Building with Nature

EcoShape

Making the business case for Building with Nature

The context of developed countries

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Marine ingenuity

Deltas in Times of Climate Change
Rotterdam, September 25th, 2014

Need for infrastructure development

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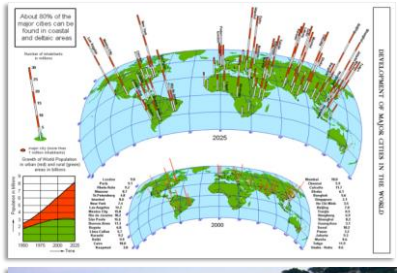

Oppose or align?

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Green tape or justified concern?

What if we are so focused on minimizing negative effects that we miss opportunities to maximize positive effects?

A paradigm shift!

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From: Building ***in*** Nature

Via: Building ***of*** Nature

To: Building ***with*** Nature

The heart of the matter

Building with Nature:

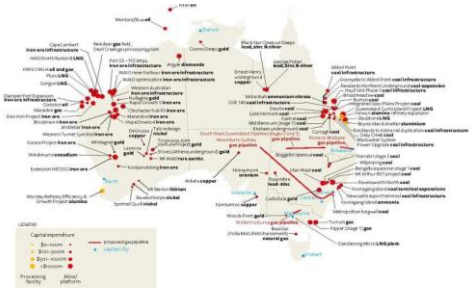
A design process aiming to work with natural processes and providing opportunities for nature as part of the infrastructure development process

Aim to maintain the productivity of the natural system; ecosystem services

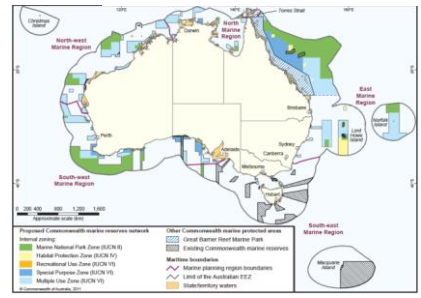
Netherlands vs. Australia

The Australian challenge

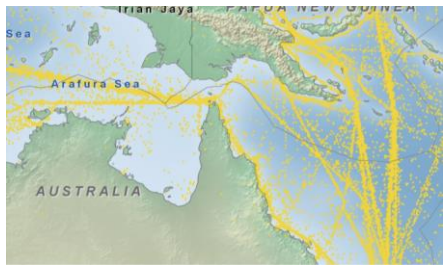
Advanced Minerals & Energy Projects



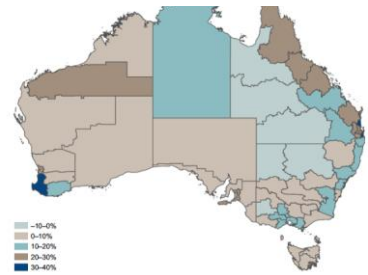
Proposed Marine Parks



Shipping Traffic



Population Growth



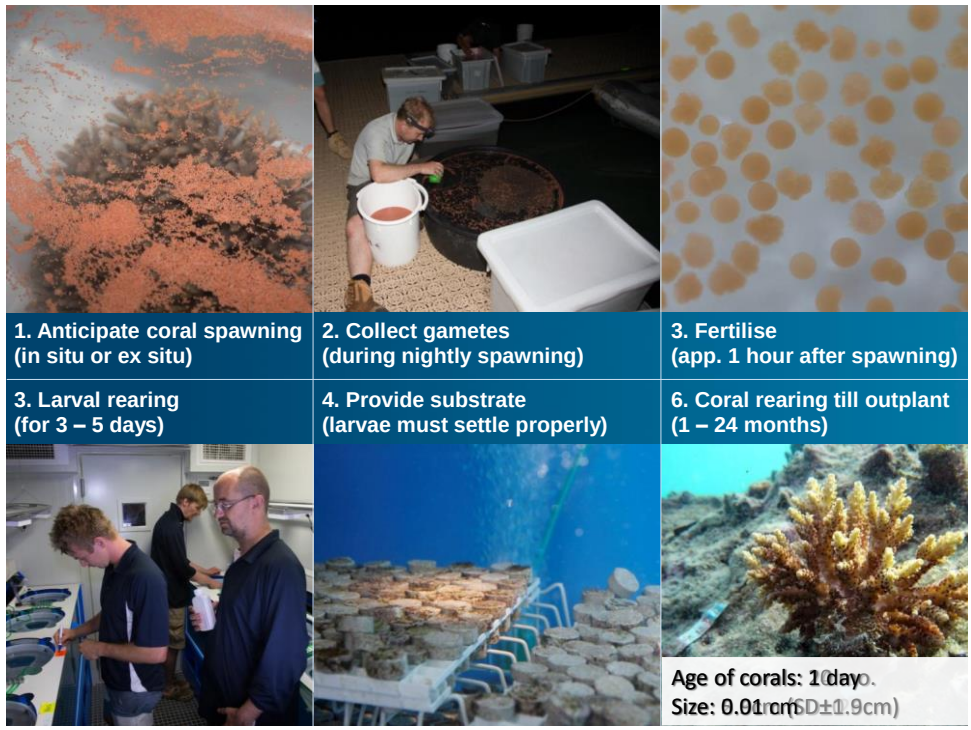
Uncertainty leads to 'green tape'

