MAREMED

"MAritime REgions cooperation for MEDiterranean"

Marseille, June 23rd 2010

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CMGIZC

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REGIONE LAZIO

THEMES FACED IN MAREMED

Pollution

Fisheries

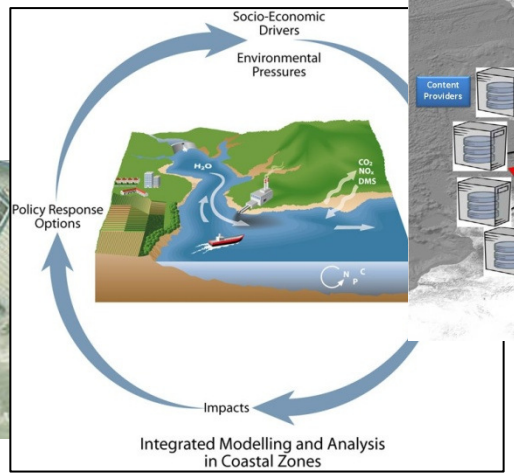
Adaptation to Climate Change

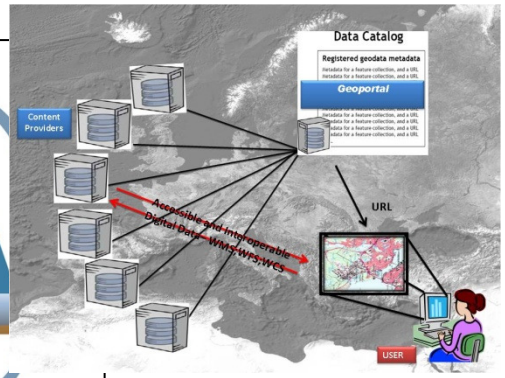
Integrated Coastal Zone Management

Data Management

Theme coordinated by Lazio Region in MAREMED

Objective: to support the implementation of concerted measures of survey and adaptation to the climate change effects in the coastal regions





Adaptation of coastal area to climate change

….the vulnerability of marine and nearshore waters and of many coasts is very dependent on local factors *(IPCC Fourth Assessment Report: Climate Change 2007 (AR4))*

coastal area with:
- **Low-lying coastline**
- **High population densities**
- **Small tidal ranges**

….will be most vulnerable to sea-level rise

the knowledge of coastal territory at regional and local scale is essential for the management of the impacts of climate changes to coastal territories

On Mediterranean some examples of coastal risks management at regional scale are already started…

Adaptation of coastal area to climate change

Towards a European framework for action

European Projects experiences on adaptation measures

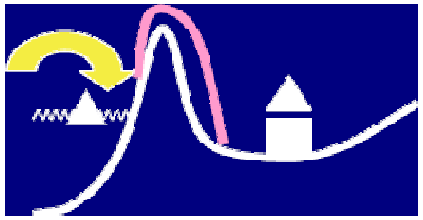
COMRISK

safecoast

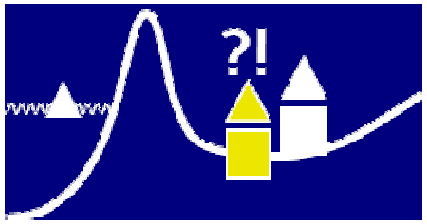
Generally, adaptation to climate change refers to policies, practices and measures which can moderate damage or realize opportunities associated with climate change. Throughout the different papers, policies, interviews etc.

six main adaptation were identified

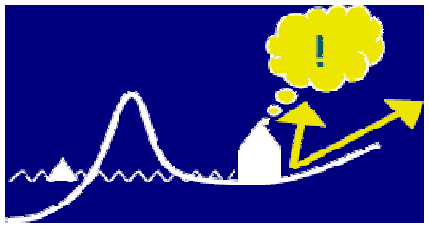
Short term (0 50 years)



Strengthening defences
(dike reinforcements, nourishments etc)

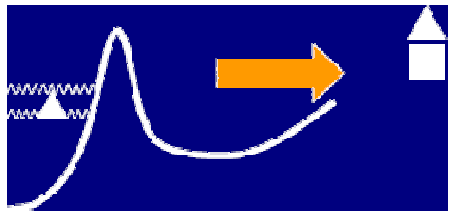


Spatial planning
(minimize risks, reserve space for future adaptation measures)

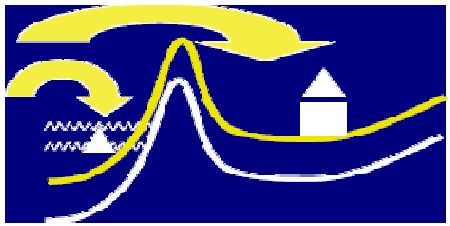


Increasing risk awareness & being prepared
(support for proposed adaptation measures, (early warning, evacuation plans, etc)

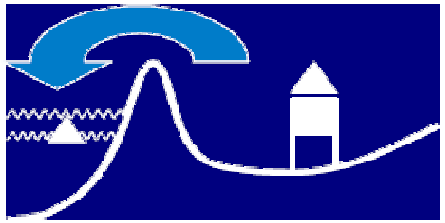
Long term (50 200 years)



(Managed) retreat



Strengthening and/or moving seaward
(sand, super dikes, planning, widening coastal defences, artificial reefs and islands)



Stay put, increase capacity existing measures
(more pumping & adjusting, flood proofing)

Adaptation of coastal area to climate change

Emphasize the results of cross-border projects…

BEACHMED (2001-2004) – "*Environmental recovery and management of littorals with exploitation of marine sand deposits*"

BEACHMED-e (2005-2008) – "*Strategic management of beach protection for sustainable development of Mediterranean coastal zones*"

MICORE (2006-2009) – "*Morphological Impacts and coastal risks induced by extreme storm events*"

COASTANCE (2009-2012) – "*Regional action strategies for coastal zone adaptation to climate change*"

Adaptation of coastal area to climate change

Emphasize the results of cross-border projects…

BEACHMED-e

MAREMED

The philosophy of Bologna Carta…

Start up of a **European Grouping for Territorial Cooperation (EGTC)** among the partners (Directive 1082/2006).

Technical feasibility study was already identified and the impact proven by the **sub-project OBSEMEDI** (RFO Beachmed-e – INTERREGIIIC-South – 2004/07).

