GESTIONE E PREVENZIONE
DEL RISCHIO COSTIERO
DI UN TERRITORIO
IN EVOLUZIONE

PISA 8 OTTOBRE 2019

Scuola Normale Superiore
Piazza dei Cavalieri
9:00 - 17:30

Erosione Costiera e adattamento

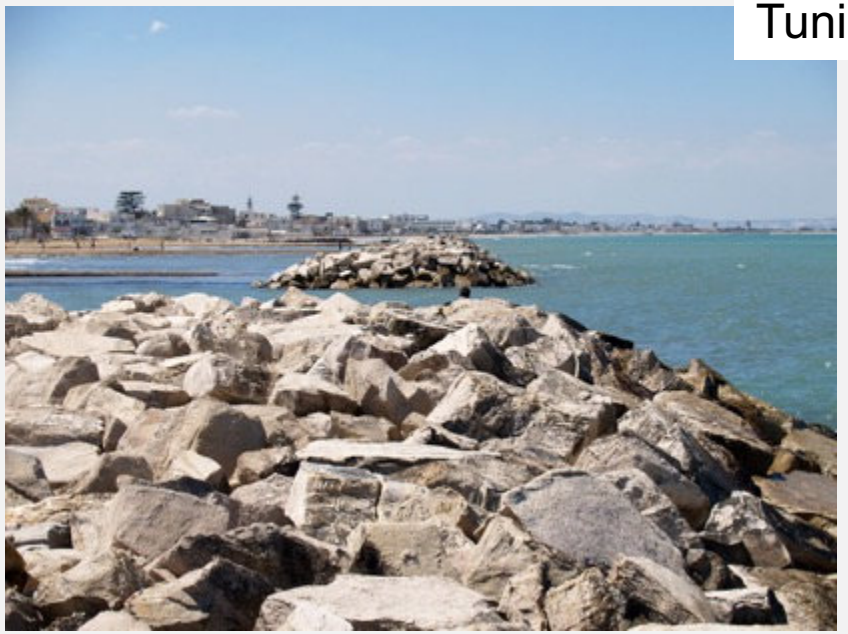
Enzo Pranzini, Dipartimento di Scienze della Terra, Università di Firenze

La cooperazione al cuore del Mediterraneo

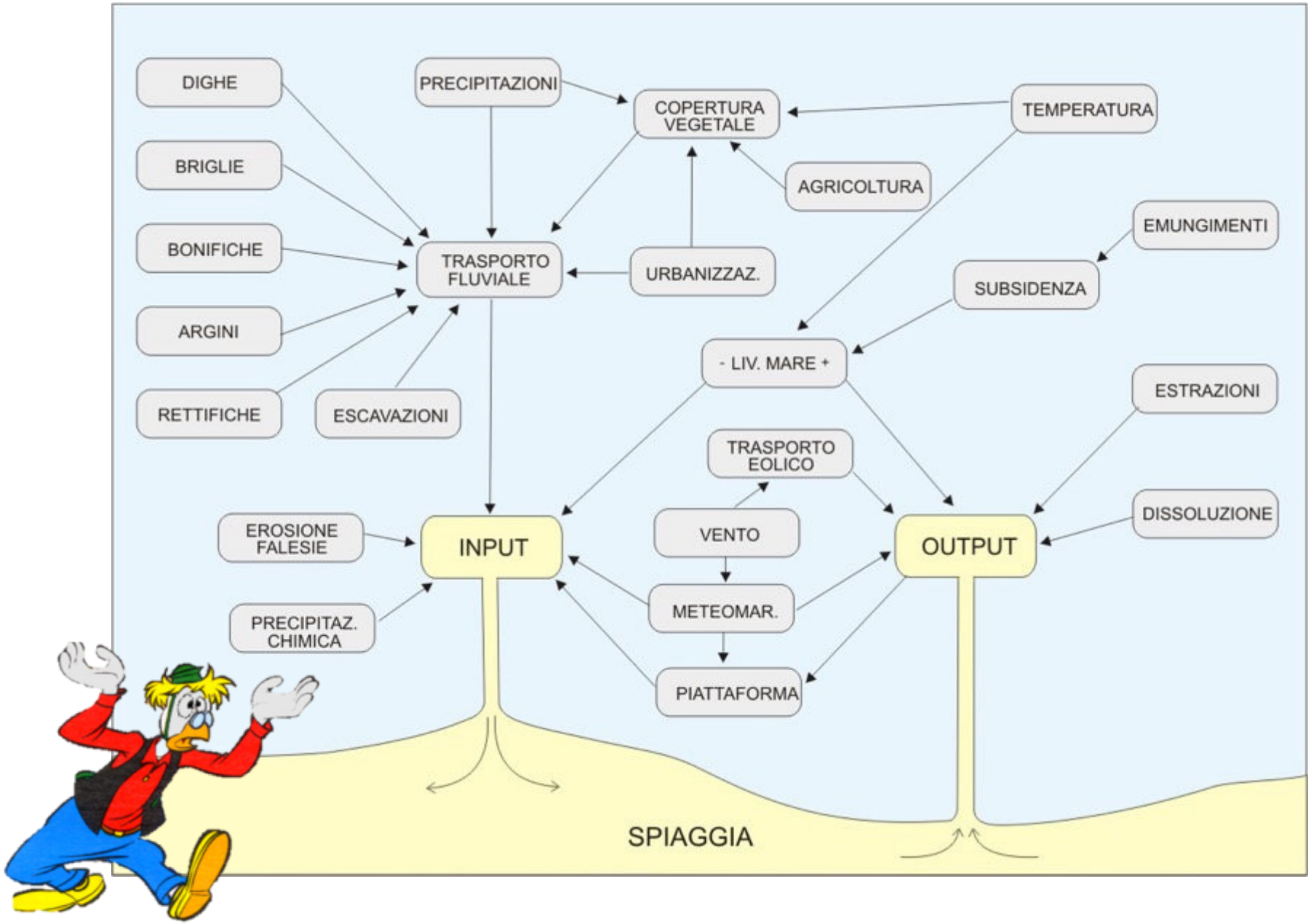
Interreg
UNIONE EUROPEA
MARITTIMO-IT FR-MARITIME
Fondo Europeo di Sviluppo Regionale
MAREGOT

La gran parte delle spiagge del Mediterraneo è in erosione

Italia Grecia
Tunisia Spagna



Bilancio sedimentario



Marche

Misano (Emilia-Romagna)

