



THE CHALLENGES OF CLIMATE CHANGE IN LISBON

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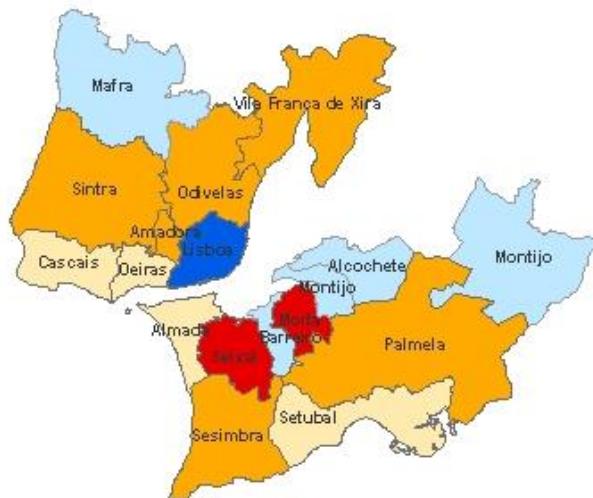
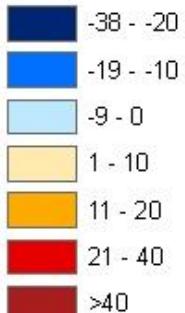


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THE CHALLENGES

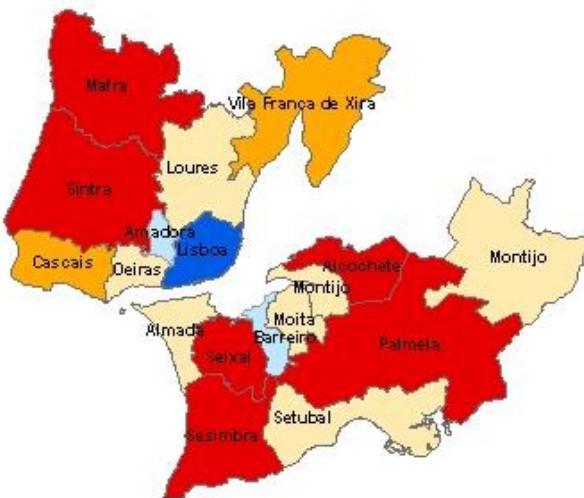
Population variation in Lisbon's Metropolitan Area, 1981 - 2011

