RESEARCHING ON THE TIDAL FLOODING THROUGH THE COASTAL SIMULATION:

Developing potential managed realignment areas of Humber Estuary in England

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Photo by T.Zhao


Humber Estuary

PART ONE: INTRODUTION

1.1 Background

In 1950s, Ports along the Humber Estuary grew into one of ***the busiest ports*** *in the UK*

- Lost Access to rich fishing areas -
- The fishing industry declined dramatically -

PART ONE: INTRODUTION

1.1 Background

70%** of seafood in Grimsby is **imported

PART ONE: INTRODUTION

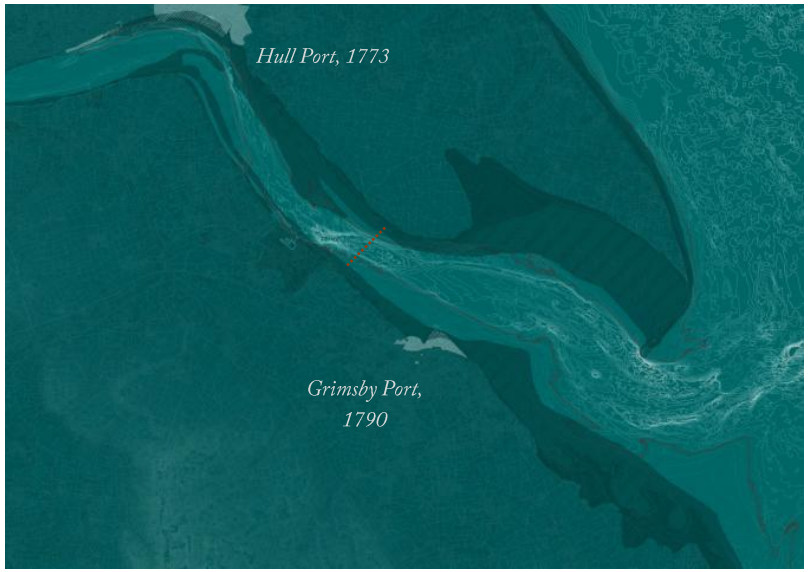
1.1 Background

PART ONE: INTRODUTION

1.2 Tidal flooding

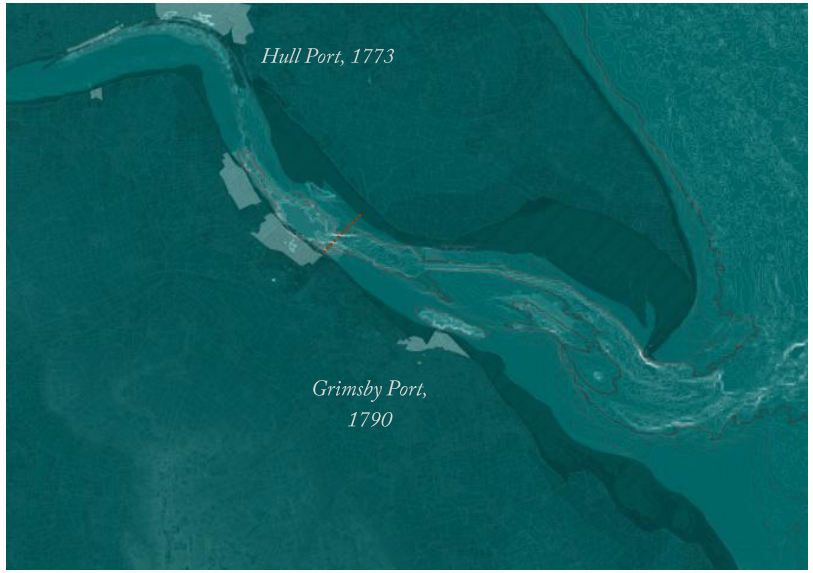
PART ONE: INTRODUTION

