Providing Terms for EUROSION:</u> - for EUROSION Consortium : <i>Agreement Form</i> to get S.A.B.E free of charge for the duration of the project. - The European Commission is already licensed for the SABE v1.0 version.		
<u>Dissemination :</u> Restricted (cf. D2.5.1 SABE 97 Licence – to be published)		
EUROSION Wor		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - integration only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
ADMINISTRATIVE BOUNDARIES SHORELINE (for reajustment of the shoreline only)	WP 2.5.1 WP 2.5.3	
Contact		
Name Company	Eurogeographics	contact@eurogeographics.org Tel. +33 1.64.15.32.39 Fax +33 1.64.15.32.19
Address	6-8, Avenue Blaise Pascal Cité Descartes Champs-sur-Marne F-77455 Marne-la-Vallée Cedex 2	<a href="http://www.eurogeographics.org">www.eurogeographics.org</a>
<u>Related Links :</u>		

### ***Scope and content***

Maritime boundaries are critical elements for the planning of any activity in the ocean realm. From the early 1700s when the Dutch issued a decree establishing a "territorial sea", nations have sought to control portions of the global ocean which touch their shores. Under progressive criteria being established by the United Nations Convention on the Law of the Sea (UNCLOS), nations continue to redefine their sovereign claims to ocean space. Many activities recognize the growing importance of maritime claim and boundary delimitation. National claims may overlap, creating areas of disputed ownership and jurisdiction that can lead to confrontation and even open conflict. In the assessment, exploration and recovery of petroleum, mineral or fishing resources, a distance of a few hundred meters can have significant economic importance. Trespassing a nation's claims could have serious consequences: arrests, fines, ship confiscation, prison, loss of limb or life. By delimiting areas where specific maritime activities are allowed and others not allowed, maritime boundaries may help delineate the extent of activities which directly or indirectly impact erosion processes, namely sediment extraction (sand and shell), and dredging for navigation. There also helps identifying areas where these activities and associated erosion are conflicting with other activities (fishing for example).



**Figure 4 - Maritime claims of Cyprus**

### ***Main characteristics***

The Global Maritime Boundaries Database (GMBD) comprises all maritime claims, limits and boundaries of the world with detailed attribution and documentation so they can be queried and viewed using GIS software. Included in the GMBD are:

- territorial seas;
- contiguous, joint development, fishing, and economic zones;
- potential claim median line solutions,
- disputed areas,
- boundary status

### ***Copyright and accessibility***

The dataset is copyrighted and disseminated by VERIDIAN.

The Global Maritime Boundaries Database (GMBD) CD-ROM sells for US \$3.500 and will include one semi-annual update. The \$3.500 will cover a one year subscription. However, if the subscription is renewed before it expires then a discount (currently 33%) will be applied to the current retail price. Purchasers are solely responsible for renewing their subscription before it has ended. A renewal discount will only be given if a subscription is renewed before it expires.

**Summary sheet**

Data & Metadata		
VERIDIAN GMBD		
<u>Description of the Dataset :</u> Maritime Boundaries Vector data, corresponding to the scale 1 : 100.000		
<u>Geographical Extent :</u> Worldwide	<u>Restrictions :</u> Unknown	
<u>Providing Terms :</u> - Copyright - Annual fees of 3.500 USD for a <u>single-user</u> licence		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
ADMINISTRATIVE BOUNDARIES	WP 2.5.1	
Contact		
Name Company Address	Veridian Fairfax, Virginia USA	<a href="mailto:MaritimeBoundaries@Veridian.com">MaritimeBoundaries@Veridian.com</a>  <a href="http://www.veridian.com/home.asp">http://www.veridian.com/home.asp</a>
<u>Related Links :</u>		



**Scope and content**

The GISCO Coast Line layer has been generated from the initial version of the S.A.B.E representation of the shoreline. That is the reason why **GISCO (SABE)** term is used in this report. In this version, the layer COASTLINE was identified to «sea-side» limit of coastal administrative units. In the latest delivery of SABE (1997), the layer COASTLINE has been partially rebuilt, considering that the definition of administrative boundaries with regards to sea and inland waters differs from country to country (for instance, the coastal administrative areas may extend into the sea). This implies that the sea boundary is not defined or is defined to a different precision to the other administratives boundaries. The SABE data set is now able to provide an additional separate coastline for the countries where the physical and administrative boundaries do not coincide. These countries are Finland, Germany, UK, Ireland, The Netherlands, Sweden and Poland.

**Main characteristics**

Coastline information is provided as a GIS vector line for countries in which the coastline differs from the sea-side administrative boundaries (Finland, Germany, UK, Ireland, The Netherlands, Sweden and Poland). The corresponding scale of this coastline depends on S.A.B.E delivered scale, at best 1 to 100.000.

**Copyright and accessibility**

Identical to SABE (see II-1.1)

**Summary sheet**

<b>Data &amp; Metadata</b>
S.A.B.E coastline
<u>Description of the Dataset :</u> Coast Line vector Vector data, corresponding to the scale 1 : 100.000
<u>Geographical Extent of the Coast Line layer</u> Finland, Germany, UK, Ireland, The Netherlands, Sweden and Poland NB: for other countries, the coastline is provided by the traditional administrative boundaries
<u>Providing Terms :</u> - for EUROSION Consortium : <i>Agreement Form</i> to get S.A.B.E free of charge for the duration of the project. - The European Commission is already licensed for the SABE v1.0 version and next updates.
<u>Dissemination :</u> Restricted ( <i>cf. D2.5.1 SABE Licence</i> )
<b>EUROSION Work* on Data &amp; Metadata</b>

* except Stocktaking, Quality Assessment and metadata documenting...	- update - metadata - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
SHORELINE	WP 2.5.3	
<b>Contact</b>		
Name Company Address	Claude Luzet Eurogeographics 6-8, Avenue Blaise Pascal Cité Descartes Champs-sur-Marne F-77455 Marne-la-Vallée Cedex 2	contact@eurogeographics.org Tel. +33 1.64.15.32.39 Fax +33 1.64.15.32.19 <a href="http://www.eurogeographics.org">www.eurogeographics.org</a>
<u>Related Links :</u>		

#### 11-1.4. World Vector Shoreline (WVS)



##### Scope and content

The World Vector Shoreline (WVS) is a digital data file at a nominal scale of 1:250.000, containing the shorelines, international boundaries and country names of the world. The World Vector Shoreline is a standard US Defense Mapping Agency (DMA) product that has been designed for use in many applications. The WVS is divided into ten ocean basin area files.

The main source material for the WVS was the DMA's Digital Landmass Blanking (DLMB) data which was derived primarily from the Joint Operations Graphics and coastal nautical charts produced by the US DMA. The DLMB data consists of a land/water flag file on a 3 by 3 arc-second interval grid. This raster data set was converted into vector form to create the WVS. For areas of the world not covered by the DLMB data (e.g. the Arctic and Antarctic), the shoreline was taken from the best available hard copy sources at a preferred scale of 1:250.000.

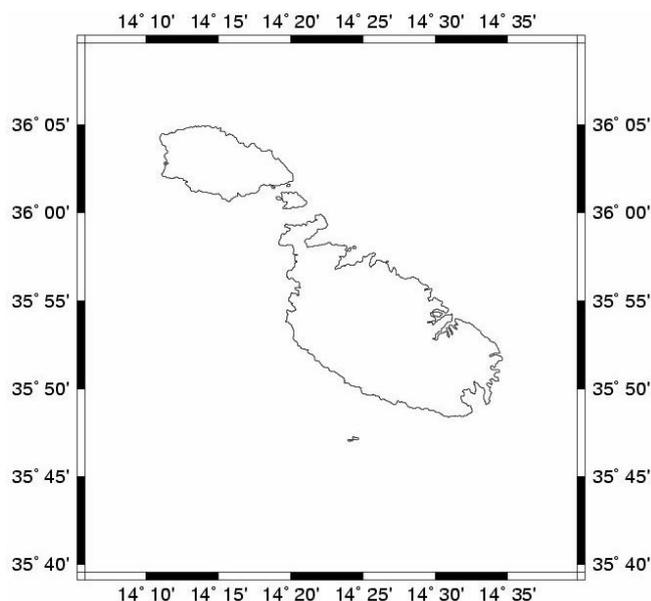


Figure 5 - Example of World Vector Shoreline – Malta

WVS provides a seamless vector representation of the coastline. Data are stored in chain-node format, and include tags to indicate the landside/waterside of the shoreline.

**Main characteristics**

- Original source of data : Defense Mapping Agency (DMA), now National Imagery and Mapping Agency (NIMA).
- World-wide coverage.
- Suitable for scales close to 250.000.
- Accuracy : requirement for this data is that 90% of all identifiable shoreline features be located within 500 meters (that is to say 2.0mm at 1:250.000) circular error of their true geographic positions with respect to the preferred datum (WGS 84).
- Horizontal Datum - World Geodetic System (WGS 84).
- Vertical Datum - shoreline based on Mean High Water.
- WVS coastline data are available on NGDC's "Global Relief" CD-ROM, along with the now-ancient World DataBank II political bounds and rivers.

**Copyright and accessibility**

WVS is freely accessible and downloadable from the web site of the US National Geophysical Data Center : <http://www.ngdc.noaa.gov/mgg/shorelines/shorelines.html>

**Summary sheet**

For Data & Metadata		
<u>Name</u> :_World Vector Shoreline (WVS)		
<u>Description of the Dataset</u> : World wide shoreline Vector data suitable for scales close to 1 : 250.000		
<u>EUROSION Geographical interest</u> : Romania, Bulgaria, Malta		
<u>Providing Terms</u> : Free of charge. Downloadable at <a href="http://www.ngdc.noaa.gov/mgg/shorelines/shorelines.html">http://www.ngdc.noaa.gov/mgg/shorelines/shorelines.html</a>		
<u>Dissemination</u> : Free		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- data import - extension - integration	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
SHORELINE	WP 2.5.3	

Contacts :		
Name	Peter Sloss	e-mail <a href="mailto:Peter.W.Sloss@noaa.gov">Peter.W.Sloss@noaa.gov</a>
Company	National Oceanic and Atmospheric Administration	Tel. +1 303-497-6119
Address	National Geophysical Data Centre	Fax +1 303-497-6513
	Mail Code E/GC3, 325 Broadway, Boulder, CO USA 80305	Web <a href="http://www.ngdc.noaa.gov/">http://www.ngdc.noaa.gov/</a>
<u>Related Links :</u>		

### II-1.5. SHOM product : TCIFMS



#### Scope and content

TCIFMS (*Trait de Côte et isobathes de France Métropolitaine du SHOM - Coastline and Isobaths for metropolitan France*) is a database produced by the French Hydrographic & Oceanographic Marine Office. It provides a vector representation of the coastline and isobathic lines.

Though efforts of european oceanographic institutes to standardize data this database covers only the french territory. Nevertheless its assessment should bring a real value either to favorize relevant quality checking of data sets or offer suitable basis data for pilot studies. Thus metadata will be prepared on this data set accordingly.

The coastline is guaranted for France, plus Corsican island. Isobaths encompass all the France boarding sees : Nord sea, the Channel, the near Atlantic and Mediterranean sea.

#### Main characteristics

- Vector coastlines digitized from paper maps at various scales from 1:150.000 to 1:50.000.
- Isobaths digitized from paper maps at scale 1:150.000.
- Delivery Format : DXF, SHOMTC, S57.

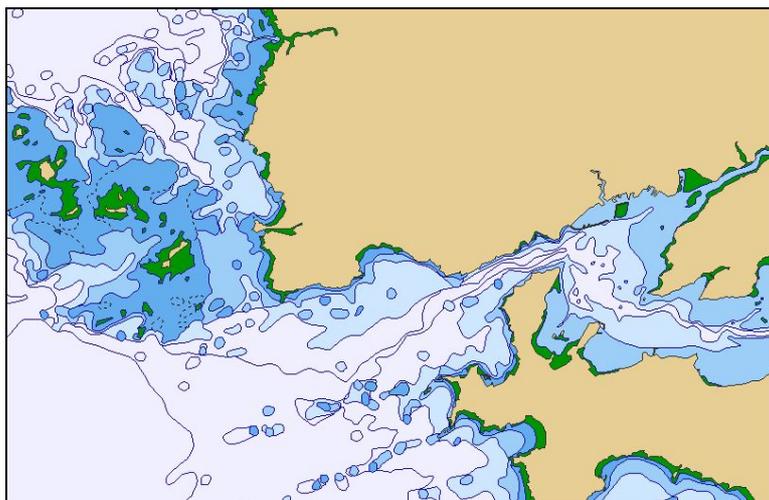


Figure 6 - Example of TCIFMS - Off Brest (Brittany)

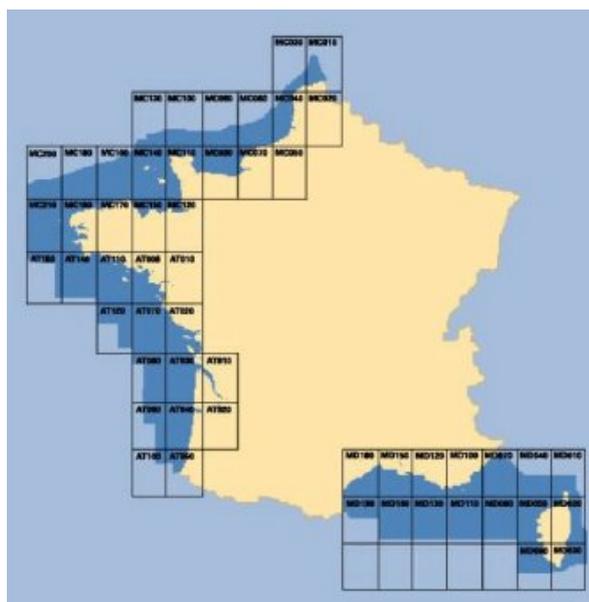


Figure 7 - Geographical coverage of TCIFMS

**Copyright and accessibility**

The database is copyrighted. Licence fees communicated to EUROSION are around 15.000 Euros for a single-user use, without dissemination.

**Summary Sheet**

For Metadata		
<u>Name</u> : TCIFMS (Trait de Côte et Isobathes de France Metropolitaine du SHOM)		
<u>Description of the Dataset</u> : Vector Coastline at approximative scale 1:50.000 and 1:150.000 and Isobaths at scale 1:150.000.		
<u>Geographical Extent</u> : Metropolitan France + Corsican		
<u>Providing Terms</u> : € 15.000 for the whole database		
<u>Dissemination</u> : Restricted		
EUROSION Work* on Data and Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- metadata - quality basis - integration	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
SHORELINE	WP 2.5.3	
BATHYMETRY	WP 2.4.2	
Contacts :		

Name Company	André le Hen EPSHOM (Etablissement Principal du Service Hydrographique et Océanique de la Marine)	e-mail <a href="mailto:lehen@shom.fr">lehen@shom.fr</a> Tel. +33 (0)2.98.22.15.55 Fax +33 (0)
Address	13 rue du Chatelier BP 30316 29603 BREST CEDEX	Web <a href="http://www.shom.fr">www.shom.fr</a>
Related Links : <a href="http://www.primar.org">www.primar.org</a>		

## **II-2. BATHYMETRY**

### ***Relevance of Bathymetry for EUROSION***

Bathymetry is a key information to understand shoreline evolution, and an important input of many erosion prediction models. Nevertheless, only near-shore bathymetry and beach profile at the very local level are relevant for modelling coastal erosion processes. Such local bathymetrical data exist, but their geographical coverage remains limited (a few kilometers of coastline), not available "on the shelf", and methodologies not always well documented.

Beside these very local datasets, many global scale coarse data exist but their relevance for the purpose of EUROSION is not established. The present report reflect the state of our inventory. Nevertheless our investigation will continue throughout the project implementation with a particular attention paid to bathymetrical databases existing at the level of regional seas (Mediterranean, North, Baltic and Black seas, and Atlantic Ocean). This medium scale model are assumed to be relevant to model coastal water dynamics and thus to estimate net sediment transport.

### ***List of Datasets inventoried***

- General Bathymetrical Chart of the Oceans (GEBCO)
- Topography of the Baltic Sea (IOWTOPO)
- Digital Bathymetric Data Base – Variable
- DigBath250
- TCIFMS

### ***II-2.1. General Bathymetrical Chart of Oceans (GEBCO)***



#### ***Scope and content***

GEBCO is the authoritative Bathymetric Chart of the World. Its main goal is to upgrade continually and promulgate an authoritative, high quality, seamless bathymetric contour chart of the world's oceans through the medium of the GEBCO Digital Atlas (GDA). It is directed by a Guiding Committee drawn equally from the Intergovernmental Oceanographic Commission (IOC) as part of UNESCO, and the International Hydrographic Organisation (IHO).

GEBCO is available in two forms, primarily as a CD ROM entitled GEBCO Digital Atlas (GDA) and also on 18 printed sheets as the Fifth Edition (1984) of the GEBCO Atlas. The First Version of the GDA, released in 1994, contains digitized contours and track lines from the Fifth Edition of GEBCO. Scale varies from 1:10.000.000 to 1:250.000 depending on the availability of data sources used to create GEBCO digital atlas. The Second Release (1997) included significant areas of new bathymetry worldwide (especially north-east Atlantic off the British Isles), as well as the World Vector Shoreline (WVS). The Third Release will, in addition to further bathymetric updating, contain a gridded version of the contours.

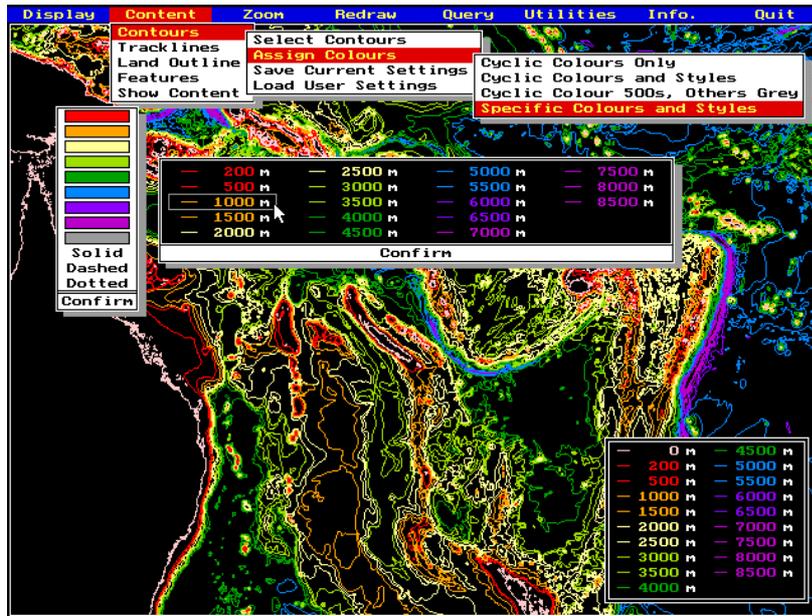
GEBCO CDROM, version 1997, contains :

- Global bathymetric contours at scale 1:10.000.000 derived from the Fifth Edition of the General Bathymetric Chart of the Oceans (GEBCO).
- Revised bathymetric contours at scale varying from 1:1.000.000 and 1:250.000 for the North East Atlantic of the British isles.
- Bathymetric contours and coastline of the First Edition of the International Bathymetric Chart of the Mediterranean at scale 1:1.000.000.
- A set of global coastline at scale 1:250.000 based on the World Vector Shoreline (WVS)

- Trackline inventory of digital echo-sounding data held at IHO data centre for Digital Bathymetry.

**Main characteristics**

The Fifth Edition of GEBCO depicts bathymetric contour depth at 50m, 100m, 150m, 200m, 500m, and at a 500m intervals thereafter. Intermediate contour depths are also available but not everywhere.



*The user has control over the contours to be displayed and on their colour and line style*

 <p><b>The GEBCO Digital Atlas</b></p>		<p>with courtesy of the</p>  <p><i>British Oceanographic Data Centre</i></p>
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**Figure 8 - GEBCO interface snapshot East of Australia**

**Copyright and accessibility**

GEBCO CDROM costs £230 (p & p inc.) + 17.5% VAT for customers within the European Union. A special discount price of £99 (+VAT if applicable) is available to educational and academic research establishments and to those organisations routinely supplying their echo sounding data to the IHO Data Centre for Digital Bathymetry. The project page for the GEBCO digital atlas at BODC is:

<http://www.bodc.ac.uk/projects/gebco/>

The consortium is still negotiating the GEBCO copyrights terms, and waiting for the agreement from the BODC for a raster dissemination of partial european GEBCO data set.

**Summary sheet**

Data & Metadata		
General Bathymetric Chart of the Oceans (GEBCO)		
<p><u>Description of the Dataset :</u></p> <ul style="list-style-type: none"> <li>• Global vector bathymetric contours at scale 1:10.000.000</li> <li>• Revised bathymetric contours at scale varying from 1:1.000.000 and 1:250.000 for the North East Atlantic of the British isles.</li> <li>• Bathymetric contours and coastline of the First Edition of the International Bathymetric Chart of the Mediterranea at scale 1:1.000.000</li> <li>• Bathymetric contours from 100m to 500m intervals</li> </ul>		
<p><u>Geographical Extent :</u> All Europe (main world seas and oceans)</p>	<p><u>Restrictions :</u></p>	
<p><u>Providing Terms :</u>                    £ 230 (p &amp; p inc.) + 17.5% VAT Ordering information from BODC can be obtained from : <a href="http://www.bodc.ac.uk/projects/gebco/gebco_obtain.html">http://www.bodc.ac.uk/projects/gebco/gebco_obtain.html</a></p>		
<p><u>Dissemination :</u> Restricted – waiting for an authorization from BODC</p>		
EUROSION Work* on Data & Metadata		
<p>* except Stocktaking, Quality Assessment and metadata documenting...</p>	<ul style="list-style-type: none"> <li>- update</li> <li>- data import</li> <li>- integration only</li> </ul>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<i>BATHYMETRY</i>	WP 2.4.2	
Contacts :		
<p>Name Company  Address</p>	<p>GEBCO Orders British Oceanographic Data Centre Bidston Observatory Birkenhead, Merseyside L43 7RA UNITED KINGDOM</p>	<p>e-mail: <a href="mailto:bodcmail@bodc.ac.uk">bodcmail@bodc.ac.uk</a> Fax : +44 (0) 151 652 3950  Web <a href="http://www.bodc.ac.uk/projects/gebco/">http://www.bodc.ac.uk/projects/gebco/</a></p>
<p><u>Related Links :</u></p>		

**Scope and content**

IOWTOPO package has been developed by the *Institut für OstSeeForschung Warnemünde (IOW)*. The package contains two datasets which provide a digitised topography of the Baltic Sea (both terrestrial elevation and bathymetry). Land heights and water depths have been calculated for two regular spherical grids from available data.

Data set "Iowtopo2" covers the whole Baltic Sea from 9° to 31° East and from 53°30' to 66° North by (660 x 750) grid cells, see Fig. 10. The resolution is 2 minutes with respect to longitude, and 1 minute to latitude. This is approximately 1 nautical mile, or 2 km resp. The region of the Belt Sea from 9° to 15°10' East and from 53°30' to 56°30' North, see Fig 10bis, is comprised within data set "Iowtopo1" with a twofold higher resolution (1 minute in longitude and 0.5 minutes in latitude corresponding to approx. 1 km).

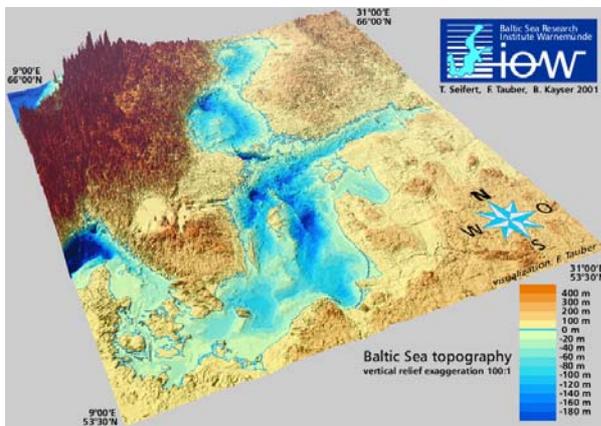


Figure 9 - IOWTOPO West Baltic Sea

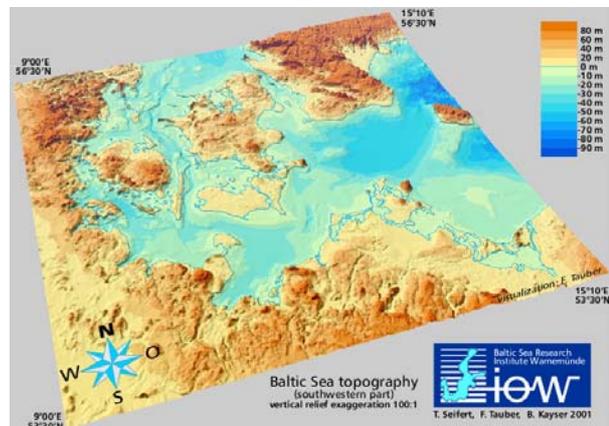


Figure 9 bis - IOWTOPO East Baltic Sea

The data specify a representative average of the water depth or the land height of each grid cell, counted by negative and positive values in meters. Some statistical parameters allow a rough estimate of the reliability of the data. (Please be aware that data are rather uncertain in regions where strong gradients of the bottom relief occur, esp. the northern parts of the Baltic. There is an urgent need of further bathymetry data to become available for the Baltic beyond 59° North.) Since a common average of land heights and water depths lead to rather unsatisfying results with respect to the gridded shoreline, a landmark is proposed in both data sets.

