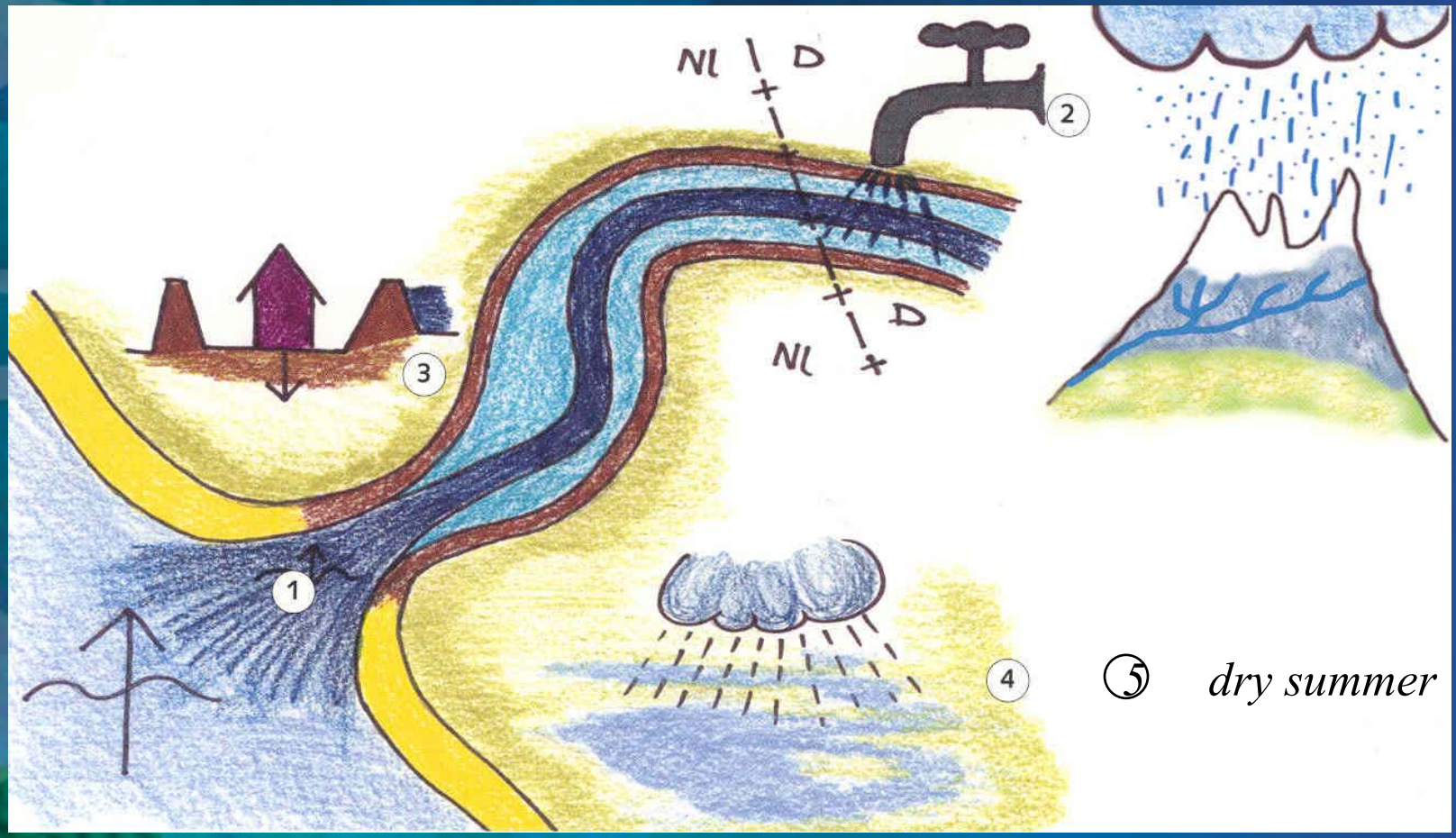
Content

1. Climate change, why worry?
2. Impact on the coastal area?
3. How to deal with increasing pressure on the coast?

