

A New N-S (North-South) System

-- Renaturing the Thames Estuary

P5 PRESENTATION

TU Delft

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Department of Urbanism; Research group Delta
urbanism

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second mentor: Inge Bobbink

Date: 07/2018

Content

- **Introduction**

- Fascination by project location and North Sea Territory
- Research questions
- Methodology
- Theoretical framework

- **Analysis on Thames Estuary**

- Coastal landscape
- Coastal urbanization
- Mobility

- **Position and Design**

- A new N-S system
- Projects A -- Tidal park, backing to nature

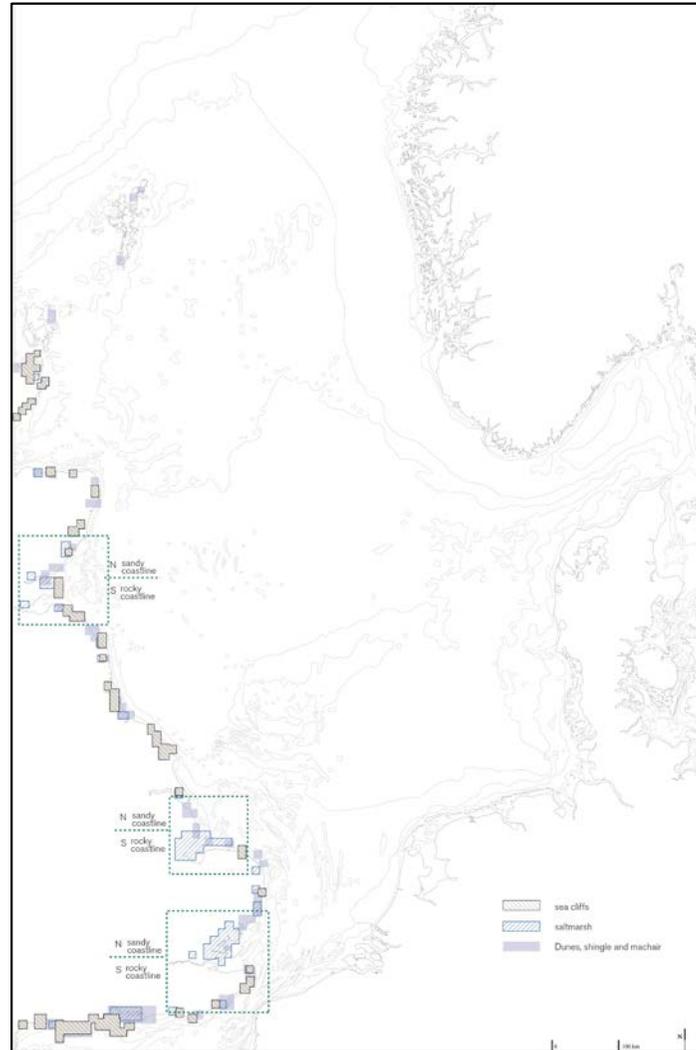
- **PART 1. Introduction**

- Fascination by project location and North Sea Territory
- Research questions
- Methodology
- Theoretical framework

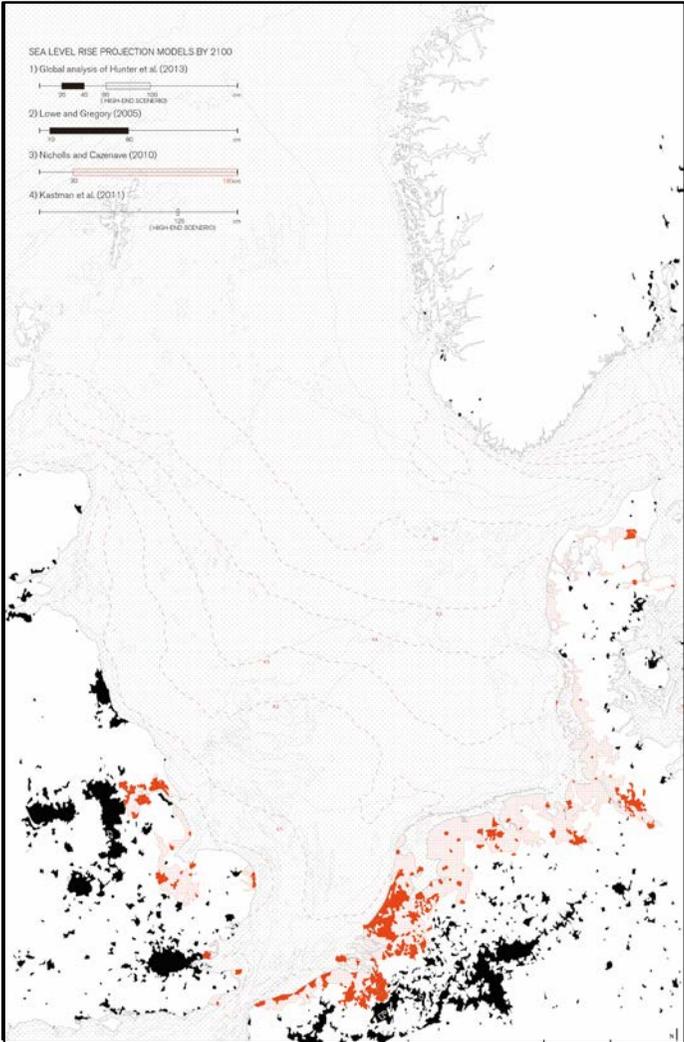
Fascination – Dynamics and transition



Coastal landscape along UK shoreline



Costal urbanization and challenges

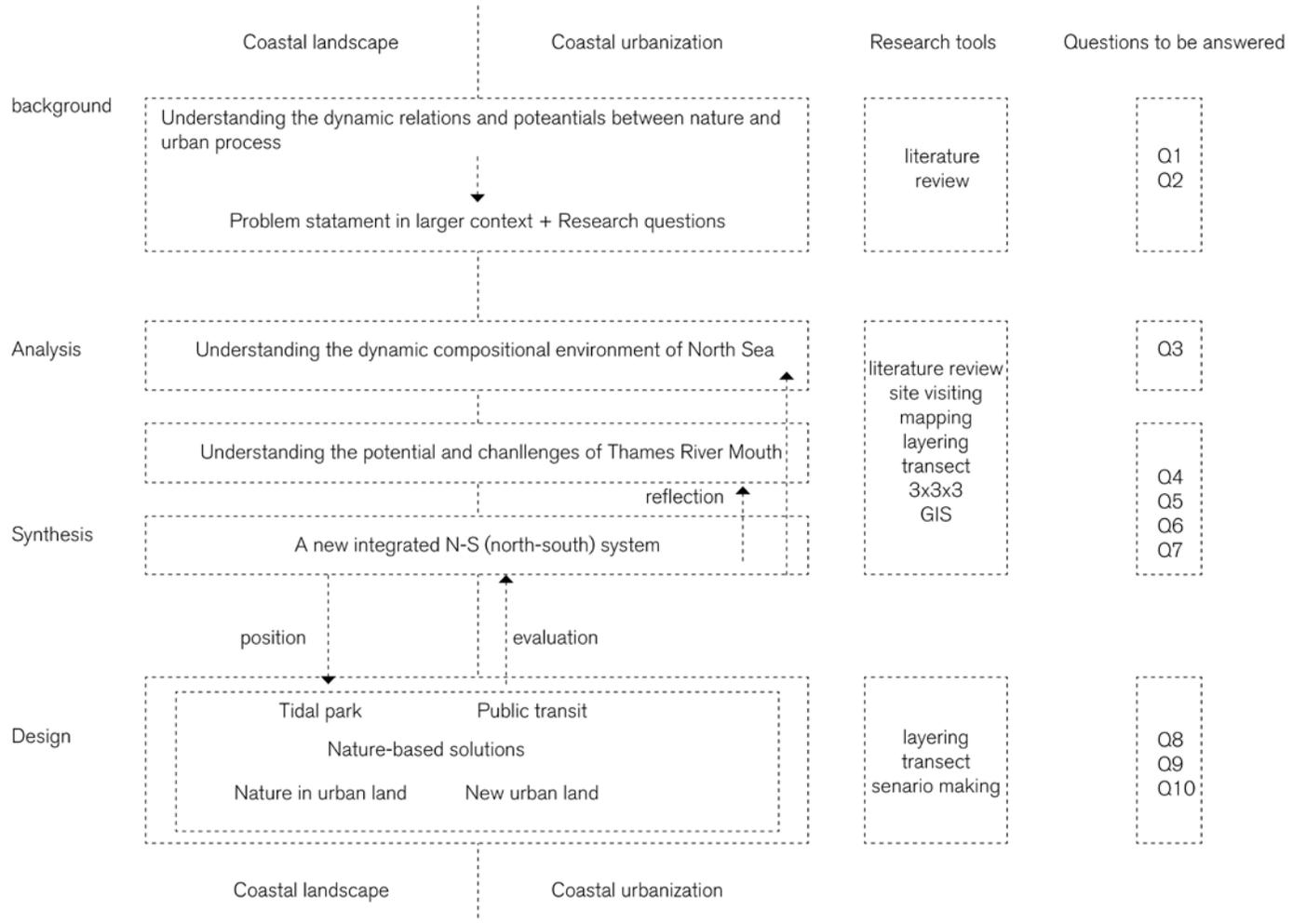


Research Questions

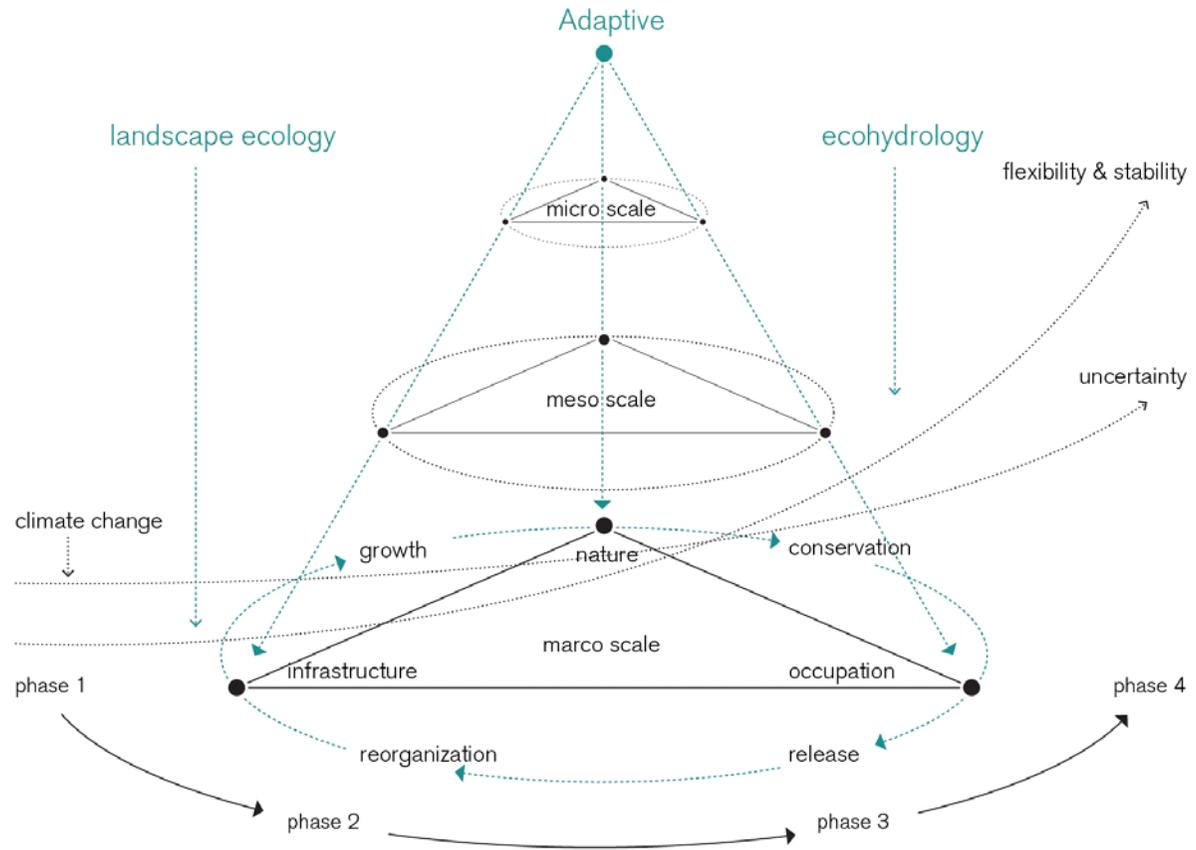
- Main research questions:

How to achieve synergetic co-existence and balance between different coastal landscapes and coastal urbanization to adapt to hydrological uncertainties in Thames Estuary through renaturing?

