Building with Nature

ScienceCafe Wageningen - December 19, 2013

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People & landscape

From adaptation to modification

Hunter - Gatherers

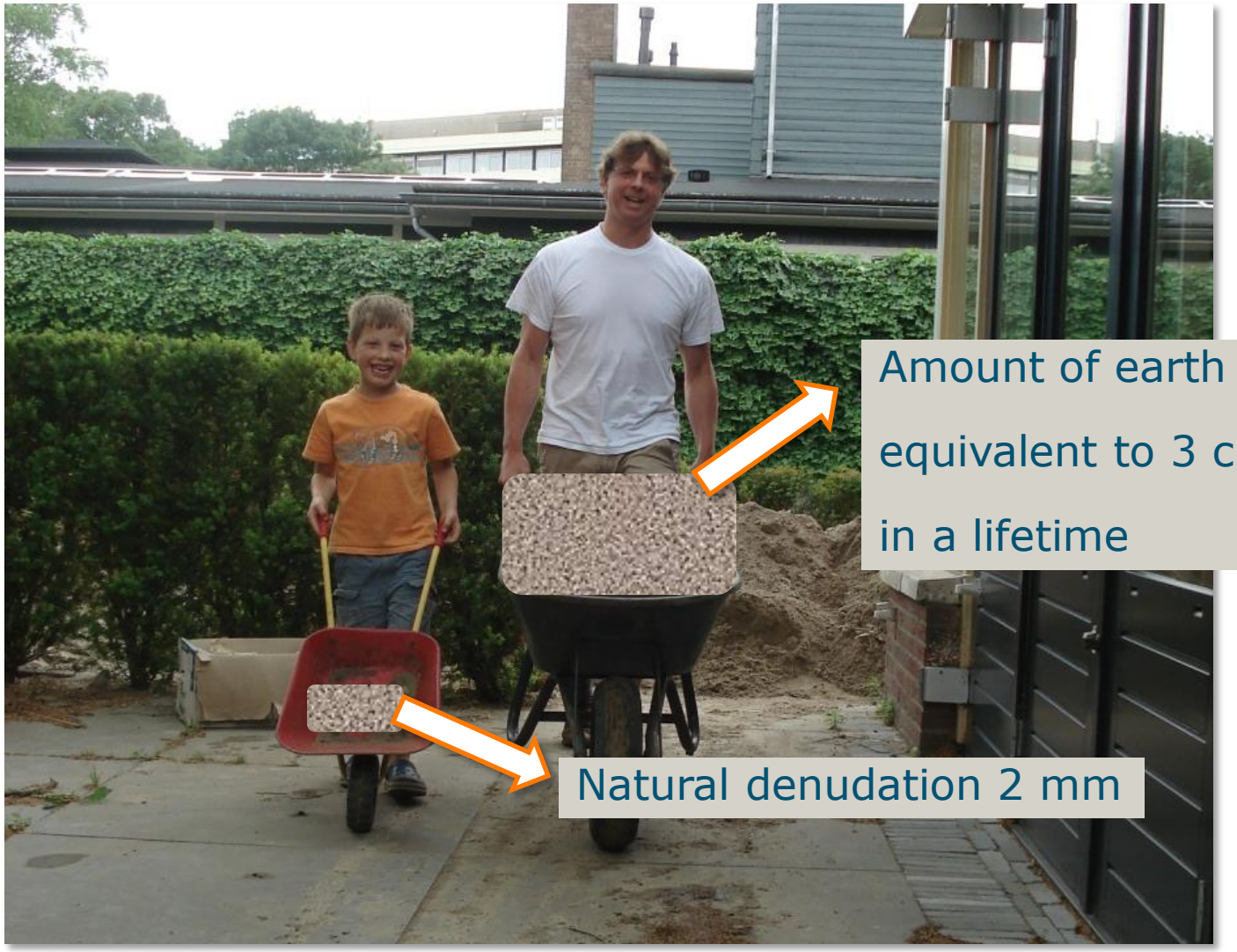
Agriculture

Redesigning the landscape

> 50 % of land surface modified by man

Hooke et al., 2012

Not only land surface…..



