Projet cofinancé par le Fonds Européen de Développement Régional (FEDER)
Project cofinanced by the European Regional Development Fund (ERDF)

MED MARITIME INTEGRATED PROJECTS
Med-IAMER

Western Mediterranean ecoregion (WME)

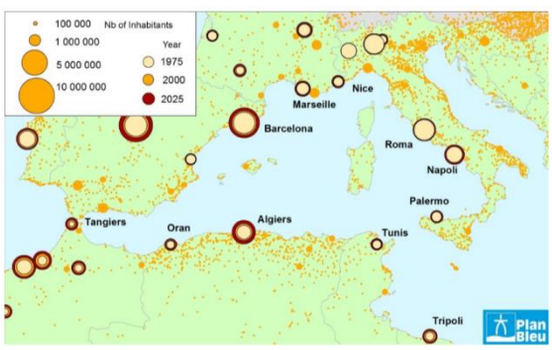
Coastal Urbanization

Definition

Urbanization is the increase over time of urban population in proportion to the region's rural population. Coastal urbanization is studied here in terms of its effects on the ecology and economy of a region with a focus on land occupation by urban land uses and related infrastructure.

Regional context

The Mediterranean coast is characterized by a large part of its population living in coastal areas. The growth of these urban settlements along the coast is difficult to stop due to migration flow towards cities for residence and for tourism. Figure below illustrates major coastal cities along the Western Mediterranean coast and puts emphasis on the largest cities (biggest circles).



Coastal cities in the Western Mediterranean

As the Western Mediterranean is characterized by the presence of a significant number of large cities (Valencia, Barcelona, Marseilles, Nice, Cannes, Rome and Naples), the impact of high population density on the coastal and marine environments is expected to be strong and therefore considered a priority in Med-IAMER.

Regarding the Spanish Mediterranean coasts, the problem of a rising 'coastal' population is not only related to the large coastal cities, such as Barcelona and Valencia, but also related to the general increase of the population living in the continuum of coastal areas (littoralisation). In Spain, 44 % of the

population lives in littoral areas even though these areas only account for 7 % of the country's surface. In addition, 80% of tourists visiting Spain spend their holidays in the coastal. In the case of large (tourist) cities with large ports, competition in terms of space is very likely to occur, especially

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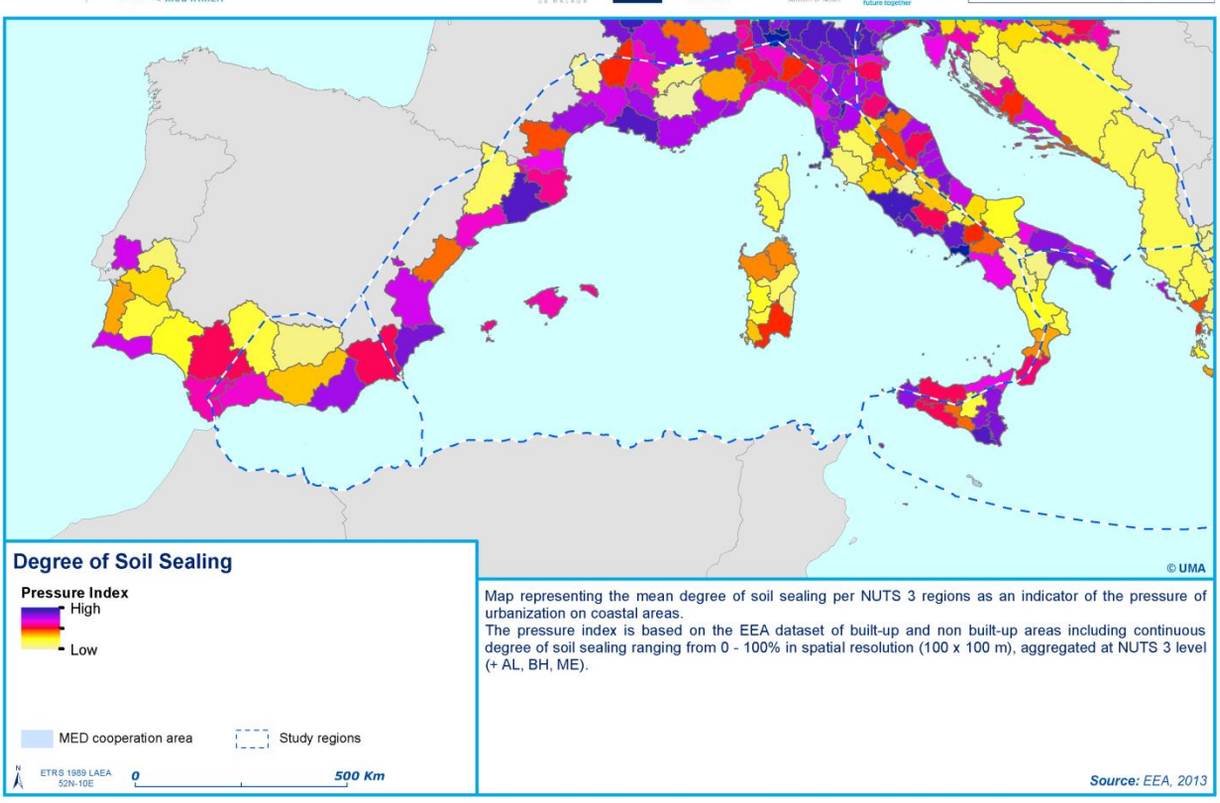

