Oyster reefs as ecosystem engineer in the Oosterschelde estuary

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IMARES
WAGENINGEN UR

Ecosystem engineers

EcoShape

Organisms that modify their environment by their biological activity or physical structure. Jones *et al*. 1994

Destabilizing organisms

Stabilizing organisms

Ecosystem engineers

EcoShape

hydrodynamic forces

physical environment

\- / +

ecosystem engineering

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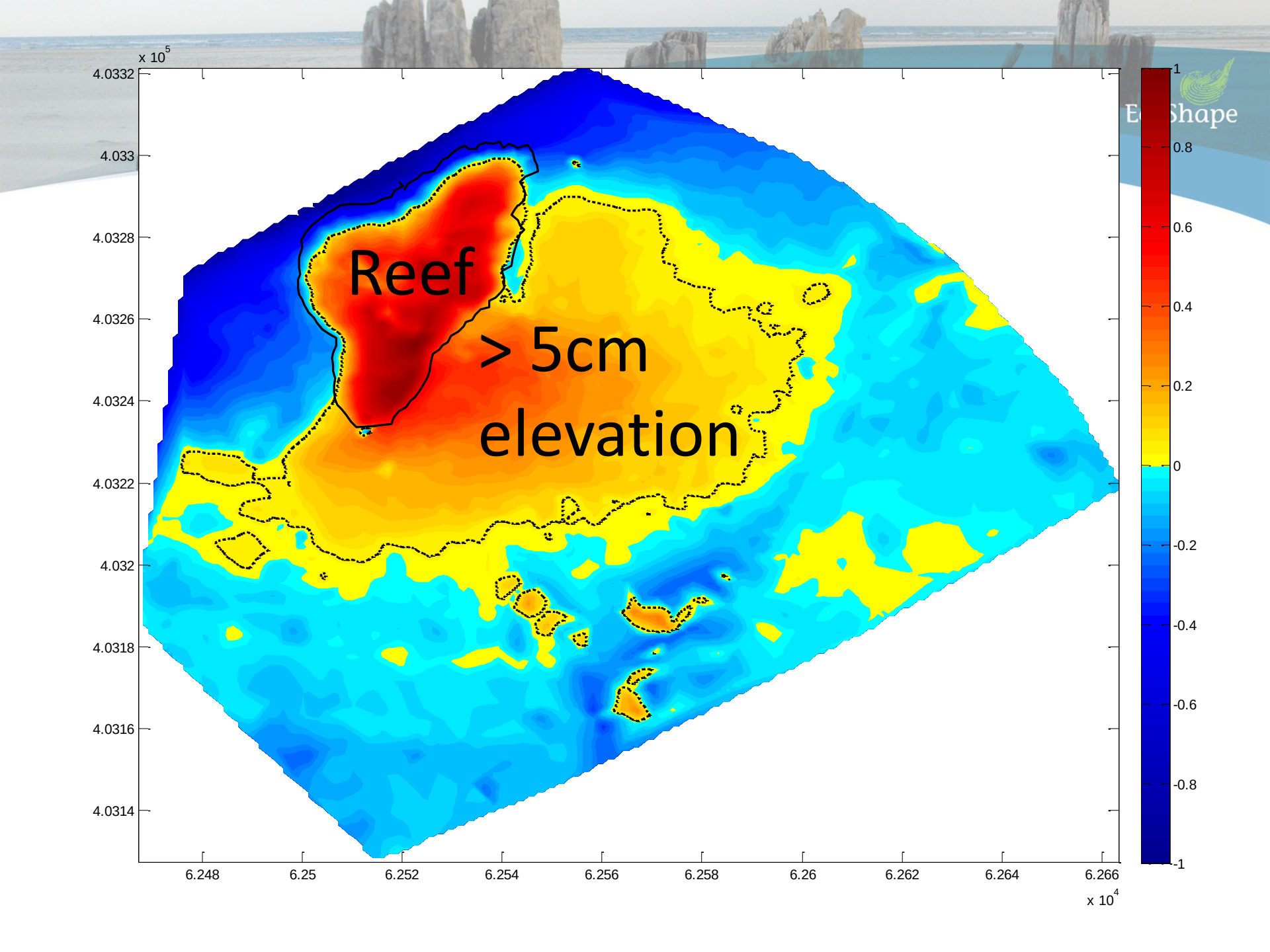
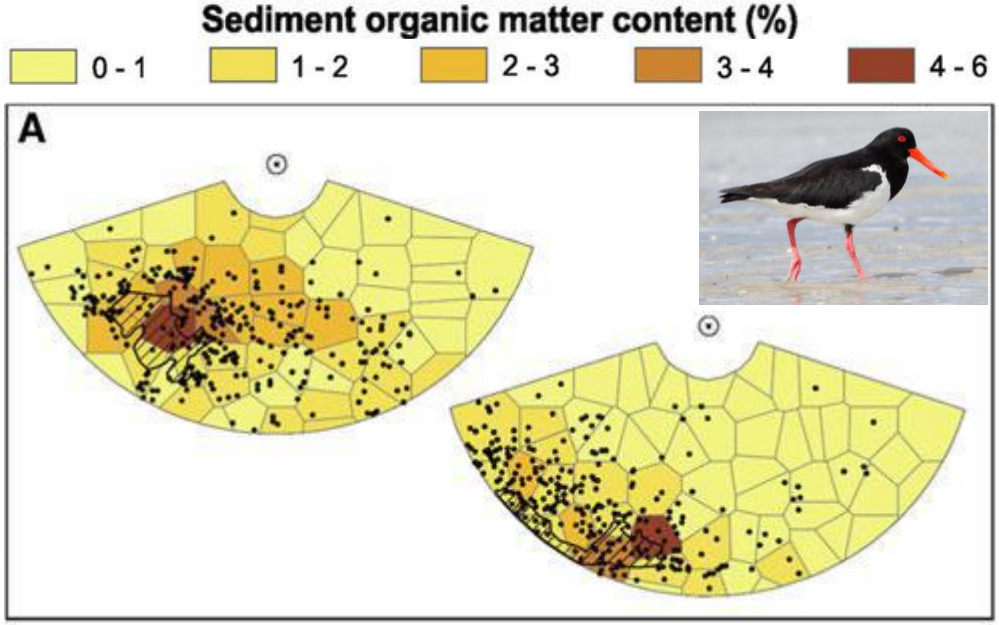