Societal relevance

Some urgent challenges

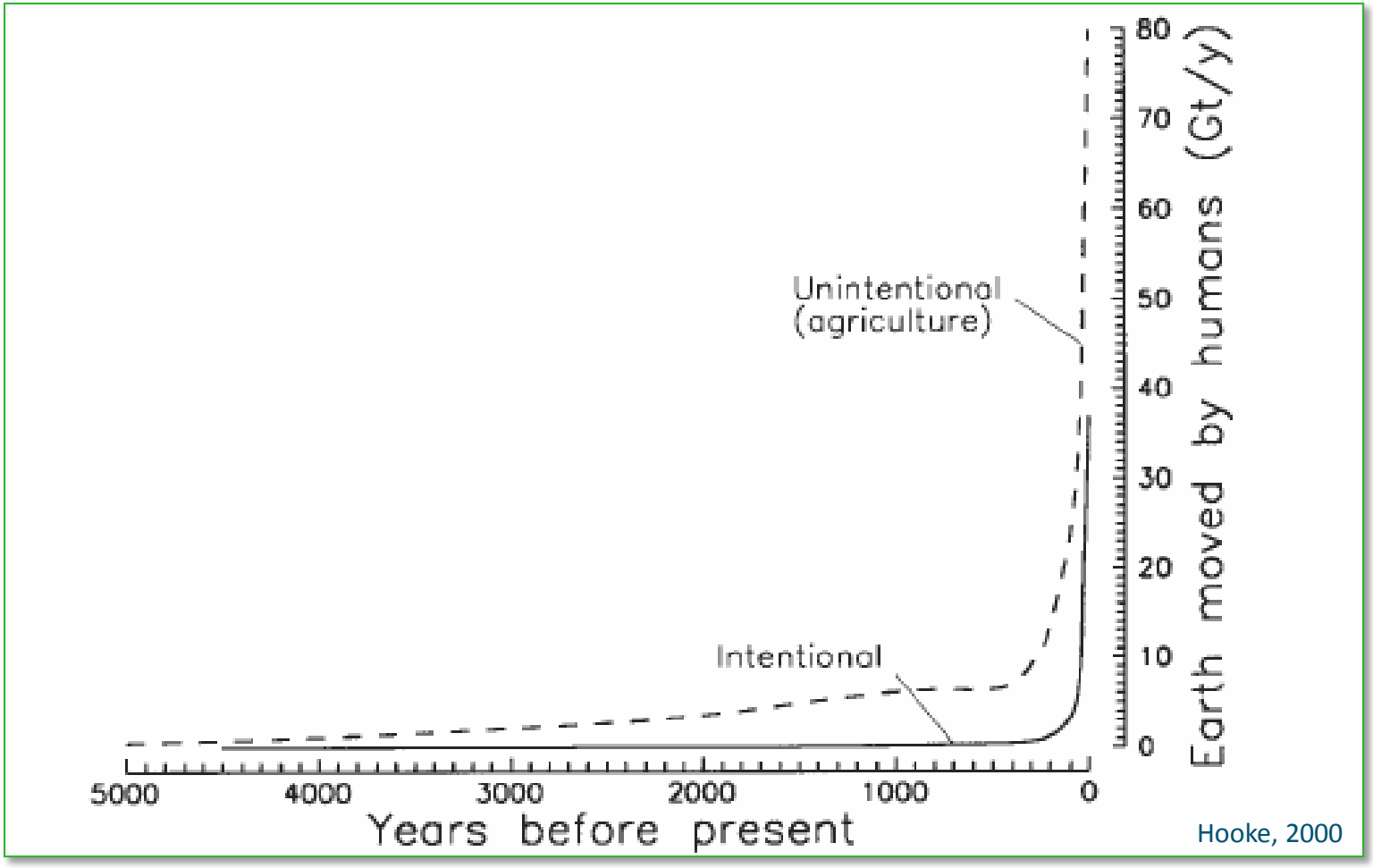
- Growing population:
  - Food, feed, fuel

