CONSCIENCE

Concepts and Science for
Coastal Erosion Management

The CONSCIENCE project:
Bridging the knowledge gap for sustainable coastline management

November 2008

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coastal erosion is a common issue in Europe

but is it always a problem?

and if so, what can we do about it?

Project background

EUROSION recommendation

'Strengthen coastal resilience by restoring the sediment balance (favourable sediment status) .This will require identifying areas where essential sediment processes occur (coastal cells), and identifying "strategic sediment reservoirs" from where sediment can be taken without endangering the natural balance

The CONSCIENCE project will provide a series of guidelines and tools in support of this approach to ensure that it can be effectively assimilated into a sustainable management strategy for erosion.

Ultimate goal of project

Make coastal erosion concepts...

(resilience, sediment cells, sediment reservoir, favourable sediment status)

operational for management...

(EU context, different coasts, different management settings, ICZM, sustainability)

that is scientifically justified...

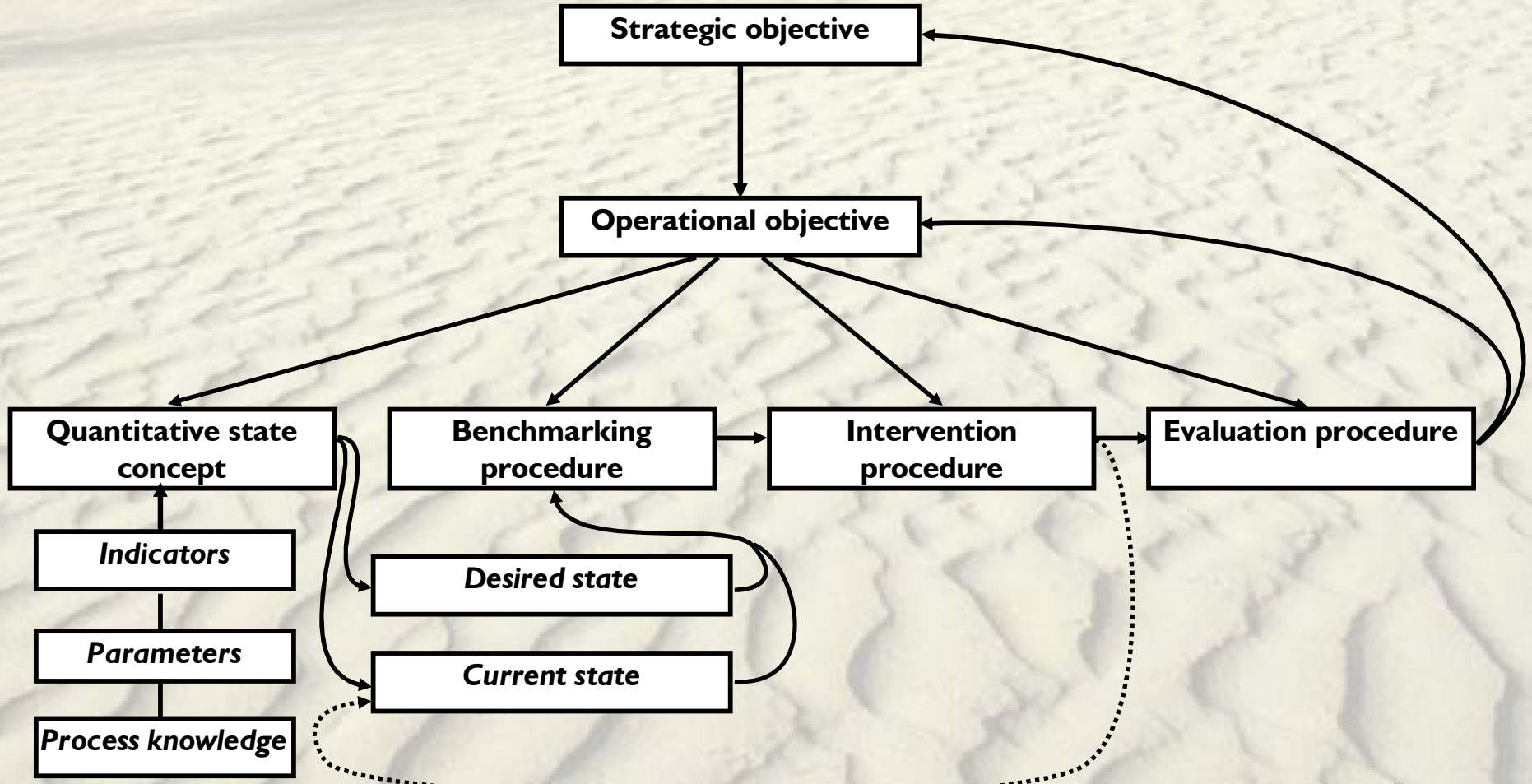
(knowledge, data, models, tools)

Key issues and concepts

- Coastal resilience
- Sediment cells
- Strategic Sediment Reservoir
- Favourable Sediment Status

