Building with Nature Indonesia

~ Opportunities for CC adaptation & mitigation ~

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Wetlands International/ Mangrove Capital
UNFCCC Bonn 2013

Cover photo from Mc Ivor et al (2012)

OUTLINE

- Mangroves for climate change adaptation
  - Science: coastal protection, sea level rise
  - Practice: Building with Nature

- (Mangroves for climate change mitigation)

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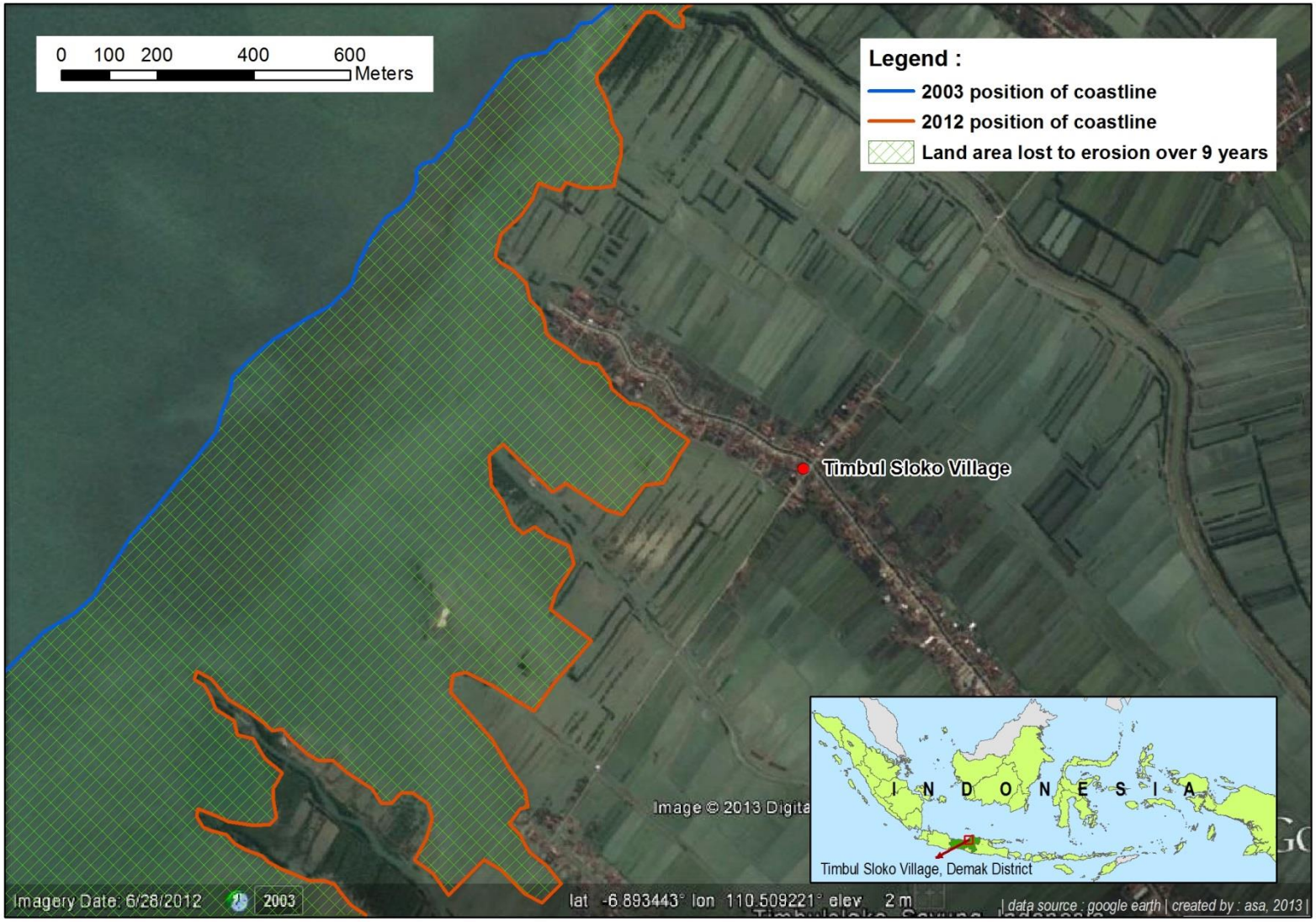
Wetlands International mission:

‘to sustain and restore wetlands, their resources and biodiversity “

MANGROVE CAPITAL partnership

When the mangroves are gone…



+ soil subsidence + sea level rise + hard infrastructure

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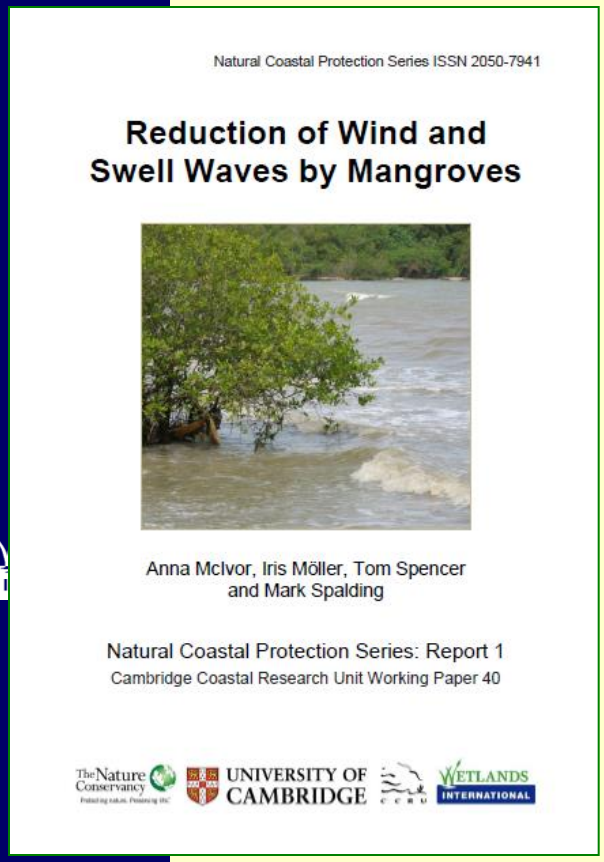
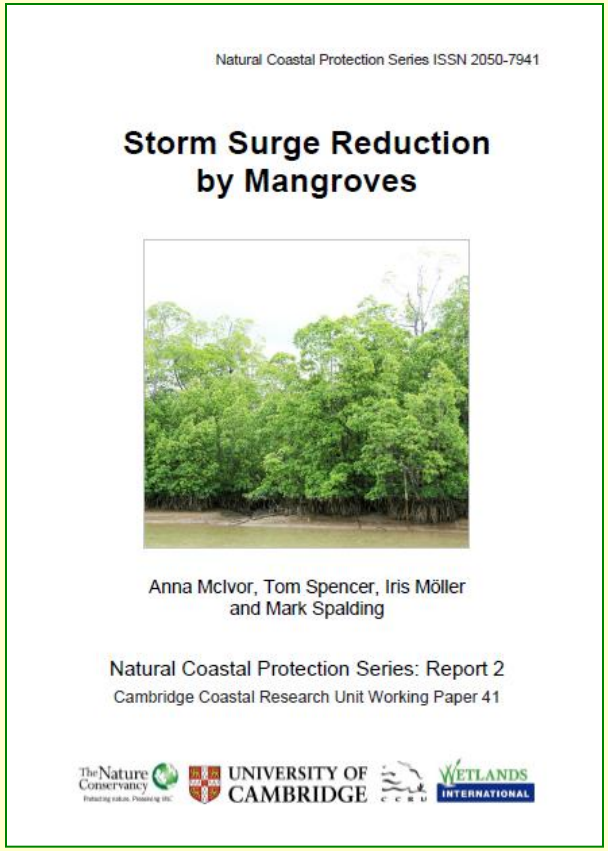
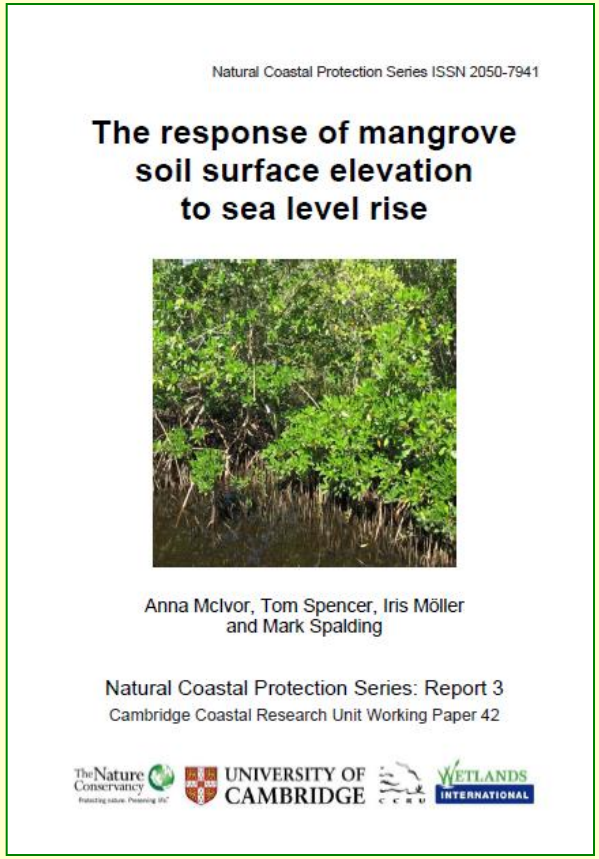
SCIENTIFIC EVIDENCE