- Climate change
  - Sea-level rise
  - Natural hazards

Many challenges meet in populated delta's

We do a lot

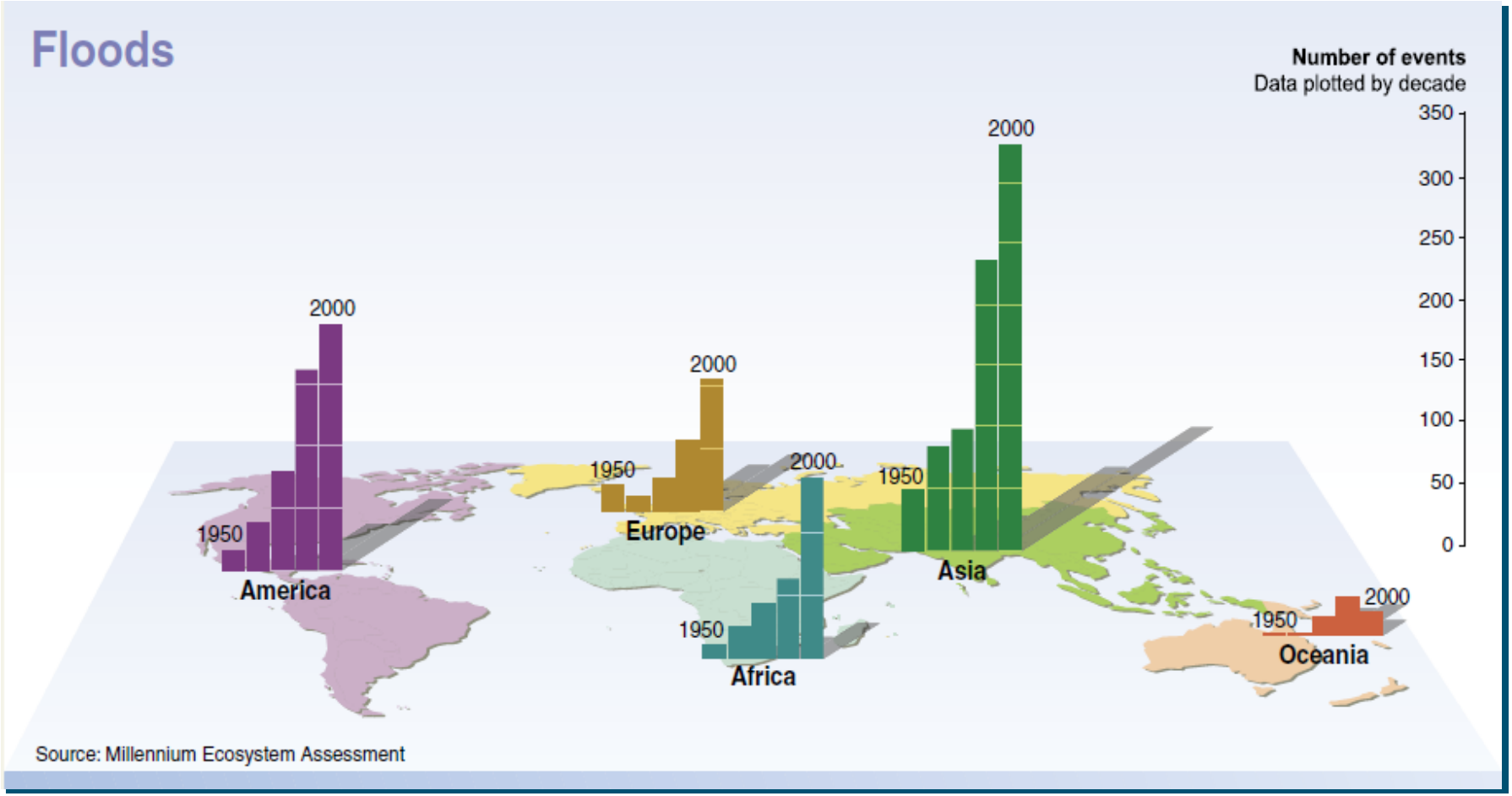
But we are not in control!