1. Climate change, why worry?

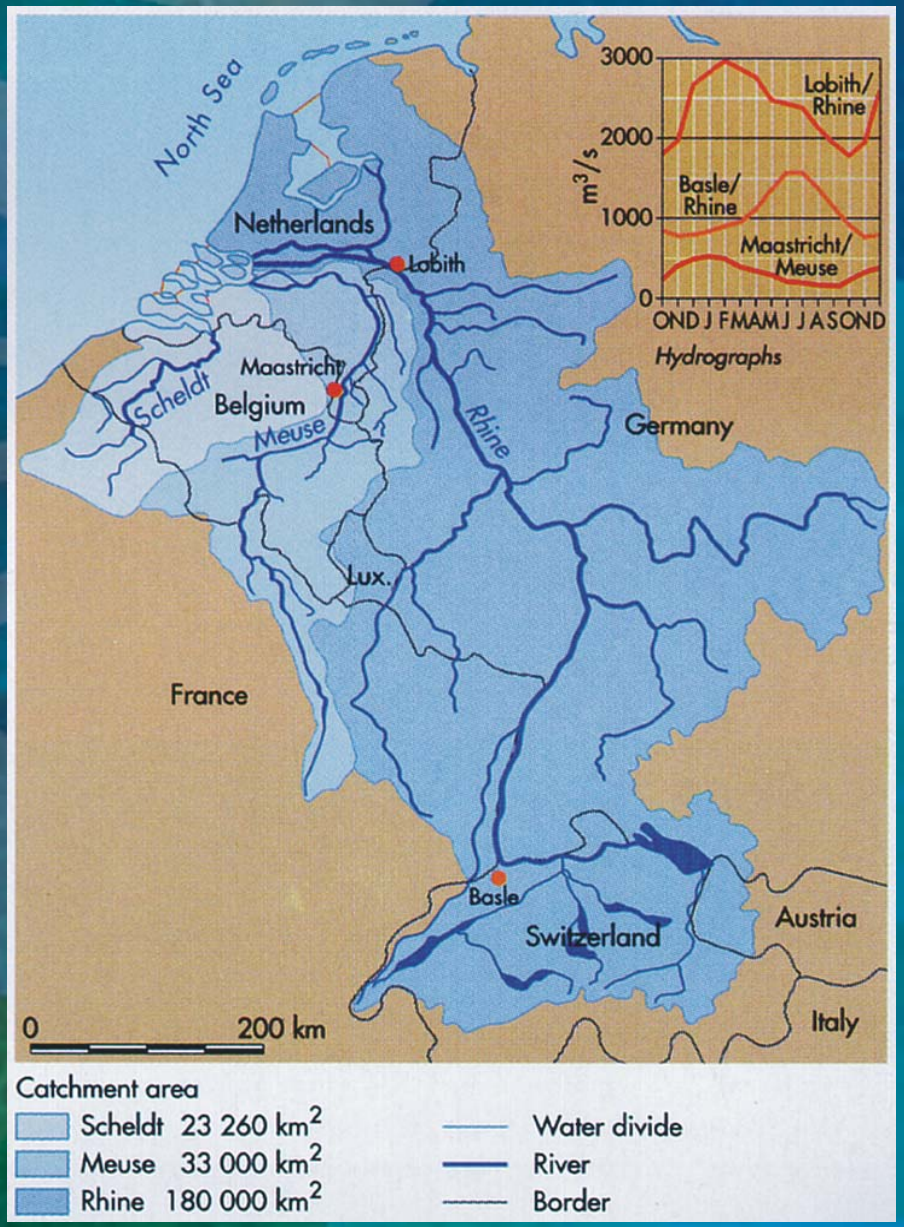
Comfortable Mediterranean climate?

Expected climate changes (1), (2), (4), (5):



