JOINT ACTION PLAN

Annex 3

MAJOR COASTAL PROJECTS

CYPRUS

1. TITLE OF THE PROJECT: Larnaca North Coastal Redevelopment Project (CYPRUS- 01)

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

- Hard Coastal defenses – revetments/ sea wall, groins
- Requalification of a coastal stretch – conversion from industrial (fuel depot) to residential/ commercial/ tourist area
- Rearrangement of the waterfront – pipelines, storage tanks removed. Tourist developments (hotels, shops, restaurants, parks, etc)
- Transformation, re-destination of a coastal area – Beach nourishment/ import of sand, coastal protection works to protect the new beaches
- Realignment of infrastructures along the coast – new pedestrian/ cyclist road, public amenities

Limitations

- Oil distribution companies are currently operating in the area. The relocation of these installations is associated with a significant capital cost. It is also associated with administrative problems since businesses and people need to be relocated.

- There are environmental problems associated with the cleaning of the area from the fuel storage facilities. The ground is expected to be contaminated, bearing in mind that the age of these installations is too old.

- Main uncertainties and knowledge gaps to be addressed in the design phase include:

- *The actual condition of the sub-soil*
- *The reaction of all those employed in the oil companies who will be forced to relocate*
- *The demand and value of all this land which will be converted from industrial to tourist/ residential/ commercial use*

- Larnaca city and the hinterland will enjoy social-economic benefits due to the removal of the fuel storage facilities. The image of the city will improve, the value of the properties next to the oil companies will increase, the risk of a major accident will be eliminated, barrier blocking the city from expanding to the north is removed.

3. LEVEL OF DESIGN OF THE PROJECT

- The project has been a Government policy for more than a decade
- The master plan for the coastal works is at its final stage
- The master plan for the road network is complete and implemented
- The town planning zones are agreed

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- The budget of the project is of the order of €50 Million
- The implementation is scheduled towards the next 5-10 years

5. ACTORS INVOLVED

- Department of Town Planning and Housing (development on land side)
- Department of Public Works (coastal works, road works)
- Ministry of Energy, Commerce, Industry and Tourism (relocation of oil companies)
- Larnaca Municipality (Local Authority)

- Private sector (oil companies)

6. MAP WITH LOCATION AND GENERAL FEATURES

Location Map. The project area is located north of Larnaca City. Larnaca is bounded by the airport and the salt lake on the south side and the port and oil companies on the north side.

The Project area. All fuel storage facilities will be relocated. The area is to be redeveloped into a tourist, residential, commercial area. The existing coastal works (revetments and groins) will be removed. Detached breakwaters and beach nourishment will create and protect sandy beaches.

Emilia-Romagna Region

1. TITLE OF THE PROJECT: protection and restoration of the area Foce Reno – Bellocchio – Lido Spina **(RER-01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

- Coastal defenses – nourishment, groins, dune reconstruction, sand motor, lagoon channels restoration
- Restoration of a costal stretch in a high value naturalistic area (SIC, ZPS, Ramsar), defense of the urban settlements of Lido di Spina, touristic resorts and activities, adaptation to climate change and defense of high value habitat of protected species.
- Waterfront of about 5 km and relative internal area, with implications on sustainable management of a coastal stretch of about 10 km

Aspects and limitations

The area has been subject to severe storms in the last 6-7 years, recording a retreat of about 30 m/year of the coastline. The threatening involves:

- the marinisation of the coastal lagoon (Vene di Bellocchio) and the total loose of specific habitats of protected species;
- the exposure to sea floods of the State road 309 (s.s. Romea)
- the exposure to sea floods of the urban settlement of Lido di Spina South, involving also the Lake of Spina.

Limitations to the interventions are given by the conditions of a natural protected area in which particular low impact techniques and materials should be employed, scheduling subject to breeding and nesting periods.

3. LEVEL OF DESIGN OF THE PROJECT

- The project has been designed also for a LIFE program application
- The master plan for the coastal works is under discussion

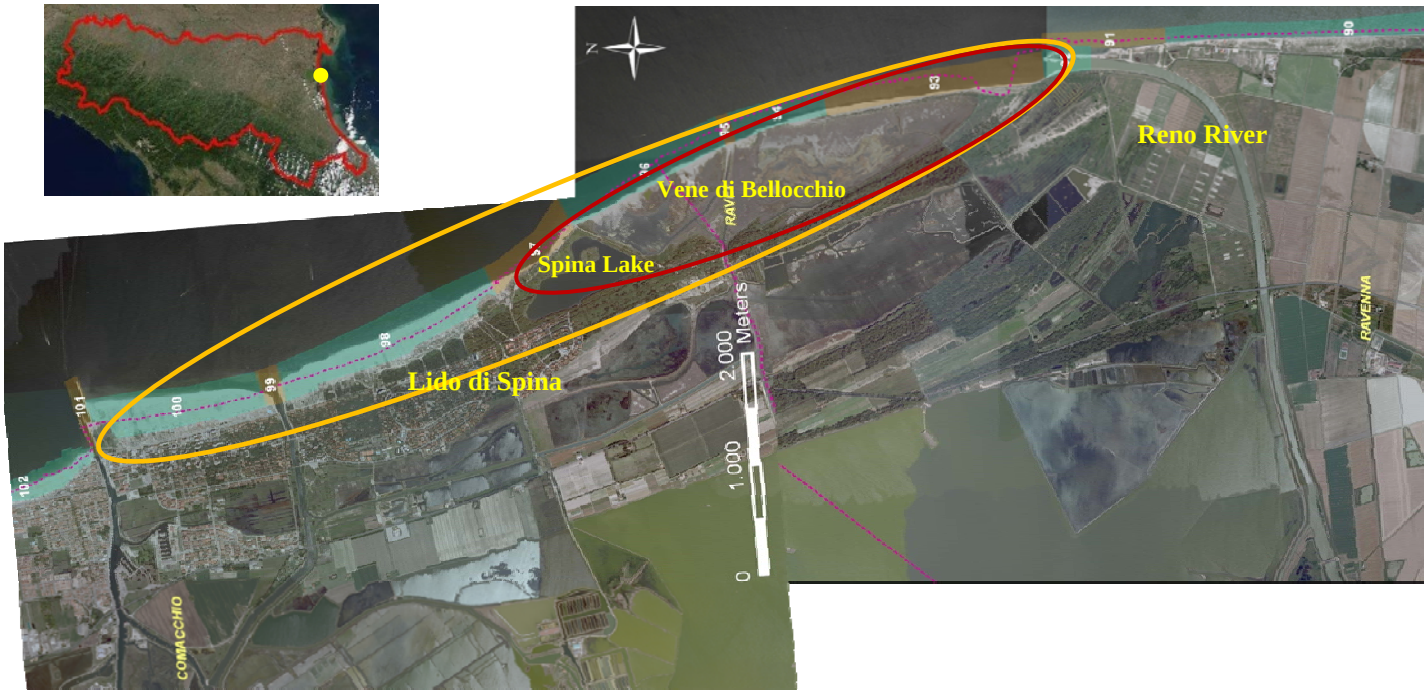
4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- The budget of the project is about € 25 Million
- The implementation is scheduled by 2015-2017

5. ACTORS INVOLVED

- Emilia-Romagna Region (Directorate General of Environment, Soil and Coast Protection)
- State Forestry Service (Biodiversity Protection Office of Punta Marina)
- Delta Po Park Body
- Ravenna and Comacchio Municipalities (Local Authorities)
- Military Polygon
- Private sector: Orsi Mangelli (farm company), Spina Camping Village (resort company)

6. MAP WITH LOCATION AND GENERAL FEATURES



Location Map. The project area is located north of Reno River mouth. The coastal stretch subject to the direct interventions is about 5 km of waterfront and involves about 213 hectares of the Vene di Bellocchio wet area. The total coastal stretch involved in the future management linked to the area of intervention is about 10 km length.

Scheme of interventions

Emilia-Romagna Region

1. TITLE OF THE PROJECT: extraordinary nourishment intervention on Emilia-Romagna coast with off-shore sand deposits **(RER-02)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The extraordinary nourishment intervention with sand from submarine deposits has the scope the restore the safety conditions of the 8 coastal stretches along the regional coast, in very critical condition, after different sea storms impacts in the last 6 years. It is foreseen the provision of sand taken from two submarine accumulations located from 40 to 50 km off the regional coastline.

The coastal stretches subject to the intervention are located within eight municipal territories (Misano Adriatico, Riccione, Rimini, Bellaria, Cesenatico, Cervia, Ravenna, Comacchio) and concern all the 4 coastal provinces of Emilia-Romagna.

The experience gained from similar interventions, performed in 2002 and 2007, has shown that with a proper enlargement of the beach are avoided damages to infrastructures/settlements and is strongly limited marine ingression risk in the inland. Taking care to follow the intervention with yearly maintenance operations, the benefit of such alimentation with "new" sand resources will affect the whole coastal system (coastal stretches directly interested and nearby stretches, in the 8 most critical zones of the regional coast). The purpose of this project is therefore to implement a significant enhancement of the beach system, considered as the first defense line against marine ingression, based on a rise in altitude and an enlargement towards the sea of the sandy shore, in order to ensure the safety of inland features (settlements, infrastructures, plants, natural protected areas, etc.) for a period of almost 5 years. One of the location of the intervention, destination of part of the sand nourishment, is the area of Foce Reno-Bellocchio, concerning further interventions for restoration and protection described in RER-01a.

Aspects and limitations

The use of submarine sand accumulations is particularly indicated by:
- the input into the coastal system of "new" sand to compensate losses due to erosion and subsidence, practice included in the regional strategy for coastal protection and adaptation to climate change effects;
- the low environmental impact during implementation on the coast, on the ground and on the road network (being the transport exclusively via sea) and the low impact in the mid period, as demonstrated in the previous post intervention monitoring, on the ichthyic and benthonic population of the off-shore borrow sand deposit;
- the benefit for the tourist economy and for the attractiveness of the different areas, adopting a "soft option" instead of a hard defense works solution.

Limitations to the interventions are given mainly by:
- the impossibility to operate during the bathing season (mainly June-September period) and in the case by the conditions of natural protected areas in which the schedule should concern also the breeding and nesting periods.

- to contain visual impacts due to the different colors of the submarine sands providing a certain opportune accumulation of site specific "original "sand to be subsequently stringing on submarine sands once put in place;
- the depth of excavation, dredging, in the two submarine accumulations must not reach the boundary level between the sands and underlying deposits in order to not alter the composition of the bottom with consequent modification of the benthic fauna associated.

3. LEVEL OF DESIGN OF THE PROJECT

- The project has been designed in its Preliminary version and approved by a deliberation of the regional government, and it's included in the Rendis database, national platform.