Hooke, 2000

‘Nature bites back’

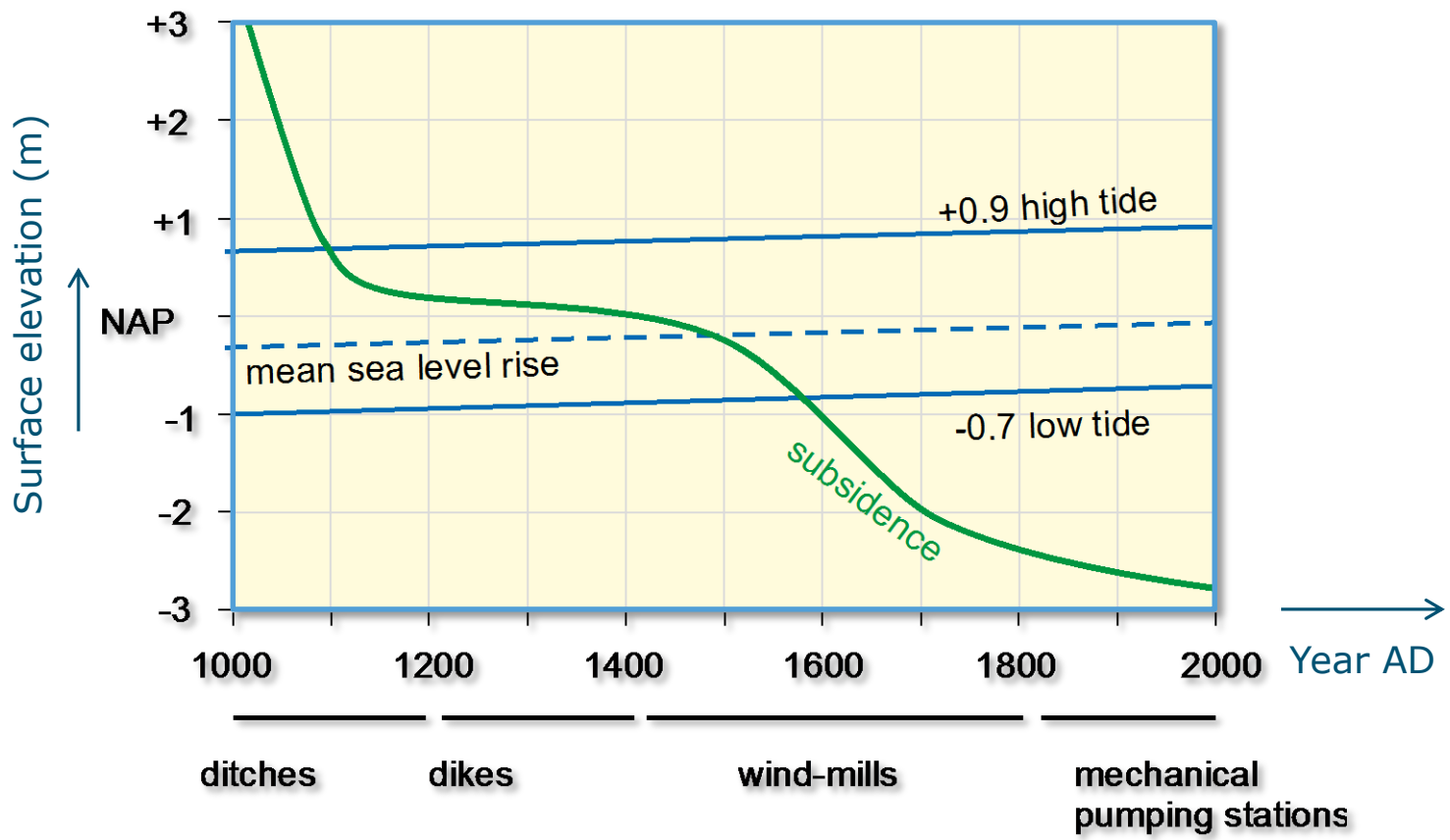
Flood events