Mangroves & climate change adaptation

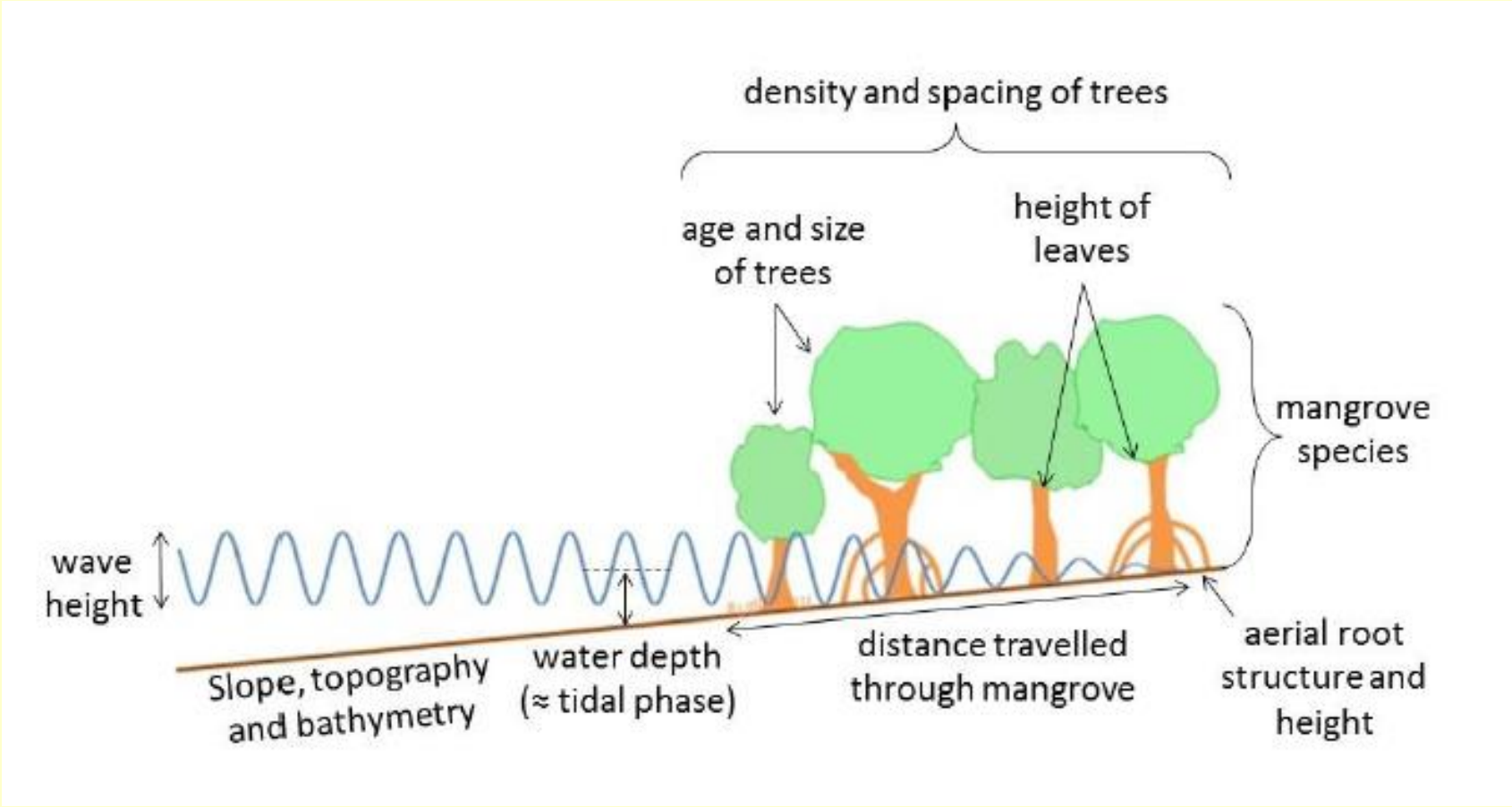
- Coastal protection
- Sea level rise







Mangroves can reduce everyday waves



.. 13 – 66 % in 100 m
.. preventing erosion

The more obstacles the better