Marina di Massa, Toscana

1000 €/day

20 €/day

Canone demaniale

Valore
2000 €/m²

1 €/m²

2 €/m²

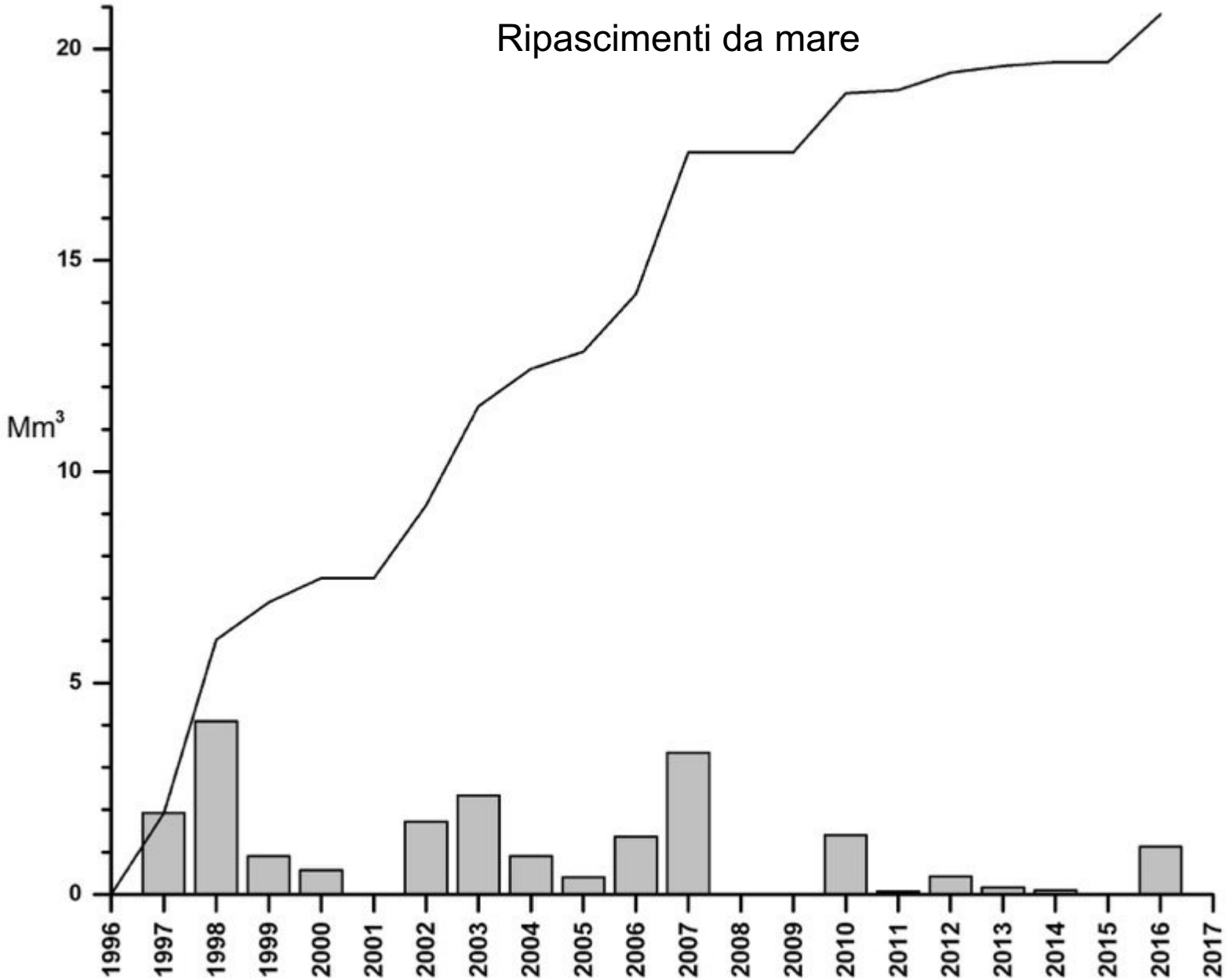
4 €/m²

Costo dell'intervento = 100.000 €

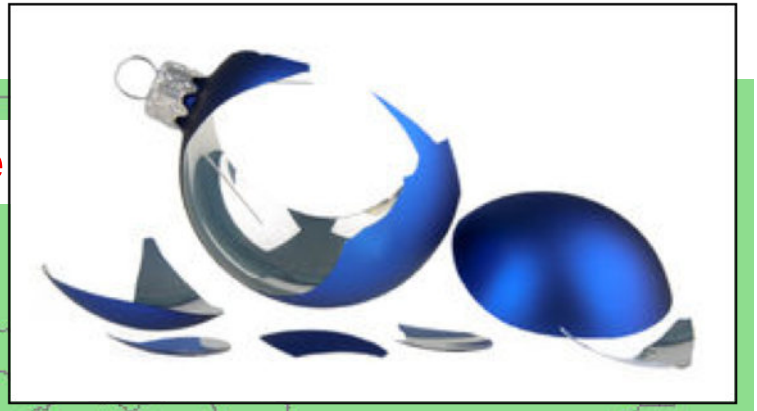
40 (74) ombrelloni in più, a 2400 €/stagione = 96.000 (177.000) €