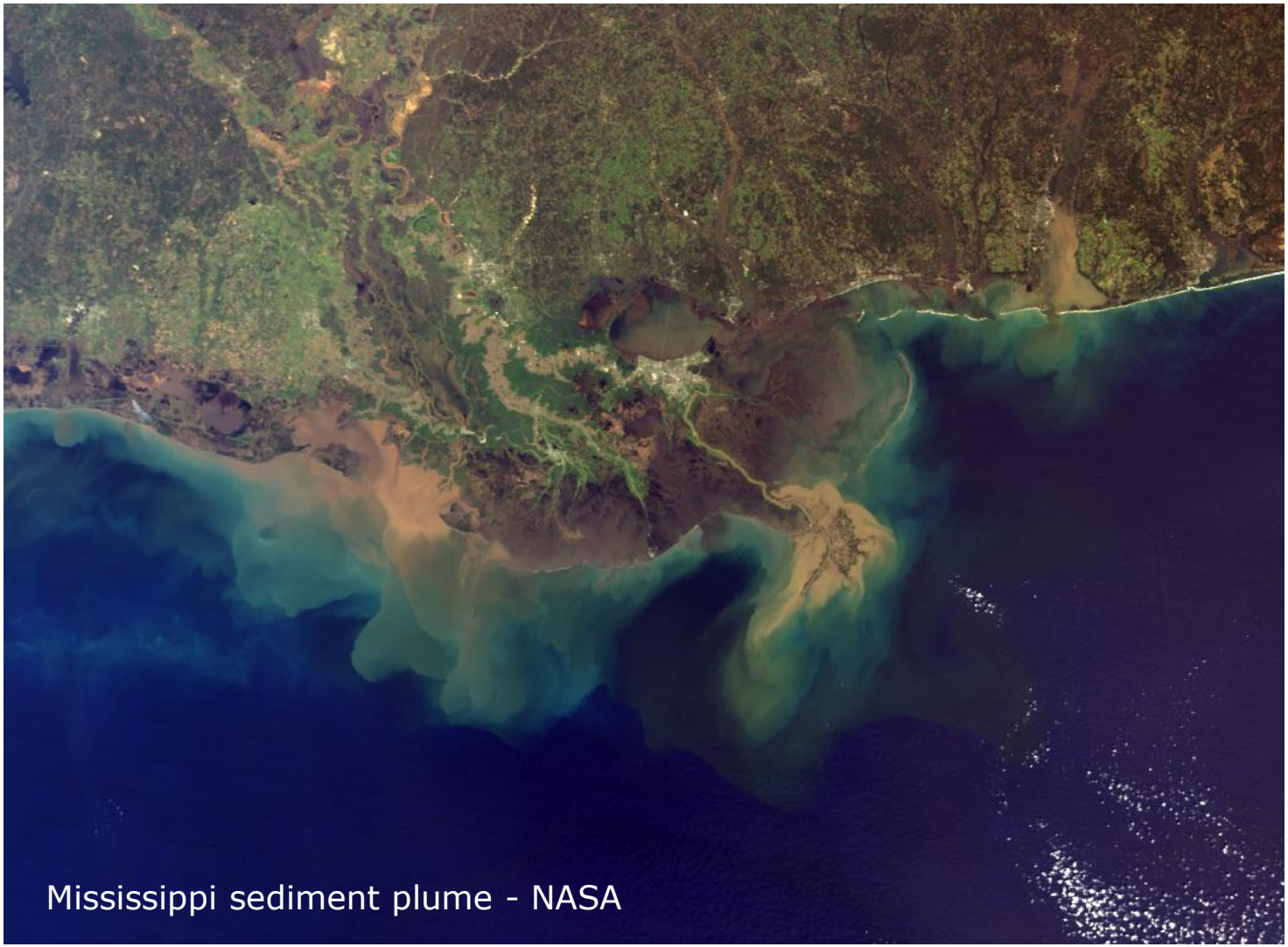
Water highway

‘Nature bites back’