Methodology



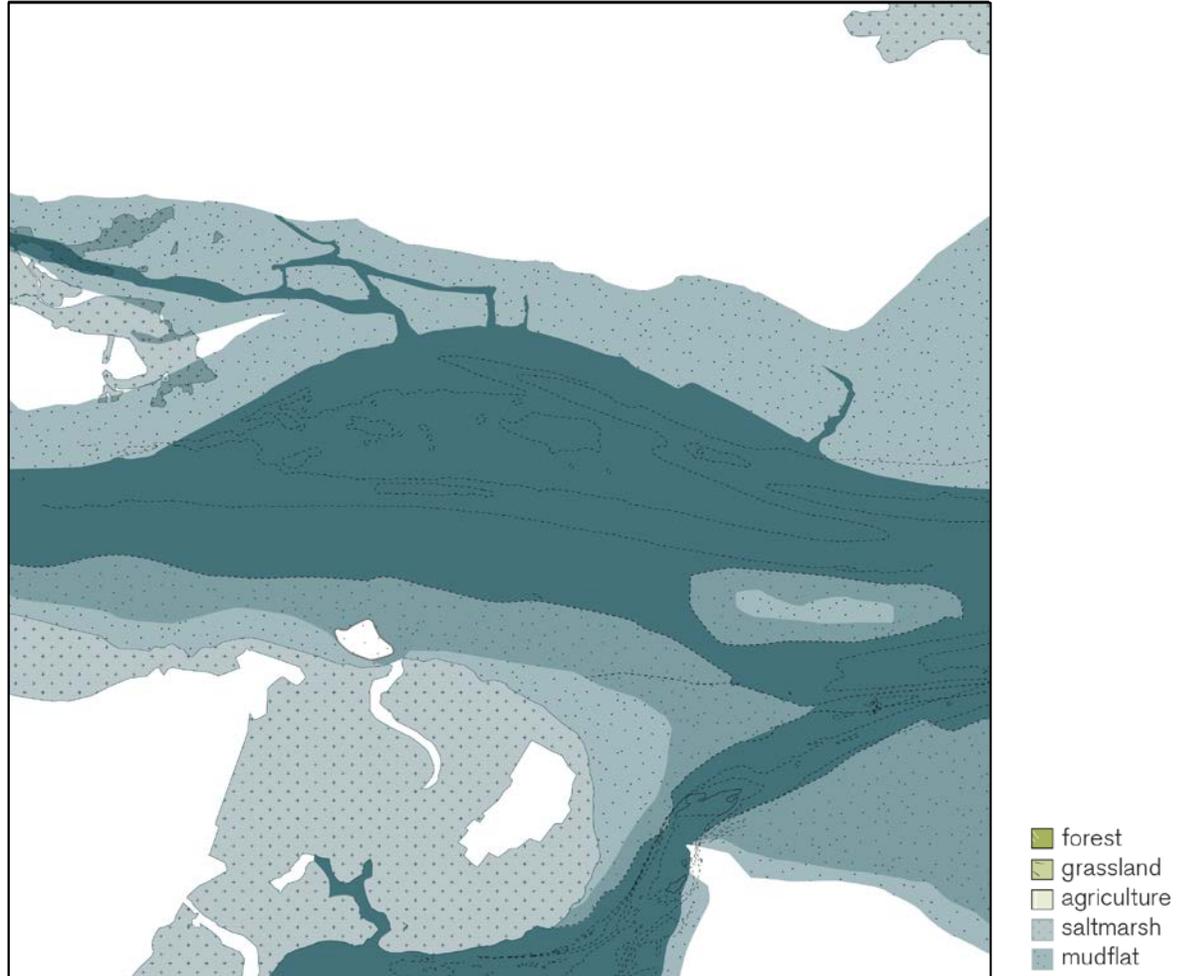
Theoretical framework



- **PART 2. Analysis on Thames Estuary**

- Coastal landscape
- Coastal urbanization
- Mobility

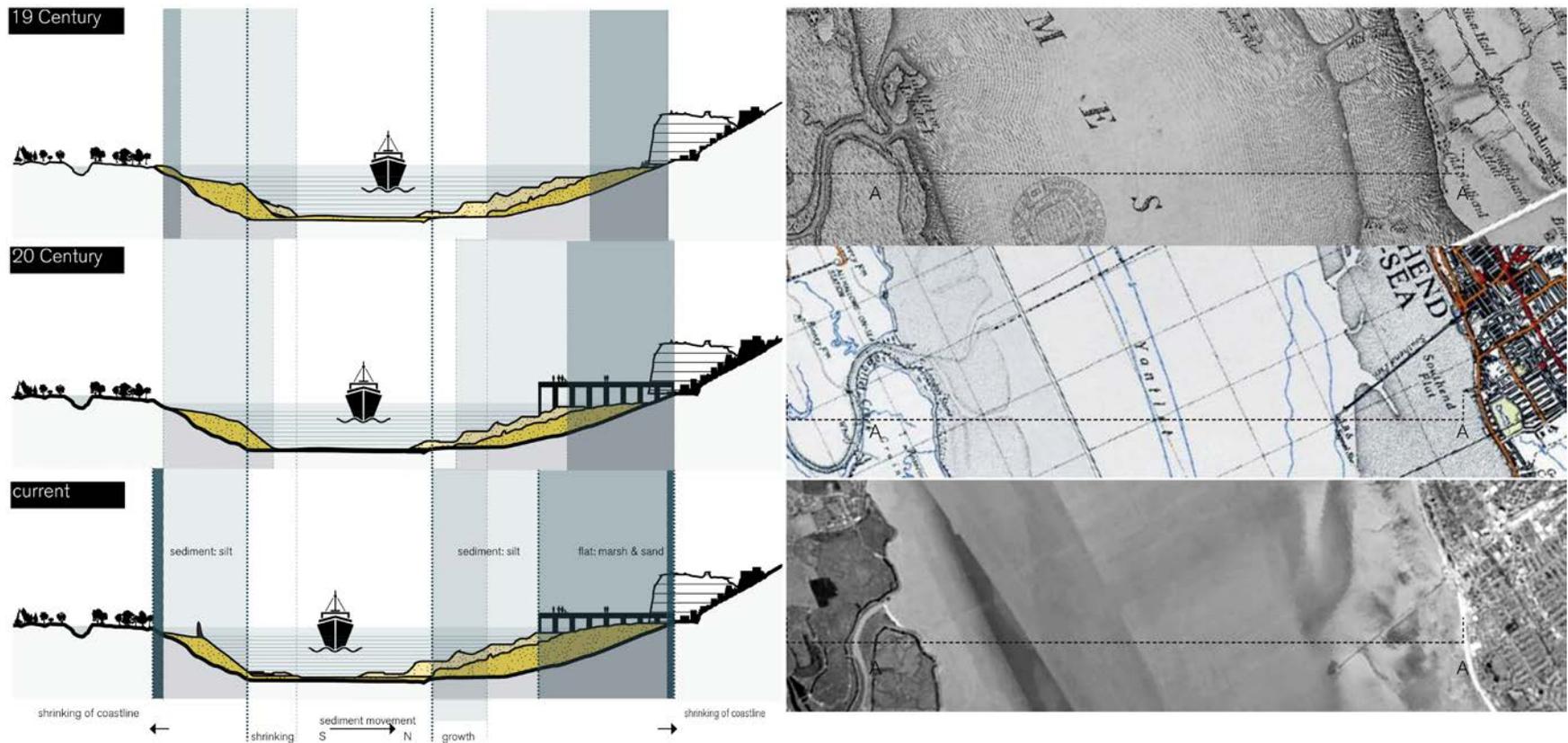
Coastal landscape ecology and saltmarsh landscape process



Coastal landscape ecology and saltmarsh landscape process

Sediment transportation:

northbank is growing while southbank is shrinking, Vanished beach due to coastal erosion at the southbank



Outcome of coastal process – changing coastline

Northbank

Southbank

change in coastline



coastline grew seaward



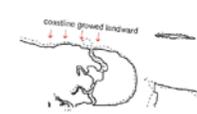
coastline grew seaward



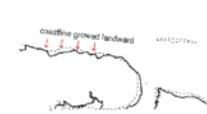
change in coastline



coastline grew landward



coastline grew landward



change in mudflat shape



mudflat are more winding



mudflat are more winding



change in mudflat shape



mudflat are more winding



mudflat are more winding



change in mudflat size



mudflat grew



mudflat grew



change in mudflat size



mudflat shrank



mudflat slightly shrank



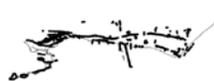
changes in shore construction



construction for sea defencing



construction for sea defencing



changes in shore construction



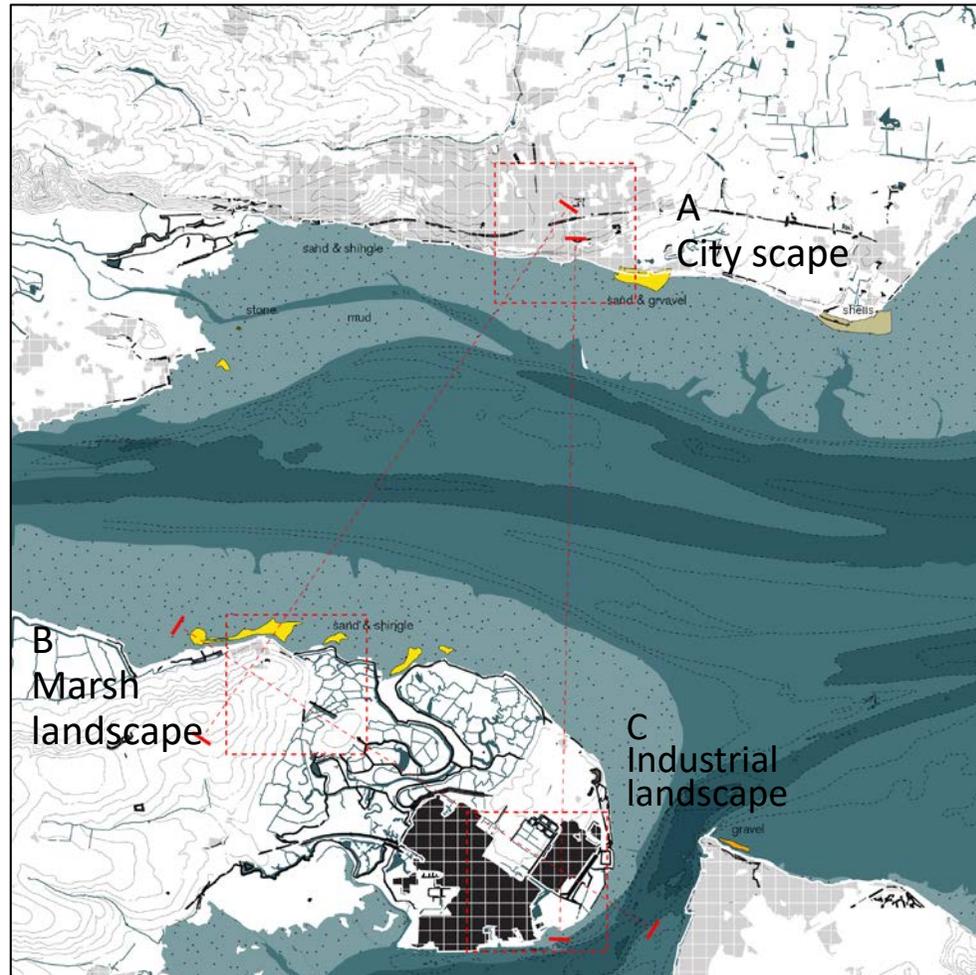
construction for sea defencing



construction for sea defencing

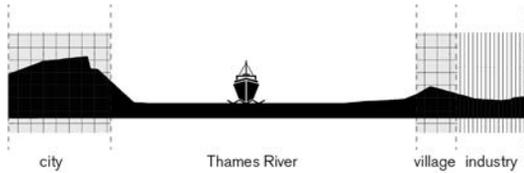


Outcome of costal process – distinguished landscapes

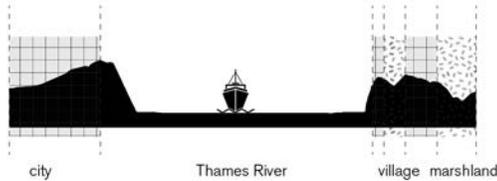


Sections of coastal landscapes in relation to elevations

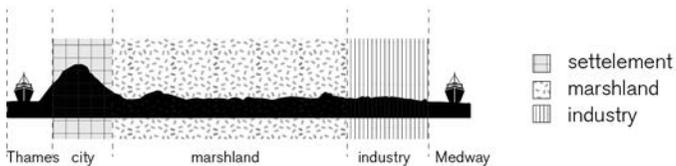
A-C: cityscape – industrial landscape



A-B: cityscape -- village

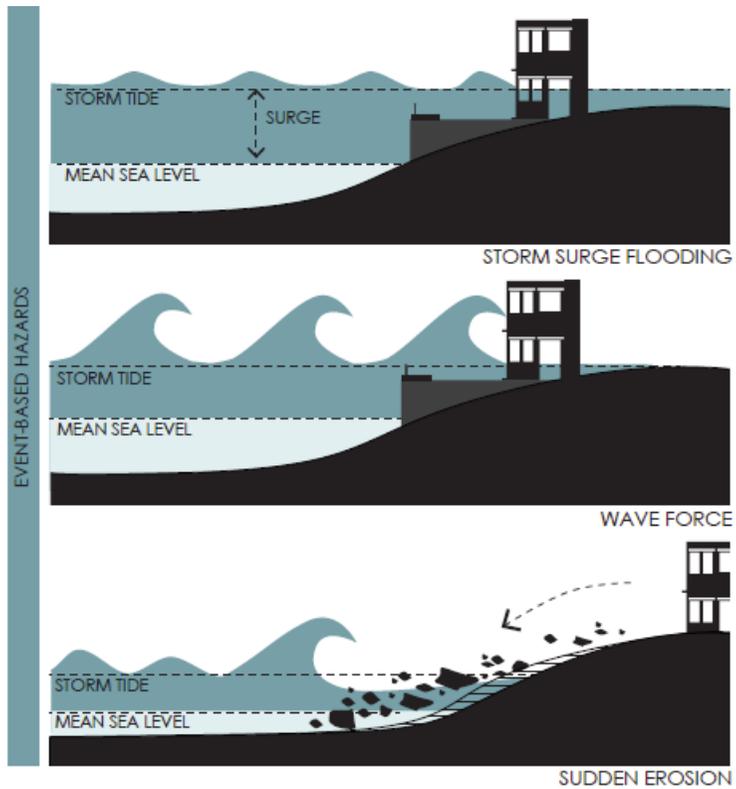


B-C: village – industrial landscape

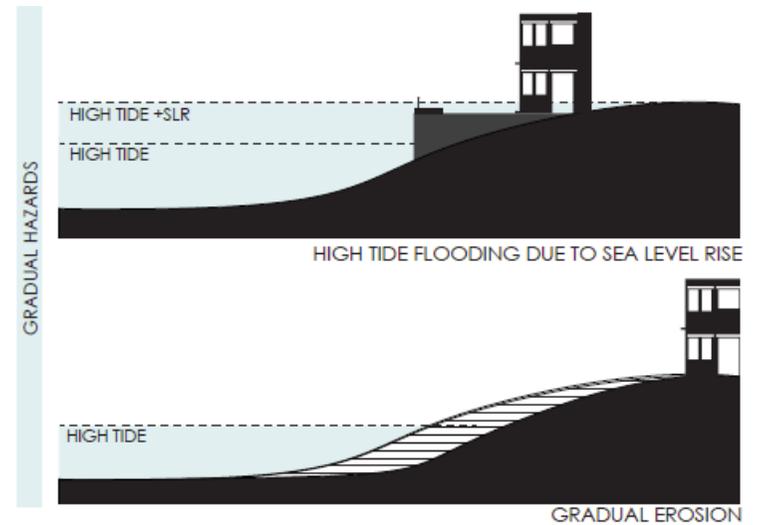


Impactors of coastal process - tides

Sudden hazards

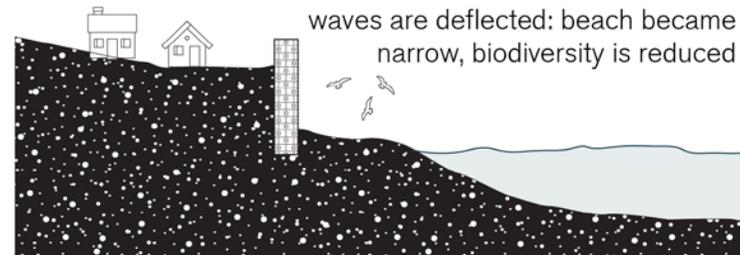
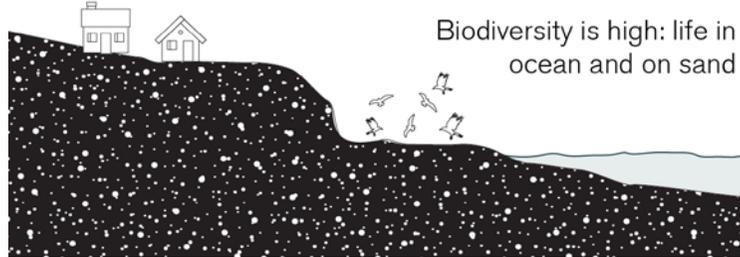