x 10^5
4.0332
4.033
4.0328
4.0326
4.0324
4.0322
4.032
4.0318
4.0316
4.0314
Reef
> 5cm
elevation
6.248
6.25
6.252
6.254
6.256
6.258
6.26
6.262
6.264
6.266
x 10^4
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

Consumer-resource interactions are affected by reefs far beyond the boundaries of the reefs (Donadi *et al.* 2013, Zee *et al.* 2012)

High densities of cockles coastward of a mussel bed in the intertidal flats of Schiermonnikoog, The Netherlands. Photo credit: S. Donadi.
Donadi *et al.* 2013



distribution of sediment organic matter content in relation to the distribution of oystercatchers. Black dots represent the positions of the birds. Zee *et al.* 2012

Ecosystem engineers contribute to tidal flat projection

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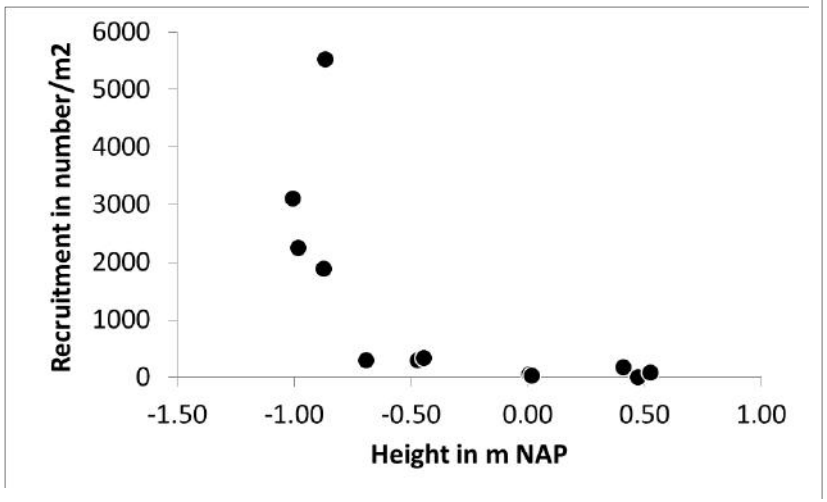
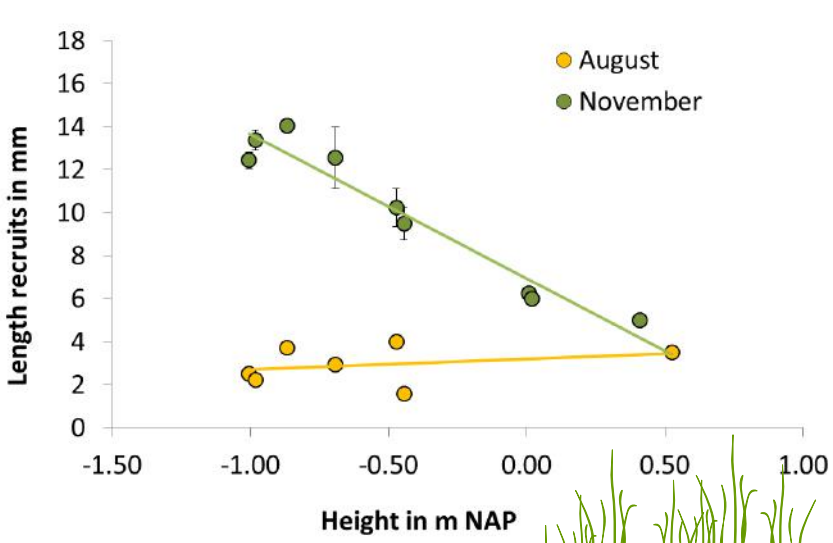
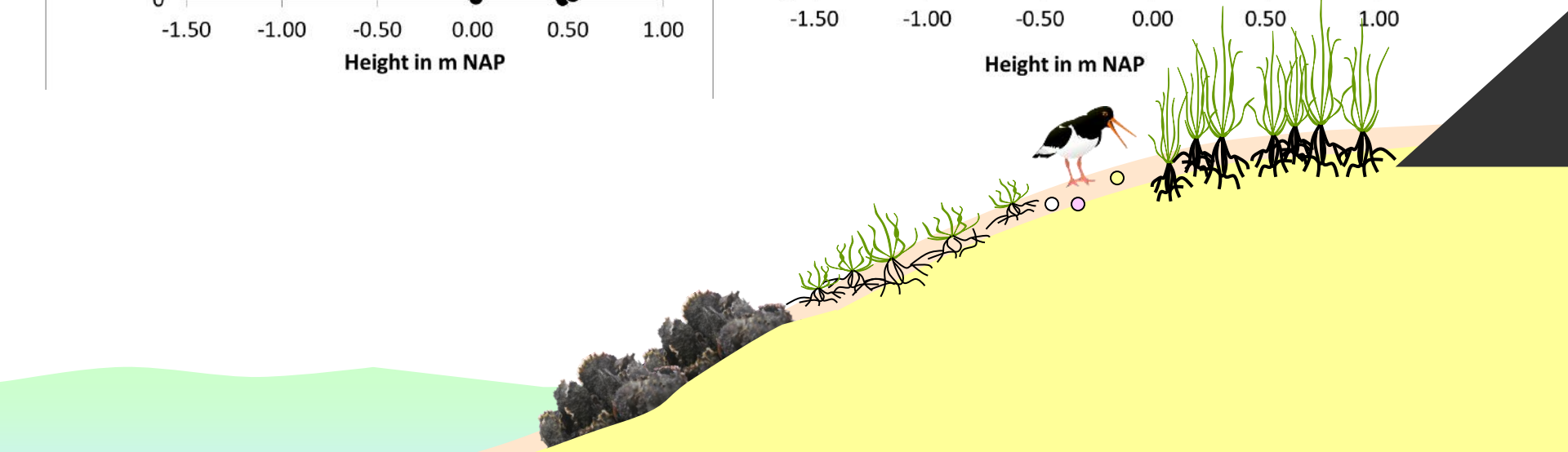
It is important to know the biology of the ecosystem engineer before implementation.