1.3 Geomorphology



Intertidal Area, 1828

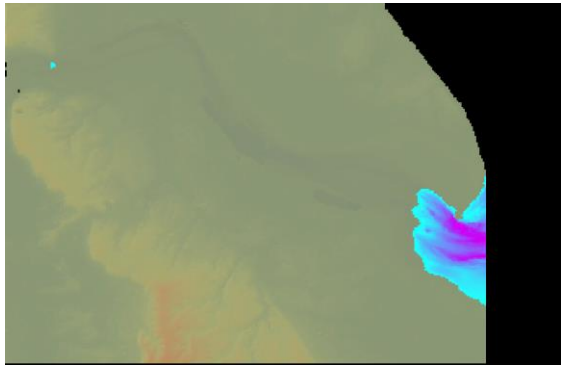
Intertidal Area, 1900



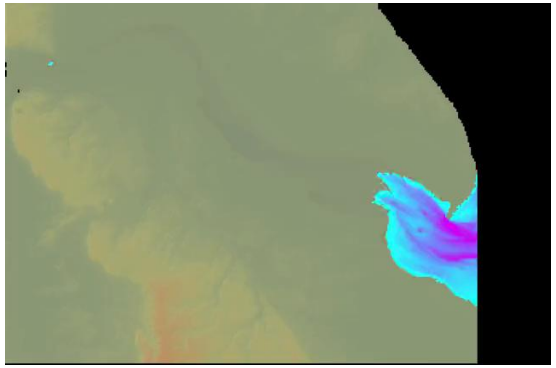
Intertidal Area, 2007

PART TWO: FIND THE MANAGED REALIGNMENT AREAS FOR AQUACULTURE

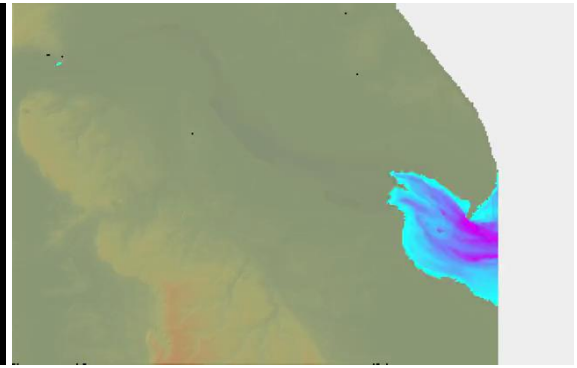
2.1 Potential area for aquaclture



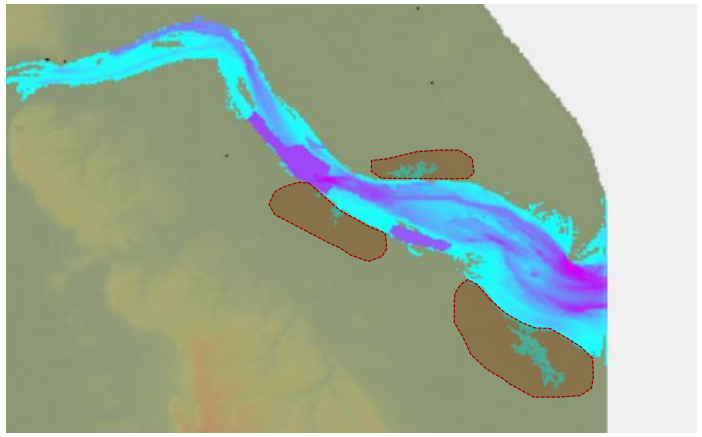
Without human intervention



With Dredging activities



With Managed Realignment areas

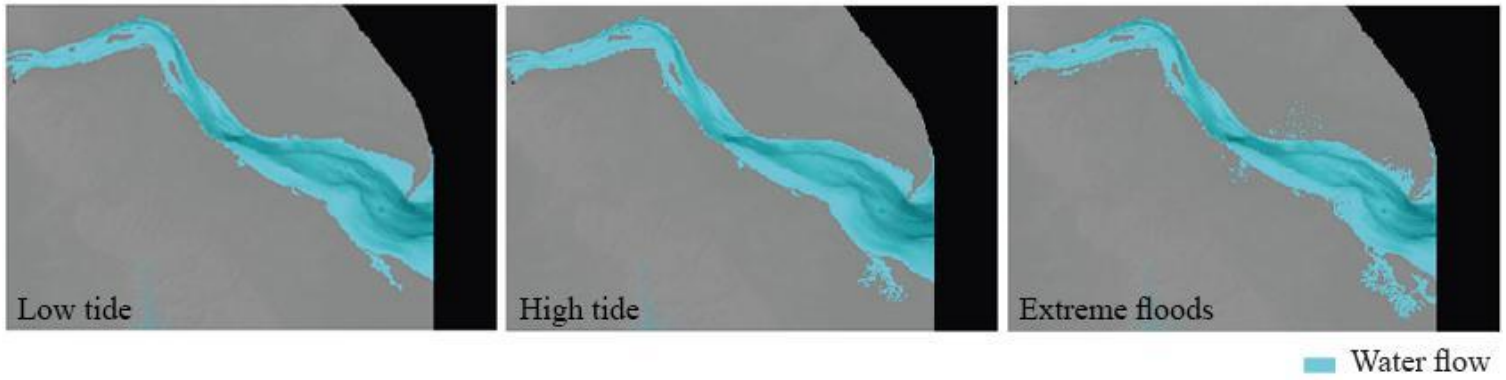


Managed Realignment Location

The potential managed realignment areas are identified in the Investing in Natural Capital Plan as Natural Capital Opportunity Areas(Natural Capital Committee. 2018).