Gradual hazards

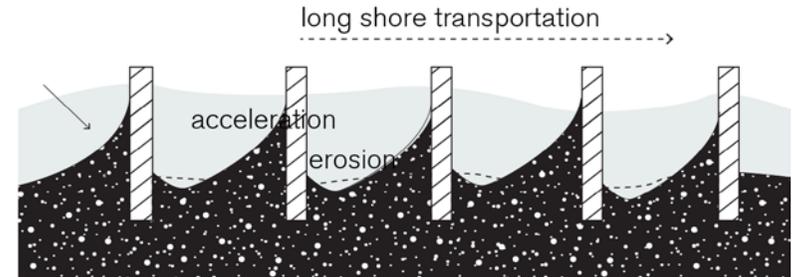
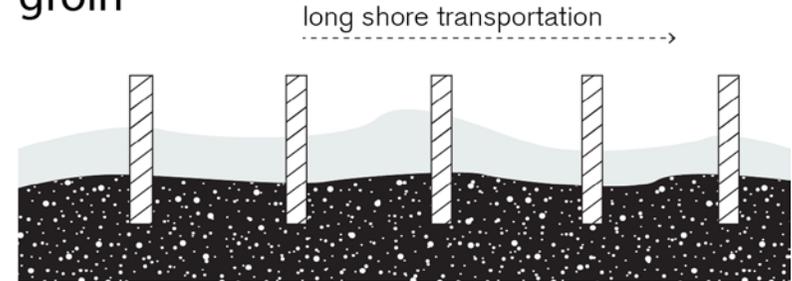


Impactors of coastal process – offshore constructions

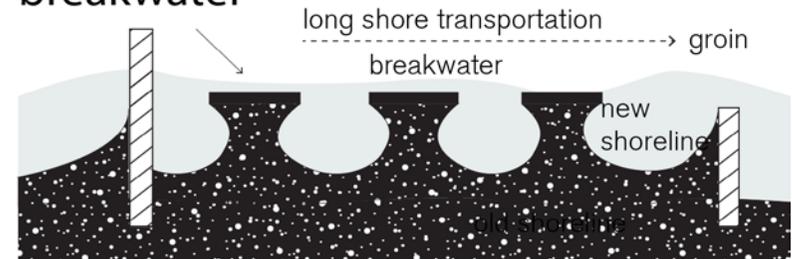
seawall



groin



breakwater

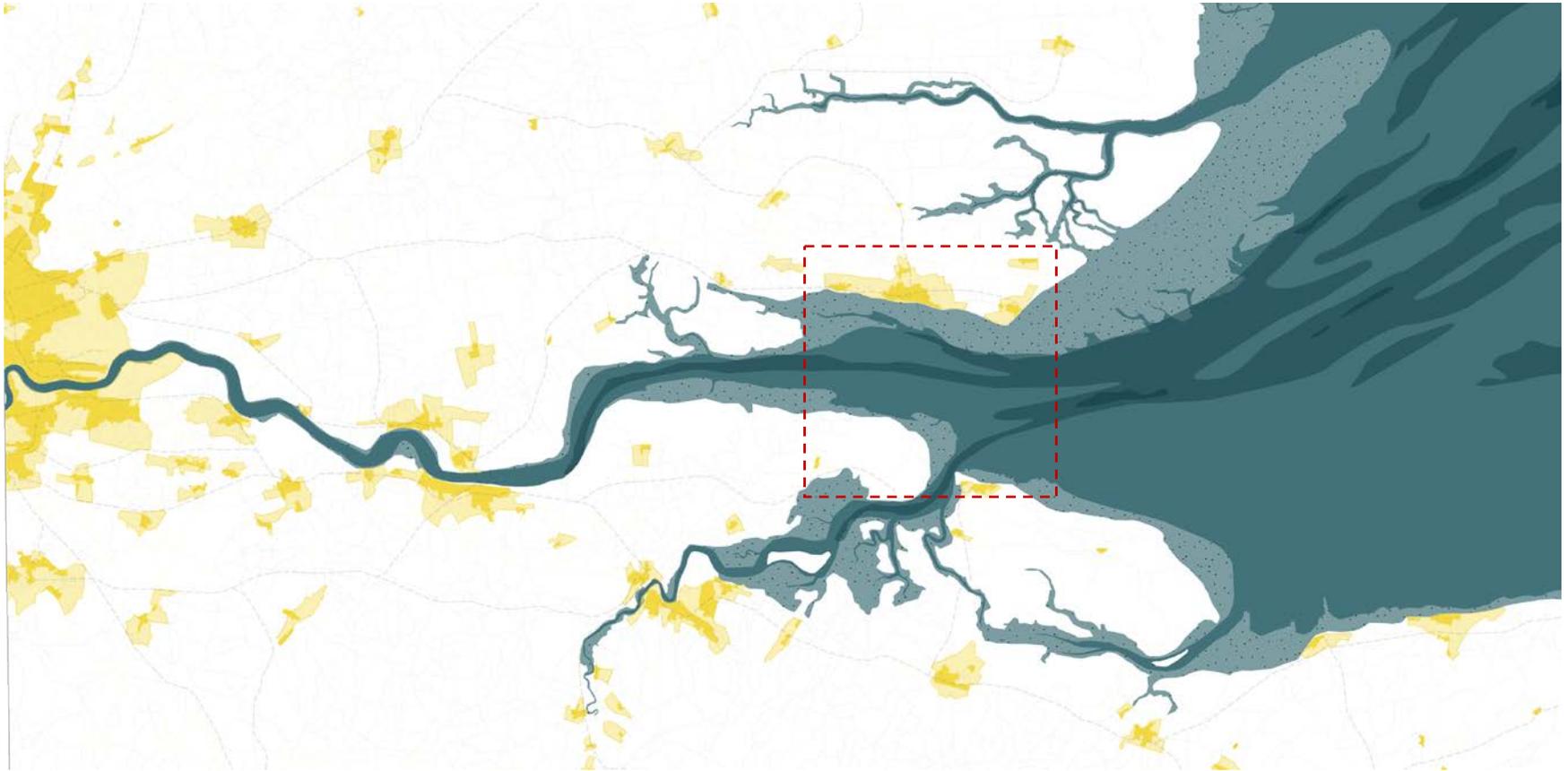


Research Questions

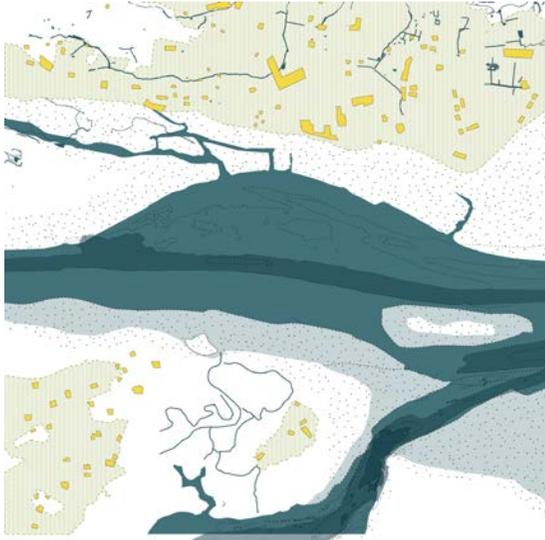
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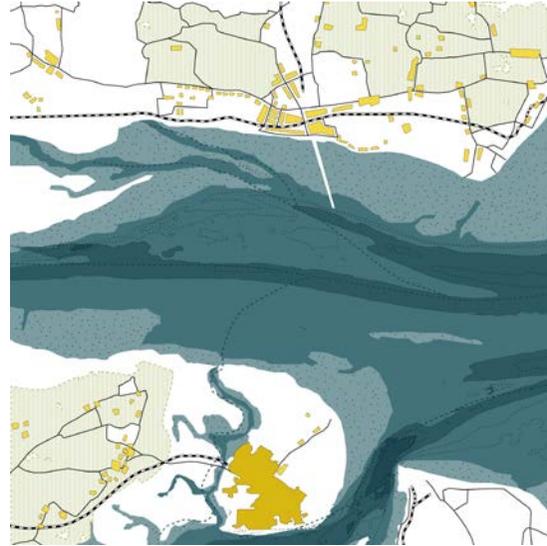
Coastal urbanization process in Thames Region



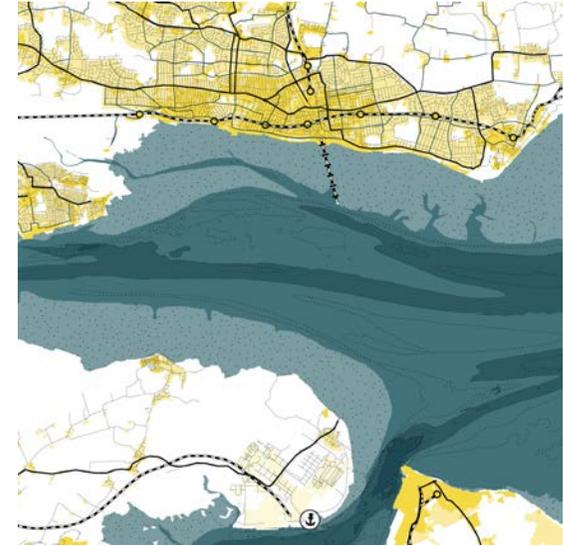
Coastal urbanization process in Thames Estuary



Agricultural period



Industrial period



Post-industrial period



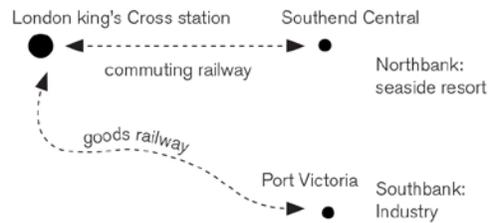
water pull the village closer

Northbank:
fishing and agriculture village



water drives the village away

Southbank:
fishing and agriculture village

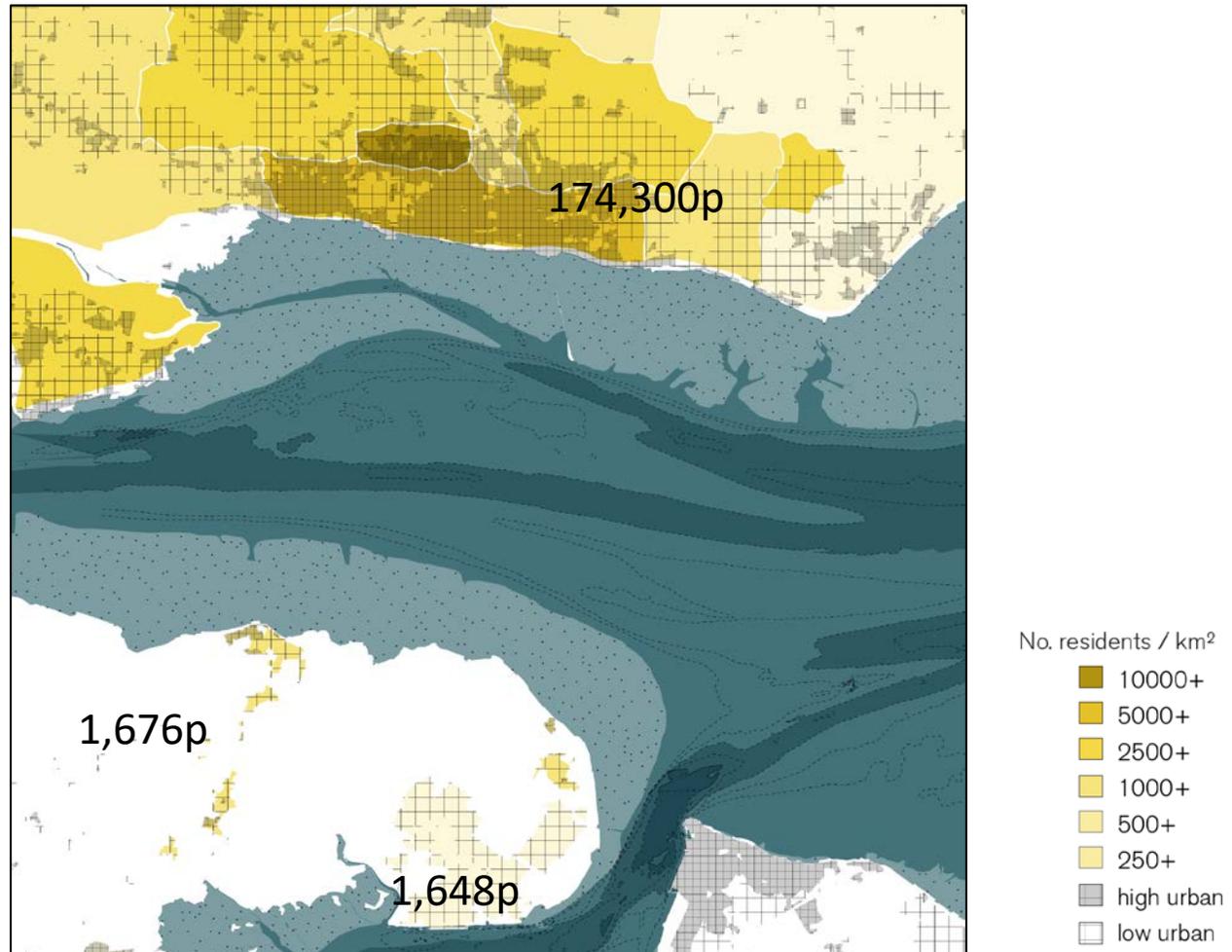


Allhallows holiday
leisure park

Northbank:
tourism and residential city

Southbank:
New seaside resort in the middle
of nowhere

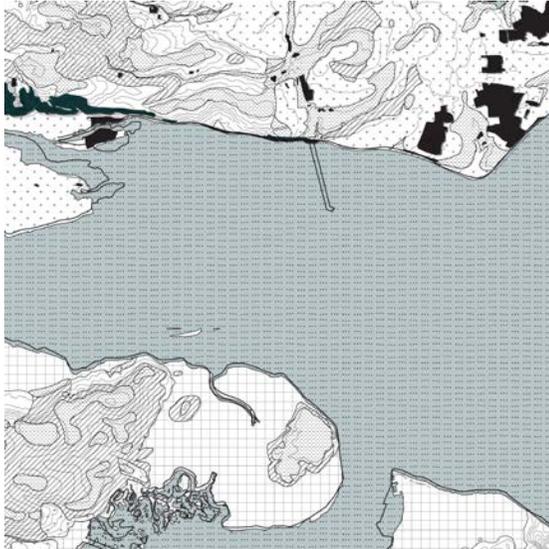
Outcome of coastal Urbanization -- density



