

An aerial photograph of a city, likely Barcelona, showing a mix of urban architecture and green spaces. In the foreground, a large, modern building with a flat roof is visible, surrounded by trees and other buildings. In the background, more dense urban development is visible, including a hillside with residential buildings. Several white birds are seen in flight over the city. A large green circle is overlaid on the left side of the image, containing the title and subtitle text.

What are Nature Based Solutions?

Context, typologies, and benefits.

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VI Local Management Session

IESE Business School Barcelona Campus

What are Nature-based Solutions?



“ Nature-based solutions

Nature-based solutions are actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits.

United Nations, 2022



NBS [...] play an essential role in the overall global effort to achieve the Sustainable Development Goals [...]

United Nations, 2022



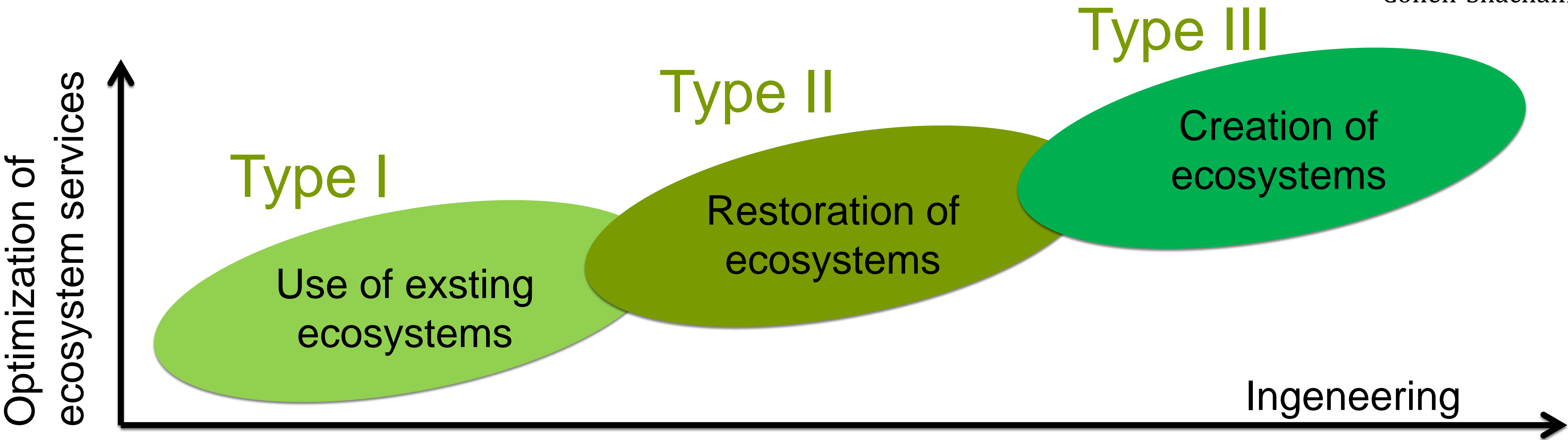
Nature-based Solutions | History



Adapted based on Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. (eds.) (2016). Nature-based Solutions to address global societal challenges