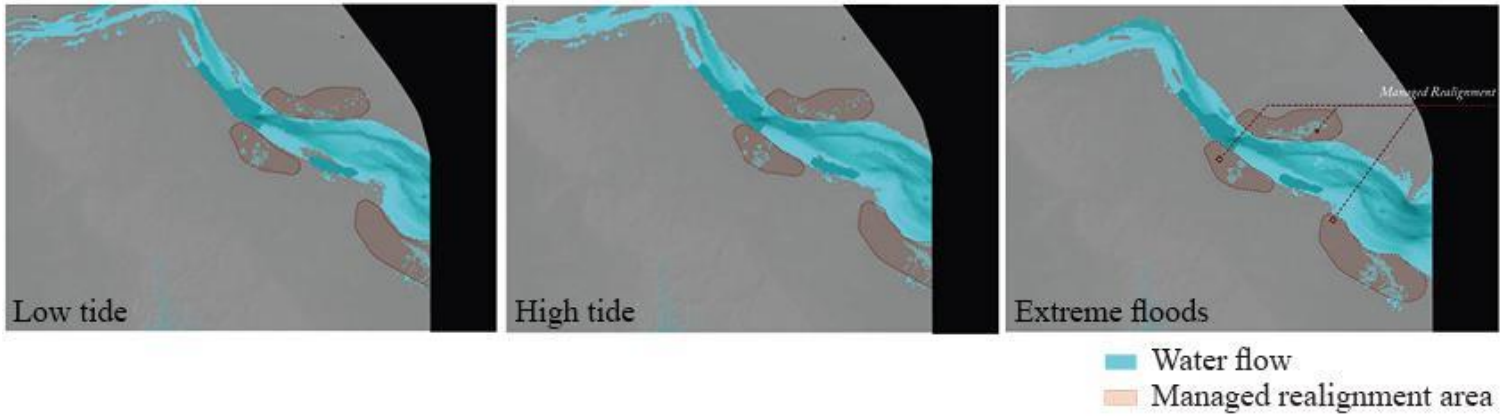
PART TWO: FIND THE MANAGED REALIGNMENT AREAS FOR AQUACULTURE

2.2 Tidal simulation



Simulation 01

Without human intervention



Simulation 02

With Managed Realignment areas

2.3 Mapping the aquaculture area

Physical condition of shellfish

Baseline lagoon condition	Blue mussel /Mytlus edulie	Native flat oyster /Ostera edulis	King scallop /Pecten maximus	European clam /Ruditapes decussatus	Cockles /Cerastoperma edulis
Depth/Bathymetry	Intertidal to 20m	80m below CD	5 to 110m below CD	Lower intertidal	Mid to lower intertidal
Seabed/Shore type	Stable sediment	Coarse/Stable sediment	Stable sediment	Sand & Silty mud	Sand/Muddy sand
Current speed	1-2knots	1-2knots	1-2knots	/	/