20/100.000.000 m^3

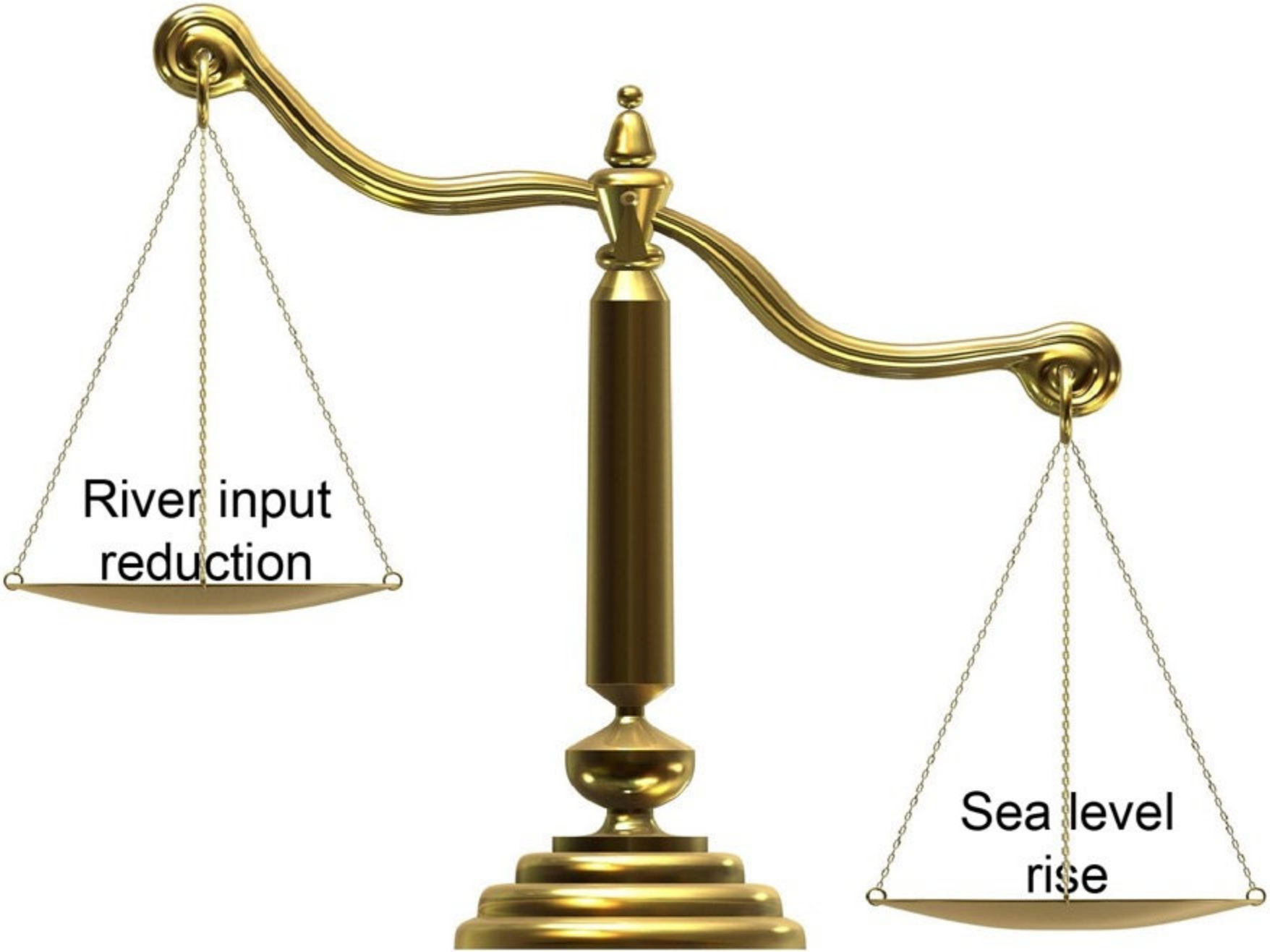
21.500.000 m^3

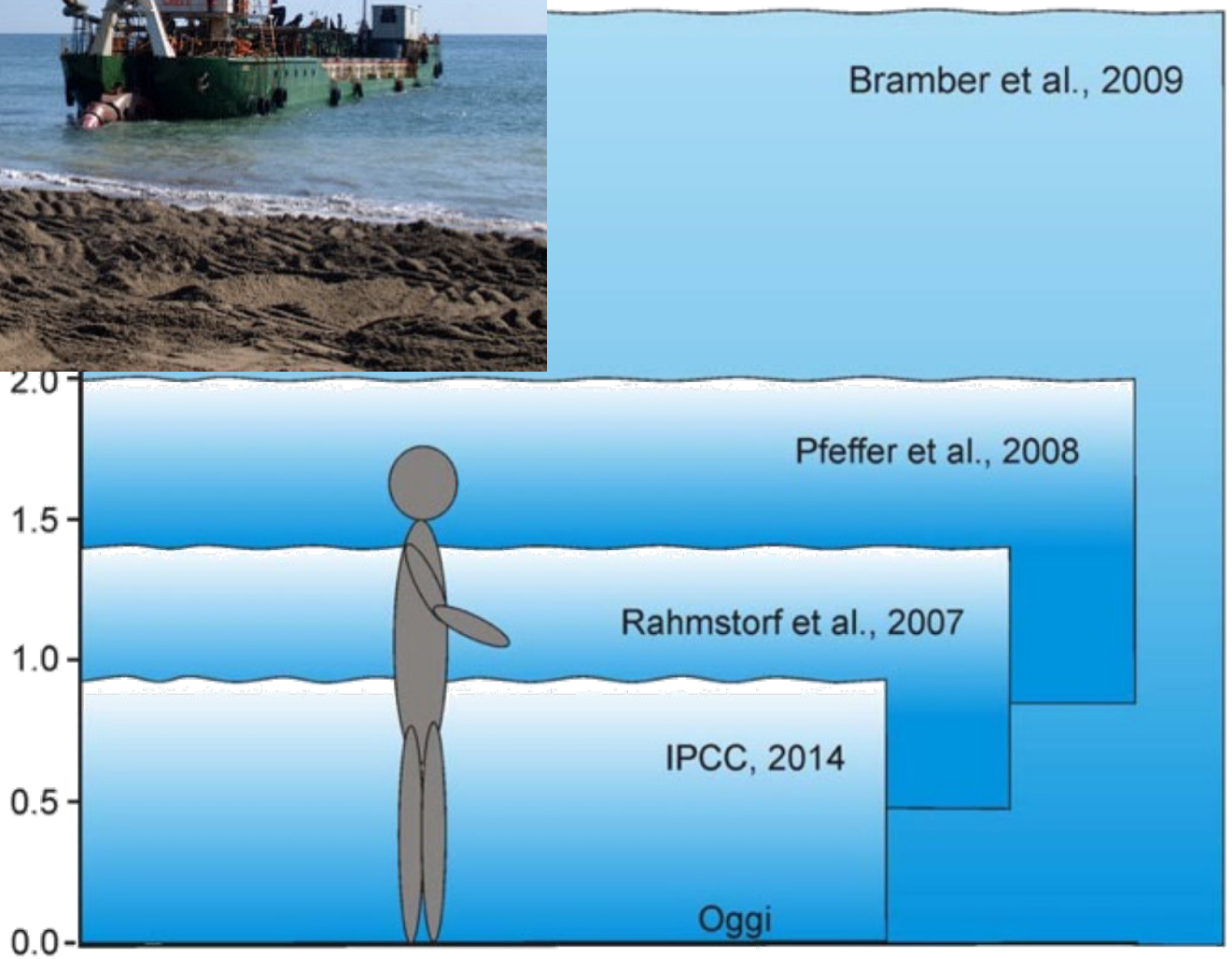

Ripascimenti da mare
Mm3
20
15
10
5
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