The political will for such a Mediterranean structure was already stated in the **BOLOGNA CARTA** (April 2007- www.beachmed.eu)

Adaptation of coastal area to climate change

Emphasize the results of cross-border projects…

BEACHMED-e

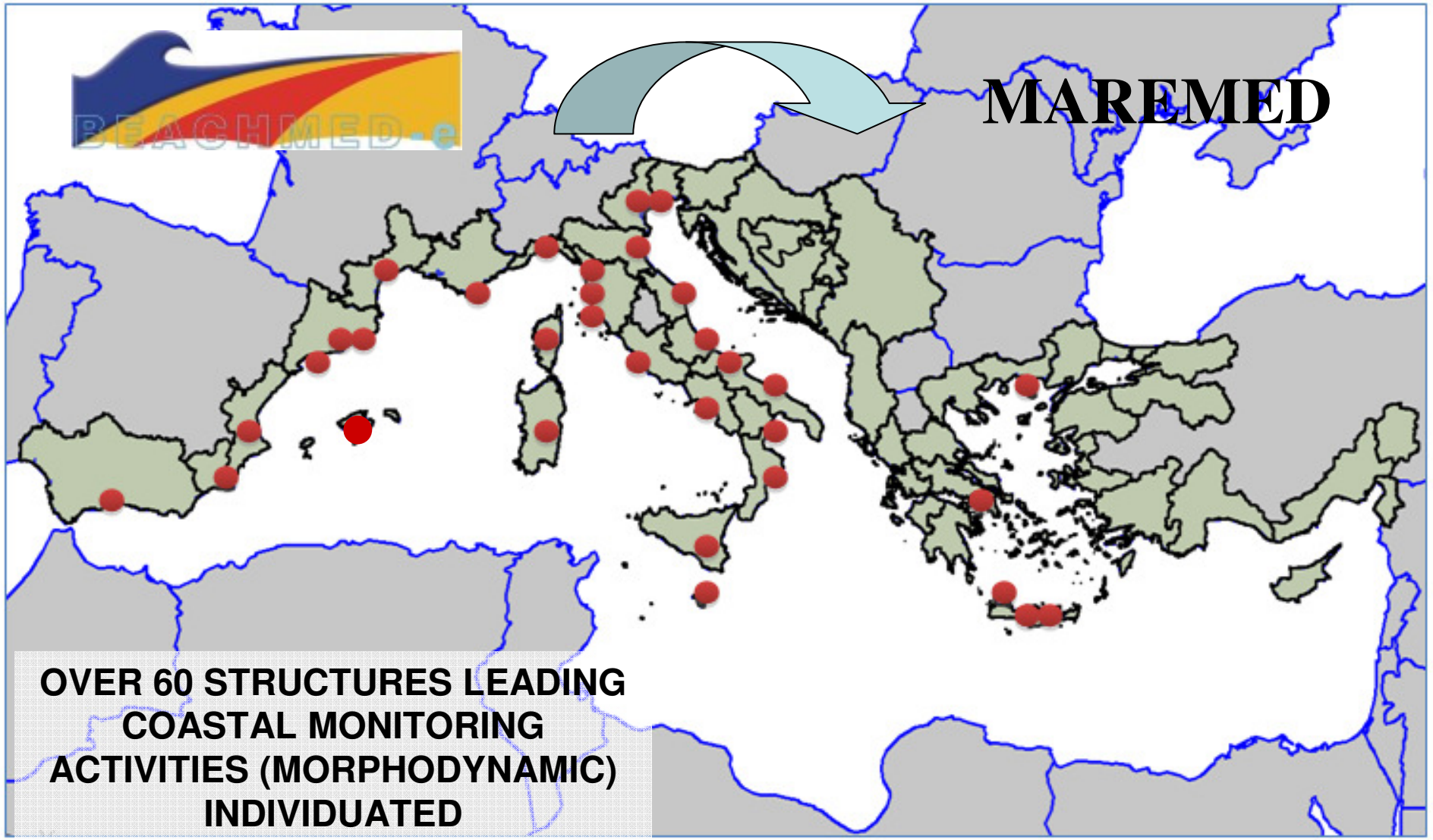
MAREMED

The philosophy of Bologna Carta…

MAREMED OUTPUT: UPDATING OF THE BOLOGNA CHARTER

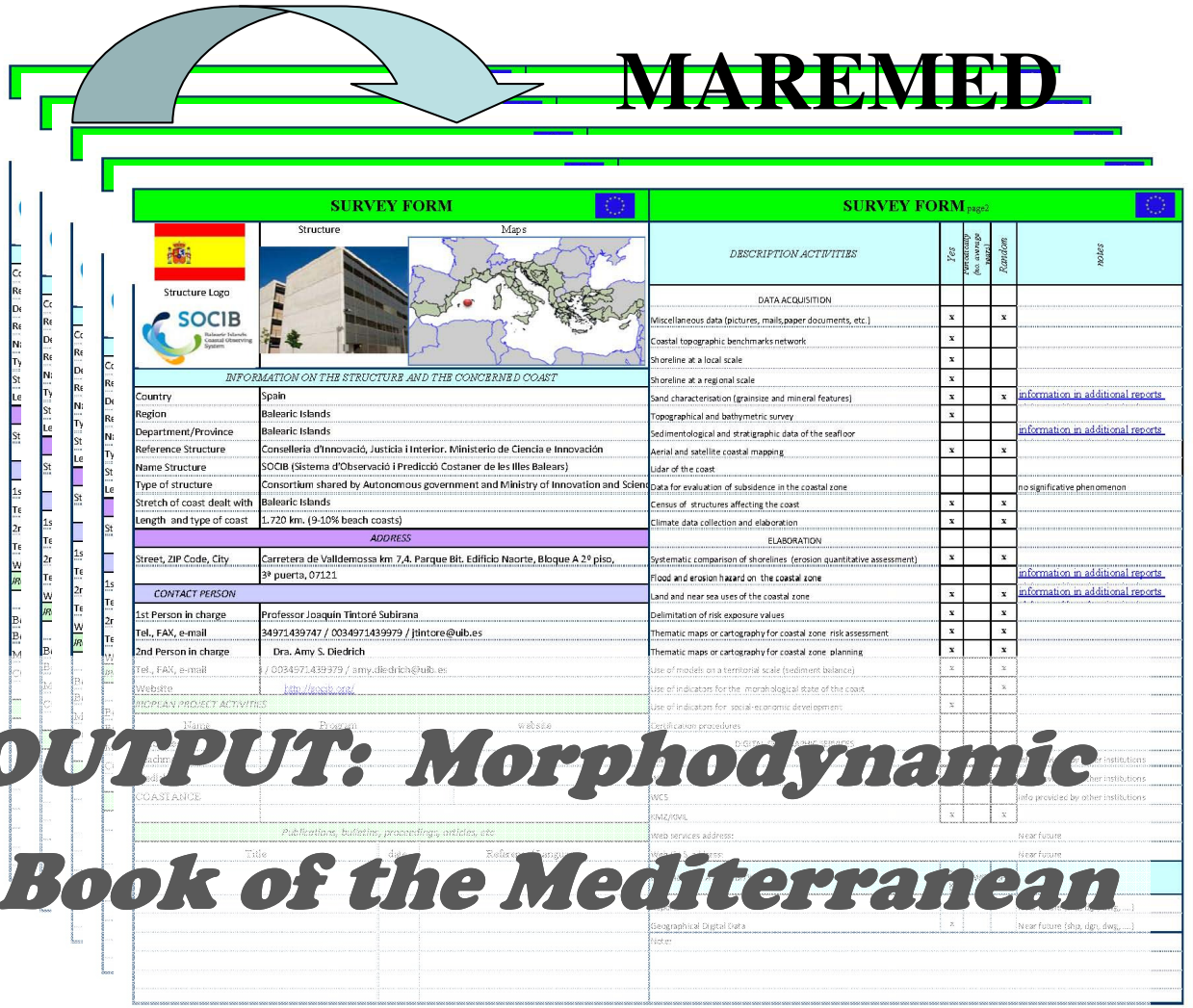
Adaptation of coastal area to climate change