CD: Central depth

PART TWO: FIND THE MANAGED REALIGNMENT AREAS FOR AQUACULTURE

2.3 Mapping the aquaculture area

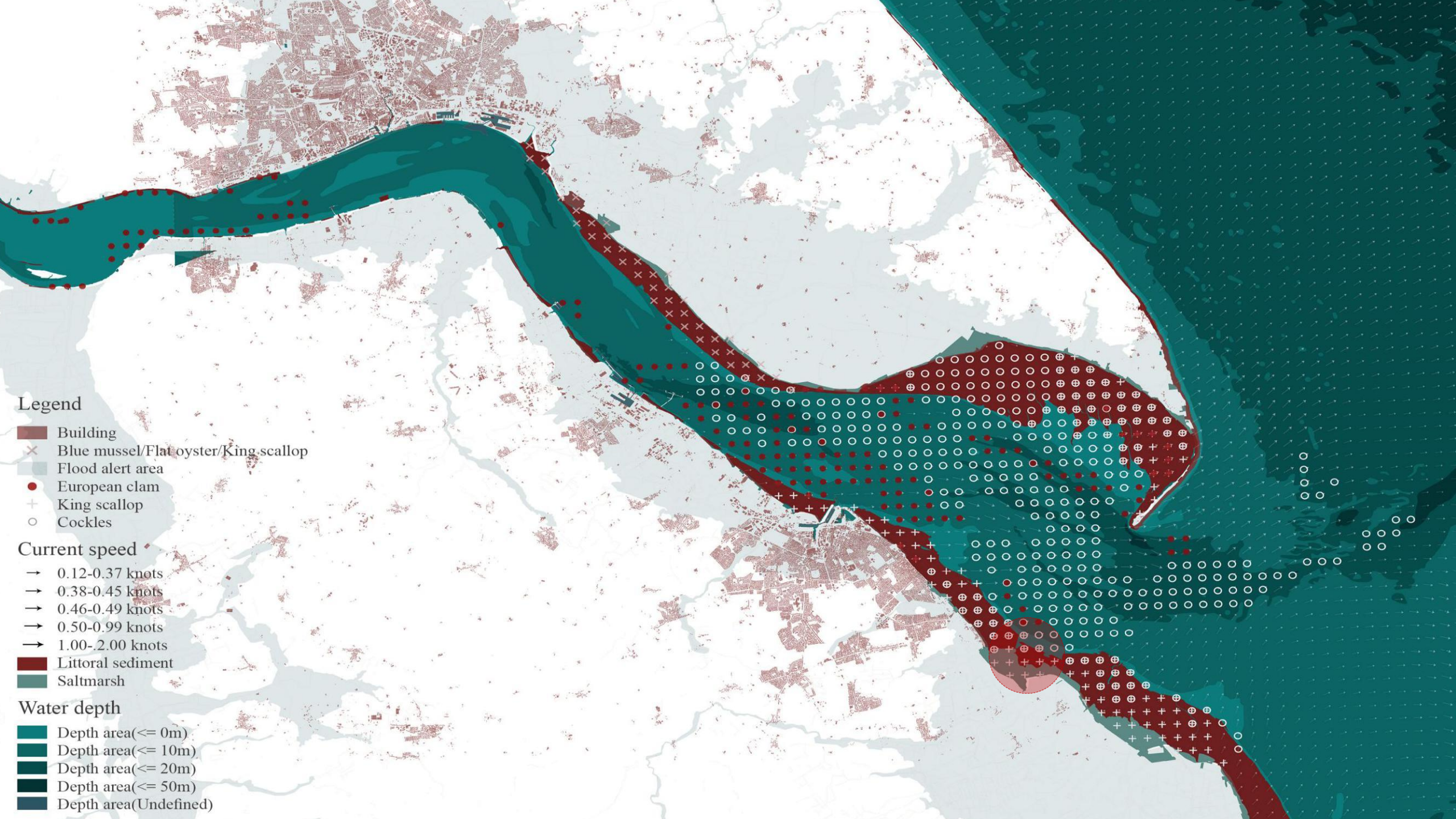
Bottom cultured bivalves

Ranching

Containment

Suspended bivalves

Researching on the tidal flooding through the coastal simulation: *Developing potential managed realignment areas of Humber Estuary in England*


