Client:
Government Of Ghana
Ministry Of Water Resources,
Works and Housing

ICCE2014

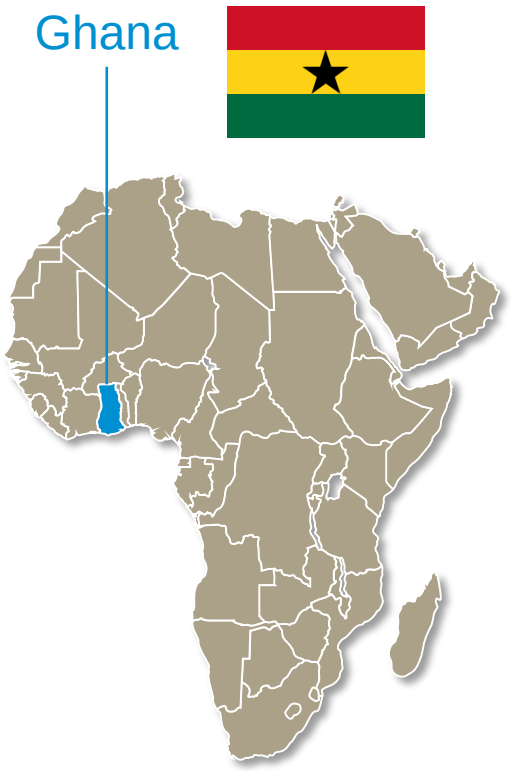
Morphologic modelling of the Coastal evolution in Ada, Ghana

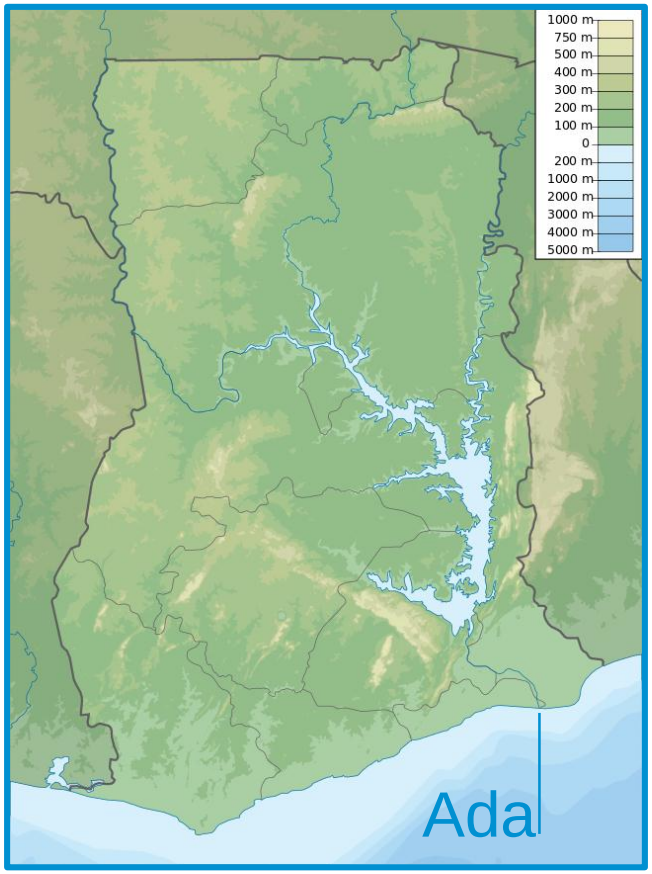
Annelies Bolle, Bart Verheyen, Vincent Gruwez, Philippe De Schoesitter, Nicolas Zimmermann, Peter Wauters, Gijsbert van Holland

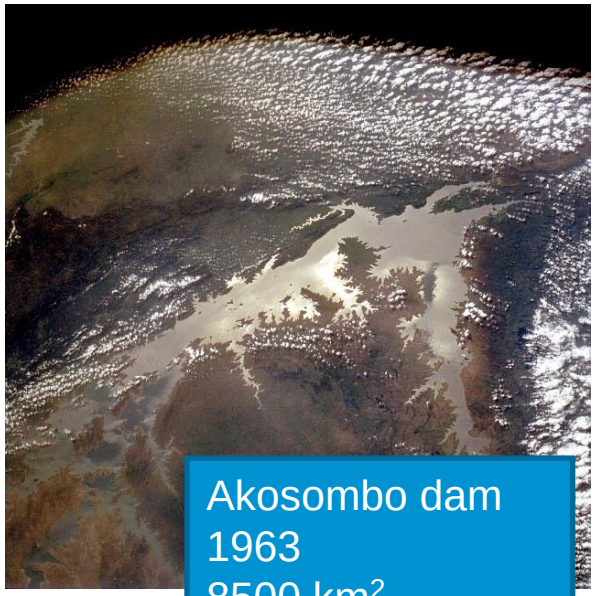
IMDC
International Marine & Dredging Consultants

subcontractor: PMI Project Management International

Project location and history







Akosombo dam
1963
8500 km^2
1020 MW

Before: upto 6000 m^3/s and est. 6 Mm^3 sediment p.a.