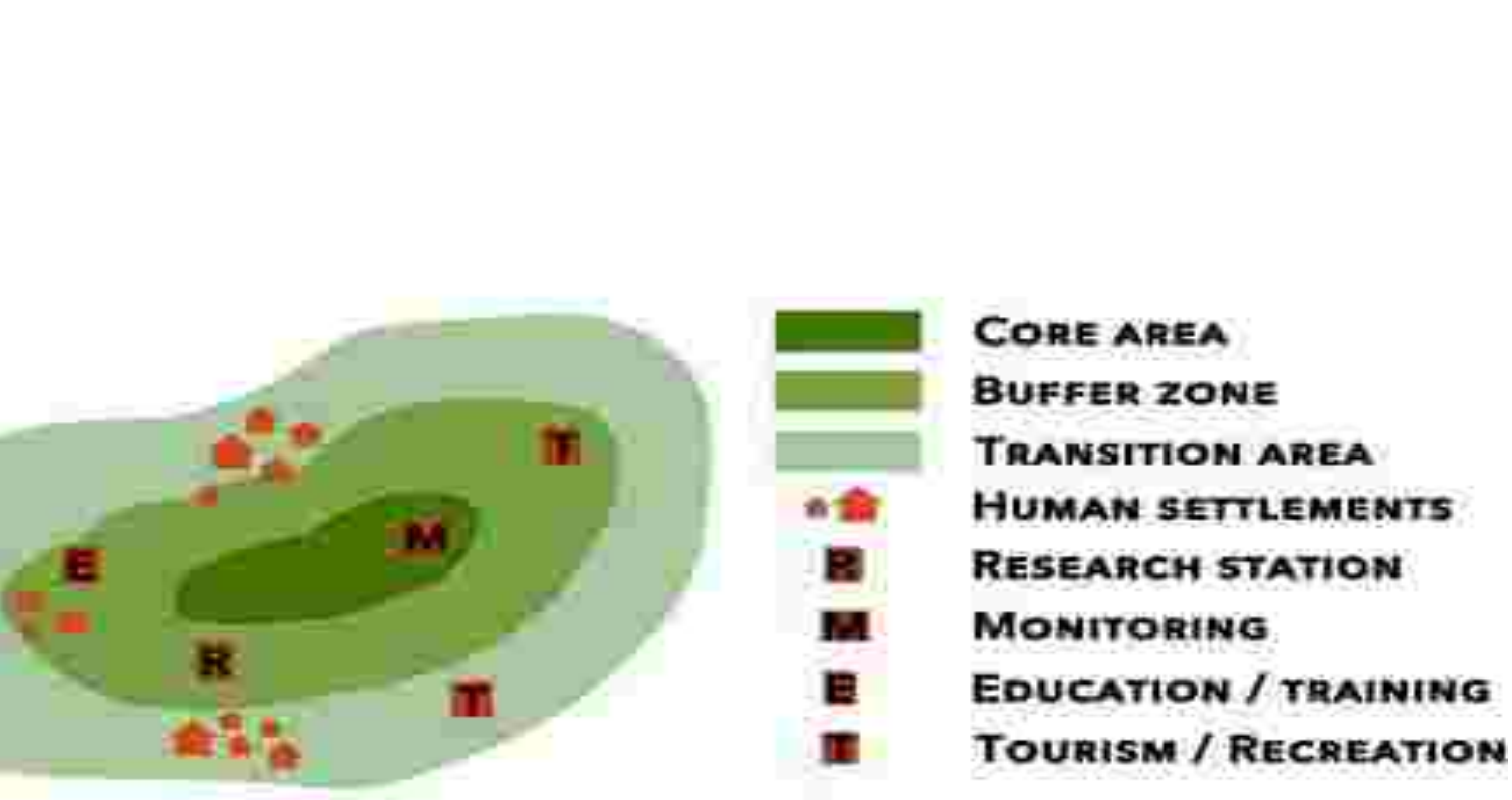
Nature-based Solutions | Typology

Cohen-Shacham, et al. (2016)