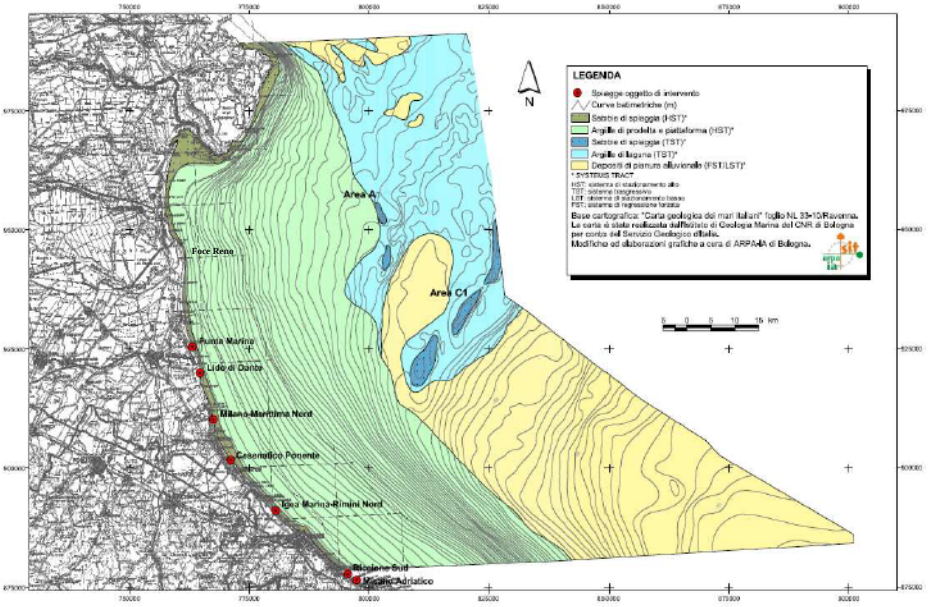
4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- The budget of the preliminary project approved is about € 16,5 Million,
- The implementation is scheduled by 2015-2016
- An extra charging of the "sand motor" by Foce Reno-Bellocchio area, with sand coming from submarine deposits, is quoted to add about € 13 Million to the above mentioned budget.

5. ACTORS INVOLVED

- Emilia-Romagna Region (Directorate General of Environment, Soil and Coast Protection)
- Municipalities (Local Authorities) interested by the intervention: Misano Adriatico, Riccione, Rimini, Bellaria, Cesenatico, Cervia, Ravenna, Comacchio.

6. MAP WITH LOCATION AND GENERAL FEATURES



General plan with sites of intervention and withdrawal (areas A and C1) and thickness of sand deposits

Departement de l'Herault

1. TITLE OF THE PROJECT beachnourishment of sandycoasts in Herault Departement / South of France **(Herault-01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

Mediterranean sea is considering as a hot spot for climat change. A lot of damages are previous on our sandy coasts : a study from 2010 for the French Ministry estimates these damages of 30 billions € in 2100. During the last period 2007 /2014, public administrations realized more than 100 M€ to protect beaches on Herault coasts (90 km) – see herewith document.
For the medium term, we project to restore the sand balance along many beaches, considering we will need enough time to sensibilize the coastal population to move behind.

We studied a bechnourishment project including 10 millions m3 of sand, associated with some groins to stabilize.
We found these offshore sand deposits during Beachmed studies 2002/2008. Moreover the environmental aspects were studied on ESPEXS project 2011/2013.

3. LEVEL OF DESIGN OF THE PROJECT

The project has been designed in its Preliminary version in Beachmed works.

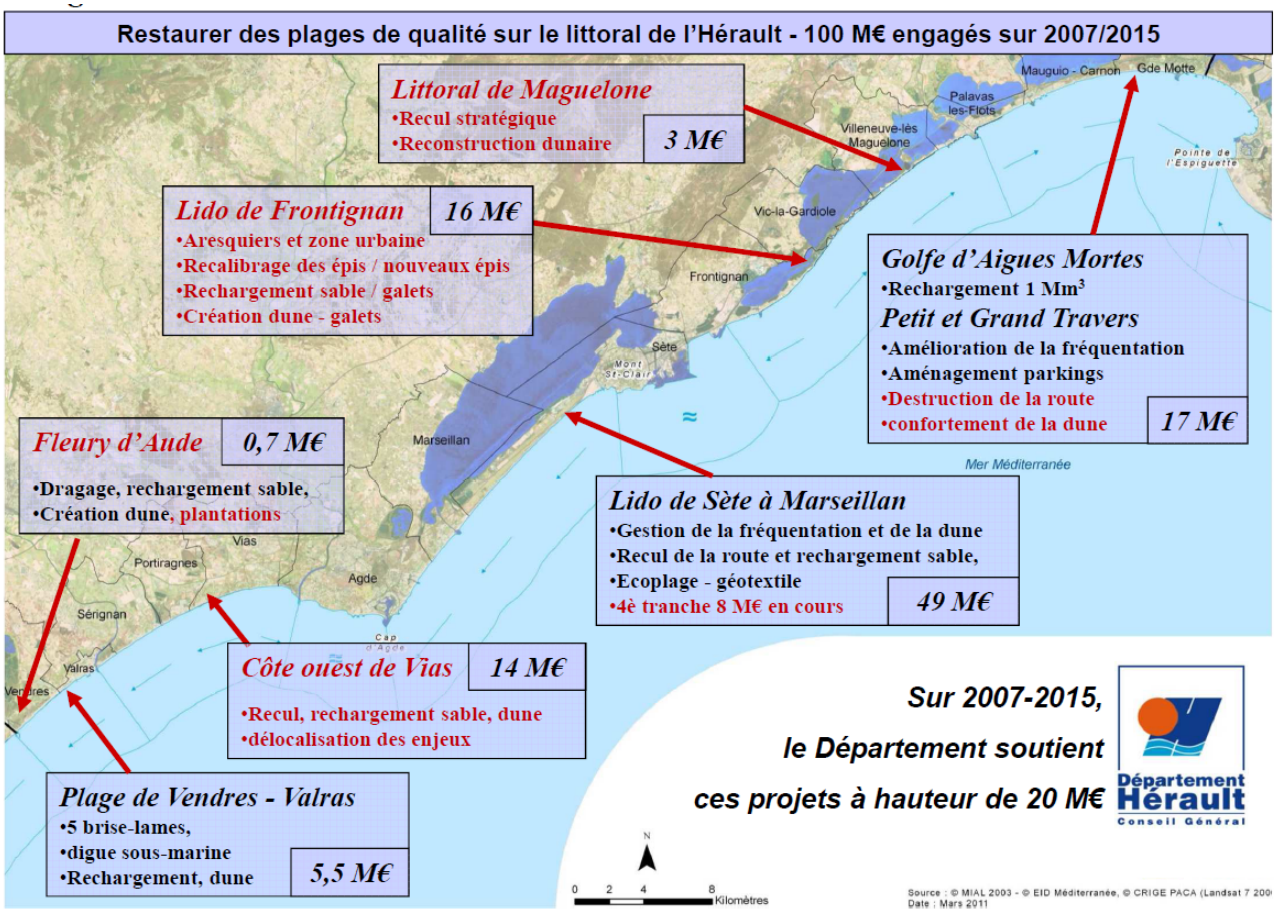
4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION (if any)

100 M€ / 10 years.

5. ACTORS INVOLVED

- French Central & local Administration
- Region Languedoc-Roussillon
- Department of Herault - Municipalities
- Private sector (owners, economic actors) - Research centers

1. MAP WITH LOCATION AND GENERAL FEATURES



Departement de l'Herault

1. TITLE OF THE PROJECT: protection du Lido de Maguelone à Frontignan – 5 km **(Herault-02)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The project consists to protect and to restore this beach and to reorganize the frequency.
Sandy Beachnourishment
Groins
Brake waters
dunes

3. LEVEL OF DESIGN OF THE PROJECT

- Definitive

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

16 M€

2015 for the first step (8 M€)

5. ACTORS INVOLVED

- French Central & local Administration
- Region Languedoc-Roussillon
- Department of Herault - Municipalities
- Private sector (owners, economic actors) - Research centers

6. MAP WITH LOCATION AND GENERAL FEATURES

Objectifs de l'intervention :

- Préserver le plus possible le caractère naturel des espaces du secteur Est des Aresquiers.
- Maintien de la vocation balnéaire des espaces littoraux situés à l'Ouest des Aresquiers.

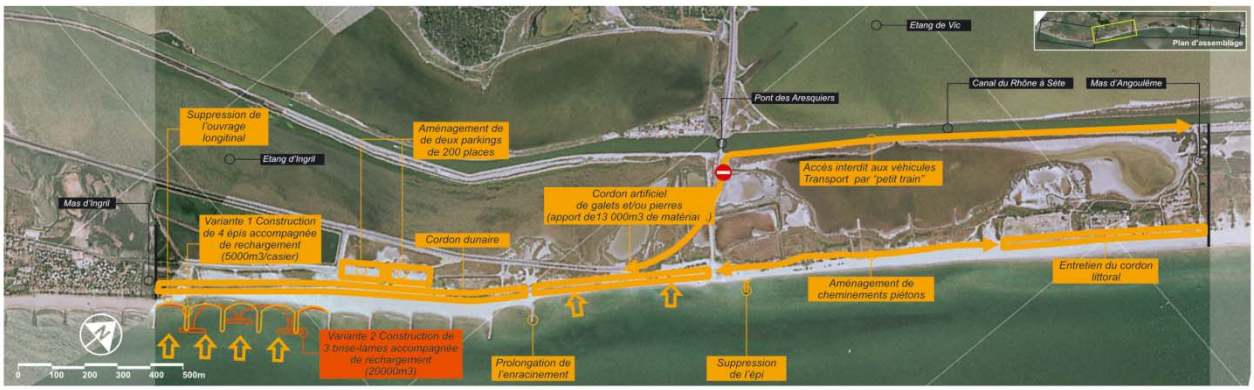
Etude générale pour la protection et la mise en valeur du littoral de Frontignan et de Villeneuve-lès-Maguelone

Mas d'Angoulême - Mas d'Ingril
Aménagement retenu

Figure 6

MAR30263C secteur4.CDR JLF 31/08/2004

BCEOM



Solution retenue : Rechargement et entretien des épis

- Maintien suivi et entretien du cordon de protection et des épis existants.
- Apport de 60 000m3 de galets associés ou non aux "pierres" (20000m3 disponibles) pour recharger la plage aux Aresquiers (solution de base)
- Apport de 104 000m3 de sable en provenance de la pointe de l'Espiguette pour recharger la plage au niveau de la dent creuse.

Variante 1

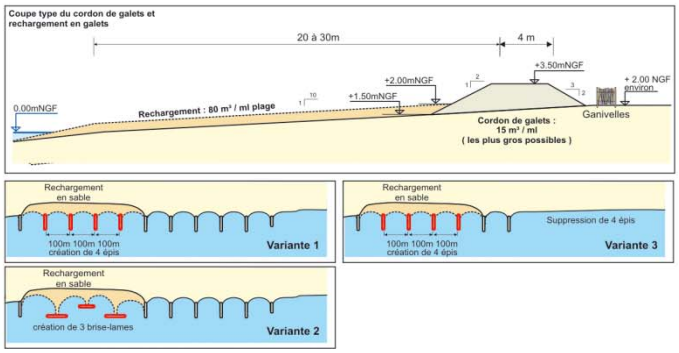
Secteur de la dent creuse :
-création de 4 épis espacés de 100m, de 80m de long et rechargement par 25 000m3 de sable.

Variante 2

Secteur de la dent creuse :
-création de trois brise-lames avec rechargement (20000m3).