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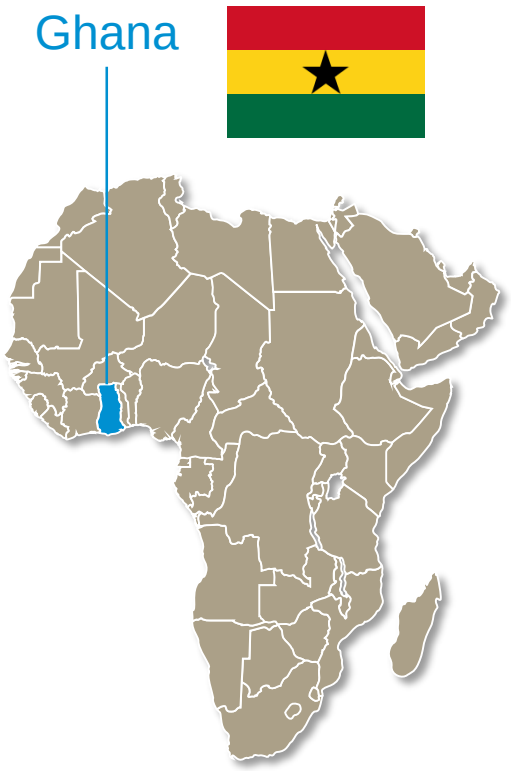
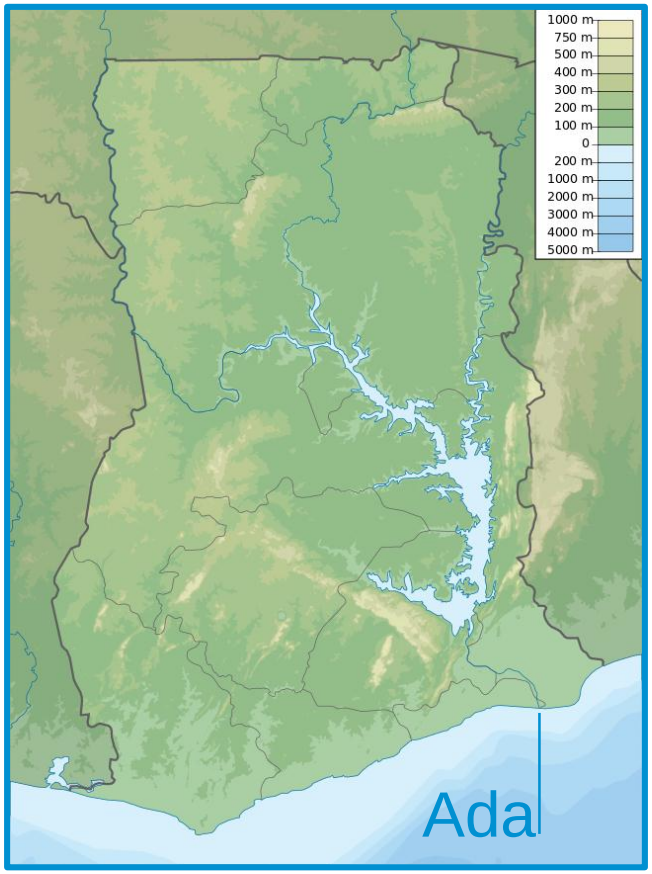
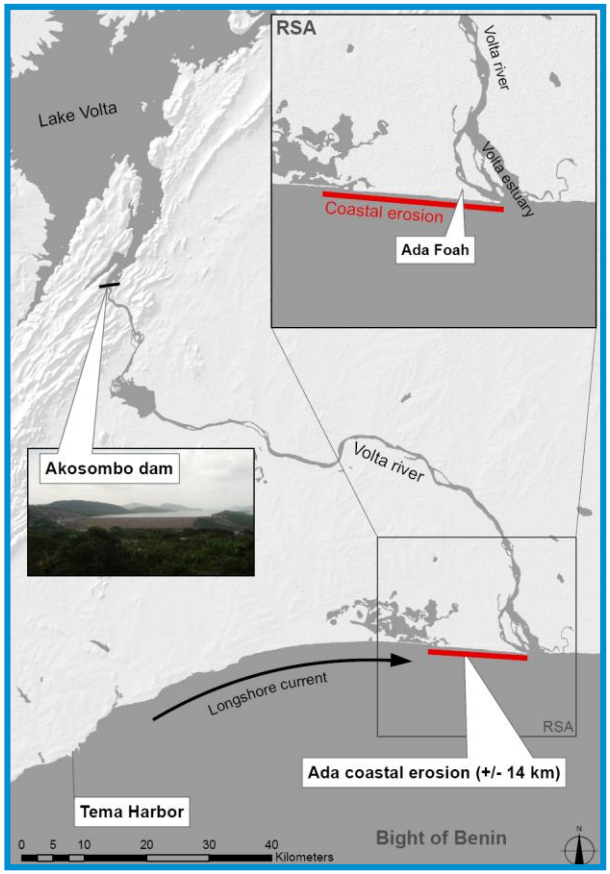
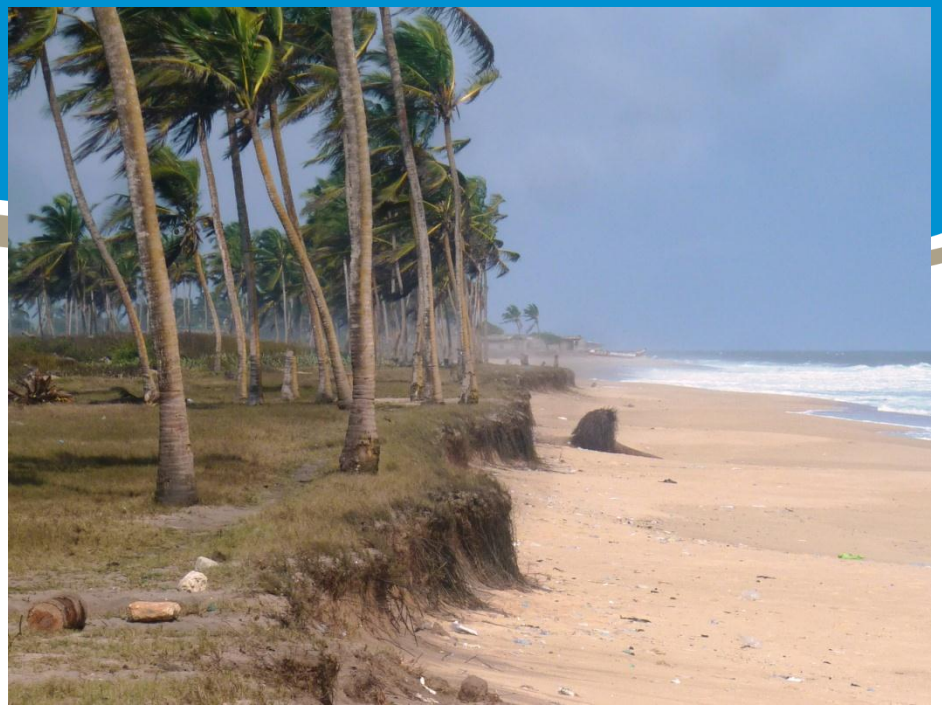