%



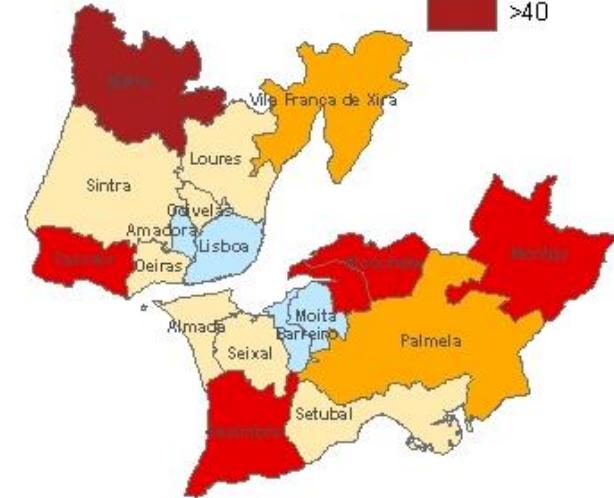
1981-1991

LMA: + 1,5%
Lisbon: - 17,9%



1991-2001

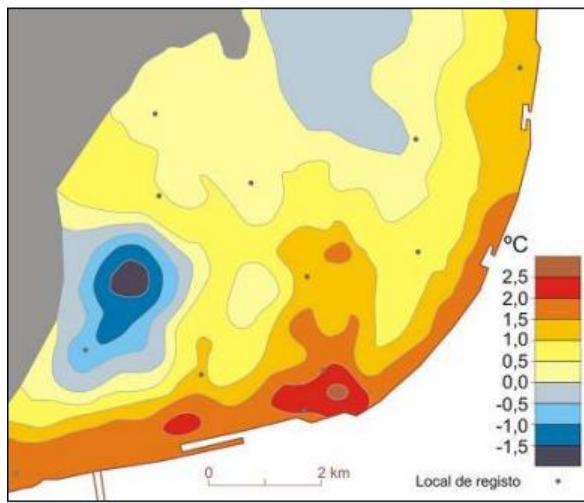
LMA: + 5,6%
Lisbon: - 14,8%



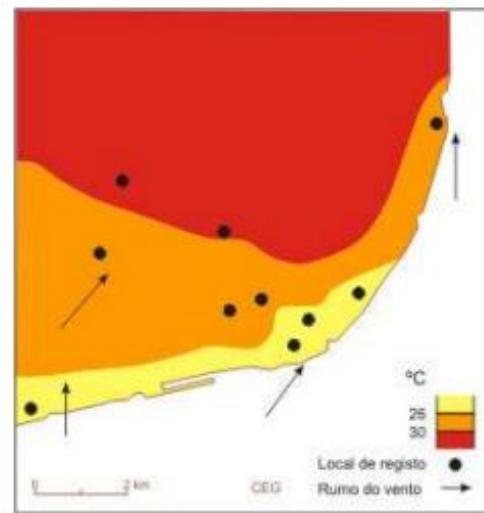
2001-2011

LMA: + 6,0%
Lisbon: - 3,4%

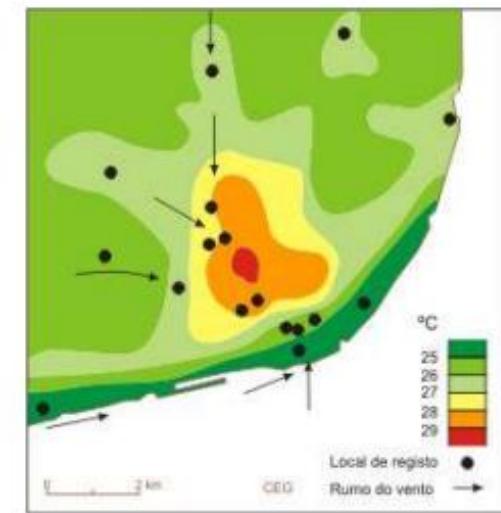
Urban heat island



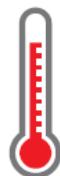
Night heat island



Daytime heat island



Fonte: Orientações climáticas para o ordenamento em Lisboa, CEG, UL



+ 4º C

Urban heat island

Effects on health

		95% CI
Threshold (T_{max})	29.3 °C	28.9 to 29.7
Percent change per 1 °C above threshold (%)		
All causes		
All ages	5.6	4.6 to 6.6
15-64 yr	2.1	0.1 to 4.2
65+ yr	6.6	5.5 to 7.7
Cardiovascular		
All ages	8.51	6.59 to 10.47
15-64 yr	2.47	-2.81 to 8.05
65+ yr	9.19	7.18 to 11.23
Respiratory		
All ages	8.99	5.28 to 12.83
15-64 yr	4.97	6.07 to 17.30
65+ yr	9.49	5.66 to 13.45

Note: models are adjusted for trend, month, day of week, holidays and air pollutants. CI: confidence interval. Yr: years. Adapted from Almeida et al (2003)³⁵



Source: Lisbon Urban Development Plan Contributions to Health Protection and Promotion, Filipe Montenegro Silva