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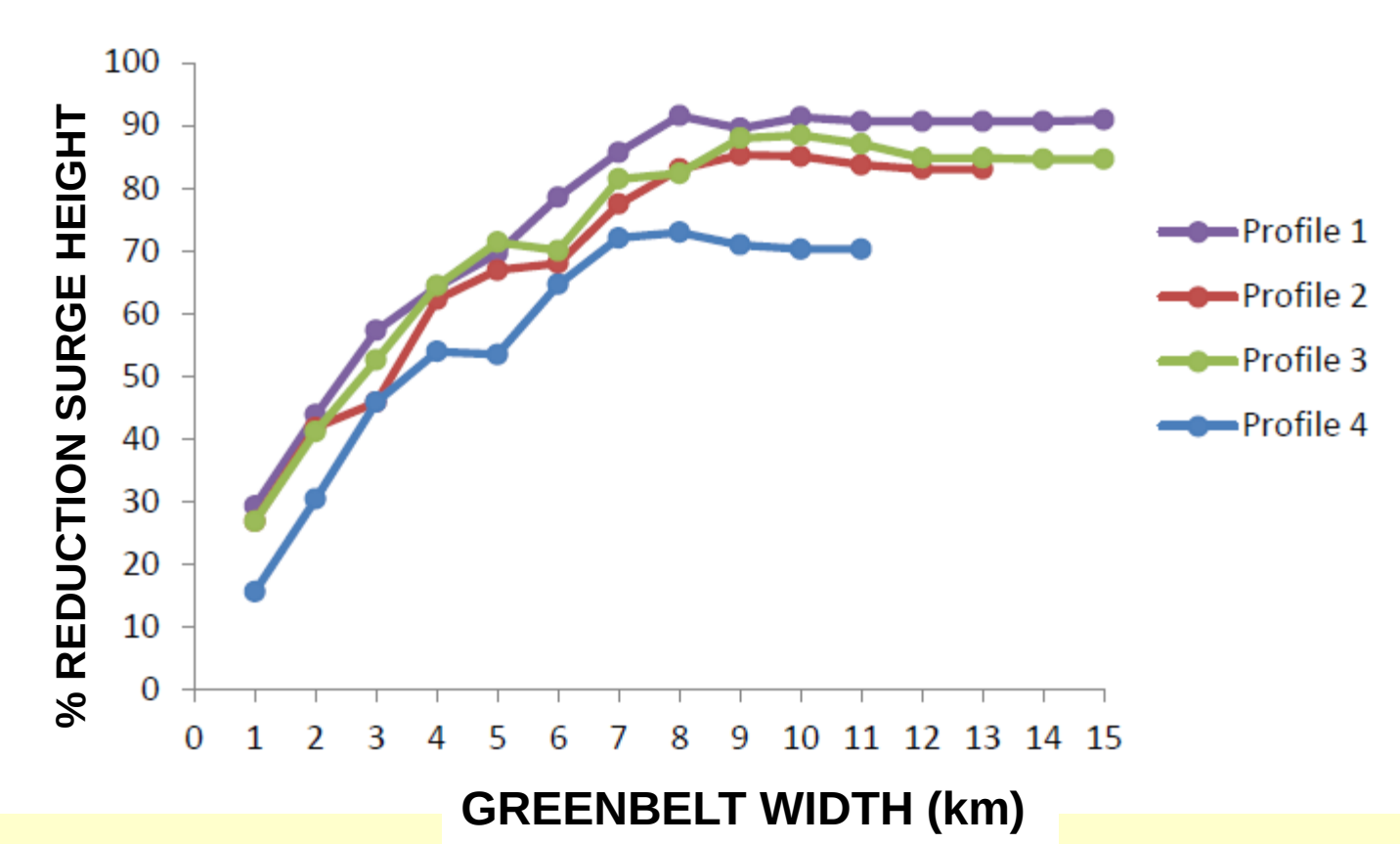
Mangroves can reduce peak water levels during storms



… but role in tsunami reduction erratic

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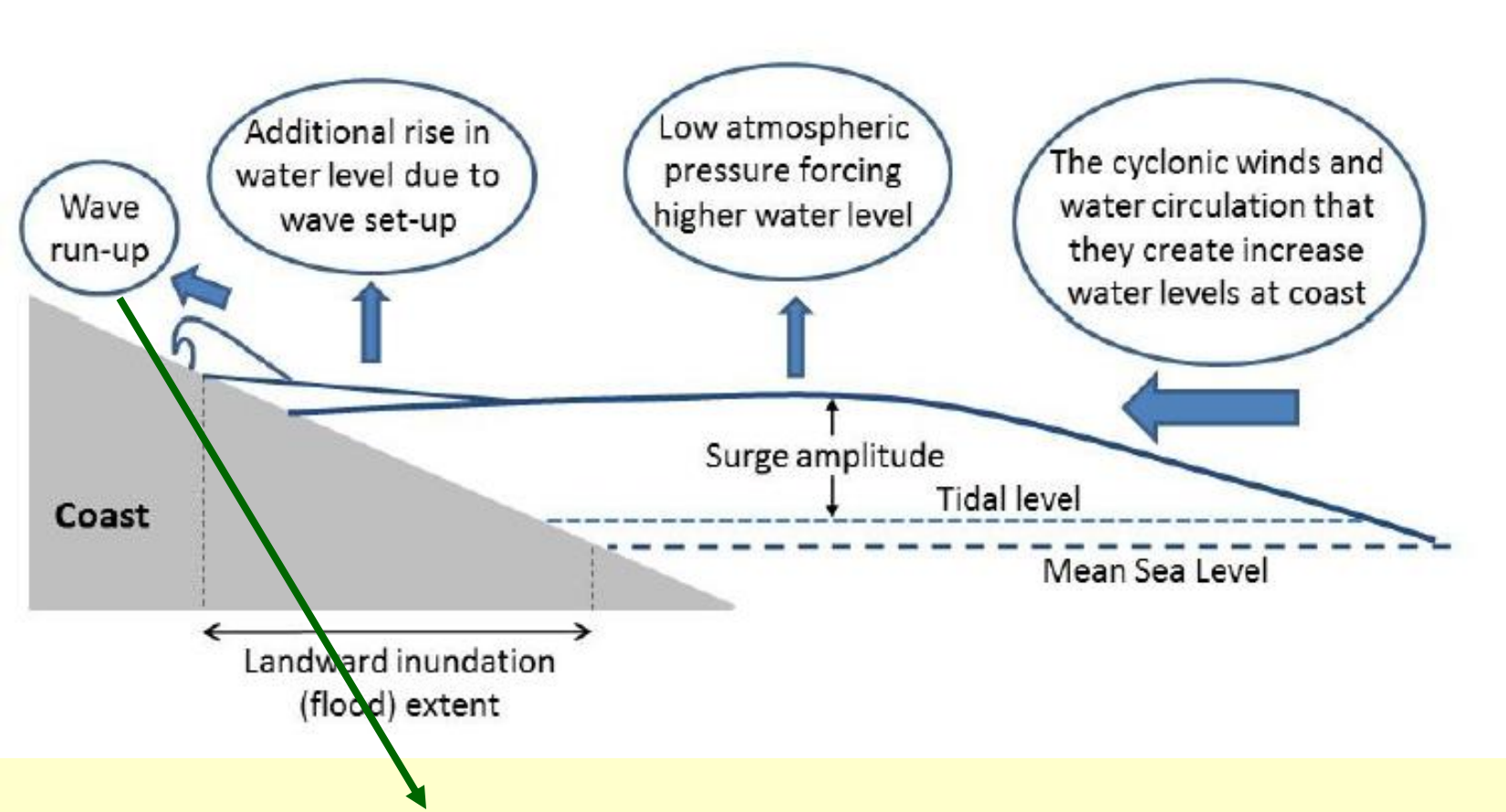
COASTAL PROTECTION