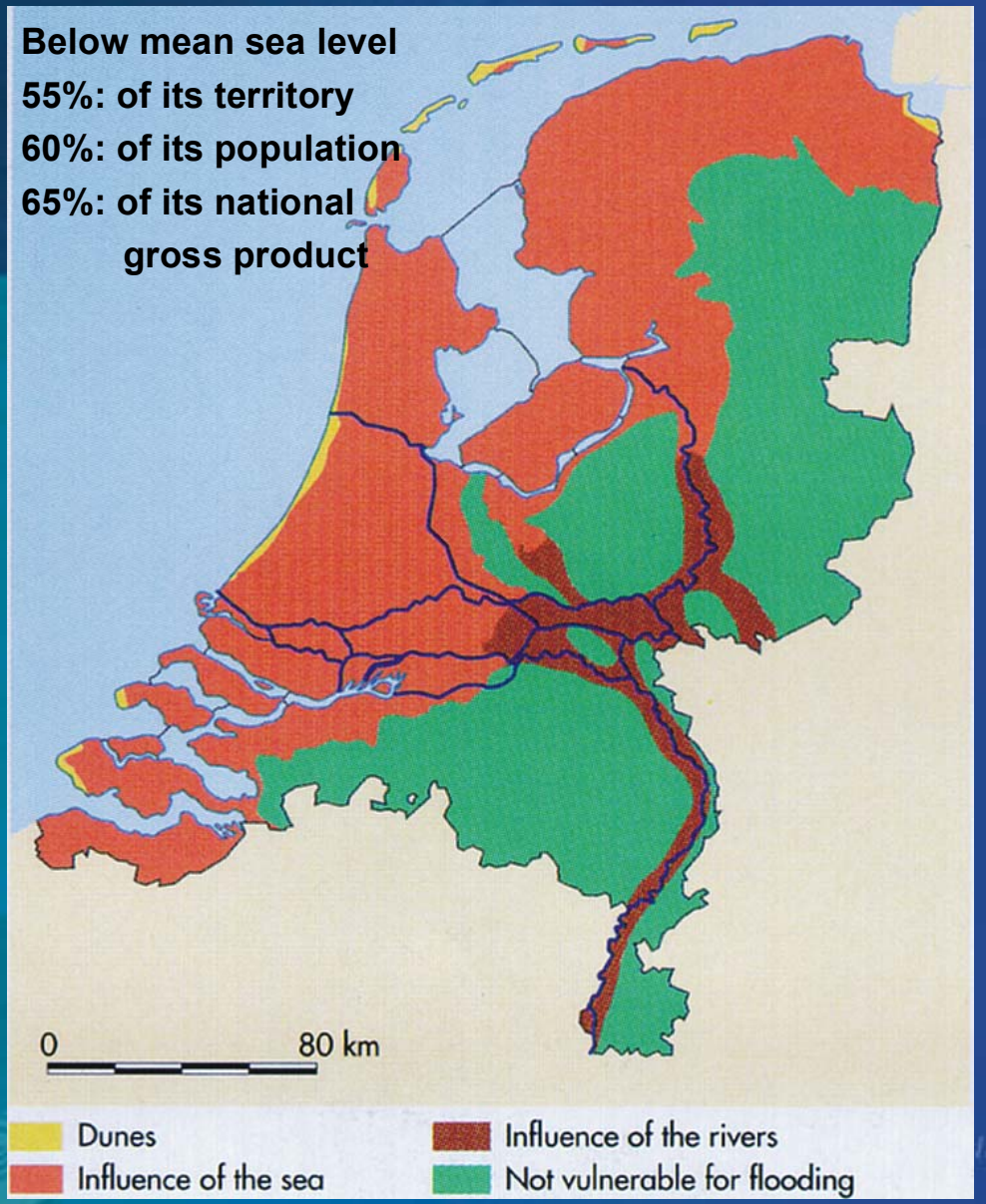
- (1) acceleration of sea level rise and (possibly) increased storminess
- (2) increase of extreme river inflow
- (4) and (5) more extremes (both wet and dry periods)