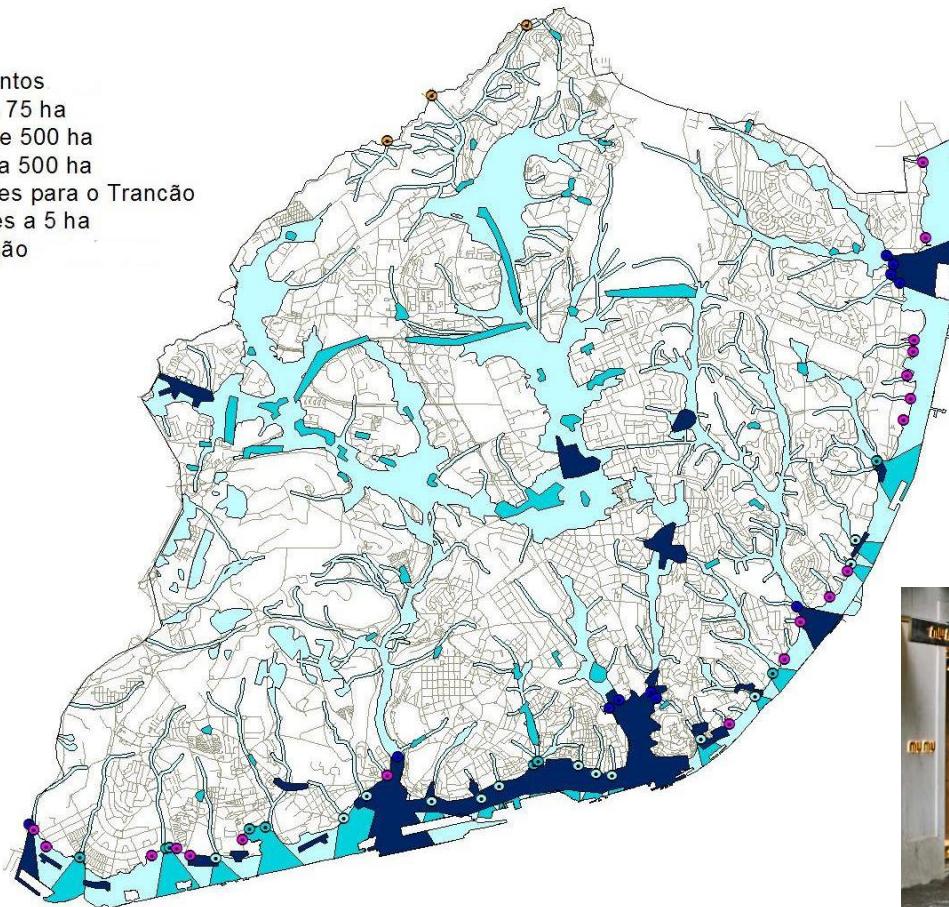
Natural Hazards - Flooding Vulnerability

Maxima acumulação pontos

- de bacia entre 5 e 75 ha
- de bacia entre 75 e 500 ha
- de bacia superior a 500 ha
- de bacias drenantes para o Trancão
- de bacias inferiores a 5 ha

Vulnerabilidade inundaçao

- muito elevada
- elevada
- moderada



Av. da Liberdade
JN 2014



3 THE STRATEGY

Master Plan – Framework



Estratégia Energético-Ambiental
para LISBOA

Energy-environmental strategy
for Lisbon (2008)



PDM
PLANO
DIRECTOR
MUNICIPAL
DE LISBOA

(2012)