- Frame of Reference

Frame of Reference for policy implementation



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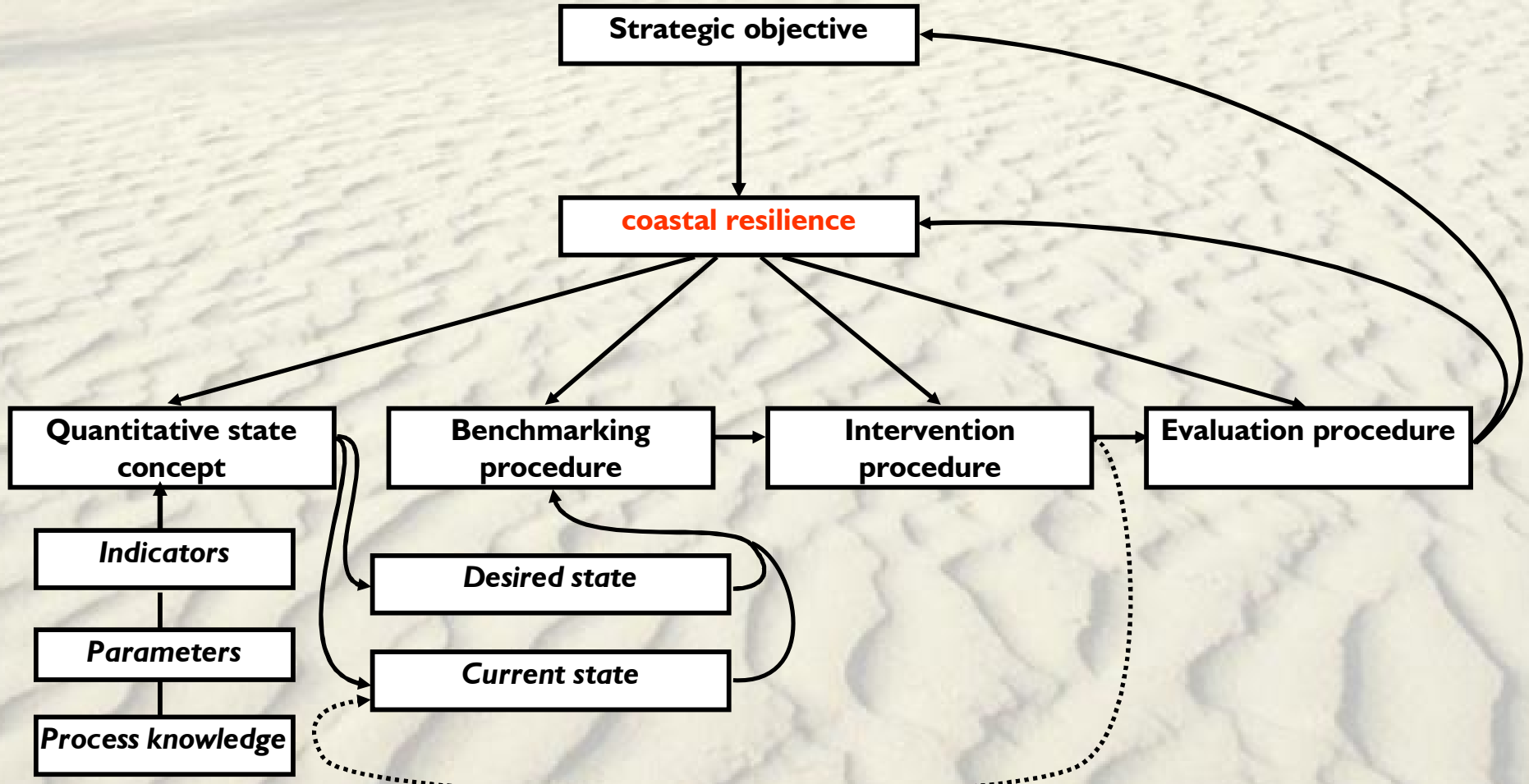

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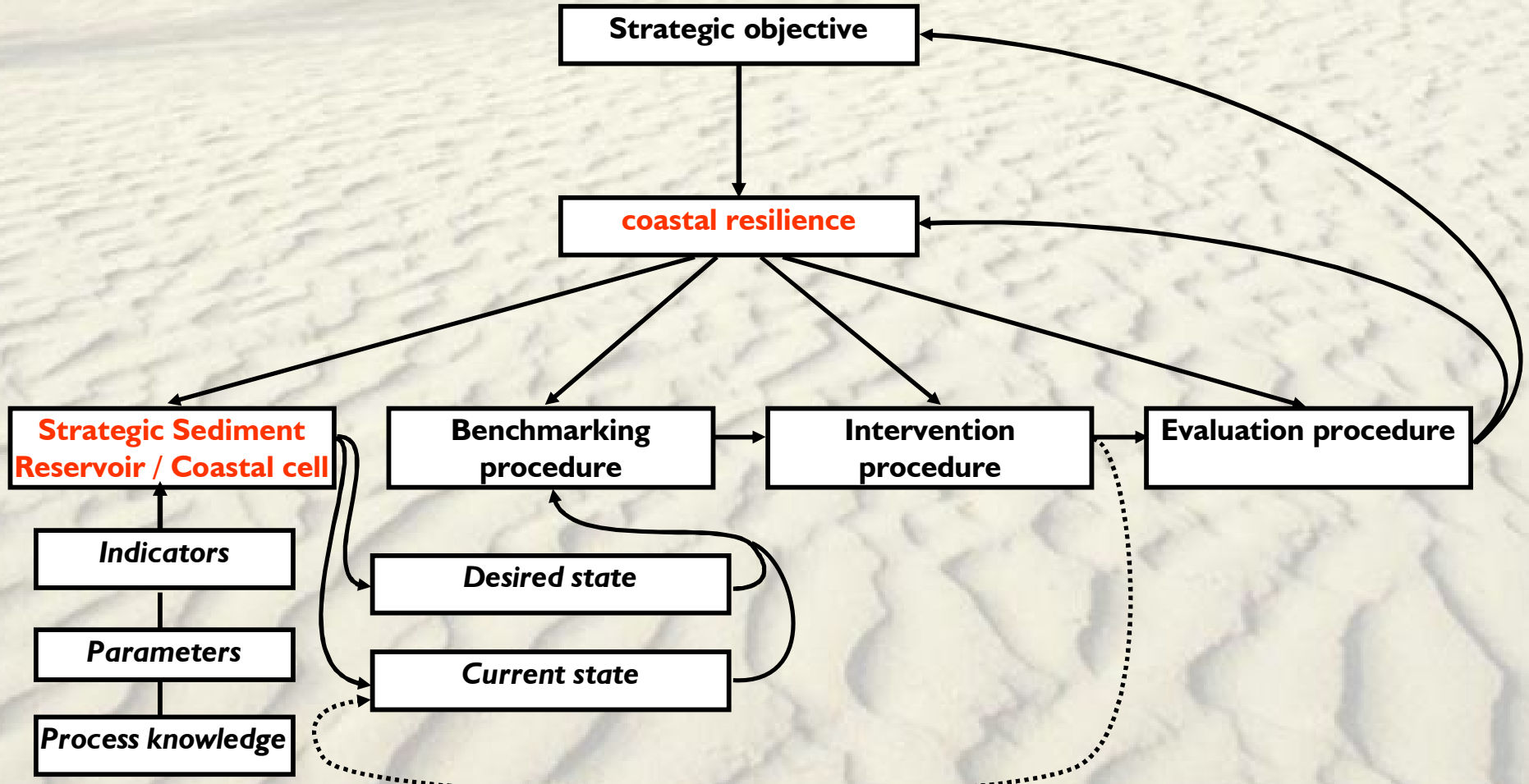