Artificial oyster reefs

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Small scale pilot 2009

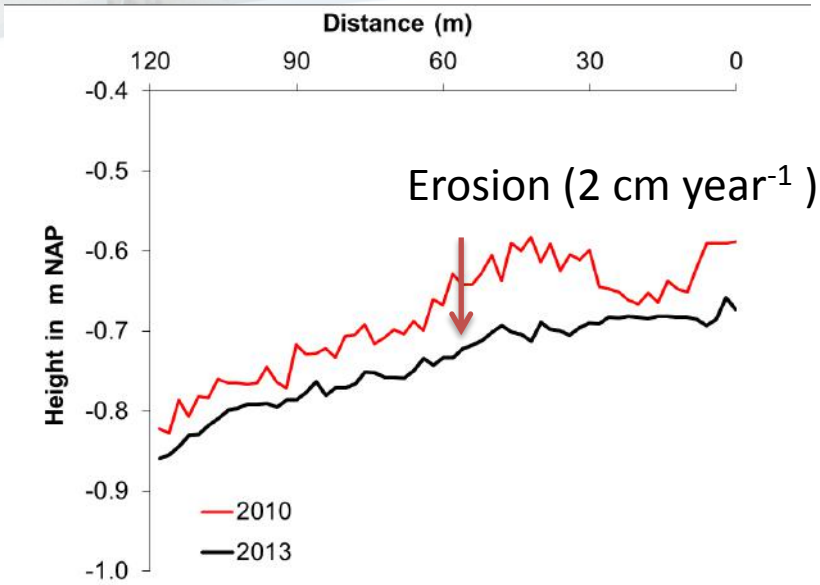
Large scale pilot 2010