Reduction of storm surge level by 5 – 50 cm/km



AND: surface wind waves reduced by 75% per km

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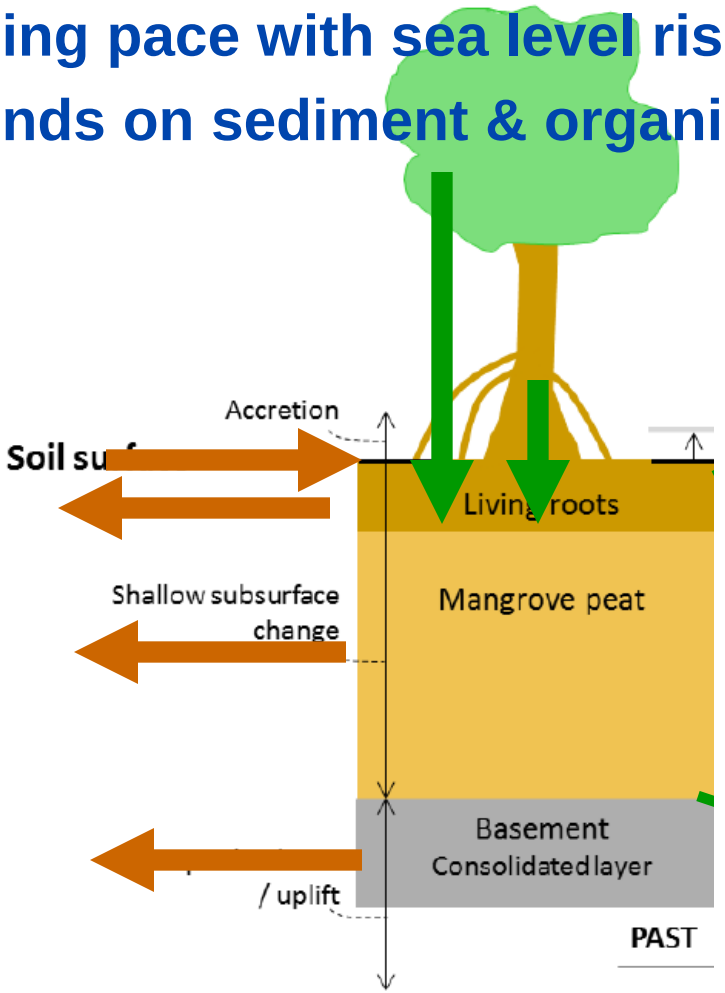
Adapting to sea level rise

Mangroves can strengthen, bind and build soils

- Preventing erosion
- Keeping pace with sea level rise?
- Depends on sediment & organic matter input



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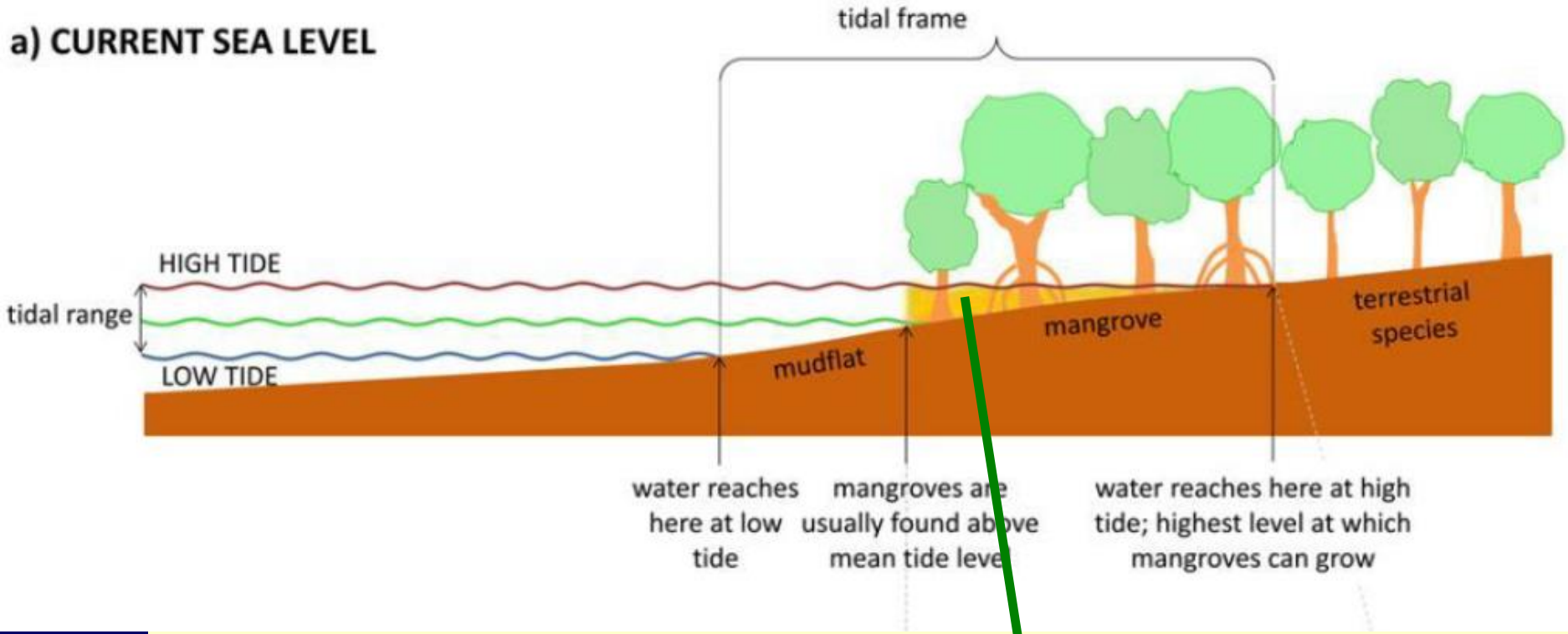
Adapting to sea level rise

Mangroves occur:

- **Above Mean Tide Level**
- **Below High Tide Level**

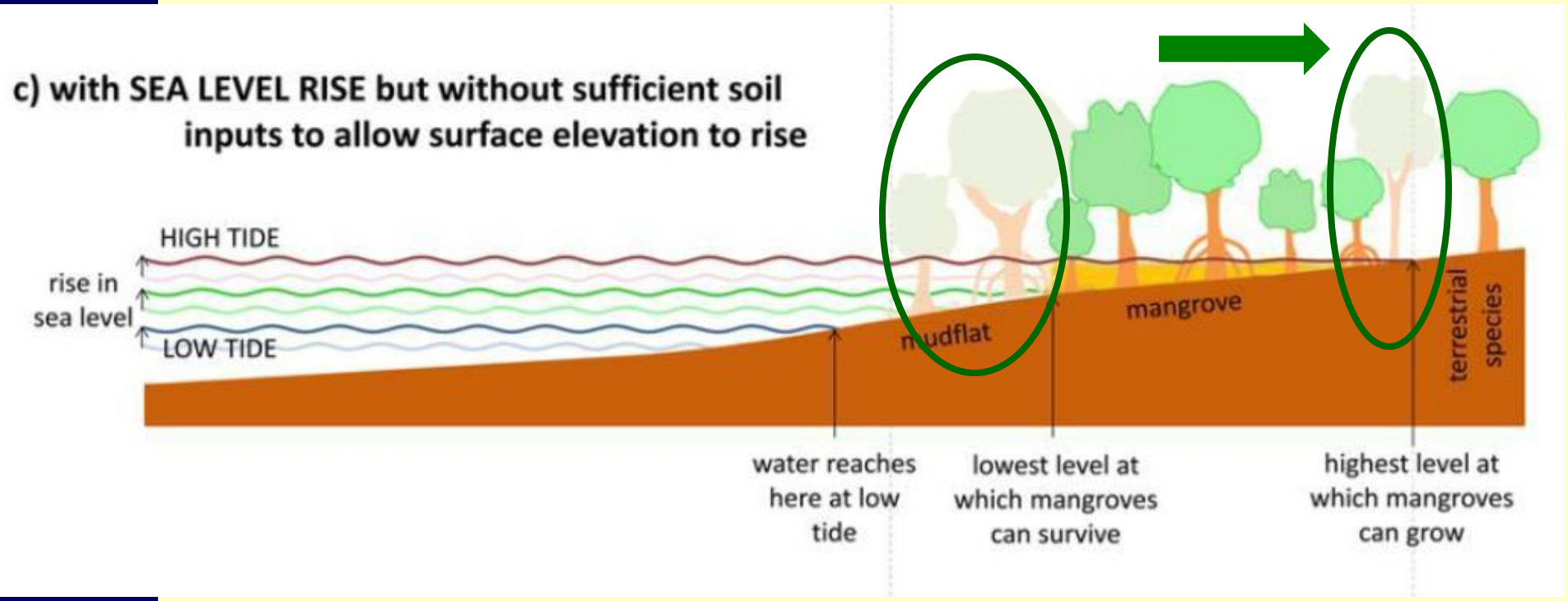


Accomodation space

Adapting to sea level rise

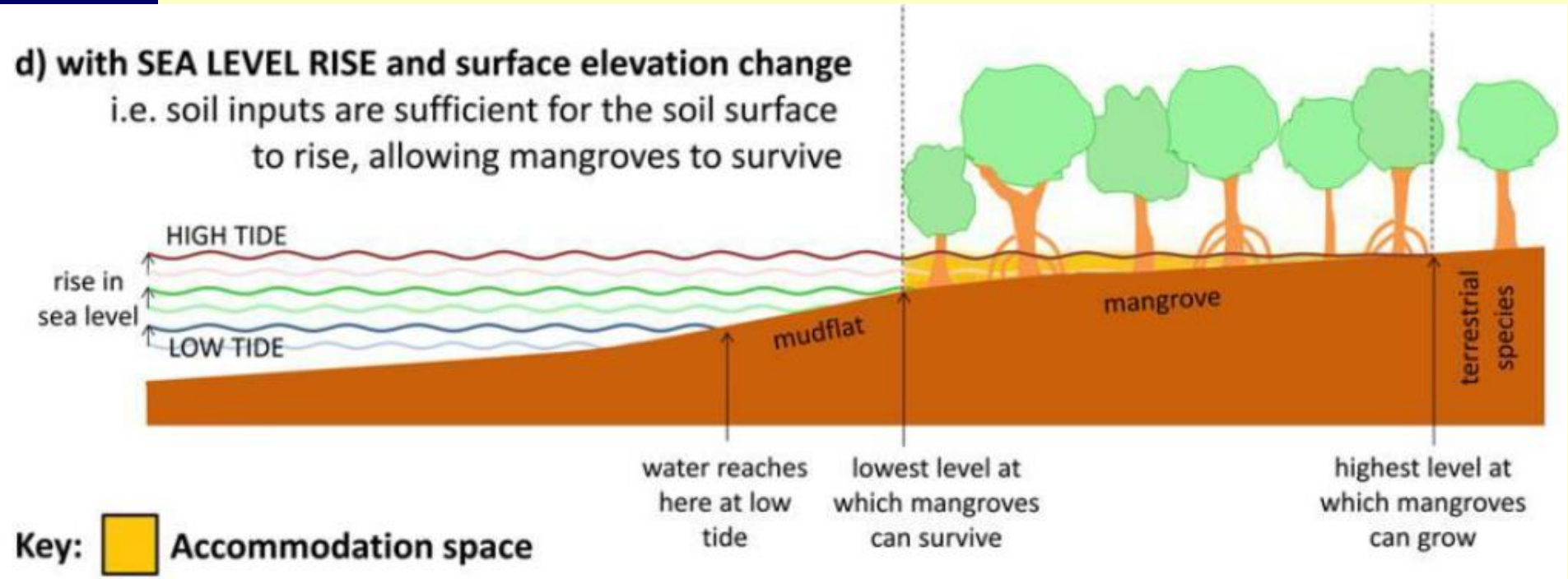
Mangroves can NOT keep up with sea level rise

… if soil input is lacking



Adapting to sea level rise

Mangroves keep up with sea level rise
… if sediment inputs are sufficient



Adapting to Sea level rise

- **Mangroves able to adapt to sea level rise (in some circumstances)**
  - Mangroves build up: 1 - 10 mm per year
  - Global mean sea level rise: 3 mm per year

- **Management implications:**
  - Allow space to move land inward
  - Ensure sediment supply

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THE PROBLEM

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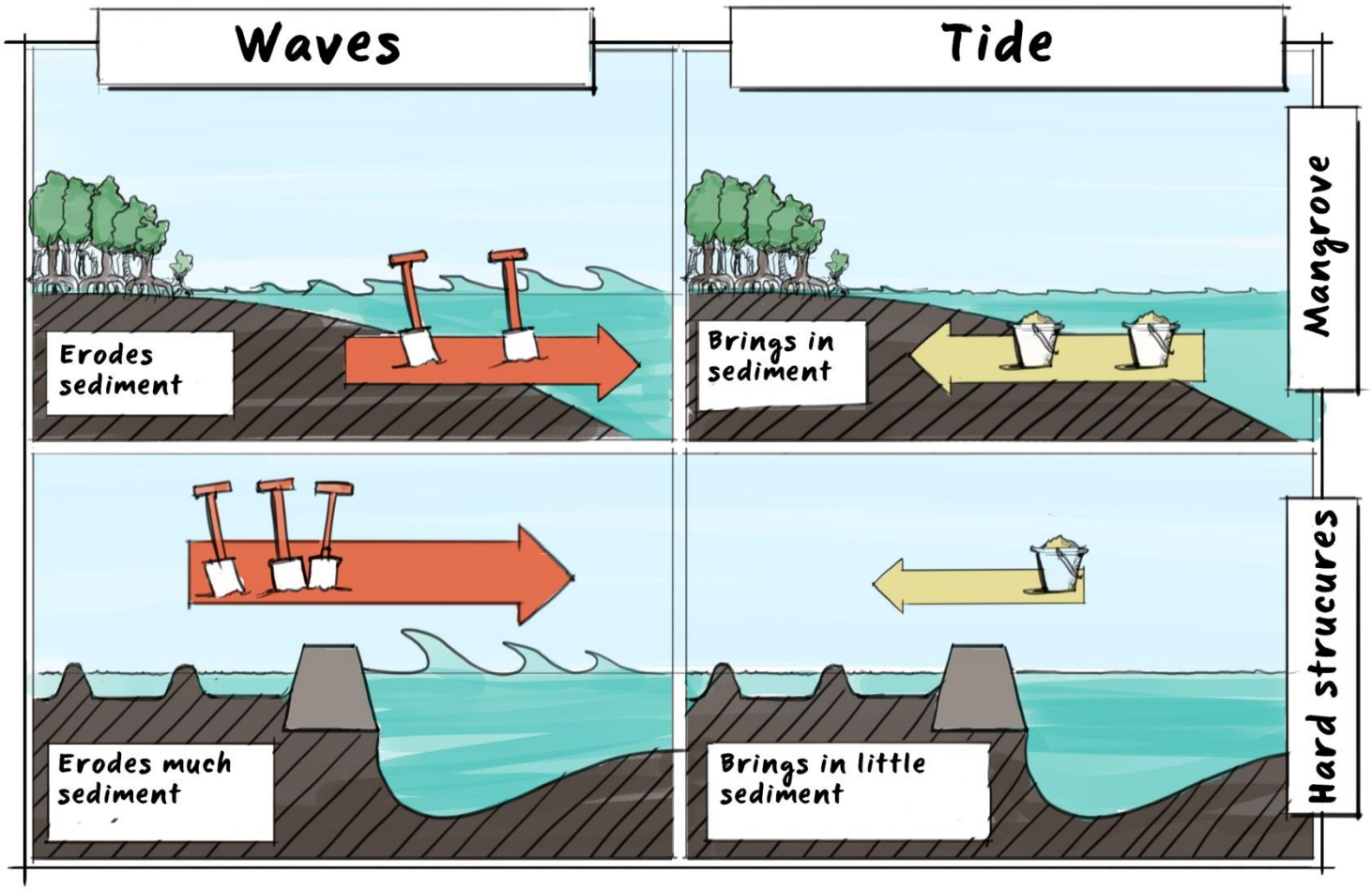
THE PROBLEM