Nature-based Solutions | Typology

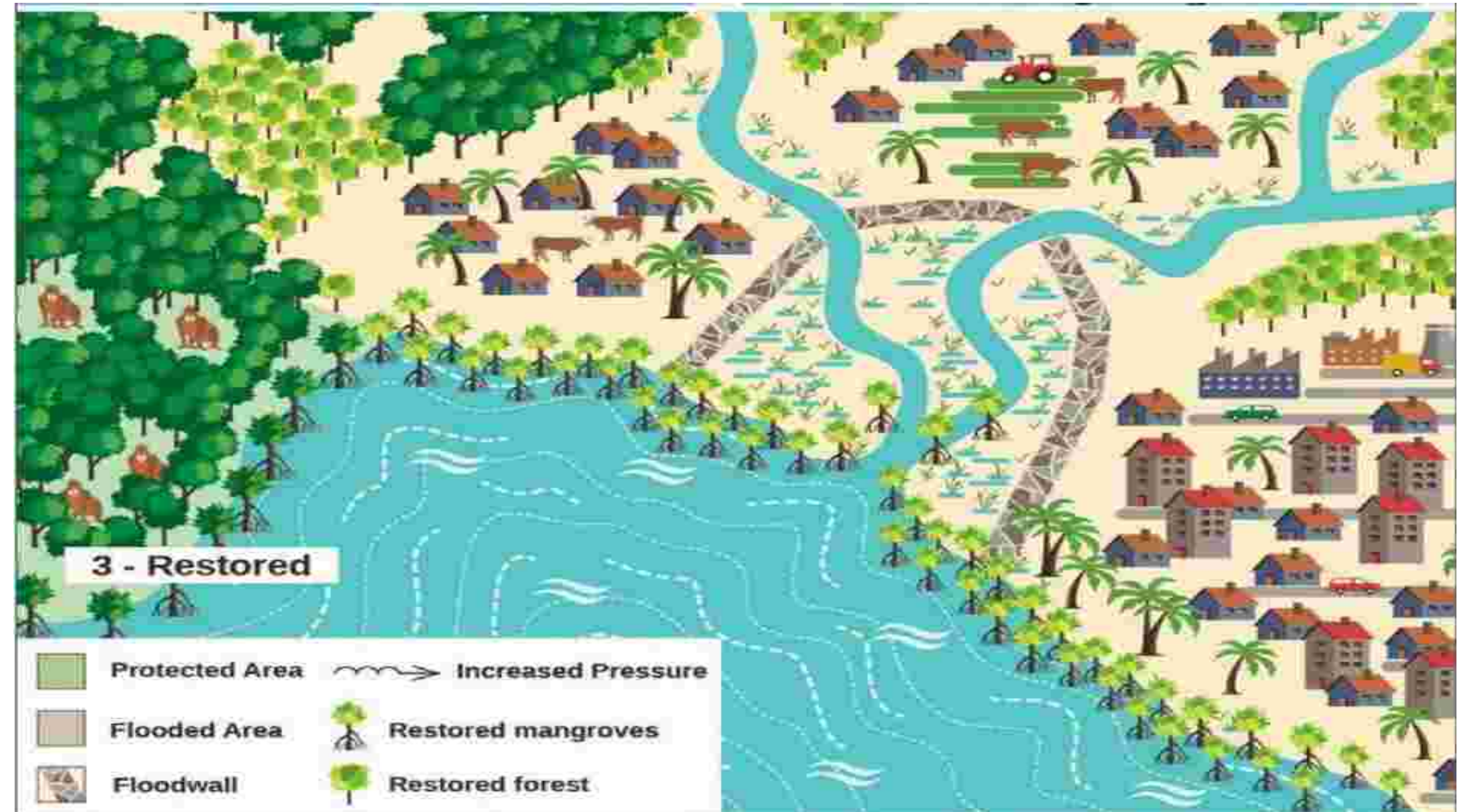
Type I *Use of existing ecosystems*



Challenge: Enhance recreational benefits to urban population