The landmarks were derived from the global high resolution shorelines [GSHHS ([www.soest.hawaii.edu/wessel/gshhs/gshhs.html](http://www.soest.hawaii.edu/wessel/gshhs/gshhs.html)) and RANGS (<http://www.io-warnemuende.de/homepages/rfeistel/rangs.htm>)] and used to get a "naturally looking" composite topography (z\_topo see below).

**Main Characteristics**

Data are provided in two formats :

- NetCDF files (\*.nc) are self-describing binaries which may be visualised and processed by tools like Ferret ([ferret.wrc.noaa.gov/](http://ferret.wrc.noaa.gov/) Ferret), Grads ([grads.iges.org/grads](http://grads.iges.org/grads)) or Matlab ([www.mathworks.com](http://www.mathworks.com)).
- Alternatively rather big ascii files (\*.dat) are given which start with two header lines and contain the following data: see details in Table 5 below.

xlon	- the geographic longitude of the grid cell centre
ylat	- the corresponding geographical latitude
z_topo	- land height/water depth, composite of z_water, z_land and the

	proposed landmask
z_water	- average of all water depths allocated from original data to this grid cell
z_land	- average of land heights allocated to this grid cell from <a href="http://edcdaac.usgs.gov/gtopo30/gtopo30.html">edcdaac.usgs.gov/gtopo30/gtopo30.html</a> data
z_min	- minimal value of the original data
z_max	- maximal value of the original data
z_stdev	- standard deviation of original data from averages z_water/z_land
z_near	- datum lying nearest to the centre of this grid cell
d_near	- distance of above mentioned data point from centre of grid cell
n_wet	> 0 number of original water depths allocated to this grid cell < 0 number of neighbors interpolated to fill this empty cell
n_dry	> 0 number of original land heights allocated to this cell < 0 number of iterations to find direct neighbours for interpolation
landmask	- proposed "naturally looking" landmask (land=0, water=1)
flag	- flag indicating a pure data average (0), or an interpolated/masked land height (+1) or water depth (-1)

Table 5 - ASCII file fields for IOWTOPO

**Copyright and accessibility**

Data are available for free at : [http://www.iowarnemuende.de/research/en\\_iowtopo.html](http://www.iowarnemuende.de/research/en_iowtopo.html)

These data sets are issued from hard scientific work which relies on free interchange of scientific data. Therefore the data are available for scientific research only.

**Summary sheet**

Metadata		
Topography of the Baltic Sea (IOWTOPO)		
<u>Description of the Dataset :</u> Digitised topography of the Baltic Sea (both terrestrial elevation and bathymetry).		
<u>Geographical Extent :</u> Baltic Sea		
<u>Providing Terms :</u> Data are available for free at <a href="http://www.io-warnemuende.de/research/en_iowtopo.html">http://www.io-warnemuende.de/research/en_iowtopo.html</a>		
<u>Dissemination :</u> For Research purposes only		
EUROSION Work* on Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
BATHYMETRY	WP 2.4.2	
Contact		
Name	Torsten Seifert	e-mail <a href="mailto:torsten.seifert@io-warnemuende.de">torsten.seifert@io-warnemuende.de</a>
Company	Institut für OstSeeForschung Warnemünde	Fax : +49 (0381) 51970
Address	SeeStrasse 15 D-18119 Rostock	Web <a href="http://www.io-warnemuende.de/">http://www.io-warnemuende.de/</a>
<u>Related Links :</u>		

**Scope and content**

DBDB-V is a digital bathymetric database that provides ocean depths at various gridded resolutions. DBDB-V was developed by the Naval Oceanographic Office (NAVOCEANO) to support the generation of bathymetric chart products, and to provide bathymetric data to be integrated with other geophysical and environmental parameters for ocean modeling. Grid resolutions available include 0.5, 1, 2, and 5 minutes of latitude/longitude.

The 0.5 minute grid is available for selectively dispersed areas of the world including the waters surrounding Florida, the U.S. northeast coast, the Canadian east coast, portions of coastal Iceland and Greenland, and portions of coastal Great Britain and the North Sea.

The 1 minute grid is available for the Baltic Sea, Black Sea, Mediterranean Sea, South China Sea, and the U.S. west coast to 140 degrees west longitude.

The 2 minute grid is available for the Bay of Biscay, the Atlantic approaches to the Strait of Gibraltar, the Red Sea including the Gulf of Aden, and the Persian Gulf including the Gulf of Oman.

The 5 minute grid is available globally from 78 degrees south latitude to 90 degrees north latitude.

**Main characteristics**

The vertical accuracy for the 0.5 minute grid in surveyed areas is less than 18 meters Linear Error (L.E.) 90 with respect to Mean Sea Level (MSL), using a standardized sound velocity in sea water of 1500 meters per second. The horizontal accuracy for the 0.5 minute grid in surveyed areas is less than 457 meters Circular Error (C.E.) 90 with respect to the World Geodetic System (WGS).

The relatively coarse resolutions of 5, 2 and 1 minute grids provide only a generalized portrayal of the bottom configuration. At the present, there is no formal requirement for absolute or relative accuracy of DBDB-V.

**Copyright and accessibility**

Data are available for free at the U.S. Naval Oceanographic Office (NAVOCEANO) and downloadable from the URL address : <http://128.160.23.42/dbdbv/dbdbv.html>

**Summary sheet**

<b>Data &amp; Metadata</b>
Digital Bathymetry Data Base Variable (DBDB – V)
<u>Description of the Dataset :</u> Ocean depths at various gridded resolutions, from 5 to 0,5 minutes in places
<u>Geographical Extent :</u> depending on the <u>resolution</u>
<u>Providing Terms :</u> Database available on line and may be queried by specifying a point location, an arc of a great circle, or a bounding rectangle: <a href="http://128.160.23.42/dbdbv/dbdbv.html">http://128.160.23.42/dbdbv/dbdbv.html</a>
<u>Dissemination :</u> Free since unclassified

EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- extension</li> <li>- metadata only</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
BATHYMETRY	WP2.4.2	
Contact		
Name Company Address	COMMANDING OFFICER Data Center Contact Naval Oceanographic Office (NAVOCEANO) 1002 Balch Blvd. Stennis Space Center, MS 39522-5001 USA	Tel. : +1 228-688-5160 Fax : +1 228-688-4271 Web URL : <a href="http://128.160.23.42">http://128.160.23.42</a>
<u>Related Links :</u>		

**Scope and content**

The British Geological Survey (BGS) has begun the compilation and production of a vector attributed digital bathymetry of UK and adjacent European waters. The product is known as DigBath250. Its purpose is to provide a regional scale digital bathymetry as a primary dataset for geographic information systems, mapping and modelling of the seabed and sub-seabed, as well as tidal, current and water column modelling.

DigBath250 is based upon BGS and UK Hydrographic Office (UKHO) bathymetric data compiled for the published BGS 1:250 000 offshore geological maps. After the initial twelve months of the project bathymetric data will be made available by cooperating European hydrographic and geological survey authorities to complete coverage for adjacent European waters.

- DigBath250 is available as a single dataset covering UK and adjacent European waters and also as individual sectors (as shown opposite).
- The sectors will be rolled out for sale as they are completed.
- Production of the sectors of DigBath250 covering UK waters should be completed by the end of August 2002.

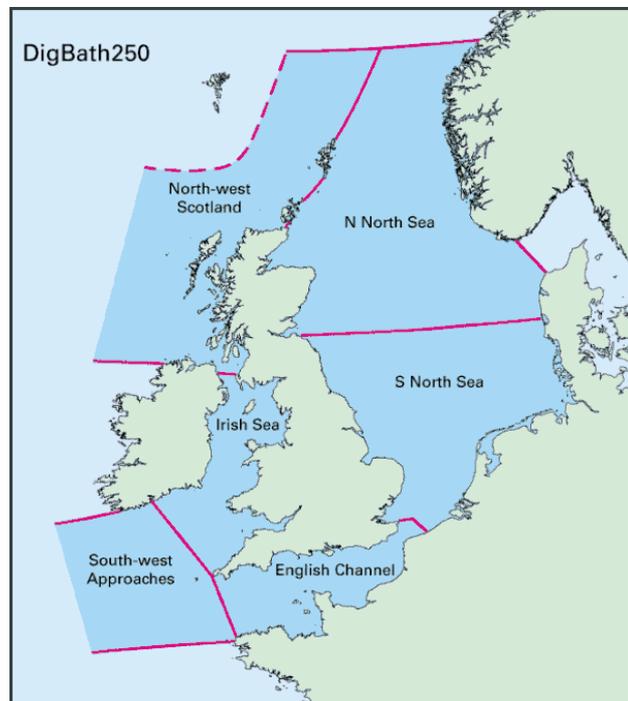


Figure 10 - DigBath250 coverage

**Main characteristics**

- Bathymetric contour intervals:
  - (i) 10 m at depths from 0 m to 200 m,
  - (ii) 20 m at depths > 200 m to 400 m,
  - (iii) 100 m at depths > 400 m.
- The vertical datum is nominally based on Mean Sea Level.
- The horizontal coordinate system is based on WGS84.

- The project coastline (nominal zero metre bathymetric contour) is based on the World Vector Shoreline (copyright free).
- Vector digital output will be available in the following formats: Bentley MicroStation (.DGN), AutoCAD (.DXF), ARC/INFO export format (.E00), ArcView shape (.SHP), MapInfo Interchange (.MIF/.MID), MapInfo (.TAB).
- DigBath250 is non-navigational.

### **Copyright and accessibility**

- Sales of DigBath250 are subject to the terms of a BGS end-user digital licence, which will allow use by one end-user only.
- The licence is for a period of three years.
- The basic price of a licence is :
  - £ 250 (excluding VAT) per sector
  - £ 1250 (excluding VAT) for all six sectors (i.e. 6 for price of 5)
- The licence is renewable for a further three years at :
  - £ 50 (excluding VAT) per sector
  - £ 250 (excluding VAT) for all six sectors
- Payment of the agreed purchase price will entitle the purchaser to receive one digital copy of the relevant parts of DigBath250 for use by one end-user only.

### **Summary sheet**

<b>Data &amp; Metadata</b>		
DigBath250		
<u>Description of the Dataset :</u> Vector digital bathymetry of UK and adjacent European waters, within nominal scale of 1 to 250.000.		
<u>Geographical Extent :</u> UK + adjacent european waters, see <a href="#">figure</a> .		
<u>Providing Terms / Copyrights issues :</u> Digbath250 three years only licence for single-user Whole data set acquisition £ 1.250 (renewable for 3-year periods at cost £ 250)		
<u>Dissemination :</u> Restricted		
<b>EUROSION Work* on Data &amp; Metadata</b>		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

BATHYMETRY		WP 2.4.2
<b>Contact</b>		
Name Company Address	B.G.S Main Sales Desk British Geological Survey Keyworth, Nottingham NG12 5GG	<a href="mailto:sales@bgs.ac.uk">sales@bgs.ac.uk</a> Tel. : +44 (0)115-936-3241 Fax : +44 (0)115-936-3488 Web :
<u>Related Links :</u>		

**II-2.5. TCIFMS**

**M**

cf infra § II-1.5. SHOM product: TCIFMS

### II-3. ELEVATION

#### **Relevance of Elevation for EUROSION**

A Digital Terrain Model (DTM) or a Digital Elevation Model (DEM) makes it possible to identify lowlands which are vulnerable to significant sea level rise and the risk of flooding.

Throughout DTMs explained as a grid data of altitudes with a 90 to 100m resolution and 3 to 15 meter height accuracy, studies can be led.

Products keeping this specifications and required quality criteria are not plethoric and often offer only partial cover. Thus complementary and similar products shall be acquired directly at national levels.

#### **List of Datasets inventoried**

- MONA PRO Europe©  
National Digital Terrain or Elevation Models

#### **II-3.1. MONA PRO Europe©**



#### **Scope and content**

MONA PRO Europe© is a medium-resolution level DTM covering the major part of Europe. Its geometrical accuracy is estimated to a mean square error of 3,5 meters, to 12,5 meters in high relief zones.

MONA PRO Europe© product has been designed for such application as flight simulation, spread maps, hydrography, telecommunications applications, environmental studies, each project requiring 3D-visualization or slope analysis.

In the framework of EUROSION, GeoSys Data will provide – wherever available - a littoral strip of the Digital Terrain Model called MONA PRO Europe©, according to the EUROSION LAI. The EUROSION useful coverage is limited to the blocks shown in the Figure below.

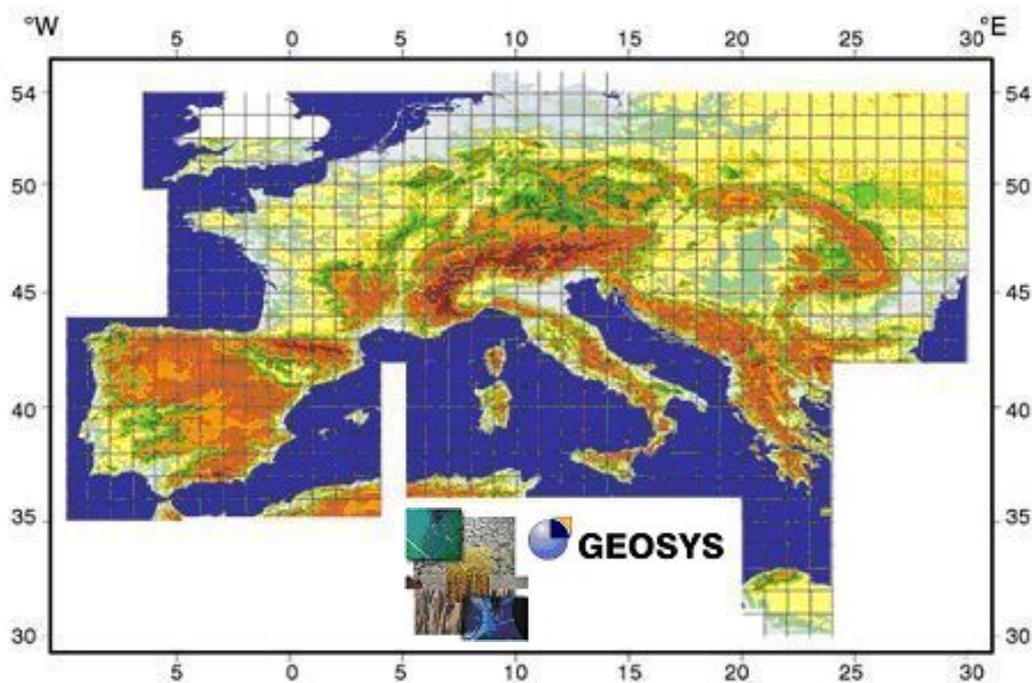
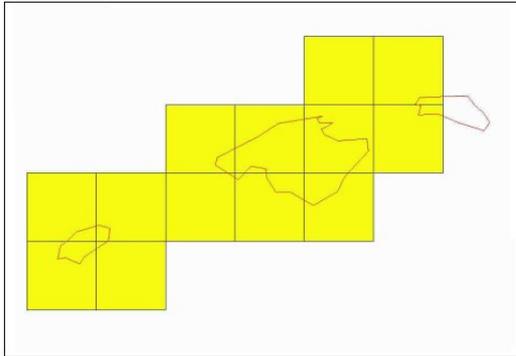


Figure 11 - EUROSION Geographical Extent for MONA PRO Europe©

**MONA PRO Europe© restrictions**

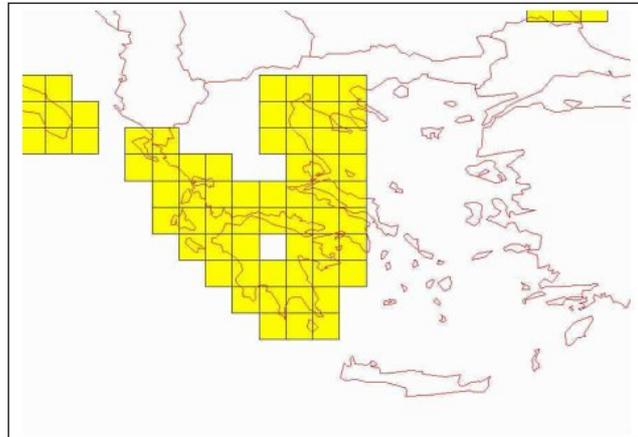
**Figure 12 - MONA PRO Europe© Balearic Islands' coverage**

(coloured)



**Figure 13 - MONA PRO Europe© Greece territory's coverage**

(coloured)



**Copyright and accessibility**

MONA PRO Europe© is copyrighted and disseminated by GeoSys France. Below is the price table as provided by Geosys France. Three products, corresponding to three different resolution are accessible – namely 75 m, 100 m, 250 m .

Price of block (0,5° x 0,5°) in Euro	Grid size		
	3 arc-seconds / 75 meters	100 meters	250 meters
1st	1270	1000	400
2nd to 10th	635	500	200
11th to 20th	317,5	250	100
21st to 100th	158,75	125	50
from 101st onwards	79,38	62,50	25

## Summary sheet

Data & Metadata		
MONA PRO Europe©		
<u>Description of the Dataset :</u> Digital Terrain Model, Resolution : 3 arc-seconds -> 90 to 100 m Corresponding scale (1:100 000)		
<u>Geographical Extent :</u> Littoral Strip upon 11 countries: Germany, The Netherlands, Belgium, France, Portugal, Italy, Slovenia, Romania, Bulgaria, Spain, Greece.	<u>Restrictions :</u> UK, Ireland, Denmark, Sweden, Finland, Poland, Estonia, Latvia, Lithuania, Malta, Cyprus; Spain : Balearic Islands; Greece : East part of the territory, see <u>figures</u> .	
<u>Providing Terms / Dissemination :</u> Terms of licensing are explained in the deliverable <i>D2.4.1 Elevation Licence</i>		
<u>Copyrights issues :</u> Rights of use within a 1-3 users Licence on the same geographical site, exclusively for the EC. Renting or Selling all or parts remains forbidden. All product issued from the DTM must mention the following text: « © GEOSYS - France ». <i>Note: for wider dissemination, please contact the provider directly</i>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - metadata - integration only	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
ELEVATION	WP 2.4.1	
Contact		
Name	Olivier Kuhlen	kuhlen@geosys.fr
Company	GEOSYS	infos@geosys.fr
Address	20, impasse René Couzinet Parc d'activité de la Plaine BP 5815 31505 TOULOUSE Cédex - France	Tel. +33 1.41.53.10.67 Fax +33 1.41.53.10.68 web : <a href="http://www.geosys.fr">www.geosys.fr</a>
<u>Related Links :</u>		

***Scope and content***

Most of European countries are well provided with high resolution DTM or DEM. These elevation products are generally generated and disseminated by National Mapping Agencies, and are meant for medium to large scale applications (regional planning). The present section will not detail all of these national datasets, but simply mentions who provides such data at the national level, and at what scale. These information have been provided by Eurogeographics, the European federation of National Mapping Agencies.

***Main Characteristics***

For most of these products, data are provided in a grid or matrix format, or as vector contour lines. In case of a matrix, altitude is recorded for all nodes of a regularly-spaced grid (the DTM/DEM resolution). For vector contour lines, elevation is represented as distinct polygons, each of them connecting points. For a typical terrain or elevation models corresponding to a nominal scale of 1:30.000, the accuracy is about 1-3 meters. The following list summarizes existing DTM/DEM at the national level:

*Belgium*

Data provider : Institut Geographique National/Nationaal Geografisch Instituut

- [DTM 1:10000](#) (1:5000 - 1:10 000)
- [Digital Terrain Elevation Data](#) (1:150 001 - 1:300 000)

*Denmark*

Data provider : Kort & Matrikelstyrelsen

- [Digital Elevation Model of Denmark](#) (1:30 001 - 1:75 000)
- [Digital Contour Lines for Denmark \(5 m equ.\)](#) (1:30 001 - 1:75 000)

*Finland*

Data provider : Maanmittauslaitos

- [Digital Elevation Model of Finland](#) (1:10 001 - 1:30 000)

*France*

Data provider : Institut Geographique National

- [BD Altimetrique](#)

*Germany*

Data provider : Bayerisches LandesVermessungsAmt

- [Digital Elevation Model of Bavaria](#) (1:10 001 - 1:30 000)

Data provider : Bundesamt für Kartographie und Geodäsie

- [Digital Landscape Model of Germ.1:1Mio; Digital Terrain Elevation Model 1x1km](#) (1:750 001 - 1:1 500 000)

Data provider : Hessisches LandesVermessungsAmt

- [Digital Elevation model in the State of Hessen](#) (1:5000 - 1:10 000)

Data provider : LandesAmt f. LandesVerm. und DatenVerarb. Sachsen-Anhalt (VuKV)

- [Digital Elevation Model](#) (No information available)

Data provider : LandesVermessung + GeoBasisInformation NiederSachsen

- [ATKIS - Digital Terrain Model 1:5000](#) (1:5000 - 1:10 000)
- [ATKIS - Digital Terrain Model 1: 50 000](#) (1:10 001 - 1:30 000)

Data provider : LandesVermessungsAmt Baden-Württemberg

- [Digital Elevation Model Baden-Württemberg](#) (1:10 001 - 1:30 000)

Data provider : LandesVermessungsAmt Brandenburg

- [Digital Elevation Model](#) (1:10 001 - 1:30 000)

Data provider : LandesVermessungsAmt Rheinland-Pfalz

- [Digital Terrain Model Rheinland-Pfalz DHM20](#) (1:10 001 - 1:30 000)
- [Digital Terrain Model Rheinland-Pfalz DHM40](#) (1:10 001 - 1:30 000)

Data provider : LandesVermessungsAmt Schleswig-Holstein

- [Digital Terrain Model 50](#) (1:30 001 - 1:75 000)

#### *Great Britain*

Data provider : Ordnance Survey

- [Land-Form PROFILE](#) (1:5000 - 1:10 000)
- [Land-Form PANORAMA](#) (1:30 001 - 1:75 000)

#### *Greece*

Data provider : Hellenic Military Geographical Service

- [Elevation Contours of Greece](#) (1:30 001 - 1:75 000)

#### *Ireland*

Data provider : Suirbhéireacht Ordanáis na Éireann

- [Digital Terrain Model of Ireland](#) (1:75 001 - 1:150 000)

#### *Portugal*

Data provider : Instituto Portugues de Cartografia e Cadastro

- [1:10 000 Altimetric Vector Map](#) (1:5000 - 1:10 000)
- [1:10000 - Digital Elevation Model](#) (1:5000 - 1:10 000)
- [1:50 000 Altimetric Vector map](#) (1:30 001 - 1:75 000)

#### *Slovenia*

Data provider : Geodetska Uprava Republike Slovenije

- [Digital Elevation Model 100 x 100](#) (1:30 001 - 1:75 000)

#### *Spain*

Data provider : Centro Nacional de Informacion Geografica

- [Digital Terrain Model DTM200](#) (1:150 001 - 1:300 000)

#### *Sweden*

Data provider : Lantmäteriverket

- [GSD-Terrain Elevation Databank](#) (1:10 001 - 1:30 000)

#### **Copyright and accessibility**

All the above mentioned data bases are copyrighted. For more information, please refer to Eurographics Web site: [http://www.eurogeographics.org/Projects/GDDD/GDDD/lists/sp\\_53.htm](http://www.eurogeographics.org/Projects/GDDD/GDDD/lists/sp_53.htm)

Data & Metadata
National Digital Terrain or Elevation Models

EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- metadata only</li> <li>- integration</li> </ul>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
ELEVATION	WP 2.4.1	

Contact		
Name	Claude Luzet	contact@eurogeographics.org
Company	Eurogeographics	Tel. +33 1.64.15.32.39
Address	6-8, Avenue Blaise Pascal Cité Descartes Champs-sur-Marne F-77455 Marne-la-Vallée Cedex 2	Fax +33 1.64.15.32.19 <a href="http://www.eurogeographics.org">www.eurogeographics.org</a>

## II-4. GEOLOGY, GEOMORPHOLOGY, SEDIMENTOLOGY, AND EVOLUTIONARY TRENDS

### ***Relevance of Geology, Geomorphology, sedimentology and evolutionary trends for EUROSION***

Capacity of the near shore areas to resist to coastal erosion processes partly depends on the geology and geomorphology of coastline materials. These patterns may help predict erosion trends.

Erosion trends makes it possible to evaluate the ecological, economical, and human capital at risk in the near future and assess efficiency of capital invested to protect the shoreline.

### ***List of Datasets inventoried***

The CORINE Coastal Erosion database (version 1990) at scale 1:100.000 is an inventory on coastal morphology and erosion risk. The prime objective of the CORINE Coastal Erosion (CCEr) project was to provide a scientific database allowing the risks from possible coastal-erosion problems to be identified.

### II-4.1. CORINE Coastal Erosion (CCEr)



#### ***Scope and content***

CORINE Coastal Erosion is one of the elements of the experimental programme CORINE (1985-1990). This programme was set up with the aim to gather, coordinate and render consistent information on the state of the environment in the Community, as a basic instrument for the European Environmental policy. The goal of CORINE Coastal Erosion (CCEr) was to concretize CORINE concept over coastal zones, considered as sensitive areas by the European Parliament.