Variante 3

Secteur de la dent creuse :
-création de 4 épis espacés de 100m, de 80m de long et rechargement par 25 000m3 de sable.et suppression des quatre épis situés le plus à l'Est



Lazio Region

1. TITLE OF THE PROJECT: "TIBER MAJOR PROJECT" **(Lazio-01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

- Increasing sediment transport of Tiber river
- Requalification of Tiber river banks and
- Environmental monitoring system
- Maintenance
- Requalification of Tiber River mouth (Passo della sentinella – Idroscalo)
- Waters quality
- Flood risk mitigation
- Tiber at zero emissions
- Touristic promotion
- Eco-compatible agriculture development
- Tiber Start-up (Old buildings re-establishment and co-working initiatives)
- Nourishment of Tiber River mouth system beaches (Fiumicino, Roma, Pomezia)
- New and existent Marinas and Ports adaptation to sustainable coastal management

3. LEVEL OF DESIGN OF THE PROJECT

- Feasibility Study in the Regional Operational Programme ERDF 2014-2020

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- Natural sediment transport improvement	➔	7,2 Million €
- Environmental enhancement	➔	12,0 Million €
- Nourishment of beaches and dunes restoration	➔	16,0 Million €
- Tiber Urban stretch and mouth requalification	➔	11,5 Million €
- Marinas and Ports adaptation	➔	8,4 Million €
- Total Tiber major project	➔	55,1 Million €

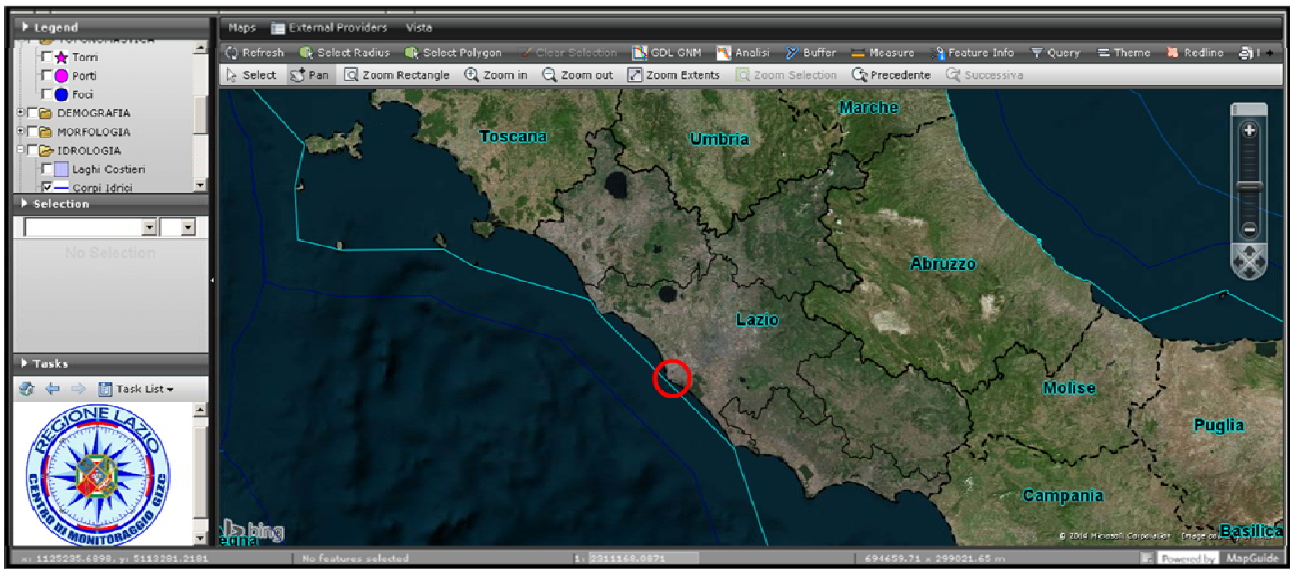
Intervention schedule ➔ 48-60 months

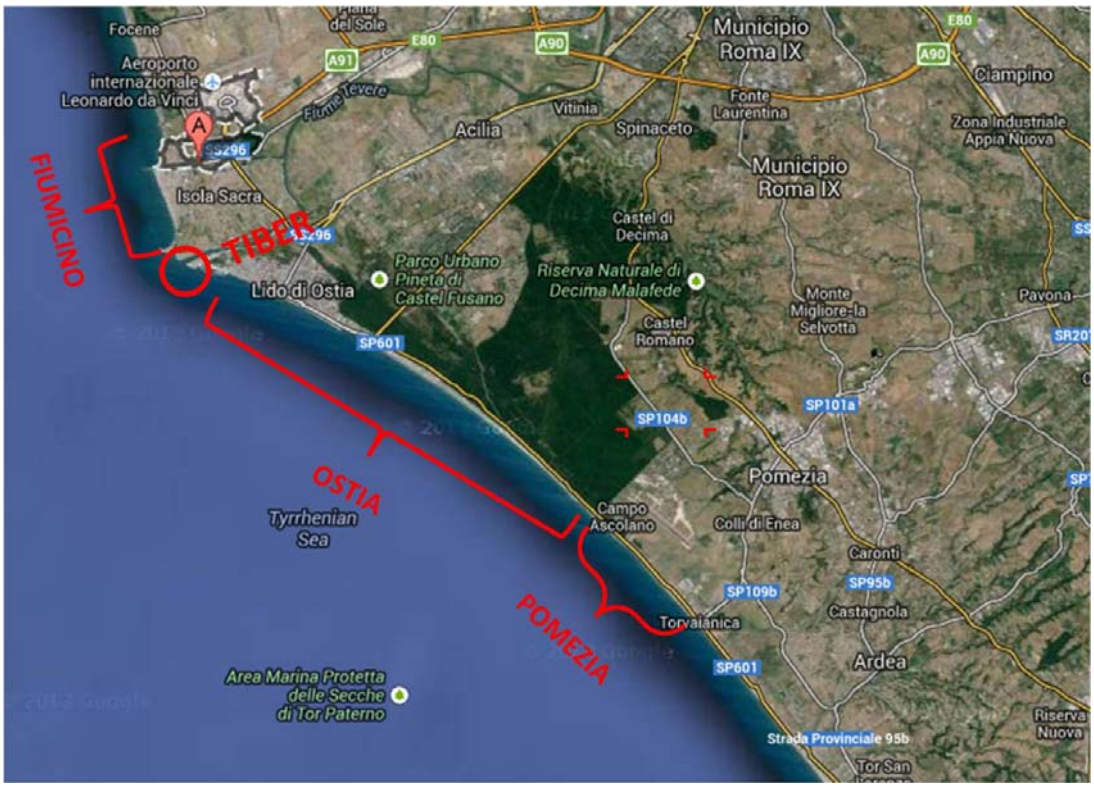
5. ACTORS INVOLVED

- Regional Administration (Regional Coastal Defence Agency ARDIS, Regional Environment Agency ARPA); planning, tender
- Municipalities (Fiumicino, Roma, Pomezia); planning, tender
- Tiber Regional Basin Authority; planning

- Port Authority of Civitavecchia; planning, tender
- Private Sector; planning, work

6. MAP WITH LOCATION AND GENERAL FEATURES





Liguria Region

1. TITLE OF THE PROJECT: Recupero litorale tra Albenga e Ceriale /Regione Liguria – Provincia Savona (Liguira-01)

2. DESCRIPTION

- Restoration of a coastal stretch of 6 km completely modified by a sea wall built during the last century to protect the railway
- Improvement of the defence against sea floods for a coastal plain through the use of a off shore borrow site for sand nourishment
- Integrated planning of the near shore area in order to improve public uses and pedestrian and cycling mobility

3.LEVEL OF DESIGN OF THE PROJECT

- The project is already approved at the preliminary level; it was developed by a multidisciplinary team that designed the interventions both for the shore restauration and for a new land use plan in the nearshore area.
- The Liguria Region included the intervention in the "Piano Tutela Ambiente marino e costiero (PTAMC)", now (2014) under EIA procedure
- The borrow site in the sea bottom was firstly studied thanks to the Beachmed-e project; additional surveys were carried on by the Region in the 2012 for the PTAMC.
- The 7 municipalities of the sedimentary cell signed an agreement for the use of the borrow site

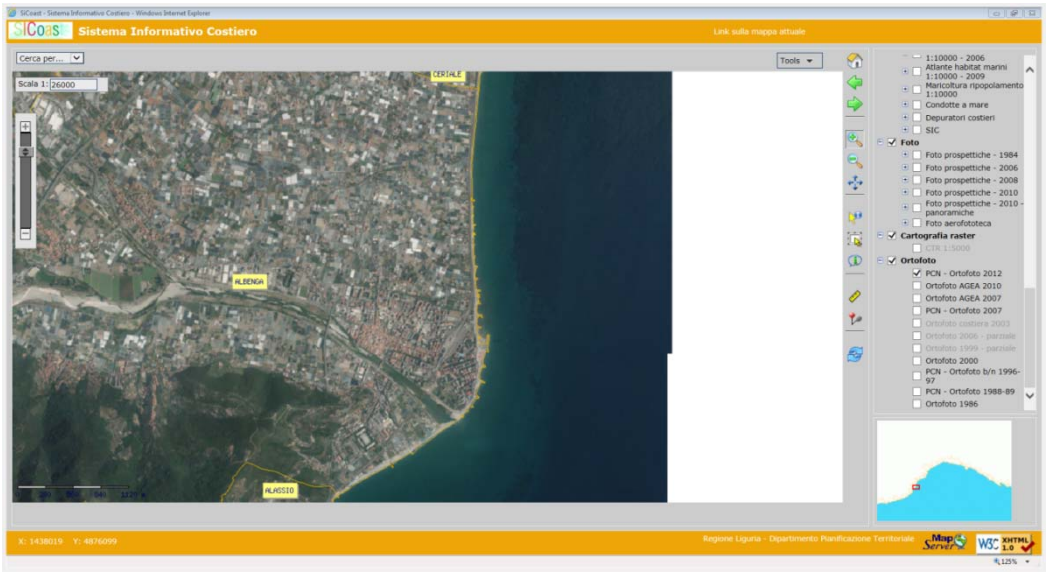
4.BUDGET AMOUNT ESTIMATION & SCHEDULE OF INTERVENTION

The budget of the project is €10 million.
The implementation is not scheduled because of the lack of financement

5. ACTORS INVOLVED

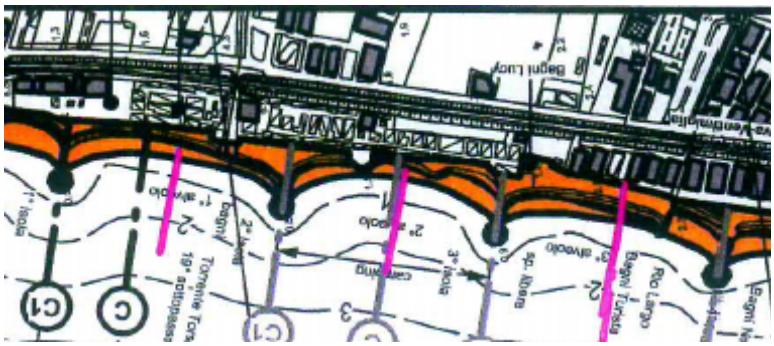
- Regione Liguria
- Provincia di Savona
- Albenga and Ceriale municipalities
- All the other municipalities of the sedimentary cell
- RFI (Italian Railways)
- Ministero Beni Culturali

6.MAP WITH LOCATION AND GENERAL FEATURES



The area of intervention

The railway runs directly by the sea.



An example from the project.