Akosombo
Adome
Kpong
Hopko
Mafi-Kumase
Proper
Noepe
Dzodze
Akepe
Sanguera
Akatsi
Adidome
Lomé
Kilkor-Agbozume
Mepe
Adidome
Akropong
Mampon
Aburi
Dodowa
Tema-Jasikan Rd
Accra-Aflao Rd
Teffe
Sogakope
Keta
Lagoon
Adina
Keta
Big Ada
Akplabnya
Pute
Ada Foah
Anloga
Dawhwenya
Adenta
Municipality
Madina
Tema
Accra
Anfoin
Wogba
Aneho
Ghana



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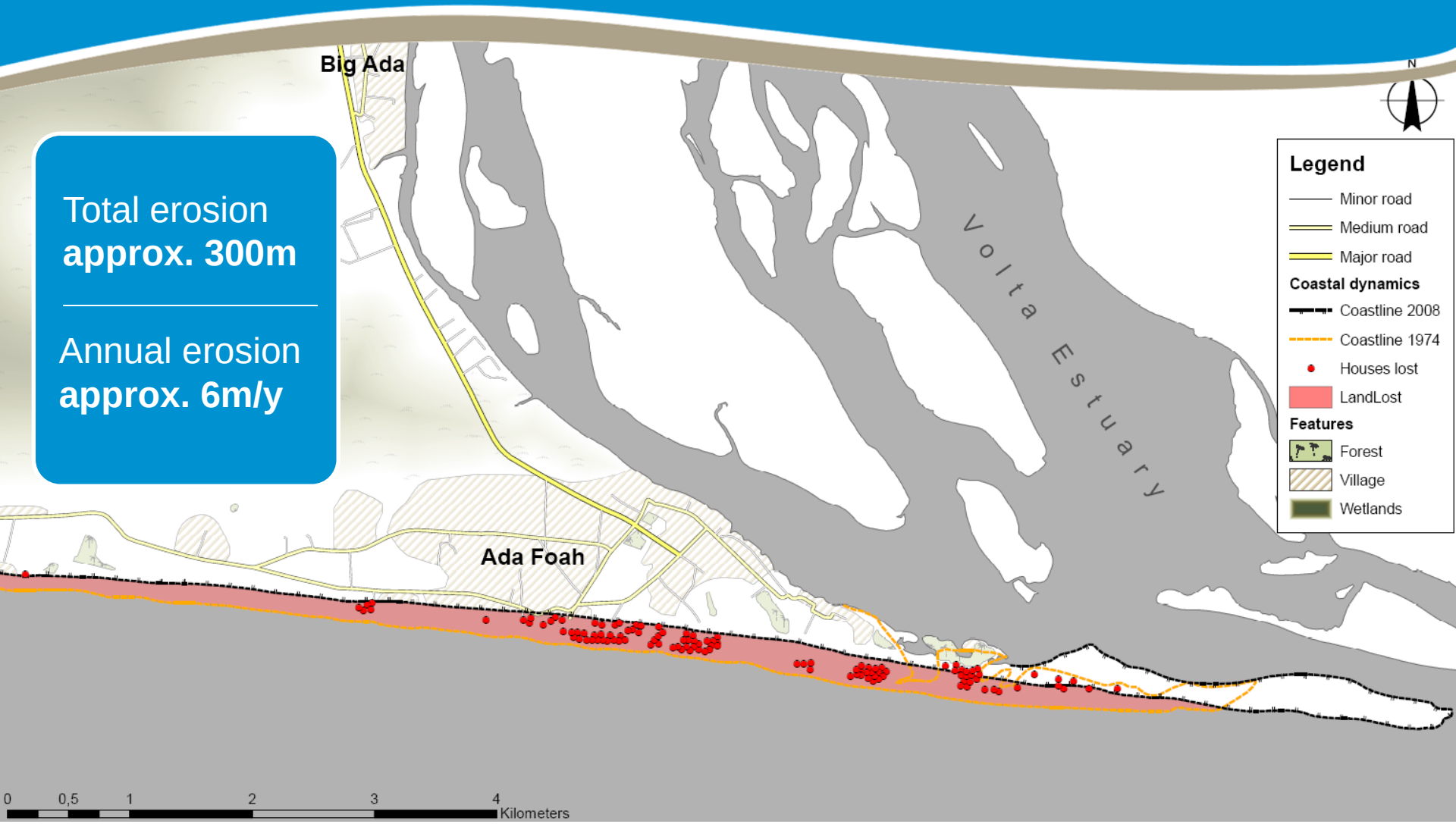