The concrete goal of CCEr was to provide a « wall to wall » description of European coastal systems' morphology and highlight the causes of its modification. Such causes fall under two non-exclusive categories:

- i) major natural events:
  - phenomena of slow variation: subsidence and rising of the marine level;
  - severe or parasismic events: storms and marine overhigh tides, seisms, mass movements ;
- ii) human actions causing movements of sediments:
  - reduction of river contributions;
  - development of estuaries, artificialization of the coast;
  - construction on the coastal dunes;
  - harbor work and coastal defence construction;
  - destruction of dune vegetation, of algae areas and of the underwater grass;
  - sediment, water, gas or oil extraction, etc.

#### ***Main characteristics***

CCEr mainly contains three layers:

- Morpho-sedimentology such as rocky coast, beach, cohesive sediment, muddy coast, articial coast..
- Presence or not of coastal defence works
- Evolutionary trends (erosion, accretion, stability, no information)

CCEr is delivered as vector format with corresponding scale 1/100 000.

The CCEr database encompasses the UE countries in 1990, that is to say Belgium, Denmark, France, WEST Germany, Greece, Ireland, Italy, The Netherlands, Portugal, Spain and the UK. Some danish inland waters and Euboa island (Greece) are not covered either.



Figure 14 - CORINE Coastal Erosion version 1.0 shoreline extent

***Copyright and accessibility***

CORINE Coastal Erosion version 1990 is downloadable free of charge from EEA web site:  
<http://dataservice.eea.eu.int/dataservice/metadetails.asp?table=COASTEROS&i=1>

**Summary sheet**

Data & Metadata		
CORINE COASTAL EROSION		
<p><u>Description of the Dataset :</u></p> <ul style="list-style-type: none"> <li>- Morpho-sedimentology</li> <li>- Presence (or not) of coastal defence works</li> <li>- Evolutionary trends</li> <li>- Geological Layer to be produced</li> </ul>		
<p><u>Geographical Extent :</u> UE in 1990, no CEEC</p>	<p><u>Restrictions :</u> East-Germany, Sweden, Finland, CEEC</p>	
<p><u>Providing Terms :</u> Downloaded from the European Environment Agency website</p>		
<p><u>Dissemination :</u> inside the EC</p>		
EUROSION Work* on Data & Metadata		
<p>* except Stocktaking, Quality Assessment and metadata documenting...</p>	<ul style="list-style-type: none"> <li>- update UE</li> <li>- extension to CEEC</li> <li>- metadata</li> <li>- integration</li> </ul>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<p>GEOLOGY, GEOMORPHOLOGY, SEDIMENTOLOGY, AND EVOLUTIONARY TRENDS</p>		<p>WP 2.6</p>
Contact		
<p>Name Company  Address</p>	<p>Nicole LENOTRE BRGM Bureau des Recherches Géologiques &amp; Minières 3, avenue Claude Guillemin BP 6009 - 45060 Orléans Cedex 45</p>	<p><a href="mailto:n.lenotre@brgm.fr">n.lenotre@brgm.fr</a> Tel. +33 2 38.64.34.34 Fax +33 2 38.64.35.18  web : <a href="http://www.brgm.fr">www.brgm.fr</a></p>
<p><u>Related Links :</u></p>		

### *Scope and content*

The EU-SEASED database provides a searchable catalogue of sedimentary composition of over 220.000 seafloor samples from the ocean basins and continental shelves, held at European institutions. About 200.000 samples are located within European waters. As a metadata base, EU-SEASED does not provide access to the sedimentary composition of seafloor sample itself but information on how to access the samples. Any related accessory datasets is for negotiation between the user and the repository where the sample is stored. Contact information is provided as well.

Figure below shows location of all seafloor samples documented within EU-SEASED.

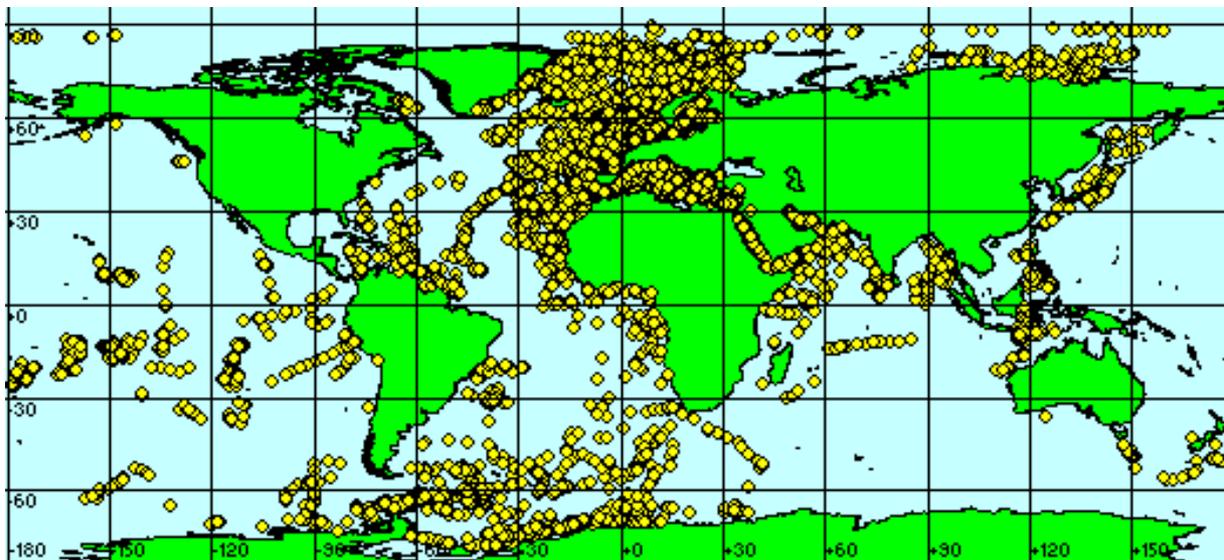


Figure 15 - Location of seafloor samples

The EU-SEASED database consists in various tables:

- A library table containing all keywords;
- An organisation table containing all information about data source holders and partners;
- A meta-table on map information;
- A meta-table on sample/core information.

### *Main characteristics*

The database format has partly been based on the Meta-Data Format GEIXS Project (Catalogue of European Geological Data) and the Meta-Data Format Marine Core Curator's Database of NOAA (Index to Marine Geological Samples).

The most important table is the meta-table on sample/core information. Table below is a list showing the elements of this table.

<b>Name of field (** = Mandatory field)</b>	<b>Description</b>
Internal code	Internal unique code automatically generated in the database
Sample id**	Id code within the data source holders system
Project**	The database contains meta-data from 2 projects: EUMARSIN and EUROCORE.
Measuring area type**	To indicate if sampling was carried out on one location, along a line or within an area.
Datum	For proper conversion from imported co-ordinates to the centrally used projection system (WGS 84) a Datum is needed. A datum represents a fixed array of parameters necessary in the conversion.
Gridtype	To indicate if a coordinate is in lat/long or UTM format.
Central meridian	The central meridian is Necessary to convert UTM coordinates to lat/long co-ordinates.
Coordinates (decimal)**	Location of sampling station, track or area.
Sampling device**	Instruments used to take samples or cores. The user can enter up to 5 different instruments per location
Data source holder**	The data source holder is the organisation/company that actually holds the samples/cores that are described in this record.
Sample state	An indication of the quality of samples/sub-samples
Sample storage condition	An indication of the way the sample/core has been stored.
Reference (50)	A reference number or code belonging to a sample core or location if different from sample id.
Objectives	Objectives of the sample/coring campaign.
Surface sample	Has a surface sample been taking
Sub-surface sample	Has a sub-surface sample been taken
Treatment	Which treatments have been performed on the samples/cores. The user can enter up to 5 different treatments per location.
Monitoring site (50)	Description of the monitoring site
Measured parameters	Parameters derived from tests on the samples/cores. The user can enter up to 5 different parameters per location.
Physiographic province	Indication of the physiographical province in which the sample/core was taken
Navigation system	Method of positioning system used on board the vessel used in taking samples/cores
Sample length (m)	Length of the recovered core
Length coring device (m)	Length of the core barrel
Water depth (m)	Water depth at the sampling location
Depth correction	Indication if water depth correction has been applied.
Reference level (50)	Zero level of water depth measurement.
Sampling penetration (m)	How deep has the device penetrated into the sediment.
Sample diameter (cm)	Diameter of core
Start date yyyy-mm-dd	Start date of sampling/coring
End date yyyy-mm-dd	End date of sampling/coring
Project cruise name	Name of cruise/project during which the sample/core was taken
Vessel name	Name of the vessel from which sampling/coring was carried out.
Cruise report	Title of cruise report
Basal age	Age of the bottom of the core.
Sediment type	Summary of sediment type(s) in sample/core
Sample recovery	Indication of the sample recovery
Reference (50)	Title(s) of reference(s)/publication(s)/report(s)
Comments	Any further comment on the sample/core

Table 6 - Description of fields available via SEASED

### ***Copyright and accessibility***

Metadata are accessible from <http://www.eu-seased.net/metadatabase/welcome.html> free of charge. However, access to the data themselves are restricted. See contact information provided in the metadata sheets for further information.

**Summary sheet**

Metadata		
EU-SEASED Metadatabase		
<u>Description of the Dataset :</u> Metadata on <u>seafloor samples</u> held by European institutions providing water depth, latitude and longitude.		
<u>Geographical Extent :</u> World seas + Europe seas		
<u>Providing Terms / Copyrights issues :</u> Downloadable of metadata are free of charge at : <a href="http://www.eu-seased.net/metadatabase/welcome.html">http://www.eu-seased.net/metadatabase/welcome.html</a>		
<u>Dissemination :</u>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- extension</li> <li>- metadata only</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<i>GEOLOGY, GEOMORPHOLOGY, SEDIMENTOLOGY, AND EVOLUTIONARY TRENDS</i>	WP 2.8	
Contact		
Name Company  Address	Dr. R.G. Rothwell Challenger Division for Seafloor Processes Southampton Oceanography Centre Empress Dock, Southampton SO14 3ZH	email <a href="mailto:R.G.Rothwell@soc.soton.ac.uk">R.G.Rothwell@soc.soton.ac.uk</a> Tel. +44 238 059 6567 Fax +44 238 059 6554 Secr. : + 44 238 059 6555
<u>Related Links :</u>		

***Scope and content***

Commissioned in 2000 by the Department of Environment, Foods and Rural Affairs (DEFRA) of UK government, The FUTURECOAST study aimed at providing predictions of coastal evolutionary tendencies over the next centuries for England and Wales. Whilst a variety of modelling techniques exist to assist in such predictions, many of these focus on short term, relatively local-scale predictions based primarily upon contemporary hydrodynamic forcing, as opposed to considering larger scale and longer term evolutionary behaviour. Although such modelling provides vital information, it does not necessarily provide the complete picture of influence and change. As a matter of fact, the FUTURECOAST study is an attempt to understand how the English and Welsh coastal zones function on a wider scale both in time and space.

FUTURECOAST analysis is supported by a nation-wide database compiled from various data sources and publications. It contains documents, cartographic and tabular data, as well as aerial photographs.

***Main characteristics***

FUTURECOAST database is provided on CDROMs. It contains the complete English and Welsh coast the following layers provided at scale up to 1:50,000:

- Bathymetry with contour depth lines of 5, 10, 20, 30, 50m.
- A detailed coastline
- Offshore sediment transport (directions)
- Solid Geology
- Backshore geomorphology (beach ridges, cliff, dune, rising ground, lowland)
- Foreshore geomorphology (rock, mud / clay, sand, sand & shingle, shingle)
- Managed frontage (presence of coastal defence works)
- Future shoreline change without interaction
- Future shoreline change with present management (direction, foreshore, changes, hotspots)
- Historic changes (beach profiles, graphs)

***Copyright and accessibility***

FUTURECOAST is property of DEFRA, and is accessible through bilateral arrangements. See contact in the summary sheet.

**Summary sheet**

Data & Metadata		
FUTURE COAST		
<p><u>Description of the Dataset (relevant for EUROSION):</u></p> <ul style="list-style-type: none"> <li>- Solid geology</li> <li>- Backshore geomorphology</li> <li>- Foreshore geomorphology</li> <li>- Managed frontage</li> <li>- Historic changes</li> <li>- Evolutionary trends</li> </ul>		
<u>Geographical Extent :</u> England, Wales	<u>Restrictions :</u>	
<u>Providing Terms :</u> Requires a specific agreement of DEFRA		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update UE</li> <li>- extension to CEEC</li> <li>- metadata only</li> <li>- integration</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
GEOLOGY, GEOMORPHOLOGY AND EROSION TRENDS	WP 2.6	
Contact		
Name	David Collins Environmental Advisor	<a href="mailto:david.r.collins@defra.gsi.gov.uk">david.r.collins@defra.gsi.gov.uk</a>
Company	Department of Environment, Food, and Rural Affairs	Tel. +020 7238 6174 Fax +020 7238 6187
Address	Area 3D, Ergon House, 17 Smith Square, London SW1P3JR	
<u>Related Links :</u>		

## II-5. HYDRODYNAMICS AND SEA LEVEL

### *Relevance of Hydrodynamics and Sea Level for EUROSION*

Waves, currents and tides are the primary cause for coastal erosion at the very local level. At an aggregated level, long-shore current, sediment transport capacity, and history of meteorological events make it possible to predict the amount of materials washed away on the shoreline.

Sea level rise, as a consequence of climate change and meteorological events, increase both impact of coastal erosion and vulnerability to the risk of flooding.

### *List of Datasets inventoried*

- Permanent Service for Mean Sea Level (PSMSL)
- Global Wave Statistics
- CLIOSAT
- Mediterranean Wave analysis datasets
- Admiralty Tide Tables

### II-5.1. Permanent Service for Mean Sea Level (PSMSL)



#### *Scope and content*

Since 1933, the Permanent Service for Mean Sea Level (PSMSL) has been responsible for the collection, publication, analysis and interpretation of sea level data from the global network of tide gauges. It is based at the Proudman Oceanographic Laboratory, Bidston Observatory, United Kingdom and is a member of the Federation of Astronomical and Geophysical Data Analysis Services (FAGS) established by the International Council for Science (formerly the International Council of Scientific Unions, ICSU). It is supported by FAGS, by the Intergovernmental Oceanographic Commission (IOC) and by the U.K. Natural Environment Research Council.

As of February 2001, the database of the PSMSL contains over 47000 station-years of monthly and annual mean values of sea level from over 1800 tide gauge stations around the world received from almost 200 national authorities. In average, approximately 2000 station-years of data are entered into the database each year.

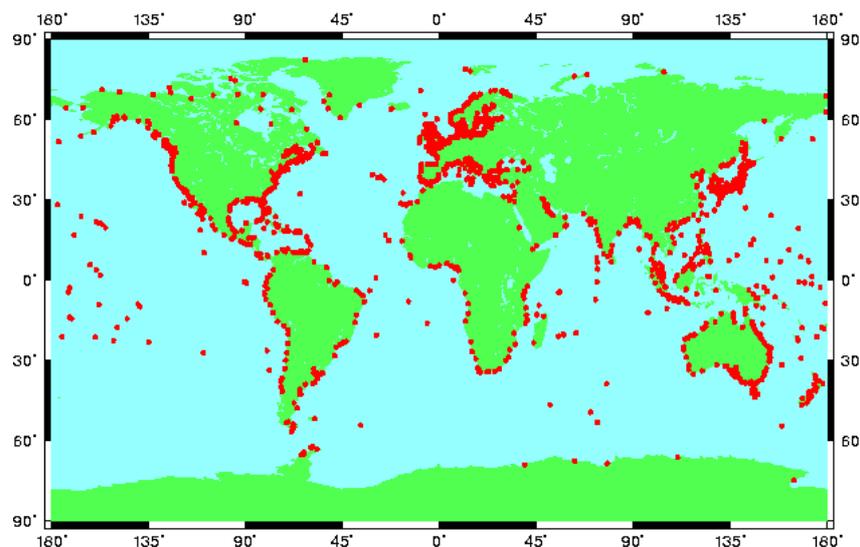


Figure 16 - Distribution of PSMSL Stations around the world

Data for all stations are included in the PSMSL METRIC (or total) data set. The METRIC monthly and annual means for any one station-year are necessarily required to be measured to a common datum, although, at this stage, datum continuity between years is not essential. The year-to-year datum checks become essential, however, if the data are subsequently to be included in the PSMSL 'Revised Local Reference (RLR)' component of the data set.

The 'Revised Local Reference (RLR)' dataset of the PSMSL contains records for which time series analysis of sea level changes can be performed. Long records from this dataset have been the basis of all analyses of secular changes in global sea level during the last century. The geographical distribution of longer RLR records contains significant geographical bias towards the northern hemisphere, a situation which is being rectified by the establishment of the GLOSS global sea level network.

### **Main characteristics**

Data are listed in country/station code order (essentially west to east around the world coastline) from which the data and information can be obtained. Data are provided in ASCII format and may be accessed as follows:

- *Monthly files:* The monthly files – both Metric and RLR - list year-month, mean sea level value for the month, number of missing days of data in the month, and 'flag for attention' in format 1x, f10.3,1x,i5,1x,a2,1x,a1. The year-month parameter is given by year + (month-1)/12. + 1./24. thereby centering the monthly mean in the middle of the month in question. The monthly mean values are in mm. If there are no data for a month, but if there are data for other months in that year, then the entry for that month will contain just the year-month parameter followed by a blank. If the entire year of data is missing, then the whole year will be omitted from the file. Figure 18 provides an extract of PSMSL monthly data as recorded by the tide gauge of Marseille (France).
- *Annual files:* The annual files (RLR only as Metric annual means have little application) list year (integer), mean sea level value for the year (mm), missing days flag for the year, and 'flag for attention' in format 1x,i4,1x,i5,1x,a2,1x,a1. In both sets of files, a number of missing days values of 'XX' indicates that some form of interpolation has been used in short data gaps during the month. If the 'flag for attention' is present, this indicates that this year of data should be treated with caution, as indicated in the corresponding documentation file.

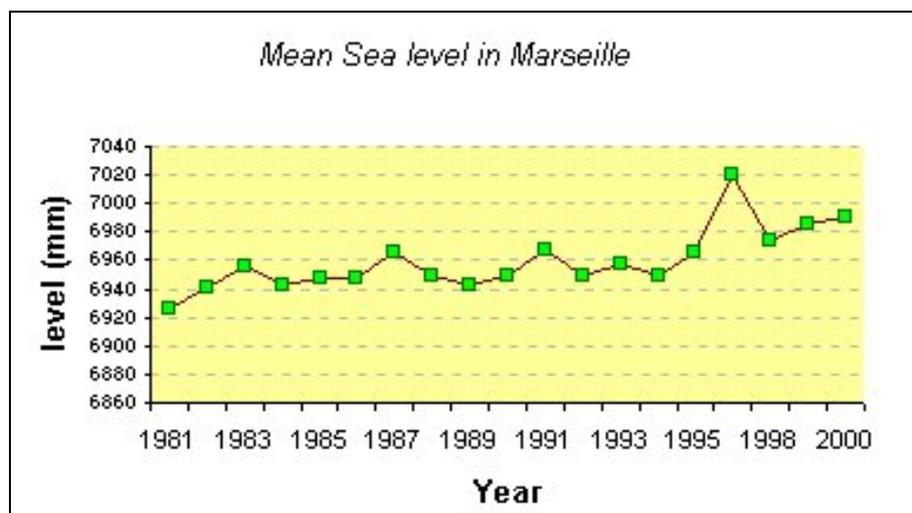


Figure 17 - Permanent Service for Mean Sea Level application

### **Copyright and accessibility**

PSMSL data are downloadable free of charge from URL : <http://www.pol.ac.uk/psmsl/>

**Summary sheet**

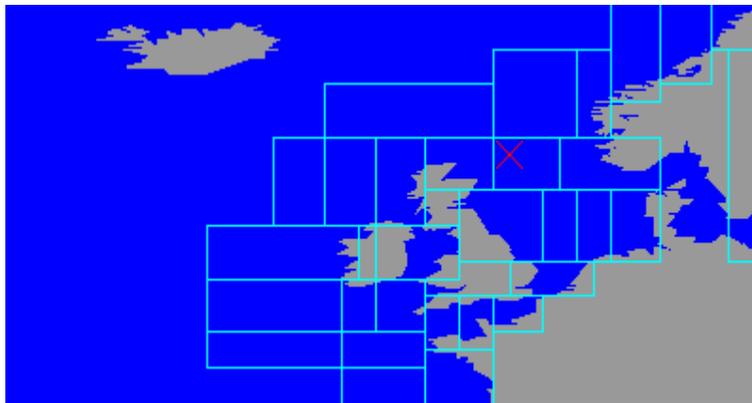
Data & Metadata		
Permanent Service for Mean Sea Level (PSMSL)		
<u>Description of the Dataset :</u> Monthly and annual mean sea level as measured by 1800 tide gauges throughout the world		
<u>Providing Terms / Copyrights issues :</u> Freely accessible at <a href="http://www.pol.ac.uk/psmsl/">http://www.pol.ac.uk/psmsl/</a>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- metadata only</li> <li>- integration</li> </ul>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
HYDRODYNAMICS AND SEA LEVEL RISE	WP 2.7	
Contact		
Name Company Address	Proudman Oceanographic Laboratory Bidston Observatory Birkenhead, Merseyside L43 7RA United Kingdom	e-mail : <a href="mailto:psmsl@pol.ac.uk">psmsl@pol.ac.uk</a> Tel.+44 151 653 8633 Fax +44 151 653 6269 Web : <a href="http://www.pol.ac.uk/psmsl/">http://www.pol.ac.uk/psmsl/</a>
<u>Related Links :</u> <a href="http://www.pol.ac.uk/psmsl/">http://www.pol.ac.uk/psmsl/</a>		

**Scope and content**

Global Wave Statistics is a package developed by an UK based marine engineering company, BMT Fluid Mechanic Ltd. The package contains both a worldwide and European database of visual observations reported by merchant of the Voluntary Observing Fleet over the World, enhanced with quality control and long term instrumental records, and analysis tools for producing reliable climatic statistics.

Visual observations are stored in two distinct datasets:

- The worldwide database covers the oceans of the world with 104 sea areas. The data from each sea area is split down into four seasons of the year (plus the whole year), and 8 directional sectors (plus all directions). Thus the database contains 4680 separate datasets.
- The Europe database covers the Northern European continental shelf with 31 sea areas. Whilst the worldwide database covers these areas, the Europe database provides greater geographical resolution.



**Figure 18 - Global Waves Statistics : the 31 sea areas of the European database**

For each sea area, analysis tools featured by Global Wave Statistics make it possible to derive:

- wind speed and direction probabilities
- wave height and period joint probabilities
- extreme wave heights at given conditions
- storm and calm persistence statistics

**Main characteristics**

The wind and wave observations used to compile this online database were all extracted from the UK Meteorological Office Main Marine Databank, a collection of reports from merchant ships on a voluntary basis. The databank is a computerized archive containing more than 55 million marine meteorological observations, whose have all been made by ships of passage. The databank contains meteorological data for all sea areas of the world; it is updated regularly to incorporate the most recent data. For the purpose of Global Wave Statistics, these data have been enhanced with instrumental data, including remote sensing images from satellites.

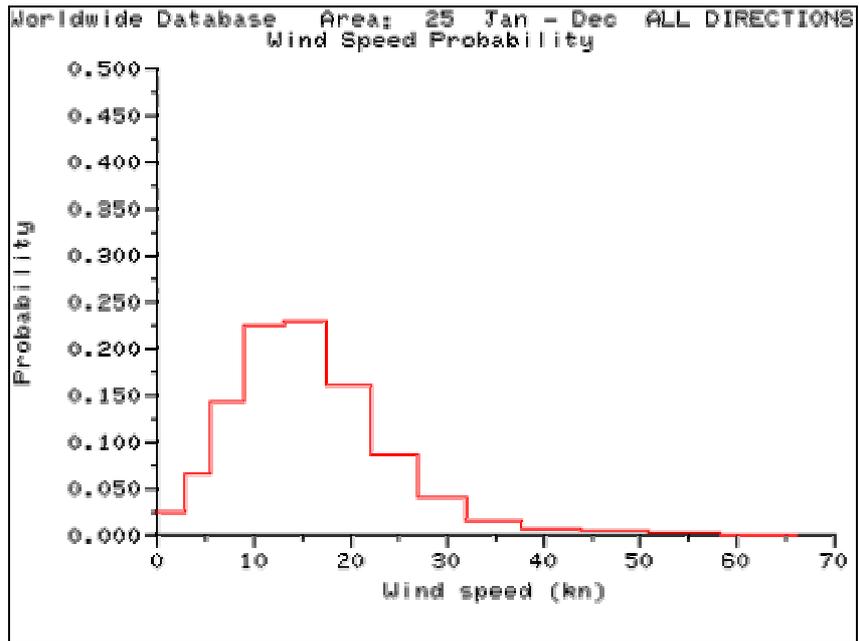


Figure 19 - Global Waves Statistics : wind speed probability - histogram

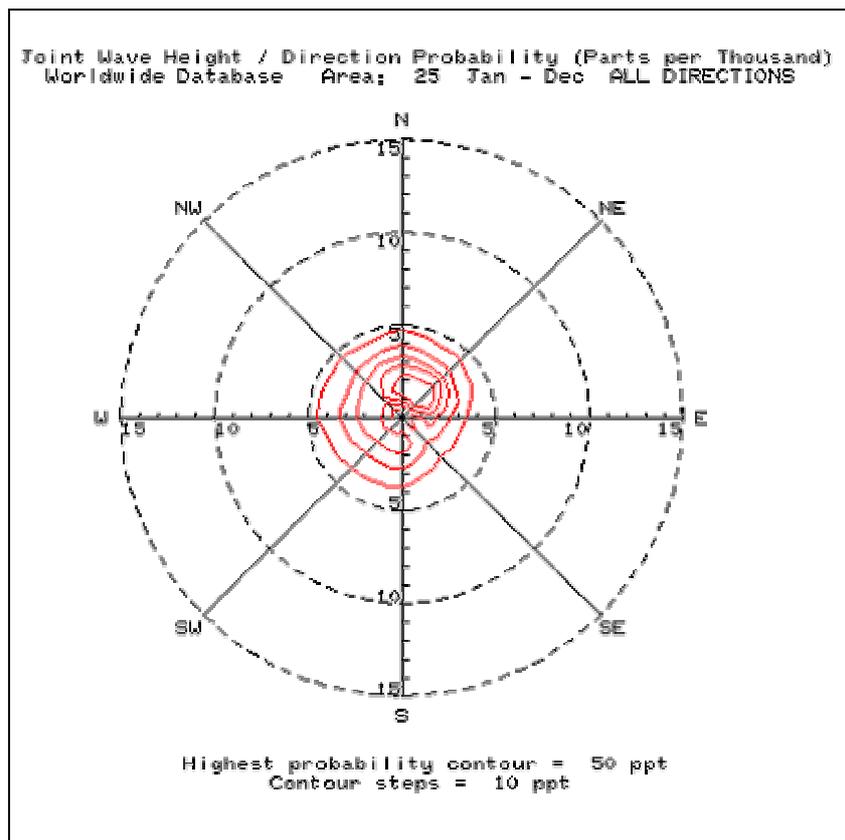


Figure 20 - Wave height / Direction probability - polar diagram

**Copyright and accessibility**

Data are available online for registered users. Registration fees are £ 50 per area (excluding VAT). Once registered, the wave climate data for the selected areas are made immediately available. A PC version of Global Wave Statistics exists as well.