Split-Dalmatia County

1. TITLE OF THE PROJECT: Restoration of Kaštela Bay Coastline (Split-Dalmatia-01)

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

Coastline of the Town of Kaštela has a very specific history and has been part of mayor one of the biggest infrastructural projects in the Mediterranean - Eco Kaštela Bay financed by the WB and EBRD . The value of the project will be300 MIO euro by its end.

It covers construction and reconstruction of sewage systems of for the city of Split, the towns of Solin, Kaštela and Trogir, the municipalities of Seget, Okrug, Dugopolje and Klis and a part of the Čiovo Island.

The project has been implemented due to high pollution caused extensive growth of the population which was not followed by simultaneous development of municipal infrastructure (i.e. construction of water supply and sewage networks). Moreover, several plants (chemical, iron, cement), situated in Kaštela, resulted very high pollution of the area . By now, a 2 level waste water purification plant was constructed.

The project has resulted with the rise of the sea quality level along Town of Kaštela coastline, transforming it to beach area for local population.

Unstable gravel beaches present 44% of Town's coastline. At the moment the area requires high nourishment costs on the yearly bases, due to lack of planning and technical documentation.

Beach erosion presents a big problem for settlements, particularly for historical castles and road infrastructure , located very close to the coastline. A systematic approach to restoration of the costal stretch would present significant contribution to the defense of urban settlements.

The scope of the project is 3,5 km of coastal stretch with very narrow internal area, from Kaštilac castle in Kaštel Gomilica to Villa Rušinac in Kaštel Lukšić. The aim of the project is sustainable management of a coastal stretch with aim to restore the coastal promenade and to integrate it with beach and park areas, protection of Kaštilac castle and construction of 2 marinas.

Aspects and limitations

The area has been subjected to series of sea flooding in recent years which has affected the inner coastal area, i.e. road infrastructure and urban settlements that are closely connected with promenade. With inevitable coastal area sinking and water level rise due to the climate change the threats are listed:

- loss of high value beach area
- exposure to sea floods; where boardwalk and road being mostly affected
- exposure to sea floods; where urban settlements being endangered in extreme events
- saltwater intrusion into the groundwater aquifer, causing loss of specific habitats

Limitations to interventions are given by the fact that the area has a distinctive number of cultural heritage sites, which could potentially turn out to be a hurdle of a kind.

The city will enjoy social-economic benefits once coastal area will undergo through restoration process. It will surely alleviate if not totally remove the negative consequences of regular sea flooding and on top restore in full the attractive promenade along with beach and park areas

3. LEVEL OF DESIGN OF THE PROJECT

- The project has been a Government policy for more than a decade
- The master plan for the coastal works is in preparation
- The master plan for the road network is in preparation
- The town planning zones are agreed

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- - The budget of the project is about € 25 Million
- - The implementation is scheduled by 2020

5. ACTORS INVOLVED

- Department of Town Planning and Housing (development on land side)
- Department of Public Works (coastal works, road works)
- Kaštela Municipality (Local Authority)
- Private sector (tourism companies)

6. MAP WITH LOCATION AND GENERAL FEATURES

The project area comprises Kaštilac castle in Kaštel Gomilica and streches to Villa Rušinac in Kaštel Lukšić. The coastal stretch subject to the direct interventions is about 4.0 km long and involves as well very narrow zone of inner land, on average 50m wide.

Valencia Region

1. TITLE OF THE PROJECT Development and implementation of the shoreline management plan for the northern coast of Valencia /Spain **(Valencia-01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The project plans a set of actions aimed at overcome the problems caused by the action of the sea over the territory in which it is probably the most erosive coastal stretch within the Spanish Mediterranean.

The project area is the coast between the ports of Burriana and Sagunto, in the north of Valencia. It is a 30 km long stretch of low-lying coast which is subject to strong sedimentary dynamics affecting directly 8 municipalities[1].

Human activities during the twentieth century[2], generated imbalances that have resulted in severe erosion problems and risks impinging on coastal populations, environment[3] and economic activity[4]. Coastal retreat reaches values exceeding 100 m in some areas, with rates greater than 5 m / year.

After half a century taking more or less successful measures with a local approach, in 2011 the Ministry of Environment drafted a study of alternatives in the area under a broad geographical perspective, integrating the long term and therefore considering adaptation to climate change. The feasibility study combines hard engineering measures of coastal protection with soft actions addressed to the management of the sedimentary cycle.

Descriptors: beach nourishment, realignment of coastal infrastructures, adaptation to climate change, reduction of coastal risks.

3. LEVEL OF DESIGN OF THE PROJECT

The strategy is drafted, and the feasibility of the different alternatives (including option 0) is studied and assessed through the quantification of key variables.

Actions that integrate the strategy are currently at different stages: there are projects at preliminary drafting stage, others at drafting stage, and others which would be ready to be tendered having passed the environmental processing.

[1] These 8 municipalities have near 140.000 inhabitants. The proximity of the metropolitan areas of Valencia (near 1 million inhab.) and Castellón (more than 180.000 inhab.) should be also considered.

[2] Hydraulic regulation and construction of coastal infrastructures (eg the port of Burriana) which have resulted in a dramatic reduction of sediment supply to the coastal system.

[3] Within the coastal zone there are three Nature 200 (SCIs and SPAs) sites covering 20 km of the coastal stretch, including wetlands (1150, 1410, 1420, 2110, 2120, 2210, 3140, 3150, 3420, 6430 and 7210) and seabeds (*1120) and other interesting habitats such as dunes.

[4] Flood hazard maps and the flood risk maps, Ministry of Agriculture, Food and Environment, 2014

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

The estimated budget for the completion of works is about 50 M € and the deadline for its completion five years (60 months), after which only management and maintenance works are foreseen. The estimated useful life of the works projected is 35 years.

5. ACTORS INVOLVED

Main actors involved:

- Directorate General for the Sustainability of the Coast and the Sea, Ministry of Agriculture, Food and Environment, responsible for coastal defence projects and works.
- Directorate-General for Transport and Logistics and Directorate General for Environmental and territorial assessment, Valencian Regional Ministry of Infrastructure, Territory and Environment, in charge of coastal planning.
- Municipalities of Burriana, Nules, Moncofa, Xilxes, La Llosa, Sagunto y Canet d'En Berenguer, in charge of coastal maintenance and as final beneficiaries.

6. MAP WITH LOCATION AND GENERAL FEATURES

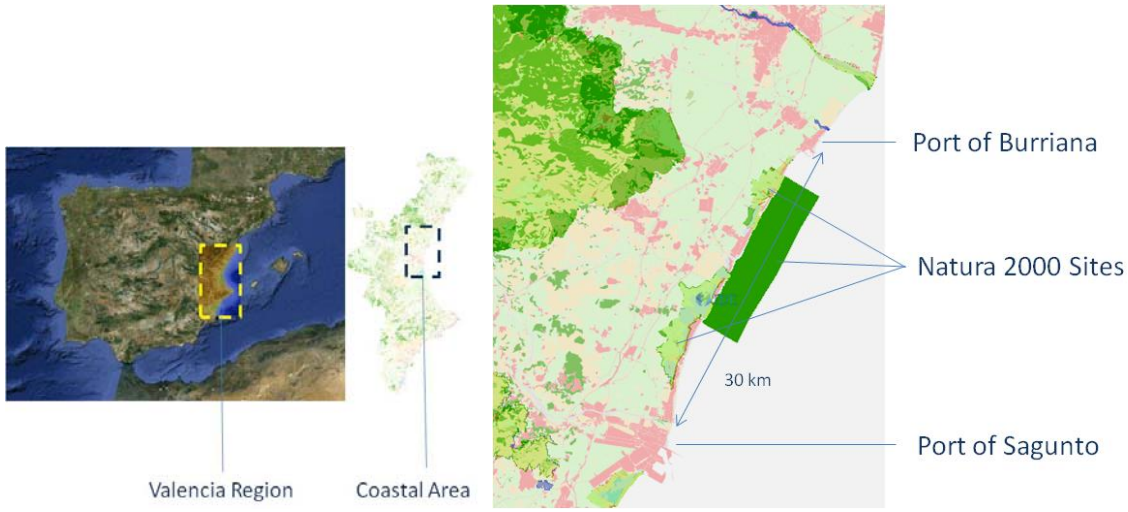


Fig. 1 Location. Sources: Google Maps and Terrasit (Valencian Regional Government)

Fig. 2 Port and southern coast of Burriana: seashore evolution. Source: Coastal Information System (Valencian Regional Government)

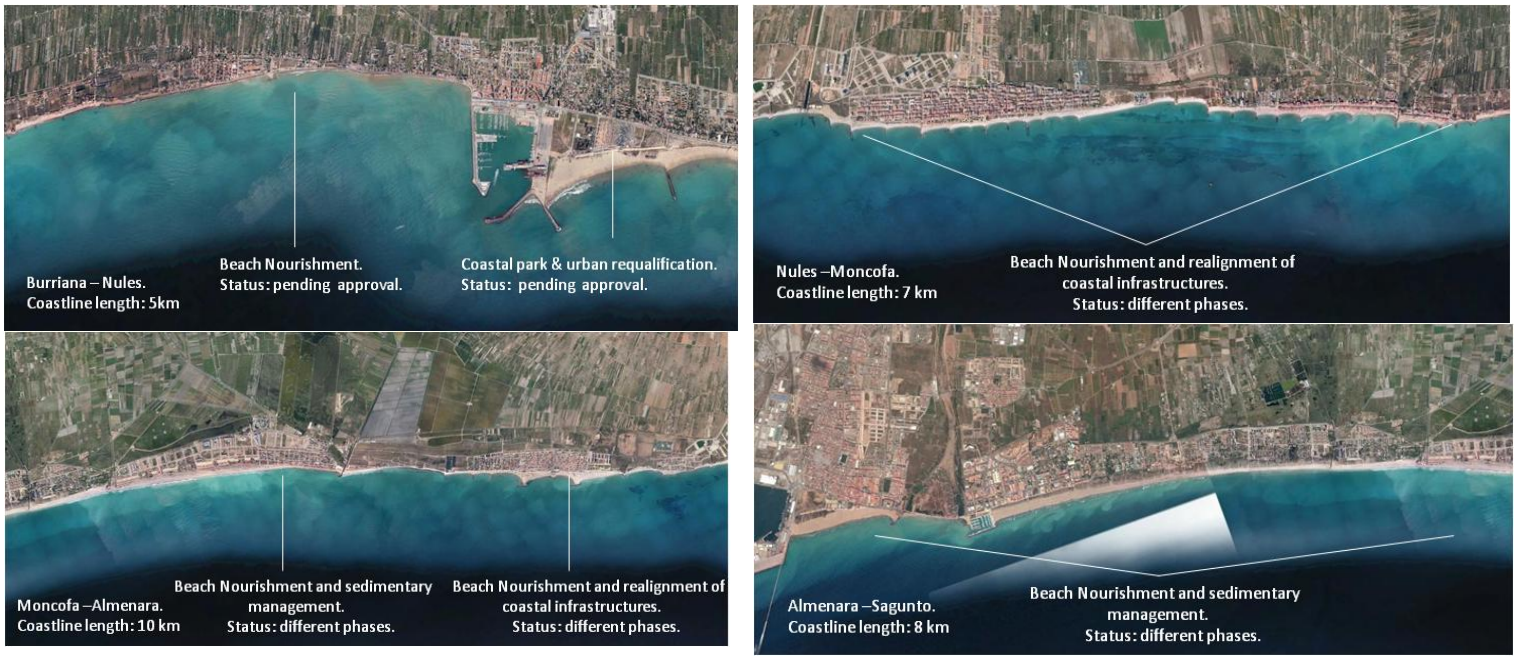


Fig. 3 Project coastal stretches from north (Port of Burriana) to south (Port of Sagunto). Source: Google Earth.