Emphasize the results of cross-border projects…



Adaptation of coastal area to climate change

Emphasize the results of cross-border projects…



MAREMED OUTPUT: Morphodynamic Observatories Book of the Mediterranean Coast

Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

$R = H \cdot E \cdot v$

R → Coastal Risk
H → Hazard
E → Exposed values
v → vulnerability

Deterministic way

Empiric way

medplan

BEACHMED-e

COASTANCE

REGIONE LAZIO

medplan

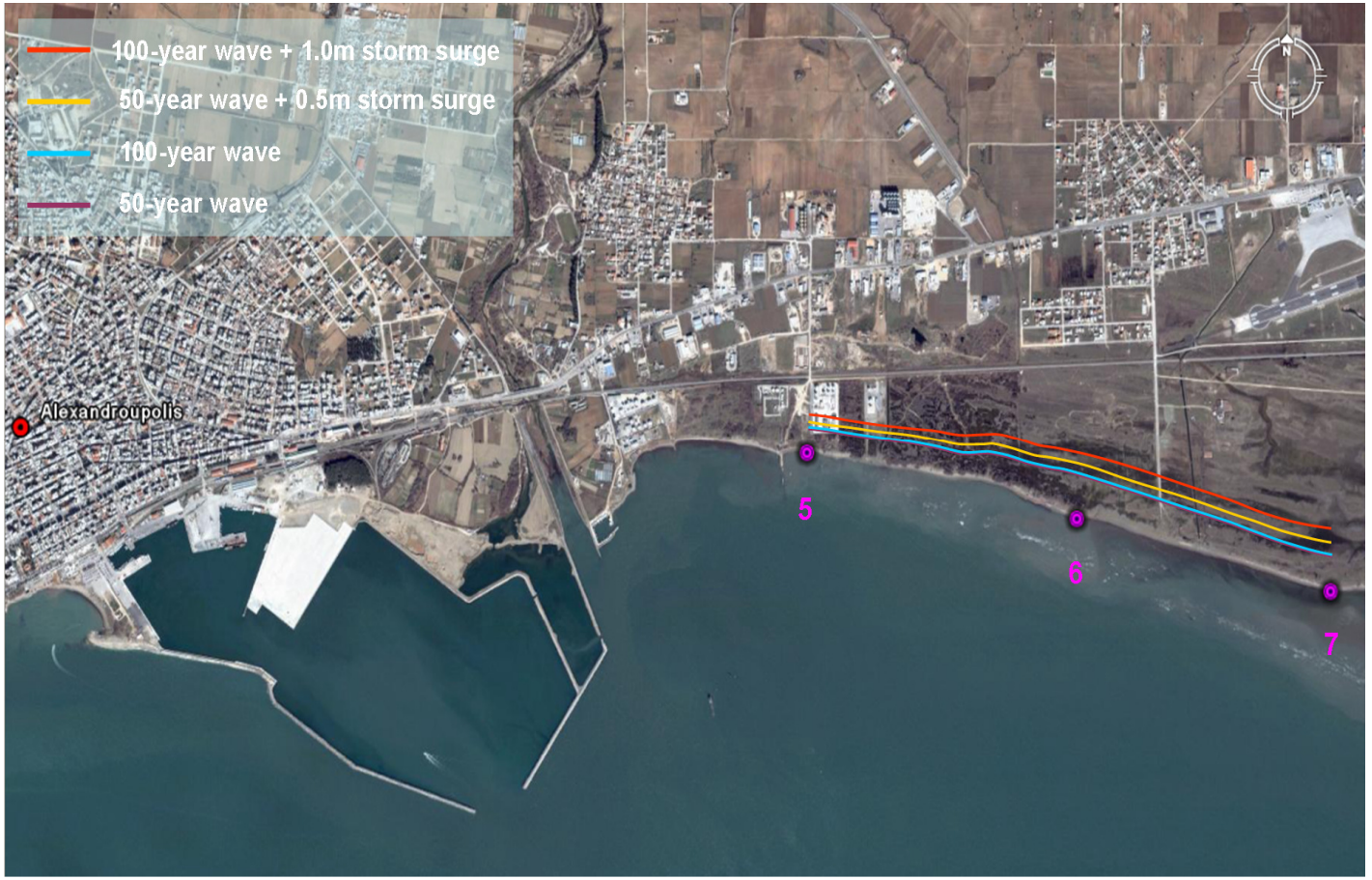
BEACHMED-e

eurosion

Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

medplan BEACHMED-e → **MAREMED**



Deterministic way

Metodi di previsione degli eventi meteomarini estremi
Studi e applicazioni nelle coste di Est Macedonia/Tracia
Limiti d'inondazione
Evento cinquantennale e secolare, in assenza e in presenza di tempesta (est del porto di Alexandroupoli)