**Summary sheet**

Data & Metadata		
Global Wave Statistics		
<u>Description of the Dataset :</u> Visual observations on wind speed and direction, wave height and period joint probabilities, extreme wave heights at given conditions, storm and calm persistence statistics.		
<u>Geographical Extent :</u> North Sea, British and Irish islands		
<u>Providing Terms / Copyrights issues :</u> Accessible after registration ( Registration fees are £ 50 per area) at : <a href="http://www.globalwavestatisticsonline.com/">http://www.globalwavestatisticsonline.com/</a>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
HYDRODYNAMICS AND SEA LEVEL RISE	WP 2.7	
Contact		
Name Company	BMT Fluid Mechanics Limited	e-mail : <a href="mailto:gwsonline@bmtfm.com">gwsonline@bmtfm.com</a> Tel. : +44 (0)20 8943 5544 Fax : +44 (0)20 8943 4434 Web
Address	Orlando House, 1 Waldegrave Road Teddington, Middlesex, TW11 8LZ, UK	
Related Links : <a href="http://www.globalwavestatisticsonline.com/">http://www.globalwavestatisticsonline.com/</a>		

### Scope and content

The metocean climate atlas CLIOSat (CLImatologies Océaniques Satellitaires) is basically elaborated after winds and waves satellite measurements provided on the following basis:

- ESA supplied all the scatterometer and SAR wave mode measurements used in the pilot-projects conducted by MétéoMer from 1991 to 1994 (referenced PP F5, F6, F7 and PP2 F9).
- EURIMAGE, the consortium responsible for marketing ERS data, provided all ERS altimetric data, on a payable fee.
- CNES-AVISO supplied MétéoMer with the Topex-Poseidon altimetric measurements in its AVAL-SAR program.
- The NOAA (National Oceanic and Atmospheric Administration) supplied the Geosat altimetric data.
- METEO FRANCE supplied the data of the ECMWF (European Center of Medium Range Weather Forecasts) on a payable fee. These data served to determine the first-guess spectra necessary to perform the inversion of SAR in wave mode data.
- The CERSAT, the French archiving center for ERS data, delivered SAR wave mode data and quality checked scatterometer measurements.

Data validation for field measurements was achieved during a number of research programs conducted, for instance, by IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer, French institute for the research for the exploitation of the seas).

Their operational use was developed during research efforts conducted by MétéoMer with the CLAROM group (Club pour les Actions de Recherche sur les Ouvrages en Mer, a group of french public bodies and private companies conducting R&D projects in the offshore field) and with the support of ESA, CNES and FSH (Fonds de Soutien des Hydrocarbures, a French body which supports research in the petroleum and parapetroleum field). Satellite measurements covering a 7-year period are now available.

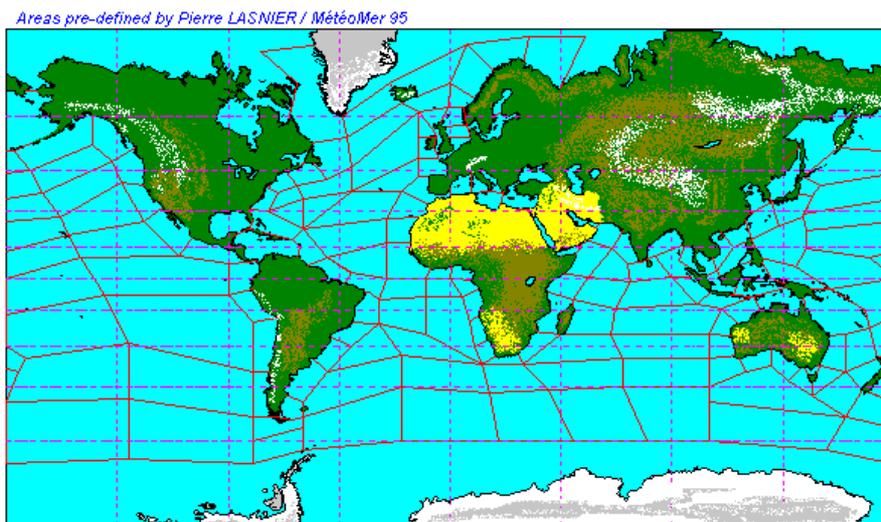


Figure 21 - CLIOSat pre-defined areas

CLIOSAT provides long-term statistics on climate coherent global areas and local specific areas. These data are available for any part of the world including remote and poorly documented areas. The system is based solely on satellite data including ERS1 radar altimeter. The CLIOSAT products

are derived from wind and wave satellite measurements and cover 170 areas (see figure above) on a quarterly and annual basis.

CLIOSAT Products include:

- (i) Histograms: significant wave height ( $H_s$ ), Wind direction ( $dd$ ), Wind speed ( $ff$ ), Direction ( $Dirp$ ) and periods ( $T_p$ ) of spectral peaks (including the mean period ( $T_z$ ) and the Direction of the Main peak ( $Dirpp$ ))
- (ii) Scatter diagrams of spectral parameters of waves: Wind speed / Direction, Significant wave height / periods of spectral peaks, Significant wave height / direction of spectral peaks, Periods / Direction of spectral peaks, Zero-crossing period / Significant wave height
- (iii) Significant heights extrapolated to extreme conditions

CLIOSat comes in 2 formats:

- (i) On standard CD ROM for use with a PC, the atlas offers general climate information on winds and waves in 170 predefined areas.
- (ii) As an On Line Service based on an archive and interrogation system. Areas and periods of interest are not pre-defined but specified by users. Statistics of winds and sea-states are then provided within 24h.

### ***Main characteristics***

CLIOSat statistics result from a combination of various remote sensing data :

- Scatterometer data - wind speed and direction ( $ff$ ,  $dd$ ) - were supplied to CLIOSat by the CERSAT (French archiving center for ERS data) after their qualification and a quality control process.
- Altimeter data - Significant wave height and wind speed ( $H_s$ ,  $ff$ ) - may be provided with errors when the satellite moves from land to sea, during heavy rains or in the presence of islands in the measurement area. Consequently, a special analysis is required for these data. First, an automatic process is applied to raw data so that most of the erroneous values can be detected and discarded. Second, an operator analyses each remaining high value for final validation.
- SAR in wave mode and scatterometer provided the global sea-state directional spectra, which have been processed to determine reduced parameters :
  - (i) significant wave height, peak periods and directions ( $H_s$ ,  $T_p$ ,  $Dirp$ ) of wind sea and swell components for each sea-state
  - (ii) significant wave height, mean period and direction of the main peak -  $H_s$ ,  $T_z$  ( $T_{0,2}$ ),  $Dirp$  - for each sea-state. Due to the instrumental limitations of the SAR in wave mode and the resulting lack of information for periods under 7.5 seconds, statistics a great number of sea-state conditions (wind sea, small swell), specially on closed seas (e.g. Mediterranean Sea) and occasionally on open seas, are underestimated. Specific procedures have been implemented to adjust these parameters.

Once a consistent climate area has been chosen and the above mentioned analysis and qualification procedures have been applied, sea-states and wind statistics can be built.

Histograms:

- The values of  $H_s$ , wind speed and wind direction histograms are expressed by percentages to the total number of data.

- Tp and Dirp histograms, estimated from the combined use of SAR in wave mode and scatterometer measurements, are obtained by counting the total number of detected spectral peaks in the processed SAR data.

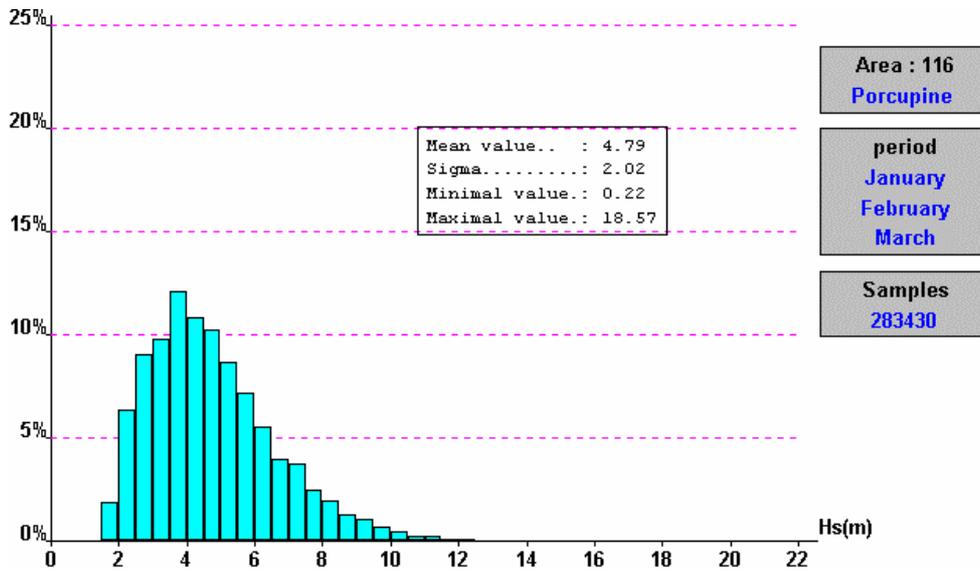


Figure 22 - CLIOSat : Histogram of significant wave height

*Diagrams:*

- Spectral wave parameters of wind sea and swell components in each sea-state: For each processed data, a triplet ( $H_s, T_p, Dirp$ ) corresponding to the wind sea component and one (or two) triplet(s) corresponding to the swell are estimated. Values of the ( $H_s, T_p$ ), ( $H_s, Dirp$ ) and ( $T_p, Dirp$ ) scatter diagrams are expressed by the number of spectral peaks. The amount of multippeak sea-states is expressed by its percentage to the number of processed data.
- Spectral reduced parameters for global sea-states: The reported number of values is equal to the number of the processed data.
- Wind parameters: Values in the ( $ff/dd$ ) diagram are expressed in thousandths of the total number of data. The scatterometer provides a wind speed vector, averaged on a circle of about 50 km in diameter. Unfortunately, for low speeds,  $ff < 3$  m/s, the variability of the wind is so great that it is impossible to derive a mean direction in this circle. Estimating the proportion of these low winds by using altimeter wind speeds enables to correct possible overestimates of the numbers of winds above 3 m/s.
- Estimated extreme significant wave heights: For each predefined climate area, 90% confidence intervals of the estimated extreme  $H_s$  values are given for different project life durations: 1, 10, 30, 50 and 100 years. The values for 50 and 100 years project life durations are only indicative, considering the 10-year initial duration of satellite measurements. The information provided in the CLIOSat atlas is relevant for widespread but still coherent climate areas. It offers a quick view in the ranges of estimated extreme  $H_s$  values that can be encountered globally within the area. As a consequence, it should be considered as pre-project information. It is necessary to process more elaborated data in order to obtain the precise extreme values which are relevant for specific offshore or nearshore sites.

Product	Sensor	Satellites	Duration of measurements	Period of measurements	Number of data used in CLIOSat
Histogram of Hs	Altimeter	Geosat, Topex-Poséidon, ERS1, ERS2	10 years	Nov 86 - Dec 89 Oct 92 - Mar 98 Jan 92 - Jul 98	220 000 000
Extreme values of Hs	Altimeter	Geosat, Topex-Poséidon, ERS1, ERS2	10 years	Nov 86 - Dec 89 Oct 92 - Mar 98 Jan 92 - Jul 98	220 000 000
Histogram of wind speed (ff)	Altimeter	Topex-Poséidon, ERS1, ERS2	7 years	Oct 92 - Mar 98 Jan 92 - Jul 98	220 000 000
Histogram of Tp	SAR	ERS1, ERS2	6 years	March 92 to May 98	1 800 000
Histogram of $\theta_p$	SAR	ERS1, ERS2	6 years	March 92 to May 98	1 800 000
Diagram (Hs/Tp) (Hs/ $\theta_p$ ) (Tp/ $\theta_p$ ) (Hs/Tz) (Hs/ $\theta_{pp}$ )	SAR	ERS1, ERS2	6 years	March 92 to May 98	1 800 000
Histogram of wind directions (dd)	Scatterometer	ERS1, ERS2	6,5 years	December 91 to May 98	380 000 000
Diagram of wind speed and direction (ff/dd)	Scatterometer	ERS1, ERS2	6,5 years	December 91 to May 98	380 000 000

Figure 23 - CLIOSat sources

Due to the spatial and temporal sampling of satellite measurements, some strong events like the cyclones may not have been measured at their very highest level. However, it has been shown that except for some extreme cases, a 10-year duration of satellite data is already sufficient to derive reliable statistical distributions. Moreover, in the next years, the ever-increasing amount of data will improve the characterisation of high values.

**Copyright and accessibility**

The complete CLIOSAT atlas is available at cost 10.340 US\$ VAT excluded, and provides all above mentioned parameters for all of the 170 pre-defined areas.

An online service exists as well : users may register and then request data for any of the predefined areas at a unit cost (e.g. about 100 US\$ ex-VAT per parameter and per predefined area), or define their own interest areas. In that specific case, metocean experts will advise on the consistency of the user-defined areas in terms of statistics accuracy.

**Summary sheet**

Data & Metadata		
CLIOSat		
<u>Description of the Dataset :</u> Significant wave height, Wind direction and speed issued from remote sensing observations.		
<u>Geographical Extent :</u> worldwide		
<u>Providing Terms / Copyrights issues :</u> The complete CLIOSAT atlas is available at cost US\$ 10.340 VAT excluded. An online service exist as well : <a href="http://www.meteomer.fr/cliosat.htm">http://www.meteomer.fr/cliosat.htm</a>		
<u>Dissemination :</u> Restricted		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
HYDRODYNAMICS AND SEA LEVEL RISE	WP 2.7	
Contact		
Name Company	METEO-MER	<a href="mailto:meteomer@meteomer.fr">meteomer@meteomer.fr</a> Tel.+ 33 (0)4 94 45 66 11 Fax +33 (0)4 94 45 68 23
Address	RN7 – 83480 Puget sur Argens	Web <a href="http://www.meteomer.fr/cliosat.htm">http://www.meteomer.fr/cliosat.htm</a>
<u>Related Links :</u>		

**Scope and content**

The European Centre for Medium-range Weather Forecasts (ECMWF) is an international organisation supported by 22 European States. Its Member States are: Belgium, Denmark, Germany, Spain, France, Greece, Ireland, Italy, the Netherlands, Norway, Austria, Portugal, Switzerland, Finland, Sweden, Turkey, United Kingdom. Since 1979, the Centre has been responsible for:

- the development of numerical methods for medium-range weather forecasting;
- the preparation, on a regular basis, of medium-range weather forecasts for distribution to the meteorological services of the Member States;
- scientific and technical research directed to the improvement of these forecasts;
- collection and storage of appropriate meteorological data.

ECMWF comprehensive data service includes – *inter alia* - access to wave model archived datasets (both analysis and forecast) on a global scale and on a regional scale for Mediterranean Sea.

The Mediterranean Wave Analysis Dataset archives analysis data as computed 4 times a day by ECMWF modelling systems on a regional basis (Mediterranean Sea), for a 0.25 degree grid resolution since 1995, and a coarser resolution before 1995. Parameters stored are the following:

Available since 1992 :

- significant wave height,
- mean wave direction,
- peak period of 1D spectra,
- mean wave period,
- coefficient of drag with waves,
- significant height of wind waves,
- mean direction of wind waves,
- mean period of wind waves,
- significant height of primary swell,
- mean direction of primary swell,
- mean period of primary swell

Available since 1995 :

- 2-D wave spectra which is produced four times per day. Note that proper interpolation is not carried out for this field. Interpolated values are just those from the nearest archive data point

Available since 1996 :

- mean square slope of waves

Available since 1998 :

- 10 metre wind speed

Available since 1999 :

- altimeter wave height,
- altimeter corrected wave height,
- altimeter range relative correction

Available since 2000 :

- mean wave period first moment,
- mean wave period second moment,
- wave spectral directional width,
- mean wave period first moment wind waves,
- mean wave period second moment wind waves,
- wave spectral directional width wind waves,
- mean wave period first moment for swell,
- mean wave period second moment for swell,
- wave spectral directional width for swell

**Main characteristics**

- Data from July 1992 to June 1995 cover the area 46.0° N to 30.0° N, 6.0° W to 36.0° E, with a 0.5° latitude/longitude grid resolution.
- Data from June 1995 to October 1998 cover the area 66.0° N to 30.0° N, 6.0° W to 42.0° E with a 0.25° latitude/longitude grid resolution.
- Data from October 1998 to date cover the area 81.0° N to 9.0° N, 98.0° W to 42.0° E.
- fields are uninitialised analyses for 0000 UTC, 0600 UTC, 1200 UTC and 1800 UTC each day.
- each parameter is stored as a field of grid point values, in latitude rows starting at the north and working southwards; within each row values run from west to east.
- data are stored in FM 92 GRIB using sufficient bits to ensure that the values represented can be retrieved to an accuracy consistent with the analysis method used.

**Copyright and accessibility**

Data are available at handling cost for research and educational institutions, and at handling cost **plus** "information" cost for commercial entities.

For more information: <http://www.ecmwf.int/products/data/archive/charges/index.html>

Specifically handling cost represents £ 60 per data unit (1 data unit = 100Mbytes) **plus** 50 £ per month for which archived data are requested.

**Summary sheet**

Data & Metadata		
Mediterranean Wave Analysis Datasets (ECMWF)		
<u>Description of the Dataset :</u> wave model parameters (e.g. significant wave height, wind speed, wind direction, etc.)		
<u>Geographical Extent :</u>	<u>Restrictions :</u>	
<u>Providing Terms / Copyrights issues :</u> informations directly on the web site : <a href="http://www.ecmwf.int/products/data/archive/charges/index.html">http://www.ecmwf.int/products/data/archive/charges/index.html</a>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

HYDRODYNAMICS AND SEA LEVEL RISE		WP 2.7
<b>Contact</b>		
Name	The Director	ECMWF-Director@ecmwf.int
Company	European Centre for Medium Range Weather Forecast (ECMWF)	Tel.+44 (0) 118 949 9000
Address	Shinfield Park, Reading RG2 9AX UNITED KINGDOM	Fax +44 (0) 118 986 9450
		Web <a href="http://www.ecmwf.int/">http://www.ecmwf.int/</a>
<u>Related Links :</u>		

### II-5.5. Admiralty Tide Tables

M

#### *Scope and content*

Magnitude and effects of tides and tidal streams at any place and any point in time is of vital importance to all mariners, from ocean going vessels to inshore fishermen, yachtsmen and port operators. Tidal data is also of considerable interest to those studying sea pollution, oil dispersion, sedimentation, flood prevention, oceanographic research and the effect of constructional work below the high water line.

Tides are periodic oscillations related to the motions and attractive forces of the moon, sun and earth system. When meteorological conditions are favourable, tide amplitudes can be mathematically approximated as the sum of a series of sine waves of determined frequency "harmonic constituents". The parameters of each sine wave are called "harmonic constants", and are the amplitude (half the height) of the wave and phase, or time of occurrence, of the maximum.

The UK Hydrographic Office has been responsible for many years for gathering and publishing both tide tables and tidal harmonic constants. Tidal publications of UKHO are made of :

- Admiralty Tide Tables
- Tidal Harmonic Constants
- Tidal Streams

The Admiralty Tide Tables (ATT) give daily predictions of the times and heights of high and low waters of over 230 Standard Ports. Further information in the form of time and height differences from the Standard Ports are also available for over 6.000 Secondary Ports.

The tables cover the world in four volumes and are published annually:

- ATT Volume 1 NP201 - United Kingdom and Ireland (including European Channel Ports)
- ATT Volume 2 NP202 - Europe (excluding United Kingdom and Ireland), Mediterranean Sea And Atlantic Ocean
- ATT Volume 3 NP203 - Indian Ocean And South China Sea (including Tidal Stream Tables)
- ATT Volume 4 NP204 - Pacific Ocean (Including Tidal Stream Tables)

In addition, UKHO also provides 17 Tidal Stream atlases which show in diagrammatic form the major Tidal Streams for selected waters of NW Europe. These atlases :

- Show at a glance both direction and rate of tidal streams at hourly intervals by careful and accurate use of graded arrows
- Display mean neap and spring tidal rates in tenths of a knot
- Include diagram to assist you to calculate the tidal stream rates for your required day

Area covered are the following :

NP209	Orkney and Shetland Islands	
NP218	North Coast of Ireland and West Coast Scotland	
NP219	Portsmouth Harbour and Approaches	
NP220	Rosyth Harbour and Approaches	
NP221	Plymouth Harbour and Approaches	
NP222	Firth Of Clyde and Approaches	
NP233	Dover Strait	
NP249	Thames Estuary	
NP250	The English Channel	
NP251	North Sea, Southern Portion	
NP252	North Sea, Northwestern Part	
NP253	North Sea Eastern Part	
NP256	Irish Sea And Bristol Channel	
NP257	Approaches to Portland	
NP264	The Channel Islands And Adjacent Coasts Of France	
NP265	France, West Coast	
NP337	The Solent and Adjacent Waters	

Table 7 - Admiralty Tide Tables' coverage

In order to facilitate retrieval of tide amplitudes, UK Hydrographic Office has developed the Total Tide 2002 package. Designed by the UKHO for SOLAS shipping, TotalTide uses a powerful calculation algorithm together with official tidal data from the world's premier hydrographic authorities to provide instant predictions for over 7000 ports and more than 3000 tidal stream stations worldwide.

**Copyright and accessibility**

Each printed volume of the Admiralty Tide Table costs £ 19 ex-VAT and mailing fees. Publication of Tidal harmonic constants is available at cost £ 8 ex-VAT and mailing fees. Each printed tidal stream atlas costs £ 7 ex-VAT and mailing fees.

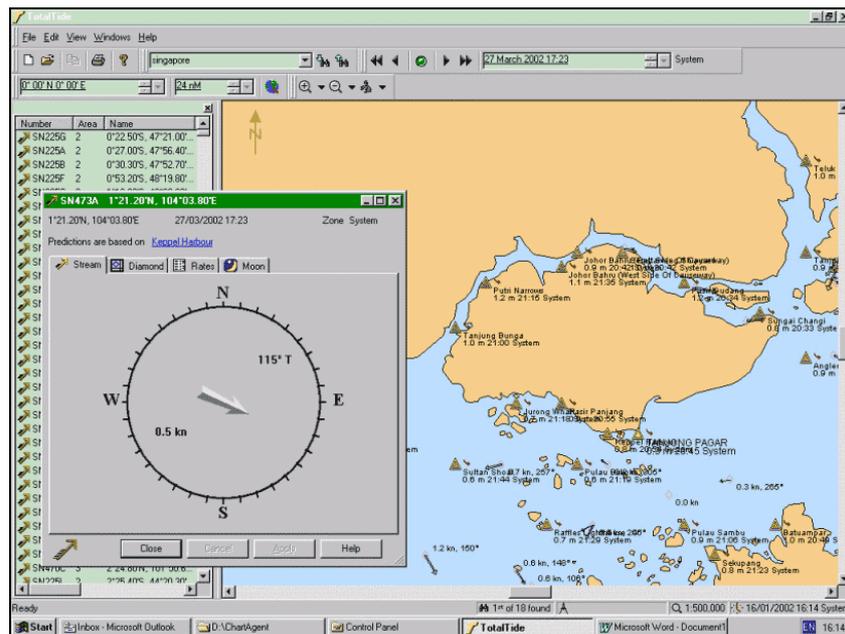


Figure 24 - Screenshot of Total Tide 2002

**Summarysheet**

Data & Metadata		
Admiralty Tide Tables		
<u>Description of the Dataset :</u> Times and heights of high and low waters, tidal harmonic constants, direction and rate of tidal streams at hourly intervals, mean neap and spring tidal rates in tenths of a knot.		
<u>Providing Terms / Copyrights issues :</u> 4 volumes of Admiralty Tide Table Publication of Tidal harmonic		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
HYDRODYNAMICS AND SEA LEVEL RISE	WP 2.7	
Contact		
Name	<a href="mailto:tides@ukho.gov.uk">tides@ukho.gov.uk</a>	
Company	The United Kingdom Hydrographic Office	
Address	Admiralty Way, TA1 2DN, Taunton, Somerset, UK	
	Tel.+44 (0) 1823 337900 Fax +44 (0) 1823 284077 Telex: 46274	

## **II-6. METEOROLOGY/CLIMATE CHANGE**

### ***Relevance of Meteorology/Climate Change for EUROSION***

Climate change and coastal erosion are intimately related. On one hand, the progressive global warming recorded in the past 30 years results in sea level rise - which may reach as much as 1 meter by 2050 - which would result in both a progressive move of surfing zones (where wave-induced chronic erosion occurs) inland. On the other hand, climate change also results in an increase of storm surge frequency and a reduction of high waves' return period.