Delta subsidence



Sediment is vital for a sustainable delta



Business as usual not succesfull strategy

How about nature: Ecosystem services

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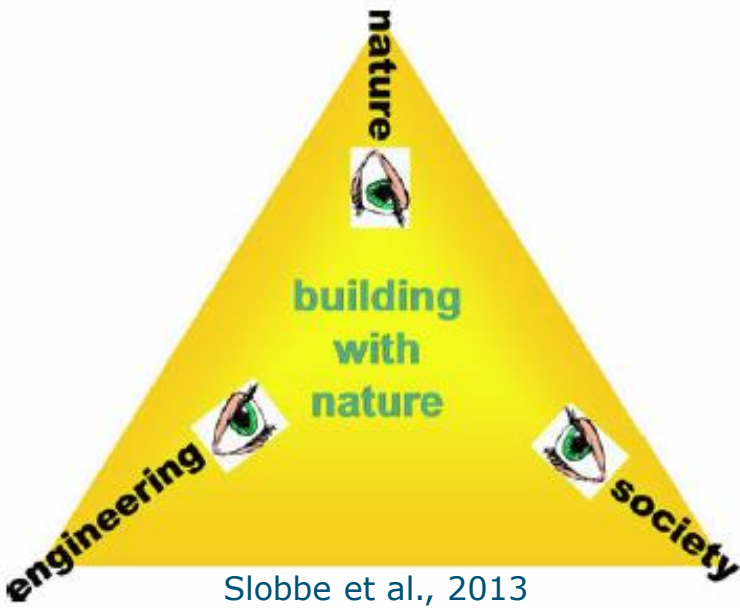
Combining human & nature:
Building with nature

- 'The intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits.'

  (Engineering with Nature; USACE)

- Don't fight nature, but join forces



Slobbe et al., 2013

Building with nature

Using sediment and/or vegetation

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Building with nature

Pro's:

- Adaptable and potentially highly economic
- Win-Win-Win
- Sustainable solution


Coastal & river management

Con's:

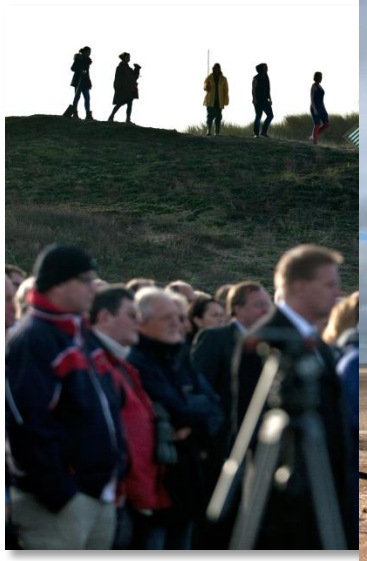
- Takes time, no quick fix
- Uncertainty in outcome & efficiency

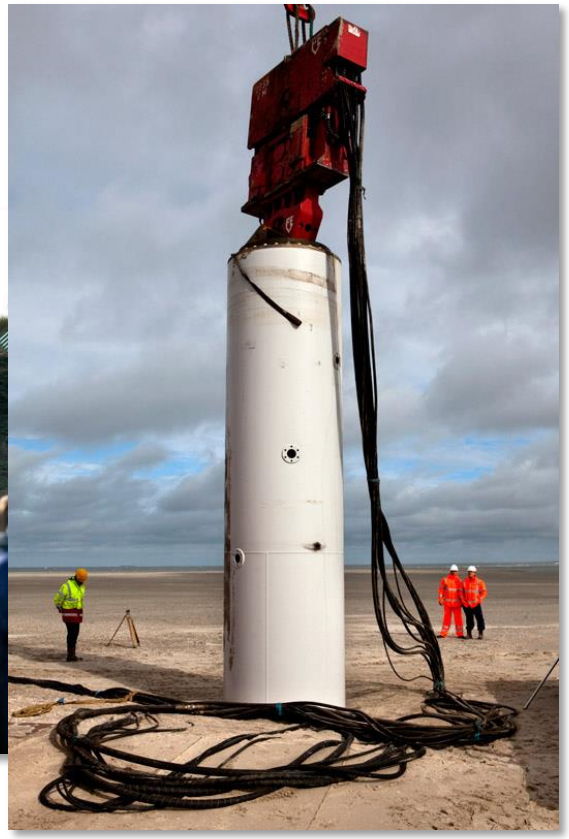

Soil regeneration

My vision on Building with nature (I)

Applying building with nature concepts in land and soil management provides the way to sustainably satisfy human needs (food & safety).