Catchment areas of the rivers Rhine, Meuse and Scheldt



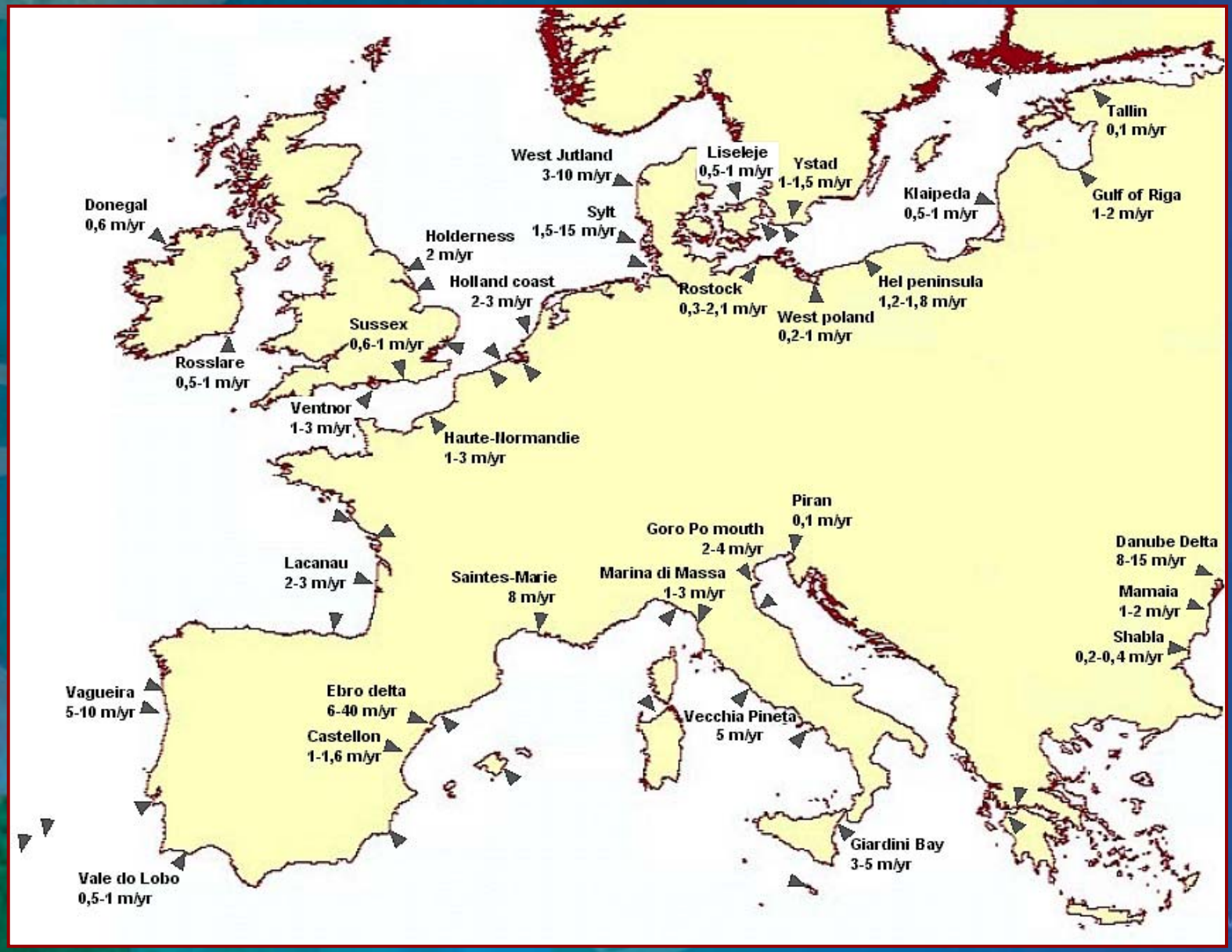
The vulnerability for flooding from rivers and sea

Below mean sea level
55%: of its territory
60%: of its population
65%: of its national gross product



RISK II: Climate change (especially sea level rise) may enforce local coastal erosion problems

EUROSION: coastal erosion ‘hot spots’ in Europe



Coastal erosion takes place at 25 % of the European coast

a natural phenomenon
(as part of a dynamic coastal system), but many local problems are also induced by human interference

RISK III: coastal erosion (induced or enforced by sea level rise) may lead to loss of 'tidal flats'

Tidal flats are of high environmental value,

Three valuable, but vulnerable inter tidal area:

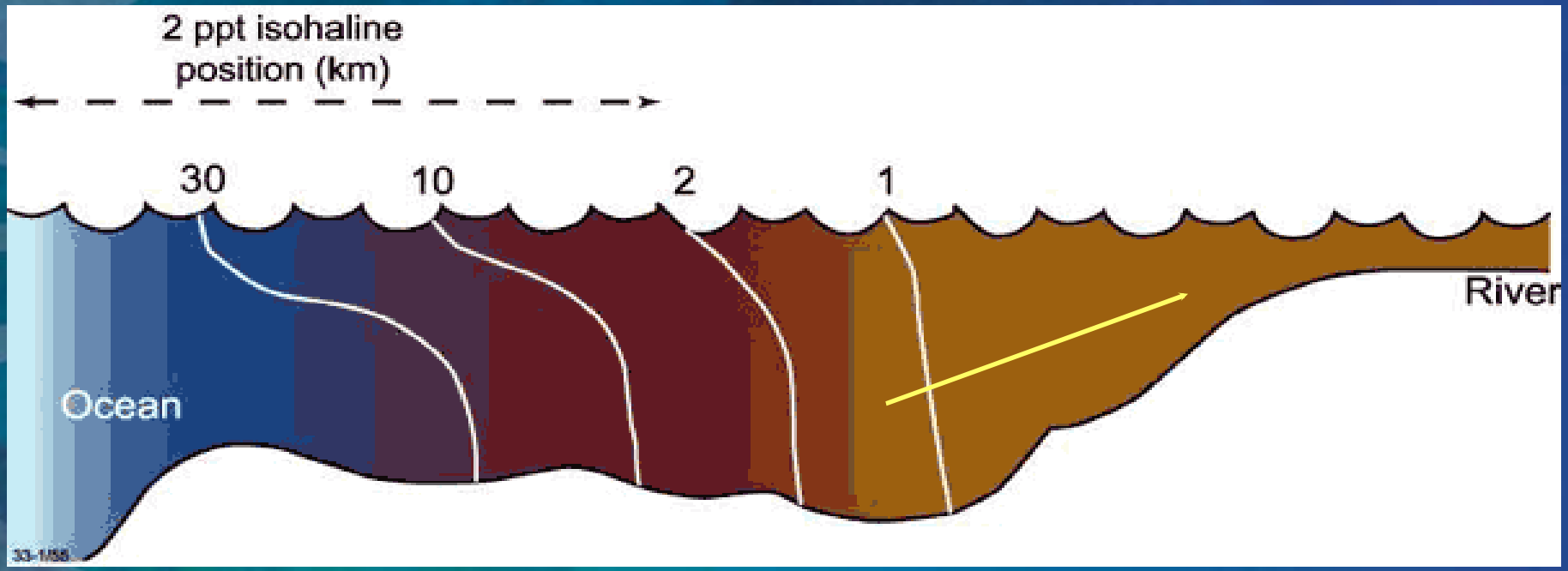
Wadden Sea
260 000 ha.

Eastern Scheldt
37 000 ha.

Western Scheldt
43 000 ha.

Bird trekking route: ‘Kanoet beach walker’

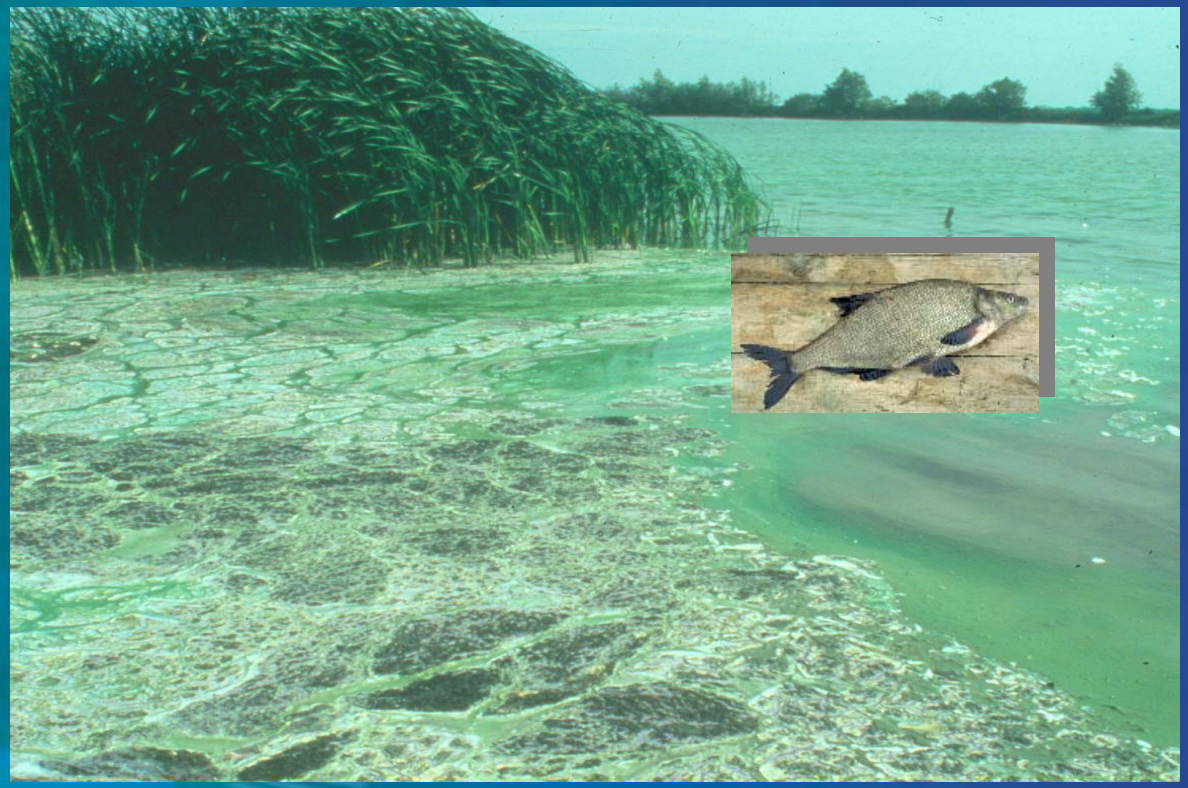
Landward intrusion of salty water during low river water levels