Legend
Building
Blue mussel/Flat oyster/King scallop
Flood alert area
European clam
King scallop
Cockles
Current speed
0.12-0.37 knots
0.38-0.45 knots
0.46-0.49 knots
0.50-0.99 knots
1.00-.2.00 knots
Littoral sediment
Saltmarsh
Water depth
Depth area(<= 0m)
Depth area(<= 10m)
Depth area(<= 20m)
Depth area(<= 50m)
Depth area(Undefined)

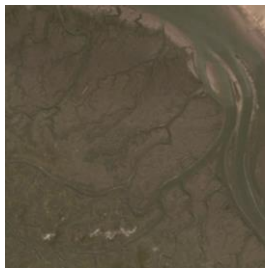

Doona Nook Site 1
Managed Realignment
Test Time: 180 Days


Doona Nook Site 1
Managed Realignment
Test Time: 180 Days

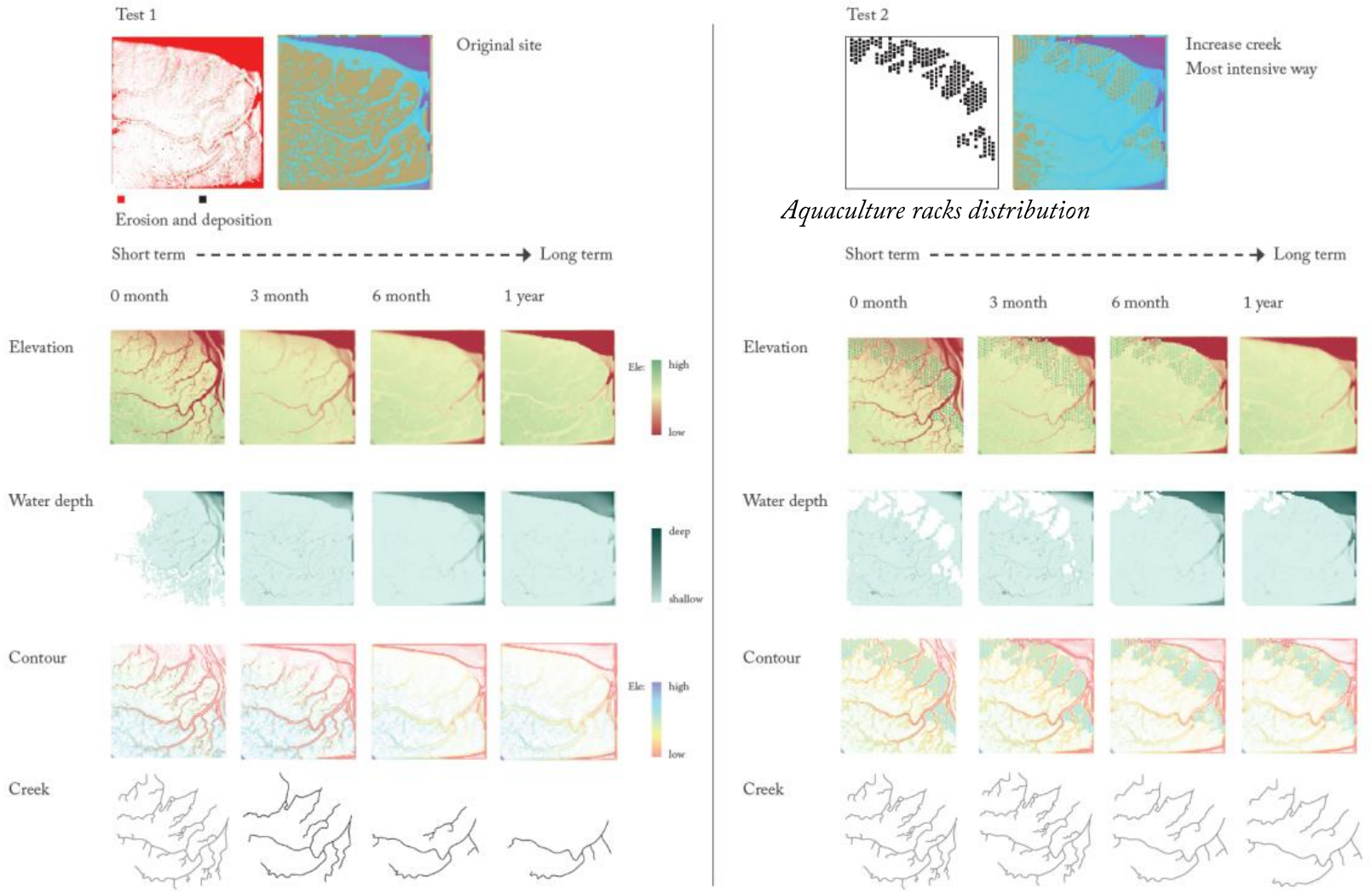

Doona Nook Site 1
Managed Realignment
Test Time: 180 Days

PART THREE: IMPACT OF AQUACULTURE ON MANAGED REALIGNMENT AREAS

3.2 Original site and shellfish farm



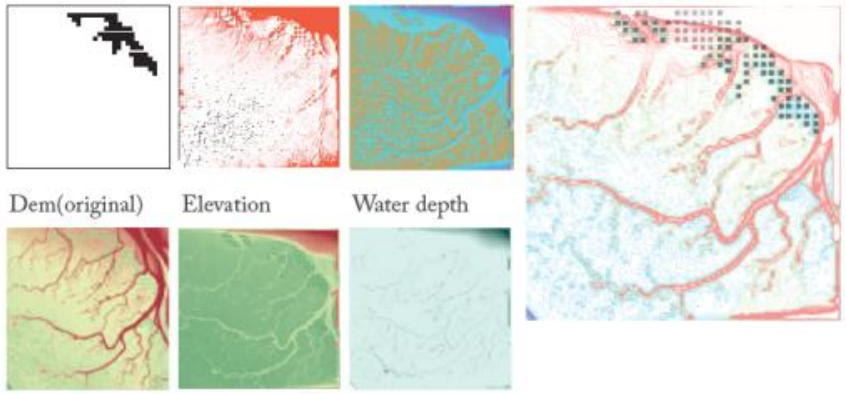
Mudflat
(Managed realignment area)