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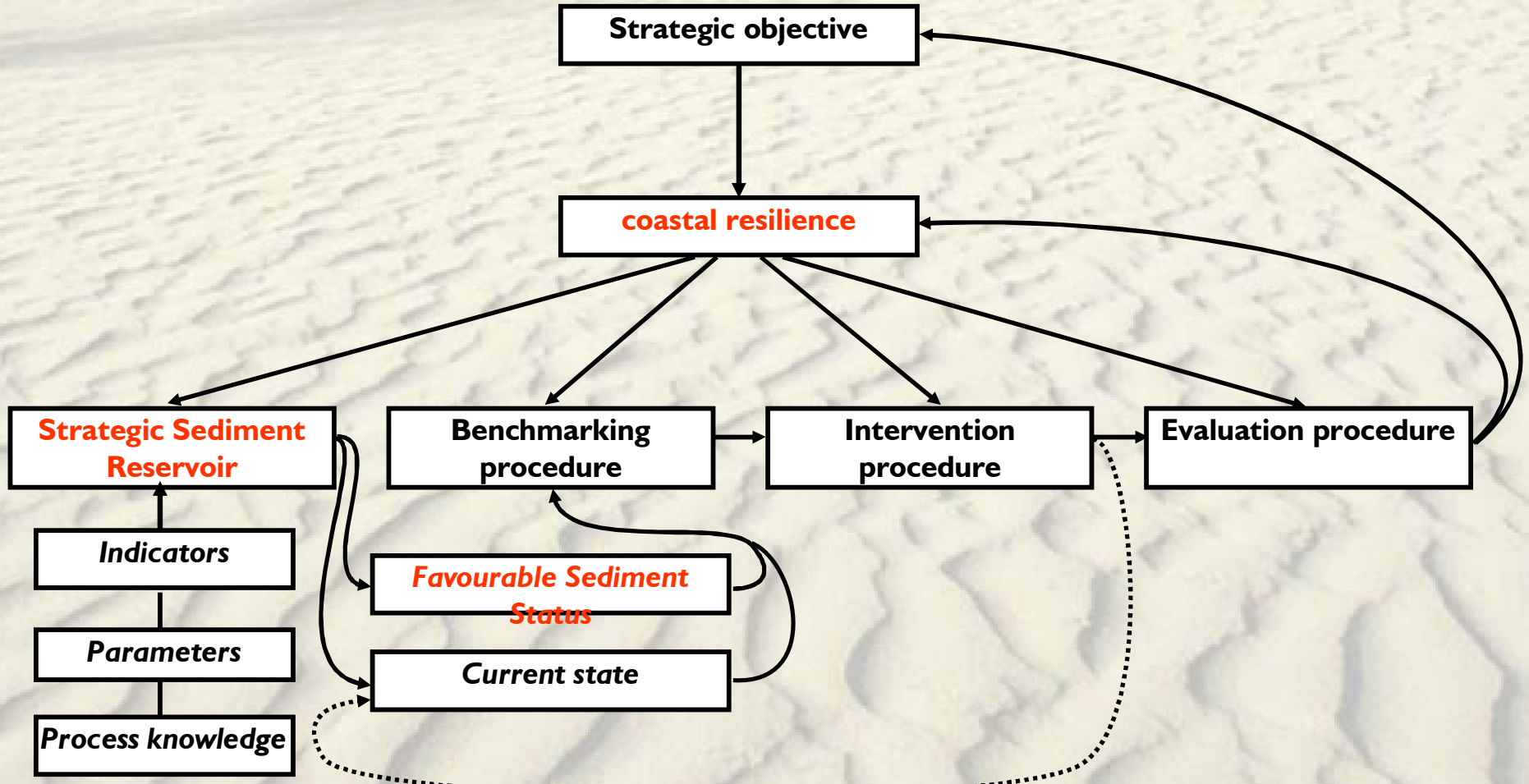