Total erosion
approx. 300m

Annual erosion
approx. 6m/y

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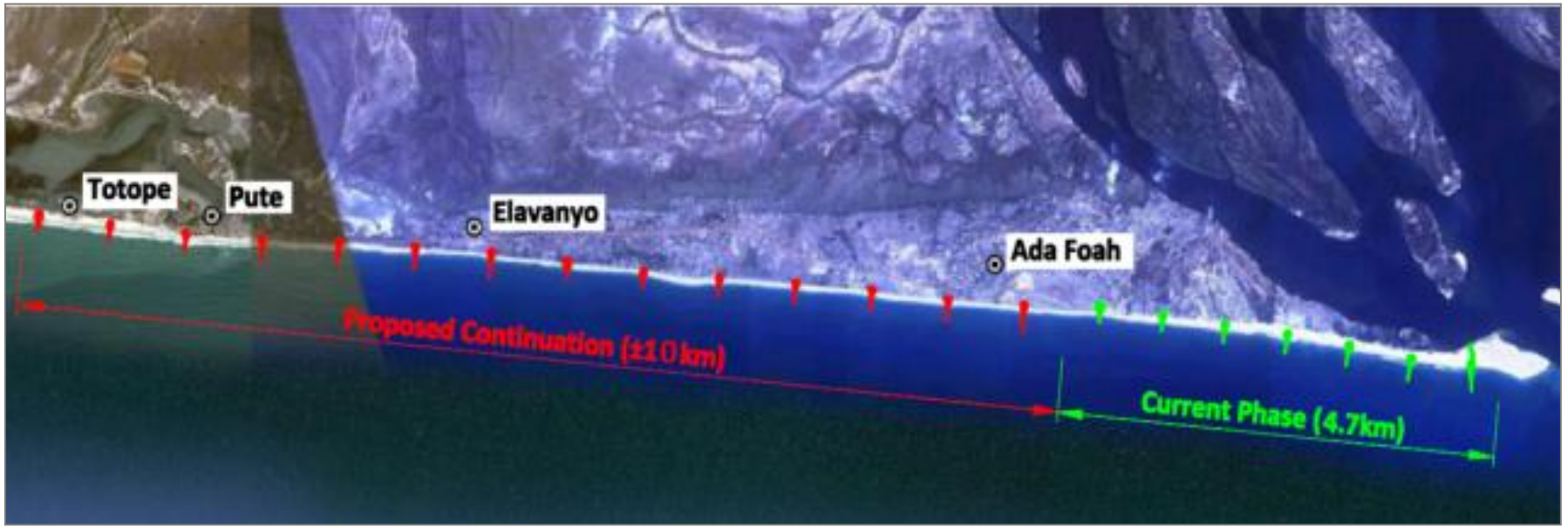
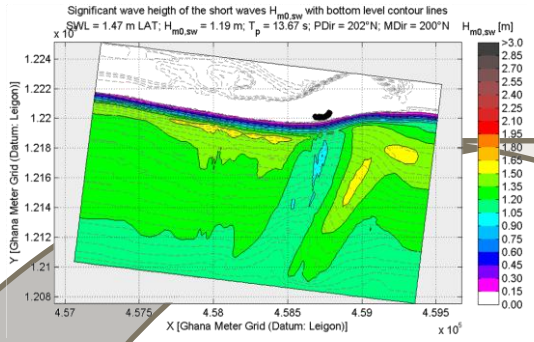
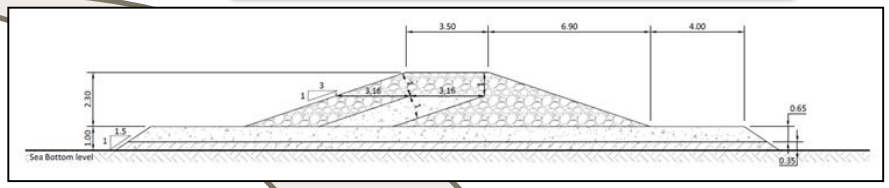


Responsibilities of the Engineer

Numerical modelling



Breakwater Design



Physical modelling

Measurements

IMDC
International Marine & Dredging Consultants

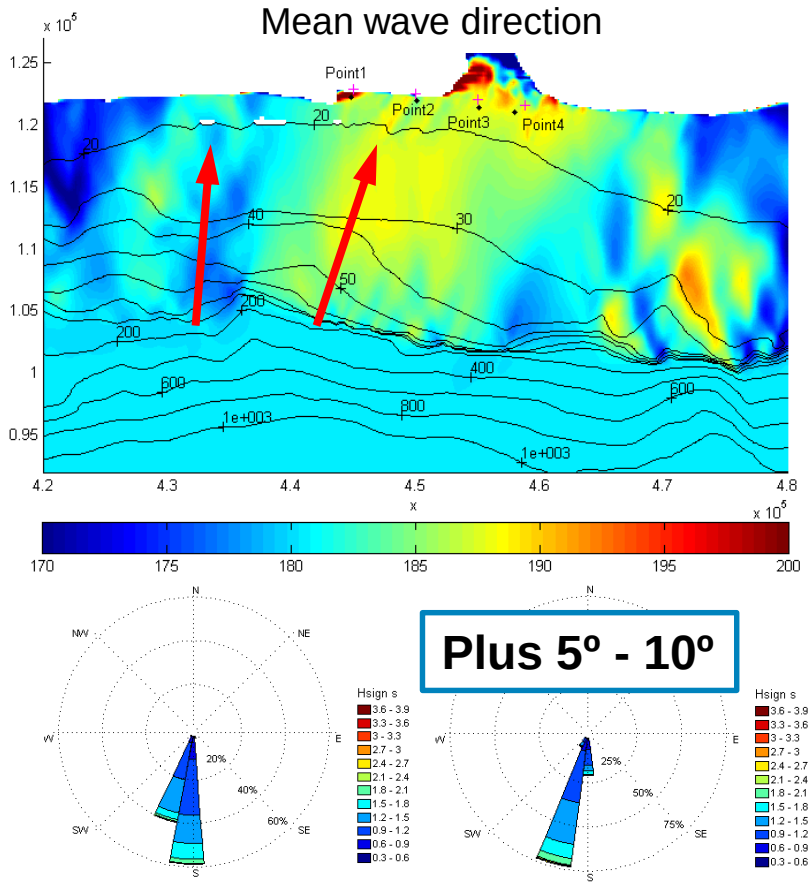
Problem analysis

Site supervision

Longterm coastal evolution with LITPACK

Objectives:

- <u>Reproduce observed erosion</u>
- Predict long-term coastline evolution
- Optimize groyne & nourishment design
- Determine longitudinal spacing, and
- the length of the groynes (bypassing)



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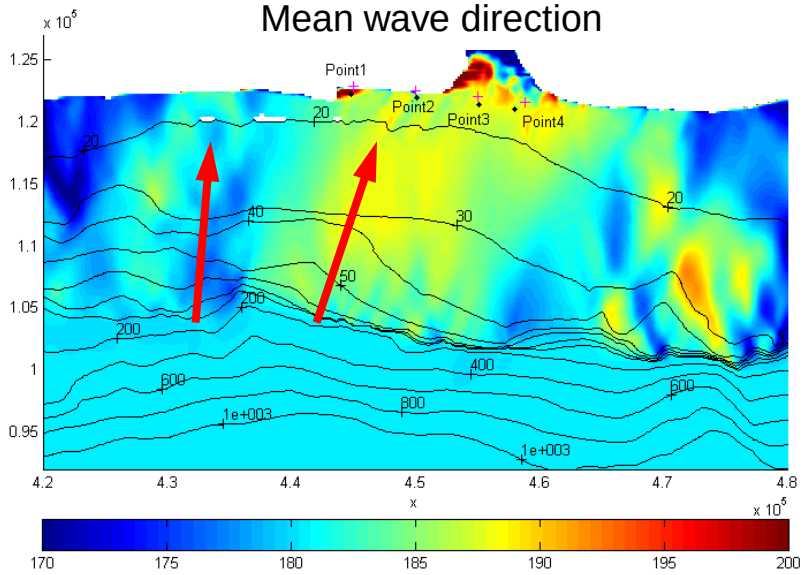