Mitigation

+

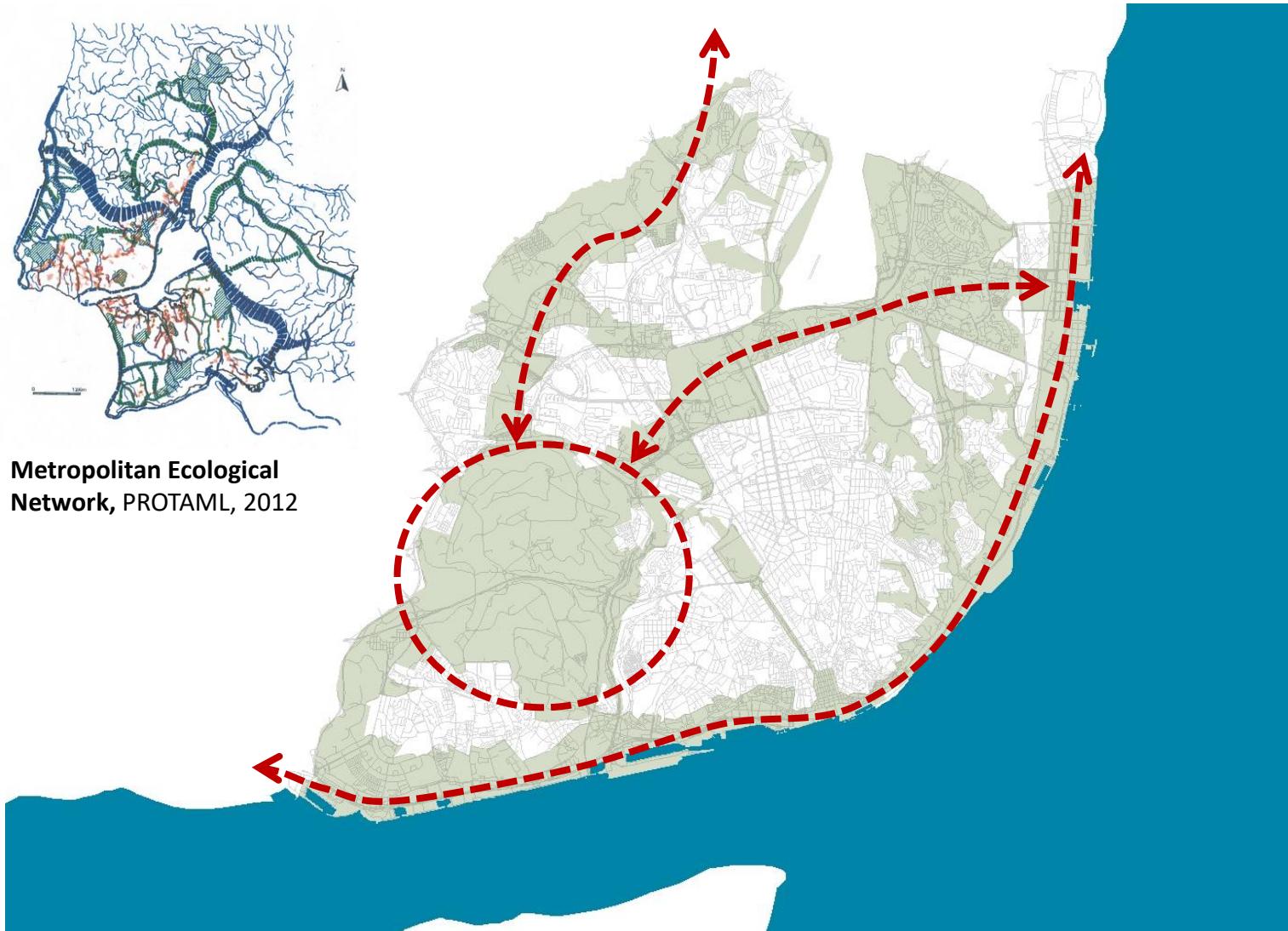
Adaptation

The Master Plan



Wet system

Master Plan – Ecological corridors



The Master Plan



Green spaces

The Master Plan



Green spaces and boulevards

The Master Plan



+ Retention basins



+ Private gardens

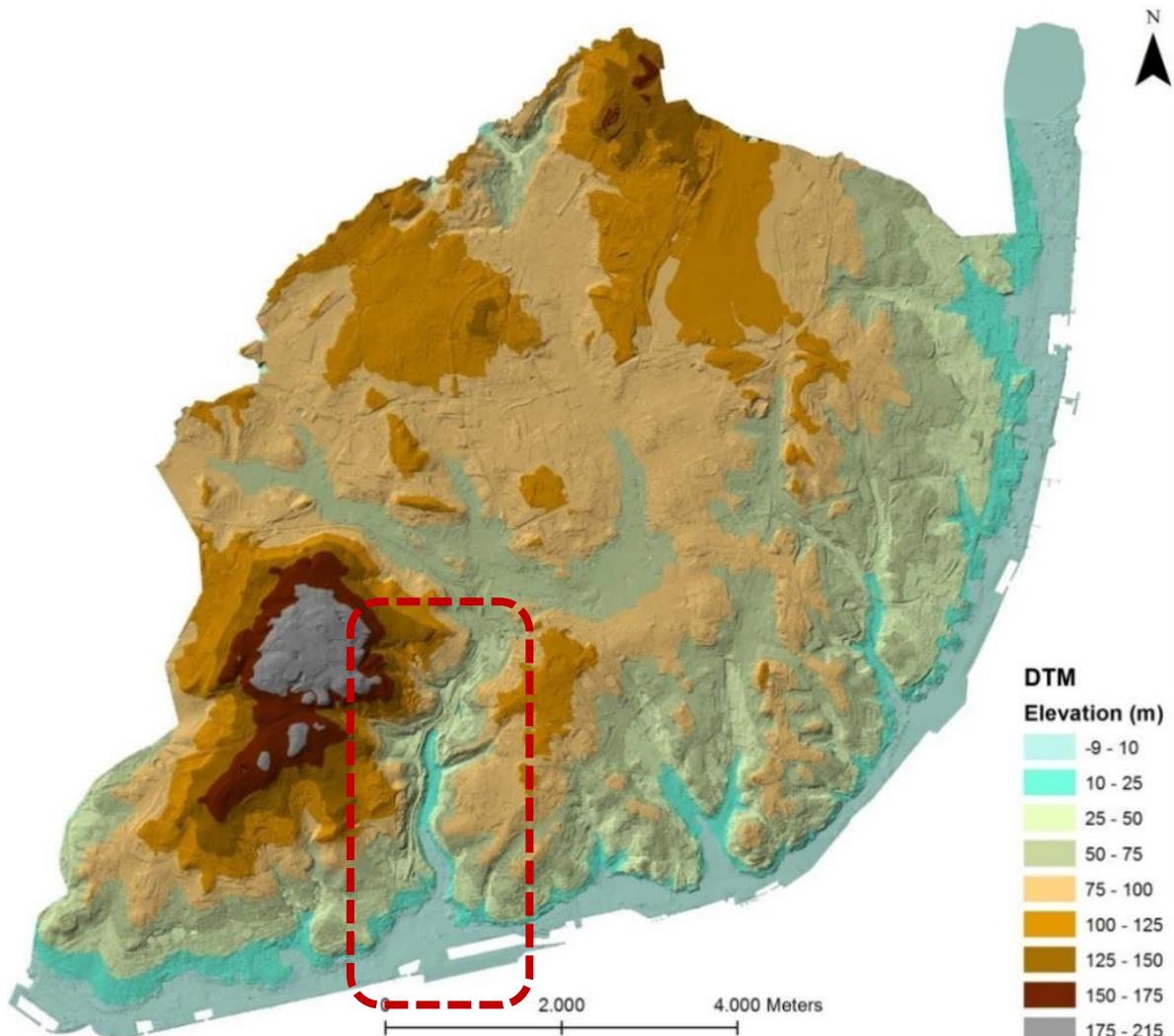


Green spaces, boulevards and green spaces integrated in built-up areas



2 WHAT WE ARE DOING

Redesign the landscape – Alcântara Valley