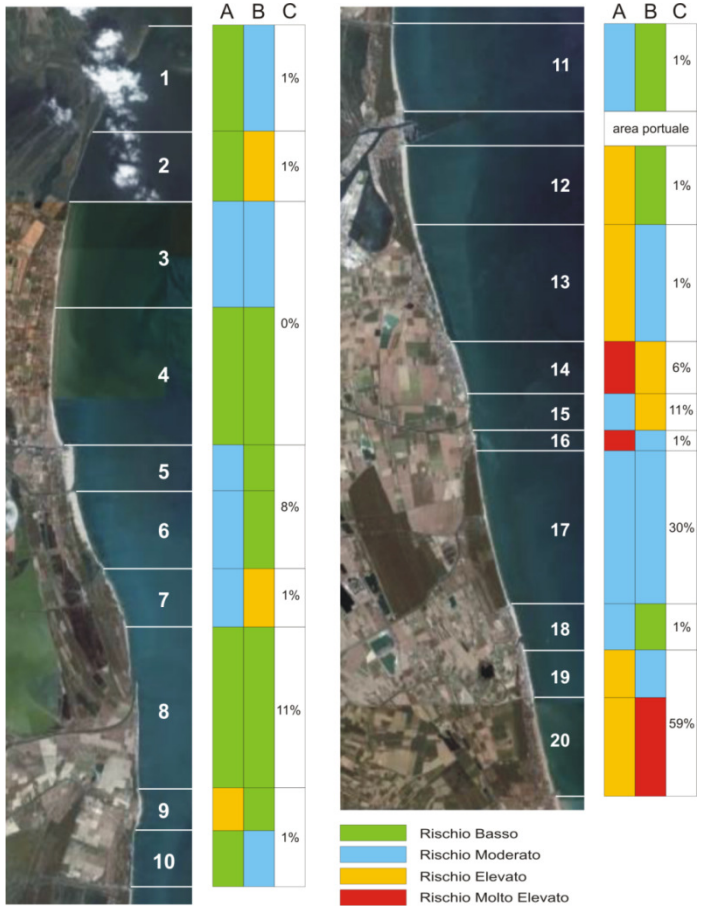
Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

medplan

BEACHMED-e

MAREMED



Empiric way

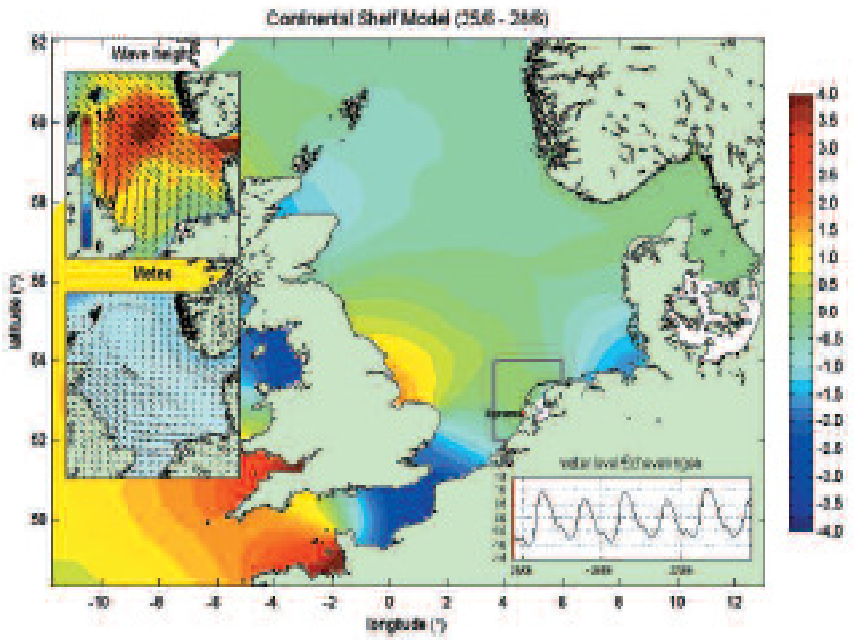
L'analisi del rischio
Confronto di metodi
Studi e applicazioni nelle coste dell'Emilia Romagna

Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

micore → MAREMED

Methods and analysis for the evaluation and prediction of extreme events (rising hazard)

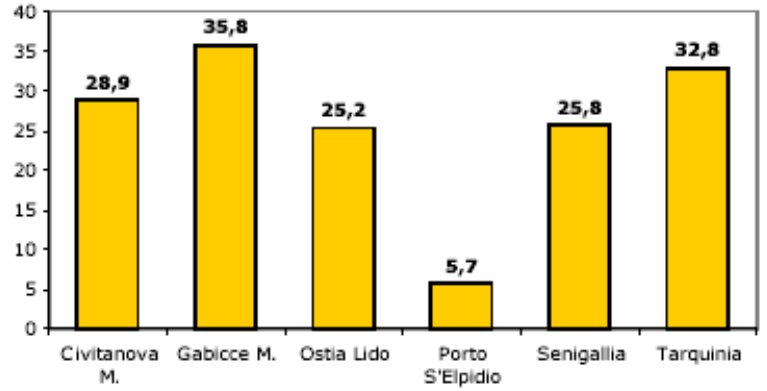


Adaptation of coastal area to climate change

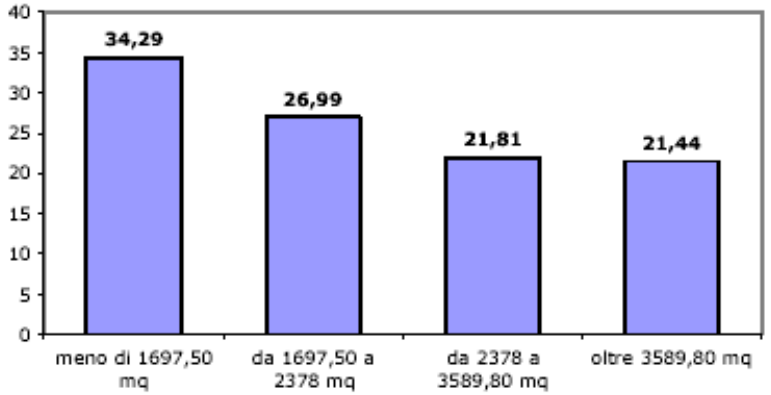
Atlas and databases on coastal risks…

MAREMED

Economical Models for the economic evaluation of exposed values



Valore del fatturato di spiaggia per mq di superficie demaniale totale: anno 2003 (euro)



Valore del fatturato di spiaggia per mq di superficie demaniale totale, per classe di superficie: anno 2003 (euro)

Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

VNK2
HIS-SSM model
(Netherlands Safety MAP)

MAREMED

Economical Models for the economic evaluation of exposed values

To determine the actual risk of flooding in the **Netherlands, the Ministry of Transport, Public Works and Water management** initiated a project to outline 'the safety' of The Netherlands. The first phase of the project (VNK1) started in 2001 and finished in 2005 (Ministerie van Verkeer en Waterstaat, 2005).
For the second phase (**VNK2**) results are expected in 2013. In the project the probability and impacts of flooding, as well as risk of flooding of, so called, dike rings in the Netherlands are documented. In this project, the potential impact on society
is being mapped using the HIS-SSM model.

Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

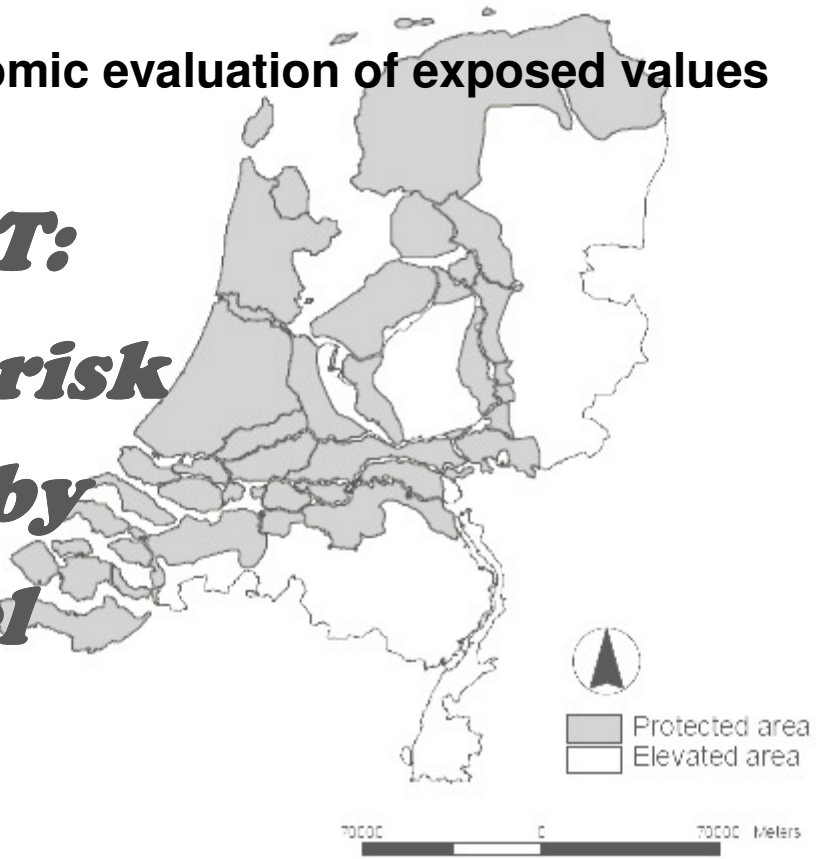
VNK2
HIS-SSM model
(Netherlands Safety MAP)

→ **MAREMED**

Economical Models for the economic evaluation of exposed values

MAREMED OUTPUT:

Guide line s for flood risk damage assessment (by HIS-SSM Dutch model adapted to Med area)



Adaptation of coastal area to climate change

Atlas and databases on coastal risks…

COASTANCE → **MAREMED**

Understand the evolution of coastal submersion and sea level based on Best Practices

State of art

DIRECTIVE 2007/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 23 October 2007

on the assessment and management of flood risks

(Text with EEA relevance)

PRELIMINARY FLOOD RISK ASSESSMENT

Article 4

…4. Member States shall complete the preliminary flood risk assessment by **22 December 2011**.

FLOOD HAZARD MAPS AND FLOOD RISK MAPS

Article 6

…8. Member States shall ensure that the flood hazard maps and flood risk maps are completed by **22 December 2013.**

FLOOD RISK MANAGEMENT PLANS

Article 7

…5. Member States shall ensure that flood risk management plans are completed and published by **22 December 2015**.

State of art

DIRECTIVE 2007/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 23 October 2007

on the assessment and management of flood risks

(Text with EEA relevance)

FLOOD HAZARD MAPS AND FLOOD RISK MAPS

Art.6

….3. Flood hazard maps shall cover the geographical areas which could be flooded according to the following scenarios:

(a) floods with a low probability, or extreme event scenarios;

(b) floods with a medium probability (likely return period ≥ 100 years);

(c) floods with a high probability, where appropriate

….4. For each scenario referred to in paragraph 3 the following elements shall be shown:

(a) the flood extent;

(b) water depths or water level, as appropriate;

(c) where appropriate, the flow velocity or the relevant water flow

…5. Flood risk maps shall show the potential adverse consequences associated with flood scenarios referred to in paragraph 3 and expressed in terms of the following:
(a) the indicative number of inhabitants potentially affected;
(b) type of economic activity of the area potentially affected;
(c) installations as referred to in Annex I to Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control (1) which might cause accidental pollution in case of flooding and potentially affected protected areas identified in Annex IV(1)(i), (iii) and (v) to Directive 2000/60/EC;
(d) other information which the Member State considers useful such as the indication of areas where floods with a high content of transported sediments and debris floods can occur and information on other significant sources of pollution.

…6. Member States may decide that, for coastal areas where an adequate level of protection is in place, the preparation of flood hazard maps shall be limited to the scenario referred to in paragraph 3(a).

…8. Member States shall ensure that the flood hazard maps and flood risk maps are completed by 22 December 2013.

State of art

DIRECTIVE 2007/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

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on the assessment and management of flood risks

(Text with EEA relevance)

http://ec.europa.eu/environment/water/flood_risk/timetable.htm

The Floods Directive Scoreboard

Country	Notification transposition (Art. 17, deadline 26.11.2009)	Competent authorities /Units of management (Art. 3, deadline notification 26.5.2010)*	Preliminary Flood Risk Assessment (Art. 4&5, deadline reporting 22.3.2012)	Flood Hazard & Flood Risk Maps (Art. 6, deadline reporting 22.3.2014)	Flood Risk Management Plans (Art 7, deadline reporting 22.3.2016)
Cyprus	☹				
France	☹				
Greece	☹				
Italy	☺				
Spain	☹				