Spatial and temporal variability of salinity

RISK IV: (increase of occurrence of) hot dry summer period leads to:

- ***Shortage*** *of good quality drinking water for households*
- ***Shortage*** *of sweat water for agriculture*
- ***Shortage*** *of cooling water for industry (due to high water temperature)*
- *Shipping routes less accessible*
- *Worsening water quality: starvation of fish, algae bloom, ...*
- *Loss of stability of river dikes (peat/clay)*



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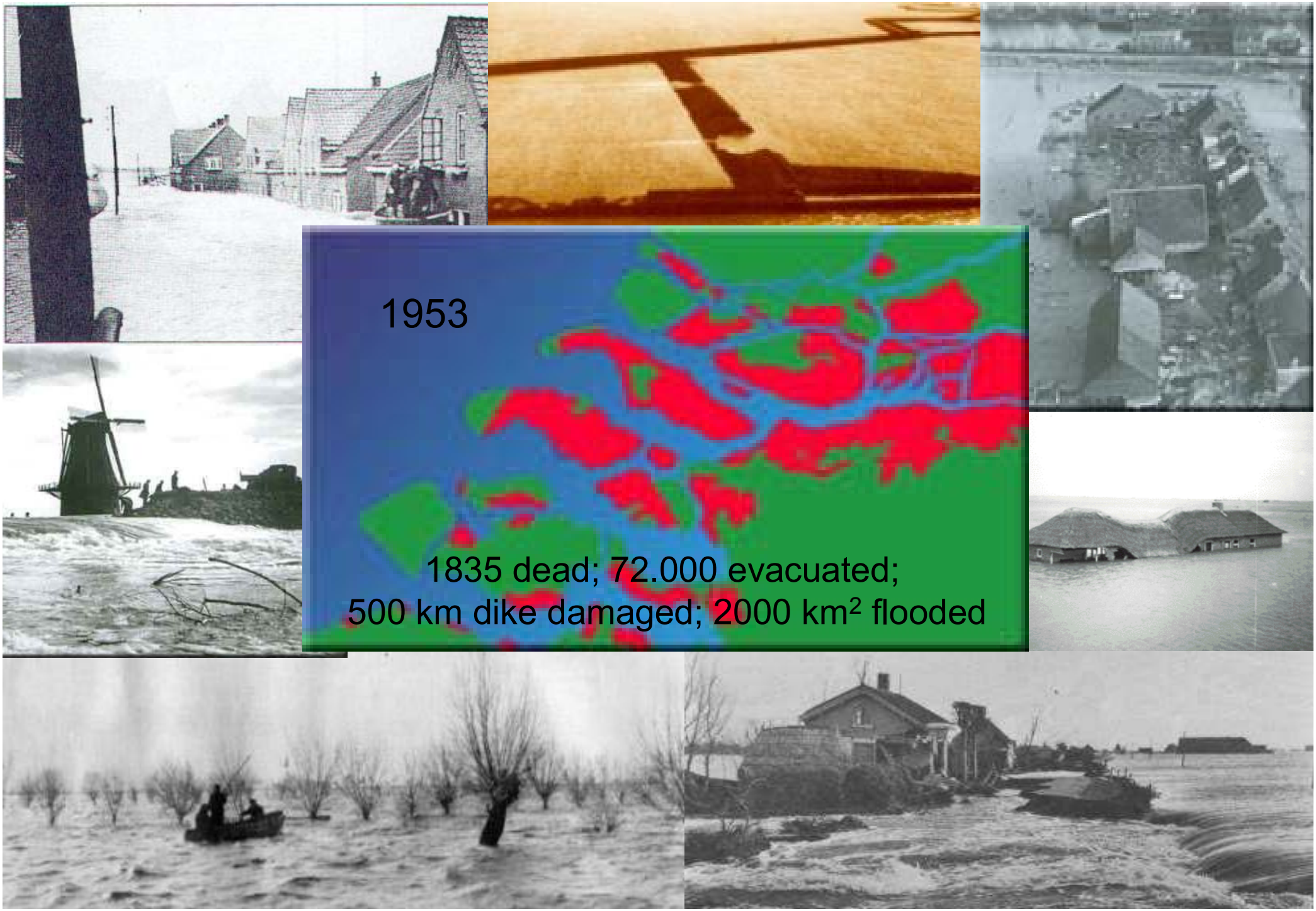
***RISK V: local abundance of water due to period of intensified rain** leads to:*