Monitoring

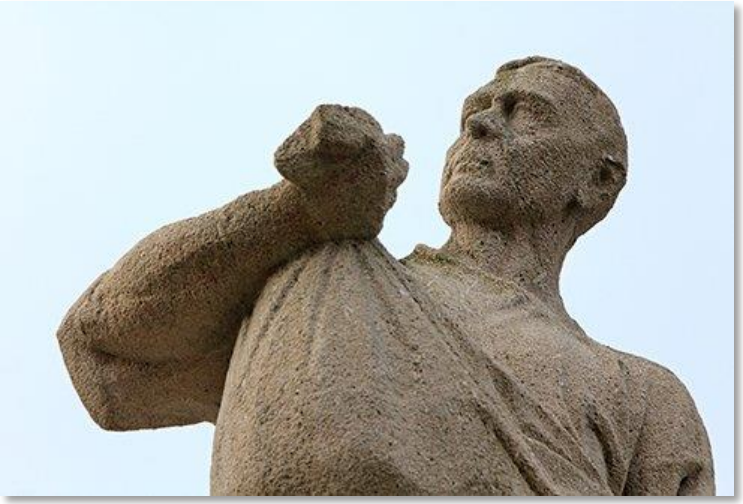




My vision on Building *with* nature (II)

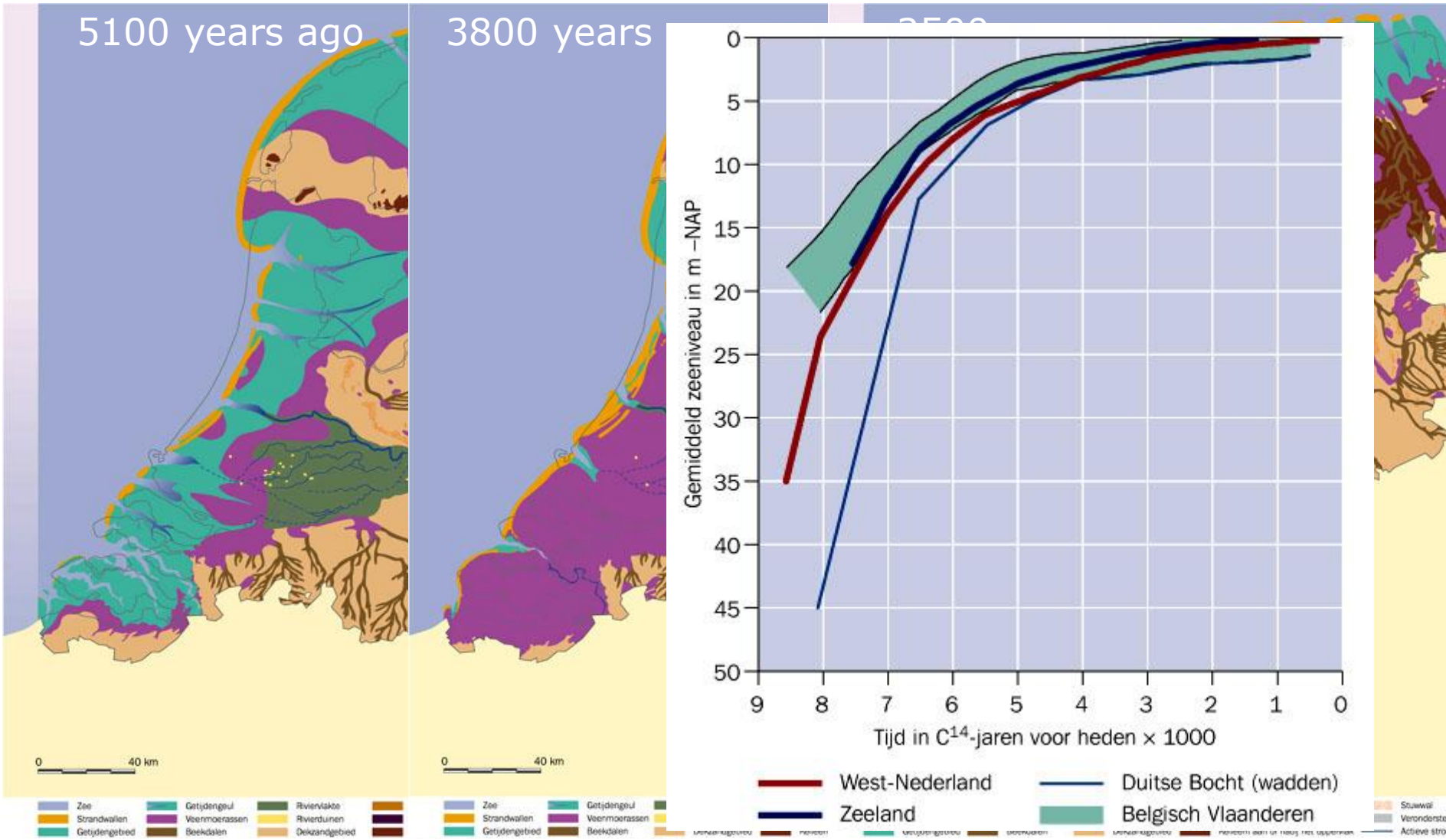
WUR mission: *'To explore the potential of nature to improve the quality of life.'*