State of art

Submersion and global sea level observing system

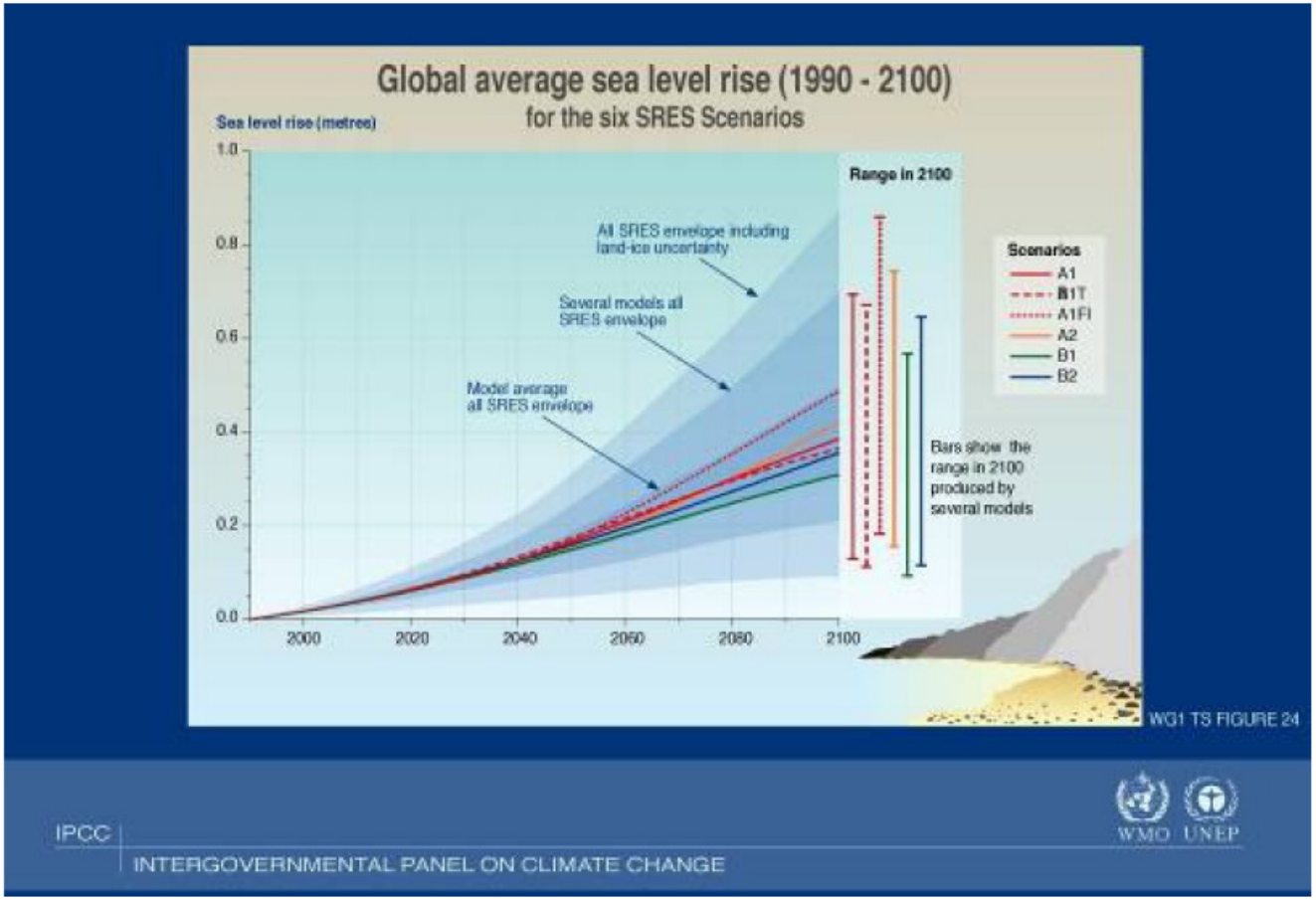
niveau des océans 2100

GIEC 2007= +20 à +60 cm avant

(ONERC 2010 : +1 m extrême)

Évolution des pics de niveau marin :

- Évolution des surcotes (circulation atmosphérique, tempêtes)
- Lente hausse du niveau marin moyen (effet stérique)



Scénario A2 :

Min. : + 1.5 mm/an*

Moy. : + 4 mm/an**

Max. : + 7.5 mm/an***

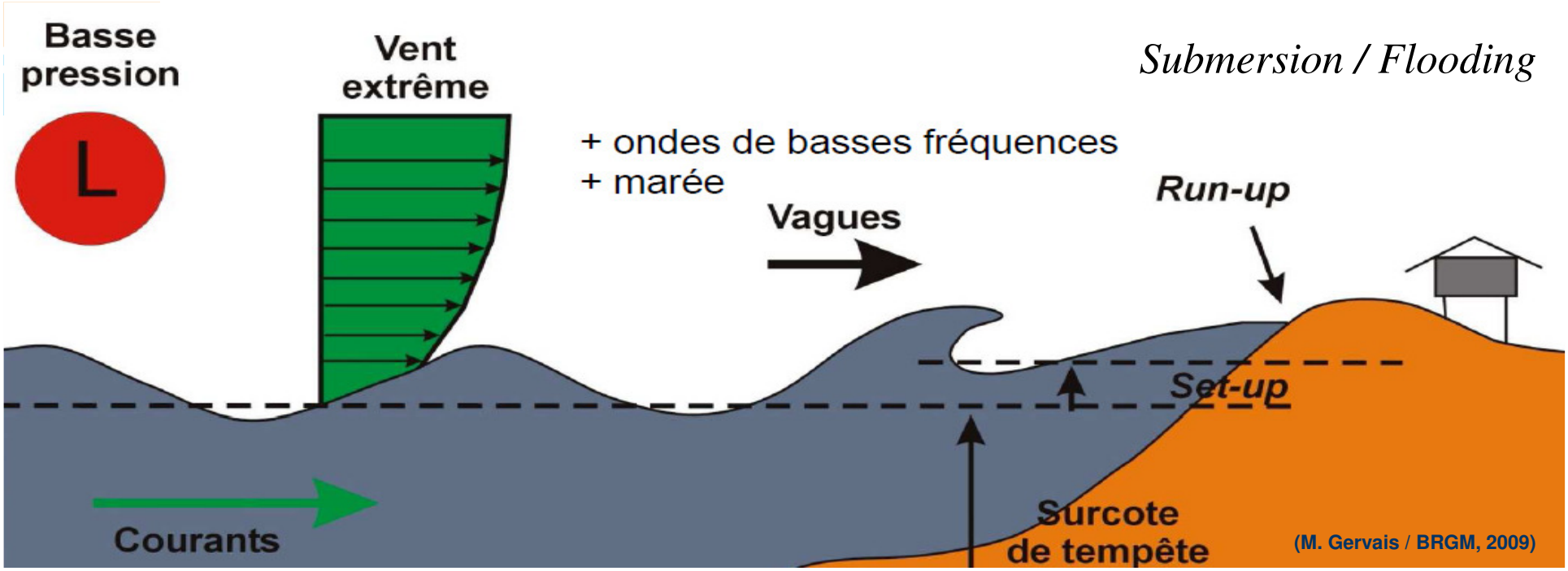
Scénario B2 :