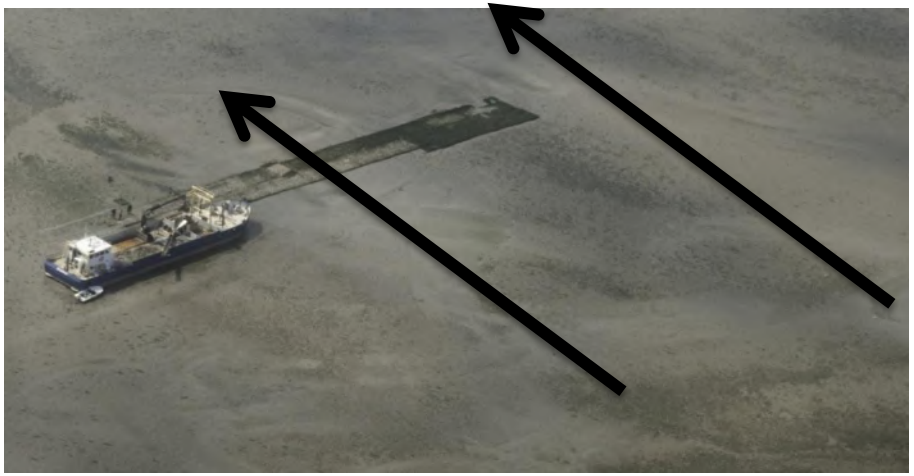
(4x) 12 x 1 m

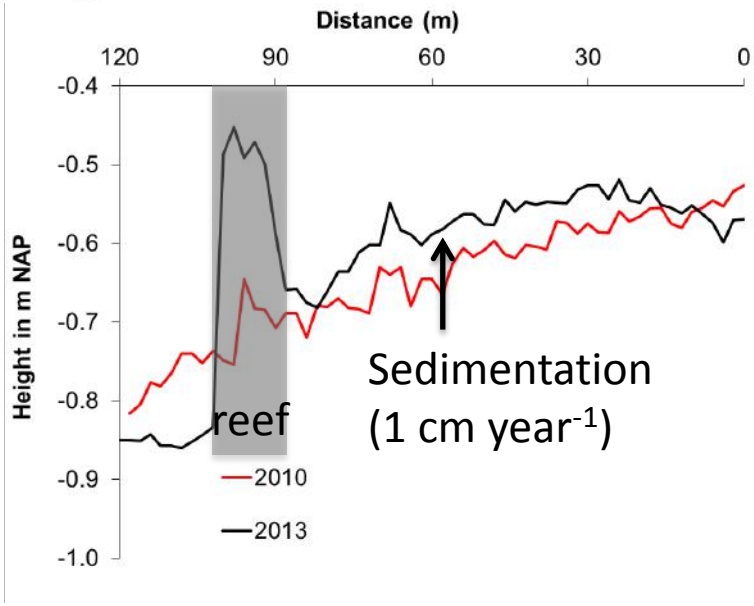
12 x 4 m

200 x 10 m

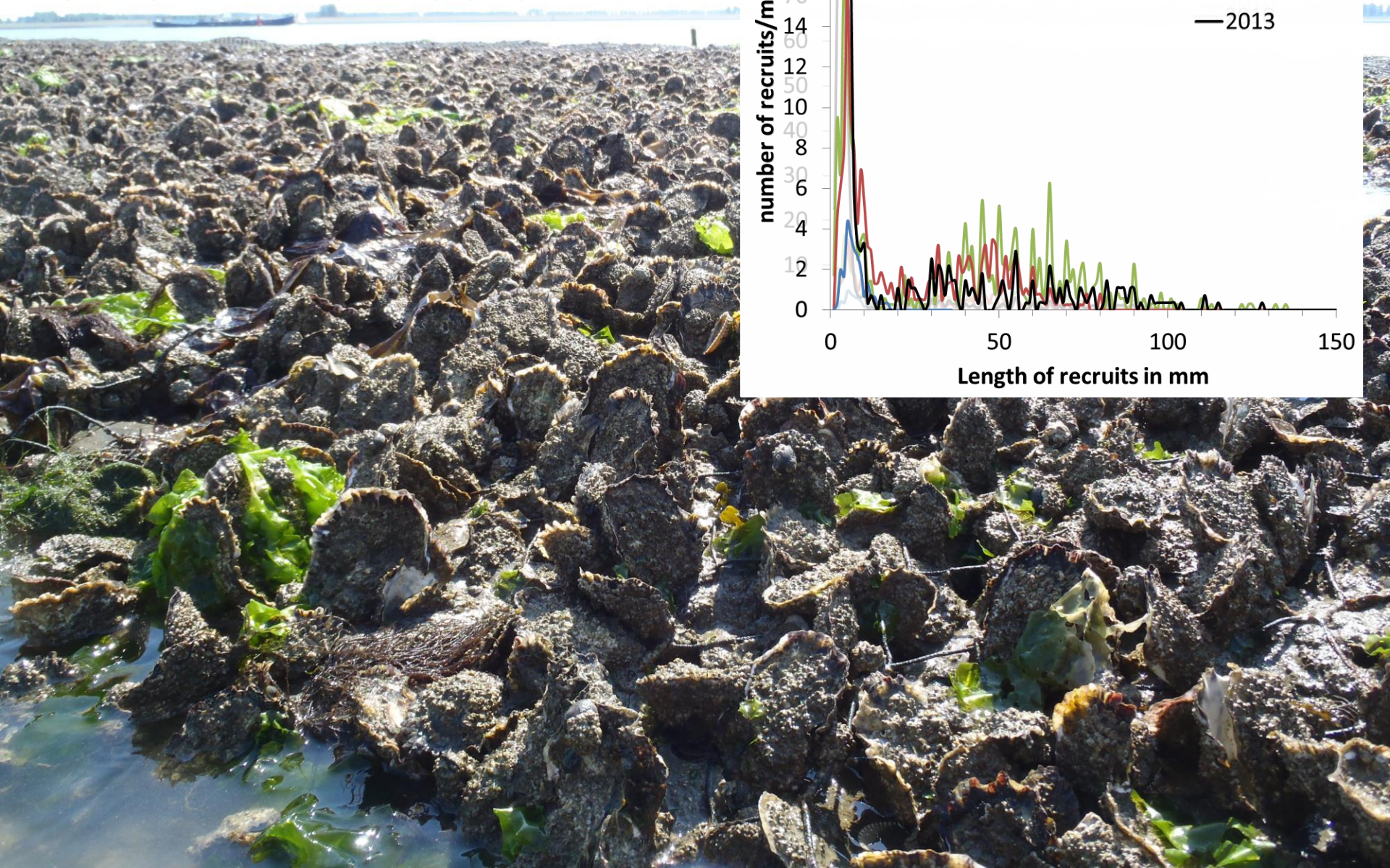
Morphological changes from 2010 till present