Il Mediterraneo è un mare molto sensibile

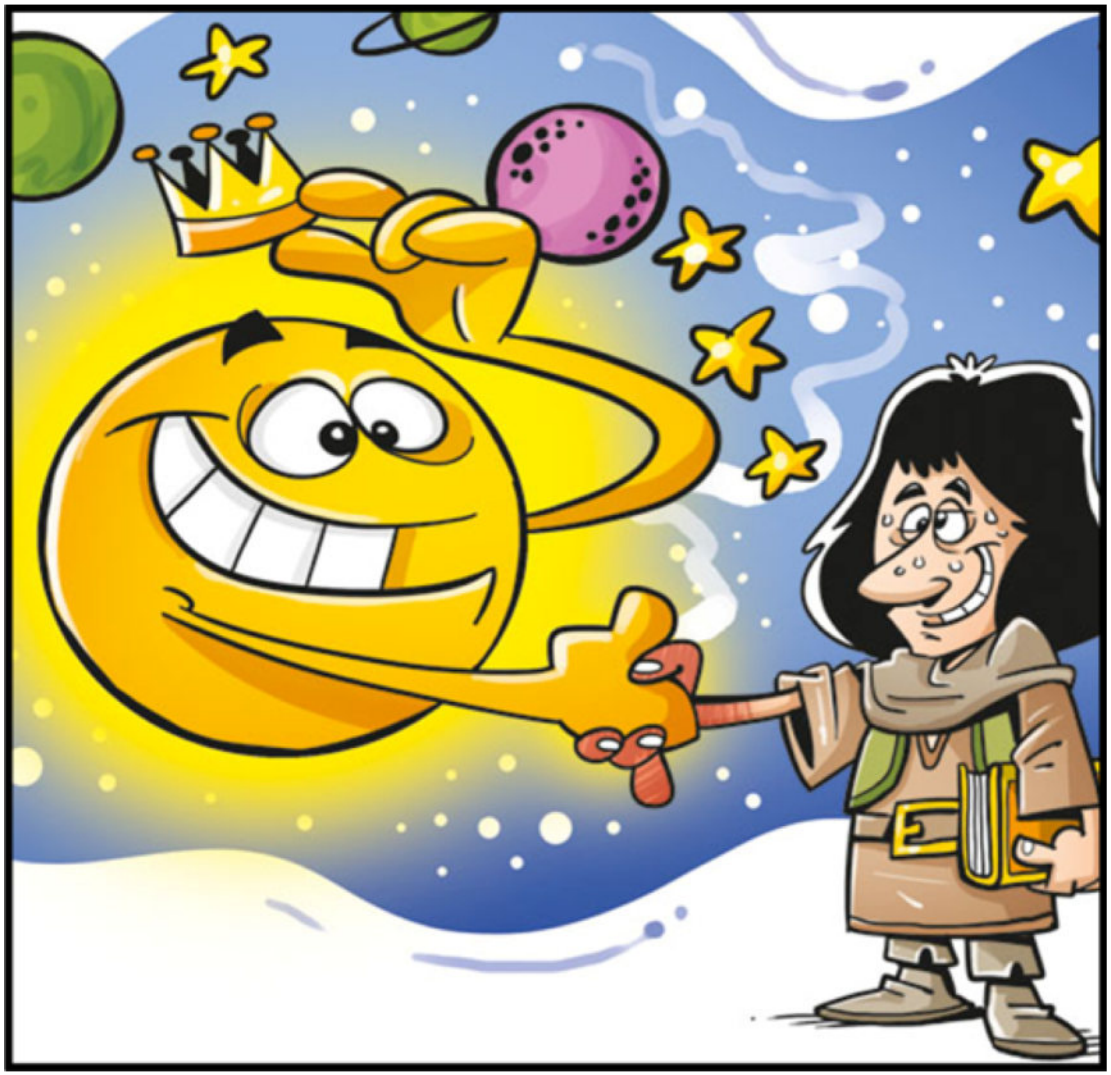


I sedimenti di fondo non sono una risorsa rinnovabile


River input reduction
Sea level rise


Bramber et al., 2009
Pfeffer et al., 2008
Rahmstorf et al., 2007
IPCC, 2014
Oggi
2.0
1.5
1.0
0.5
0.0

A Copernican revolution is needed!



Difesa dei litorali e giustizia sociale

Difesa dei litorali e giustizia intergenerazionale

Non tutti i tratti di costa italiana saranno difendibili.

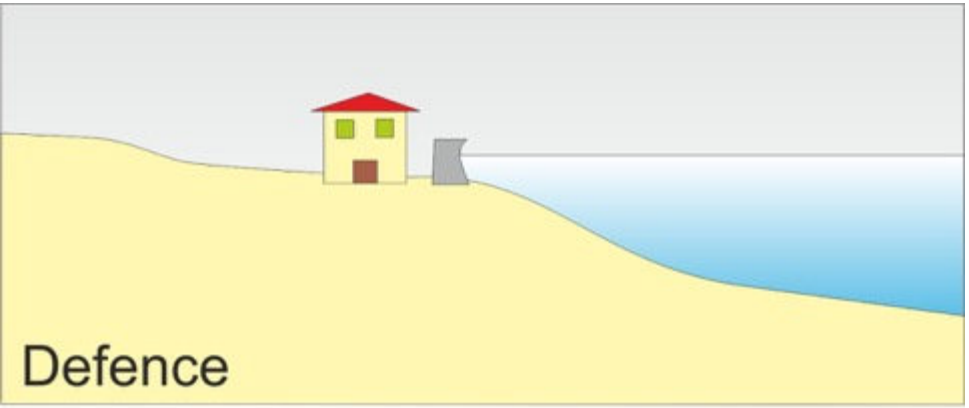
Abbandonarli?

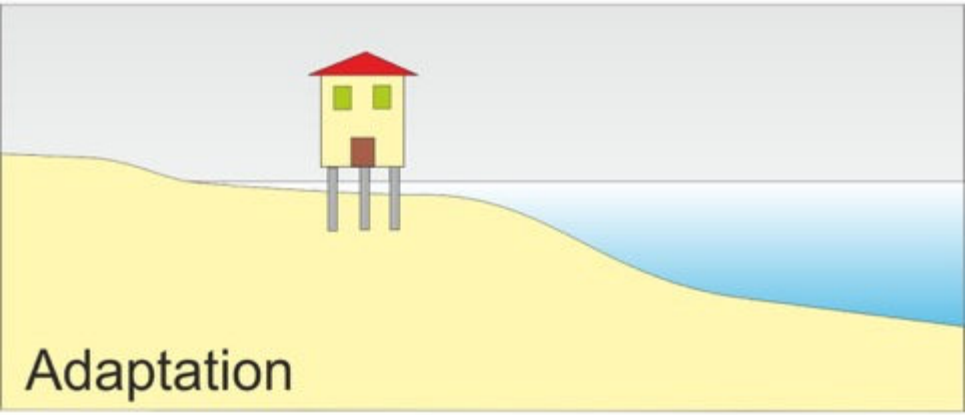
Quante file di ombrelloni metterò il prossimo anno?

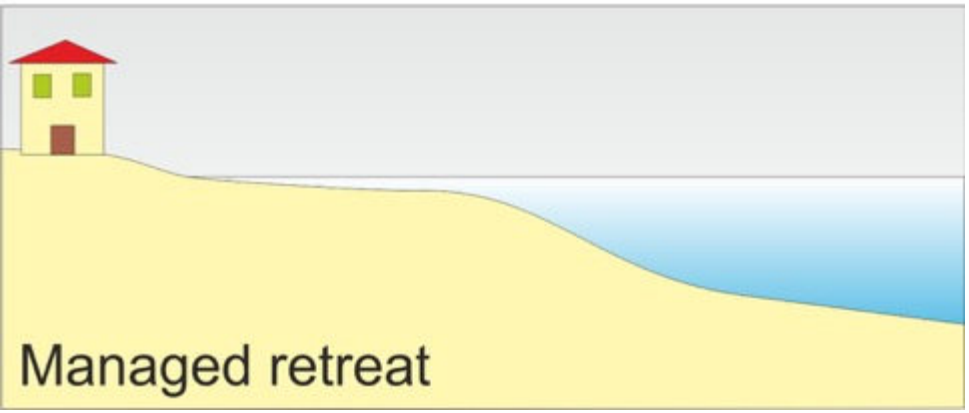
Quante file di ombrelloni metterà mio figlio?