Redesign the landscape – Alcântara Valley



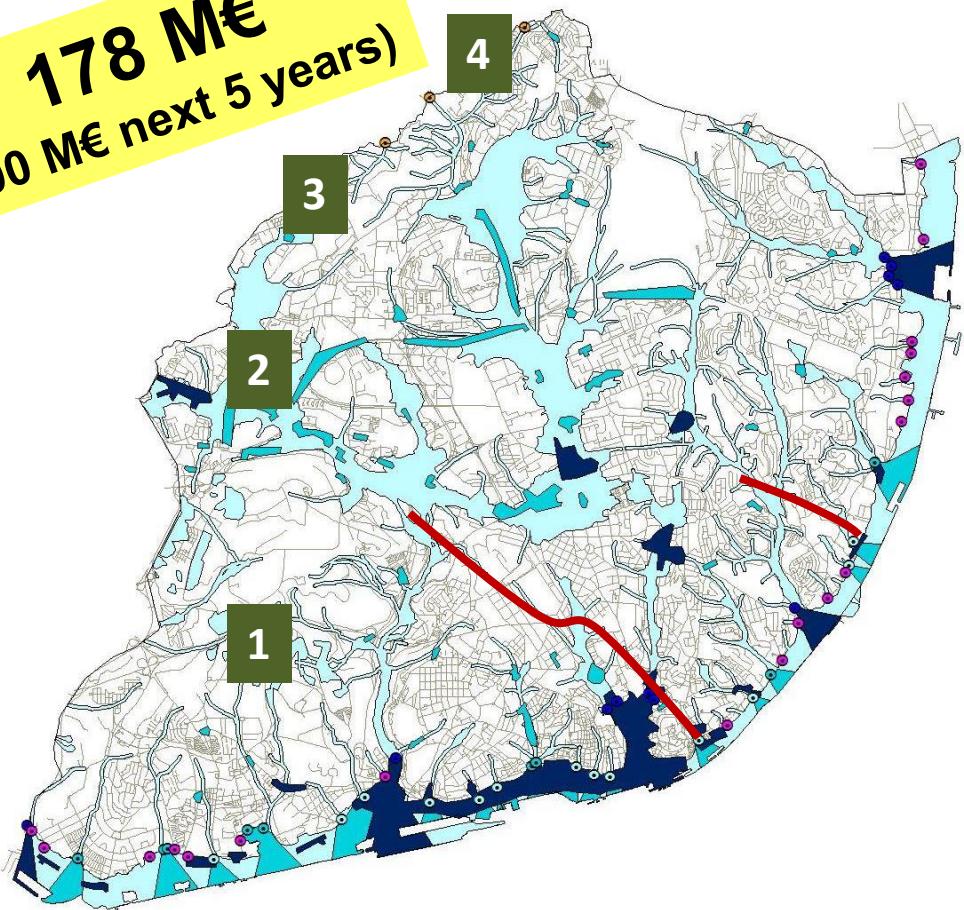
Current View



Future View

The Lisbon Drainage Master Plan, 2016-2030

178 M€
(100 M€ next 5 years)



Monsanto/Santa Apolónia tunnel
5,5m diametre / 5Km

Chelas/Beato tunnel
5,5m diametre / 1Km

1



2



3



4



Sea rise level effects study



Physical vulnerability for 2050

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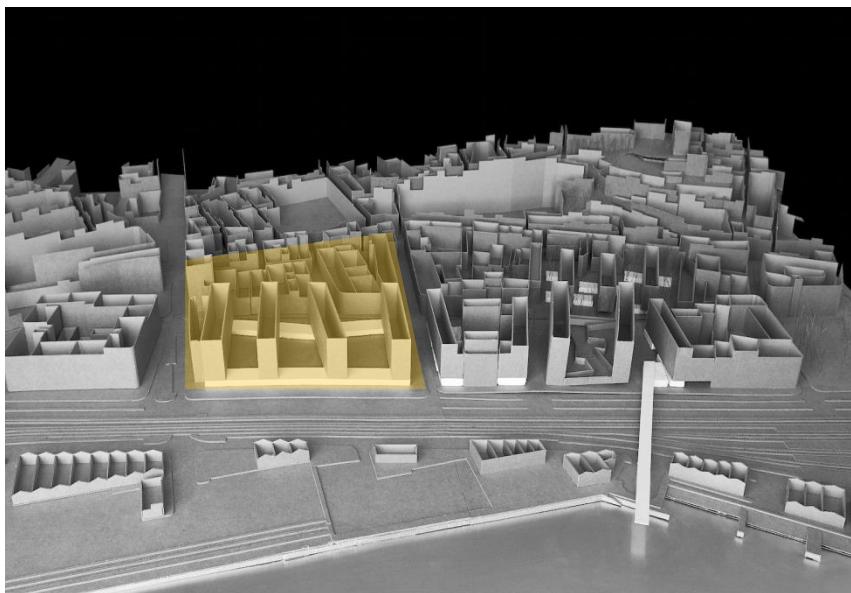