Nature-based Solutions | Typology

Type II *Restoration of Ecosystems*



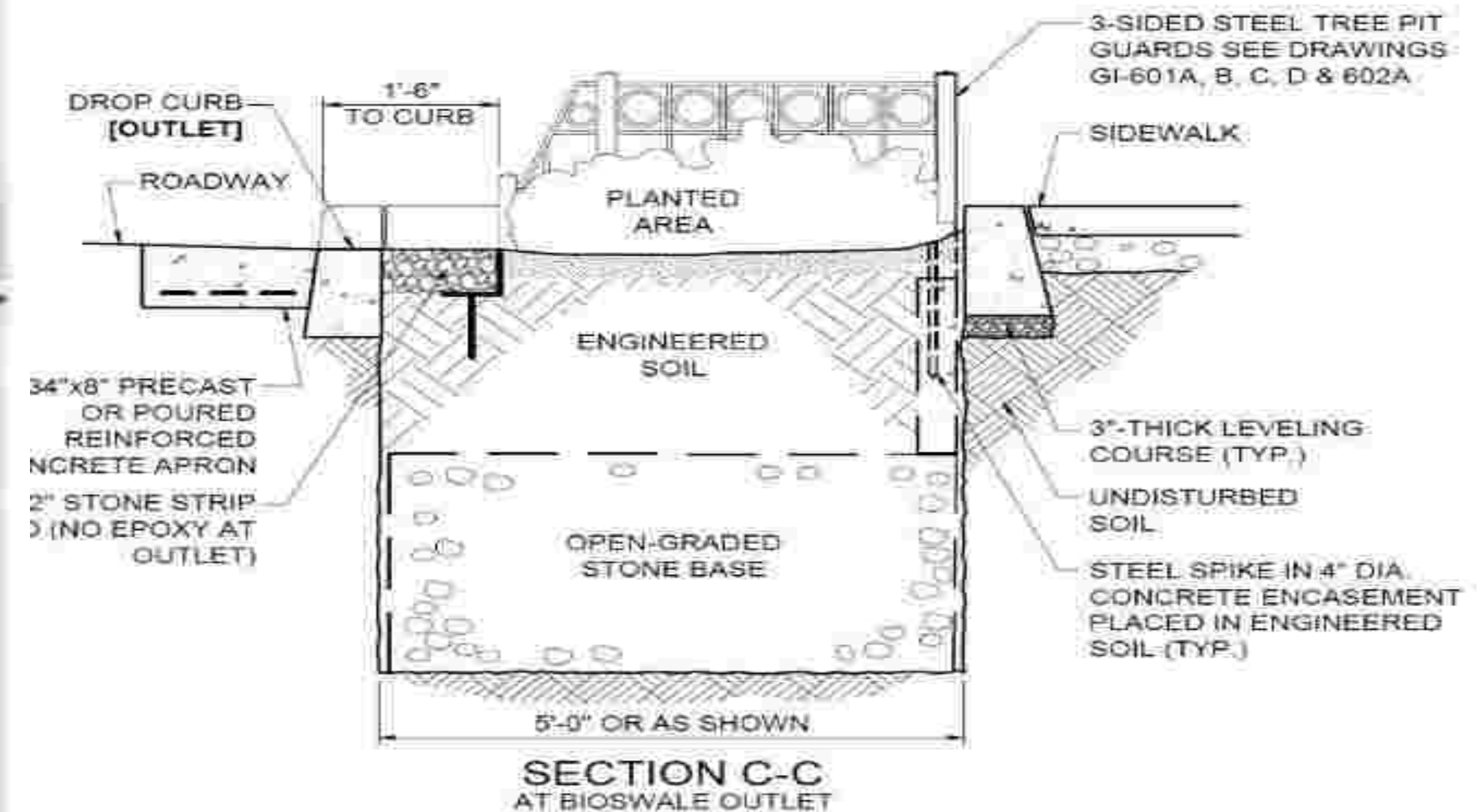
Cohen-Shacham, et al.. (Hrsg.) (2016).