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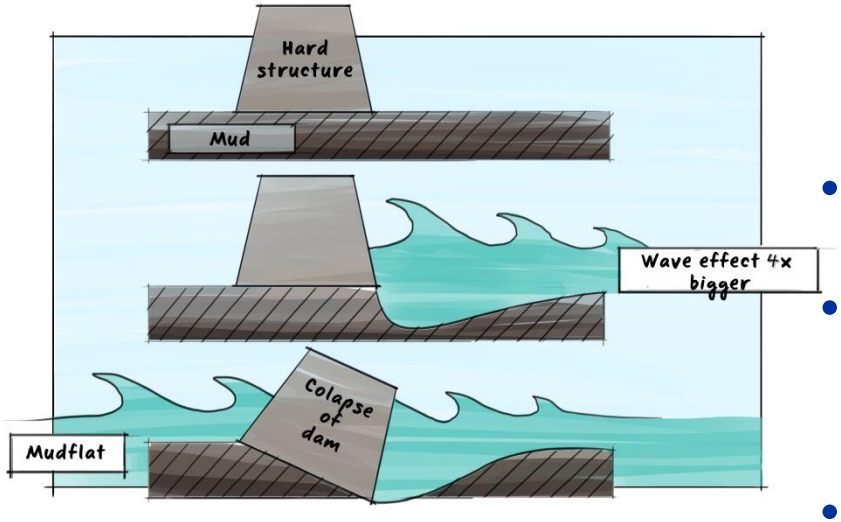
The problem



Conventional solutions

- ‘Static’ protection only
- Can damage ecosystems (affecting C stock)
- Leave out invisible costs and benefits

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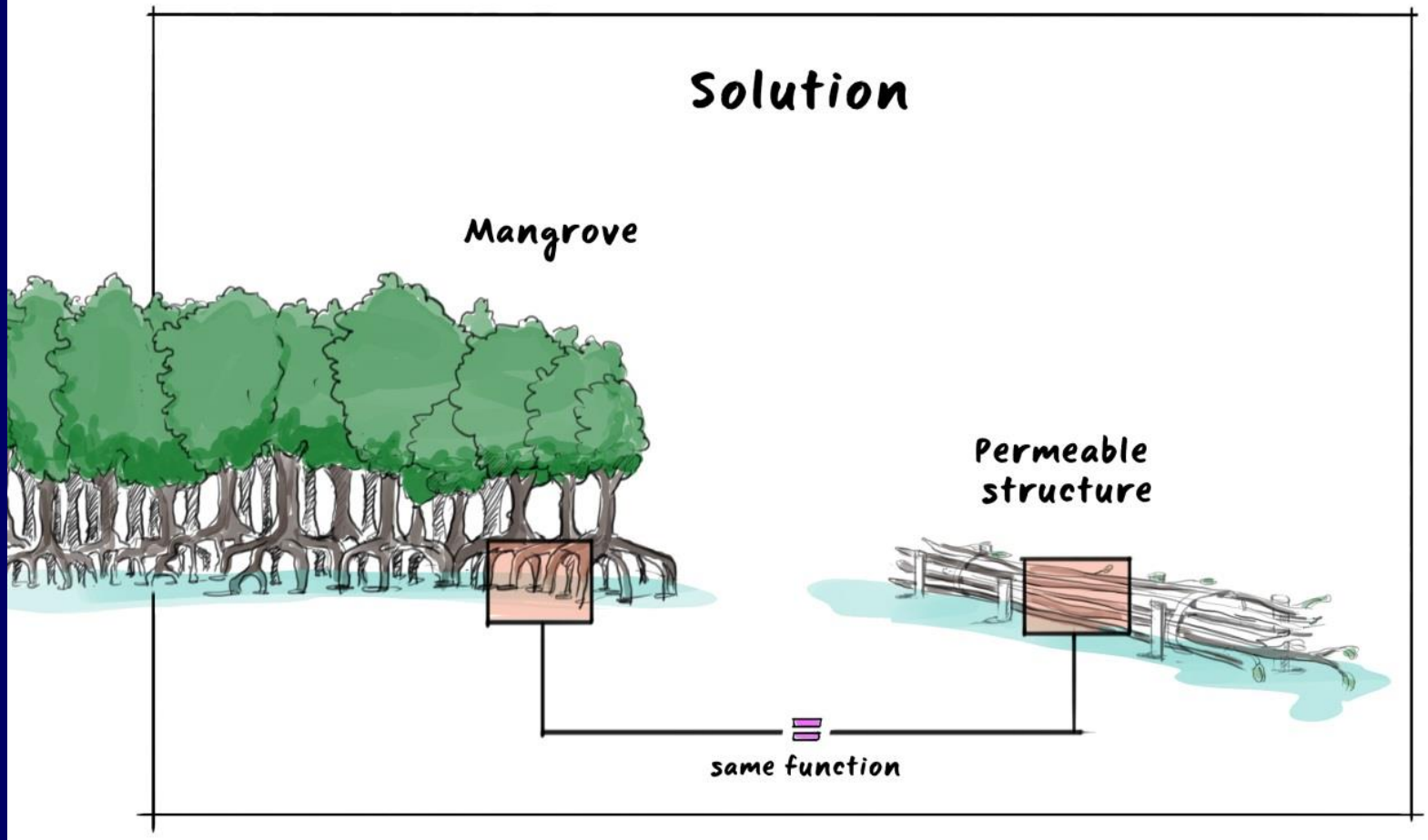
Building with Nature