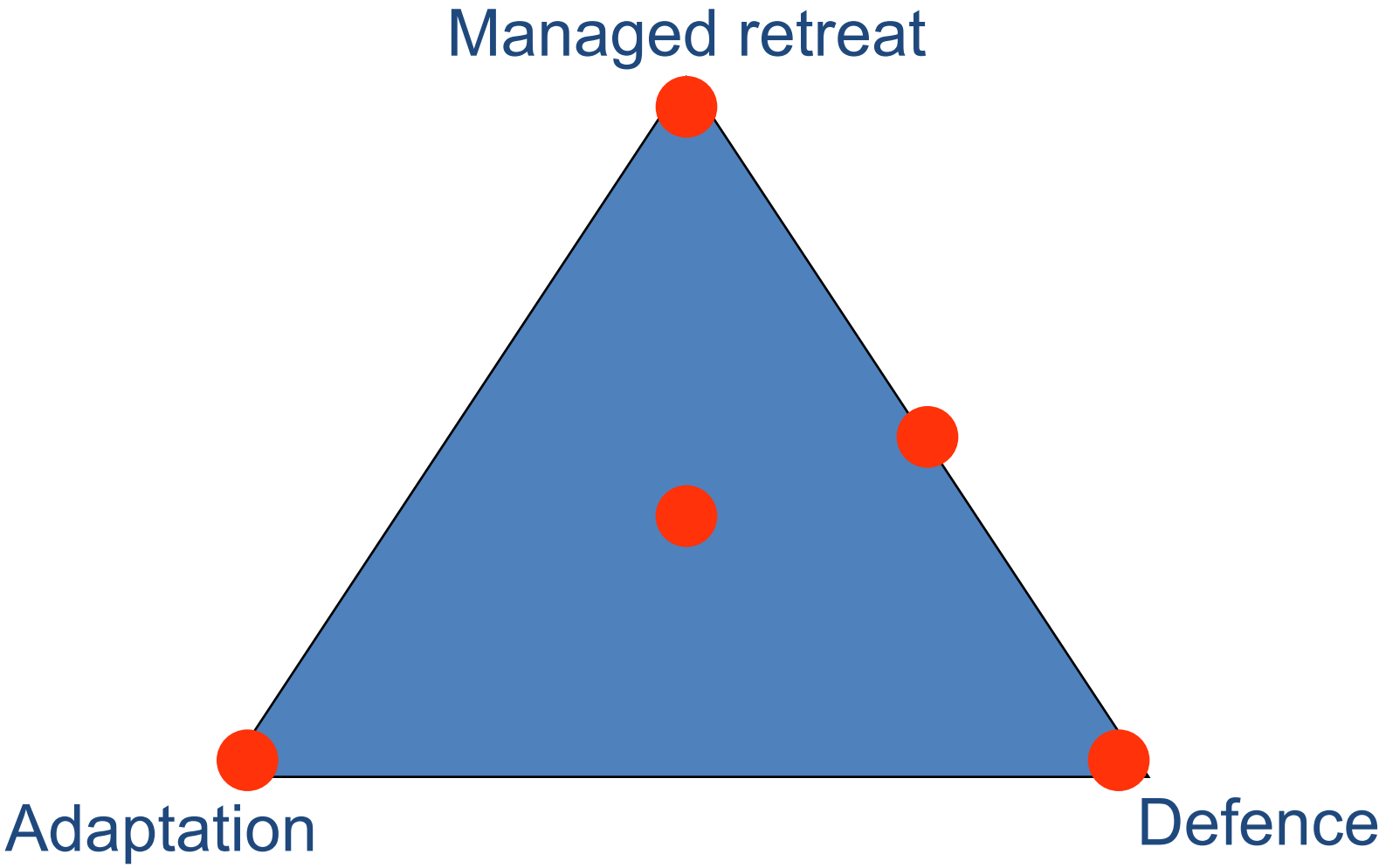
Quante file di ombrelloni metterà mio nipote?

E’ solo un problema della «mia» famiglia;
o è un problema della «mia» comunità!