Density impactors

		CORRELATION		DEGREE			DISTANCE		
		positive	negative	low	medium	high	500+	1000+	2000+
physical factors	soil strength	+	/			●	/	/	/
	soil permeability	/	-	●			/	/	/
	land form								
	flat	+	/			●	/	/	/
	highland	0	0		●		/	/	/
	slope	/	-			●	/	/	/
	flood risk	/	-			●	/	/	/
economical factors	accessibility								
	airport		-		●		---	--	--
	port	+	/		●		+++	++	+
	railway station	+	/			●	+++	++	+

Mapping of Density impactors



Superficial deposit type

- mass movement
- artificial ground
- sand and silt
- clay and silt
- ▨ sand
- ▨ clay, silt and gravel
- ▨ clay, silt and sands
- ▨ sand, silt and clay
- ▨ gravel, sand, silt and clay

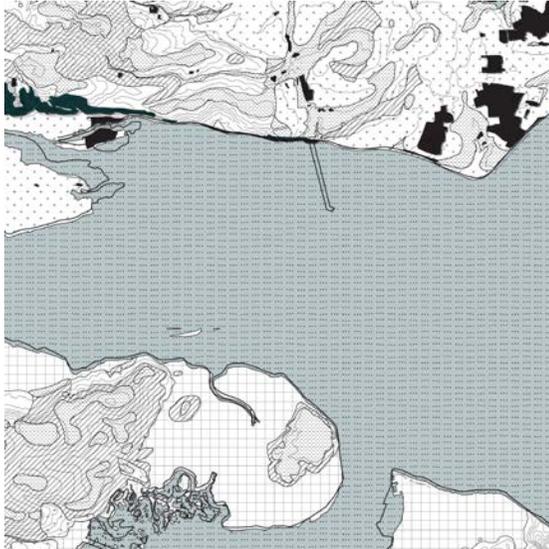
Soil strength

- strong
- medium strong
- weak
- very weak

Soil permeability

- very high
- high
- moderate
- low

Mapping of Density impactors



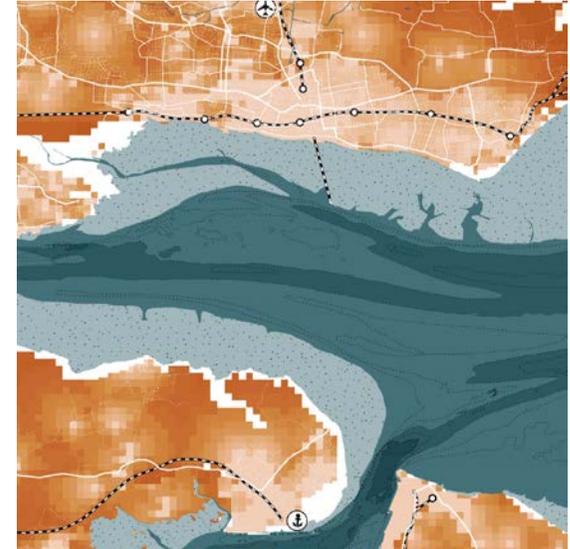
Flood risk level

- flood zone 1
- flood zone 2
- flood zone 3A
- flood zone 3B



Land form

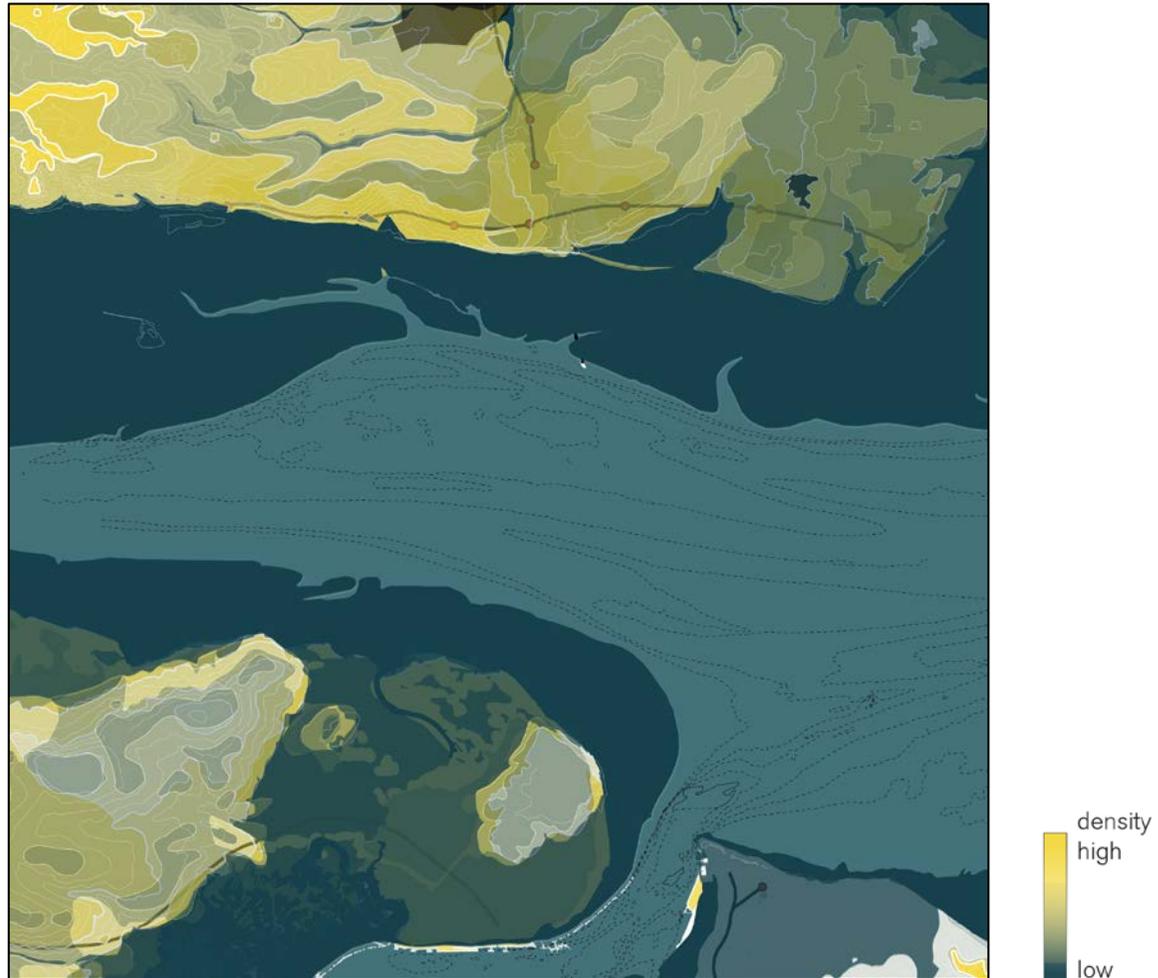
- hills
- slope
- hinterplain
- intertidal plain
- contours