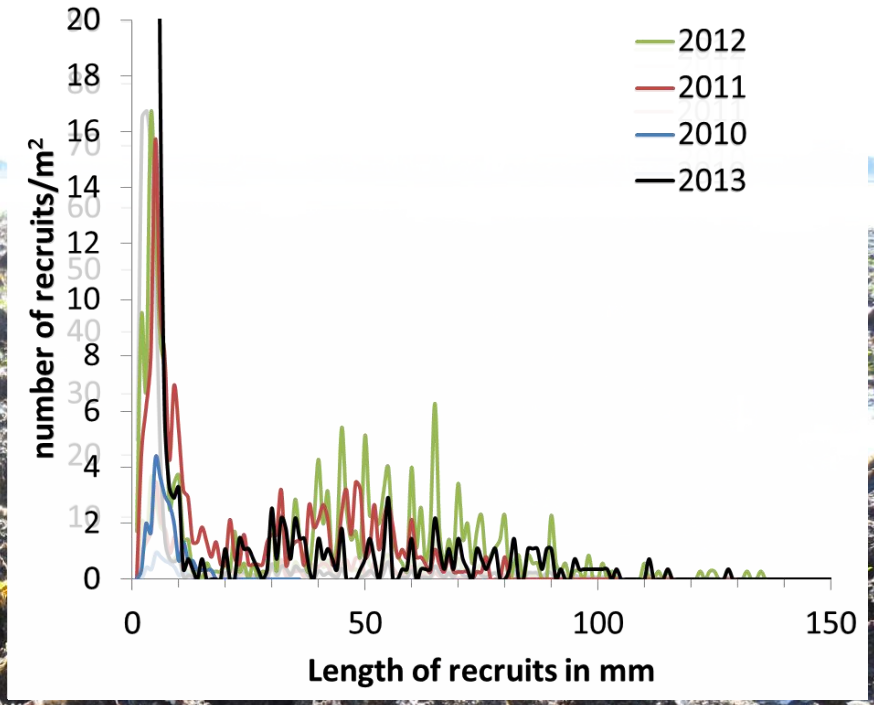






Recruitment of oysters on artificial reefs





Challenges

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Too dynamic

Recruitment failure

Structural decay

New Pilot project at the Oesterdam