- *damage to buildings ands households*
- *damage to infrastructure*
- *damage to agriculture (crops, flower bulbs, etc.)*
- *…*

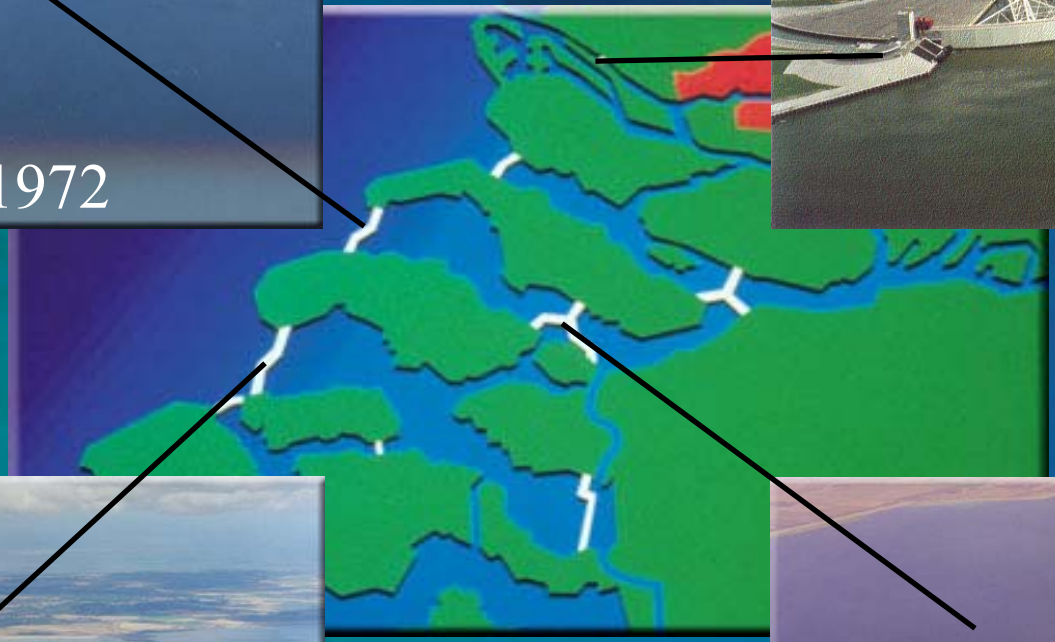
How to deal with the pressure on coastal area?

Historical context strongly influences the (possible) policy options


1953
1835 dead; 72.000 evacuated;
500 km dike damaged; 2000 km² flooded

Response: Deltaplan

(1965- 1998)



Consequences:

1. Sectoral approach (safety first) disregards other needs (water quality, ecosystem)

2. Static Delta. Adaptation becomes more and more difficult

3. People say: “government is responsible for our safety.” It is a problem of the government

Urgence

Continuation of pressure on the coast leads to increasing RISK of damage of the shorefront of coastal towns and increasing RISK of flooding of the hinterland