accessibility

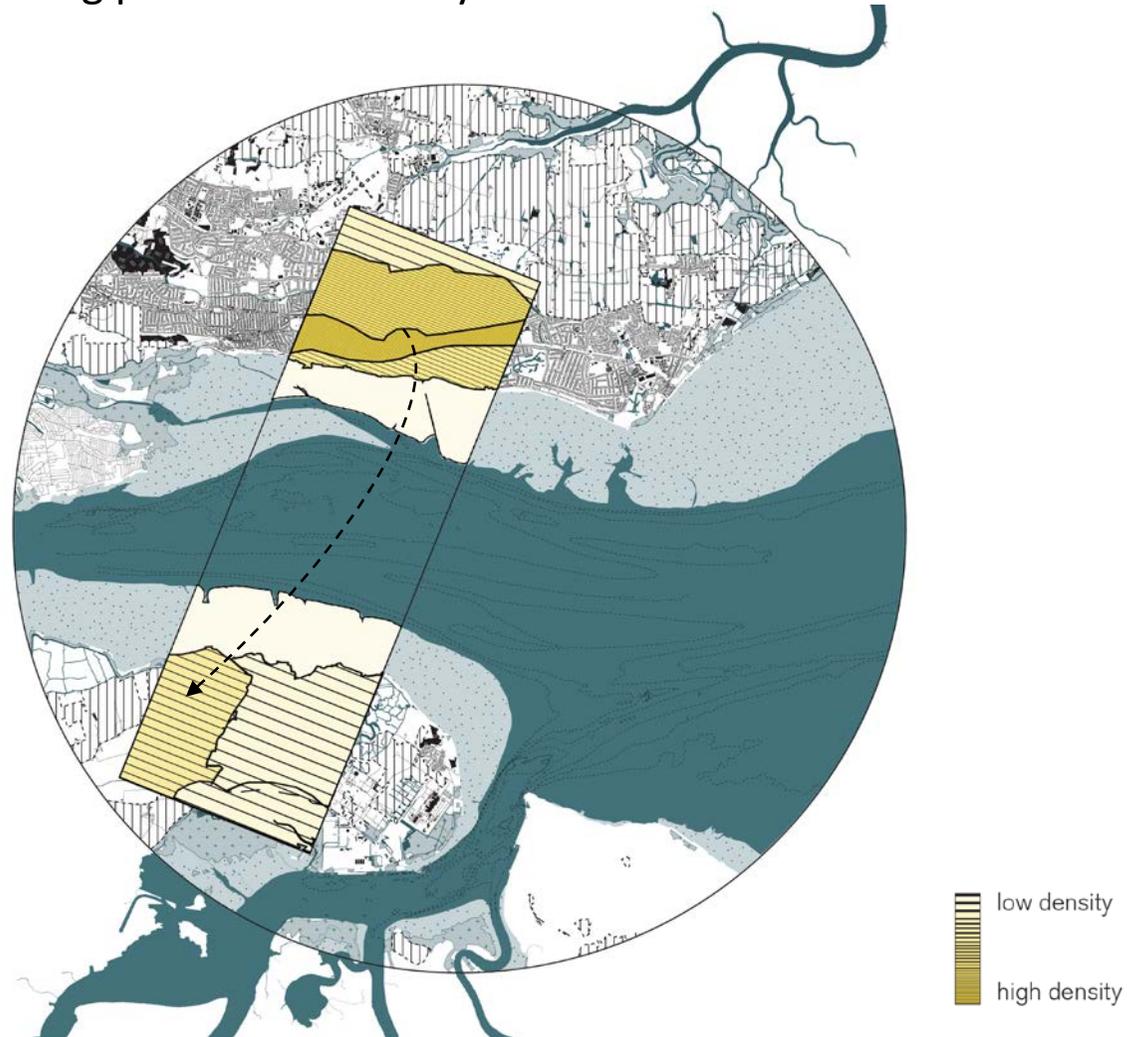
- Accessibility
- high
 - low

Density suitability map based on overlapping of impact factors

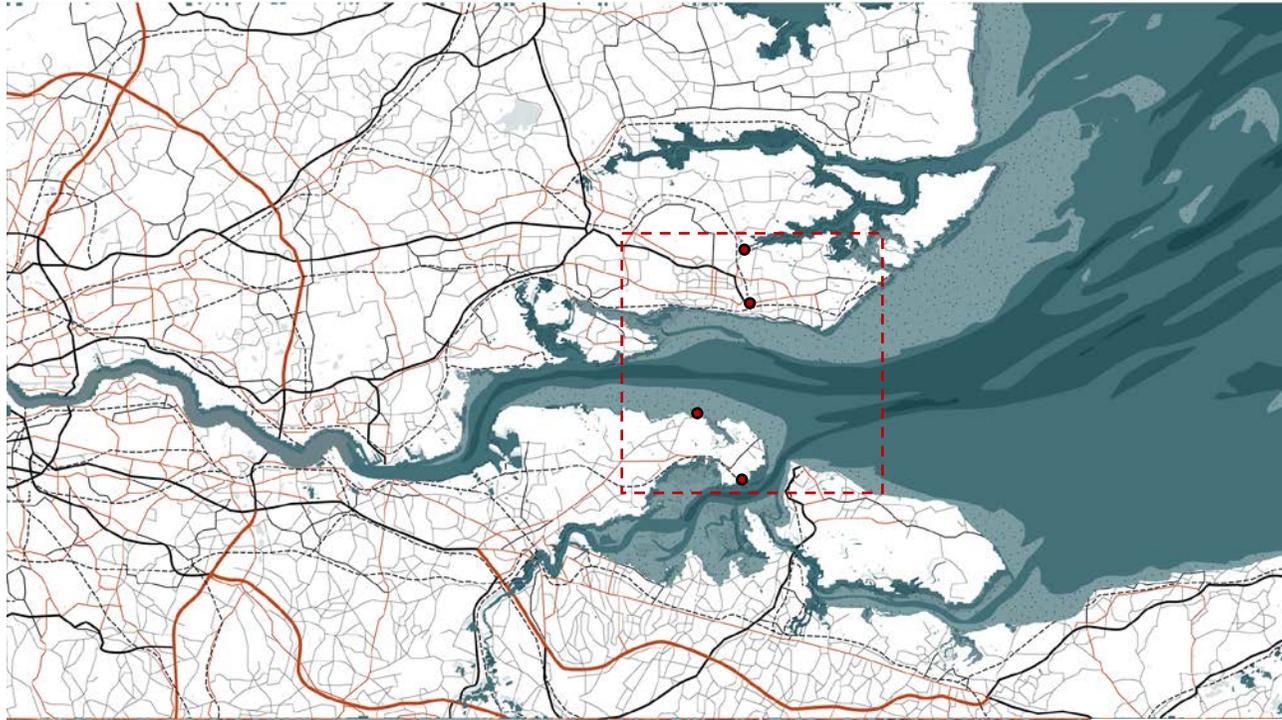


Position on future coastal urbanization

Releasing part of the density in northbank to southbank

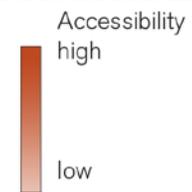
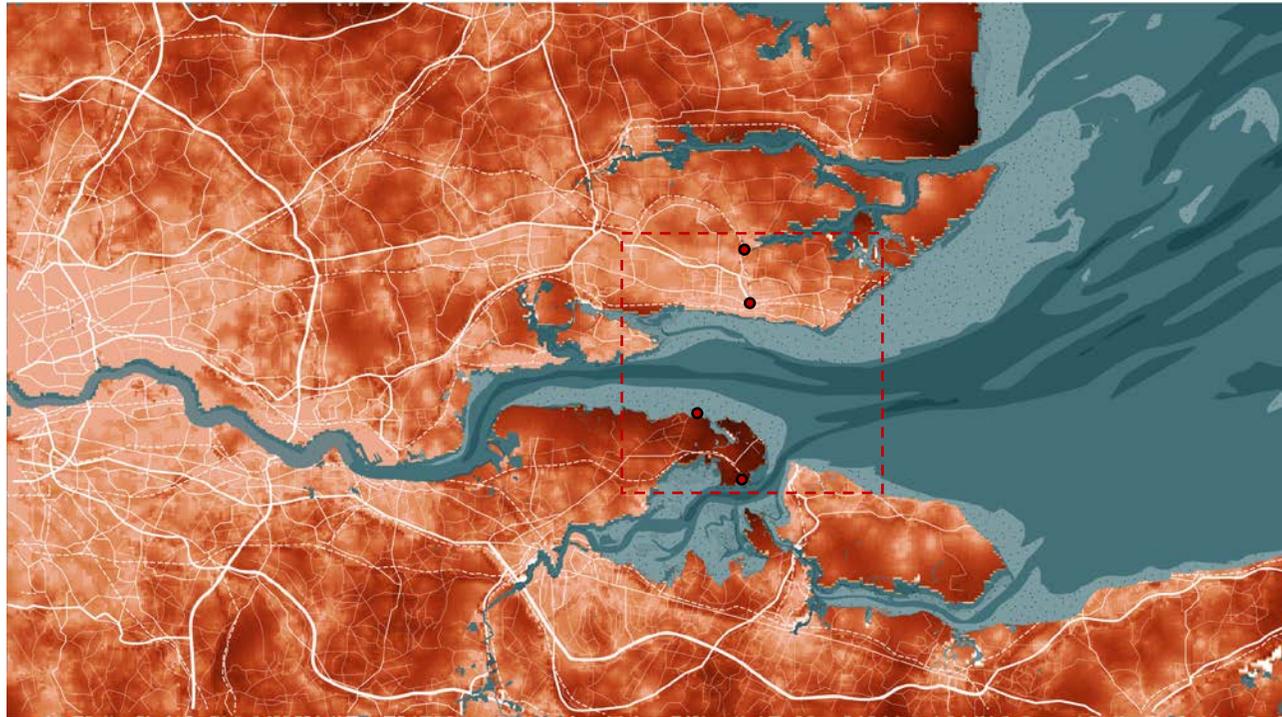


Mobility -- infrastructure connected to London

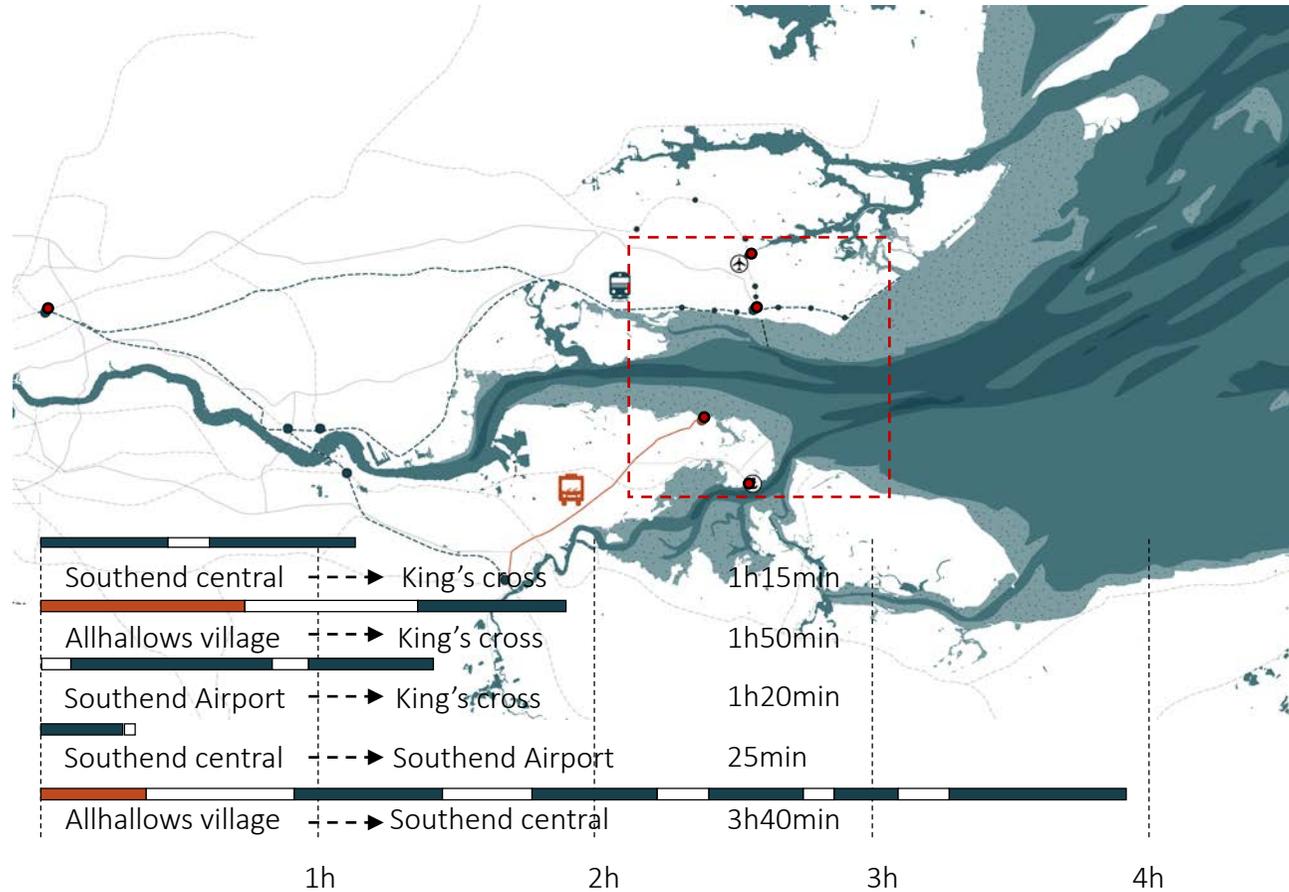


- railway
- motorway
- primary road
- A road
- B road
- path

Mobility --accessibility gradient

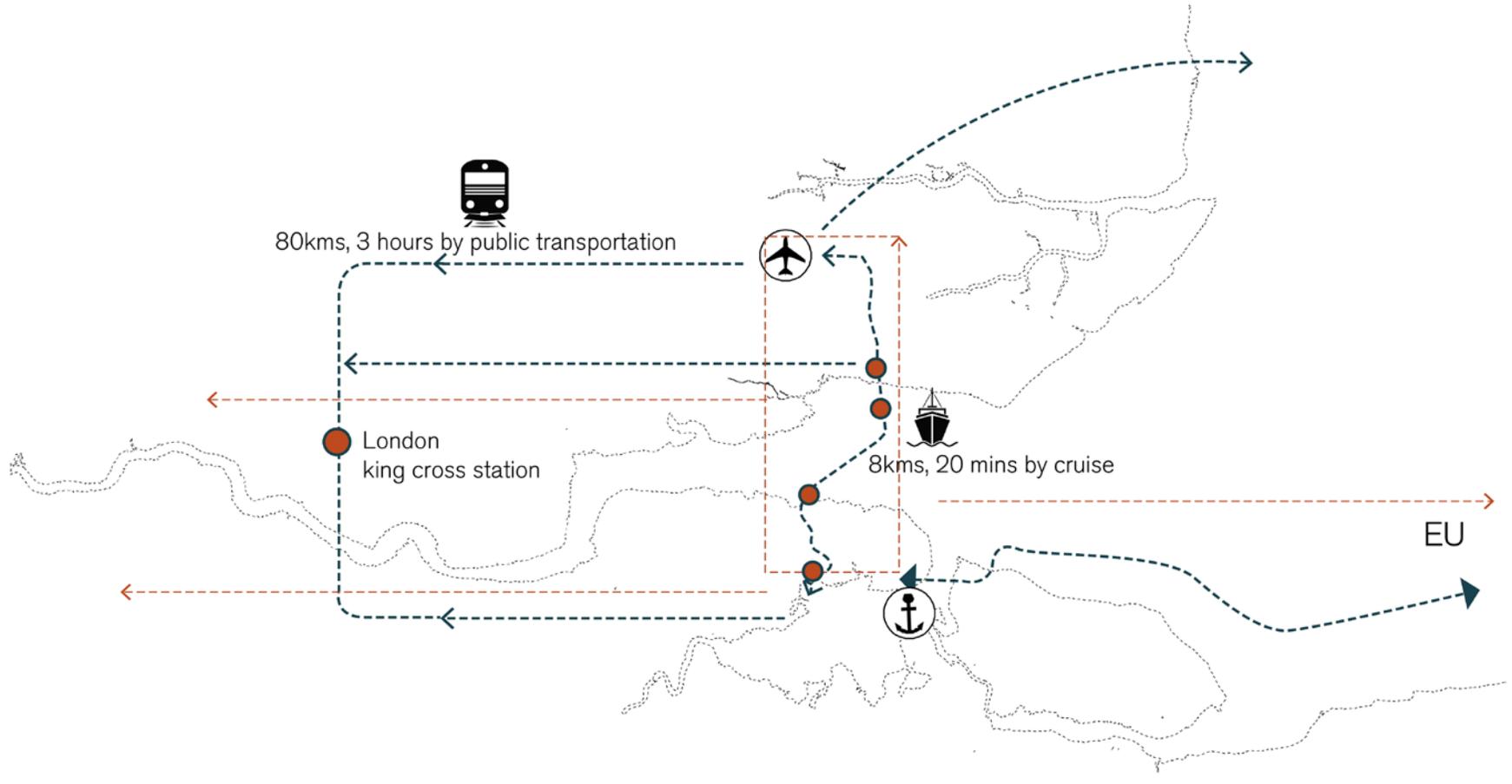


Way of mobility between important transits



Position on future mobility

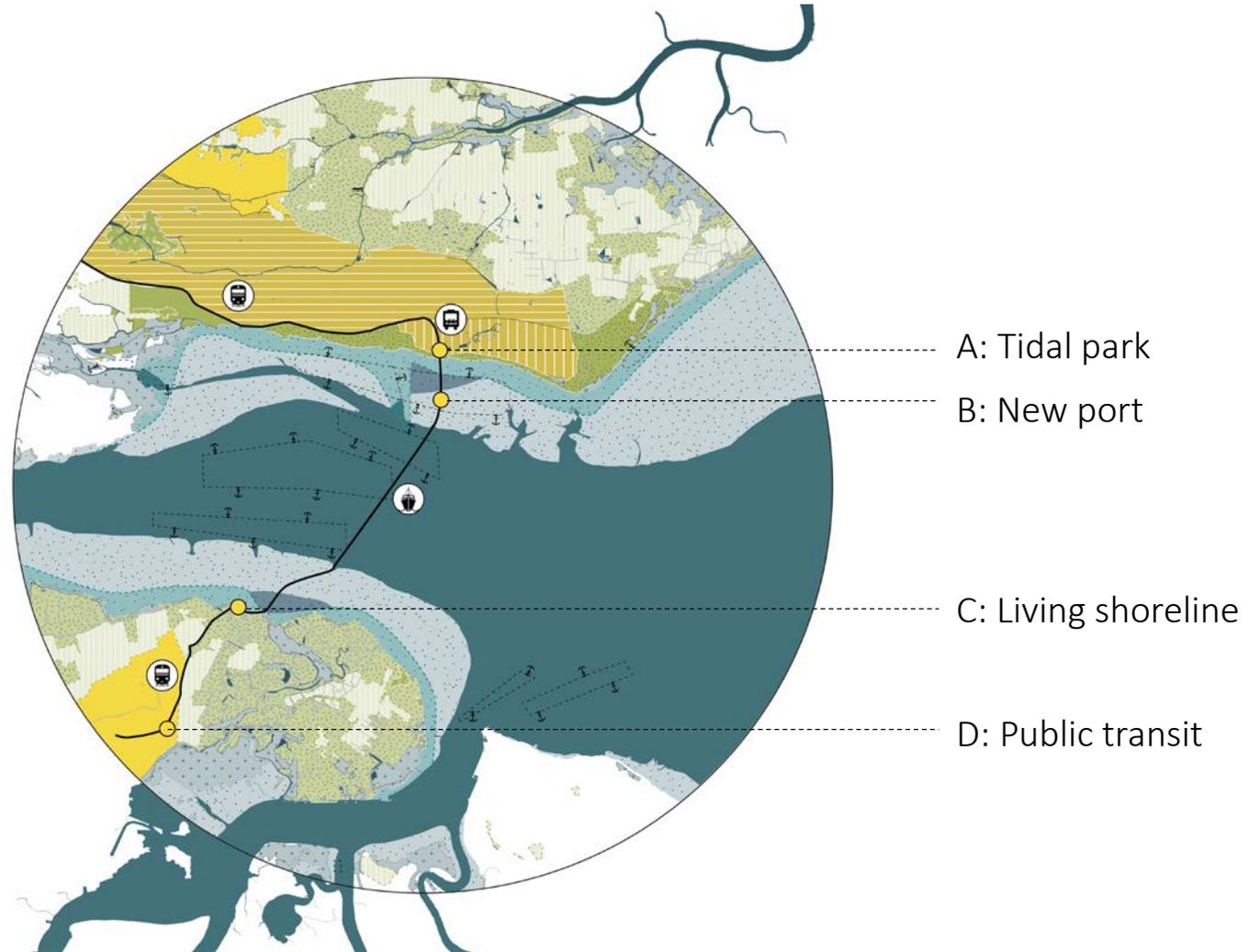
Thames river acts as a linkage rather than an obstruct



