ENVIRONMENTAL COASTAL PROTECTION:
GOOD PRACTICES AND EXPERIENCES
(Knowledge)

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APAT

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1. Introduction

In Italy the river mouth and the beaches close have been interested, for a long time, from coastal erosion due to:

• Remediation interventions

• The massive extraction of deposit materials from the rivers *alvei*

• Interventions of control of waterways

The Italian laws provides
a list of interventions to protect the human settlements and the
communication infrastructures:

- the construction of groins,
- the construction of breakwaters,
- every works to control and to stop erosion

Of the three possibilities, the first two
are massively used, while the third hasn't been
sufficiently explored.

2. New development concept

In the past, the system of coastal dunes
was used with the objective
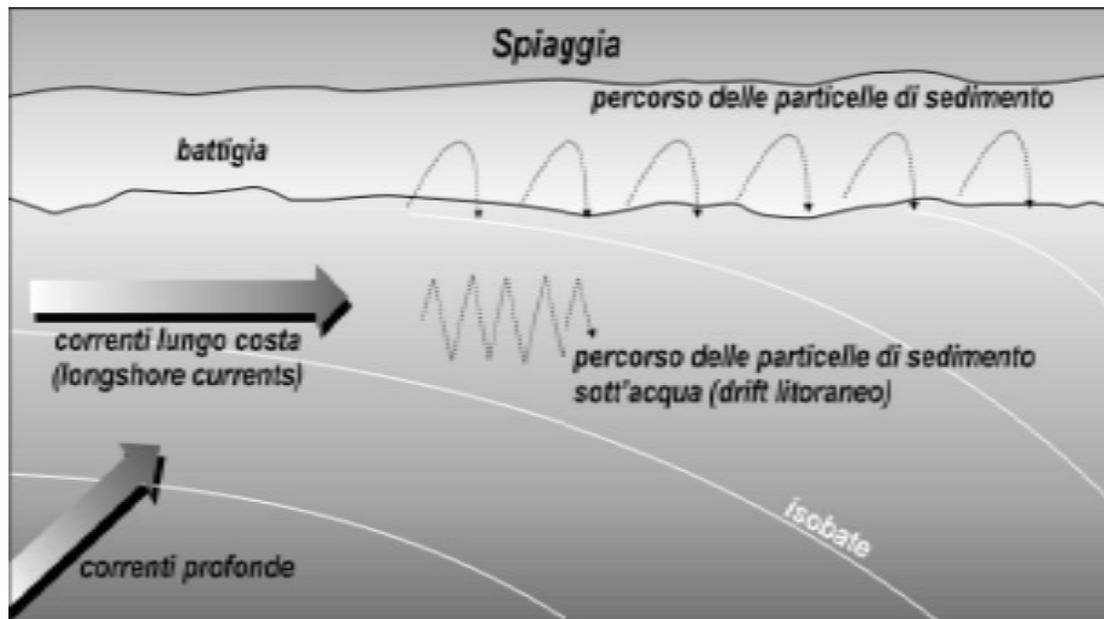to gain material for the construction industry:

- In this way, the beaches lost their functions
  of defense and *natural tank* of sedimentary
  material
- The coastal system becomes inelastic to
  the small variations or to the single
  meteo-marine (flooding, inunandation, etc.) and meteo-climatic
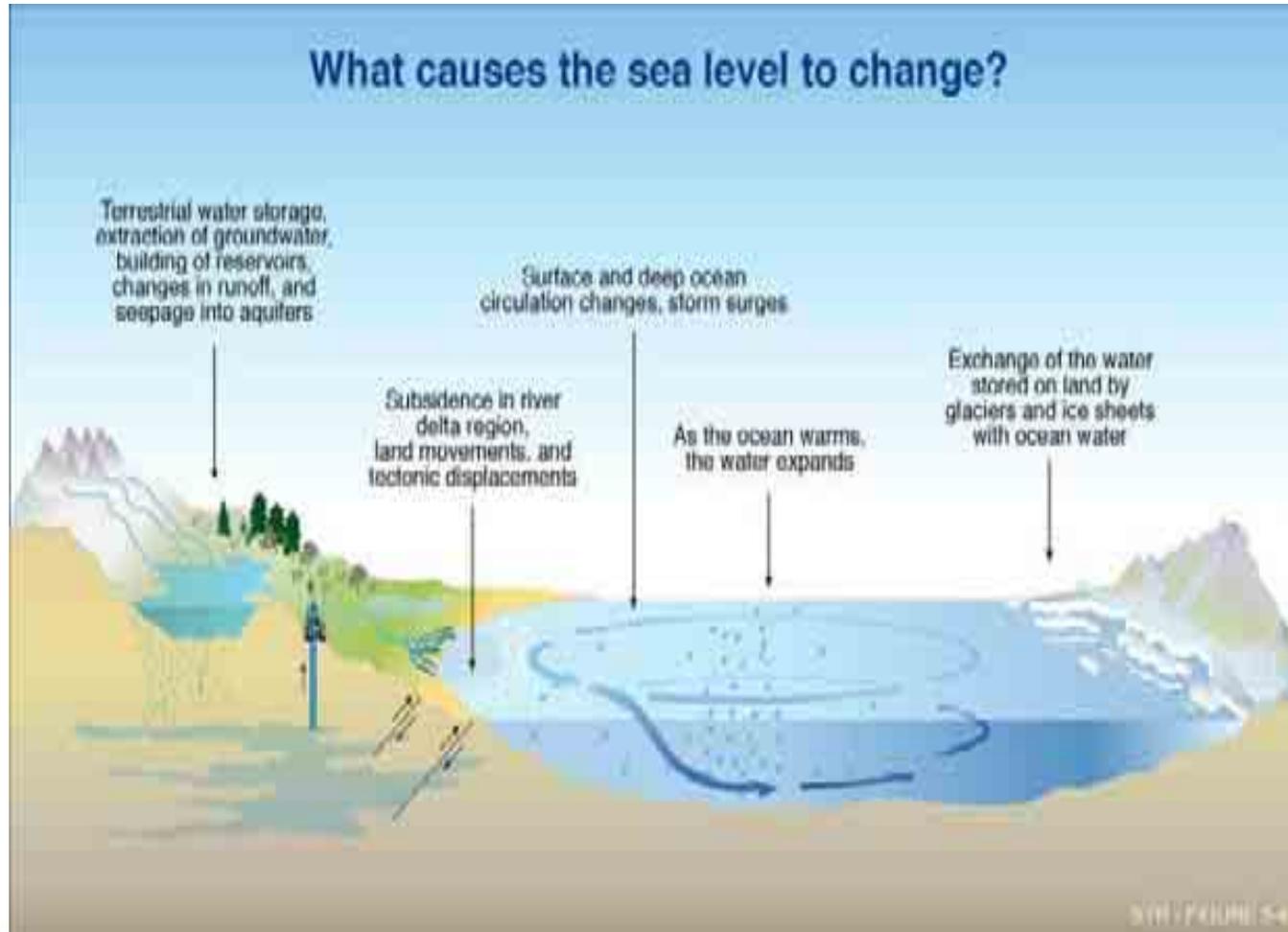 events

2. New development concept

In nature, a stable beach *lives* a state of dynamic equilibrium, where usually have place erosion and accretion of the shoreline, for few meters, in a short time.

In case of insufficient spaces (and materials) the coastal system does not an arrangement of configuration of temporary equilibrium if to the place of dunes the sea finds the *artefacts*: the consequences are an increase of the erosive processes

2. New development concept

- The increase of *medium sea level* involves the reversal of the shore line with consequent erosion of the coastlines

For an effective coastal defense

It is necessary to consider various parameters, through the use of appropriated integrated models, able to transfer to the coastal area the data collected in open sea.

Indispensable it is to know the complete temporal series (waves, evolution of shorelines, currents, etc.)

Priority it is to adopt a territorial approach, even to scale than river basin, in a position to estimating also the variations of bathymetric lines, the solid transport, the anthropic impact.

For a new development concept : sample analysis

Acquired aerial photos from Liguria coast, in Italy, with use of perspective, for the study of the coastal area use

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The coast do not go more considered the limit between earth and sea, but like a continuum between the terrestrial ecosystems and those marine, holding in due:

✓ the cycle of water
✓ the soil defense
✓ the conservation of the biodiversity
✓ the landscape
✓ the agriculture

etc.

Coastal area as a natural integrated environment

3. What to do (1)

1 Overcome the fragmentation of the competences between agencies and authorities

2 An *integrated management* of the coastal system should therefore provide interventions through planning strategies inspired to the sustainability

3 Define programmed actions on coastal zone in order to exclude any form of uncontrolled development and unauthorized building activity

What to do (2)

4 Control shoreline erosion, accretion, and stability through calibrated monitoring systems

5 Use, correctly, the beach systems and the sea bed

6 Leave space to the natural action of the sea

What to do (3)

7   Reduce the anthropic pressure on the coastal zone

8   Decrease the consumption of soil through appropriate relocation (infrastructures and others)

9   Increase the levels of naturality in coastal areas

What to do (4)

A possible solution:

- Recovery of the ecosystems **through** the techniques of the naturalistic engineering that uses alive and native plants

- Inspire works of *traditional* engineering to environmental recovery rules and not of simple defense

- Use the nourishment like last possibility, only to realize in urgency conditions