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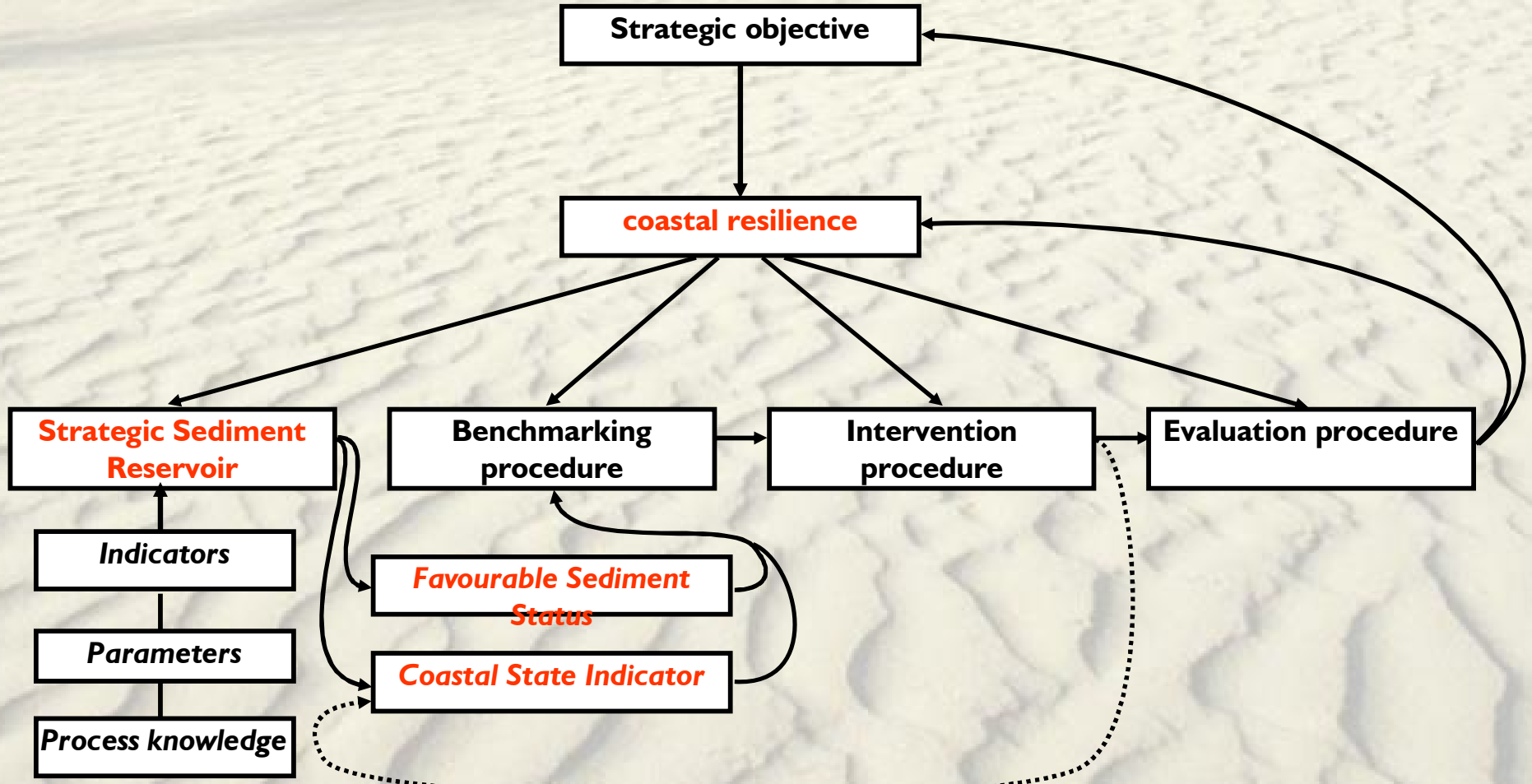