- **PART 3. Position and Design**

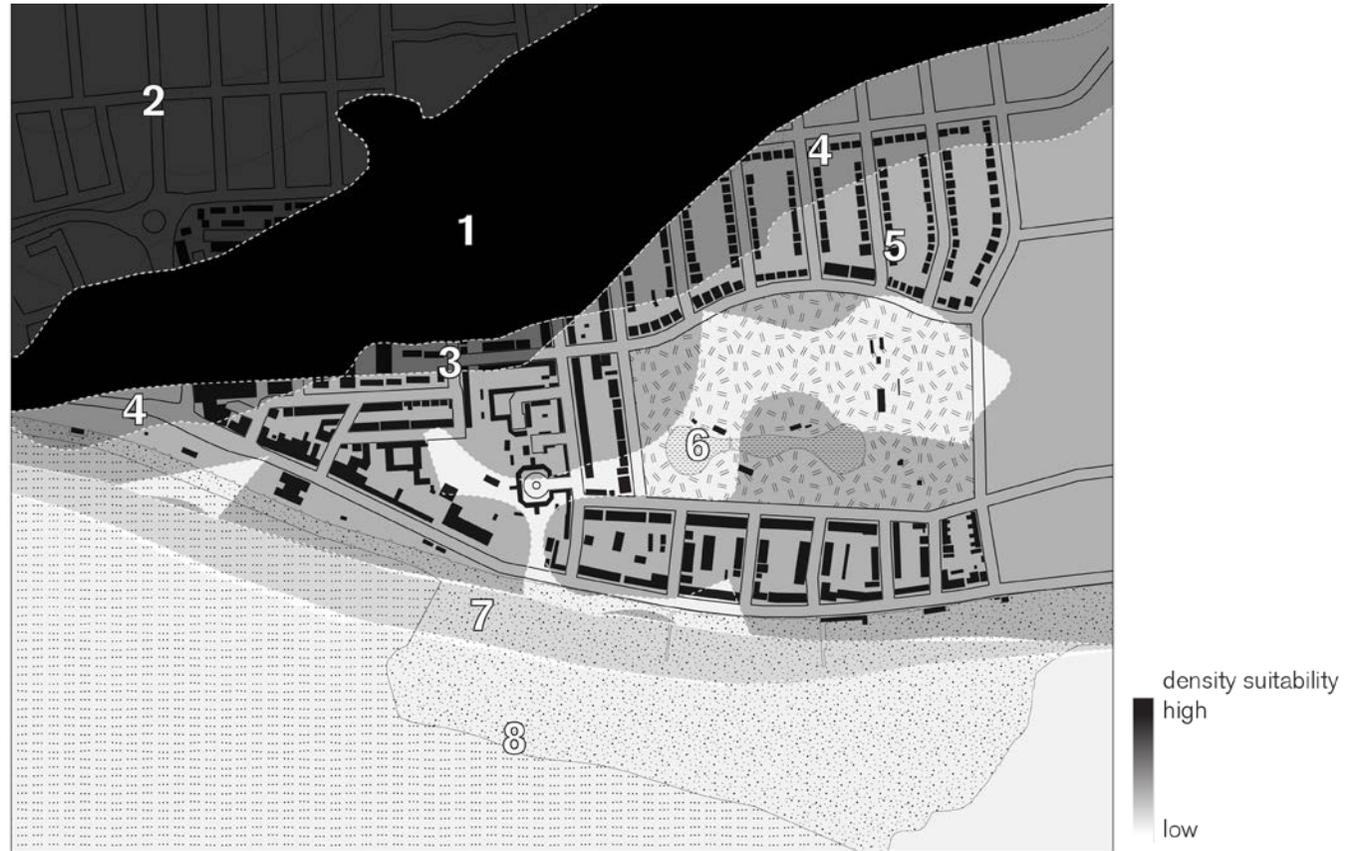
- A new N-S system
- Projects A -- Tidal park, backing to nature

Position : A new integrated N-S system



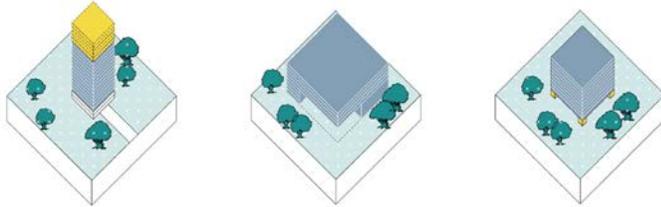
- Project A –Tidal park: Backing to nature

Density suitability

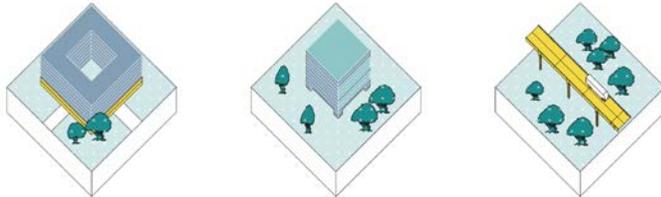


Concept and principles

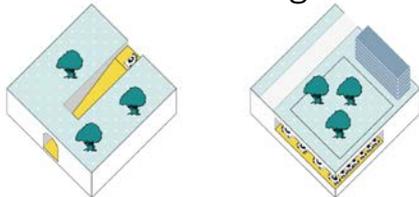
A. Intensification of land use



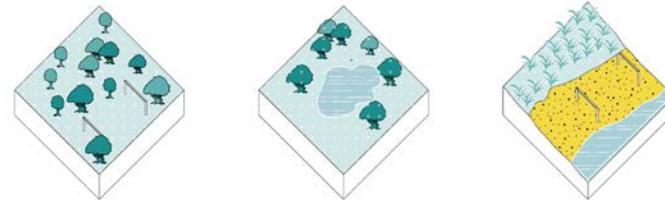
B. Co-location of uses



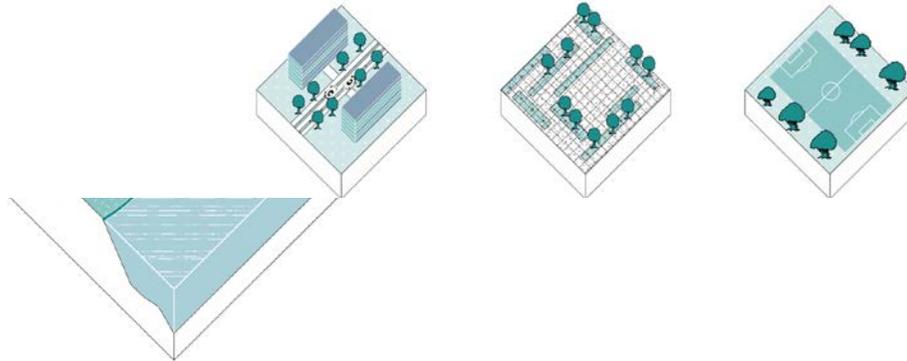
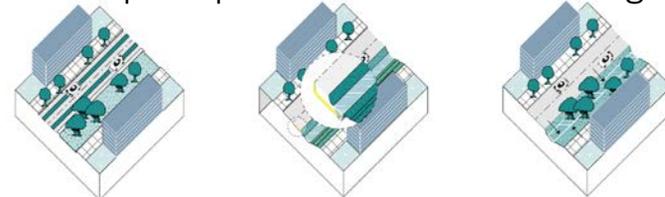
C. Use of underground space



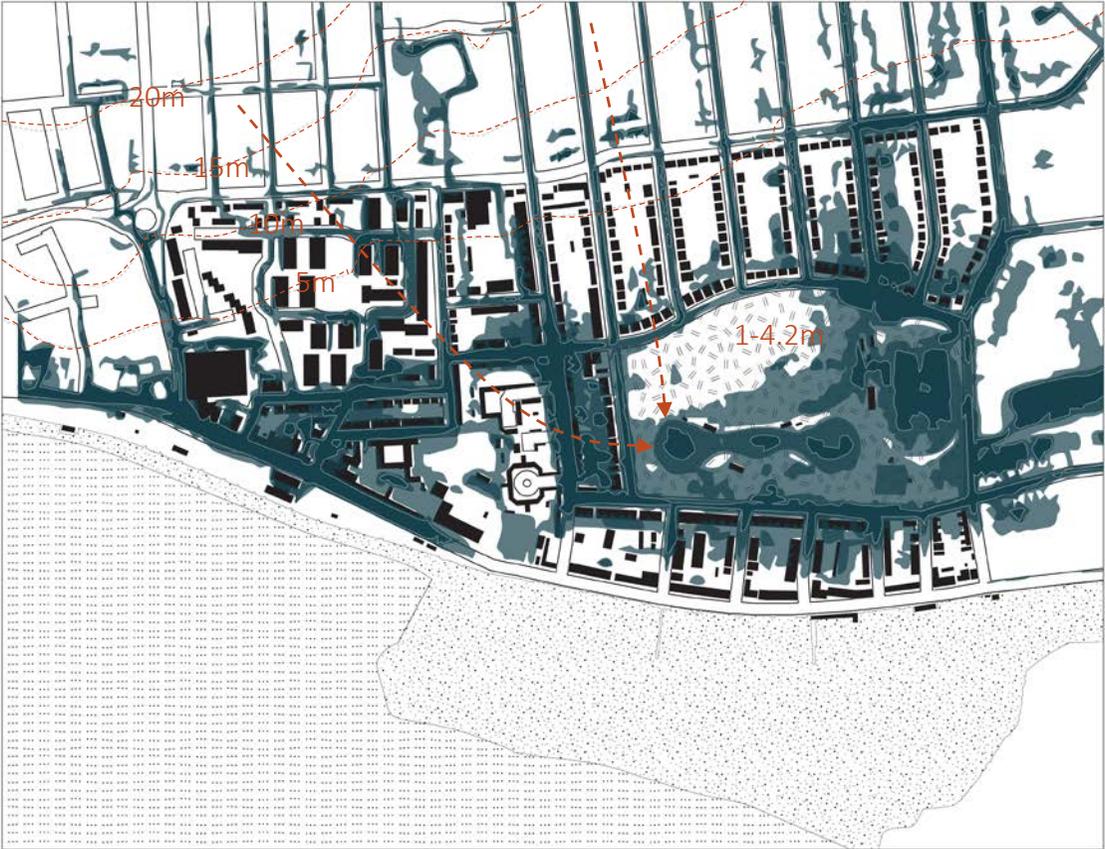
D. Return soft & permeable land to nature



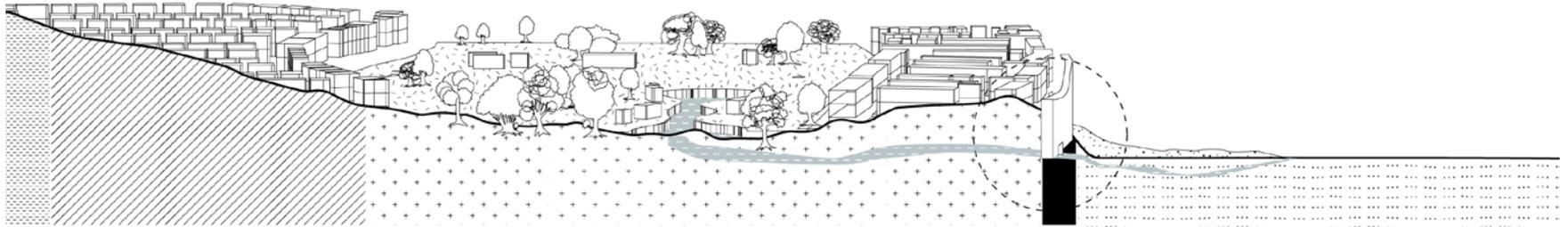
E. Open space as a continuous of green space



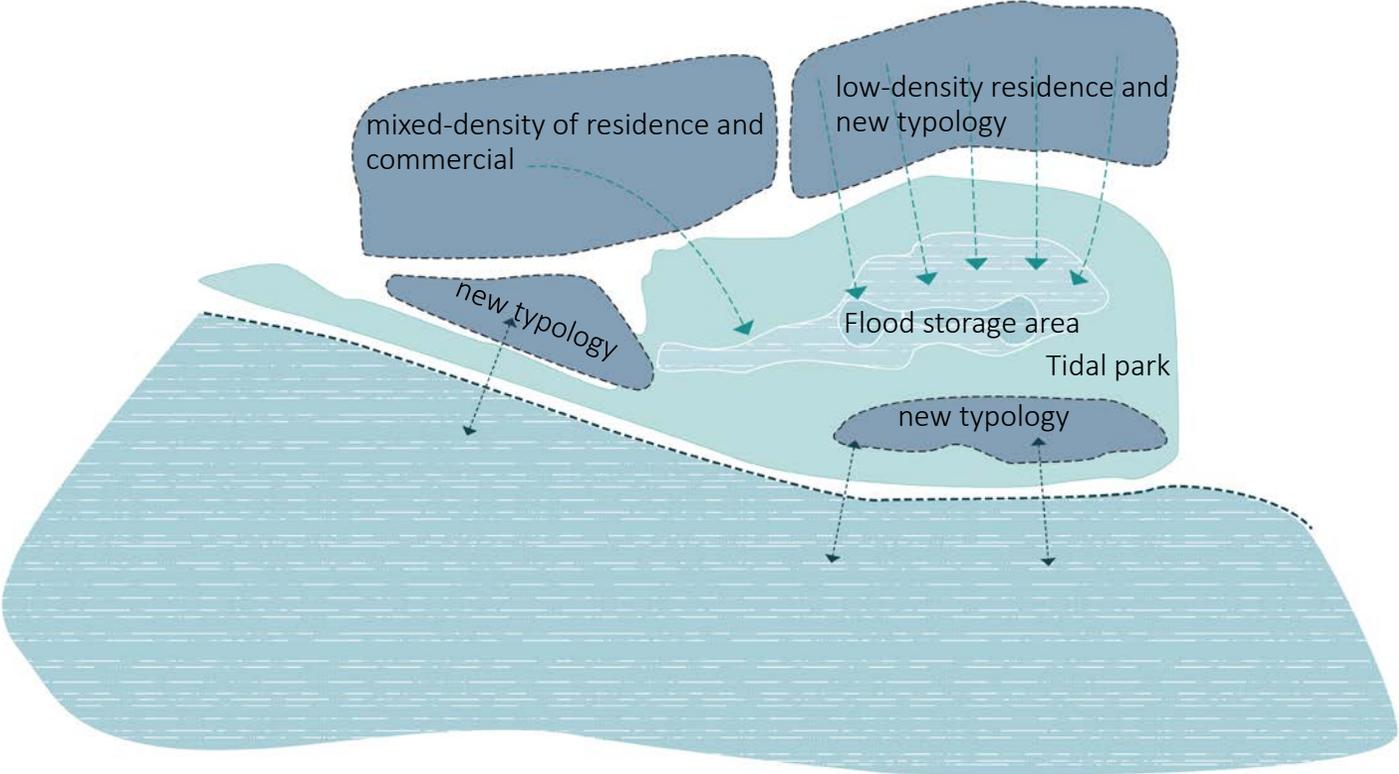
New role of Southend Church – Tidal park in dealing with flood risk