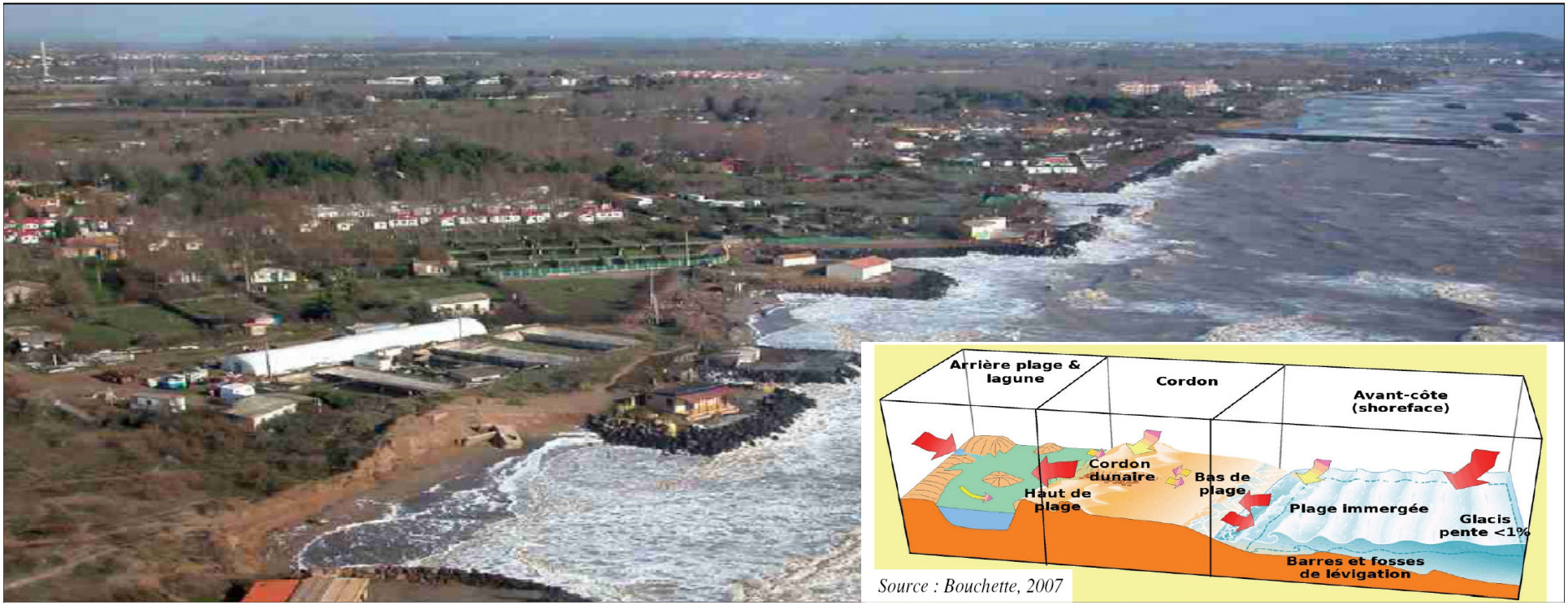
Min. : + 1 mm/an*

Moy. : + 3.3 mm/an**

Max. : + 6.5 mm/an***

Submersion / Flooding



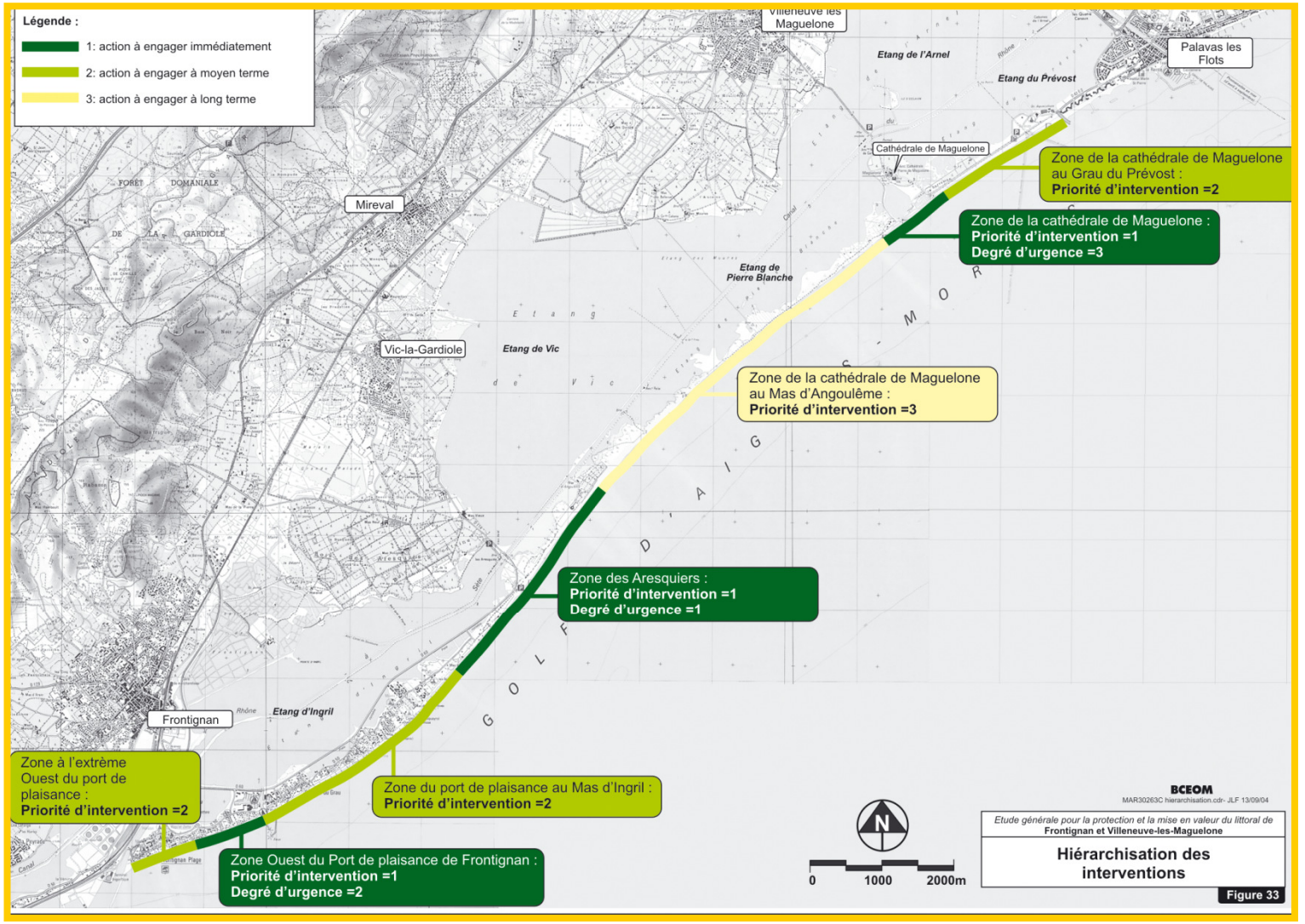


Source : Bouchette, 2007

Coastance Methodology

Define prioritary areas

Enlighten priorities for sustainable coastal planning



Seafront of the Albufera, Dehesa del Saler, sector – Generalitat Valenciana (Spain)

- **1.385 m Dune's bar reconstruction**
- **1.600 m beach reconstruction**
- **Demolition of high traffic road**
- **Demolition and reconstruction of pedestrian run**
- **About 12 Million euros of total budget**