RISK = Frequency of occurrence X Consequences

Challenge

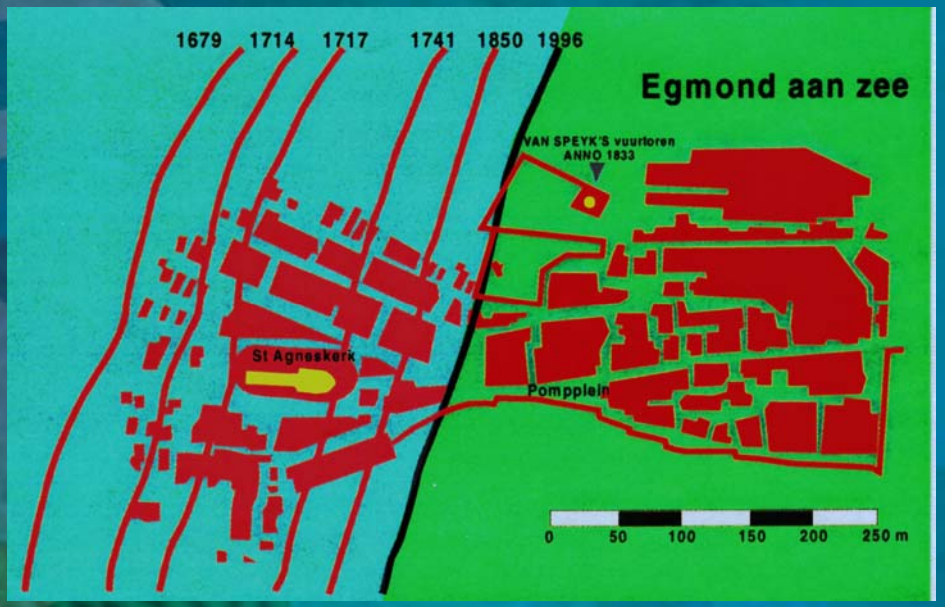
a different approach to water management:

(1) Rivers need **more space for water**;
Coast needs **more space** for future strengthening of dunes/dikes

(2) **Absolute safety doesn't exist**!
Approach is towards **acceptance of risk**. This includes thinking in terms of risk instead of **frequency of occurrence**!

“Dynamic preservation” (1990)

- no further retreat of our coastline
- compensation of coastal erosion



“Dynamic preservation”

Yearly budget:
44 million euros

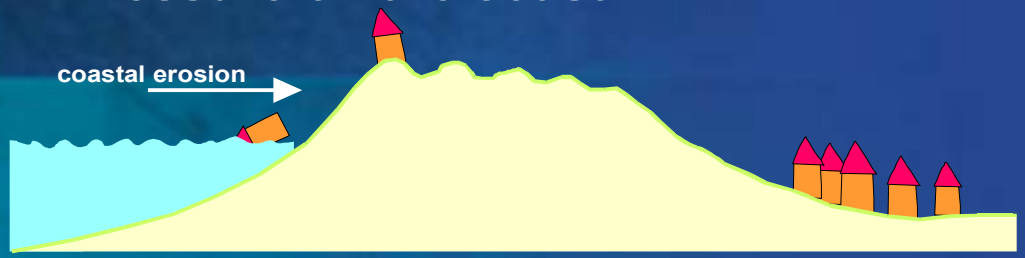
Nourishments:
12 million kubic meter
(yearly average)


Reservation of space
(spatial planning)
National Institute for Coastal and Marine Management/RIKZ
3rd Coastal Policy Document, 2000

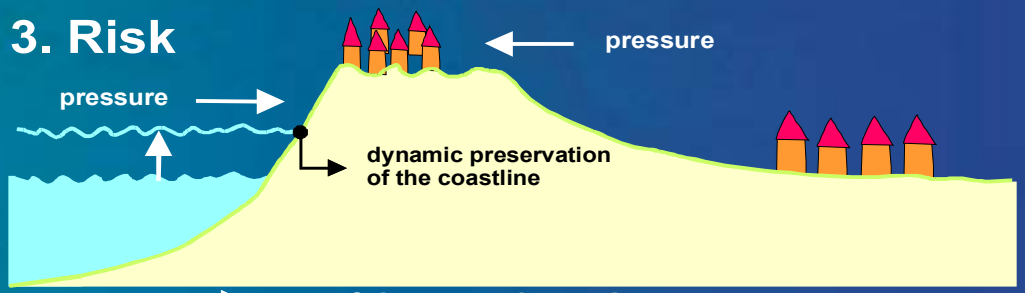
COAST

1. Past

2. Pressure on the coast



3. Risk



use of the coastal zone increases
sea level rise (coastal erosion)

4. Create space for natural processes to increase resilience