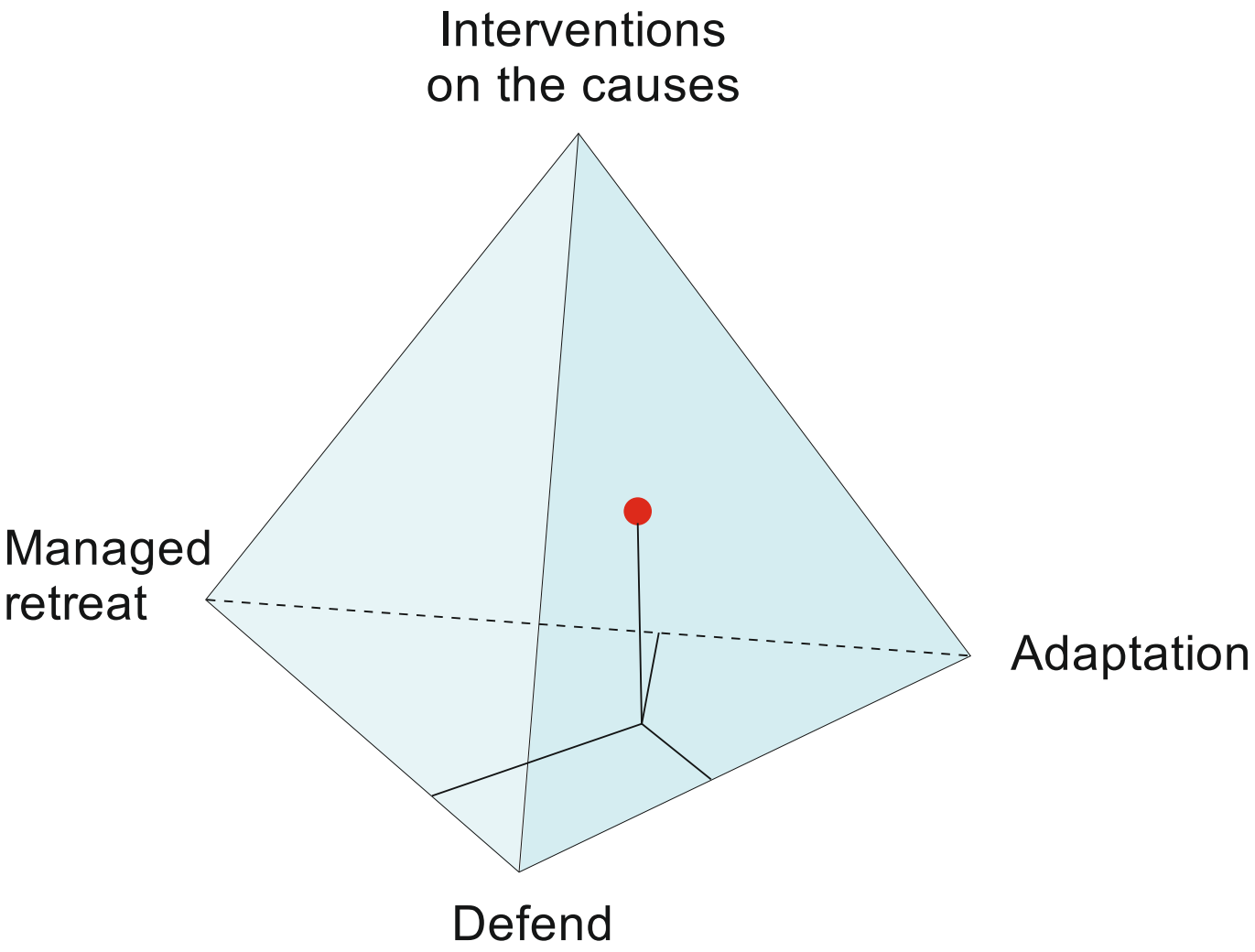

Defence


Adaptation


Managed retreat



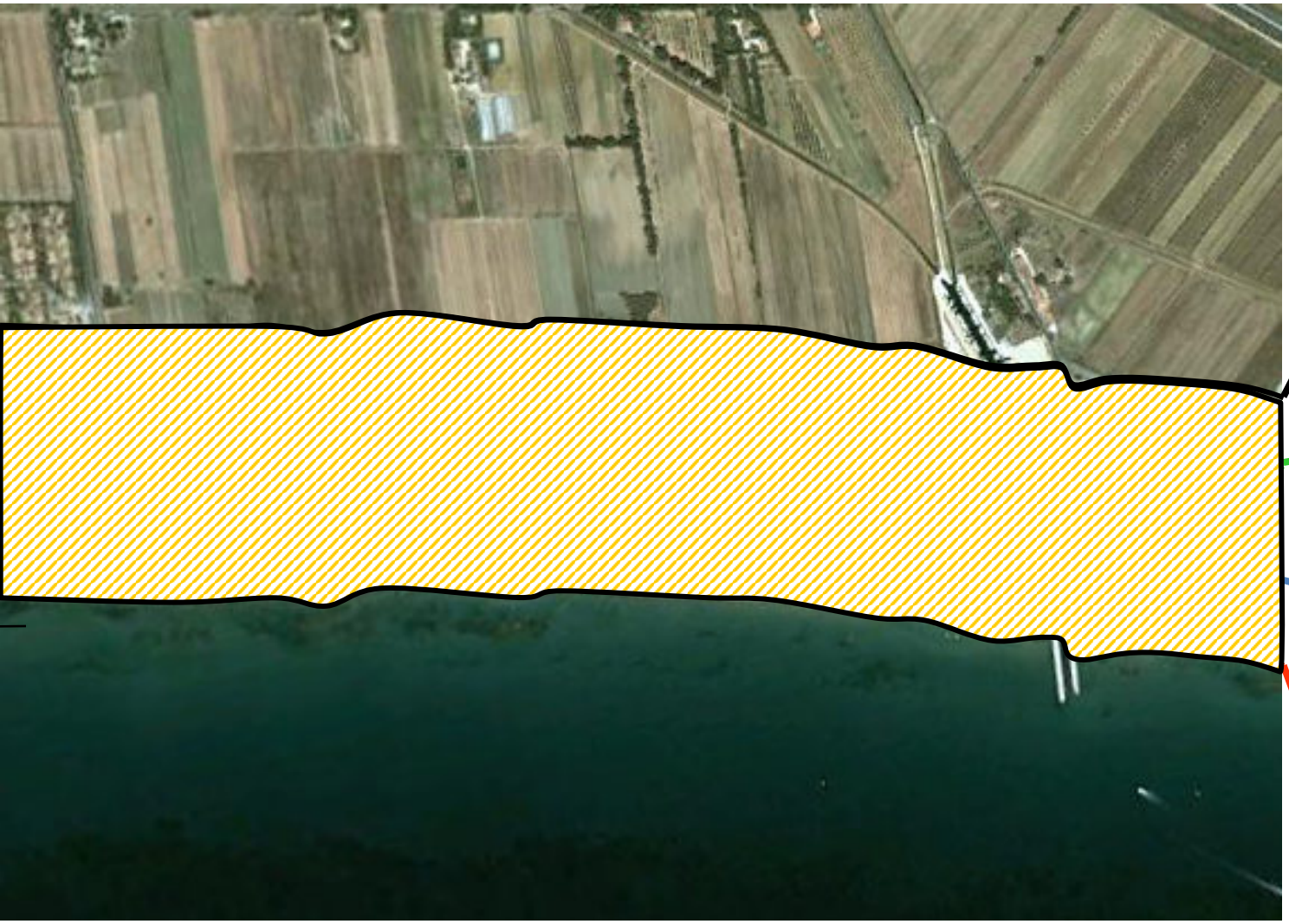
Criteri di gestione del problema


Interventions
on the causes
Managed
retreat
Adaptation
Defend

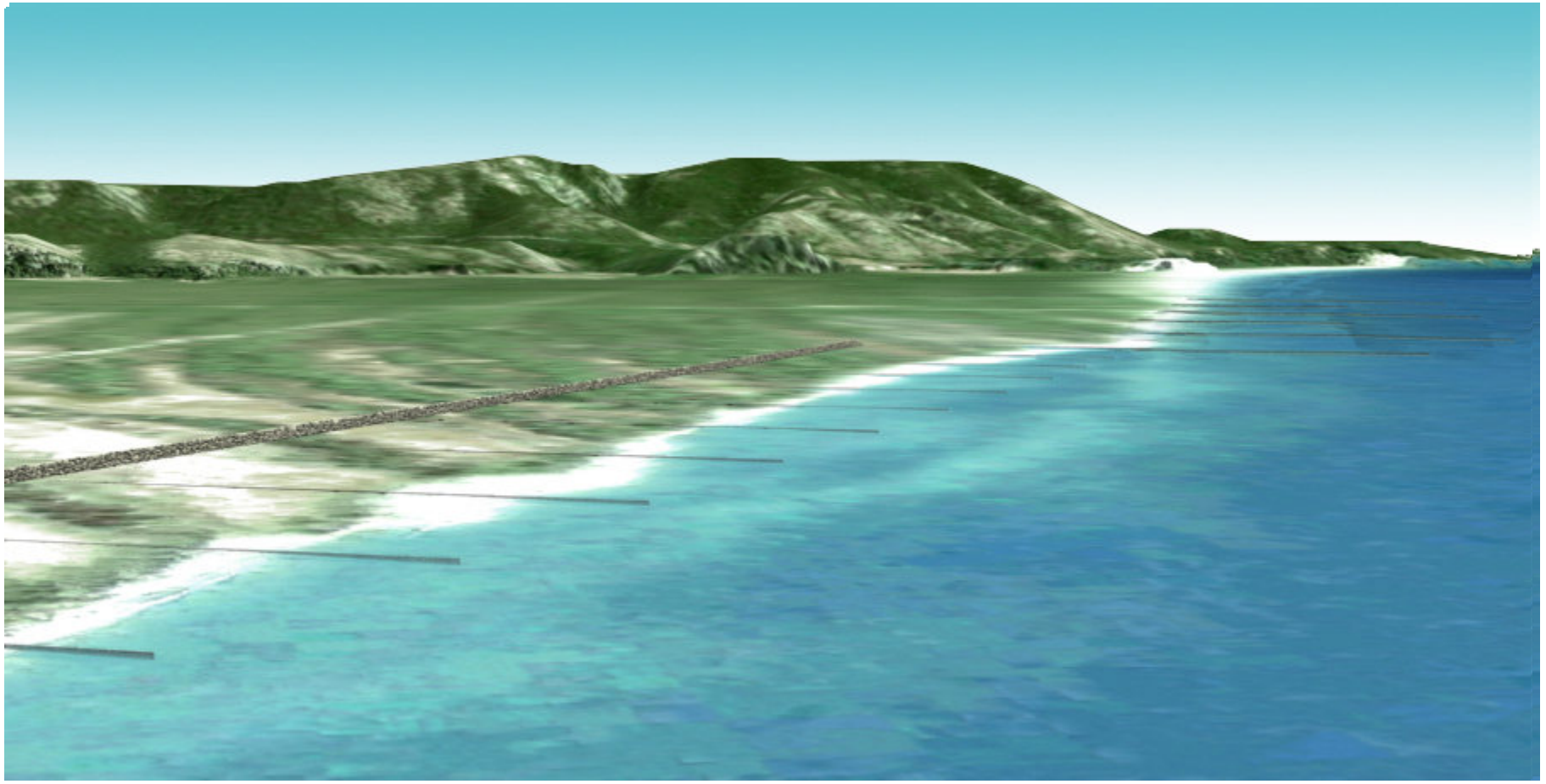