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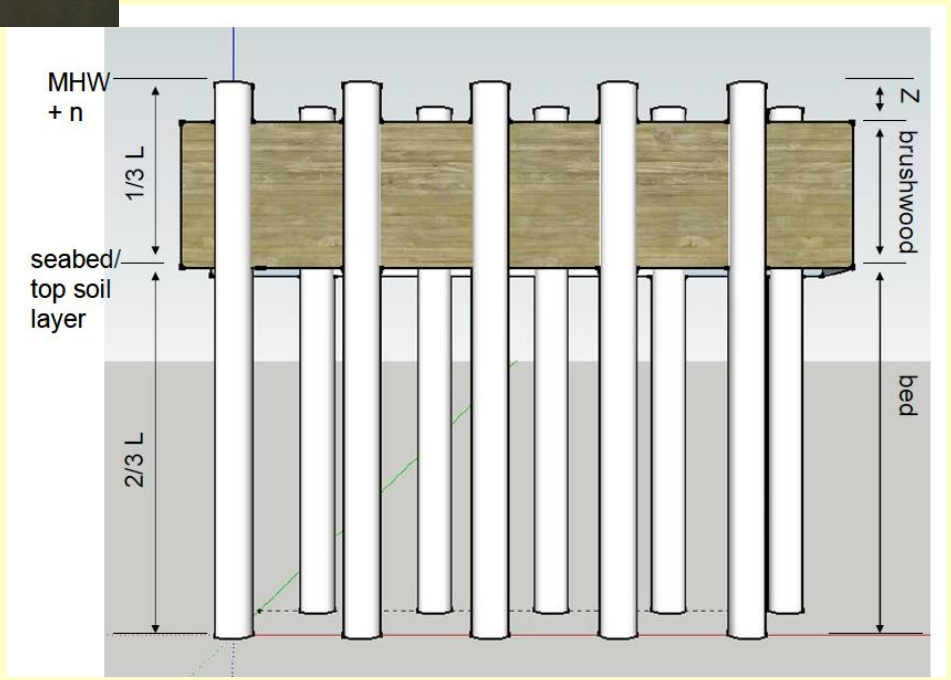
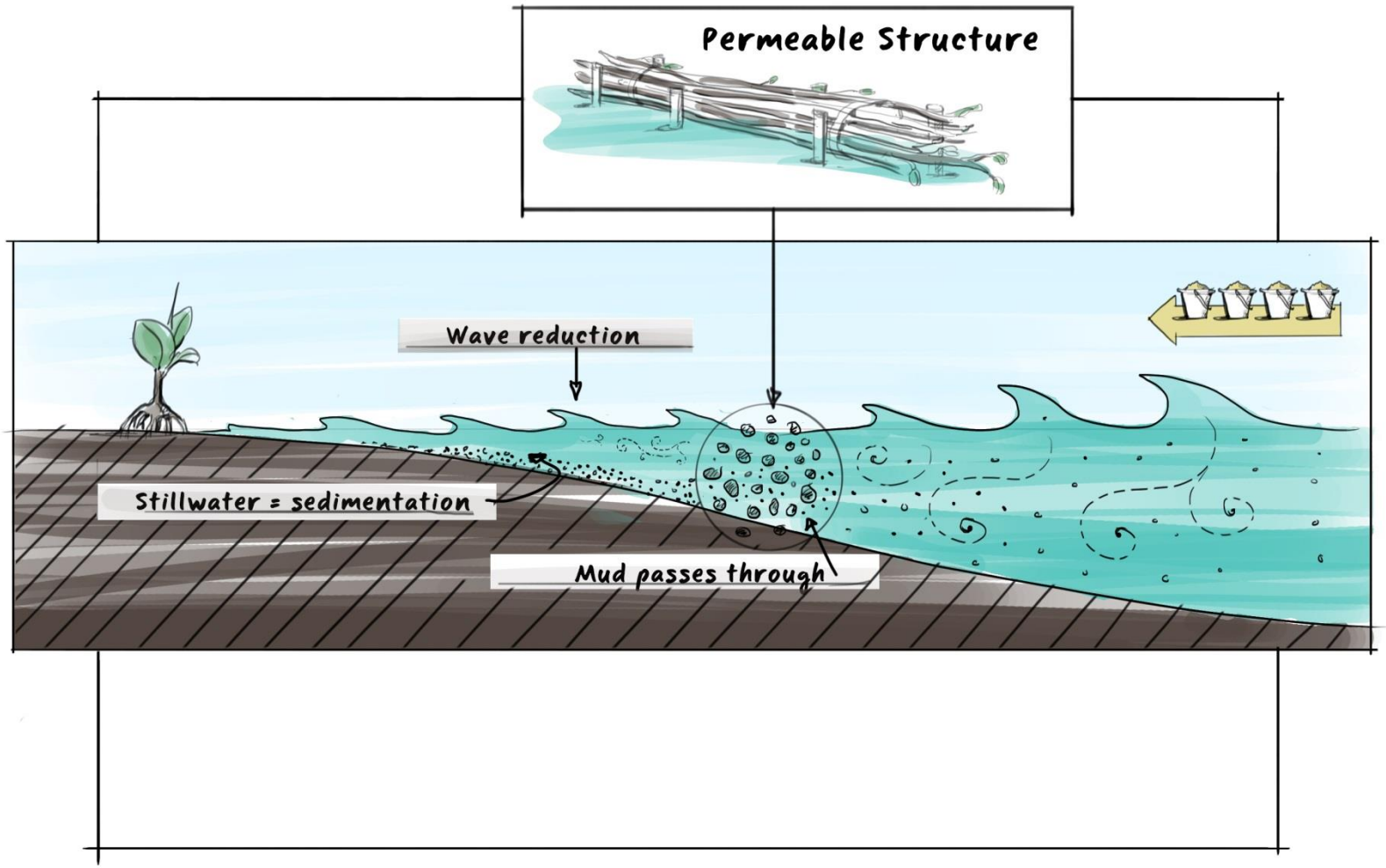
Building with Nature



Building with Nature



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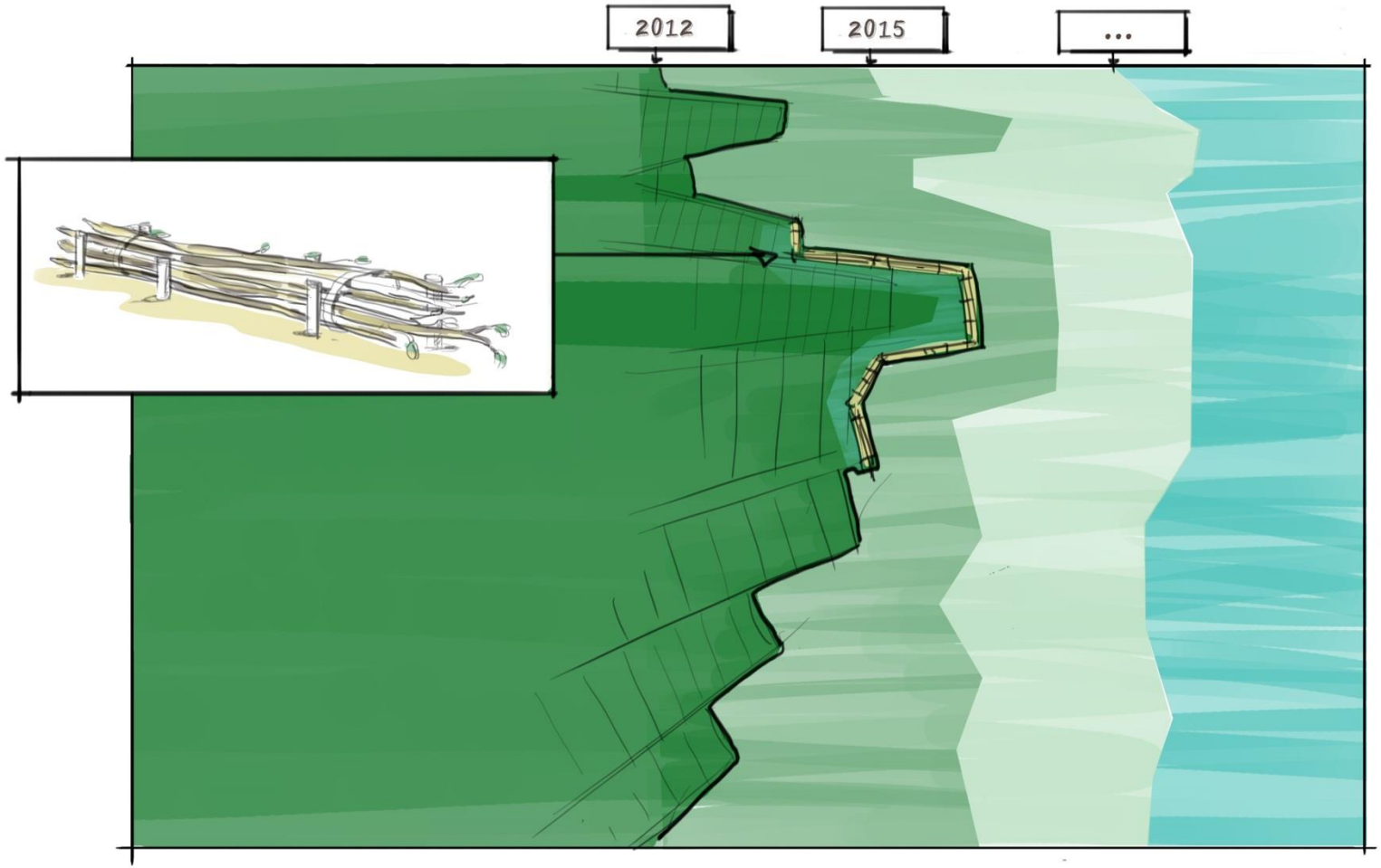
Building with Nature



