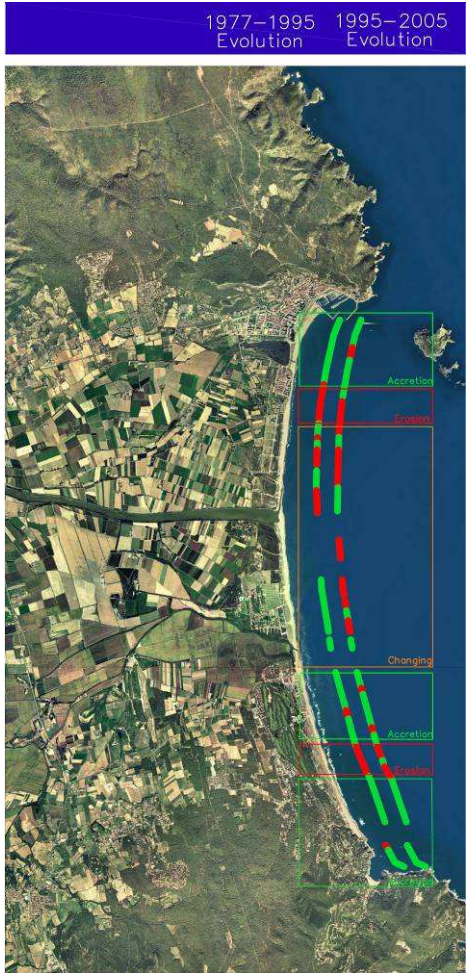
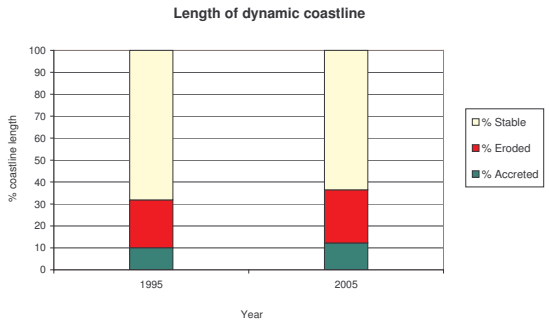


<b>Indicator</b>	
26	Coastal erosion and accretion
<b>Measurement</b>	
26.2	Length of dynamic coastline
<b>What should the measurement tell us?</b>	
<p>Erosion and accretion are naturally occurring phenomena, existing without human disturbance in dynamic equilibrium. However, the ever increasing amount of construction has accelerated the erosion processes in many coastal areas while it has caused the accretion and the shoaling of sand in many others, so changing the dynamic equilibrium on many coastlines of European countries. Erosion is considered to be a critical problem when it threatens human interests - without any threat to development or interests, erosion is just a natural process.</p> <p>This indicator measures how much the mass-energy balance of natural beach systems has been disturbed and to what extent coastal urban settlements and ecosystems might be threatened by the erosion trend in some regions.</p>	
<b>Parameters</b>	
(i)	Percentage of shoreline in erosion or accretion
<b>Coverage</b>	
<b>Spatial</b>	<b>Temporal</b>
Entire coastline for the reference region. An appropriate reference scale would be 1:10.000 scale map but scales of up to 1:50.000 can be used if the first one is not available.	Baseline measurements of 1990, 1995 and 2005. If not available, consider the most recent measurements to make a picture of the state of the coast but at least two measurements with 5 years of difference are needed to compare the position of the baseline.
<b>Data sources</b>	
<p>National mapping agency/sources</p> <p>Administrations responsible for the environment or coastal management.</p> <p>Coastal Erosion Layer CEEUBG100KV2 and the Evolution Trends attribute (CEEVV2) from EUROSION.</p> <p>While the quality of erosion rate data is very high due to on-site visits, aerial photography and remote sensing, the cause and effect relationship of erosion may be less clearly defined. Erosion rates are indicative of not just one natural phenomena but of the effect of many different processes. Care must be taken to consider the influence of single severe storm events on erosion rates. Annual analysis may not be as insightful as studies of longer time periods.</p> <p>Source data have to be rigorously checked and corrected. Double control of the quality of the database produced should be ensured.</p>	