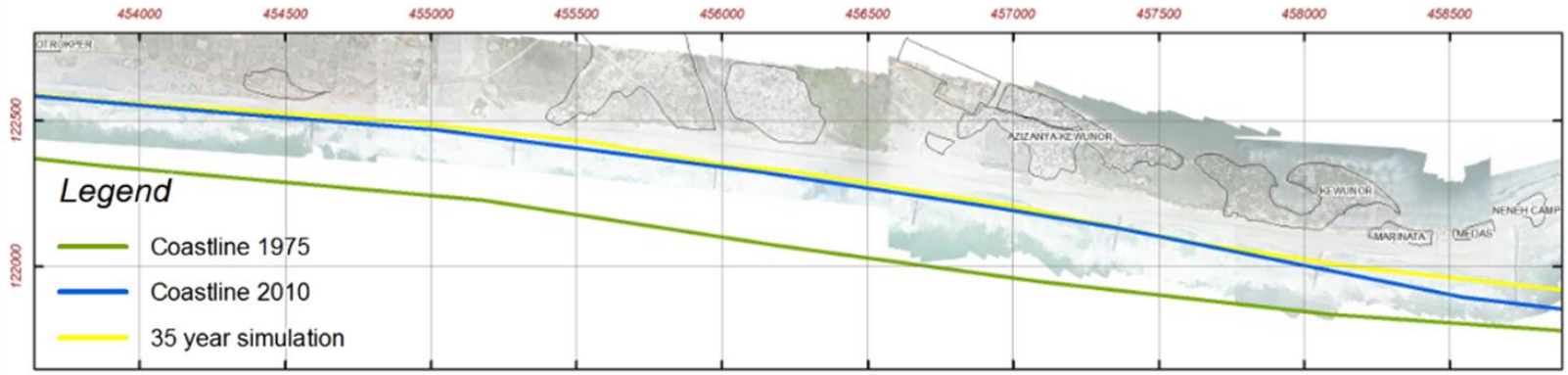

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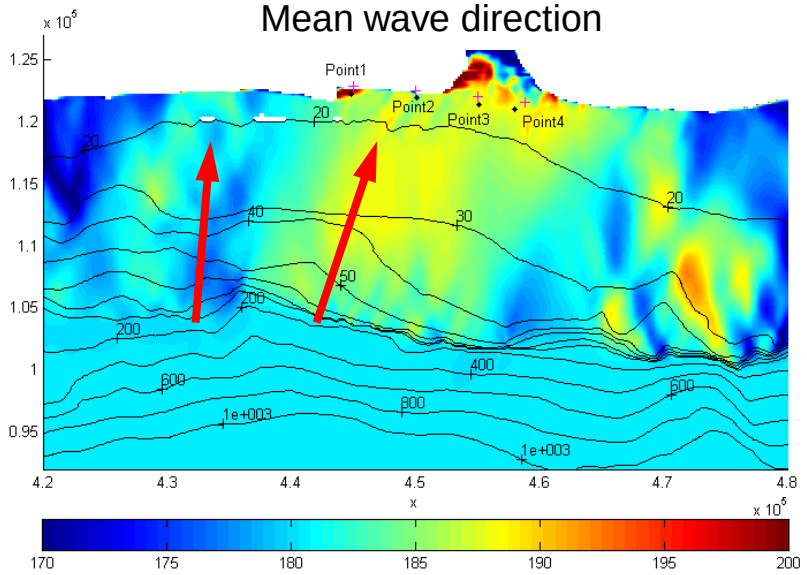
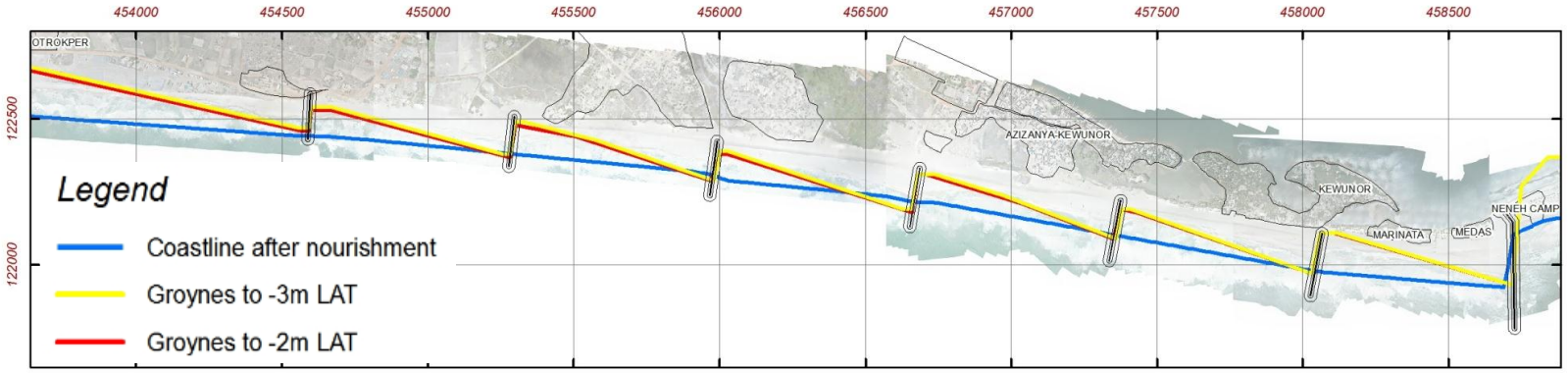
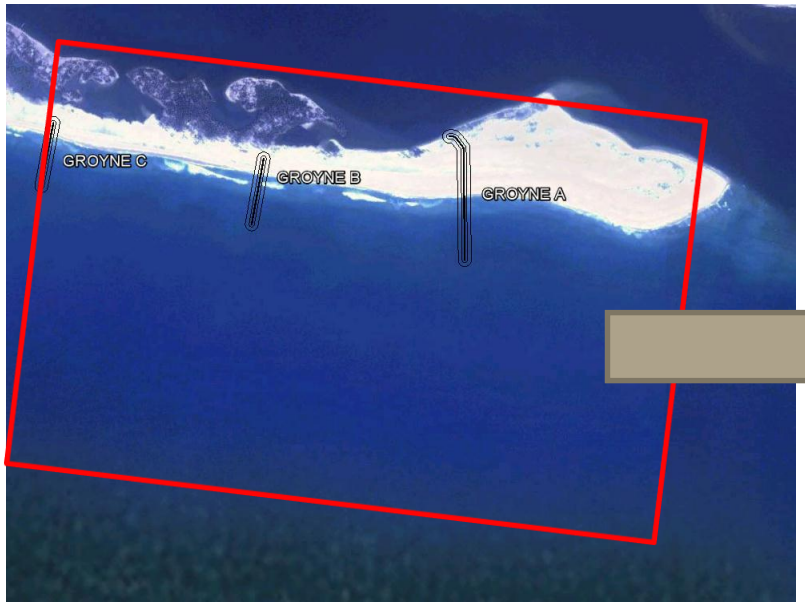


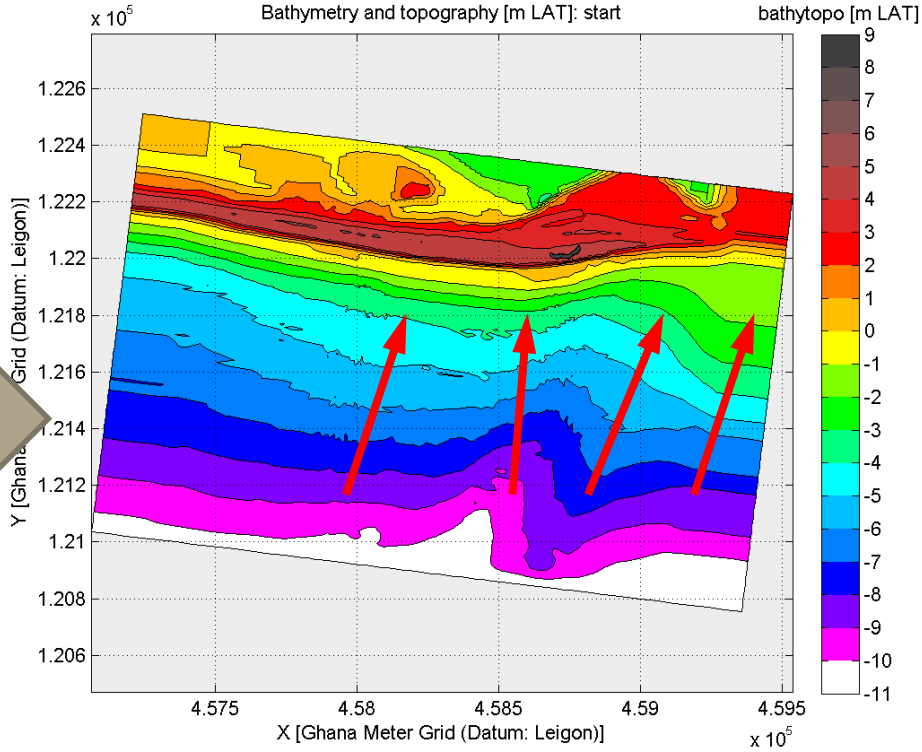


Hindcast morphological evolution: XBeach 2DH

Objectives:

- Hindcast of construction phases groynes A & B (phase 1 area)
- Reproduce the strong local erosion East of groyne A
- Identify the most important erosion processes
- Forecast (phase 2 area)



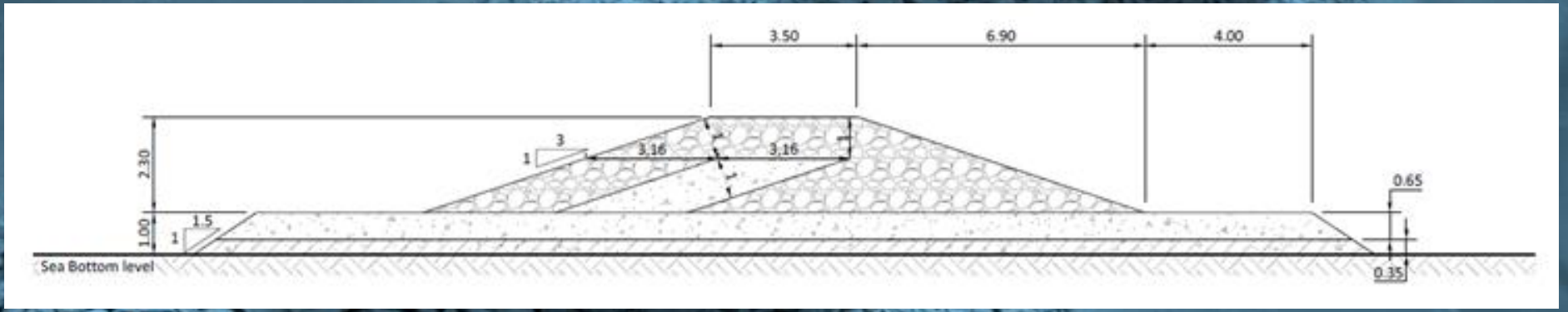


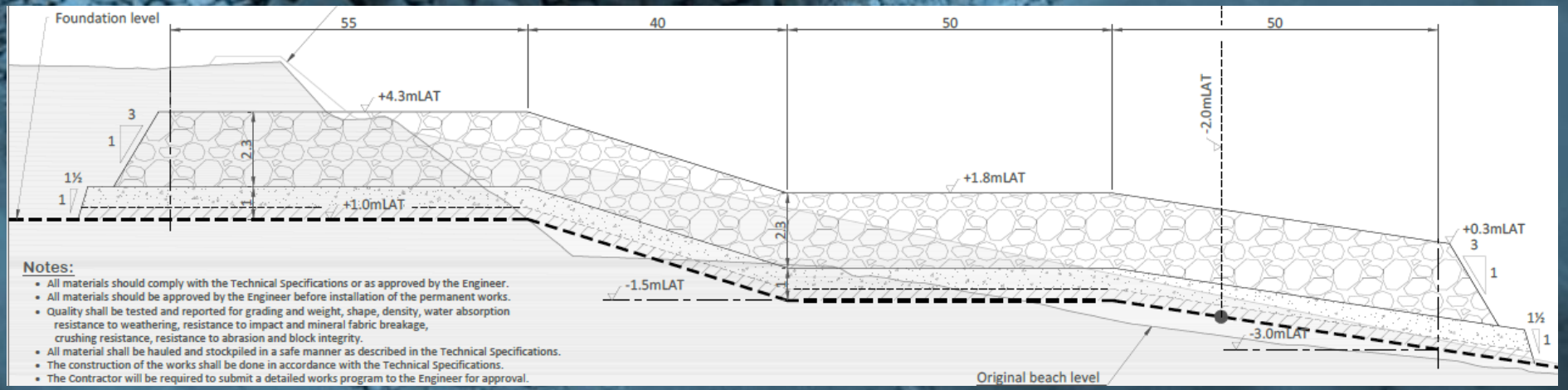
Breakwater (groyne) design

Phase 1: June 2012 – May 2013

Phase 2: under construction

Some details:
- crest width of 3,5m
- side slopes of 1 on 3
- 1m filter of a gravel (5-40mm) and rock (1-300kg)
- groyne of 2-4t rock
- perpendicular core layer of 1-300kg rock to reduce permeability and increase sand trapping.





