



**Mediterranean Action Plan
Barcelona Convention**



**United Nations
Environment Programme**

**List of Case Studies
for the
Ecological Objective 8
(Coastal Ecosystems and Landscapes)**

E08	Title	Contracting Parties, Partners	Authors and Affiliation
1	Implementation of indicator on length of artificialized coastline for Italy: continental part, Sardinia and Sicily	Italy	Giordano Giorgi, Tania Luti, Luca Parlagreco, Tiziana Cillari, Patrizia Perzia, Saverio Devoti ISPRA - Italian National Institute for Environmental Protection and Research, Via Vitaliano Brancati, 48 – 00144 – Roma, Italy

Common Indicator 16: Length of coastline subject to physical disturbance due to the influence of man-made structures (E08)

Case Study title: Implementation of indicator on length of artificialized coastline for Italy: continental part, Sardinia and Sicily¹

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1. Brief introduction

Coastal defence structures, ports and marinas were identified with GIS procedures using georeferenced aerial photographs of 2006 and 2012. As a reference coastline for the calculation of length of artificialized segments, the Italy coastline was chosen in 2006. The length of artificial coastline was calculated as the sum of segments on the reference coastline identified as the intersection of polylines representing manmade structures with the reference coastline, ignoring polylines representing manmade structures with no intersection with reference coastline.

The minimum distance between coastal defense structures was set to 10 m in order to classify such segments as natural, i.e. if the distance between two adjacent coastal defense structures is less than 10 m, then all the segment including both coastal defense structures is classified as artificial. The final product was constituted by the polylines and polygons of coastal defence structures, ports and marinas and by the three different polylines on the reference coastline for continental Italy, Sardinia and Sicily with each segment classified as natural (green color) or artificial (red color) (Figure 1). All products are represented using WGS84 as Geographic Reference Systems and shapefile format.



Figure 1: The Italian coastline with artificial and natural segments (2006).

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2. Methodologies used for the collection and analysis of the data

The methodology adopted was divided into the following phases:

- Imagery data selection and preparation of data for photointerpretation
- Information layer update through photointerpretation
- Processing of the "effective" coastline and identification of coastal defense structures
- Index calculation for 2006 and 2012

As regards the first phase, 2006 ISPRA reference coastline was selected and AGEA aerial photographs for 2006 and 2012 have been extracted to cover the entire Italian coastline and properly projected in agreement with 2006 ISPRA reference coastline. This last step required a considerable amount of time and hardware resources. Coastal defense structures included in the 2006 ISPRA reference coastline were mapped to the classification scheme proposed by UNEP/MAP IMAP Monitoring Guidance and EO8 factsheets. All polygons identified by photointerpretation were archived in a geodatabase that is compatible with shapefile format.

3. Results of the Indicator Assessment

The final results for 2006 and 2012 and trends 2006-2012 are represented in Table 1.

Table 1: Summary of results on the length of artificialized coastline for Italy

	LENGTH (KM) 2006			PERCENTAGE 2006		PERCENTAGE 2012		TREND 2006-2012
	total	natural	artificial	natural	artificial	natural	artificial	artificial
ITALY – Continental	3844.985	3058.103	786.882	79.53	20.47	79.02	20.98	+0.51%
SICILY	1177.769	1003.140	174.629	85.17	14.83	85.01	14.99	+0.16%
SARDINIA	1512.145	1444.395	67.749	95.52	4.48	95.46	4.54	+0.06%
TOTAL	6535.899	5505.638	1029.261	84.25	15.75	83.89	16.11	+0.36%

4. Lessons learnt and/or recommendations

A key concept was represented by choosing a reference coastline on which coastal defence structures, ports and marinas are to be projected. Such reference coastline should represent a reasonable compromise between proper resolution and being up-to-date. Proper resolution should assure the possibility to detect changes due to new coastal defence structures. If a reference coastline is too recent most if not all of coastal defence structures will be included in the baseline and trends will be biased by such choice. Photointerpretation procedures also play a crucial role in the identification of polygons which represent infrastructures and a well-trained GIS expert team is a pre-requisite to carry on the all work in a consistent and reasonable time period. The sole photointerpretation work to cover all Italian coastline amounts to 6 months by 4 GIS experts.

It is strongly advisable that such common procedures should be agreed at Mediterranean level in order to end up with a consistent picture among countries.