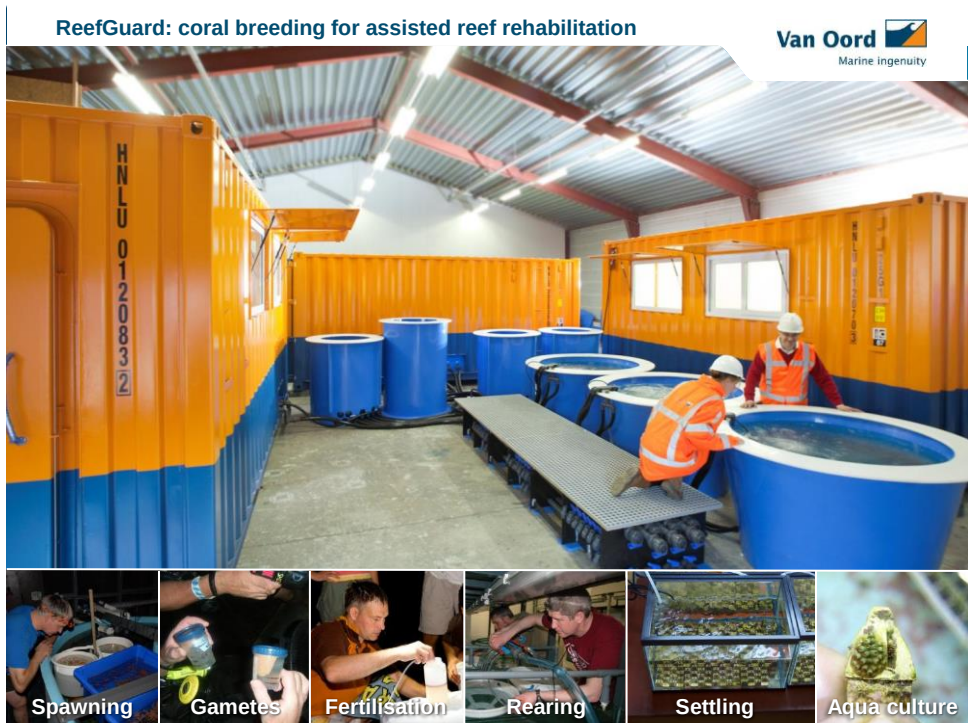
- The fate of seagrasses, mangrove forests and coral reefs, is a key issue for the general public and NGO's world wide
- Exact impacts by dredging are uncertain, which leads to complex regulatory frameworks and elaborate management schemes
- Environmental monitoring and management budgets for mega projects can lie between 5 and 10 % of the dredging scope (highly developed)

NB: monitoring and management programs only show that operations have stayed within limits and damage done is within predicted range.

There is no upside! Except maybe knowledge development?

A proactive example – coral rehabilitation


1. Anticipate coral spawning
(in situ or ex situ)
2. Collect gametes
(during nightly spawning)
3. Fertilise
(app. 1 hour after spawning)
3. Larval rearing
(for 3 – 5 days)
4. Provide substrate
(larvae must settle properly)
6. Coral rearing till outplant
(1 – 24 months)
Age of corals: 1 day
Size: 0.01 cm (SD±1.9cm)


ReefGuard: coral breeding for assisted reef rehabilitation
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HNLU 0120832
Spawning
Gametes
Fertilisation
Rearing
Settling
Aqua culture