Innalzamento del lvello del mare (globale)

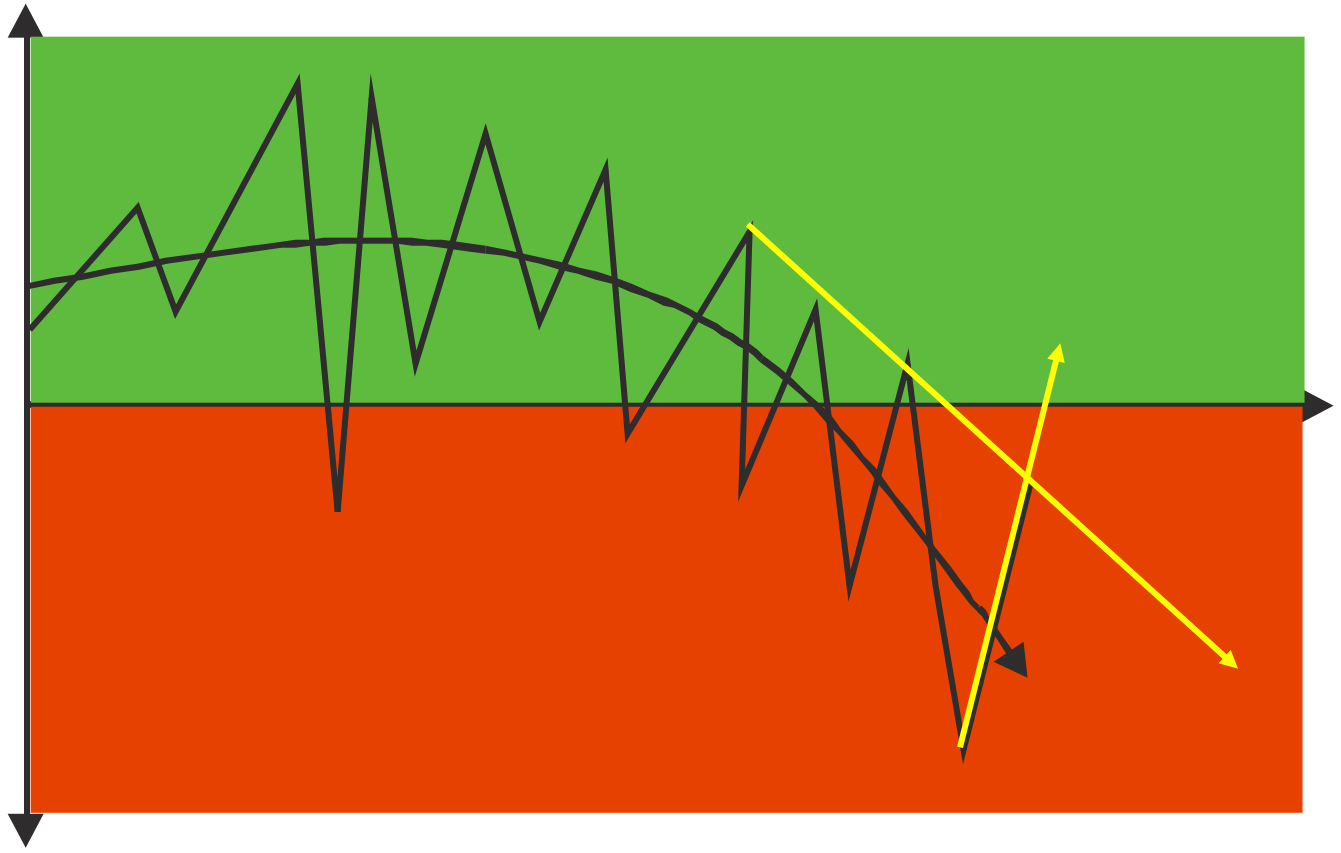
Riduzione dell’input sedimentario (regionale)

Interruzione del trasporto sedimentario (locale)


3 mareggiate estreme consecutiva
Innalzamento del Livello del Mare
Tasso di erosione x 100yrs
Linea di riva attuale