Methodology		
	Steps	Products
1	Delimit the extent of your reference region (municipality, county, province or region)	Specified reference area
2	Choose an adequate base map (for the baseline measurement of around 1995) with the appropriate reference scale. Select all the coastline segments <sup>(1)</sup> and join them in order to obtain the summation of the total coastline length using the GIS statistical tool <sup>(2)</sup> .	Total coastline length
3	Classify coastline segments into eroded or accreted compared to the previous baseline measurement. Within the GIS tool, this selection is based on evolutionary trend, superimposing the previous baseline measurement, defining layers of coastline segments that are considered dynamic <sup>(3)</sup> and classifying them into coast in erosion and coast in accretion.	<u>Location and extent of dynamic coastline, classified as eroded or as accreted shoreline.</u> (Thematic Map)
4	Add up the coastline lengths of eroded or as accreted shoreline	A number that estimates the length of dynamic coastline, classified as eroded or as accreted coastline length.
5	Divide the product of step 4 by the product of step 2 and multiply it by 100.	<u>Percentage of eroded and accreted length of coastline, as a proportion of the total coastline length</u> (Graph 1)
6	Repeat steps 3 to 5 for the subsequent baseline measurements and obtain the same products as step 3 and 5 for these measurement.	<u>Location and extent of dynamic coastline, classified as eroded or as accreted shoreline.</u> (Thematic Map)  <u>Percentage length of eroded and accreted coastline, as a proportion of the total coastline length</u> (Graph 1)

<b>Presentation of the data</b>													
<p>Maps</p>	<p>Base map with the location and extent of dynamic coastline in the country or reference region. This map will show the erosion trends along the coastline divided into 2 categories - eroded and accreted shoreline.</p> 												
<p>Graph 1</p>	<p>Bar chart showing the trend in coastal erosion - length of dynamic (eroded/accreted) and stable coastline as a percentage of the total coastline.</p>  <table border="1"> <caption>Length of dynamic coastline</caption> <thead> <tr> <th>Year</th> <th>% Accreted</th> <th>% Eroded</th> <th>% Stable</th> </tr> </thead> <tbody> <tr> <td>1995</td> <td>~10%</td> <td>~15%</td> <td>~75%</td> </tr> <tr> <td>2005</td> <td>~10%</td> <td>~20%</td> <td>~70%</td> </tr> </tbody> </table>	Year	% Accreted	% Eroded	% Stable	1995	~10%	~15%	~75%	2005	~10%	~20%	~70%
Year	% Accreted	% Eroded	% Stable										
1995	~10%	~15%	~75%										
2005	~10%	~20%	~70%										
<b>Adding value to the data</b>													
<p>(i)</p>	<p>Length of non-critically eroding beaches (areas where the erosion processes do not currently threaten any substantial development or recreational interests) and length of critically eroding beaches (areas where substantial development or recreational interests are threatened) can be represented as an added value to the data.</p>												
<p>(ii)</p>	<p>Length of dynamic (eroded and accreted) coastline per body of surface water <sup>(4)</sup></p>												

<b>Aggregation and disaggregation</b>

**Notes**

- (1) The term “coastal segment” is used because it greatly depends on the coastline calculation method used and size may vary in accordance with techniques.
- (2) In measuring the length of the coastline, the perimeter of harbours and other shelter constructions (such as marinas) is not considered. It is very important that, the sum of dynamic coastline length plus stable coastline length, must equate to the total coastline length. Segments where data is not available can be labelled as “no data”
- (3) A segment is considered stable if evolution is almost imperceptible at human scale and generally stable if small “occasional” variations around a stable position occur (evolutionary trend is uncertain).
- (4) The Water Framework Directive 2000/60/EC defines the “Body of surface water”. This implies a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional waterway or a **stretch of coastal water**. Therefore, the necessary implementation of the Directive divides the coast into stretches of uniform coastal water masses according to the criteria of Annex II of the Directive and the COAST guidance document.