Valencia Region

1. TITLE OF THE PROJECT: Exploitation of deep-waters sand deposits for beach nourishments along the Valencian coast /Spain **(Valencia-02)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The project is framed within the recommendations of the EU projects Eurosion and Conscience, which suggest that Member States investigate the so-called strategic resources to identify potential sources of sand usable for beach nourishment projects at a regional scale and with long-term vision.

As consequence, within the context of the EU project Beachmed the Spanish Ministry of Environment launched the works to locate deepwater sand deposits in the Gulf of Valencia. These works resulted in the location of a potentially exploitable site whose resources would be able to mitigate regional problems of coastal erosion, promote coastal environmental regeneration measures and adaptation to climate change, by minimizing the environmental impact of the works.

The sand deposit has about 90 million m3 of sedimentary resources usable for future beach nourishment in Valencia. The dredging project already has a positive environmental impact declaration[5] and must be supplemented with the approval of specific projects of beach nourishment and coastal restoration.

Given the position and characteristics of the sand deposit it is required by 2020 to have ready a battery of beach nourishment projects which allows economies of scale making viable the exploitation of the deposit. Thus, the project would allow to address major erosion problems in the Mediterranean Spanish coast under a coordinated action.

On the other hand, the implementation of the project would have clear synergies with other Regional initiatives on coastal planning such as the Regional Network of Coastal Parks[6] and the initiatives on rearrangement and requalification of urban waterfronts[7].

Descriptors: beach nourishment, adaptation to climate change, reduction of coastal risks, coastal restoration, requalification of urban waterfronts, environmental regeneration.

[5] See Spanish Official Gazzete (BOE) Num. 237 of 3 October 2013.

[6] See specially articles 21 “Green Infrastructure” and 147 “Coastal Parks” of the Valencian Territorial Strategy (adopted by Regional decree 1/2011 of 13 January).

[7] As an example see General Protocol on Integrated Actions in the North Bay of the Municipality of Alicante (BOE Num. 268 of 5 November 2010). Should be taken into account that almost 60% of the Valencian coastline is urban.

3. LEVEL OF DESIGN OF THE PROJECT

As pointed out the dredging project is drafted and already has a positive environmental impact declaration. Studies assessing strategic options under integrated approaches were previously completed[8].

For its implementation, the action needs to be supplemented by a set of coastal projects. The design of such projects is currently in different phases.

Approval and implementation of other synergic actions such as projects of the Regional Network of Coastal Parks are also in different phases.

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION (if any)

The estimated budget for the completion of works is about 75 M € and the deadline for its completion five years (60 months). The estimated useful life of the works projected is 50 years.

5. ACTORS INVOLVED

Main actors involved:

- Directorate General for the Sustainability of the Coast and the Sea, Ministry of Agriculture, Food and Environment, responsible for coastal defence projects and works.
- Directorate-General for Transport and Logistics and Directorate General for Environmental and territorial assessment, Valencian Regional Ministry of Infrastructure, Territory and Environment, in charge of coastal planning.
- Coastal Municipalities, in charge of coastal maintenance and as final beneficiaries.

[8] See:

"Estrategia para la Sostenibilidad de la Costa", Ministry of Environment, 2008

"Comprehensive study on coastal defense options for the northern coast of Valencian Region (Port of Burriana - Port of Sagunto)", Ministry of Environment, 2011

Works within the "General Protocol between the Ministry of Environment, the Association of Municipalities of La Safor and Generalitat Valenciana for the conservation and restoration of the coast", Polytechnic University of Valencia, 2008

6. MAP WITH LOCATION AND GENERAL FEATURES

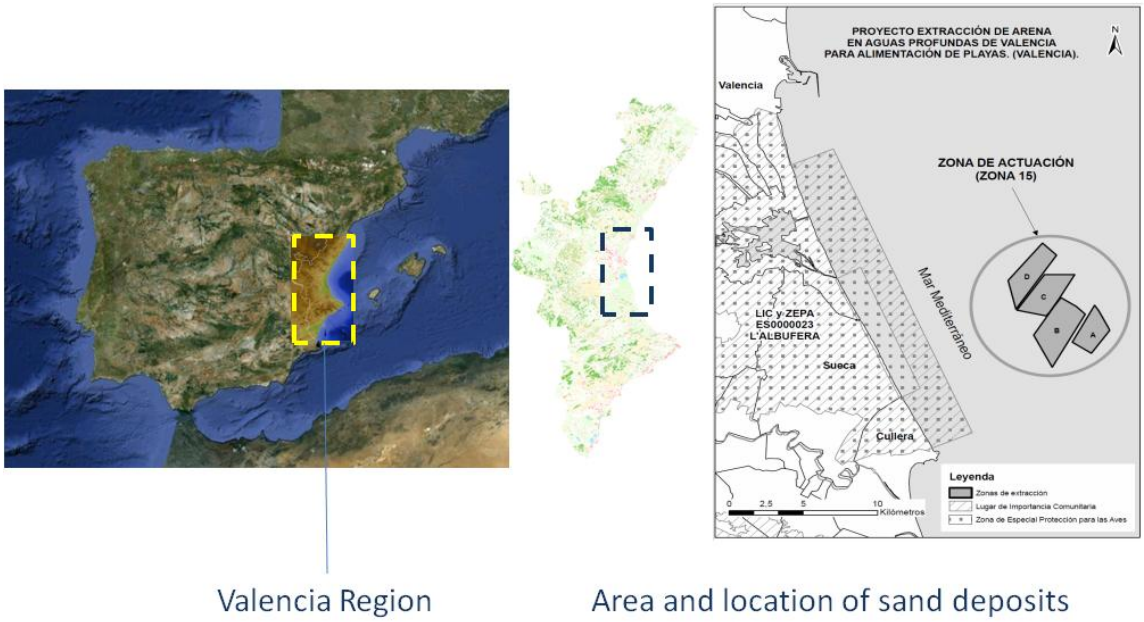


Fig. 1 Location. Sources: Google Maps, Terrasit (Valencian Regional Government) and Project's Environmental Impact Declaration

Ubicación		V aporte arena estimado ($x10^6$ m^3)
Tramo 1	Puerto de San Carles de Rápita. Puerto de Burriana.	6
Tramo 2	Puerto de Burriana. Puerto de Valencia.	10,5
Tramo 3	Puerto de Valencia. Cabo de San Antonio.	12,5
Tramo 4	Cabo de San Antonio. Límite Alicante Murcia.	5
Tramo 5	Límite Alicante –Murcia- Cabo Palos.	5
Total		**39**

Fig. 2 Assessed needs and estimated allocation of sedimentary volumes for coastal defence. Source: Project's Environmental Impact Declaration.

Region of East Macedonia Thrace

1. TITLE OF THE PROJECT

Fanari beach rehabilitation (**REMTH-01**)

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

Fanari beach is a linear dune beach between the Aegean Sea and the Ksirolimni Lagoon. A road crosses the beach and makes it accessible to the public. Along the beach there are beach bars, some non permanent structures and parking lots.

Because of the natural beauty of the beach and the easy access (less than half an hour from Komotini and the Egnatia highway) the beach attracts a great number of tourists and beach activities. However the fragile dune system has been disturbed and rehabilitation works are necessary in order to obtain a sustainable development of the beach front. Furthermore few small coastal works perpendicular to the coastline have disrupted the alongshore sediment transport.

The rehabilitation project can include:

- Dune rehabilitation and planting
- Dune access management
- Rehabilitation of the road and parking lots so as to limit the access of vehicles on the sand and application of ecofriendly materials
- Rehabilitation of the perpendicular existing coastal works and sand rearrangement

3. LEVEL OF DESIGN OF THE PROJECT

- Prelininary study

REMTH wishes to use Fanari as a demonstration site putting in practice the Bologna Charter Best Practices

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- Budget estimation for Prelininary design ~100K€ Necessary time 1 year (mainly for data collection and stakeholders involvement)
- Budget estimation for Final Design ~500K€ Necessary time 2-3 years
- Budget estimation for works 2M€ to 10M€ Necessary time 2-3 years

5. ACTORS INVOLVED

- Central Administration, Cadastral Service, Ministry of Infrastucture and Ministry of Environement
- Regional Directorate of Technical Works, Regional Service of Environmental and Spatial Planning, Regional Service of Water Bodies – Municipality of Komotini (Φορέας Διαχείρισης)
- Private sector – Owners of coastal land, owner of a coastal camping, individuals that rent the coastal infrastructure from the municipality (beach bars, umbrellas etc.)

6. MAP WITH LOCATION AND GENERAL FEATURES

Figure 1: Picture of Fanari beach, approximately 4 Km between the cape of Fanari and the cape of Arogi

Figure 2: Picture of Fanari beach, many activities concentrated on a narrow (approximately 80 -100 m width) and fragile coast

Figure 3: Picture of Fanari beach, relative position-ing of Fanari beach from the city of Komotini and Egnatia highway

Figure 4: Picture of Fanari beach, beach and dune condition in 2014

Israel (MoEP)

1. TITLE OF THE PROJECT: ICZM for the northern Tel-aviv to Hertzeliya coastal zone **(Israel-01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The project area runs about 10 km on Israel's central Mediterranean coast, from the Yarkon River outlet in the northern part of the city of Tel Aviv northward to Apollonia National Park at the northern end of the city of Hertzeliya. This area's rich endowment of man-made features (e.g. power plant, detached breakwaters, sea walls, marina, sewage outlets), combined with its mix of ecological, economic, social, political and cultural interests (e.g. touristic resorts, intensive urban areas, archeological site) exemplify the need for integrated coastal zone management.

The coastal area's primary feature is approximately 9 km of narrow, sandy beaches backed by eroding aeolianite sandstone ("kurkar") cliffs, up to a height of 30 meters. Today, these beaches are probably Israel's most valued leisure area.

Project objectives:

- Establishment of an integrated GIS database for the coastal zone.
- Establish a model for an integrated coastal zone management scheme (bathing, maritime sports activities, marinas, infrastructures etc.)
- Restoration and expansion of eroded beaches, by sand nourishment and up-to-date ecological marine constructions (e.g. submerged detached breakwaters based on "Geotube" solutions, reef balls, etc).
- Stabilization and minimization of coastal cliffs erosion.

Aspects and Limitations

During the last 50 years, large sections of the sandy coast and coastal cliff have been eroded and retreated due to the construction of marine and coastal structures, together with an extreme sea conditions.

An expansion is planned for the coastal power plant, doubling its production capability. This poses a conflict, as the plant is surrounded by a promenade, an urban park and an airport, and stresses the need for the project.

There is a large knowledge gap concerning bathymetry, wind, waves, currents, and sea-level data, static information, sedimentology processes, morphology and topography. The cities of Tel Aviv and Hertzeliya will enjoy the social-economic benefits of increased touristic activity in the restored beaches. The general public will enjoy an improved leisure area.

The river outlet area should be of special interest, because of its unique ecological system.