### ***List of Datasets inventoried***

- CRU05 0.5 Degree 1901-1995 Monthly Climate Time-Series
- OFDA/CRED International Disaster Database
- Swiss Re Catastrophe Database (CATNET)
- Eurowind

### **II-6.1. CRU05 0.5 Degree 1901-1995 Monthly Climate *Time-series***

#### ***Scope and content***

CRU05 0.5 Degree Monthly Climate Time-Series is a 0.5 degree lat/lon dataset of monthly surface climate extending from 1901 to 1995 over global land areas, excluding Antarctica. It has been developed by the Climate Research unit of the University of East Anglia. The database features two groups of variables. Primary variables are interpolated directly from station time-series: precipitation, mean temperature and diurnal temperature range. Secondary variables are interpolated from station series where data are available and estimated using relationships with primary variables in regions with no data: wet-day frequency, vapour pressure, cloud cover and ground-frost frequency. This available on CD or via ftp from the Climatic Research Unit.

#### ***Main characteristics***

The dataset comprises a suite of seven climate elements: precipitation, mean temperature, diurnal temperature range, wet-day frequency, vapor pressure, cloud cover, and ground frost frequency. The spatial coverage extends over all land areas, including oceanic islands but excluding Antarctica. Fields of monthly climate anomalies, relative to the 1961–90 mean, were interpolated from surface climate data. The anomaly grids were then combined with a 1961–90 mean monthly climatology to arrive at grids of monthly climate over the 96-yr period.

The primary variables - precipitation, mean temperature, and diurnal temperature range - were interpolated directly from station observations. The resulting time series are compared with other coarser-resolution datasets of similar temporal extent. The remaining climatic elements, termed secondary variables, were interpolated from merged datasets comprising station observations and, in regions where there were no station data, synthetic data estimated using predictive relationships with the primary variables. These predictive relationships are described and evaluated.

It is argued that this new dataset represents an advance over other products because (i) it has higher spatial resolution than other datasets of similar temporal extent, (ii) it has longer temporal coverage than other products of similar spatial resolution, (iii) it encompasses a more extensive suite of surface climate variables than available elsewhere, and (iv) the construction method ensures that strict temporal fidelity is maintained. The dataset should be of particular relevance to a number of applications in applied climatology, including large-scale biogeochemical and hydrological modeling, climate change scenario construction, evaluation of regional climate models, and comparison with satellite products. The dataset is available from the Climatic Research Unit and is currently being updated to 1998.

### Copyright and accessibility

A handling charge of 80 £ to cover the costs of postage, relevant publications, data storage and maintenance of the dataset is requested.

### Summary sheet

Data & Metadata		
CRU05 0.5 Degree 1901-1995 Monthly Climate Time Series		
<u>Description of the Dataset :</u> Comprises precipitation, mean temperature, diurnal temperature range, wet-day frequency, vapor pressure, cloud cover, and ground frost frequency over a global 0.5° x0.5° grid.		
<u>Geographical Extent :</u> Global terrestrial	<u>Restrictions :</u> Antarctica	
<u>Providing Terms :</u> Via CD or FTP. Fees are requested : 80 £ for CD-ROM, 50 £ for FTP delivery		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- extension to CEEC - metadata - integration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
METEOROLOGY/CLIMATE CHANGE	WP 2. ?	
Contact		
Name	David Viner	d.viner@uea.ac.uk
Company	Climate Research Unit	
Address	School of Environmental Sciences University of East Anglia Norwich, East Anglia	Web : <a href="http://www.cru.uea.ac.uk/~markn/cru05/cru05_intro.html">http://www.cru.uea.ac.uk/~markn/cru05/cru05_intro.html</a>
<u>Related Links :</u>		

***Scope and content***

Since 1988 the World Health Organisation (WHO) Collaborating Centre for Research on the Epidemiology of Disasters (CRED), hosted by the Université Catholique de Louvain (UCL), has been maintaining an Emergency Events Database - EMDAT. EMDAT was created with the initial support of the WHO and the Belgian Government. Maintenance of the database is nowadays supported by the Office of US Foreign Disaster Assistance (OFDA).

The main objective of the database is to serve the purposes of humanitarian action at national and international levels. It is an initiative aimed to rationalise decision making for disaster preparedness, as well as providing an objective base for vulnerability assessment and priority setting. For example, it allows to decide whether floods in a given country are more significant in terms of its human impact than earthquakes or whether a country is more vulnerable than another for computing resources is.

EMDAT contains essential core data on the occurrence and effects of over 12800 mass disasters in the world from 1900 to present. The database is compiled from various sources, including UN agencies, non-governmental organisations, insurance companies, research institutes and press agencies.

While the 12800 records of natural and man-made disasters contained within the database have been checked, neither OFDA or CRED can accept any responsibility for the contents of the database. This is because the data in EMDAT is based on reports compiled by external organisations and sent to CRED. Every effort is made to use reliable sources (e.g. United Nations agencies) but it means that the data presented here *may* contain errors and/or duplications.

***Main characteristics***

The disaster databases contain essential data on the occurrence and effects of mass disasters in the world from 1900 to the present. The following definition for disaster has been used: *"A disaster is a situation or event which overwhelms local capacity, necessitating a request to national or international level for external assistance."* The disaster data are subdivided into three types: natural, technological and conflicts. At present the databases (natural and technological data) are in two forms: standard and enhanced.

The standard database consists of the data taken from an existing disaster database, checked for duplications, but no additional information have been included. As the databases are enhanced (i.e. additional information added), then these will be added to CRED web site.

In the framework of EUROSION, only the two files focused on natural disasters are of interest. These files come as Excel sheets and include:

Sheet No.1 (natural.xls): A summary of all natural disasters occurred in the world since 1900.

The description is composed of:

- Location of the disaster (country, continent)
- Type of disaster (Wind Storm, Wave/Surge, Flood, Earthquake, Volcano, Drought, Slide, Epidemic, Extreme temperature, Famine, Insect infection, Fire)
- Date of disaster
- Victims (number of killed, injured, homeless, affected people)
- Estimation of damages occurred
- Sources of information

Sheet No. 2 (enatural.xls) : An enhanced summary of natural disasters occurred in the world from 1975 to date. Beyond information detailed above, the extended description provides a more detailed location of the disaster (including geographical coordinates) and enhanced comments on damages occurred, coming from various companies mainly insurance companies.

### Copyright and accessibility

The database is freely downloadable from URL: <http://www.cred.be/emdat/intro.html>

### Summary sheet

Data & Metadata		
OFDA/CRED INTERNATIONAL DISASTER DATABASE (EM-DAT)		
<u>Description of the Dataset :</u> contains essential data on the occurrence and effects of mass disasters in the world from 1900 to the present		
<u>Geographical Extent :</u> Global	<u>Restrictions :</u> No restrictions	
<u>Providing Terms :</u> Excel sheets freely downloadable from CRED Web site: <a href="http://www.cred.be/emdat/intro.html">http://www.cred.be/emdat/intro.html</a>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- extension to CEEC - metadata - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
METEOROLOGY/CLIMATE CHANGE	WP 2.7?	
Contact		
Name Company  Address	Professor D. GUHA-SAPIR Centre for Research on the Epidemiology of Disasters (CRED) School of Public Health Université Catholique de Louvain 30.94 Clos Chapelle-aux-Champs 1200 Brussels	+32 (0) 2 764.33.27 +32 (0) 2 764.34.41 <a href="mailto:cred@epid.ucl.ac.be">cred@epid.ucl.ac.be</a> Web : <a href="http://www.cred.be/emdat/intro.html">http://www.cred.be/emdat/intro.html</a>
<u>Related Links :</u>		

**Scope and content**

*Swiss Re* is one of the world leading reinsurance companies. Reinsurance companies share the risks that direct insurance companies cannot carry alone. In order to improve its methods for assessing and managing risks from natural disasters, *Swiss Re* recently developed a GIS-based service, called Catastrophe Network (CATNet). CATNet aims at disseminating information to direct insurers and other organizations via an ArcIMS application. It provides information on 500.000 locations, including risk rates and CRESTA Zones (i.e. insurance industry zones that separately evaluate total exposure in different areas), so users can more intelligently evaluate risks.

**Main characteristics**

The database comprises three individual layers:

- Hazard information: (i) seismic hazard, (ii) wind speed (tropical storms and European winterstorms), (iii) Floods for Argentina, Belgium, Hungary, Italy, Netherlands, UK, and USA, and (iv) Volcanoes
- Historic Events: (i) Earthquakes Epicentres, (ii) Tropical cyclone tracks, and (iii) Tornadoes
- Insurance related data: CRESTA zones (accumulation zones for insured values)

Only information on wind speed and floods may be of interest for EUROSION.

Wind speed. As regard information on European winterstorm hazard (October-March), the estimation of the local maximum gust speed is based on a catalogue of all major European windstorm events 1946-1999, basically the same storm catalogue used in EUROWIND (see next section). A maximum gust speed map was drawn up for every single storm based on meteorological surface data. The layer displayed represents the results of statistical analysis of all these events at every single grid point. Please note that summer thunderstorms and regional winds (Mistral, Bora, Foehn) are not taken into account.

Floods. CATNet flood zones are available in Europe only for UK, Netherlands, Italy, and Belgium. These flood zones are based on a wide variety of heterogeneous sources. Therefore depending on the country, either storm surge and/or fresh water flood zones are displayed. Data is provided in a single raster layer with a horizontal resolution of about 200 meter. For correct interpretation, it is important to understand the meaning of the «outside» and «no data» values.

- The zone «outside» is not generic but country specific. It defines areas with a higher return period of being flooded than the return periods defined for designated flood zone in a particular country. For example in the US, «outside» classifies all areas that are affected less often than every 500 years. The methodologies employed for flood zones designation generally disregard very small bodies of water, such as rivulets or small creeks. Therefore «outside» does not mean that there is no flood risk.
- The zone «no data» applies either to areas where the flood hazard was not determined, or where flooding from small or medium sized rivers could not be excluded due to the employed methodology.

**Copyright and accessibility**

The database is copyrighted and only accessible online. Access to information is subject to *Swiss Re* prior approval. A free 8 weeks trial is granted, but the licence extension beyond this term is subject to the payment of fees. Annual fees range from 500 Euros for NGO single user licence to more than 3000 Euros for corporate multi-user licence.

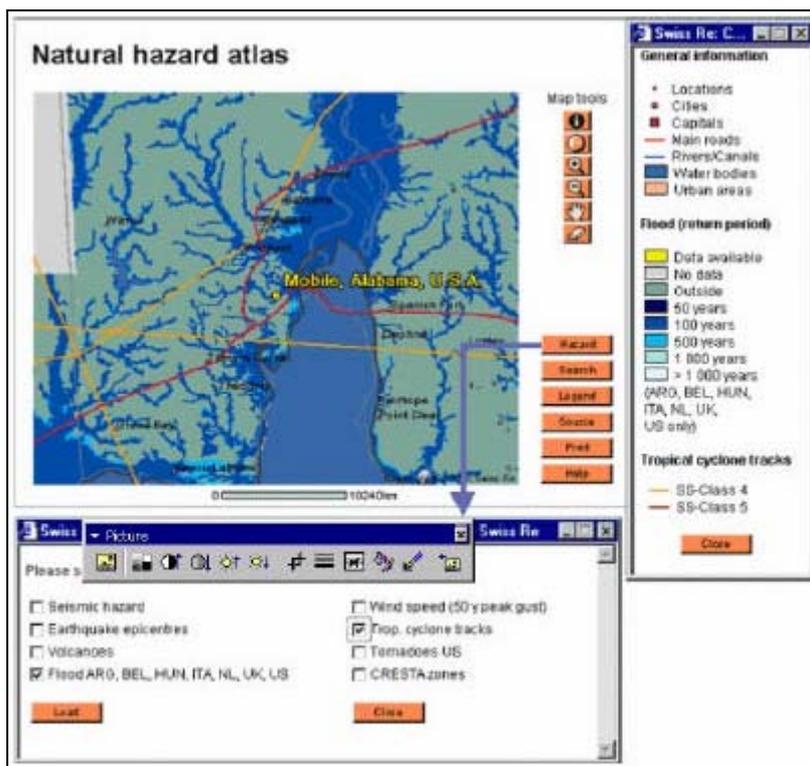


Figure 25 – Screenshot of *Swiss Re* Catastrophe database

**Summary sheet**

Data & Metadata		
SWISS RE CATNet		
<u>Description of the Dataset :</u> contains information of the risk of natural hazard occurrence over more than 500.000 locations worldwide, and especially information on European winterstorms and floods areas.		
<u>Geographical Extent :</u> Global	<u>Restrictions :</u> Unknown	
<u>Providing Terms :</u> The database is copyrighted and only accessible online via ArcIMS. A free 8 weeks trial is granted. Licence extension beyond this term is subject to annual fees. See <a href="http://www.swissre.com/portal">http://www.swissre.com/portal</a> then click on <i>Services</i> for more information.		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- extension to CEEC - Metadata only - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
METEOROLOGY/CLIMATE CHANGE	WP 2.7 ??	
Contact		

Name	Client Services	
Company	Swiss Reinsurance Companies ( <i>Swiss Re</i> )	+ 41 43 285 9990
Address	Swiss Re Client Services Mythenquai 50/60 PO Box, 8022 Zurich Switzerland	Web : <a href="http://www.swissre.com">http://www.swissre.com</a> <a href="mailto:client_services@swissre.com">client_services@swissre.com</a>
<u>Related Links :</u>		

**Scope and content**

EUROWIND® is a state-of-the-art wind-modeling software package for insurers, reinsurers, and financial institutions wishing to assess and control exposure of their European property portfolios to windstorm damage.

It includes over 100 years of detailed meteorological records, topographic data and building vulnerability information based on analysis of over one million recent storm damage claims.

EUROSION makes it possible to import CRESTA zones and property types (residential, commercial, industrial and agricultural), choose either a probabilistic or scenario analysis and, as an output, get expectation of loss potential.

Reinsurers can also get a technical rate for Catastrophe Excess of Loss, Stop Loss and Quota Share at the touch of a button.

**Main characteristics**

EUROWIND® covers the United Kingdom, Ireland, France, Germany, Belgium, the Netherlands, Luxembourg, Denmark, and Southern Sweden - the areas of Europe most prone to storm damage claims.

Probabilistic calculations are based on approximately 6.000 possible storms with differing return periods. These are derived from a painstaking reconstruction of the wind speed and duration of 125 historic storms dating back to 1897. You can also test your portfolio against an individual historic storm or a "worst-case" storm of your own specification.

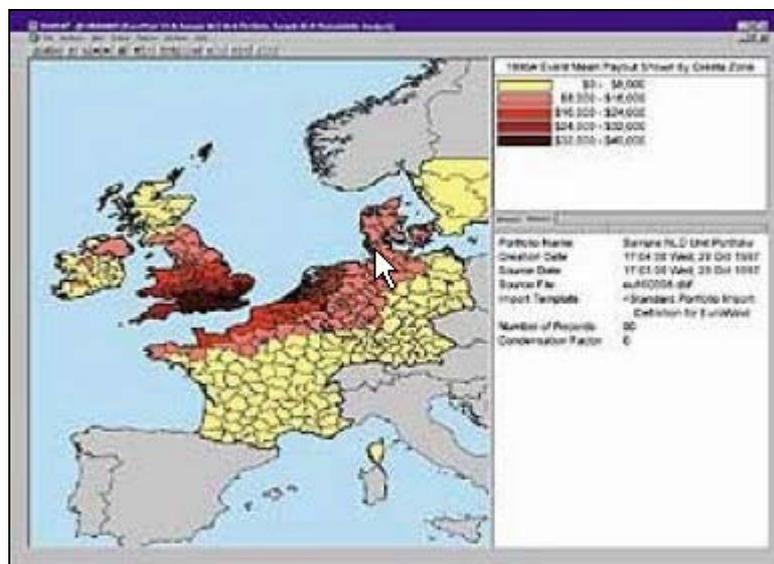


Figure 26 - Screenshot of EUROWIND

EUROWIND® gives estimation of probable maximum losses for a specific insurance portfolio or for portfolio accumulations by property types in a particular zone. The model can calculate the mean losses and standard deviation for various return periods, giving paralleled accuracy of information.

Property damage ratios are calculated from estimates of the peak two-second gust speed, a fundamental factor in European building design codes. Building vulnerability classifications are based on detailed analysis of over one million recent storm damage claims and cover residential, commercial, industrial, and agricultural property.

EUROWIND® is developed for use on PCs running Windows 95 or Windows NT, making it simple to exchange data with spreadsheet and database applications. Portfolio information can be downloaded directly into the model from most database or spreadsheet applications, and output data can simply be exported to word-processing packages or further analyzed with database or spreadsheet applications.

The model has been developed in an ISO 9002 accredited software environment.

**Copyright and accessibility**

EUROWIND® is licensed to users on an annual basis and is regularly updated as new demographics, topographic, meteorological, seismic and building vulnerability information becomes available.

**Summary sheet**

Data & Metadata		
<b>EUROWIND</b>		
<u>Description of the Dataset :</u> The database includes over 100 years of detailed meteorological records, topographic data and building vulnerability information based on analysis of over one million recent storm damage claims.		
<u>Geographical Extent :</u> United Kingdom, Ireland, France, Germany, Belgium, the Netherlands, Luxembourg, Denmark, and Southern Sweden		
<u>Providing Terms :</u> EUROWIND® is licensed to users on an annual basis. No information on fees are available		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- extension to CEEC - metadata only - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<b>METEOROLOGY/CLIMATE CHANGE</b>	<b>WP 2.??</b>	
Contact		
Name Company	Michel Voronkoff ABS Consulting	Mvoronkoff@absconsulting.com Tel: +33 1 44 79 01 01 Fax: +33 1 44 79 01 05
Address	16 rue Drouot 75009 Paris, France	Web : <a href="http://www.eqecat.com/eurowind.htm">http://www.eqecat.com/eurowind.htm</a>
<u>Related Links :</u>		

## **II-7. HYDROGRAPHY, INFRASTRUCTURE**

### ***Relevance of hydrography and infrastructure for EUROSION***

Suspended materials drained by watersheds are discharged at the level of river mouths, and contribute to increase the sediment budget near the river mouth (sometimes hundreds of kilometres if long-shore transport is important). Thus more than indicative informations, hydrography layer will favour the understanding for other layers. Information of infrastructure makes it possible to estimate both capital at risk along the coast, and the capital invested to protect the coastline.

Moreover, such major infrastructures as dams, or harbours, significantly disturb sediment budget generally by trapping sediment carried by rivers or longshore currents.

### ***List of Datasets inventoried***

At the desired scale of 1 : 100.000, every european NMA can provide heterogeneous cartographic (hydrographic and infrastructure) data but no european wide harmonized and standardized data are existing.

At a lower scale (1 to 1 million), EUROSTAT has built the GISCO database that contains hydrographic networks and infrastructure elements within a common european view.

For a couple of years Eurogeographics started to work on the standardization of cartographic concepts in relation with the different NMAs. Therefore two products are going to be issued by Eurogeographics in the next two years: EuroRegionalMap© et EuroGlobalMap©.

Before the delivery of this product, Eurogeographics shall provide metadata on all cartographic data available at national level in every NMA, so as to build a whole metadata database inventoring most of cartographic elements.

So far the main products inventoried regarding the hydrography and infrastructure themes are:

- GISCO (scale 1: 1 000 000)
- EuroGlobalMap© (scale 1 : 1 000 000)
- EuroRegionalMap © (scale 1 : 250 000)



**Scope and content**

Within the framework of the GISCO (GIS for the European Commission) service, a large geo-referenced database has been developed. EUROSTAT assumes the mandate to stock, extend, maintain and update this database.

The numerous datasets offered by GISCO include:

- Topographical data on:

GISCO Theme	Layer Name
Administrative Entities derived from S.A.B.E	Administratives Regions
	NUTS Regions
	Communes
	Sub-Communes Boundaries
Hydrography	Coast Line
	Lakes
	Water Pattern
	Watershed
Altimetry	Digital Terrain Model
Infrastructure	Airport
	Ferry Links
	Ports
	Roads
	Railways
	Settlements

Yellow highlighted rows are the layers related to coastal purposes which the consortium propose to integrate into the "EUROSION" database.

- Thematic data on:

GISCO Theme	Layer Name
Environmental Data	Coastal Erosion
	Soil Erosion risk
	Land Quality
Industrial Themes	Nuclear Power Stations
	Energy Production
	Energy Transport
Infra Regional Statistics	Population
	Degree of Urbanisation
Land Resources	Climate
	Climate Interpolated
	Fishing Areas
	Soils
Nature Resources	BioGeographical Regions
	Biotopes
	Designated Areas
	Natural Vegetation
	Landscapes

## ***Hydrography theme's description***

### *Coast Line*

The Coast Line layer is a line coverage that indicate the entire european coastline. The current version of the coverage has been built form different sources among others SABE. Since the original SABE 97 coast line is to be integrated, this GISCO layer should not.

### *Lakes*

Some Lakes are not taken up in administrative regions like for example NUTS. Therefore a single coverage with the lakes has been built. The coverage holds all relevant European lakes. The SABE 97 (30m resolution) has been used as main datasource but some other lakes were added to the list.

### *Water Pattern*

Data on water pattern of Europe represent an important element of the topographic base map on which results may be presented. These data also indicate the distribution of surface water resources in Europe.

The main purpose of the water pattern data sets is to provide a cartographic background. Depending on the type of map, adding a river network to a map provides a more complete view to the data to be shown.

### *Watershed*

The Watersheds layer contains data regarding the major sea drainage basins of Europe.

The catchments were derived from a hierarchical river network of scale 1:1 million, which was combined with a DEM of 1km grid size. Catchments are separated into those draining into the sea, referred to as "primary" catchments, and those, which constitute partitions of primary catchments, referred to as "sub-catchments". Coastal areas below the mapping limit were aggregated into catchment regions.

Primary catchments are stored in a single layer.

Sub-catchments are defined by a size threshold and thus, depending on the threshold, different limits of sub-catchments can be defined. In this data set the smallest size threshold was set to 1000 km<sup>2</sup>.

Consistency in the boundaries of data layers is warranted by using those sub-catchments as building blocks for larger sub-catchments. To generate those larger units a hierarchical system of sub-catchment layers is applied. The system defines layers by doubling the nominal size of the lower layer. The layers themselves are not stored explicitly, but in form of the catchment code. They can be generated through the code by merging sub-catchments.

## ***Infrastructure theme's description***

The theme Infrastructure (IN) belongs to the GISCO basic topographic data that constitutes important factor determining spatial segmentation. it contains data sets on features such as transport (e.g. roads and railways) or infrastructure and settlements.

They make up a skeleton for displaying other thematic data, whether or not related to infrastructure topics. Obviously, they are the prime basic data for all transport related issues, which form the engine for many socio-economic activities.

### *Airports*

Multiple applications can be envisaged if the airport data are combined with other themes of the GISCO reference database, for example, which important biotope sites are located within a distance of x kilometers of certain airports.

### Ports

Ports are significant infrastructure features enabling the movement and export or import of people and goods between different regions and often different countries. Same studies as airports can be led.

### Roads

Roads are central to the infrastructure of a region or country. It is for this reason that many applications have evolved using digital road networks. The availability of a transport network database seems to become more and more important because international exchange and co-operation increase.

Many applications are possible using the road network data. For example, by using the speed limit (or a percentage of it), isochrones of expected journey times can be made around towns based upon their road infrastructure. This enables questions such as which communes are within an hour's drive of an airport, a town or any other infrastructure feature.

### Railways

The railway network like the road network, provides essential infrastructure information that can be referenced geographically to the correct regions and other infrastructure details

### Settlements

Information on settlements allows referencing on population attributes and can be used in conjunction with other infrastructure data for planning purposes. It also serves as part of the cartographic 'background' against which other results may be presented

### Summary sheet

Data & Metadata	
GISCO	
<u>Description of the Dataset :</u> Infrastructure and Hydrography layers Vector data, corresponding to the scale 1 : 1.000.000	
<u>Main Characteristics :</u> Lakes, Water Pattern, Watersheds Airport, Ports, Roads, Railways, Settlements	
<u>Geographical Extent :</u> All UE and all CEEC	<u>Restrictions :</u>
<u>Providing Terms :</u> Agreement Form to get GISCO free of charge	
<u>Copyrights issues :</u> GISCO is a product from EUROSTAT for the EC.	
EUROSION Work* on Data & Metadata	

* except Stocktaking, Quality Assessment and metadata documenting...	- update - data - metadata	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<i>HYDROLOGY, INFRASTRUCTURE</i>		WP 2.5.4
<b>Contact</b>		
Name Company	De Diego Diez César EUROSTAT	Tel. +352 4301-34992 Fax +352 4301-34029 <a href="http://europa.eu.int/comm/eurostat/">http://europa.eu.int/comm/eurostat/</a>
Address	Bâtiment Jean Monnet, Rue Alcide de Gasperi, L-2920 Luxembourg; Bâtiment Joseph Bech, 5 Rue Alphonse Weicker, L-2721 Luxembourg	
<u>Related Links :</u>		

## II-7.2. EuroGlobalMap© from Eurogeographics

### **Scope and content**

EuroGlobalMap© can be considered as the response of the European NMAs to the Global Mapping Initiative. The members of EuroGeographics have come to the conclusion that the European NMAs wish to work together on this project and create a European database in scale 1 : 1 million. The National Land Survey of Finland was chosen to be responsible for the Project Management, *i.e.* to be the Project Coordinator.