Map representing the mean degree of soil sealing per NUTS 3 regions as an indicator of the pressure of urbanization on coastal areas.
The pressure index is based on the EEA dataset of built-up and non built-up areas including continuous degree of soil sealing ranging from 0 - 100% in spatial resolution (100 x 100 m), aggregated at NUTS 3 level (+ AL, BH, ME).

Source: *EEA, 2013*

with the expected boosting of maritime tourism, i.e. cruises, calling for the creation of marinas as well as the intensification of tourism in the Mediterranean region. In this respect, Genoa is a good example since both the city and the port have been developing considerably in recent years arising spatial competition between the two resulting in cohabitation problems. Therefore, the city and port have developed port functions and large seaward infrastructure.

Highlighted features

This map shows the mean degree of soil sealing per NUTS3 region. The most densely populated NUTS3 regions stand out with highest values of sealed soils due to urbanization and infrastructures. Particularly, the NUTS3 regions of the Gulf of Lion and Genoa, as well as the East coast of Spain are highlighted as highly artificialized (high soil sealing density), while Corsica, Toscana and some areas of Andalusia and Sardinia regions have relatively lower values of soil sealing.

Data/Indicator used

Indicator: Mean degree of soil sealing

The pressure indicator is based on the EEA raster data set (coverage EEA 39) of built-up and non-built-up areas including continuous degree of soil sealing ranging from 0 – 100% in spatial resolution 100m*100m, aggregated at NUTS3 regions.

Gaps

The development of this indicator is based on satellite imagery. Minor gaps are due to some non-cloud-free areas in the satellite images covering Northern Italy.

Limits of methodology

The aggregation to NUTS regions does not provide a detailed vision of the most sealed areas at a pixel scale. But at the ecoregion scale, the aggregated statistics at

NUTS3 level is the best possible representation for the sake of clarity.

Related Pressures

Soil sealing and smoothening

In the Mediterranean region, soil sealing is a particular problem along the coasts where rapid urbanization is associated with the expansion of coastal tourism. All the countries around the WME have high rates of sealing namely in some coastal areas including Costa Brava in Spain and Côte d'Azur in France.

Marine litter

A major pressure generated by this human coastal occupation is the erosion of coastlines due to the retention of sediments (about 45% of sediments that would be delivered by rivers annually are either retained behind dams or extracted from river beds for sand and gravel - UNEP/MAP 2009). Erosion has many impacts on coastal ecosystems including destruction of soil surface layers, leading to groundwater pollution and to reduction of water resources; degradation of dunes, leading to desertification; reduction of biological diversity; adverse effects of beach dynamics; reduction of sedimentary resources; and disappearance of sandy littoral lanes that protect agricultural land from the intrusion of seawater, resulting in soil and groundwater salinisation (EEA and UNEP 2006).

The Gulf of Lion, the Ligurian Sea and the Tyrrhenian coast of Italy include many sites of ecological value highly affected by coastal erosion (UNEP/MAP 2012).

Introduction of non-synthetic substances and compounds

Urbanization is the main cause for introduction of non-synthetic substances and compounds in the WME. Urban and industrial wastewaters, atmospheric deposition and run-off from metal contaminated sites constitute major sources of toxic metals. Lead levels are high in sediments around the area of Marseilles-Fos and Toulon (France), Cartagena (Spain), along the western Italian coast, around Naples and in the Gulf of Genoa (UNEP/MAP 2012).

List of proposed indicators

The following table lists the indicators developed and mapped within Med-IAMER on the pressures and impacts of urbanization on coastal (land) and marine environments. **All maps, identified by the indicator ID, can be found at the project's web page:** http://www.medmaritimeprojects.eu/section/med-iamer-redirect/outputs

ID	Indicator description
UB01	Eutrophication
UB02	Degree of Soil Sealing
UB03	Level of Urban Sprawl per NUTS3 (under development)

Bibliography

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L'Europe en Méditerranée
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Designed by Plan Bleu