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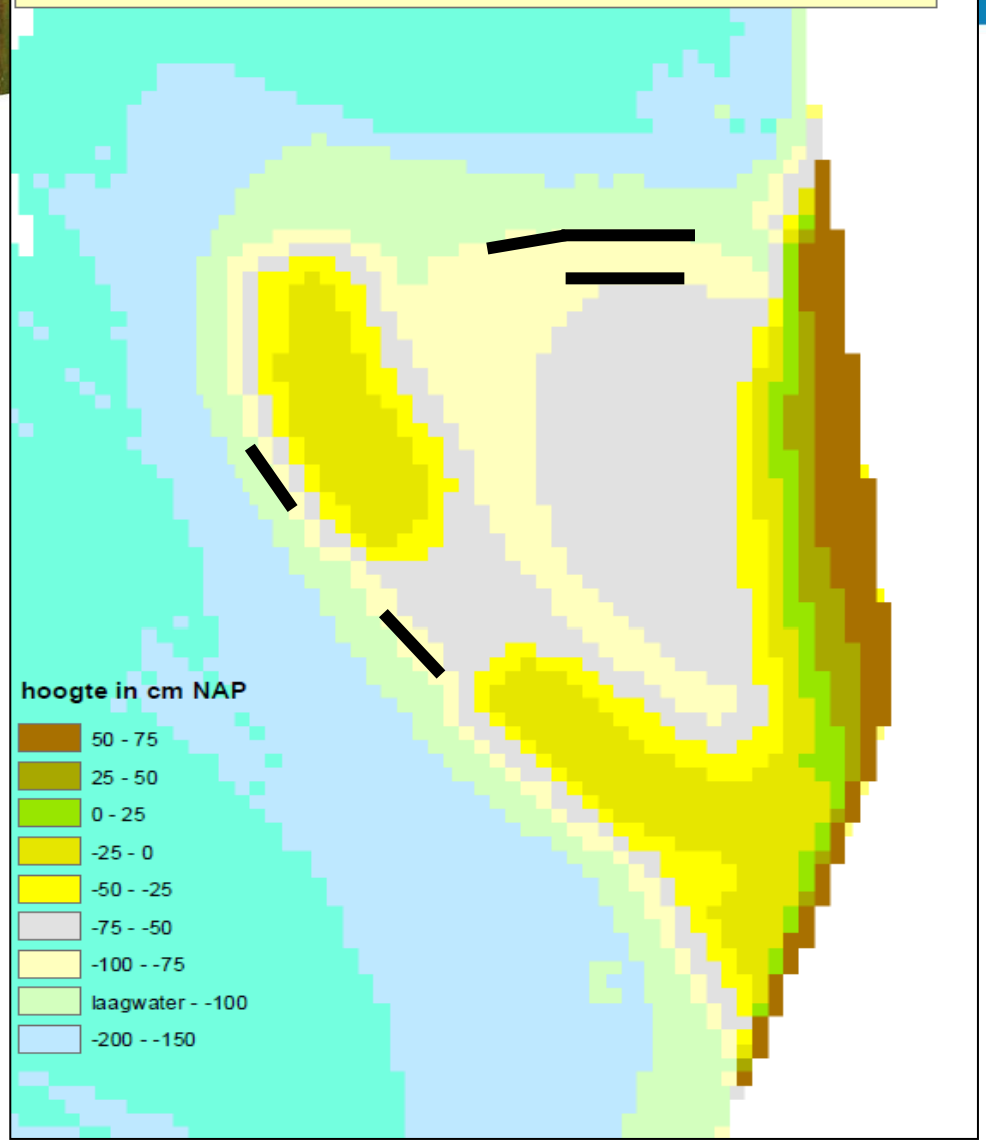
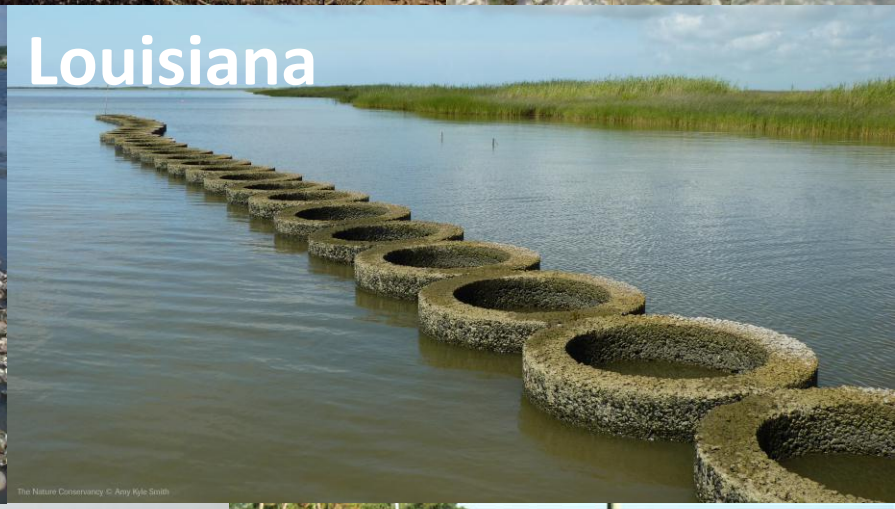
Bodemligging na aanleg



Examples World Wide

EcoShape



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Questions?