### **Main characteristics**

EuroGlobalMap© is to include the following themes :

- Administrative boundaries (issued from S.A.B.E)
- Hydrography
- Transportation
- Population centre / Settlement
- Elevation
- Named location
- Cartographic names

The geographical extent and restrictions are the following:

December 2002 : release of EuroGlobalMap v.1 (covering western Europe)  
December 2003 : release of EuroGlobalMap v.2 (covering all/most of Europe)

### **Copyright and accessibility**

Please contact EUROGEOGRAPHICS for further information.

**Summary sheet**

Metadata		
EUROGLOBALMAP©		
<u>Description of the Dataset :</u> Hydrography, Infrastructure - Transportation, Cartographic names, named location, Population centre, Settlements. Vector data, scale equivalence 1 : 1.000.000		
<u>Geographical Extent :</u> All UE countries at the earliest end of 2002.	<u>Restrictions :</u>	
<u>Providing Terms :</u> Such an "Agreement Form " has to be set.		
EUROSION Work* on Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
HYDROGRAPHY, INFRASTRUCTURE	WP 2.5.4	
Contact		
<u>Contacts :</u>		
Name		<a href="mailto:contact@eurogeographics.org">contact@eurogeographics.org</a>
Company	Eurogeographics	Tel. +33 1.64.15.32.39 Fax +33 1.64.15.32.19
Address	6-8, Avenue Blaise Pascal Cité Descartes Champs-sur-Marne F-77455 Marne-la-Vallée Cedex 2	<a href="http://www.eurogeographics.org">www.eurogeographics.org</a>
<u>Related Links :</u>		

### Scope and content

EuroRegionalMap© is a pan-European database at medium scale suitable for spatial analysis, network analysis and visualisation.

The EuroRegionalMap© database is intended as a topographic framework or base data product for multi-purpose GIS at the scale of 1 : 250.000 covering the whole of Europe seamlessly and more or less homogeneously in order to facilitate the implementation of cross-border and pan-European GIS as well as the transfer of GIS expertise and solutions from one national market to another.

The project furthermore wants to make the experience from a pragmatic approach towards harmonisation of existing national databases available to other Mapping Agencies in order to promote its extension to the rest of Europe. Institut Géographique National, Belgium (IGN B) is the Project Co-ordinator of the project in charge of the project management.

### Main characteristics

EuroRegionalMap© is to include the same themes than EuroGlobalMap© :

- Administrative boundaries
- Hydrography
- Transportation
- Population centre / Settlement
- Elevation
- Named location
- Cartographic names

EuroRegionalMap© geographical extent and restrictions are the following :

#### May 2002

a prototype of the ERM database is available.

#### February 2003

the database for the six consortium partners will be ready.

These partners are France, Germany, Belgium, Luxemburg, Denmark, Ireland and Northern Ireland (coloured in orange on the opposite map)

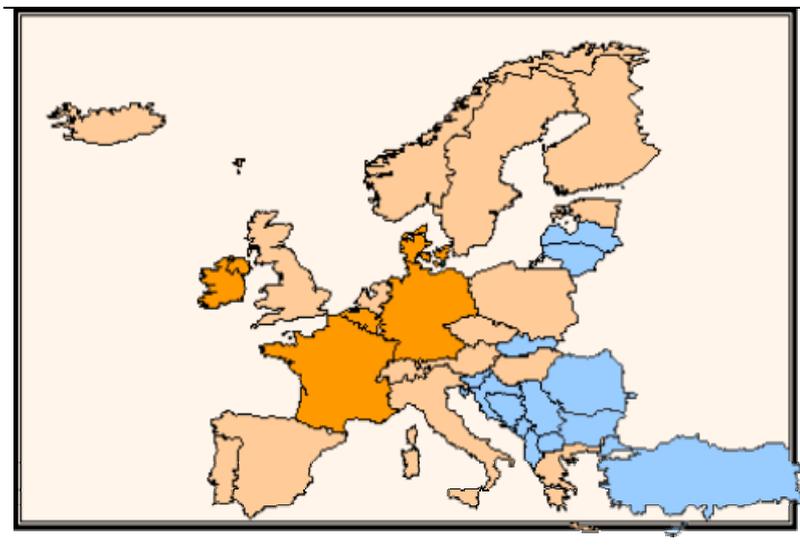


Figure 27 - EuroRegionalMap© foreseen coverage

### Copyright and accessibility

Please contact EUROGEOGRAPHICS for further information.

**Summary sheet**

<b>Metadata</b>		
EUROREGIONALMAP©		
<u>Description of the Dataset :</u> Hydrography Infrastructure - Transportation, Cartographic names, named location, Population centres, Settlements. Vector data, scale equivalence 1 : 250.000		
<u>Geographical Extent/Restrictions :</u> <b>BEWARE :</b> France, Germany, Belgium, Denmark, Ireland and Northern Ireland, available early February 2003		
<u>Providing Terms :</u> Such an "Agreement Form " has to be set.		
<u>Dissemination :</u>		
<b>EUROSION Work* on Metadata</b>		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - metadata only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
HYDROGRAPHY, INFRASTRUCTURE	WP 2.5.4	
<b>Contact</b>		
Name Company Address	Eurogeographics 6-8, Avenue Blaise Pascal Cité Descartes Champs-sur-Marne F-77455 Marne-la-Vallée Cedex 2	contact@eurogeographics.org Tel. +33 1.64.15.32.39 Fax +33 1.64.15.32.19 <a href="http://www.eurogeographics.org">www.eurogeographics.org</a>
<u>Related Links :</u>		

***Scope and contents***

The main objective of the EUROLandscape Project is to develop Geographic Information for assessing, mapping and monitoring the European landscape. The project aims to:

- Assist the European Commission on a sound scientific basis in collecting and producing the information required for the formulation of new strategies and policies for rural areas, landscape planning and regional development.
- Facilitate timely access to information relevant for monitoring the environment and for answering questions, which may arise from the implementation of EU policies and their impact on the environmental resources.
- Develop remote sensing and GIS based cost-effective methods for the management of less favoured areas and renewable resources within the Pan-European area.

The EUROLandscape (Geo-Information for Development and Environmental Monitoring) project is striving to provide harmonized European or Pan-European information on important aspects of the landscape.

The composition, structure, and the use of the landscape are determining factors for local and regional water-balance, and fundamental for the sustainability of the diversity of habitats for flora and fauna. Forest and other wooded land cover 40% of the EU's land surface. Grasslands cover a further 16%. These two permanent land-cover types house the majority of the biodiversity in Europe. In addition, they are our most important assets in binding carbon and thereby play an important role in reducing CO<sub>2</sub> emissions in the EU.

The core elements of the EUROLandscape project are forests, other wooded land, grasslands, terrain characteristics, drainage networks and catchment boundaries, their socio-economic importance and the impact of legislation. The project is thus divided into components dealing with:

1. Catchment Characterization and Modeling (relevant for EUROSION)
2. European Forestry
3. Monitoring Urban Landscapes
4. Studying Complex Landscape Structures

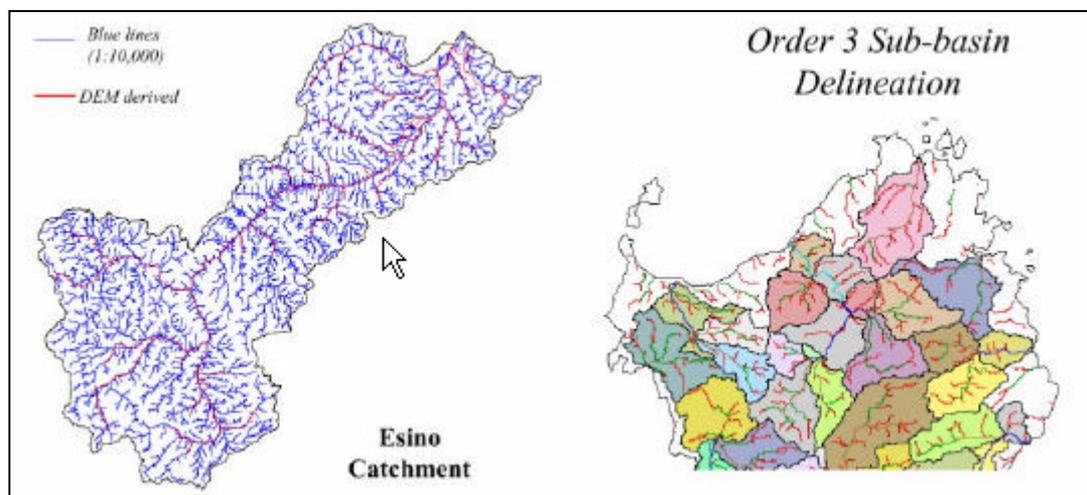
The importance of the EUROLandscape project is underpinned by the fact that it directly supports a series of EU regulations and international conventions. The project links closely to the EU regulations and agendas on environmental conservation, rural development, forestry, desertification, biodiversity and water. It provides the necessary background information for and assists in implementing the Water Framework Directive (WFD).

***Main characteristics***

More precisely, the Catchment Characterisation and Modelling (CCM) module of EUROLandscape is of interest for EUROSION. This module aims at building a pan-European spatial database of rivers and catchments and their characteristics, therefore, is important for the analysis of these processes, for the monitoring and sustainable management of our water resources, and for evaluating likely changes in the European landscape. The module will be divided into 4 major components:

- Mapping of rivers and catchments at the pan-European scale. Here the aim is the creation of a database of rivers and catchments at a nominal scale of 1 : 250 000, covering pan-Europe from Scandinavia to the Mediterranean and from the Atlantic to the Urals, including an appropriate coding system. Such a database is of high importance for the monitoring activities of the European Environmental Agency (EEA), for the implementation of the Water Framework

Directive, and for the efforts of the water related activities of EUROSTAT. For more detailed information relevant documentation may be downloaded from :  
<http://eurolandscape.jrc.it/watershed/pdfs/Catchment-DB.pdf>



**Figure 28 - Derivation of rivers and catchment boundaries from DEM**  
 (source: EUROLandscape)

- Characterisation of rivers and catchments according to physiographic and socio-economic variables. This is an important step towards improved environmental monitoring and towards a profound and reliable analysis of cause-effect relationships between political actions and landscape processes in the different regions of Europe. The catchment characterisation is to be based on a set of fundamental multipurpose parameters, capable of representing both the diversity and the key features of the pan-European landscape.
- Development of a watershed typology (classification) as a necessary step for extrapolating the results of sophisticated models of landscape and hydrological processes, usually run at the watershed or sub-watershed level.
- Process Modelling in order to lay the ground for assessing the impact of policy, societal changes and possible climate changes on the dominant landscape processes and for predicting likely changes in the European landscape.

All mentioned issues are a question of scale and need a substantial amount of research and development to result in robust methods and reliable data of use to the benefit of the European citizens.

**Copyright and accessibility**

Data are available through an agreement form concluded with JRC and for non-profit applications.

**Summary sheet**

<b>Data</b>
EUROLANDSCAPE
<u>Description of the Dataset :</u> Only the Catchment Characterisation and Modelling part of this database is relevant for EUROSION
<u>Geographical Extent :</u> Europe

<u>Providing Terms</u> : Restricted to the EC		
<b>EUROSION Work* on Data &amp; Metadata</b>		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - calculation	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<i>HYDROGRAPHY AND INFRASTRUCTURE</i>		WP 2.7
<b>Contact</b>		
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Address	Land Management Unit TP 262, 21020 Ispra (VA), Italy	Web <a href="http://www.jrc.it">www.jrc.it</a>
<u>Related Links</u> : <a href="http://eurolandscape.jrc.it/">http://eurolandscape.jrc.it/</a>		

***Scope and content***

Most of European countries are well provided with large scale topographical databases. These databases are usually generated and disseminated by National Mapping Agencies, and are meant for medium to large scale applications (regional and local planning). The present section will not detail all of these national datasets, but simply mentions who provides such data at the national level. These information have been provided by Eurogeographics, the European federation of National Mapping Agencies.

***Main Characteristics***

Data are provided in vector GIS format compatible with wide range of software (ArcInfo, AutoCAD, MapInfo, etc.). For a typical topographical dataset at a nominal scale of 1:10.000, the expected accuracy is generally about 1-3 meters. At a smaller scale (eg. 1:100.000), the accuracy is about 10-20 meters. The following list summarizes existing topographical databases at the national level :

*Belgium*

Data provider : Institut Geographique National/Nationaal Geografisch Instituut

- [1:10 000 topographic database](#) (1:5000 - 1:10 000)
- [1:250 000 topographic database](#) (1:150 001 - 1:300 000)

*Denmark*

Data provider : Kort & Matrikelstyrelsen

- [TOP10DK](#) (1:5000 - 1:10 000)

*Finland*

Data provider : Maanmittauslaitos

- [Topographic Database of Finland](#) (1:10 001 - 1:30 000)

*France*

Data provider : Institut Geographique National

- [BD TOPO](#) (1:10 001 - 1:30 000)
- [BD CARTO](#) (1:75 001 - 1:150 000)

*Germany*

Data provider: LandesVermessung + GeoBasisInformation Niedersachsen

- [Authoritative Topographic-Cartographic Inform. System](#) (1:10 001 - 1:30 000)

Data provider : LandesVermessungsamt Mecklenburg-Vorpommern

- [Authoritative Topographic-Cartographic Inform. System](#) (1:10 001 - 1:30 000)

Data provider :LandesVermessungsamt Schleswig-Holstein

- [Authoritative Topographic-Cartographic Information System](#) (1:5000 - 1:10 000)

*Great Britain*

Data provider : Ordnance Survey

- [OSCAR](#) (1:5000 - 1:10 000)

*Ireland*

Data provider : Suirbhéireacht Ordanáis na Éireann

- [Urban Street Vector Database](#) (1:10 001 - 1:30 000)
- [6 inch RVCS](#) (1:10 001 - 1:30 000)

#### *Italy*

Data provider : Istituto Geografico Militare Italiano

- [Vector 1:50000](#) (1:30 001 - 1:75 000)
- [Vector 1:250000](#) (1:150 001 - 1:300 000)

#### *Netherlands*

Data provider : Topografische Dienst Nederland

- [Topographic vectordatabase of the Netherlands 1:10 000](#) (1:5000 - 1:10 000)
- [Topographic vectordatabase of the Netherlands 1:50 000](#) (1:30 001 - 1:75 000)
- [Topographic vectordatabase of the Netherlands 1:250 000](#) (1:150 001 - 1:300 000)

#### *Northern Ireland*

Data provider : Ordnance Survey of Northern Ireland

- [Large Scale Digital Data \(Vector\)](#) (Larger than 1:5000)
- [1:50 000 Scale Digital Data \(Vector\)](#) (1:30 001 - 1:75 000)
- [1:250 000 Scale Digital Data \(Vector\)](#) (1:150 001 - 1:300 000)

#### *Portugal*

Data provider : Instituto Portugues de Cartografia e Cadastro

- [1:10 000 Topographic Vector Map](#) (1:5000 - 1:10 000)

#### *Slovenia*

Data provider : Geodetska Uprava Republike Slovenije

- [Digital Topographic Database](#) (1:5000 - 1:10 000)
- [Generalized cartographic database](#) (1:10 001 - 1:30 000)

#### *Spain*

Data provider : Centro Nacional de Informacion Geografica

- [Cartographic database 1:25 000](#) (1:10 001 - 1:30 000)
- [Cartographic Database 1:200 000](#) (1:150 001 - 1:300 000)

#### *Sweden*

Data provider : Lantmäteriverket

- [GSD-Blue Map](#) (1:75 001 - 1:150 000)
- [GSD-Blue Map Roads](#) (1:75 001 - 1:150 000)
- [GSD-Red Map](#) (1:150 001 - 1:300 000)

#### **Copyright and accessibility**

All the above mentioned databases are copyrighted. For more information, please refer to Eurographics Web site: [http://www.eurographics.org/Projects/GDDD/GDDD/lists/sp\\_54.htm](http://www.eurographics.org/Projects/GDDD/GDDD/lists/sp_54.htm)

### ***Relevance of land cover for EUROSION***

As a proxy of land use policies, land cover makes it possible to fine-tune both the estimation of capital at risk in case of advanced coastal erosion, and the natural resistance of the near-shore soils to erosion processes (e.g. vegetated area are more likely to resist to erosion processes than bare area). Over the eighties programmes had been launched whose results are offering today relevant amount of data.

### ***List of Datasets inventoried***

- CORINE LAND COVER 90
- IMAGE2000
- LAND COVER Changes since 1975 in the UE : the LaCoast database
- Coastal Land Cover Changes local experiences and studies in Europe:
  - 'Alencoast' project on portuguese coast, led by JRC and the portuguese university of Lisboa (Contract n° 14579 - 1998 - 12 F1ED ISP PT)
  - 'Study on the Oder delta' (JRC; Polish Geodetic Cartographic Institute - IGiK)



**Scope and content**

The aim of the european CORINE LAND COVER (COOrdination on INformation for the Environment) project was initially to provide the UE countries with consistent localized geographical information on the land cover.

The CORINE land cover database provides a pan-European inventory of biophysical land cover, using a 44 class nomenclature. It is made available on a raster 250m by 250m grid database or vector 100m resolution which have been aggregated from the original vector data at 1:100 000. CORINE land cover is a key database for integrated environmental assessment.

Preliminary work on the CORINE information system showed that information on land cover, together with information on relief, drainage systems etc., was essential for the management of the environment and natural resources. Thematical issues for the EUROSION project might be directly extracted from an appraisal of CLC database: continuous urban development along coastlines, tourism recreation development, intensification of agriculture in vulnerable areas, disappearance of areas of wetlands...

The CORINE land cover database provides a pan-European inventory of biophysical land cover, using a 44 class nomenclature.

**CORINE LAND COVER in a nutshell**  
over 4.5 M km<sup>2</sup>

- Area covered: 6.9 millions km<sup>2</sup>
- Working Scale : 1/100.000
- Original Vector Data 1,5 Gb
- 1500 standard map sheets produced using 10 different projection systems
- Area of the smallest mapping unit: 25 hectares

Land Cover Nomenclature with three evels

- first level : five headings
- second level : 15 headings
- third level : 44 headings

The methodology mainly consists of the computer-assisted photointerpretation of Earth observation satellite images (Landsat TM), with the simultaneous consultation of ancillary data, into the categories of the CORINE Land Cover nomenclature.

- **Data inputs** : LANDSAT and SPOT satellite images (mainly from 1987 to 1994)
- **Method** : photo interpretation of the satellite images, geometric and analysis assistance with exogen data (such as aerial photographs, maps, ...), nomenclature fitted into 3 headings up to 44 at the finest tuned level. Topological surface objects are described by their area, perimeter, land cover code issued from the nomenclature and two other ids)
- **Constraints** : scale of interpretation of 1 : 100 000, minimal surface's threshold 15/25 hectares depending on the themes, mimimum width 100 m for linear objects.

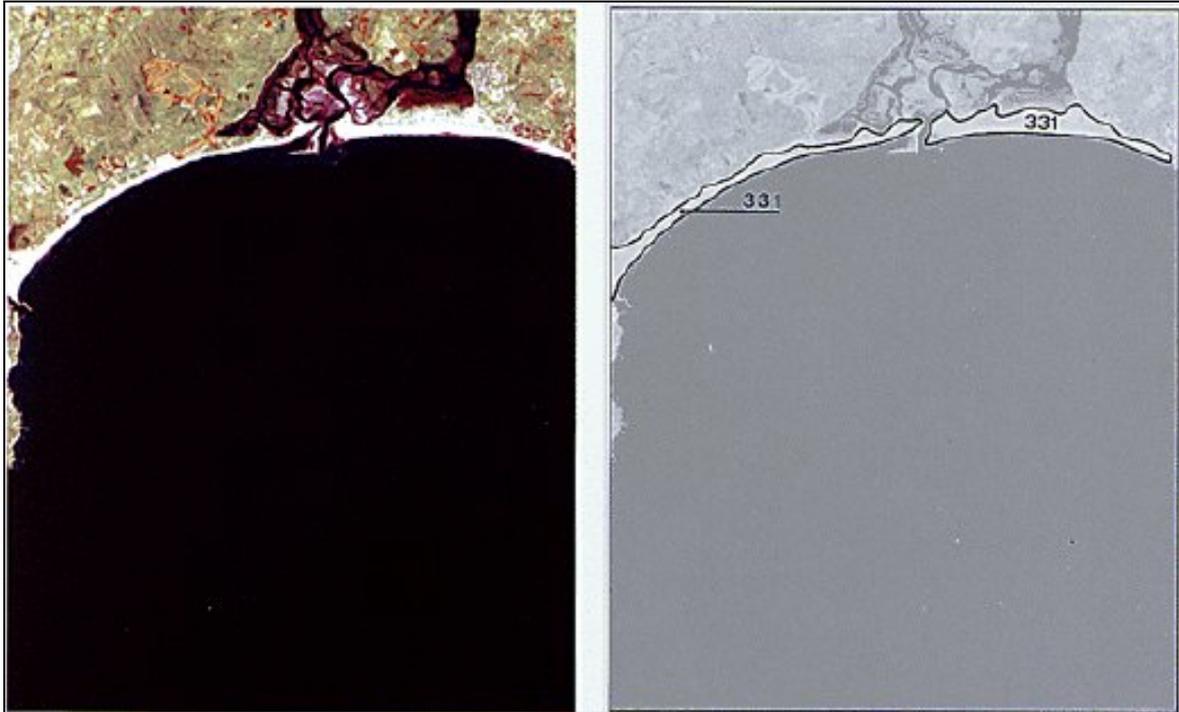


Figure 29 - Baía de Lagos (Portugal) Satellite Image - CLC results

The initial wish was to provide information on the land cover of the 12 Member States of the European Community. Thus it was supposed to be extended to Finland, Sweden (and Austria) since these states joined the EC few years ago.

New data sets has been created by national mapping projects under PHARE program and later merged to European wide datasets. Nowadays the database represents the final product of mapping under the CORINE Land Cover Programme covering all countries listed in the Table below.

Restrictions:

Sweden is not completed yet (validation phase).

Cyprus and Malta are not planned for the moment.

UE countries	CEEC counties
Belgium	Bulgaria
Denmark	Poland
Finland	Romania
France	Slovenia*
Germany	Estonia*
Greece	Lituania*
Ireland	Latvia*
Italy	
Netherlands	
Portugal	
Spain	
United Kingdom	
<b>12</b>	<b>7</b>

*Infos: site web EEA (text), \* Infos site web EEA (map)*

Table 8 - CORINE LAND COVER 90' covered countries, regarding EUROSION

**Main characteristics**

CORINE Land Cover data sets are made available either on a raster 250m by 250m grid database or on a vector 100m resolution. Both have been aggregated from the original vector data at 1 : 100.000.

The vector data sets supplying is twofold:

- national land cover databases in national co-ordinate reference systems. These data sets are distributed in form as prepared and provided during original CORINE Land Cover.
- database that has been merged to a Pan-European data set in a unified projection-system (Lambert Azimuthal). It is currently not edge-matched to create a seamless database between national borders.

The raster data sets supplying is twofold, distributed by the ETC/LC, restricted dissemination policy:

- within 100 metres resolution
- within 250 metres resolution

**Copyright and accessibility**

For both outputs:

- ✓ Data access is restricted
- ✓ Agreement Form has to be signed
- ✓ Data are free of charge
- ✓ Only handling cost for manipulating and preparing the data
- ✓ Data suppliers : mainly PTL/LC and the authorities responsible for distribution<sup>3</sup>

**Summary sheet**

Data & Metadata		
CORINE LAND COVER 90		
<u>Description of the Dataset :</u> Land Cover with a nomenclature of 44 headings Vector corresponding to the scale 1 : 100.000		
<u>Geographical Extent :</u> UE + CEEC	<u>Restrictions :</u> Sweden, Cyprus	
<u>Providing Terms :</u> Free of charge data, available through the E.E.A – ETC/TE		
<u>Dissemination :</u> Restricted access and dissemination, Agreement Form to be signed		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - integration only	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

<sup>3</sup> cf. **D2.9.1 CLC90 Licence**

<i>LAND COVER</i>		<i>WP 2.9</i>
<b>Contact</b>		
Name Company	Chris Steenmans European Environment Agency	Chris.steenmans@eea.eu.int Web www.eea.eu.int
Address	EEA Kongens Nytorv 6 DK-1050 Copenhagen K, Denmark	
<u>Related Links :</u> <a href="http://dataservice.eea.eu.int/dataservice/">http://dataservice.eea.eu.int/dataservice/</a> <a href="http://nfp-lv.eionet.eu.int/nodes/etc_ptl.html">http://nfp-lv.eionet.eu.int/nodes/etc_ptl.html</a> <a href="http://terrestrial.eionet.eu.int/">http://terrestrial.eionet.eu.int/</a>		

### Scope and content

Between 1985 and 1990 the European Commission carried out the CORINE programme. As its results are recognized today as a key reference data set for spatial and territorial analysis, EEA took initiative and put forward the update of CLC database. This CORINE Land Cover update consists of two main components strongly interconnected:

- IMAGE 2000 covering all activities related to satellite image acquisition and processing;
- CLC2000 covering all activities related to interpretation and mapping of land cover changes.