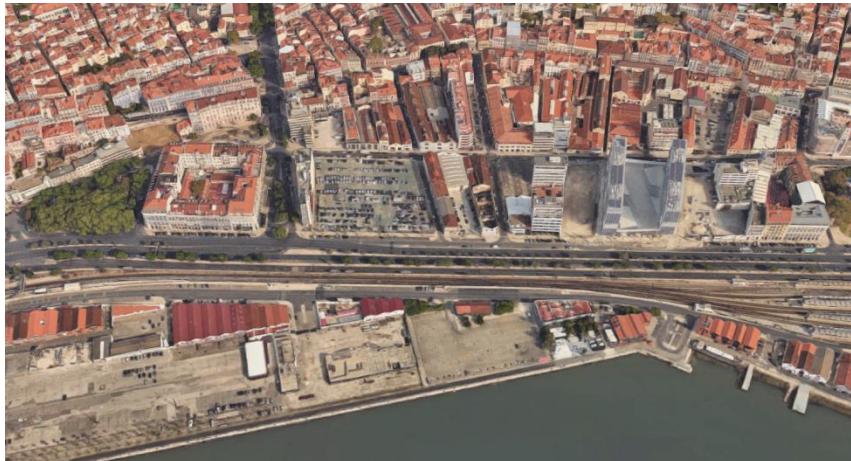
Sea rise level effects study



Physical vulnerability for 2100

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Detail Plan - West Boavista Landfill



Climb the ground floor

Execution Unit – West Alcântara



Rise the terrain

Examples of rising the terrain



Parque das Nações
Foto: Wikipedia.org



Fundação Champalimaud
Foto: construir.pt



THANK YOU!

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