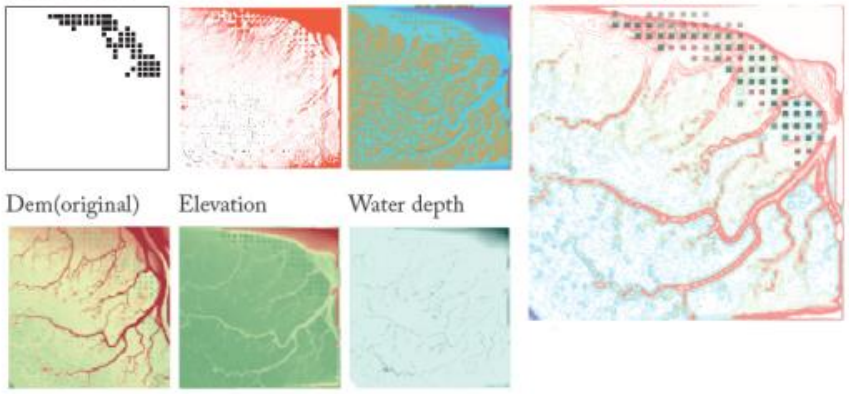
PART THREE: IMPACT OF AQUACULTURE ON MANAGED REALIGNMENT AREAS

3.3 Shellfish farm density simulation (1m,2m,3m,4m)

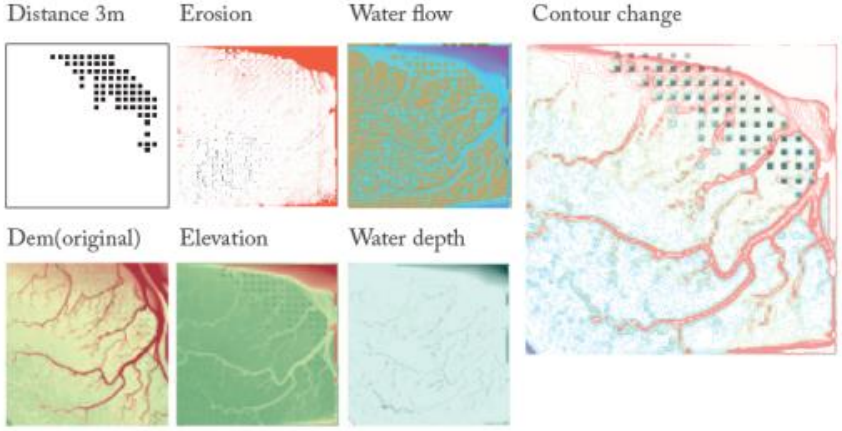
Text 1