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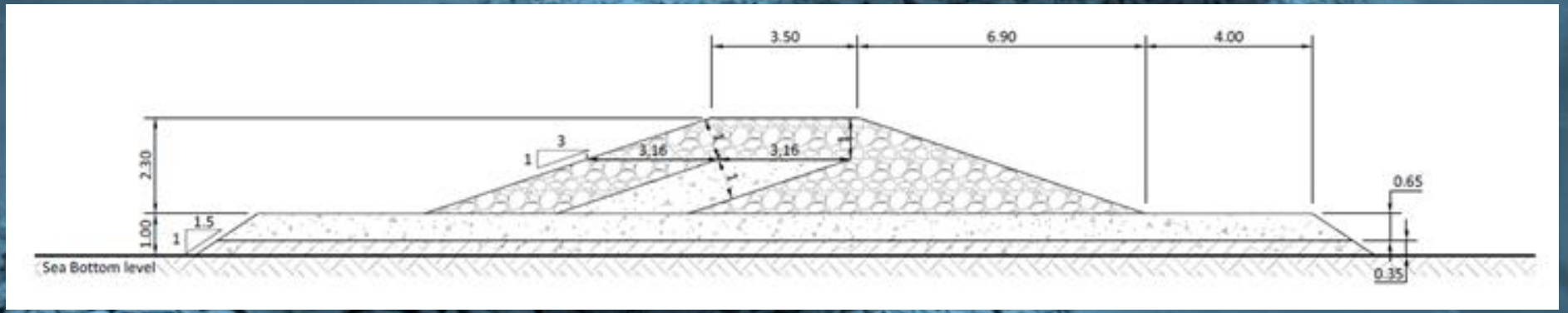
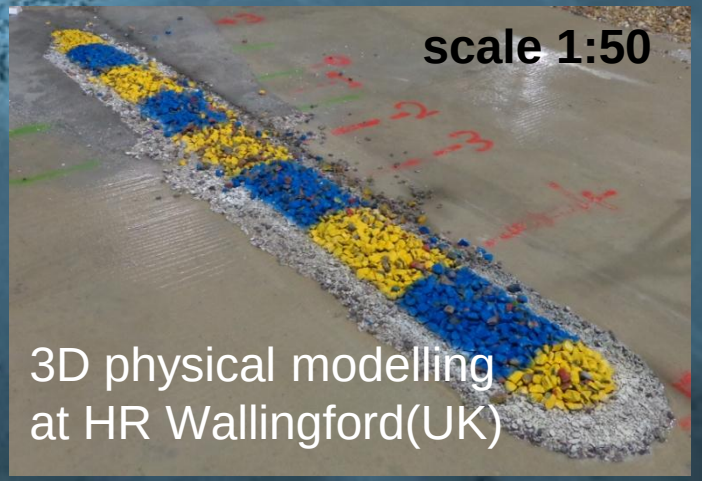
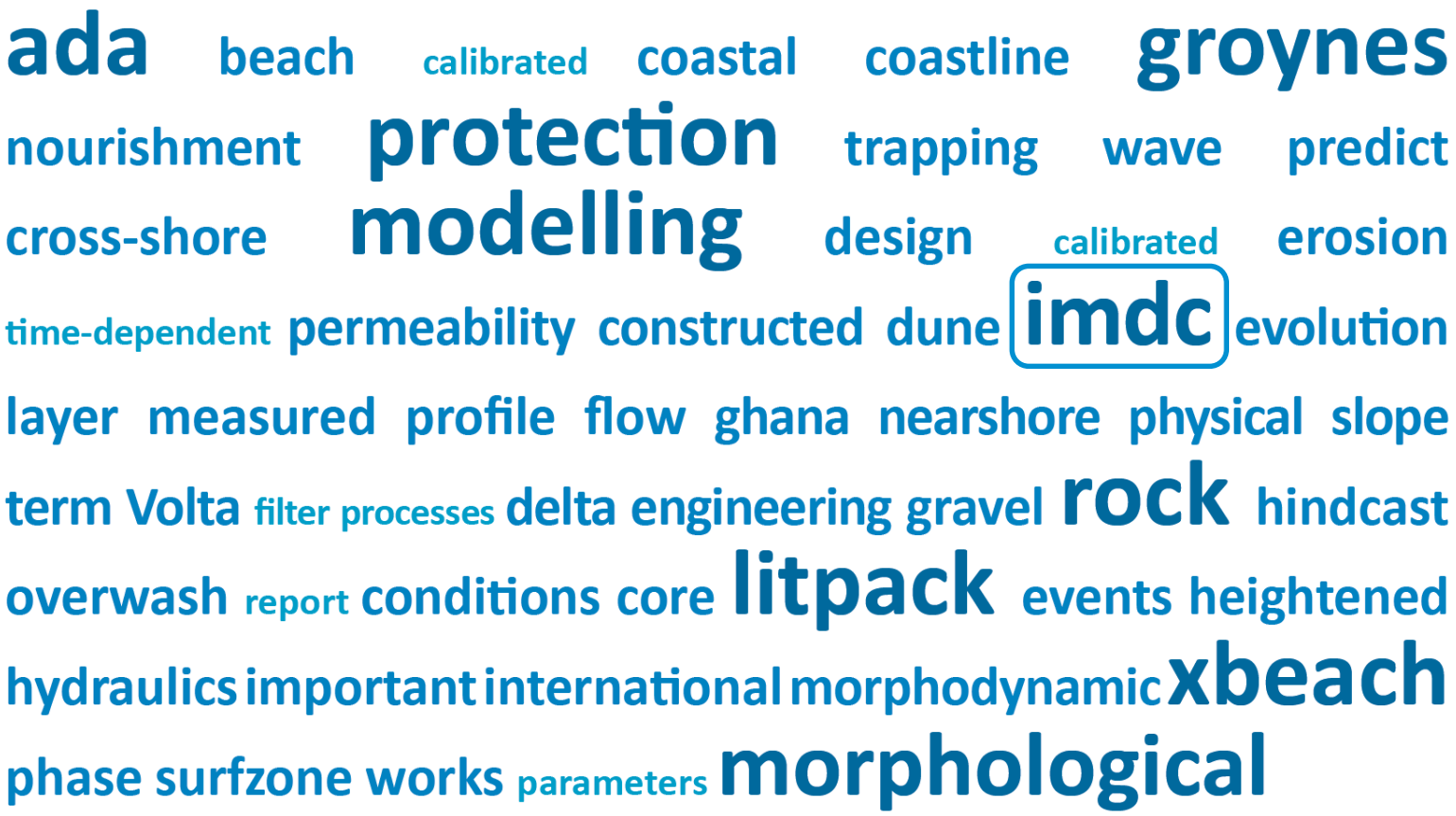




3D physical modelling
at HR Wallingford(UK)

Thank you for your attention and see you in the lobby!



contact: Gijsbert van Holland, gvh@imdc.be