Albufera natural park

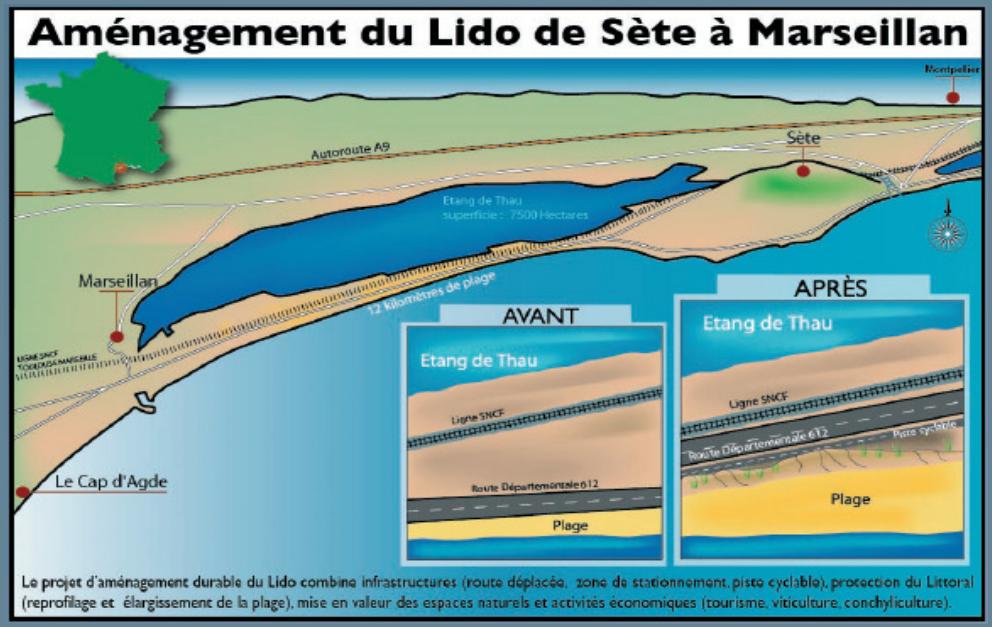
Programme Interreg IIIB MEDOCC Pour la cohésion des territoires de l'Europe du Sud FEDER

BEACHMED

Retirada planeada y aporte de arenas para regenerar la playa y las dunas en la Dehesa de El Saler (Parque Natural de La Albufera)

Revista Europea de la Dirección General de Economía Unión, july 2005

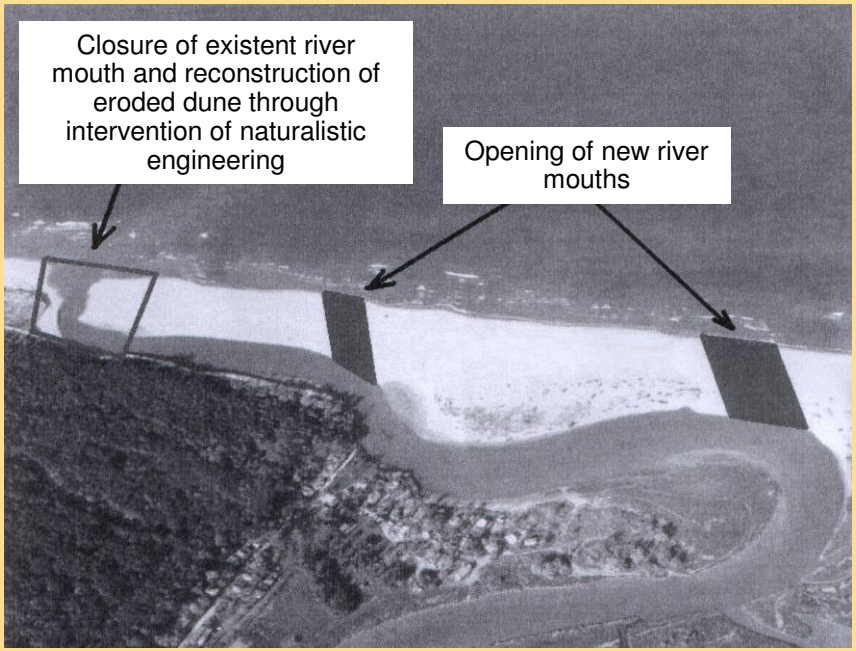
Lido de Sète à Marseillan – Languedoc Roussillon (France)



- 12 km Dune's bar rehabilitation
- 70 m widened beach (600.000 m³ of sand)
- Demolition and reconstruction of road
- 150.000 € collectivity coasts for each storm
- About 55 Million euros of total budget
- Duration of works: oct. 2007 – dec. 2010

Dossier de presse, Agglomération THAU

Bevano river mouth – Emilia-Romagna (Italy)



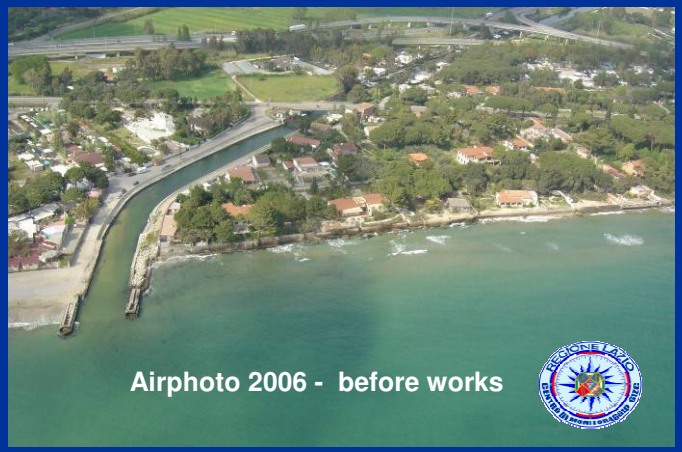
- **Realization of a new river mouth**
- **Dredging of sand and closure of old mouth**
- **500 m Dune's bar rehabilitation**
- **361.519 euros of total budget**
- **Duration of works: jan 2006 – apr 2007**

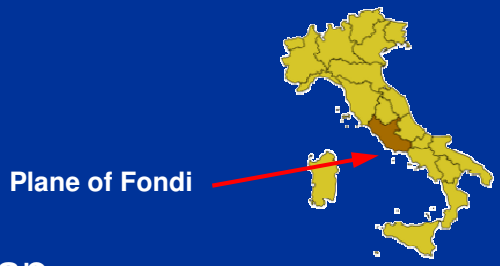
BEACHMED-e POSIDUNE phase c long report, June 2008

Plane of Fondi – Regione Lazio (Italy)

- Nourishment protected by groynes
- 2.200 m length of the beach
- 30 m widened beach (580.000 m^3 of sand)

- About 5 Million euros of total budget
- End of works: June 2007





Sea level rise risk map

-2,0 m msl

-3,9 m msl

ENEA Report « Reply to climate change in Italy »

Plane of Fondi – Regione Lazio (Italy)

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Marseille, June 23rd 2010

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