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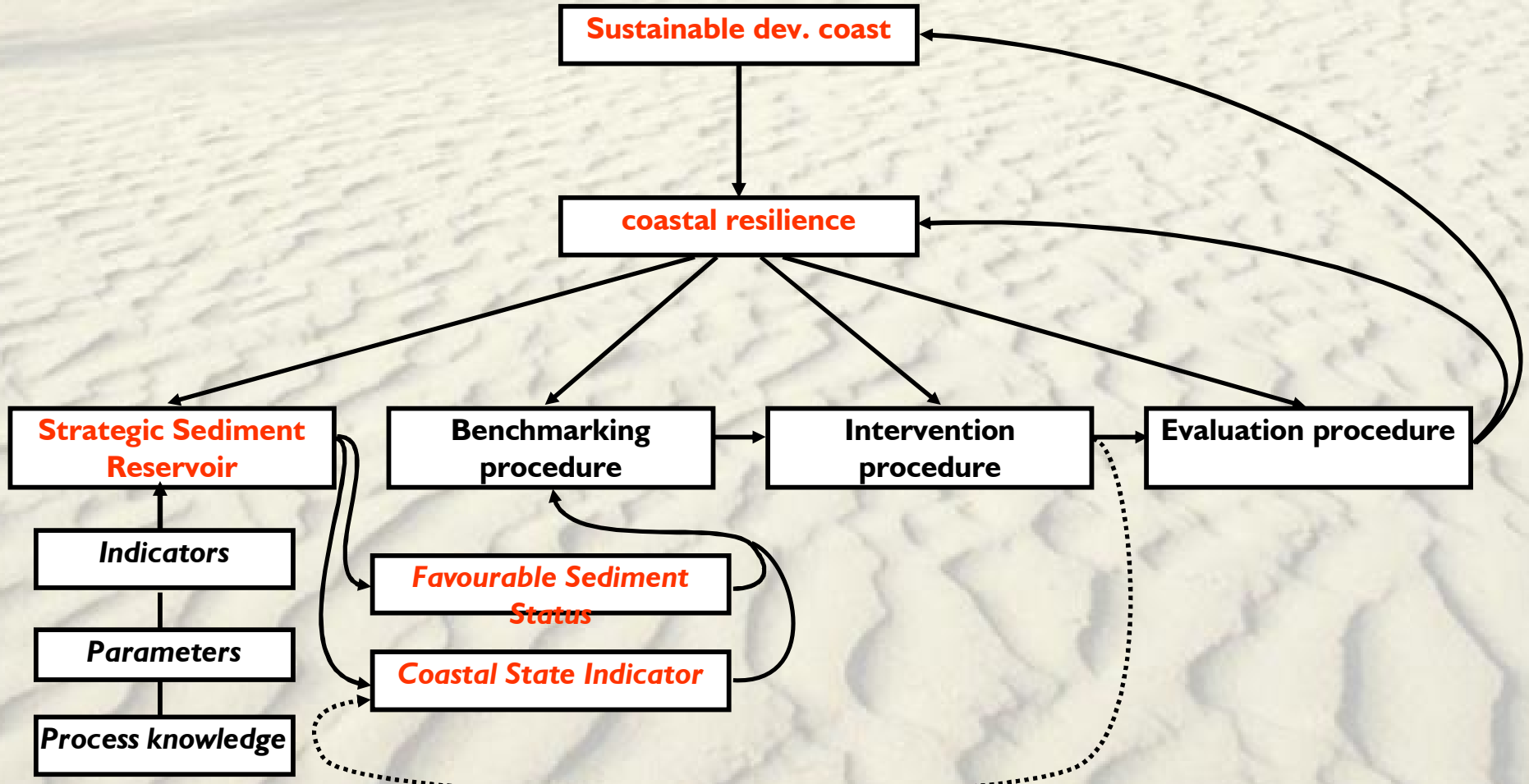
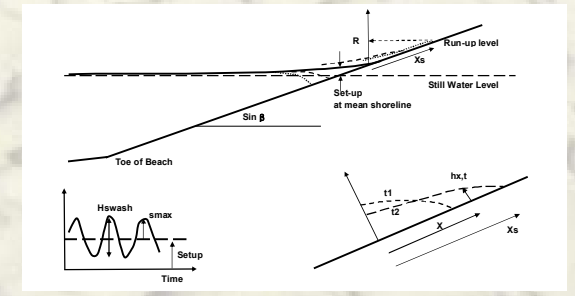
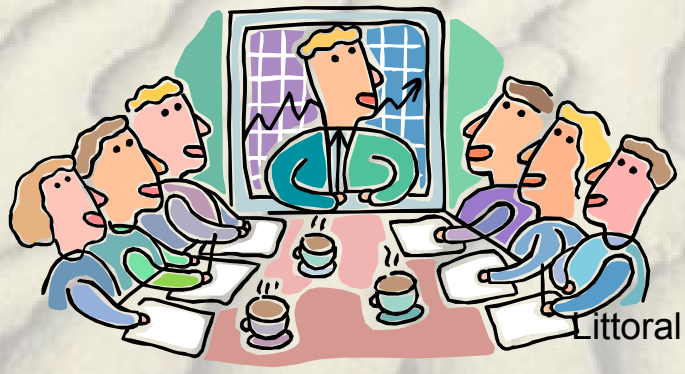


Main challenges

Science – Policy interface:

- Complexity of physical processes and social context
- Uncertainty: models
- Time and space scales
- End user involvement