ReefGuard: coral breeding for assisted reef rehabilitation

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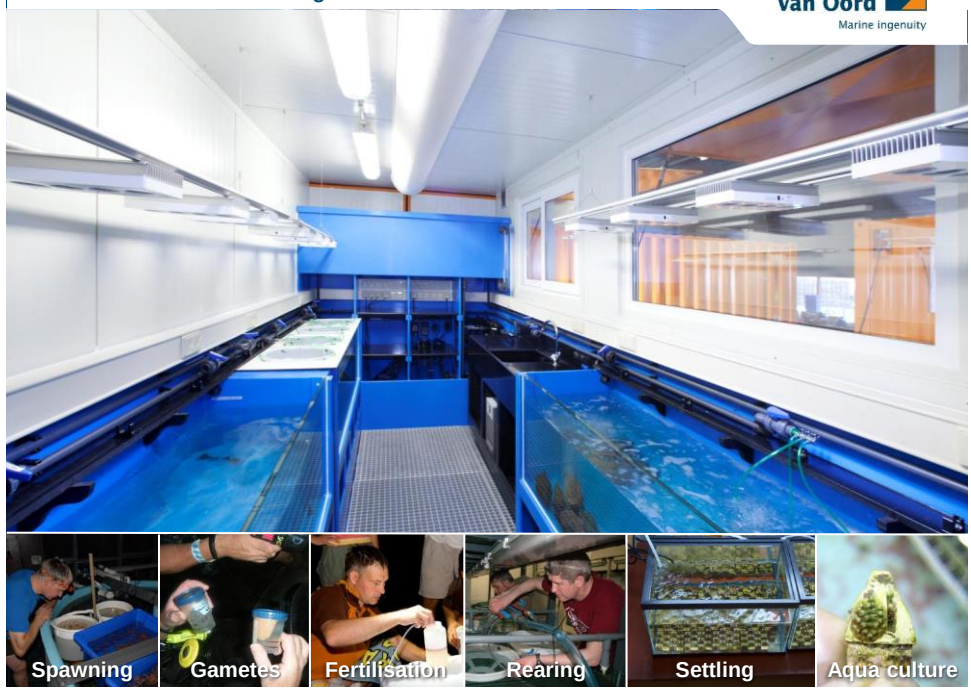

2014, March to October – The first field trial of the ReefGuard

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Set up of the facility (four weeks pre-spawning)

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Dredging and Marine Contractors

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Scooping up the gametes released during spawning (minutes after spawning)

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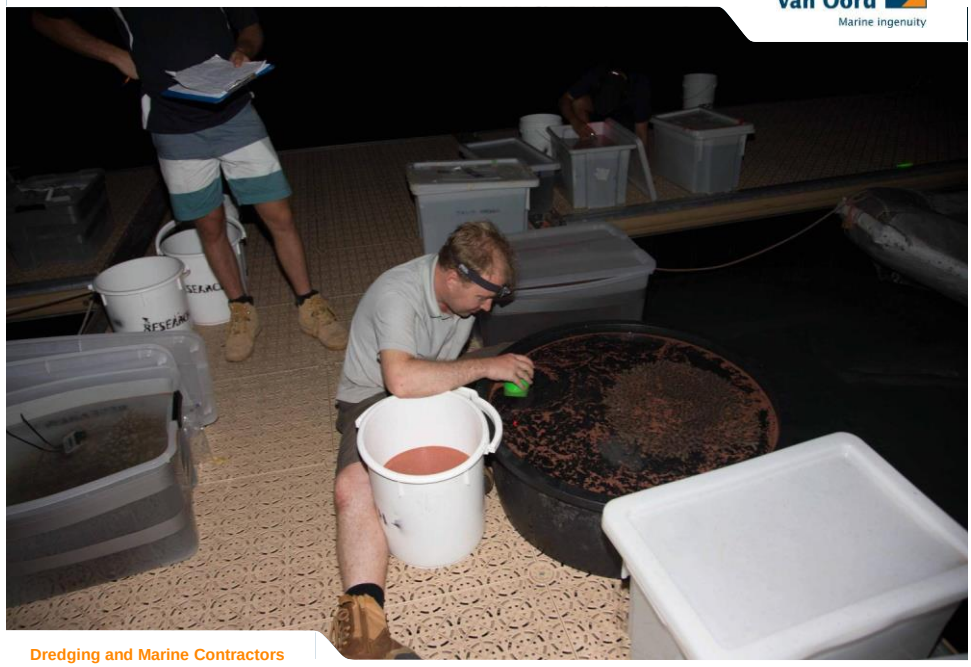

Dredging and Marine Contractors

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Washing the fertilised eggs gently (90 minutes after spawning)

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Dredging and Marine Contractors

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Taking care of the larvae (one to five days after spawning)

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Dredging and Marine Contractors

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Settling the matured larvae onto the pre-conditioned settlement tiles

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Dredging and Marine Contractors

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Inspecting tiles for settlement success (five to twelve days after spawning)

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Dredging and Marine Contractors

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Settled larvae could be observed in 40 – 60 % of all tiles

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Dredging and Marine Contractors

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Part of the tiles remained in the ReefGuard for ex-situ rearing

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Dredging and Marine Contractors

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We successfully bred several thousand juvenile corals

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Dredging and Marine Contractors

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Outplacement trial currently still ongoing

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Dredging and Marine Contractors

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Questions

- Are we so focussed on minimizing negative effects that we miss opportunities to promote positive effects?
- Can landscape restoration be achieved in the side line of infrastructure development projects or should it be a business case on its own?
- If landscape deterioration was caused by a 'tragedy of the commons' who should be the owner of the restoration challenge?
- Are the initial restoration cost a key bottleneck in developing a bankable business case for ecosystem based adaptation?