IMAGE2000 is managed by the Joint Research Center (JRC) and aims to produce a consistent European coverage based on Orthorectified satellite imagery, necessary for the updating of the European Land Cover database (CORINE Land Cover) and for the European Spatial Reference.

In the framework of EUROSION, IMAGE 2000 would be used to assess geometrical accuracy of the different layers. It would also make it possible to map near-shore land cover - with a specific attention paid to dunes - as they are generally not featured by CORINE Land Cover (< 25 ha). Unfortunately IMAGE 2000 will give no information of inter-tidal areas. Negotiations between the EUROSION consortium and the JRC/SAI (Space Applications Institute) service have been initiated but no informations can be presented up to now.

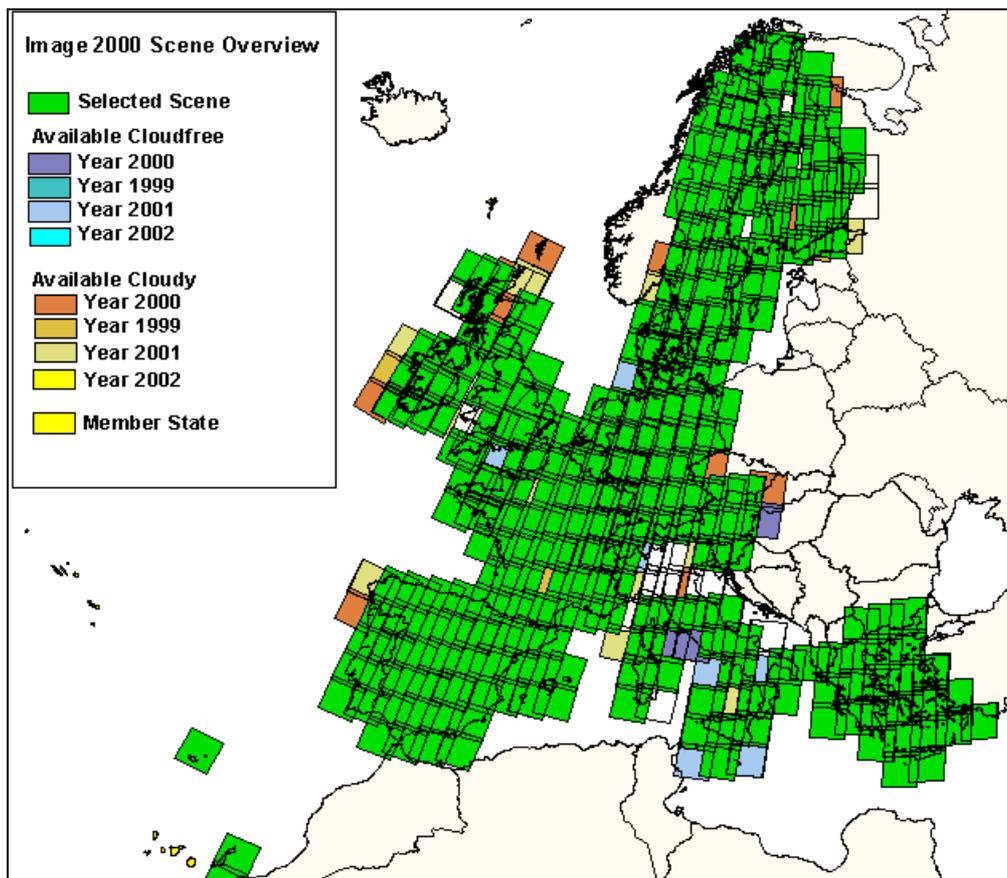
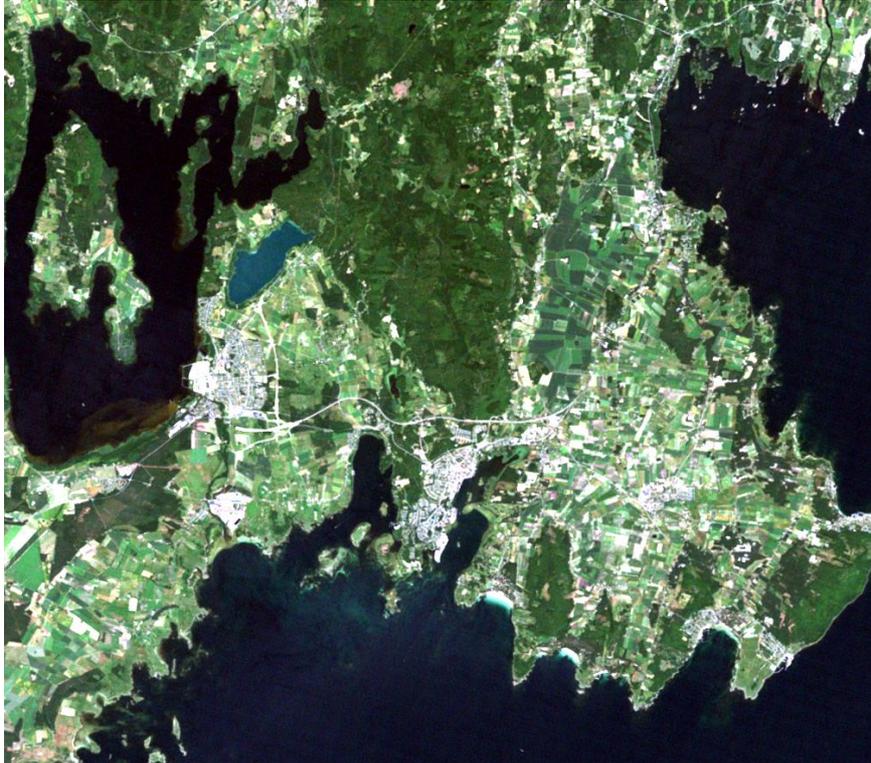


Figure 30 – IMAGE2000 planned acquisition overview

### ***Main characteristics***

IMAGE 2000 dataset is a mosaic of orthorectified LANDSAT images. Approximately 300 scenes Landsat 7 have been required to have a full cloud free coverage of Europe. Orthorectification has been performed using ETRS89 as the reference system and a European digital elevation model temporarily granted by a US based company and the Swedish Space Corporation.



**Figure 31 - Example of satellite acquisition for IMAGE2000**

### ***Copyright and accessibility***

IMAGE 2000 is supervised by JRC. Access to data are restricted. JRC shall be contacted for further information.

**Summary sheet**

Data & Metadata		
IMAGE2000		
<u>Description of the Dataset :</u> Satellite images		
<u>Geographical Extent</u> : to be checked	<u>Restrictions</u> : to be checked	
<u>Providing Terms :</u> To be negotiated with the JRC		
<u>Dissemination :</u> Restricted access and dissemination, Agreement Form to be signed To be negotiated with the JRC		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- metadata</li> <li>- integration only</li> </ul>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<i>LAND COVER</i>	<i>WP 2.9.1</i>	
Contact		
Name	Vanda Lima/Perdigão Susan B. Christensen	vanda.perdigao@jrc.it susan.christensen@jrc.it
Company	Joint Research Centre / Space Applications Institute	Tel/fax +39 332 78 50 52
Address	Environment and Geo-Information Unit TP 262, 21020 Ispra (VA), Italy	Web www.jrc.org
<u>Related Links :</u>		



### ***Scope and content***

LaCoast database has been developed under the supervision of the Joint Research Centre (JRC). It is aimed:

- To quantify land cover changes of the European coastal zones, for a period of 20 years - 1970's when the first satellite images were available and 1990's, date of the first European land cover database (CLC);
- To contribute to the European Commission's demonstration Programme on Integrated Management of Coastal Zones, by providing information on historical land cover and land cover changes over two decades;
- To support the reporting on the state of environment by the European Environment Agency, providing informations that allow to deriving environmentally related indicators, verifying trends in land cover changes along different coasts and interpreting the processes through an integrated appraisal.
- To promote the operational use of earth observation data, demonstrating the capabilities of these data to provide uniform and integrated information throughout the years and over large areas.

### ***Main characteristics***

The data production methodology used were:

- CORINE Land Cover as a baseline data set of Europe: to assess changes in land cover, the CLC90 database was taken as the reference data, to which identified land cover changes are mapped.
- Satellite data that allow an exhaustive time and spectral consistent coverage of large areas such the European coast zones, mainly LANDSAT but also SPOT together with ancillary data.
  - The oldest satellite data available are the Multi Spectral Scanner (MSS) images, dated from 1975 to 1976.
  - Aerial photographs were used for these dates to complete lacks of satellite coverage.

The quality control (either topology or geometry) was done for each country by the team correspondent under the responsibility of the JRC. Matrix of changes were carefully analysed to verify less probable land cover class changes.

Although the LaCoast project concerns the EU's coastal zone, only the Member States for which CLC90 was achieved in 1996, could be included since CLC90 database was the reference data set. First results have encouraged other countries to carry out this study, so as the list of countries covered today is:

### ***Main Restrictions known***

- UE** : all countries except Great-Britain (North Ireland exists), Sweden and Finland.
- CEEC** : no real product available (see next paragraph)

### ***Copyright and accessibility***

LaCoast is a project of JRC. Access to full quality data is copyrighted and restricted. Available through EEA or JRC agreement.

**Summary sheet**

Data & Metadata		
LaCoast		
<u>Description of the Dataset :</u> Land cover changes since 1975 Vector corresponding to the scale 1 : 100.000		
<u>Geographical Extent :</u> EU No CEEC	<u>Restrictions :</u> Great Britain (North Ireland exists) Sweden, Finland	
<u>Providing Terms :</u> free of charge through the JRC through an agreement form		
<u>Dissemination :</u> product initiated by the EC, no dissemination rules.		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - extension - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<i>LAND COVER CHANGES SINCE 1975</i>	WP 2.9.2	
Contact		
Name	Vanda Lima Perdigão	vanda.lima@jrc.it
Company	Joint Research Centre Space Applications Institute	Tel/fax +39 332 78 50 52
Address	Environment and Geo-Information Unit TP 262, 21020 Ispra (VA), Italy	Web www.jrc.org
<u>Related Links :</u>		

***Land cover changes in Central and Eastern Europe***

An inventory and analysis of major land cover changes in Central and Eastern Europe over the past 20 years were carried out by the Phare Topic Link. The two main objectives of this task were:

- ❖ an assessment of major land cover changes between the 1970s and 1990s;
- ❖ an inventory of land cover changes between 1990-1998 using high resolution data.

Major land cover changes were identified and mapped for the Czech Republic, Hungary, Romania and Slovakia. Data on land cover changes were collected by means of image-to-image comparison between archived Landsat MSS data and Landsat TM data using the CORINE Land Cover 1990 map as reference. The major land cover changes were identified up to the second level of the CLC nomenclature (15 classes).

Land Cover changes that occurred in the late 1990s were examined on four test sites located in different bio-geographic regions in the Czech Republic, Lithuania, Romania and Slovakia. Using the latest available satellite data, a detailed inventory of land cover changes on the 3rd level CLC nomenclature was mapped (44 classes).

***Alencoast project***

The aim of this project is to understand the land use changes in coastal areas through the analysis of the impact of the human and biophysical dynamics. The articulation between the human and biophysical factors, which is at the root of land use, contributes to the understanding of the complexity of the processes of change, through the comparative analysis of local case studies.

The research focuses on the Portuguese mainland coast (832 km) which can be broadly divided in two sections: west coast and south coast (Algarve). The West Coast can be divided in two main sectors located to north and to south of Lisbon area. In this study the coastal area of Alentejo is the territorial unit of research. This fact is justified by two main reasons:

- In the same region we can identify a great diversity of activities and uses of the territory: the agriculture at north; the industry in Sines county; and tourism, that are related with urban pressure, at the south.
- It is also a region where the environmental degradation is, for the time being, restricted to the areas near the industrial harbour of Sines. Nevertheless the increasing pressure over the land towards a higher tourist expansion could, if not well planed, damage the environmental balance expressed by the existence of the Natural Park of Alentejo Coast.on the Alentejo region, on the Portuguese coast.

One of the main challenges in the elaboration of the methodology proposed is how to articulate information from different sources and natures, different scales into the system of analysis.

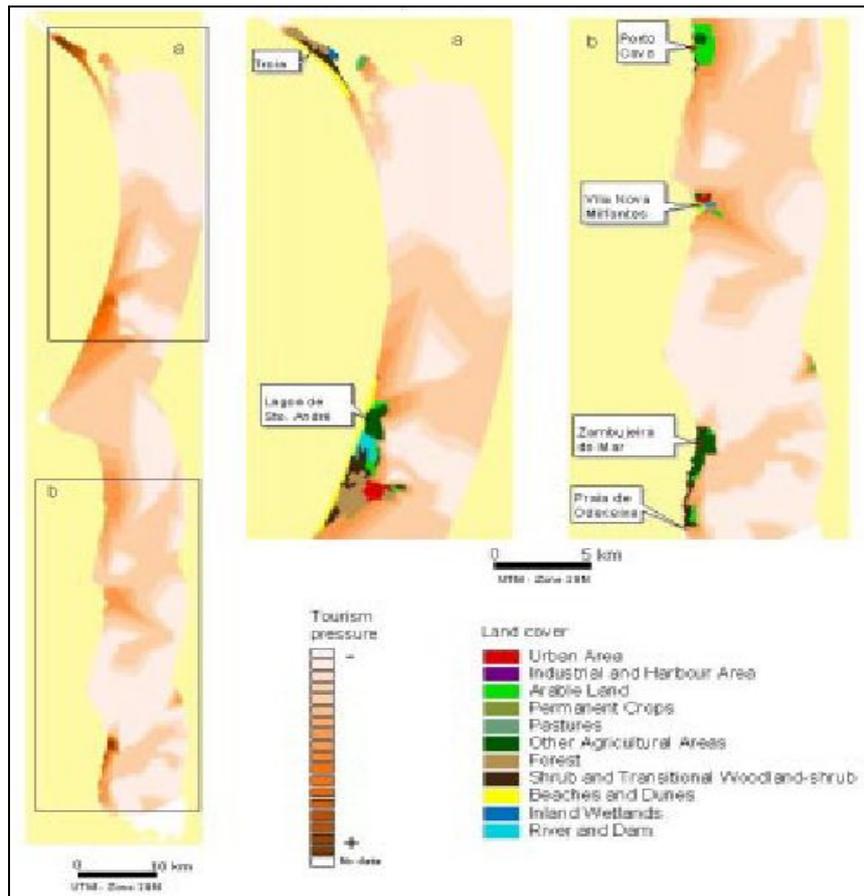


Figure 32 - Output from the Alencost project

### *Land use and land cover changes in the Oder catchment*

An analysis of land use and land cover changes in the Oder river catchment was launched in 1999 by JRC/SAI and IGIK, Poland, identifying biophysical and socioeconomic drivers affecting opportunities and constraints for decisions concerning land use inside the catchment between 1975 and 1992, and over the past 150 years. Data from the first half of the 19th century was used (Prussian topographic maps at scale 1:100 000 issued in 1816-32), maps dated 1945-48 and other data sources covering the 150-year period.

The analysis is designed to:

- ❖ interpret the changes in land cover and land use between the period of 1975 and 1992;
- ❖ spatialize them, based not only on the information derived from the georeferenced databases, but also integrating information provided by other sources, in particular socio-economic data relevant for this period;
- ❖ use available historical information on land cover in order to analyse the major (human or environmental) causes of land cover changes in different historical contexts and different socio-economic conditions.

Results from this assessment has been made available during the second half of 2000 and an article should appear on the website of JRC Space Applications Institute as soon as the official publication is made.

Some other informations on Land Cover in Poland are however accessible through the following link: [http://pti.gisat.cz/clc\\_dird10.shtml](http://pti.gisat.cz/clc_dird10.shtml)

## **II-9. LAWS AND DECREES**

### ***Relevance of laws and decrees for EUROSION***

Legal and regulatory frameworks, and their consequences on coastal zone development, are expected to impact positively or negatively capital at risk along the shore (e.g. a permissive law is likely to increase capital investment in the coastal zone). This shall help local stakeholders to be aware of all the actual juridical texts into effect.

### ***List of Datasets inventoried***

Depending on national, regional and local authorities the sources of documents are numerous. Additional regulatory texts are already encompassed into european organisms such as Eurlex.

The objectives remain:

- to gather maximum data and links to data;
- to sort data with respect to their level of enforcement (european, national, regional, communal);
- to create a metadata form for those links to data;
- to design a structure being incorporated into the EUROSION database design.

Formats of data are mainly PDF and/or Word documents with geographical links to administrative boundaries.

### ***Some links to laws, decrees, conventions...***

- Yearbook of International Cooperation on Environment and Development, last updated 2002, point of contact The Fridtjof Nansen Institute, online at : <http://www.greenyearbook.org/agree/mar-env/ospar.htm>
- European Centre for Nature Conservation, last updated 20 Jne 2002, point of contact [ecnc@ecnc.nl](mailto:ecnc@ecnc.nl), online at <http://www.ecnc.nl>
- International Erosion Control Association, last updated 2002, point of contact [ecinfo@ieca.org](mailto:ecinfo@ieca.org), online at [www.ieca.org](http://www.ieca.org)
- OSPAR, Rules of Procedure, last updated 26 July 2002, point of contact [secretariat@ospar.org](mailto:secretariat@ospar.org), online at <http://www.ospar.org>
- Integrated Coastal Management, last updated 2002, point of contact [steeve.morrison@noaa.gov](mailto:steeve.morrison@noaa.gov), online at : <http://icm.noaa.gov/laws/laws.html>
- United Kingdom Coastal Zone Law Web Site, last updated 2 August 2002, point of contact [jgibson@law.uct.ac.za](mailto:jgibson@law.uct.ac.za), online at <http://www.uct.ac.za/depts/pbl/jgibson/iczm>

**Example of regulatory text**

L 148/24	EN	Official Journal of the European Communities	6.6.2002
II			
(Acts whose publication is not obligatory)			
COUNCIL			
RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe (2002/413/EC)			
THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,	(6)	Population growth and the development of economic activities are increasingly threatening for both the environmental and social equilibria of coastal zones.	
Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,	(7)	The decline of fishing activity and related employment makes many fisheries-dependent areas particularly vulnerable.	
Having regard to the proposal from the Commission,	(8)	Existing regional disparities in the Community affect the	
Having regard to the opinion of the Economic and Social Committee <sup>(1)</sup> ,			

.../...

## **II-10. HIGH ECOLOGICAL VALUE AREAS**

### ***Relevance of high ecological value areas for EUROSION***

Knowledge of sensitive natural areas is of the utmost importance to assess the ecological capital at risk of eroding and flooding. Coastal erosion and sea level rise, by being a driving force of the «so-called» coastal squeeze, results in habitat loss for animal species.

### ***List of datasets inventoried***

- CORINE Biotopes
- Common Data Base on Nationally Designated Areas database (CDDA)
- Special Protected Areas (SPA) database
- Sites of Community Interest (SIC) database

### ***II-10.1. CORINE Biotopes***

#### ***Scope and content***

The CORINE biotopes (Version 1995) database is an inventory of major nature sites. The database began under the CORINE Biotopes project to enhance reliable and accessible information about vulnerable ecosystems, habitats and species of important as background information for Community environmental assessment.

#### ***Main characteristics***

CORINE database is a relational database made of different tables including:

- Species tables (mammals, birds, reptiles, etc.)
- Habitats tables
- Natural sites tables
- Look up files

The dataset is currently being updated with information from Central and Eastern European Countries. Nevertheless the current database version suffers from many inconsistencies, which should be partly fixed by the ongoing Natura 2000 enhancement project. New developments should include :

- Integration of the geometry vector data in the table
- Marine Area column (denormalized from NUTS areas)
- Owner indication field, from repeating information of site managers
- Link to site manager, address ETC normalization
- Format change of centroid data now in the E-W DD-MM-SS to decimal degrees
- Addition of a logging record for significant changes
- Documents information concerning a site is removed to a table dedicated to store that kind of less structured information
- A site status indicator is added to enable controlled publishing of sites of poor quality or with political sensitiveness

#### ***Copyright and accessibility***

The database is free of charge and downloadable through the <http://dataservice.eea.eu.int/dataservice/>

**Summary sheet**

Data		
CORINE BIOTOPES		
<u>Description of the Dataset :</u> The CORINE biotopes (Version 1995) database is an inventory of major nature sites		
<u>Geographical Extent :</u> Europe		
<u>Providing Terms :</u> Downloadable free of charge from <a href="http://dataservice.eea.eu.int/dataservice/">http://dataservice.eea.eu.int/dataservice/</a>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - metadata - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
High Ecological Value Areas	WP 2.10	
Contact		
Name Company	EEA	
Address	<i>Kongens Nytorv 6 DK-1050 Copenhagen K, Denmark</i>	
<u>Related Links :</u> <a href="http://dataservice.eea.eu.int/dataservice/">http://dataservice.eea.eu.int/dataservice/</a> <a href="http://nature.eionet.eu.int/">http://nature.eionet.eu.int/</a>		

**Scope and content**

The Common Database on Designated Areas is a joint project between of the European Environment Agency, the Council of Europe, and The World Conservation Monitoring Centre of UNEP (WCMC). It aims at better co-ordinating and streamlining information on designated areas resulting from various legal frameworks, whether at international, Community or national level. This initiative is in line with priority action 27 of the IUCN "Parks for Life" report on Action for protected Areas in Europe. There are basically three broad categories of designations:

- legal country commitment in the framework of international or regional conventions and programmes (Ramsar, World Heritage, Bern, Barcelona, Helsinki conventions; UNESCO Biosphere Reserves),
- legal country commitment under EU Directives (Birds and Habitats Directives),
- specific national designations, with considerable variability from one country to another (National parks, nature reserves, regional parks etc...).

Very often, a same site is designated totally or partially, under several legal frameworks, often with different boundaries and surface areas. Thus, if site designations are not identified individually in a database, general statistics on designated areas in Europe are wrong, with many overlaps and double-counting.

**Main characteristics**

The dataset contains the geographic location and size of the nationally designated areas. The inventory of nationally designated areas began under the CORINE programme. It is now maintained for EEA by the European Topic Centre on Nature Protection and Biodiversity and is being updated through EIONET.

The part of the database related to Nationally Designated Areas is validated and updated through EIONET. By the end of 1999, there were 44.000 records (29.000 for EEA member countries and 15.000 for other European countries). The sites are listed according to the official designations at national level. This list of designation types has about 600 individual designations registered according to national or sub-national law (of which about 350 for EEA member countries).

The following table summarizes the format of data contained in CDDA

Item	Definition	Datatype	Key
Areaname	Site Name (in principle in local language)	nvarchar(240)	No
Desigabb	national designation type code	nvarchar(5)	Yes
Designat	Designation title in english	nvarchar(160)	No
Iso3	Country ISO code	nvarchar(6)	No
Iucncat	IUCN management category	nvarchar(8)	No
Lat	Latitude decimal degrees	float(8)	No
Latdeg	Latitude degrees	float(8)	No
Latmin	Latitude minutes	float(8)	No
Latns	Latitude North/South (always N)	nvarchar(2)	No
Latsec	Latitude seconds	float(8)	No
Lon	Longitude decimal degrees	float(8)	No
Londeg	Longitude degrees	float(8)	No
Lonew	Longitude East/West (E or W)	nvarchar(2)	No
Lonmin	Longitude minutes	float(8)	No
Lonsec	Longitude seconds	float(8)	No
Nuts1	Nuts code	nvarchar(10)	No
Parentis	Parent country ISO code	nvarchar(6)	No

Sitecode	Unique site reference code	float(8)	No
Sitecode1	CDDA site code (sequential number)	nvarchar(24)	No
Size	Surface area in ha.	float(8)	No
Year	Year of establishment of the site	nvarchar(8)	No

### Copyright and accessibility

The database is free of charge, downloadable through <http://dataservice.eea.eu.int/dataservice/>

### Summary sheet

Data		
CDDA		
<u>Description of the Dataset :</u> The dataset (Version 1999) contains the geographic location and size of the Nationally Designated Areas. The inventory of nationally designated areas began under the CORINE programme. It is now maintained for EEA by the European Topic Centre on Nature Protection and Biodiversity and is being updated through EIONET.		
<u>Geographical Extent :</u> Europe		
<u>Providing Terms :</u> Downloadable free of charge from <a href="http://dataservice.eea.eu.int/dataservice/">http://dataservice.eea.eu.int/dataservice/</a>		
EUROSION Work* on Data & Metadata		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- metadata</li> <li>- integration</li> </ul>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
High Ecological Value Areas	WP 2.10	
Contact		
Name Company Address	EEA <i>Kongens Nytorv 6            DK-1050 Copenhagen K, Denmark</i>	
<u>Related Links :</u> <a href="http://dataservice.eea.eu.int/dataservice/">http://dataservice.eea.eu.int/dataservice/</a> <a href="http://nature.eionet.eu.int/">http://nature.eionet.eu.int/</a>		

***Scope and contents***

Special Protection Areas (SPAs) are areas designated under Article 4 of the European Community Directive on the Conservation of Wild Birds 1979 (EC79/409), commonly known as the Wild Birds Directive. SPAs are intended to safeguard the habitats of migratory and certain particularly threatened species of birds. Together with Special Areas of Conservation, which are designated under the Habitats Directive for habitats and non-bird species, SPAs form the Natura 2000 network of sites. The Natura 2000 network is designed to conserve natural habitats and species of animals and plants which are rare, endangered or vulnerable in the European Community.