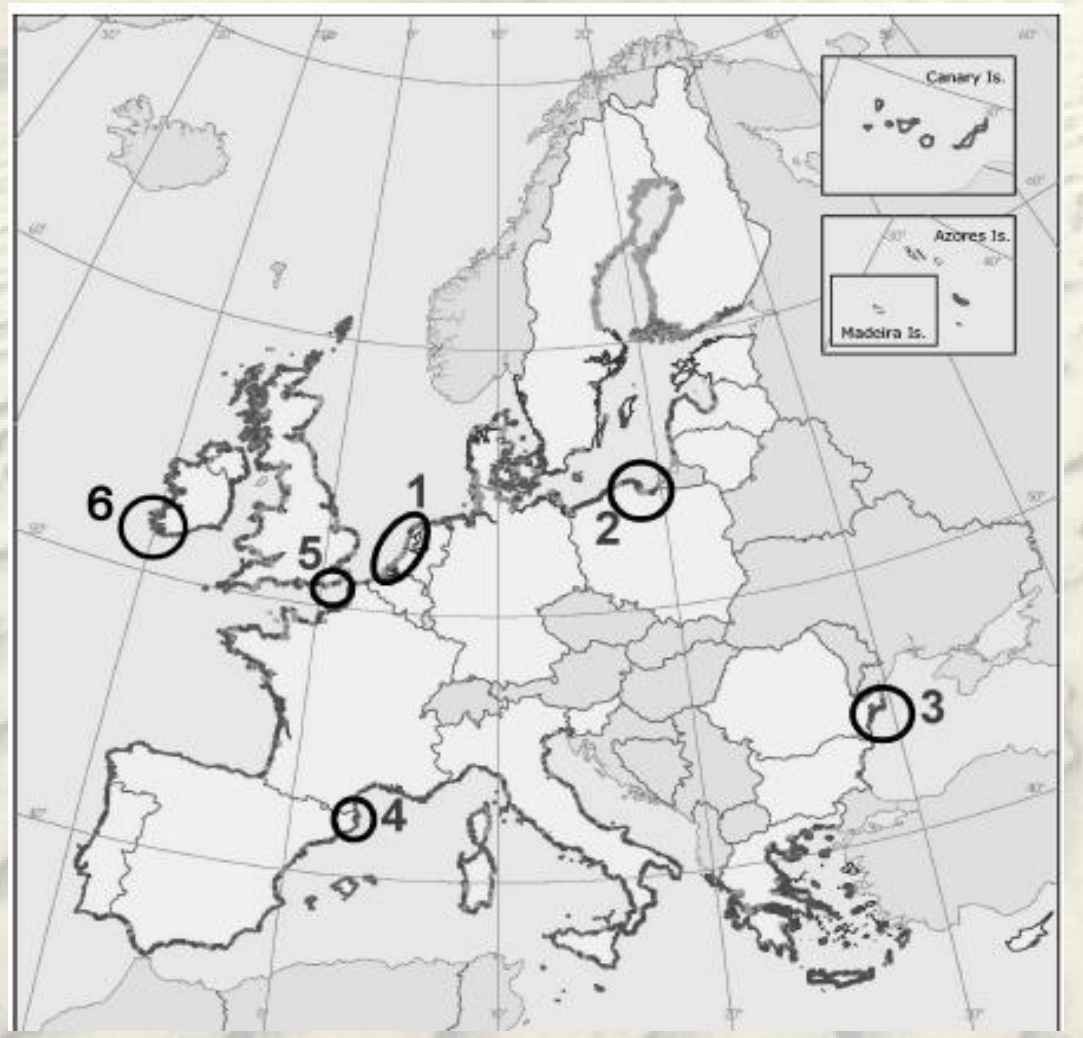




Research perspectives

- **Scientific validity**:
  theory, empirical evidence, body of knowledge
- **Political relevance**:
  embedded in policy (ICZM), judgements, legislation, ethics, economy, culture
- **Practical (management) usefulness**:
  measurements, monitoring, explainable to people, fit for regulation

Pilot sites



1 Holland coast

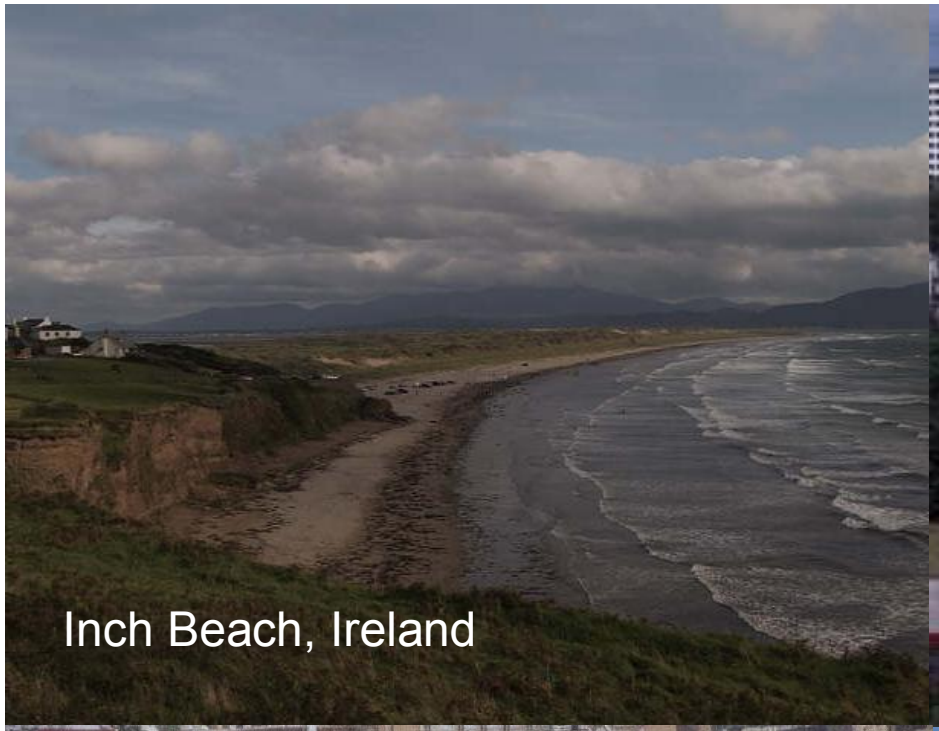
2 Hell peninsula

3 Danube delta

4 Coast Brava

5 Pevensey bay

6 Inch Beach (Kerry)


Inch Beach, Ireland


Mamaia, Romania


Lloret de Mar, Spain


Hel Peninsula, Poland


Texel, the Netherlands
Pevensey, UK

characteristics of the pilot sites

Site	Process	S-scale	T-scale	Function	Strategic obj.	Operational obj.
NL	E	N-R (10^2 km)	C-D (10^2 y)	SI-SH-NC-R	Sustainable safety. Sustainable values & functions	Preservation of coastal foundation
		R (10 km)	D (10 y)			Preservation 1990 coastline
	SE – F	L (10^{-1} km)	Ev (10^{-2} y)	SH	Everyday safety	Preservation of dune strength
PL	E	R (10 km)	D (10 y)	SI-R	Preserve the Hel Peninsula coastal system	Maintain beach width
	SE	L (10^{-1} km) §	Ev (10^{-2} y)			Prevent breaching
RO	E	R (10 km)	D (10 y)	SI - SH – NC	Sustainable development of the area	Reduce coastal erosion
	SE	L (10^{-1} km) §	Ev (10^{-2} y)			
ES 1	E	L (10^0 km)	D (10 y)	SI - R	Maintain recreational carrying capacity	Maintain beach configuration for CR
	SE	L (10^{-1} km)	Ev (10^{-2} y)	SI	Enhance safety of infrastructures	Maintain beach configuration for IP
ES 2	W	L (10^0 km)	S (10^{-1} y)	SI - R	Maintain recreational carrying capacity	Maintain beach configuration for CR
	SE	L (10^{-1} km)	Ev (10^{-2} y)	SI	Enhance saftey infrastructures	Maintain beach configuration for IP
UK	SE - F	L (10^0 km)	Y (10^0 y)	SI - SH – CH	Affordable risk management	Hold the line
	SLR	L (10^0 km)	D (10 y)			
IR	E - SE	L (10^0 km)	D (10 y)	SI - R	Promote sustainable tourism	Prevent damages to infrastructures