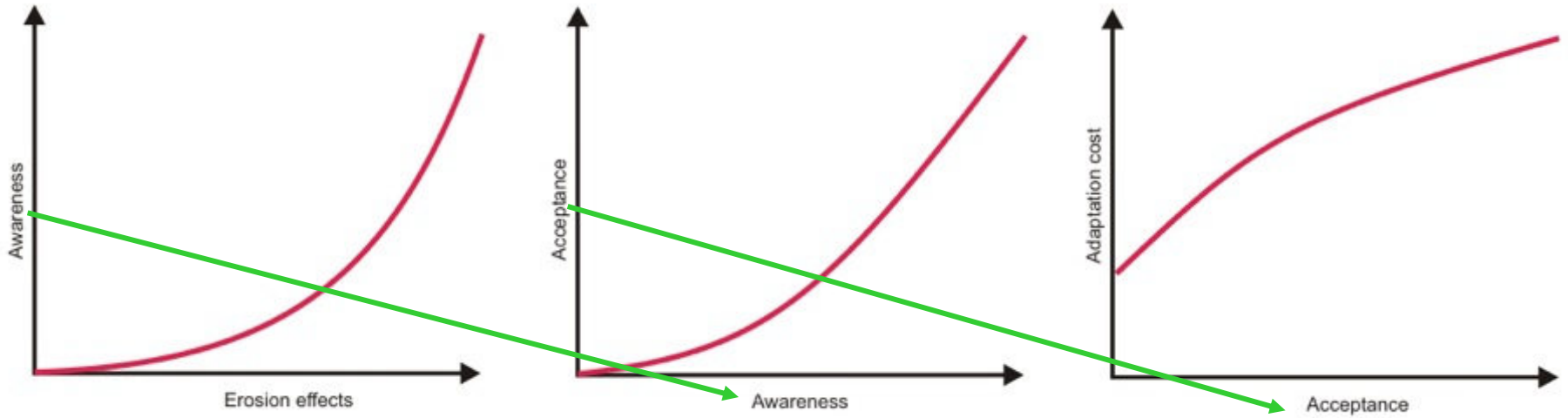
10 m/anno
2 km





Decision making under deep uncertainty

Making decisions when it is difficult or impossible to make quantitative estimates of the probabilities of alternative future conditions


Awareness
Erosion effects
Acceptance
Awareness
Adaptation cost
Acceptance

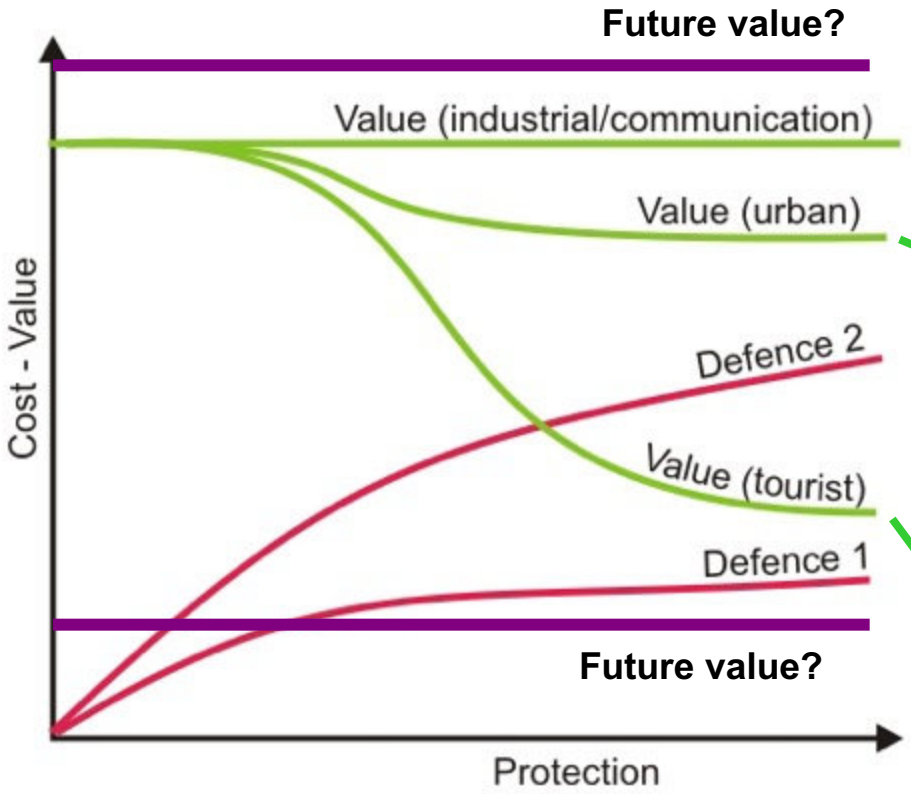

Future value?
Value (industrial/communication)
Value (urban)
Defence 2
Value (tourist)
Defence 1
Future value?
Cost - Value
Protection

Photo: Jess Walker

Physical aspects

Data availability and reliability
Model reliability
Future data and models will produce different results?

Technical aspects

Present solutions: not suited to solving the problems!
Faith in science: future technology will be more effective?

Economic aspects

Present value
Future value

Present economic resources (low!)
Future economic resources (lower?)

Social aspects

Stakeholders' present expectations
Stekeholders' awarenes

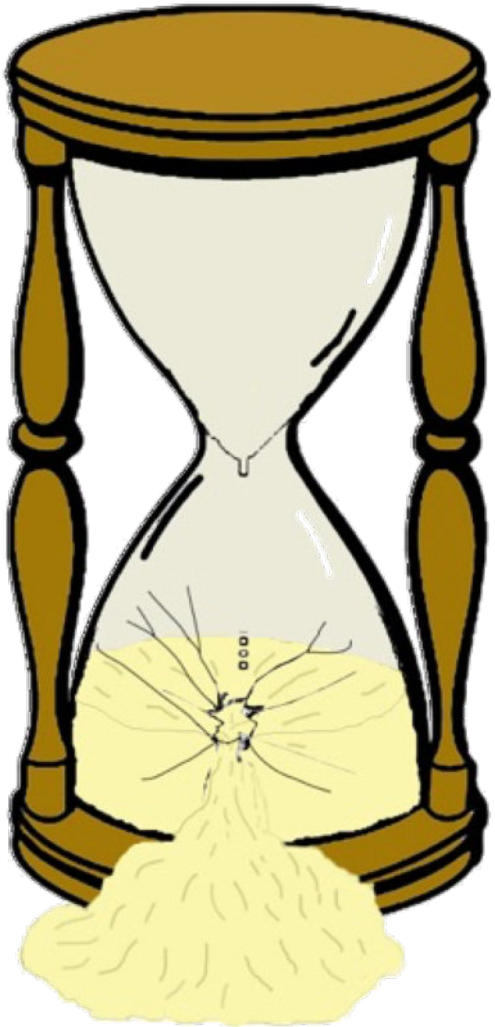
Political aspects

Clearing hous of the contrasting interests/needs
No short time political reward of long-term projects

La clessidra si è rotta

Perde sabbia e nessuno la ricarica

Il tempo delle spiagge è finito!



Anche io mio!

Grazie!