Design of building with nature measures requires quantitative understanding of soil and landscape functioning.



The answers are under our feet…

Dynamics of natural systems



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Extreme events

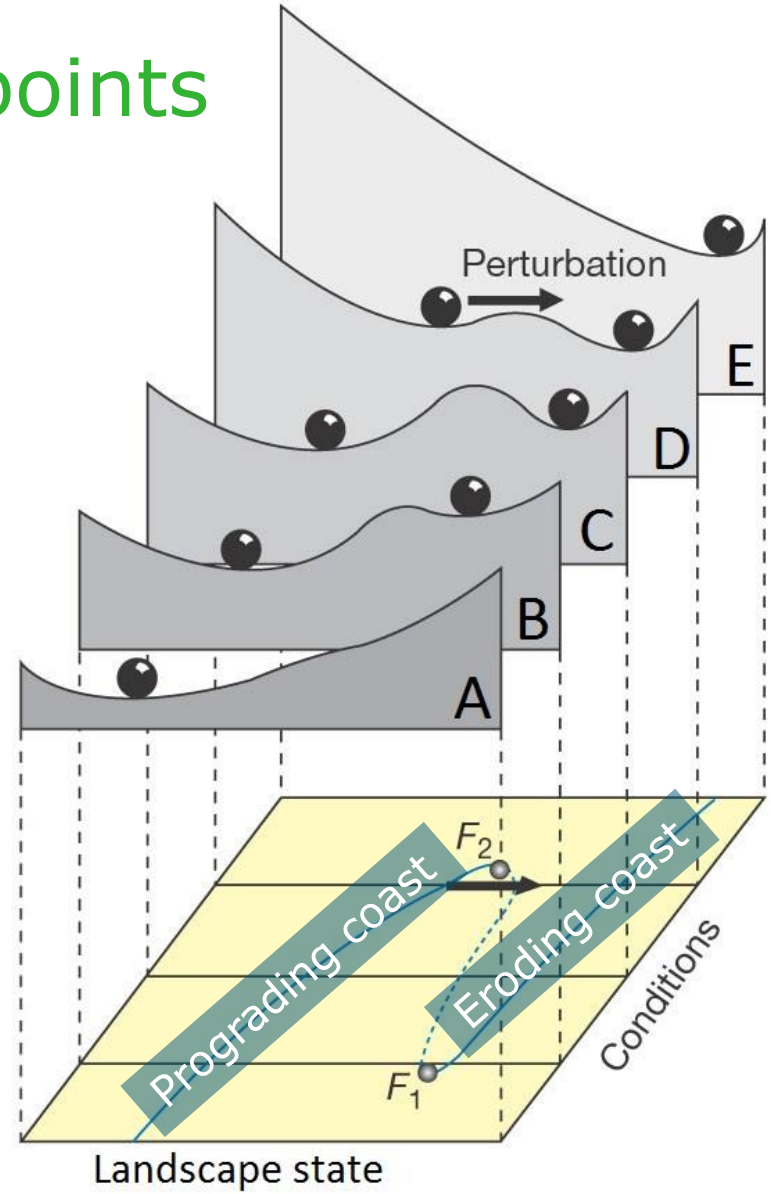
Pre and post-disaster images at Banda Aceh

Vegetation – Sediment feedback

Van Loon-Steensma & Slim, 2013

Complex systems

Stability & Tipping points



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Adapted from Scheffer et al., 2001

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