E: long-term (structural) erosion
SE: storm-induced erosion; F:flooding

C: Century; D: Decade
Y: Year; S: Season; Ev: Event

N: National
R: Regional
L: Local

Littoral 2008

CH: Cultural Heritage; NC: Natural Capital; R: Recreation
SH:Safety for Humans; SI: Safety for Infrastructures

national coastal policies and practices

	NL	UK	IRL	PL	R	E
sediment management :	+	--	--	--	--	+/-
Coastal resilience :	(		*sustainability*			)
Strategic sediment reservoir :	+	--	--	--	--	--
Favourable sediment status:	+	--	--	--	--	--
Coastal sediment cell :	+	+	--	+/-	--	+/-

national policies are just starting to identify sediment management as a basic approach

national coastal policies and practices

UK - England:

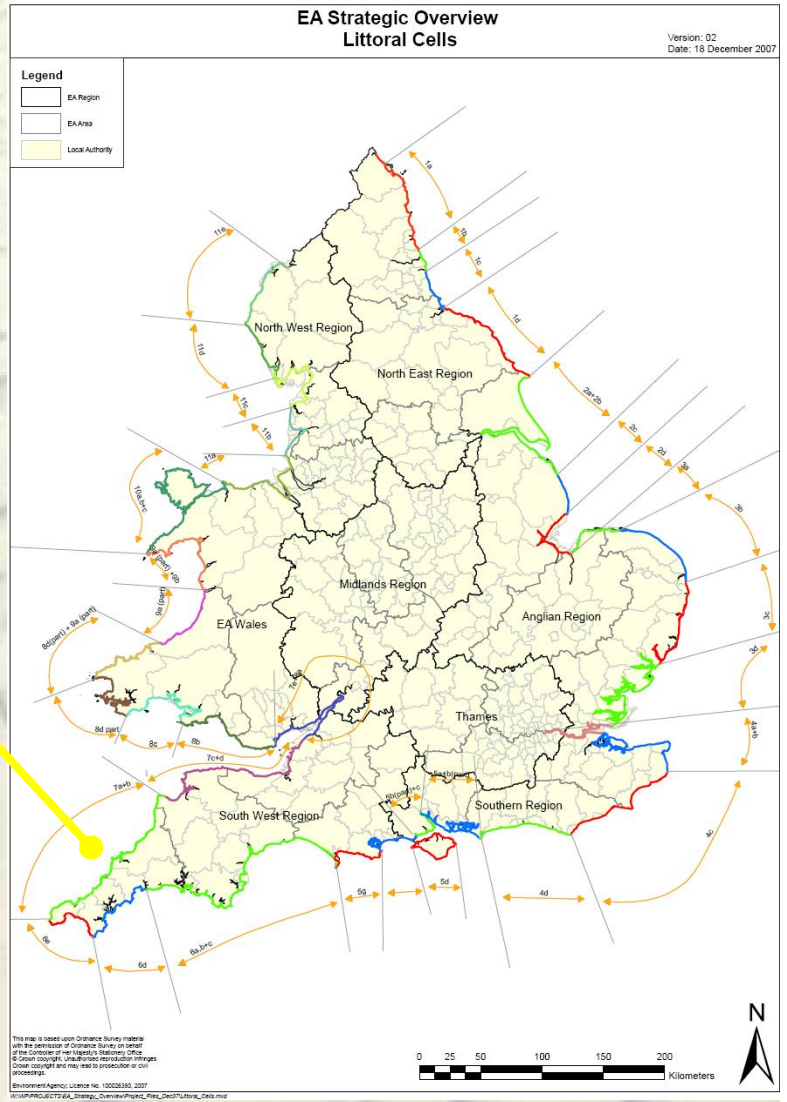
sediment management : **implicitly**

Coastal resilience : **sustainability**

Strategic sediment reservoir : **--**

Favourable sediment status: **--**

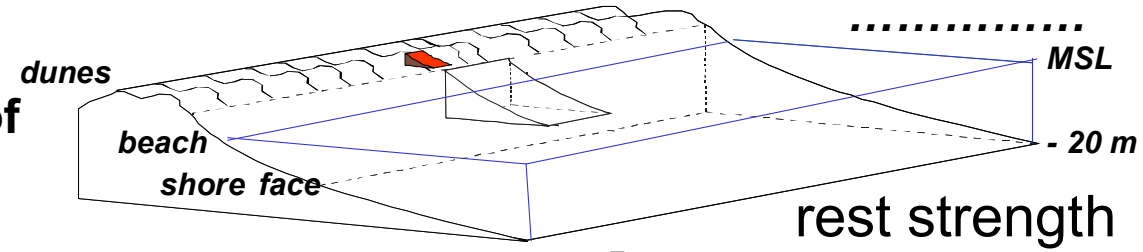
Coastal sediment cell : **+**



national coastal policies and practices

Netherlands (Coast.Pol.Doc. 2000; Nat. Spat.Strat. 2006):

responsible authority	*strategic objective*	*operational objective*
regional waterboard	**preservation of safety**	rest strength
national government	**sustainable preservation of safety and functions in dune area**	basal coast line coastal foundation



national coastal policies and practices

Netherlands :