New role of Southend Church – Tidal park options



Density rearrangement



Design and phasing

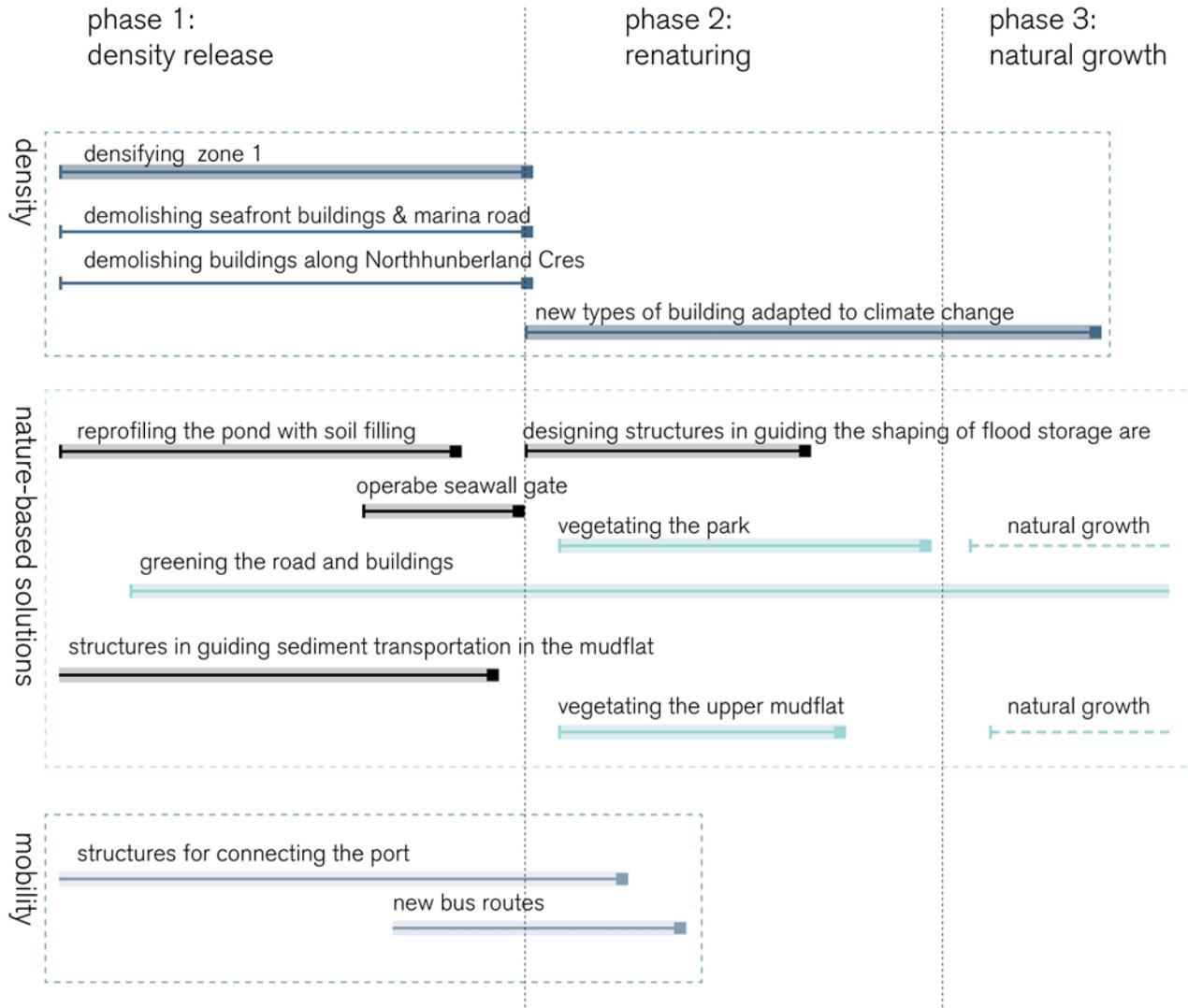


Before



After

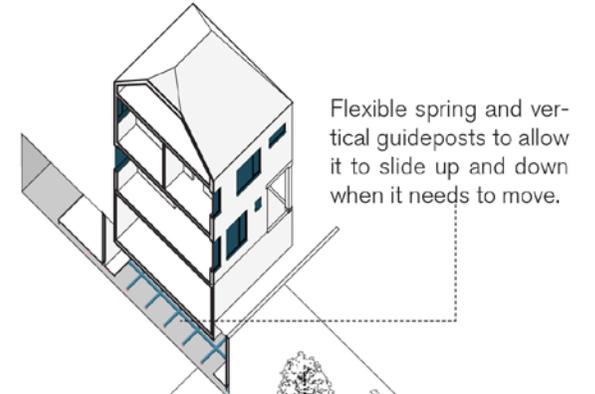
Phasing



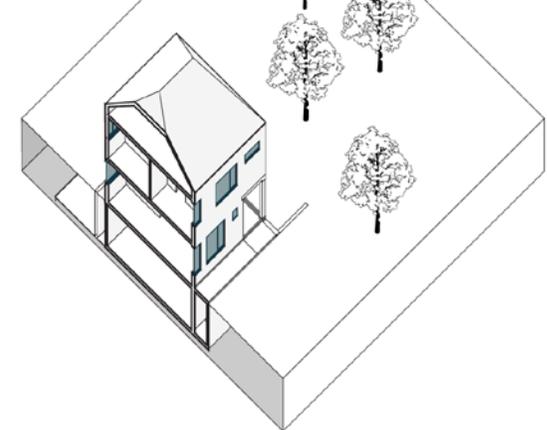
Interventions on Density



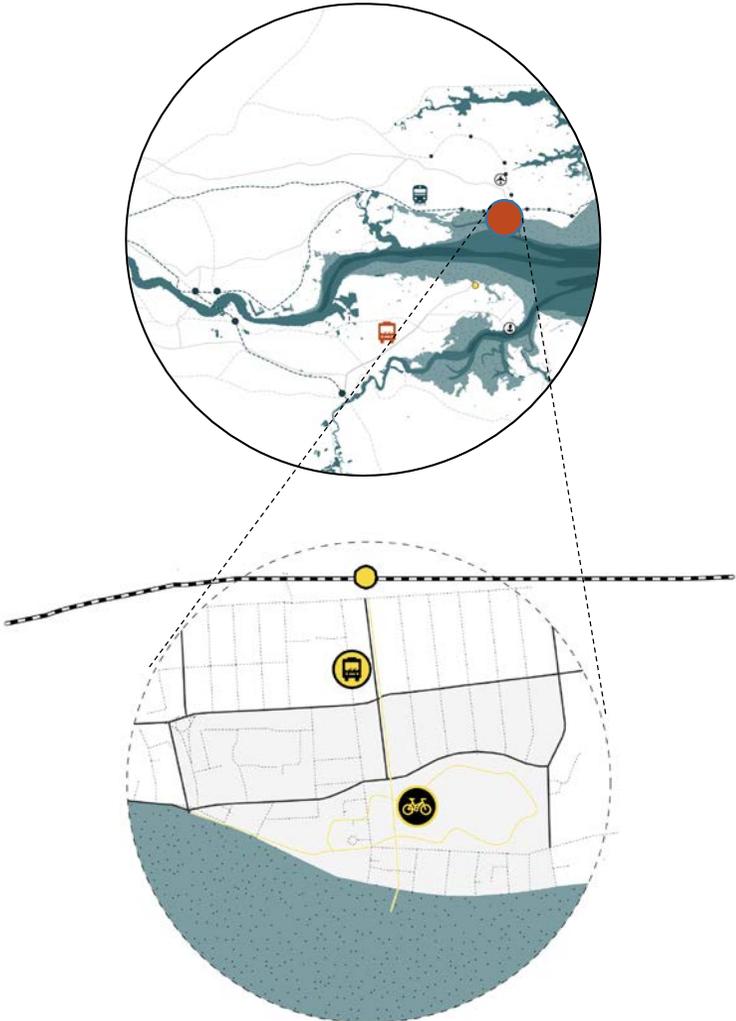
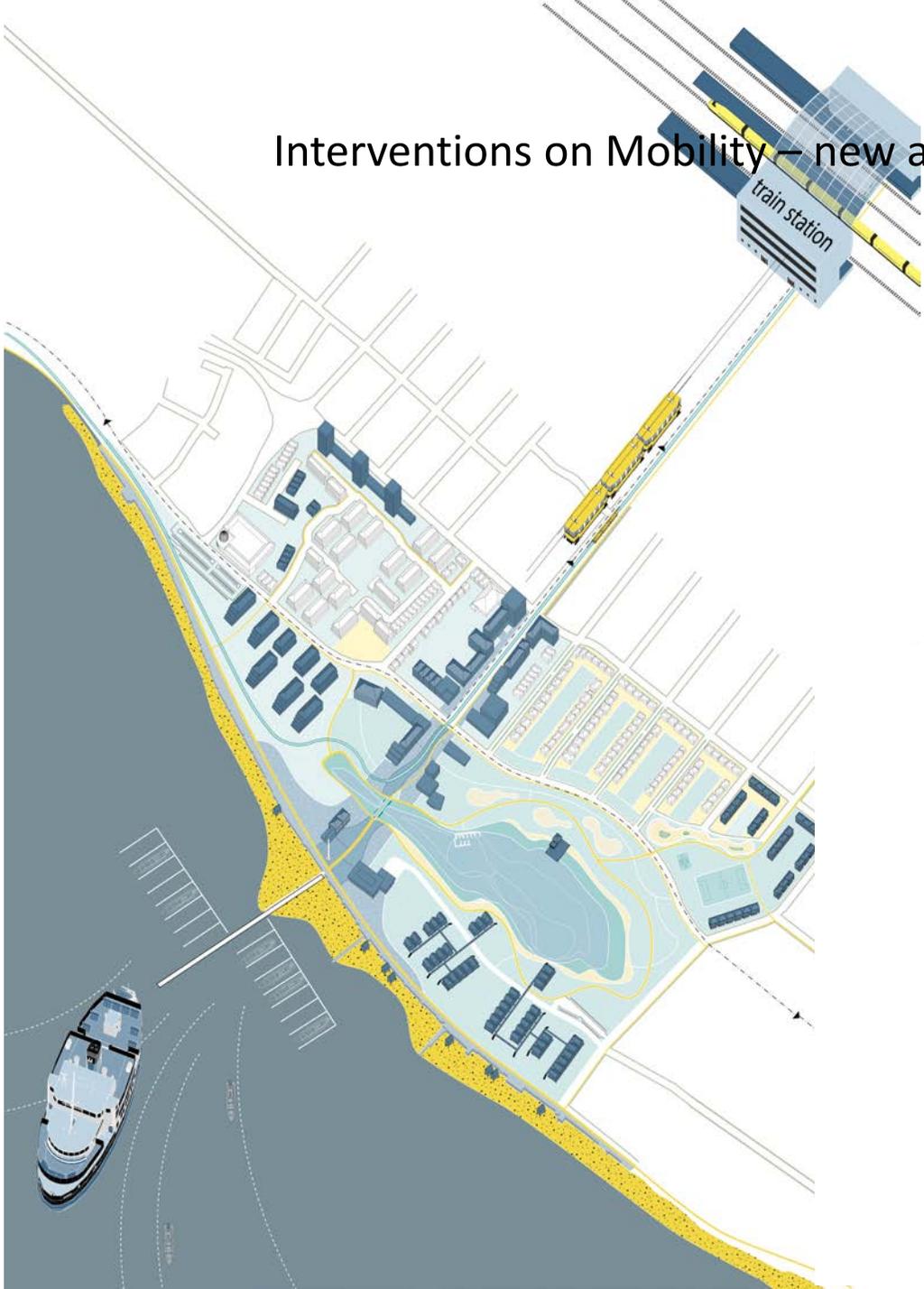
During a flood event