Up to date, there is no integrated approach to the developments on the one hand and the fragile and sensitive ecological assets on the other, so the risk of quick unsustainable, development is clear and present.

3. LEVEL OF DESIGN OF THE PROJECT

- The power plant expansion project is at a preliminary planning stage.
- An EIA for the Hertzeliya beaches restoration plan is in preparation.
- A submerged Geotube pilot plan is in preparation, on one of the beaches.
- A national master plan for the protection of the coastal cliff is in the process.

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- The project budget is estimated by €30 million.
- The implementation will take place during the next 10 years.

Therefore the forecast of this current project is to take place for about 3 years with an estimation of 1.5 million EU.

5. ACTORS INVOLVED

- National: Israel Ministry of Environmental Protection (regarding environmental aspects), Israel Port Authority (regarding marinas), Israel Ministry of Interior (regarding spatial planning), Israel Nature and Parks Authority (regarding Apollonia National park and ecological systems), Israel Archeological Authority, Israel Ministry of Tourism (regarding resorts).
- Regional: Tel Aviv and Herzliya Municipalities, Yarkon River Authority
- Companies: Israel Electric Corporation

6. MAP WITH LOCATION AND GENERAL FEATURES

Israel (MoEP)

1. TITLE OF THE PROJECT: Eco-Friendly Marine Structures for Coastal Protection Solutions (Israel-02)

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The coastline of Israel as a model to many other coastal stretches in the Med region is a vulnerable interphase, subject to heavy degradation processes, partly human induced and partly nature induced. The latter is a process which is gaining attention as the CC is a powerful engine that is threatening the coastal areas.

The coastal sandstone cliff in Israel (KURKAR) is a unique feature, occupying about 20% of the total length of the Med Israeli coast. A government decision was taken to protect around 14km of these cliffs, with the building of marine based structures that would reduce wave and current energy and lessen the impact on the shoreline cliffs.
Since there are no natural bays or protecting structures in the Israeli territorial Med basin, and on the other hand, these coastal areas are heavily populated including on some cases, on top of the very coastal cliff itself, the only solution seems to be a series of structural works, both marine based and coastal based to reduce the impact of the degradation and erosion of the coastal area.
Sand nourishment has been identified around the world and in this case also, as the most environmentally friendly soft and sustainable solution. However, the scarcity of sand reservoirs is of a crucial nature in the Israeli case, so we are bound to look for more innovative solutions.

The conservative ways include building breakwaters and waterfronts out of rocks, concrete structures of many configurations and textures.

Attempting to support the design of structural works for coastal protection and while adapting to climate change results, this project which is based on eco-friendly marine structures will try to introduce alternatives for the old conservative structures, which may also enhance the endemic species and thus, strengthen the resilience of the local coastal ecosystem.

The regional challenge is therefore to collect a number of coastal works around participating regions in the Mediterranean that would be willing to implement the envisaged structures in a coordinated way. That way, we will be able to create the conditions for the realisation of structural works and management solutions, favouring the collaboration between public (regional as well as national), private and scientific community sectors.
The project:
We will construct a pilot, real scale, breakwater made out of eco-friendly concrete blocks that will substitute the building blocks such as tetrapod's or natural land-originated boulders that by definition are strangers to the natural marine habitats of the eastern Med.
In this project we will strive also to save on the sand resource, and instead, use more efficient, economic, ecological, alternative for the physical protection of the coastline.

One of the important issues which this project is aiming to enhance, is the understanding of a feasible marine structures that would serve their main purpose of protecting the coastline features, but at the same time, may lower significantly the uncertainties of invasive species introduction and perhaps, induce the presence of endemic species, thus creating more meaning to ecological management of the coastal regions of the Mediterranean. Private companies such as SeaArc and Ocean Bricks will take part at this initiative and thus incorporating already experimented building blocks which should serve the purpose of the project.

The project will therefore consist of the following steps:

1. Construction of a 1:1 scale of a "soft" breakwater as a part of an already marked project in a water depth of 15-20m in front of the city of Netanya or Ashqelon
2. Continuous measurements of hydrodynamic characteristics of waves, currents, and other physical parameters which will be set a priori.
3. Continuous measurements of biological assets on the breakwater's building blocks as well as on nearby control areas.
4. A choice of at least two the three alternatives will be tested in situ for the construction blocks, possibly all.
5. An ecological, economic, engeneerical analysis and assessment will be made out of which we could recommend the feasibility of the project for further uses such as to other marine infrastructures.

3. LEVEL OF DESIGN OF THE PROJECT

At the this time we are able to introduced experimental results as well as laboratory test results for both physical and ecological assists of the proposed building blocks.
The challenge is to see how it will hold within harsh eastern Med sea conditions, and see the interaction with its surroundings both in terms of marine ecosystems, protection of the coastal erosion, and the added forecasted value of improvement of a degraded marine ecosystem, while keeping the promise of an economic value which is competitive to any other solution.

The pictures attached below, show clearly that the potential of enhancing marine life with the use of the Eco-Concrete blocks (by Sea Arc), and are present.

The main obstacles of this proposal are financial resources and the lengthy processes in such a project.

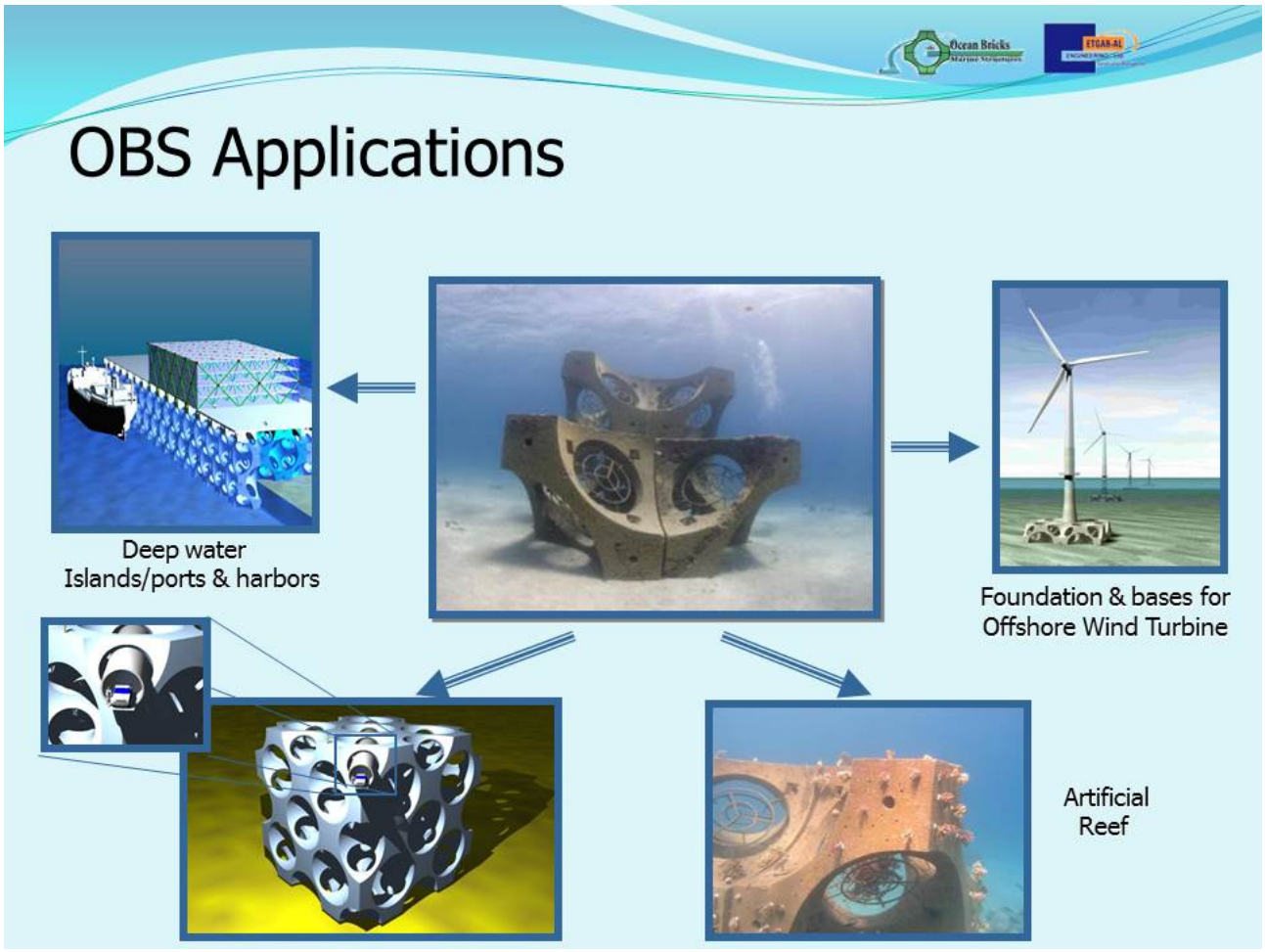
4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

A rough estimation of building 100m of a breakwater, including the surveys needed, monitoring of all parameters is around 10-15 million EU. Schedule of intervention would be around 3-5 years, depending on the willingness of all stakeholders

5. ACTORS INVOLVED

Ministry of Environmental Protection, Israel
Municipality of Netanya/Herzlia
Private companies - Sea Arc , DZ, OBS
Academia – University of Bologna
Research center – CAMERI, Haifa

6.GENERAL FEATURES



Eco-concrete pilot project, Haifa harbor.

JOINT ACTION PLAN

Annex 4

REGIONAL PROJECTS FOR MONITORING INFRASTRUCTURES AND MANAGEMENT OF COASTAL AND MARINE AREAS

Catalunya Region

1. TITLE OF THE PROJECT: The XIOM: a regional coastal observatory for the Catalan coast **(Catalunya-M01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The Catalan coast is located in the north-western Mediterranean at the latitude 40° 45' N to 42° 25' N and long 0° 45'E to 3° 15' E. Some environmental properties of the NW Mediterranean are highly conditioned by the fact that it is a semi-enclosed sea. The coastal wind field is highly heterogeneous with main components from E, NW and S. This will have some implication for the coastal wind waves. Even with the relatively short fetch in the NW Mediterranean, the Catalan coast can be impacted by damaging waves during storms. At the Ebro delta the complex winds develop bimodal spectral wave features. In the central and north coast typical unimodal spectra are found. The most important variations in sea level in the Catalan coast are due to meteorological conditions and in some areas the resonant effect of bays and harbours. Storm surges may be of the order of 1 m, a magnitude much larger than tidal range. This sea level variation has a very important effect on storm risk and coastal flooding and it is a very important factor when modelling coastal dynamics in extreme events. The continental shelf slope dynamics are dominated by a quasi-permanent slope current. The mean current intensity is not very strong (~10 cm/s at 100 m depth) but it presents a seasonal intensification in winter where velocities can reach higher values. The mean current intensity is not very strong (~10 cm/s at 100 m depth) but it presents a seasonal intensification in winter where velocities can reach higher values. Over the shelf, little work has been previously done over long time series. The measurements obtained allowed the identification of the relative influence of winds, Ebro river outflow and open sea dynamics on the shelf dynamics.