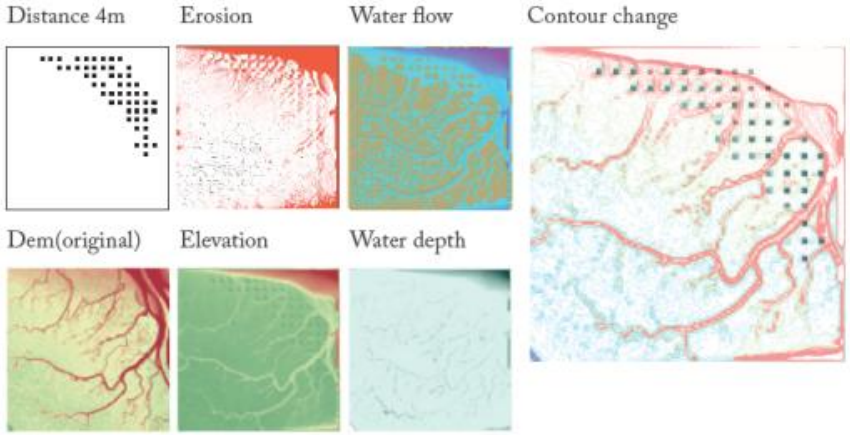
Text 2



Text 3

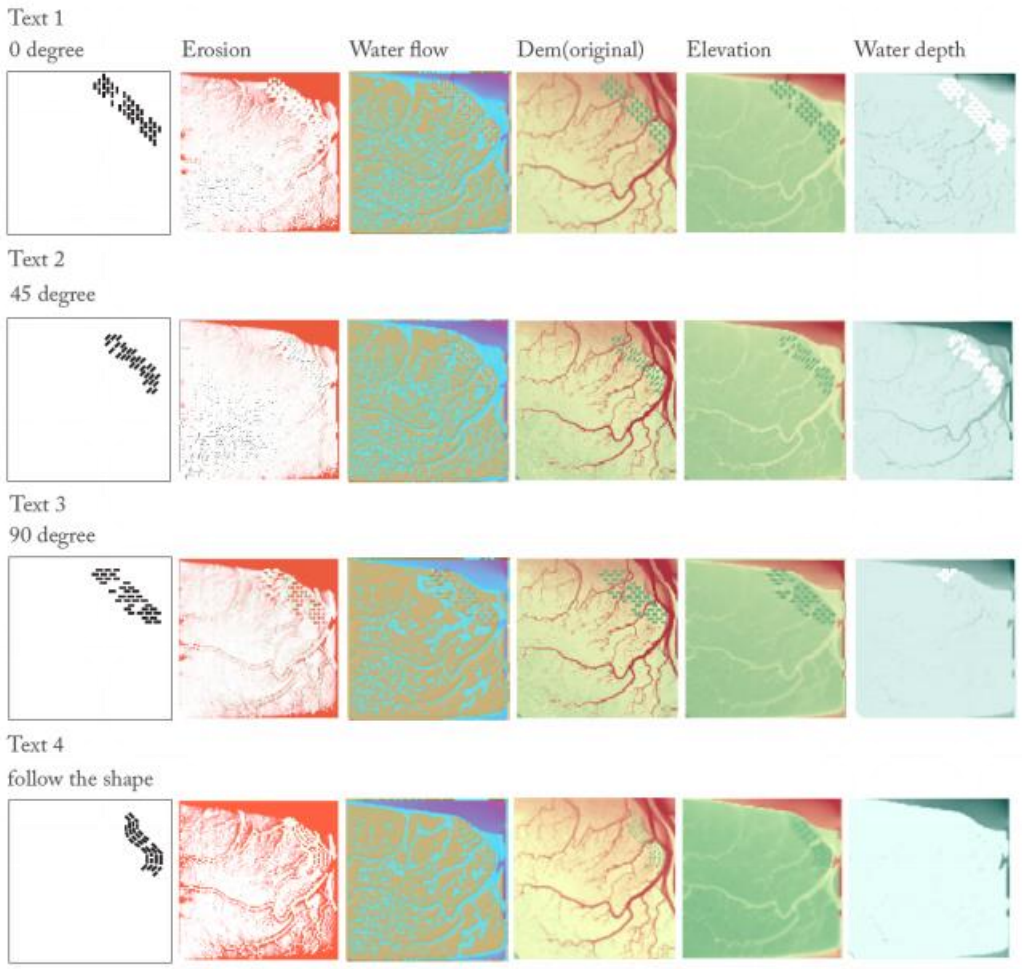


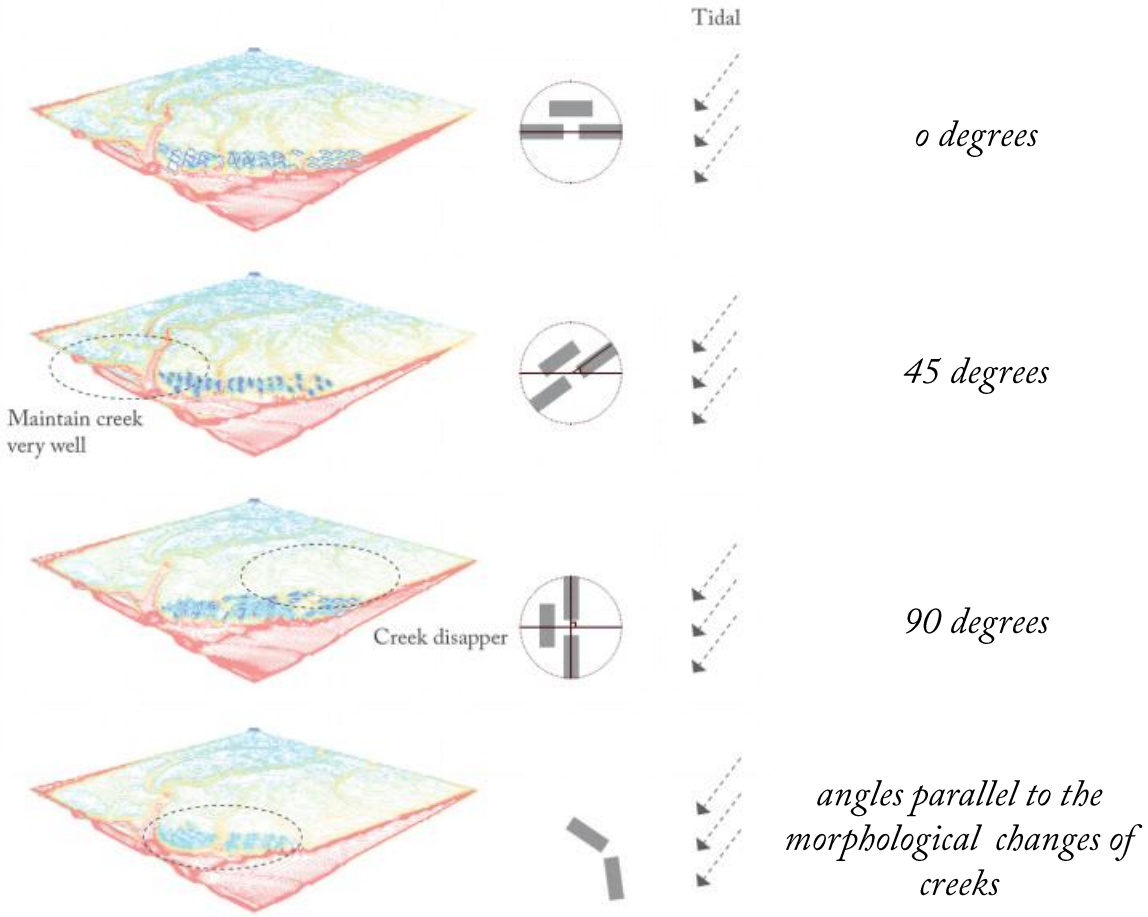
Text 4



PART THREE: IMPACT OF AQUACULTURE ON MANAGED REALIGNMENT AREAS

3.4 Shellfish farm angle simulation





o degrees

45 degrees

90 degrees

angles parallel to the morphological changes of creeks

References

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