Static position



Interventions on Mobility – new axis and biking lane



Interventions on Mobility – transforming hard-paved road

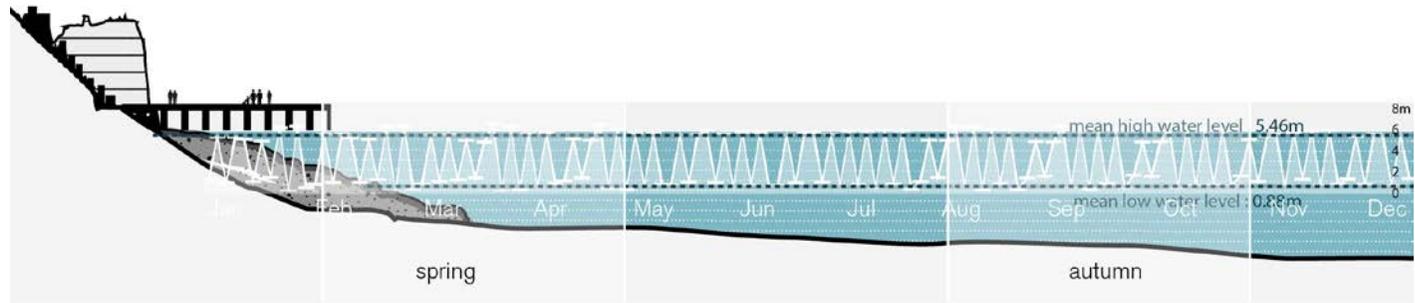


Interventions on tidal park

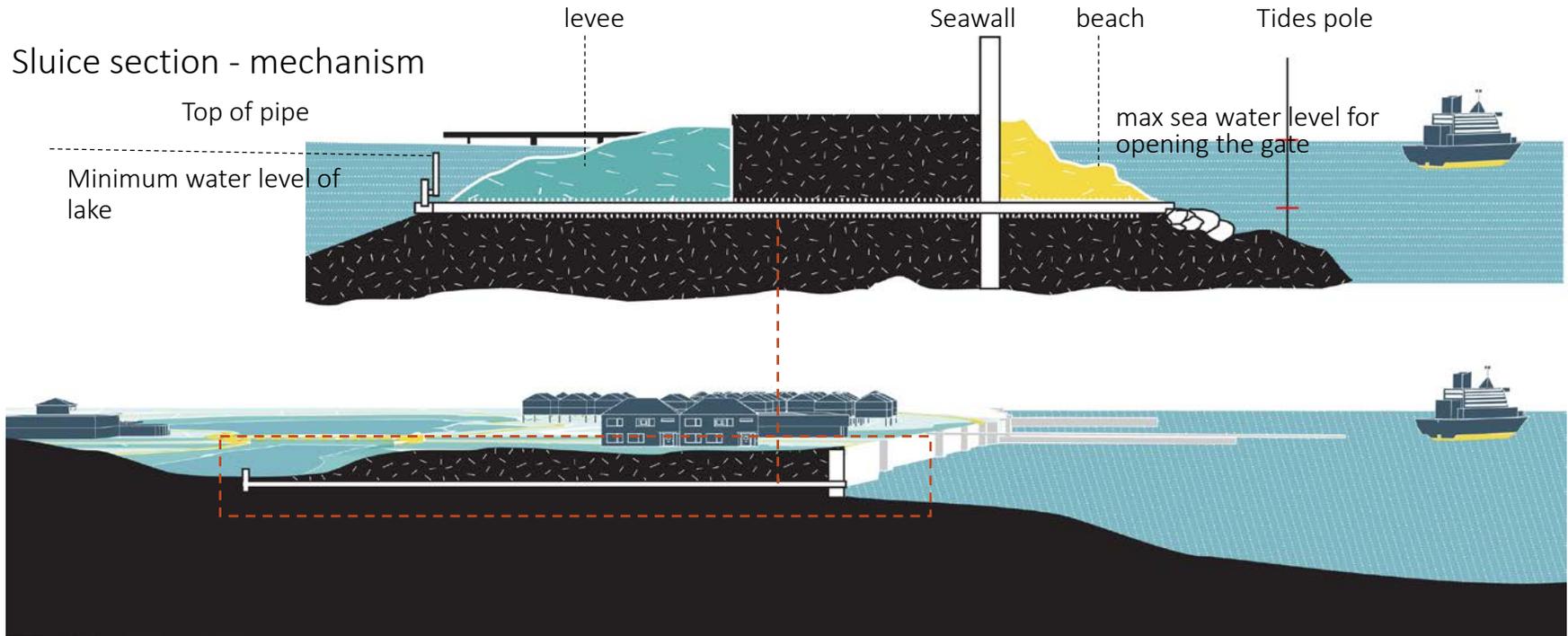


Interventions on tidal park -- Sluice and levees

Tides in 2016

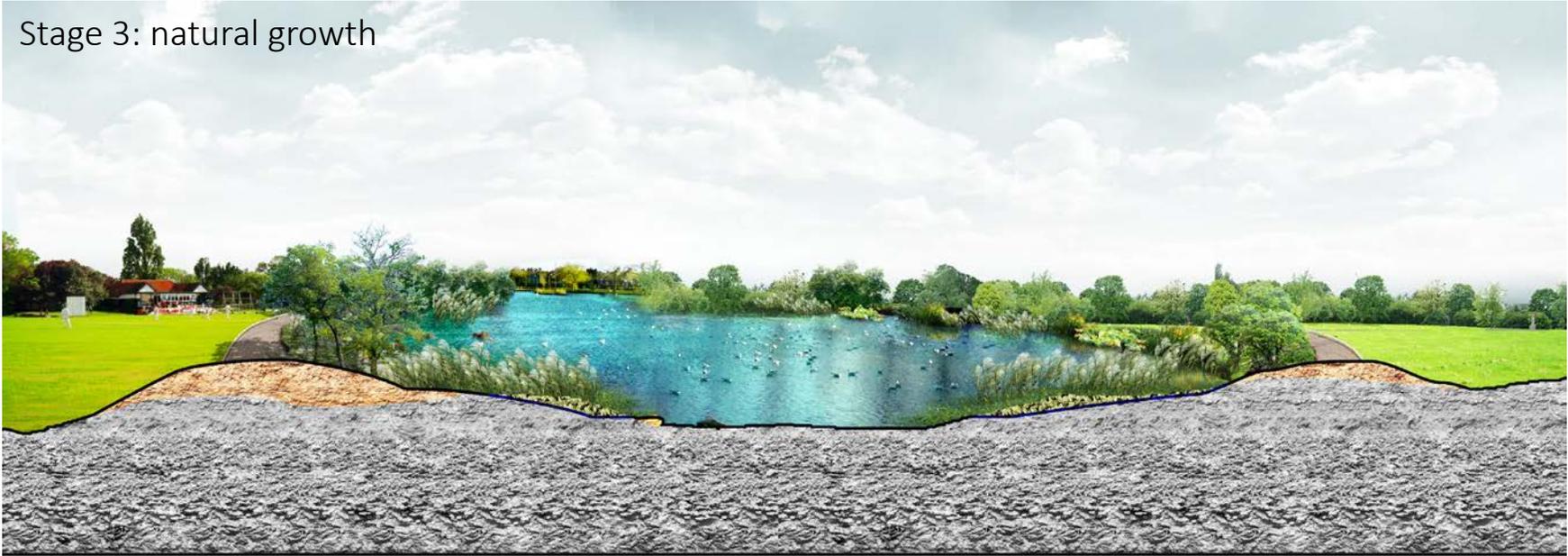


Sluice section - mechanism

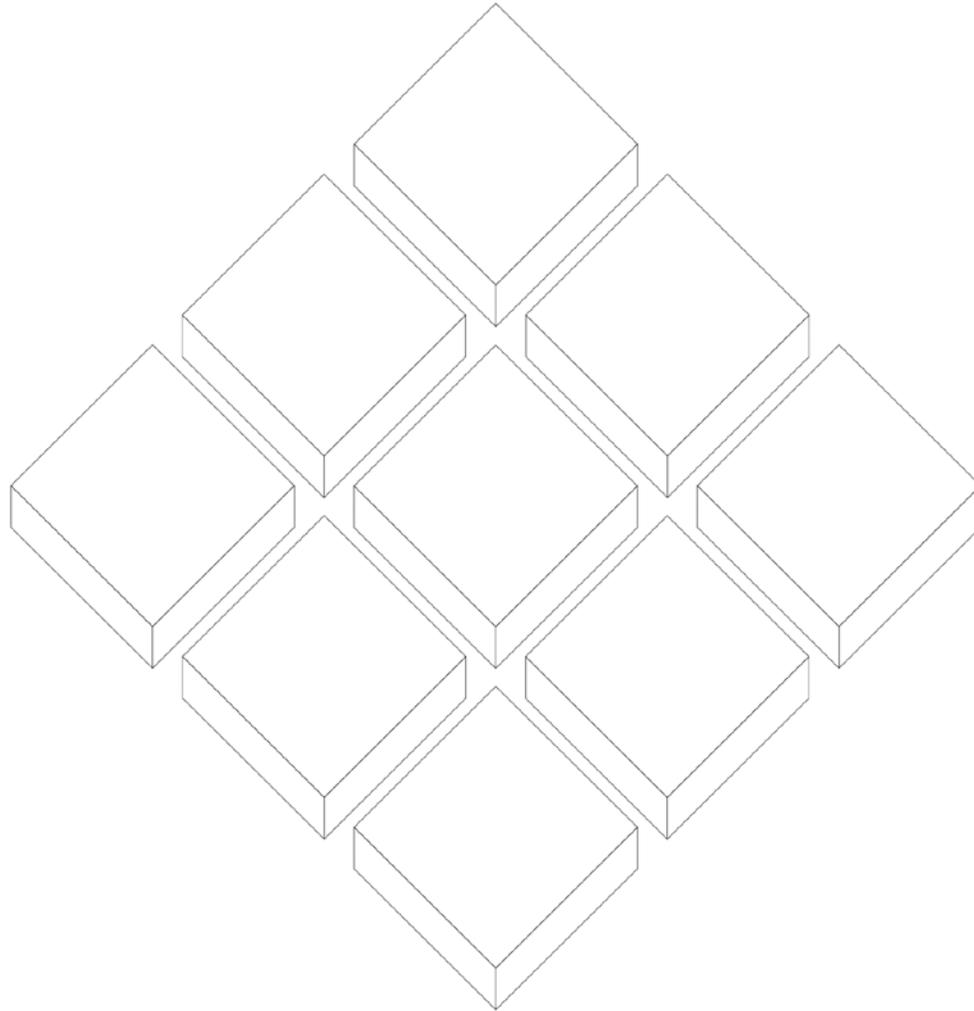


Interventions on tidal park – re-profiling

Stage 3: natural growth



Interventions on tidal park -- vegetation



Scenarios of Project A – axis view



Scenarios of Project A – biking lane cross the lake



Scenarios of Project A – biking lane along the lake



Lake view from Cafe



Boating lake view



Sea view from hotel room



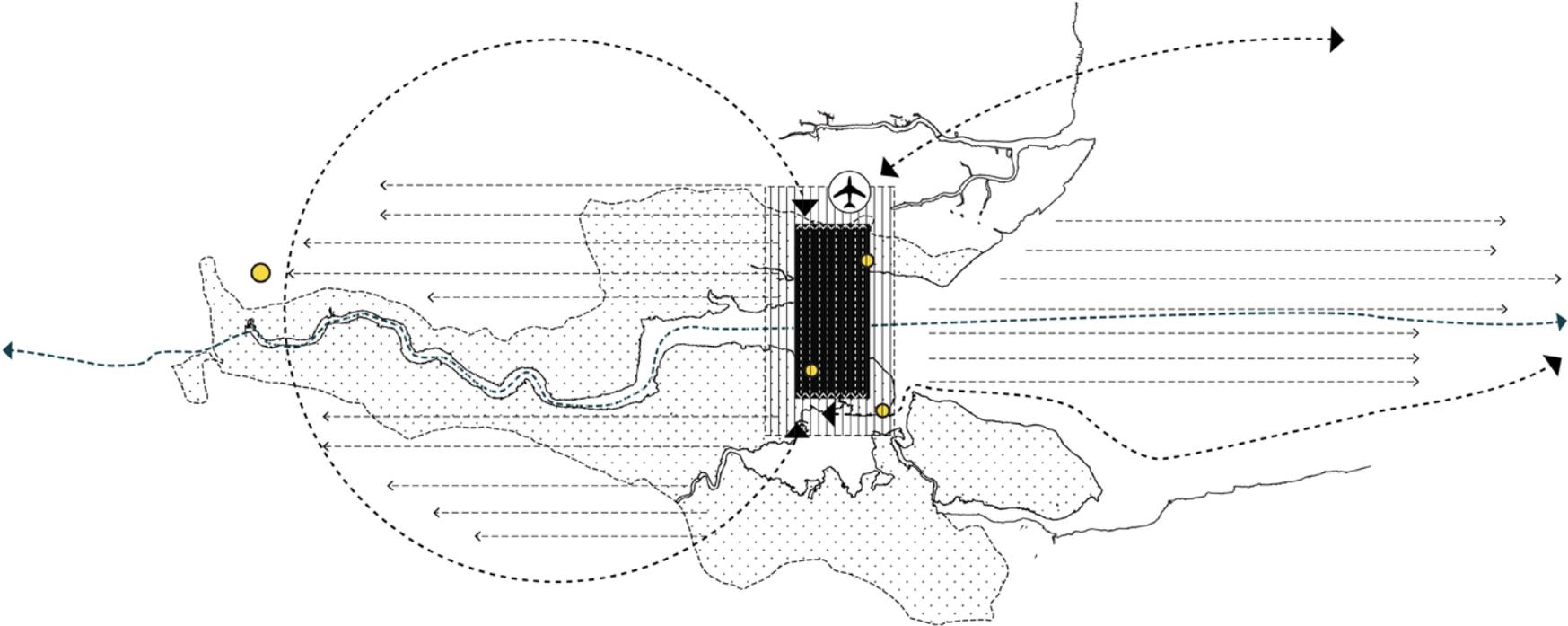
Sea view from harbor



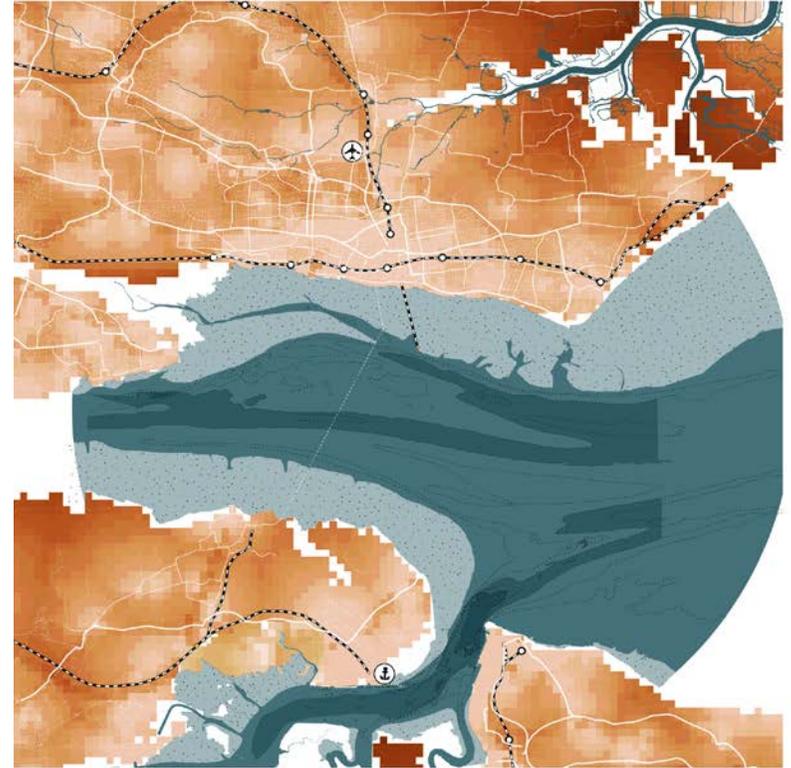
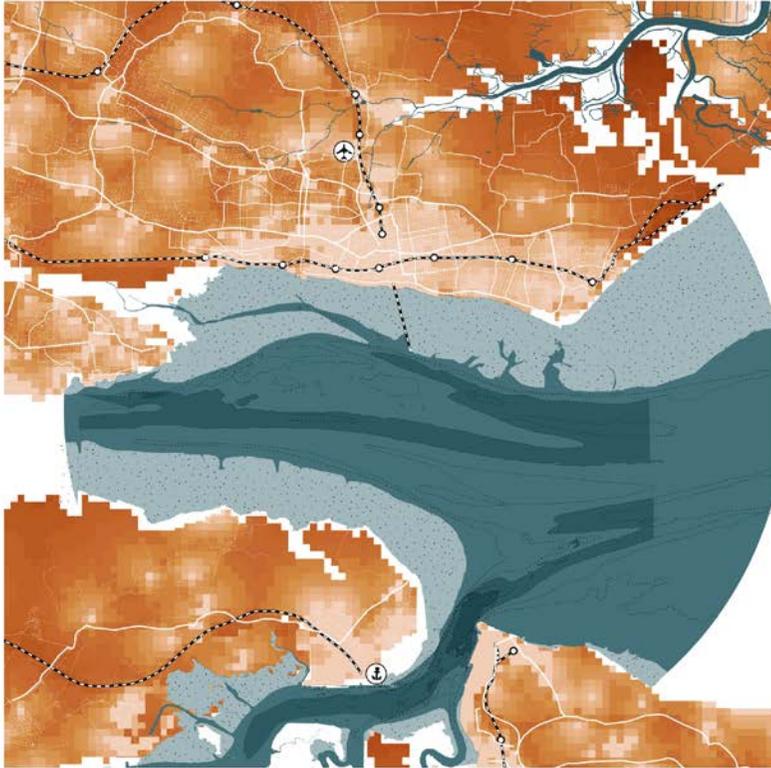
Scenario from the back of train station



Reflections of the project's contribution to the Thames region



Mobility -- current vs future



Reflections of the project's contribution to the Thames region