The importance of coasts and the need for improving knowledge of their environment through the observation and modelling of processes is evident from human activities and ecosystems that they support. The capability of monitoring and predicting the marine environment leads to a more sustainable development of coastal and offshore regions. In recent years operational oceanography has been considered a necessity given its essential role in solving economic, environmental and social problems

For this reason, our project objetive will be to continue with the coastal observatory activities in the Catalan coast and its contribution to a better understanding of processes that take place in this area. The XIOM network for oceanographic and coastal meteorological measurements (Xarxa d'Instrumentació Oceanogràfica i Meteorològica) will be owned by the Catalan government. wave buoys will collect wave height, periode and direction data at local receiving stations, which will be then validated statistically, and the subsequent results will be displayed on website (www.xiom.cat) . Water level recordings will be based on radar measurements and atmospheric variables recorded with typical meteorological stations. Finally, meteorological buoys with current meters will be deployed, at the same locations as wave buoys to record atmospheric variables and ocean currents at 5 and 15 m depth.

3. LEVEL OF DESIGN OF THE PROJECT

The XIOM first instruments were deployed by the regional harbour authorities and the coastal management department to provide observations to support local studies of beach evolution. In 1984 two scalar wave buoys were deployed at about 50 m depth in front of the most vulnerable regions close to Barcelona: Llobregat delta and Blanes. In 1990 the constant retreat of the coast line at the Ebro Delta (the main deltaic formation in the Mediterranean Spanish coast) stimulated the deployment of two directional wave buoys at 60 m and 8 m depth in the area, and two tide gauge and meteorological stations in neighbouring harbours. Finally, in 1992 a third scalar wave buoy was deployed in the Roses bay. In 1997, some instruments were temporarily retired. They were reinstalled in 1999, and were then regarded as a single network providing homogeneous and real-time data, which was able to give support to wave-climate studies and forecast systems in addition to its former goals. In 2003 the Llobregat buoy was replaced by a

directional one. Correspondingly, governmental involvement was reinforced by the addition of the Catalan Meteorological Service (METEOCAT) to the involved institutions, and regular instrument maintenance was guaranteed. Finally, in the frame of a regional plan for pollution accidents at sea expanded its measurements by adding current and meteorological sampling in the same locations. Its instrument composition has had no relevant changes since then. However, since 2012 all instruments have been temporarily retired.

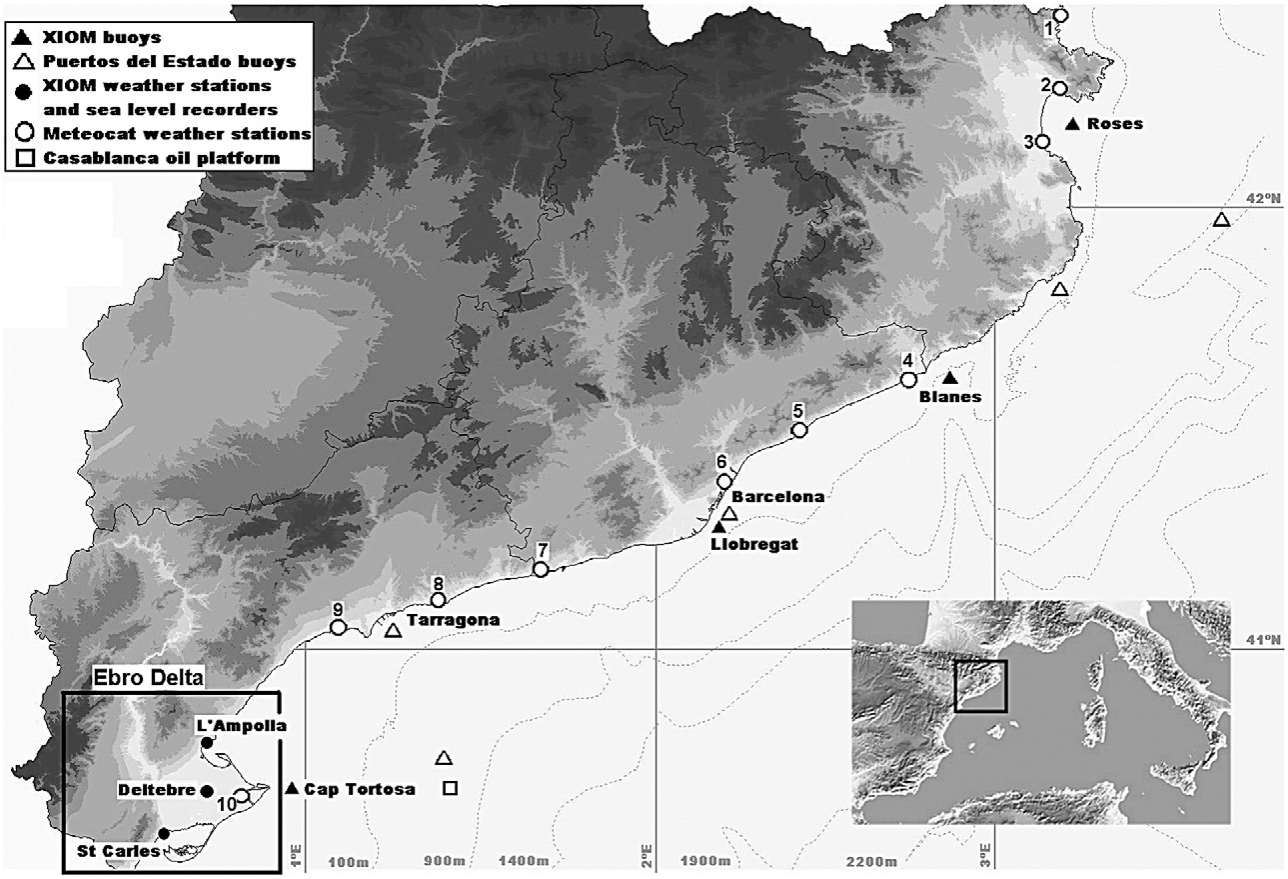
4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

The project budget is estimated by €2,5 million (deployment and maintenance of the network) during the next 10 years. Therefore the forecast of this current project is to take place for about 4 years with an estimation of €1 million.

5. ACTORS INVOLVED

- Central Administration: Barcelona and Tarragona Harbour Administration (APB and APT) regarding big regional harbour
- Regional Administration: Coastal Management Department (Servei de Costes) regarding spatial planning and environmental aspects, Regional Harbour Authorities (Ports de la Generalitat) regarding marinas, Catalan Meteorological Service (Servei Meteorologic de Catalunya) regarding meteorological forecasting.
- Research centers Maritime Engineering Laboratory (LIM/UPC) regarding network manegament and coastal research.

6. MAP WITH LOCATION AND GENERAL FEATURES



Catalunya Region

1. TITLE OF THE PROJECT: Towards a sustainable management and protection of the Tordera delta coast **(Catalunya-M02)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

The Tordera delta is a small cuspate delta located about 50 km northwards of Barcelona (NW Mediterranean). Its about 6 km sandy coastline extends from s'Abanell beach at the north (Blanes) to Malgrat de Mar beach at the south (Malgrat de Mar), with the Tordera river acting as a border between them.

This is a highly dynamic zone currently in retreat due to a combination of natural and human-made factors. Among them, the most important factor has been the decrease of Tordera river sediment supplies due to massive sediment extraction from the river course (in the 60's-70's). This has resulted in a progressive and significant narrowing of beaches in the areas closest to the river mouth (southernmost part of s'Abanell and northernmost part of Malgrat beaches). This is an important coastal tourism area, with the activity being essentially supported by camp sites located in the coastal/fluvial plain just back of existing beaches. The combination of existing infrastructures (e.g. those associated to camp sites, beach promenade) and progressive narrowing beaches has resulted in (i) a significantly increase in coastal damage during the last 2 decades and, (ii) in a depletion of the main resource supporting the economic development of the area (beach surface).

The current situation of the Tordera delta coast can be considered as the integrated result of the action of natural processes, human interventions in the territory and, lack of governance to tackle existing problems. In fact, until now, commitment to pursue a solution that considers the participation of all the social agents involved was low from all administrations involved. The favoured approach has been to solve problems as they appear, i.e. reactive management, which in many cases has (unintentionally) produced an increase in their magnitude and, even worse, make the system to approach to a tipping point.

Within this context, the main goal of the project is to design a sustainable management and protection plan for the Tordera delta coast based on three main cornerstones: (i) restoring the integrated sediment dynamics, (ii) maintaining/enhancing natural values and (iii) promoting a sustainable economic development.

To this end, three phases have been identified:

1) build up of deltaic coast evolution model during the last decades, assessing actual evolution rates and identifying results of past interventions along the coast;
2) identifying conflicts and problems related to interactions and feedbacks between actual coastal dynamics and land-use;
3) proposal of solutions and pre-design of required actuations.

3. LEVEL OF DESIGN OF THE PROJECT

A first assessment on coastal problems in the area has been already done using existing information. In addition to this, a study to propose short-term solutions to remediate/mitigate the present degradation of the system has been launched. This study has been designed to propose measurements compatible with the natural dynamics of the area in such a way that their implementation will not affect/condition any long-term management plan. In addition to this, other parallel studies affecting spatial planning in the area has also been done. Within them, the Water Agency of Catalonia has delimited flood prone areas to implement the EC Directive on Floods. The IGCC has acquired new data (aerial photographs and Lidar) in the area and, additional campaigns are also planned. All these studies and new data will be used to develop the project here proposed.

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

The project budget is estimated by 70,000 € and a total duration of 1 year. The first phase will have a duration of 4 months and a budget of 15,000 € whereas the remaining phases 2 and 3 will have a total duration of 8 months and a corresponding budget of 55,000 €.

This budget does not include the acquisition of large scale topographic (Lidar) data and ortophotos which will be responsibility of the IGCC (Generalitat de Catalunya).

5. ACTORS INVOLVED

- *Catalan Government*: Department of Territory and Sustainability. Spatial planning, environmental aspects and competences on management of the coastal zone.
- *Spanish Government*: Ministry of Agriculture, Food and Environment (General Directorate of Marine and Coastal Sustainability). Competences on management and protection of the public coastal domain.
- *Regional Administration*: Water Agency of Catalonia. River basin management.
- *Local Administrations*: Municipalities of Blanes and Malgrat de Mar. Partial responsibilities on beach management issues, urban plans and liason with local stakeholders.
- *Local (economic) stakeholders*: Camp sites representatives. Main local economic actors. Providing data, requirements and constraints for economic activity development.
- *Technology Center (Regional Administration)*: Institut Cartogràfic i Geològic de Catalunya (ICGC). Competences on geodesy, cartography and spatial data infrastructure in Catalonia. Provider of digital cartography (orthophotos) and Lidar data of the study area.
- *Research Center*: Laboratori d'Enginyeria Marítima, Universitat Politècnica de Catalunya·BarcelonaTech (LIM/UPC). Coastal research. Analysis of conflicts and problems in the study area and proposal of solutions.

6. MAP WITH LOCATION AND GENERAL FEATURES

Puglia Region

1. TITLE OF THE PROJECT: Common Implementation of tools for the enhancement of integration among Integrated Coastal Zone Management, Marine Spatial Planning and Marine Strategy Framework Directive in the Puglia Region **(Puglia-M01)**

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

A coherent application of Maritime Spatial Planning (MSP; 2014/89/UE) and Integrated Coastal Zone Management (ICZM) will improve interaction between land and sea based activities supporting an integrated approach. This is not only integration of sectorial interests, but also integration at different governance levels and integration at EU policy level, such as Marine Strategy Framework Directive (MSFD), relevant for marine and coastal areas. Because many of these policy instruments are relatively stand-alone, they miss an overall consistency at a time when social issues and development are becoming more coherent. For a fully integrated management process to work it is vital that EU policies and other instruments (e.g. economic mechanisms) which also drive coastal change are addressed coherently.