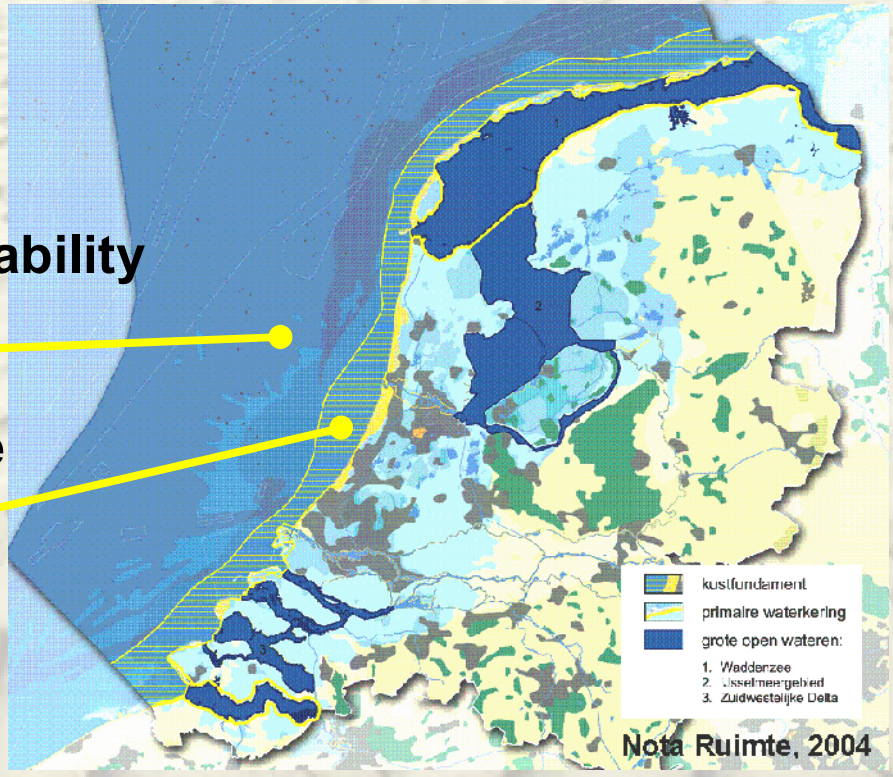
sediment management : **+**

Coastal resilience : **sustainability**

Strategic sediment reservoir : **+**

Favourable sediment status: **volume**

Coastal sediment cell : **+**



Preliminary conclusions

- knowledge, models and tools available
- each objective and concept has its own time/space scale
- most concepts not yet in mainstream management
- many countries do not have a clear coastline policy (strategic/operational objectives often lacking)
- Frame of Reference is useful for preparing such a policy, concepts give operational guidance

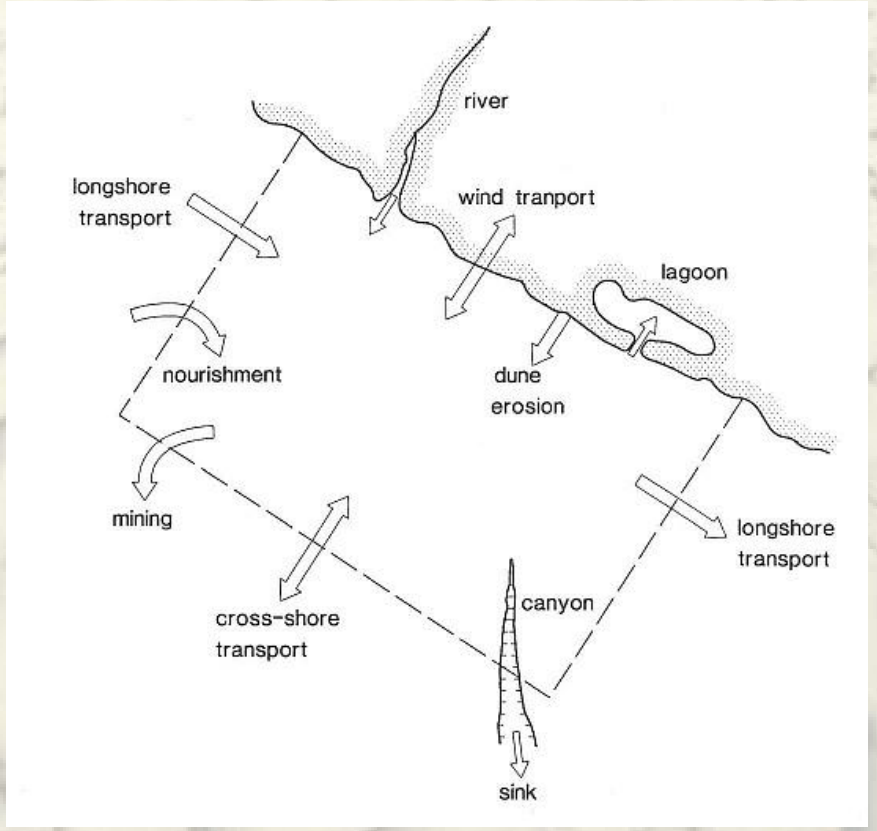
Thank You!

Coastal resilience

- Is resilience a natural state of the coast?
- What about natural receding or accreting coasts?
- Which time scales are we looking at?
- Not applicable to soft cliff coasts?!
- Resilience is not an aim in itself but a means to arrive at sustainability.

Coastal Sediment Cell

- How to delineate a CSC?
- How do CSC's behave in time?
- Cross-boundary problems / administrative boundary does not coincide



Favourable Sediment Status

- How to define?
- Who decides what is favourable?
- Which parameters to measure?
- Which Coastal State Indicators?

Strategic Sediment Reservoir

- When is a sediment deposit strategic?
- Who decides?
- What are the consequences if sediment is considered inside or outside the reservoir?
- How to deal with distant sources (e.g. river catchments)?