Land reclaimed from the sea

Need for sustainable land use (ecosystem services)

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- **Ecoshape consortium**
- **Initiated by Van Oord & Boskalis**
- **Building with Nature program**

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Continuum of concepts

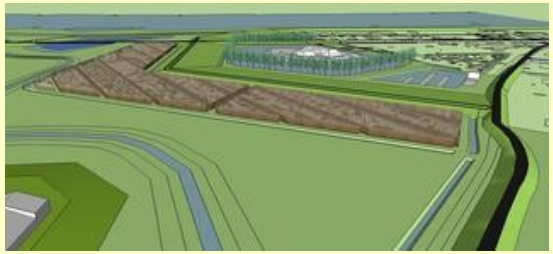
Soft solutions **Hybrid solutions** **Hard solutions**

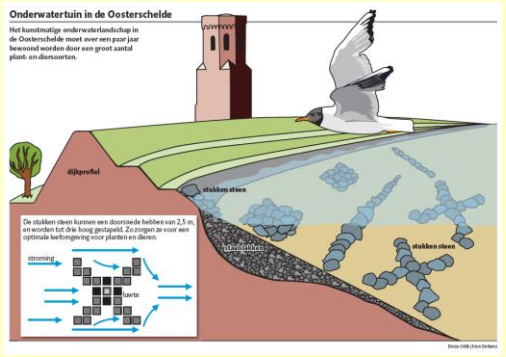
more space, no dike

flexible and cost-effective

less space, dike

less flexible, extra investment





CC MITIGATION

- **Comparing GHG footprint of Building with Nature solutions to conventional engineering**
- **Incentive: CO2 performance ladder for climate friendly procurement**
- **Synergy adaptation & mitigation**
- **Exploring opportunities for Building with Nature Indonesia case**

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Key messages

Mangroves for Climate Change adaptation

- **Offering coastal protection**
  - Managing expectations: protection against what?
  - Building with Nature solutions

- **Keeping pace with sea level rise**
- **Ensure healthy mangroves!**

•Other ecosystem services: CC mitigation, fisheries enhancement, tourism, timber, fuel, biodiversity

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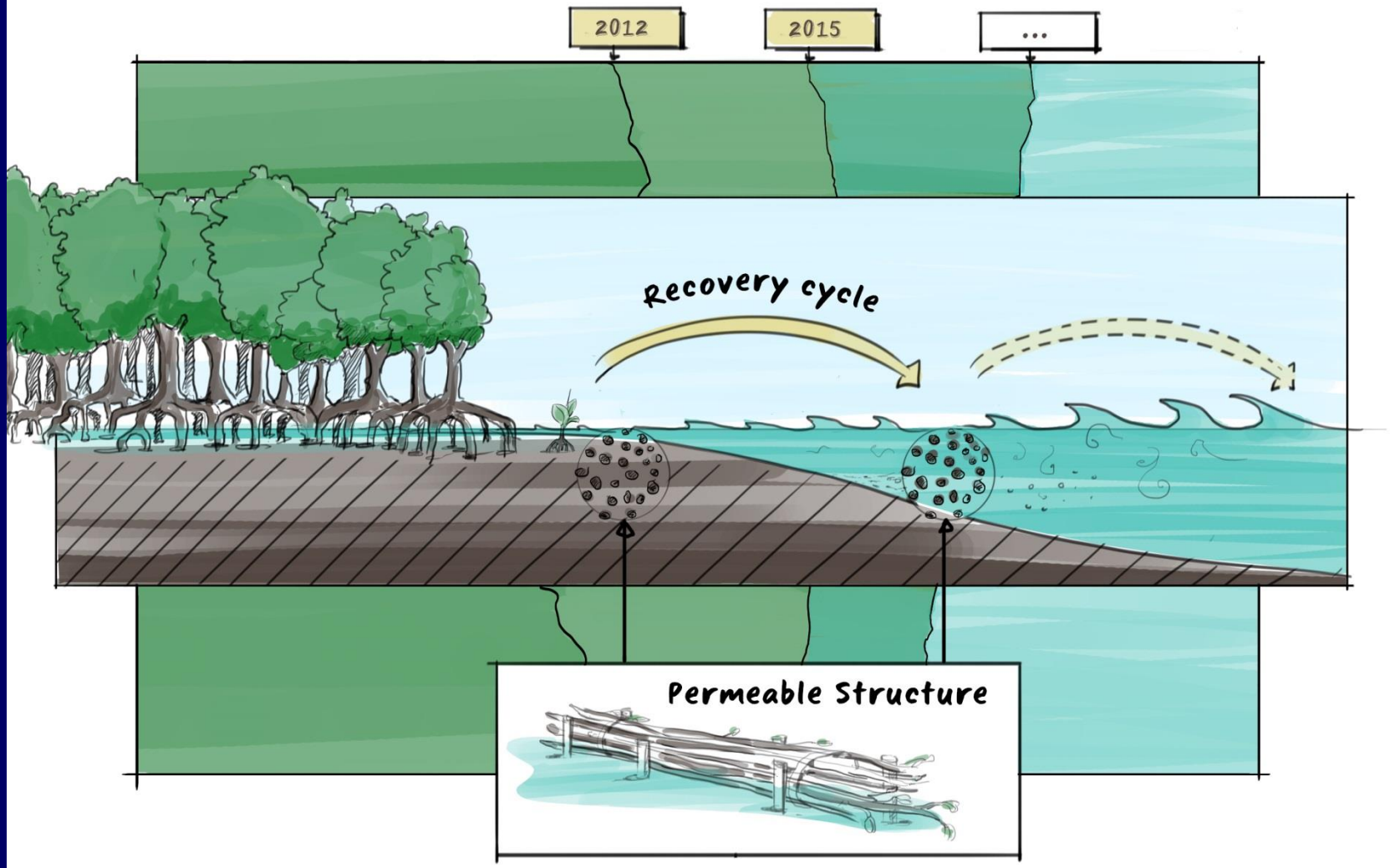

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