In order to address these issues this project aims to support, for the Puglia Region, the capacity building for Integrated Coastal (Zone) Management (ICZM) and Marine Spatial Planning (MSP) in relation to the Marine Strategy Framework Directive and specifically the development of new ICZM measures focused on achieving Good Environmental Status (GES).

The projects is based on different and coordinated actions in the Puglia Region and foresee the contribution of different local actors (Public administration, Environmental Protection Agency, Universities and Research Centers).

The proposed action are:

- collection of all relevant data and information on many topics, as the geo-morphological features of the marine coastal area, the coastal and marine climate features, the oceanographic features, the marine-coastal biological communities, the terrestrial habitats, flora and fauna species, the environmental protection system, the land and sea uses and the restriction system (landscape, urban, hydrological, etc.)
- application of DPSIR model linking quality element of WFD, qualitative descriptors of MSFD to the natural/human pressure at local level (national or cross-border contest) in order to give a global picture of the effect of pressures on marine ecosystems. Analysis of multiple stressors operating in the entire Puglia Region coastal area characterized by different pressures and management regimes (protected zones, touristic, urbanized and industrial ones) in order to identify the best strategy for risk prevention.
- implementation of the Article 8 of the ICZM Protocol in the Puglia Region: individuation of the set-back zone;
- Creation of an integrated GIS database for the Apulian Coastal and Marine Area based on the INSPIRE Directive. The database will support European initiative such as EDMODNET (European Marine Observation and Data Network);
- Implementation of a model for the ICZM and MSP for the Puglia Region.
- 3D hydrodynamic modelling of Apulian coastal waters, including model of sediment transportation (CMCC).

Aspects and Limitations

The Puglia coastal zone is an area of intense activity; the most important are the urbanization and the tourism (bathing), although the industrialization of some specific areas can also affect the quality of the marine-coastal environment.

The apulian marine-coastal ecosystems are and have been investigated by different technical-scientific local Institutions. The most important are the Universities of Bari and Lecce, the Polytechnic University of Bari, the C.N.R. Institutes of Lesina (ISMAR) and Taranto (IAMC), the Puglia River Basin Authority, the Regional Agency for the Environmental Prevention and Protection (ARPA Puglia) and the CMCC (Centro Euro-Mediterraneo sui Cambiamenti Climatici). All the mentioned Institution have data and information on the specific topics related to the marine-coastal environment. Particularly, the Polytechnic University of Bari (LIC Laboratory) contributed, as technical-scientific support, to the drafting of the Regional Coast Plan (PRC), while ARPA Puglia is in charge of the surface waters monitoring according to the 2000/60/EC Directive (including the marine-coastal and the waters at specific use as the bathing ones and for mussel-culture purposes).

The SHAPE Project of the apulian coastal zone is regulated by actors at different levels (region, municipality) through many Regional Acts, including Laws and Plans for the management of the human activities. Unfortunately, in the current situation the Puglia government system does not provide for the coordination of the integrated management of all the activities that take place on the coastal zone. The fragmentation of both information/data systems and governance levels, is probably the main limitation for a coherent and integrated coastal zone management.

3. LEVEL OF DESIGN OF THE PROJECT

The nut of the project was planned capitalizing the achievements and results of SHAPE project (http://www.shape-ipaproject.eu/), with explicit references to the action 3.2 (“Testing some provisions of the ICZM Protocol through local/regional demonstration projects”) and 4.a (“Pilot Project on ICZM-MSP integration), both applied to the pilot area of Torre Guaceto and neighbouring costal area of Brindisi (example figure 1 and 2).

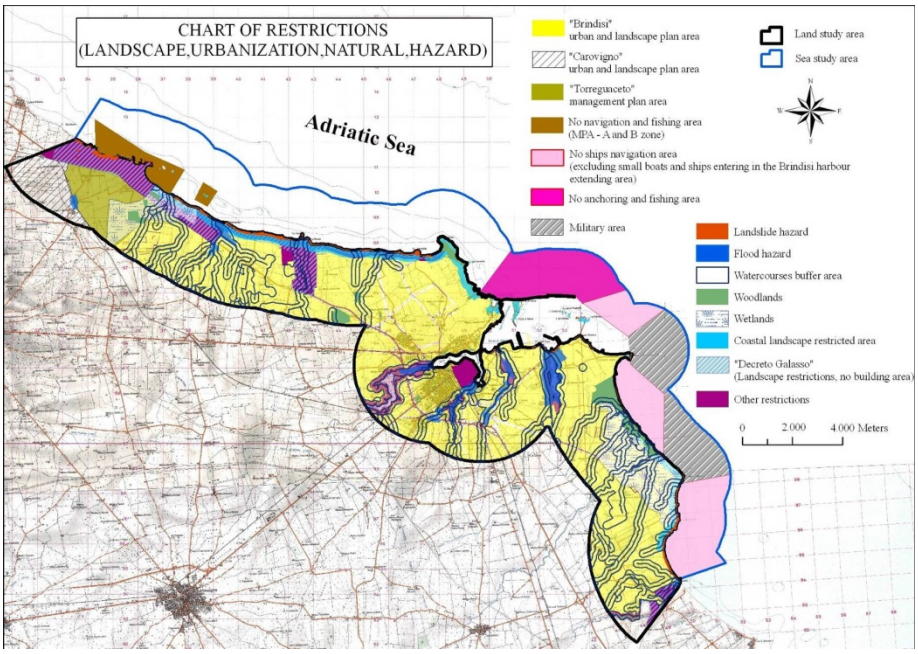


Figure 5 Distribution and delimitation of zones subjected to restrictions in the study area (SHAPE Project - ARPA Puglia)

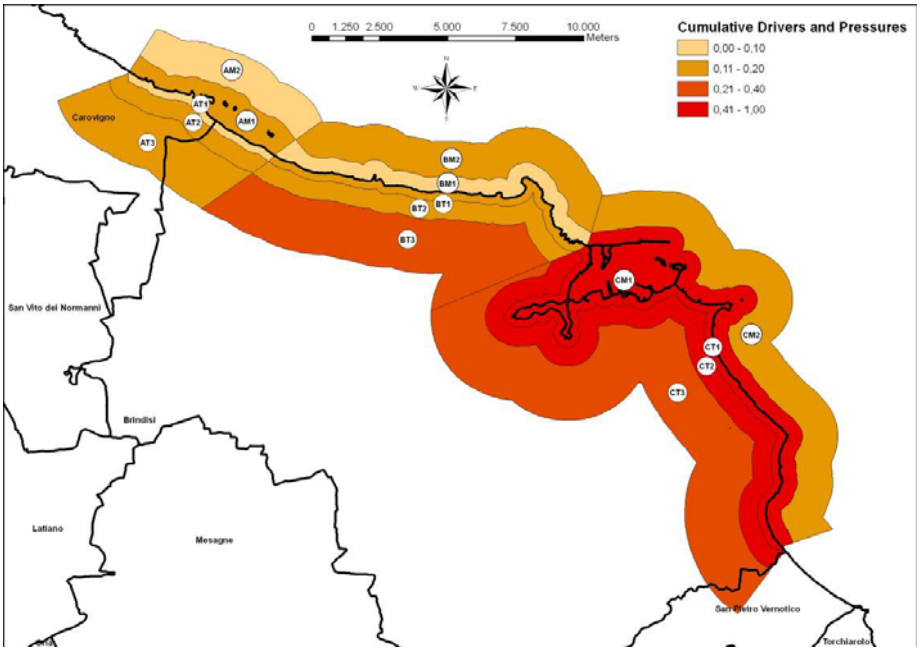


Figure 6 Map of the Driver-Pressure cumulative values in the 15 sectors of the study area (SHAPE Project – ARPA Puglia)

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

Project budget: to be estimated

The implementation is scheduled by 2015-2016

5. ACTORS INVOLVED

- Puglia Region
- Environmental Protection Agency of Puglia Region
- Basin Authority of Puglia Region
- Centro Euro-Mediterraneo sui Cambiamenti Climatici
- Universities and research centers

6. MAP WITH LOCATION AND GENERAL FEATURES

The project area is located along the Puglia Region coast line (Figure 3).

Figure 7 The project area is located along the Puglia Region coastline (~ 900 km)

Region of East Macedonia Thrace

1. TITLE OF THE PROJECT: REMTH Coastal Management Master Plan (**REMTH-M01**)

2. BRIEF DESCRIPTION OF THE TYPOLOGY OF THE PROJECT

REMTH disposes of approximately 450 km of coastline without any significant hard defences nor beach nourishment projects, till recently.

Locally severe erosion problems have occurred, EUROSION, COASTANCE and MAREMED projects have studied the phenomena but there are no detailed data for the entire coastline.

The Regional Direction of Technical Works of REMTH is responsible for the proposition, construction and management of coastal defence works including beach nourishment projects. Municipalities are also responsible for coastal protection. The Port Authorities are responsible for coastal defence works related to ports.

In the last years, because of severe erosion problems and pressure for the touristic development of the coastline, municipalities and other local authorities have proceeded in the design and construction of few coastal works with local impact (nearshore breakwaters in Kavala, seawall in Alexandroupoli etc.).

REMTH wishes to develop a regional Coastal Management Master Plan so as to better coordinate the local authorities and plan and manage coastal works in regional level so as to limit the erosion phenomena but also make the best of the available resources.

REMTH plans to create a digital database on the state of erosion of the coastline (an adaptation of SICELL) based on:

- existing survey data
- the acquisition and elaboration of satellite photos from multiple dates
- inventory of existing coastal works (build of planned to be build)

in order to be able to better plan future littoral management and also take preventive measures through planning procedures (urban and spatial planning, major infrastructure etc.)
This database will allow the identification of areas with the most important erosion rate.

The next step of the MasterPlan will be to implement the COFLERMAP methodology to selected critical areas, so as to produce Hazard and Risk Maps and prioritize the areas that need coastal works or the areas where future development should be limited because of high coastal flood hazard.

The MasterPlan will be completed by the proposition of a long term coastal Monitoring scheme.

3. LEVEL OF DESIGN OF THE PROJECT

- Regional Coastal Protection MasterPlan

REMTH wishes to use the MasterPlan in order to use at operational level the Bologna Charter Best Practices

4. BUDGET AMOUNT ESTIMATION & SCHEDULE of INTERVENTION

- Budget estimation for the MasterPlan 500K€ to 1M€
- Necessary time 3 year

5. ACTORS INVOLVED

- Central Administration, Cadastral Service, Ministry of Infrastucture and Ministry of Environement
- Regional Directorate of Technical Works, Regional Service of Environmental and Spatial Planning, Regional Service of Water Bodies – All Coastal Municipalities – Management Bodies of the protected coastal areas – Port Authorities of Kavala and Alexandroupoli – Democritus University of Thrace
- Private sector – Owners of coastal land, professional of tourism (hotels, bars, restaurants, cafes)

6. MAP WITH LOCATION AND GENERAL FEATURES

Figure 8: Picture of REMTH coastline from the Strimonas River Delta, on the west to Evros River Delta on the east.