The database is updated by the European Topic Centre for Nature Protection and Biodiversity (ETC/NPB). The update consists in incorporating annually the new sites designated by Member States, as well as ensuring a permanent update of the full database through the incorporation of new data concerning already designated sites. This information is the basis for the preparation of the EC DG Env. annual report "Special Protected Areas". On 30-06-2001, there were 2663 SPAs included in the database distributed as follows within the 15 EU Member States:

<b>Member state</b>	<b>SPA's number</b>	<b>Area (km<sup>2</sup>)</b>
België/Belgique	36	4 313
Denmark	111	9 763
Deutschland	501	9 050
Ellas	52	5 530
España	151	25 228
France	117	8 867
Ireland	106	2 055
Italia	342	18 746
Luxembourg	13	160
Nederland	30	3 522
Österreich	81	11 664
Portugal	47	8 671
Suomi	451	28 346
Sverige	394	24 647
United Kingdom	231	12 638
<b>Total</b>	<b>2663</b>	<b>173 200</b>

***Main characteristics***

Information not available

***Copyright and accessibility***

Access to data are restricted to EC and authorized representatives of Member state.

**Summary sheet**

<b>Data</b>		
SPA		
<u>Description of the Dataset :</u> The dataset contains the geographic location and size of special protected areas, designated under Article 4 of the European Community Directive on the Conservation of Wild Birds 1979 (EC79/409)		
<u>Geographical Extent :</u> Europe		
<u>Providing Terms :</u> Agreement required with European Commission		
<b> </b>		
* except Stocktaking, Quality Assessment and metadata documenting...	- update - metadata - integration	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
High Ecological Value Areas	WP 2.10	
<b>Contact</b>		
Name Company Address	José Rizo-Martin DG Environment <i>European Commission Avenue Beaulieu Brussels, Belgium</i>	
<u>Related Links :</u>		

***Scope and contents***

The Habitats Directive committed EU Member States to ensure nature conservation mainly through designation of natural Sites of Community Importance (SCIs) to be integrated in the Natura 2000 Network.

To comply with this obligation, each EU Member State has to provide the Commission, as a first step, with a National List of proposed Sites of Community Importance (pSCIs). In close co-operation with the Member States, the European Commission will establish the Community List of SCIs which shall be designated by Member States and included in the Natura 2000 Network. Since 5<sup>th</sup> June 1994, the date of effect of the Habitat Directive, the Special Protected Areas (SPAs) designated under the Directive 79/409/CEE for the protection of birds are included automatically in the Natura 2000 Network.

The NATURA2000 database on 02-01-2002, included 11519 sites distributed as follows:

<b>Member state</b>	<b>pSCI's number</b>	<b>Area (km<sup>2</sup>)</b>
België/Belgique	271	1786
Denmark	206	10346
Deutschland	460	11918
Ellas	236	27228
España	1218	115014
France	1109	37924
Ireland	363	9698
Italia	2425	41799
Luxembourg	38	352
Nederland	76	7078
Österreich	130	8915
Portugal	93	16456
Suomi	1380	47136
Sverige	2947	53854
United Kingdom	567	23531
<b>Total</b>	<b>11519</b>	<b>413037</b>

***Main characteristics***

Information not available

***Copyright and accessibility***

Access to data are restricted to EC and authorized representatives of Member state.

**Summary sheet**

<b>Data</b>		
pSCI		
<u>Description of the Dataset :</u> The dataset contains the geographic boundaries and description of Sites of Community Interest, proposed by Member States in accordance with the European Community Directive on Natural Habitats.		
<u>Geographical Extent :</u> Europe		
<u>Providing Terms :</u> Agreement required with European Commission		
<b>EUROSION Work* on Data &amp; Metadata</b>		
* except Stocktaking, Quality Assessment and metadata documenting...	<ul style="list-style-type: none"> <li>- update</li> <li>- metadata</li> <li>- integration</li> </ul>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
High Ecological Value Areas	WP 2.10	
<b>Contact</b>		
Name	José Rizo-Martin	
Company	DG Environment	
Address	<i>European Commission          Avenue Beaulieu          Brussels, Belgium</i>	
<u>Related Links :</u>		

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## Glossary Of Abbreviations And Nomenclatures

Description:

The Left Column contains the *ABBREVIATION* used in this report (with 'italic' police), and the corresponding extended name on the right column. **ACRONYMS** appear in 'bold' police with their meaning on the right.

<b>ArcIMS</b>	ESRI <i>Arc Interactive Mapping System</i> : GIS tool
<b>ASPB</b>	Areas of Special Protection for Birds
<b>ATT</b>	Admiralty Tide Tables
<b>BGS</b>	British Geological Survey
<b>CATNet</b>	Catastrophe Network
<i>CCEr</i>	CORINE COASTAL EROSION
<b>CCM</b>	Catchment Characterisation and Modelling
<b>CDDA</b>	Common Database on Designated Areas
<b>CEEC</b>	Centre and East European Countries
<b>CERSAT</b>	Centre ERS d'Archivage et de Traitement - French archiving Center for ERS data
<b>CLAROM</b>	CLub pour les Actions de Recherche sur les Ouvrages de la Mer
<i>CLC</i>	CORINE LAND COVER
<b>CLIOSat</b>	CLImatologies Océaniques Satellitaires
<b>CNES</b>	Centre National d'Etudes Spatiales
<b>CNES-AVISO</b>	CNES - Archiving, Validation and Interpretation of Satellites Oceanographic data
<b>CNIG</b>	Centro Nacional de Informação Geográfica
<b>CORINE</b>	Co-ORDination on INformation of the Environment
<b>CRED</b>	Centre for Research on the Epidemiology of Disasters
<b>CRESTA</b>	Catastrophe Risk Evaluation and Standardizing Target Accumulations
<b>DBDB-V</b>	Digital Bathymetric Data Base – Variable
<b>DEFRA</b>	Department of Environment, Foods and Rural Affairs
<b>DigBath250</b>	Digital Bathymetry 250
<b>DLMB</b>	Digital LandMass Blanking
<b>DMA</b>	US Defense Mapping Agency
<b>DTM</b>	Digital Terrain Model
<b>EAP</b>	Environmental Action Programme
<b>EC</b>	European Commission
<b>ECMWF</b>	European Centre for Medium-range Weather Forecasts
<b>EEA</b>	European Environment Agency
<b>E-ESDI</b>	Environmental European Spatial Data Infrastructure
<b>EIONET</b>	European Environment Information and Observation NETwork
<b>EMDAT (EM-DAT)</b>	EMergency events DATabase
<b>EPSHOM</b>	Etablissement Principal du SHOM
<b>ERS</b>	European Remote Sensing satellite family
<b>ESA</b>	European Spatial Agency
<b>ETC</b>	European Topic Centre
<b>ETC/LC</b>	ETC/Land Cover
<b>ETC/NPB</b>	ETC/Nature Protection & Biodiversity
<b>ETC/TE</b>	ETC/Terrestrial Environment
<b>EU</b>	European Union
<b>EURIMAGE</b>	European consortium supplying satellite images
<b>FAGS</b>	Federation of Astronomical and Geophysical Data Analysis Services
<b>FSH</b>	Fonds de Soutien des Hydrocarbures
<b>GEBCO</b>	GEneral Bathymetric Chart of the Oceans
<b>GEIXS</b>	Geo-scientific Electronic Information eXchange System
<b>GIS</b>	Geographic Information System
<b>GMES</b>	Global Monitoring for Environment and Security
<b>GSE</b>	GMES Service Element
<b>GSHHS</b>	Global Self-consistent, Hierarchical, High-resolution Shoreline database
<b>GISCO</b>	Geographic Information System of the European Commission
<b>GLOSS</b>	Global Sea Level Observing System
<b>GSHHS</b>	Global Self-consistent Hierarchical High-resolution Shoreline Database
<b>ICZM</b>	Integrated Coastal Zone Management

<b>IES</b>	Institute for Environment and Sustainability (inside JRC)
<b>IFREMER</b>	Institut Français de Recherche pour l'Exploitation de la MER
<b>IGiK</b>	Instytut Geodezji i Kartografii
<b>IHO</b>	International Hydrographic Organization
<b>INSPIRE</b>	INfrastructure for SPatial InfoRmation in Europe
<b>IOC</b>	Intergovernmental Oceanographic Commission
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources
<b>JOG</b>	Joint Operations Graphics
<b>JRC</b>	Joint Research Centre
<b>JRC/SAI</b>	JRC / Space Applications Institute
<b>LaCoast</b>	Land Cover Changes on Coastal Zones
<b>LAI</b>	Littoral Area of Interest
<b>MSS</b>	Multi Spectral Scanner
<b>NGDC</b>	National Geographic Data Centre
<b>NGO</b>	Non-Governmental Organization
<b>NIMA</b>	National Imagery and Mapping Agency
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NMA</b>	National Mapping Agency
<b>NUTS</b>	Nomenclature des Unités Territoriales Statistiques Nomenclature of Territorial Units for Statistics.
<b>OFDA</b>	Office of US Foreign Disaster Assistance
<b>PHARE</b>	Poland and Hungary Aid for the Reconstruction of the Economy
<b>PSMSL</b>	Permanent Service for Mean Sea Level
<b>RAMSAR</b>	United Nations Convention on Wetlands of International Importance, signed in Ramsar, Iran, in 1971
<b>RANGS</b>	Regionally Accessible Nested Global Shorelines
<b>RLR</b>	Revised Local Reference
<b>SABE</b>	Seamless Administrative Boundaries of Europe
<b>SAC</b>	Special Areas of Conservation
<b>SAR</b>	Synthetic Aperture Radar
<b>SCI</b>	Sites of Community Importance
<b>SHOM</b>	Service Hydrographique et Océanographique de la Marine
<b>SOLAS</b>	(International Convention on the) Safety Of Life At Sea
<b>SPA</b>	Special Protected Areas
<b>SPOT</b>	Satellite Pour l'Observation de la Terre
<b>TCIFMS</b>	Trait de Côte et Isobathes de France Metropolitaine du SHOM
<b>TM</b>	Thematic Mapper
<b>UCL</b>	Université Catholique de Louvain
<b>UKHO</b>	UK Hydrographic Office
<b>UNEP</b>	United Nations Environment Programme
<b>UNEP-WCMC</b>	UNEP - World Conservation Monitoring Centre
<b>UNESCO</b>	United Nations Educational and Socio-Cultural Organisation
<b>URL</b>	Uniform Resource Locator
<b>WFD</b>	Water Framework Directive
<b>WHO</b>	World Health Organisation
<b>ZNIEFF</b>	Zone Naturelle d'Intérêt Ecologique Floristique et Faunistique

## Annex : Study on EUROPEAN COUNTRIES and ISLAND's Coverages

Study has been led (according to Chapter 1 §2.2.4) to determine the percentage of coast length covered by the five major inventoried data sets:

- ✓ CORINE Coastal Erosion
- ✓ LaCoast
- ✓ SABE97
- ✓ GISCO
- ✓ CORINE Land Cover 90

The aim of this study is twofold:

- to show that geographical extents are fully depending on the data sets.
- to underline that the coverage scenario number 2 advocated by the consortium and agreed by the Steering Committee should be hold. This scenario implies that the final coverage for CEEC countries plus Ultraperipheral Territories shall be at least 20 %.

Results are explained in terms of percentages of coastline covered, by categories, by inventoried databases, by entities (UE, CEEC)

Categories have been split into:

- mainland (+ close islands)
- ultraperipheral regions
- overseas territories

**Table A1** (Percentage of Coast covered per category and main inventoried database) details country by country, the coverage repartition of the main five inventoried databases in each category: mainland (including close islands), ultraperipheral regions and oversea territories.

**Table A2** (Percentage of Coast covered per database and category) summarizes Table A1 indicating the percentages of coastlines covered by the various inventoried databases.

**Table A3** (Percentage of Coast covered per inventoried database – EU and CEEC split) represents for each main inventoried database the coverage for EU countries and CEEC countries. Ultra-peripheral regions and Overseas territories have not been taken into account. Since a 100% coverage is not reach for all the inventoried databases, an explanation in terms of data sets restrictions is also given for EU countries.

**Table A4** shows the geographical classification by category, indicating coastline lengths of all european countries referred by the Terms of References.

**Table A1 - Percentage of Coast covered per CATEGORY and MAIN INVENTORIED DATABASES**

**CATEGORIES**

"m/ci" : mainland/close islands

"up" : ultra-peripheral islands

"ot" : overseas territories

COUNTRIES	ENTITY	Coast lengths (km)			MAIN INVENTORIED DATABASES														
		m/ci	up	ot	CORINE Coastal Er.			LaCoast			SABE 97			GISCO			CORINE LAND COVER		
					Coast COVERAGE (km)			Coast COVERAGE (km)			Coast COVERAGE (km)			Coast COVERAGE (km)			Coast COVERAGE (km)		
		m/ci	up	ot	m/ci	up	ot	m/ci	up	ot	m/ci	up	ot	m/ci	up	ot	m/ci	up	ot
Belgium	EU	66			66			66			66			66			66		
Denmark	EU	9442	1117	44087	9311	0	0	9170	0	0	9442	0	0	9442	1117	0	9442	0	0
Finland	EU	1126	501		0	0		0	0		1126	0		1126	501		1126	501	
France	EU	4211	1158	2826	4211	1158	0	4211	0	0	4211	1158	0	4211	1158	59	4211	274	0
Germany	EU	1226			1226			1226			1226			1226			1226		
Greece	EU	17342			17342			17342			17342			17342			17342		
Ireland	EU	1448			1448			1448			1448			1448			1448		
Italy	EU	10186			10186			10186			10186			10186			10186		
Portugal	EU	1793	841		1793	0		1793	0		1793	0		1793	141		1793	0	
Spain	EU	6649	1200		6649	1200		6649	0		6649	0		6649	1200		6649	1200	
Sweden	EU	3476			0			0			3476			3476			0		
The Netherlands	EU	451		301	451		0	451		0	451		0	451		0	451		0
UK	EU	12024	472	4483	11739	352	0	3172	0	0	12024	292	0	12024	0	0	11578	0	0
Bulgaria	CEEC	354			0			0			0			354			0		
Estonia	CEEC	4308			0			0			4308			4308			4308		
Latvia	CEEC	531			0			0			531			531			531		
Lithuania	CEEC	99			0			0			99			99			99		
Malta	CEEC	239			0			0			239			239			0		
Poland	CEEC	491			0			0			491			491			491		
Romania	CEEC	225			0			0			0			225			225		
Slovenia	CEEC	47			0			0			47			47			47		
Cyprus	CEEC	735			0			0			735			735			0		
sum(km)		76468	5289	51696	64423	2710	0	55715	0	0	75889	1450	0	76468	4117	59	71219	1975	0
% COVERAGE / CATEGORY / inv. DATABASE :					84,2%	51,2%	0,0%	72,9%	0,0%	0,0%	99,2%	27,4%	0,0%	100,0%	77,8%	0,1%	93,1%	37,3%	0,0%

**Table A2 - Percentage of Coast covered per inventoried DATABASE per CATEGORY**

CATEGORIES*	Mainland	Ultra Peripheral	Overseas Territories
	% of 76468 km	% of 5289 km	% of 51696 km
<b>Inventoried DATABASES</b>			
<b>CORINE COASTAL EROSION</b>	84,25%	51,23%	0,00%
<b>LACOAST</b>	72,86%	0,00%	0,00%
<b>SABE</b>	99,24%	27,41%	0,00%
<b>GISCO</b>	100,00%	77,84%	0,11%
<b>CORINE LAND COVER</b>	93,14%	37,35%	0,00%

\* all countries (UE+CEEC)

**Table A3 - Percentage of Coast covered per inventoried DATABASE**

Inventoried DATABASES	EU**	CEEC**	
	% of 69440 km	% of 7029 km	
<b>CORINE COASTAL EROSION</b>	92,78%	0,00%	(1)
<b>LACOAST</b>	80,23%	0,00%	(2)
<b>SABE</b>	100,00%	91,76%	
<b>GISCO</b>	100,00%	100,00%	
<b>CORINE LAND COVER</b>	94,35%	81,10%	(3)

\*\* except Ultra-peripheral and Overseas Territories

<b>EU MISSING TERRITORIES</b>	
(1)	<b>CORINE Coastal Erosion:</b> SWEDEN, FINLAND whole country, Danish, Greek & small UK islands are missing
(2)	<b>LaCoast:</b> UK (but North Ireland present), SWEDEN, FINLAND whole country, Danish, Greek and Balearic Islands are missing
(3)	<b>CORINE LAND COVER 90:</b> - SWEDEN country is not validated yet - Italian, Greek and UK islands are missing



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**Table A4 - Classification and Coast Lengths of European Countries (EU+CEEC)**

m/ci : mainland/close islands  
up : ultra-peripheral regions  
ot : overseas territories

Countries	State/Island	Coast length km	Area in sq. km	Classification
<b>Belgium</b>	mainland	66,00	30536	m
<b>Denmark</b>	mainland	7300	43106	m
Denmark	Lolland	250,30	1 264,20	m
Denmark	Fyn	418,80	3 012,10	m
Denmark	Sjaelland	942,00	7 031,30	m
Denmark	Bornholm	141,40	587,90	ci
Denmark	Falster	146,00	486,20	m
Denmark	Langeland	130,40	285,10	m
Denmark	Mon	112,90	226,30	m
Denmark	Faeroe Islands	1117,00	1 399,00	up
Denmark	Greenland	44087,00	2 175 600,00	ot
<b>Finland</b>	mainland	1126,00	338 235,00	m
Finland	Aland Islands	501,30	1 527,00	up
<b>France</b>	mainland	3427,00	543 965,00	m
France	Corsica	784,20	8 681,00	ci
France	Clipperton	11,10	5,00	ot
France	Grande Terre	1719,20	6,62	ot
France	Bora Bora	30,90	36,00	ot
France	Moorea	57,60	132,00	ot
France	St-Pierre et Miquelon	120,00	242,00	ot
France	Tahiti	178,00	1 042,00	ot
France	Marquesas Islands	650,00	1 049,00	ot
France	<i>Nuku Hiva</i>	122,9	345	ot
France	<i>Hiva Oa</i>	129	318	ot
France	Martinique	298,70	1 166,60	up
France	Reunion	207,10	2 512,00	up
France	Guiana	378,00	91 000,00	up
France	Guadeloupe	306,00	1 438,00	up
France	<i>Grande-Terre</i>	134,9	591	up
France	<i>Basse-Terre</i>	139	847	up
France	St. Martin (Sint Maarten)	58,90	88,00	ot
<b>Germany</b>	mainland	2,00	357072	m
Germany	Rugen	318,80	926,40	ci

Legend *italic characters* : Name/coastlength/area of island belonging to an entity for which information is already given in the table. Example:

Guadeloupe	306,00	1 438,00
<i>Grande-Terre</i>	134,9	591
<i>Basse-Terre</i>	139	847

est. = estimation (no official information found)

**Classification and coast lengths of european countries**m/ci : mainland/close islands  
up : ultra-peripheral regions  
ot : overseas territories

Countries	State/Island	Coast length km	Area in sq. km	Classification
<b>Greece</b>	mainland	13676,00	131992	m
Greece	Rhodes	220,00	1 398,10	ci
Greece	Euboea	556,30	3 655,10	ci
Greece	Crete	1046,00	8 261,20	ci
Greece	Lesbos	288,50	1 640,90	ci
Greece	Corfu	200,00	592,10	ci
Greece	Andros	119,50	371,20	ci
Greece	Karpathos	135,80	310,80	ci
Greece	Cefallonia	210,20	775,40	ci
Greece	Chios	165,50	822,50	ci
Greece	Zante	114,80	419,40	ci
Greece	Lefkas	104,30	279,30	ci
Greece	Santorini (Thira)	68,00	35,80	ci
Greece	Limnos	193,90	482,30	ci
Greece	Samos	132,40	477,20	ci
Greece	Cos	111,10	288,10	ci
<b>Ireland</b>	mainland	1448,00	70 303,00	m
<b>Italy</b>	mainland	7600,00	301 230,00	m
Italy	Elba	113,20	223,00	ci
Italy	Sicily	1115,00	2 546,00	ci
Italy	Sardinia	1336,00	23 813,00	ci
Italy	Stromboli	5,00	12,00	ci
Italy	Capri	17,00	10,00	ci
<b>Portugal</b>	mainland	1793,00	91854	m
Portugal	Madeira Islands	141,00	794,00	up
Portugal	Azores	700,00	2 247,00	up
Portugal	<i>Faial</i>	61,8	171	up
Portugal	<i>Sao Jorge</i>	117,9	220	up
Portugal	<i>Terceira</i>	88	396	up
Portugal	<i>Pico</i>	112	433	up
Portugal	<i>Sao Miguel</i>	165,3	754	up
<b>Spain</b>	mainland	5849,00	505 988,00	m
Spain	Balearic Islands	800,00	5 014,00	ci
Spain	<i>Majorca</i>	407,8	3640	ci
Spain	<i>Menorca</i>	168,60	692,00	ci
Spain	<i>Ibiza</i>	142,30	576,90	ci
Spain	<i>Fomentera</i>	65,50	84,90	ci

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Guadeloupe	306,00	1 438,00
<i>Grande-Terre</i>	134,9	591
<i>Basse-Terre</i>	139	847

est. = estimation (no official information found)

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up : ultra-peripheral regions  
ot : overseas territories

Countries	State/Island	Coast length km	Area in sq. km	Classification
Spain	Canary Islands	1200,00	7 273,00	up
Spain	<i>Gran Canaria</i>	174,5	1533	up
Spain	<i>La Palma</i>	119,9	690,2	up
Spain	<i>Lanzarote</i>	155,6	790,5	up
Spain	<i>Fuerteventura</i>	249,7	1730	up
Spain	<i>Tenerife</i>	237,8	2059	up
<b>Sweden</b>	mainland	2700	449 964,00	m
Sweden	Oland	328,40	1 344,00	ci
Sweden	Gotland	447,20	3 001,00	ci
<b>The Netherlands</b>	mainland	451	41 536,00	m
The Netherlands	Bonaire	106,40	282,50	up
The Netherlands	Curacao	194,60	444,00	up
<b>UK</b>	mainland	6028,40	231 000,00	m
<b>UK</b>	Northern Ireland	3172,00	14 148,00	m
UK	Wight, Isle of	391,90	381,00	ci
UK	Lundy			ci
UK	Scilly Islands			up
UK	Mull	291,80	925,00	up
UK	Orkney Islands	193,70	976,00	ci
UK	Shetland Islands	534,10	1 432,00	ci
UK	Skye, Isle of	520,90	1 665,00	ci
UK	Hebrides	600,00	7 107,00	ci
UK	<i>Souther Hebrid. Lewis</i>	546,6	286,4	ci
UK	Alderney	8,00	7,9	ci
UK	Man	128,40	572,00	ci
UK	Anglesey	148,40	712,00	ci
UK	Islay	185,50	619,60	ci
UK	Jura	112,40	377,3	ci
UK	Bermuda Islands	103,00	53,30	ot
UK	Tristan da Cunha	39,60	98,00	ot
UK	St. Helena	60,00	122,00	ot
UK	Virgin Islands	80,00	153,00	ot
UK	<i>Tortola</i>	59,9	54	ot
UK	South Georgia I.	700,10	3 756,00	ot
UK	Channel Islands	120,00	194,00	up
UK	<i>Sark</i>	est.3	5,2	up
UK	<i>Jersey</i>	est.60	116,2	up
UK	<i>Guernsey</i>	est.40	63,4	up

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Guadeloupe	306,00	1 438,00
<i>Grande-Terre</i>	134,9	591
<i>Basse-Terre</i>	139	847

est. = estimation (no official information found)



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**Classification and coast lengths of european countries**

m/ci : mainland/close islands  
up : ultra-peripheral regions  
ot : overseas territories

Countries	State/Island	Coast length km	Area in sq. km	Classification
UK	Falkland Islands	3500,00	12 170,00	ot
UK	<i>East Falkland</i>	1668,7	6605	ot
UK	<i>West Falkland</i>	1258,7	4532	ot
UK	<i>Saunders</i>	106,8	131,6	ot
UK	<i>Weddel</i>	175,7	265,8	ot
<b>Bulgaria</b>	mainland	354,00	111023	m
<b>Cyprus</b>	mainland	735,00	951	m
<b>Estonia</b>	mainland	3794,00	45238	m
Estonia	Saaremaa	513,50	2 674,00	ci
<b>Latvia</b>	mainland	531,00	64626	m
<b>Lituania</b>	mainland	99,00	65318	m
<b>Malta</b>	mainland	196,80	316,00	m
Malta	Gozo	42,60	67,00	ci
<b>Poland</b>	mainland	491,00	312685	m
<b>Romania</b>	mainland	225,00	237453	m
<b>Slovenia</b>	mainland	46,60	20273	m

Legend *italic characters* : Name/coastlength/area of island belonging to an entity for which information is already given in the table. Example:

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<i>Grande-Terre</i>	134,9	591
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est. = estimation (no official information found)

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