Challenge: Flood protection of human settlements

Nature-based Solutions | Typology

Type III Creation of Ecosystems

Bioswale

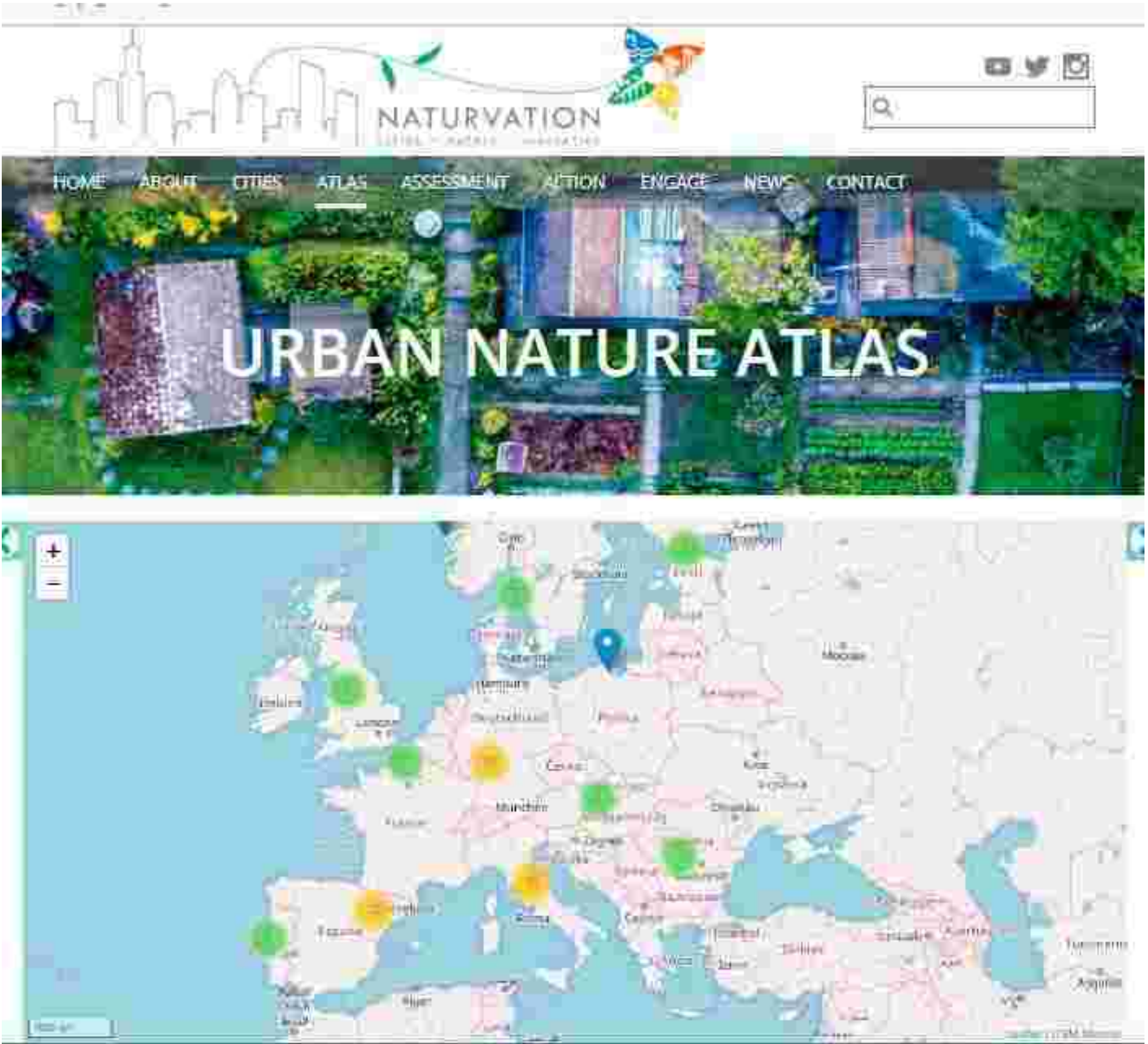


Challenge: Stormwater runoff/sewage overflow mitigation

Nature-based Solutions | Examples



FP7-OpenNESS



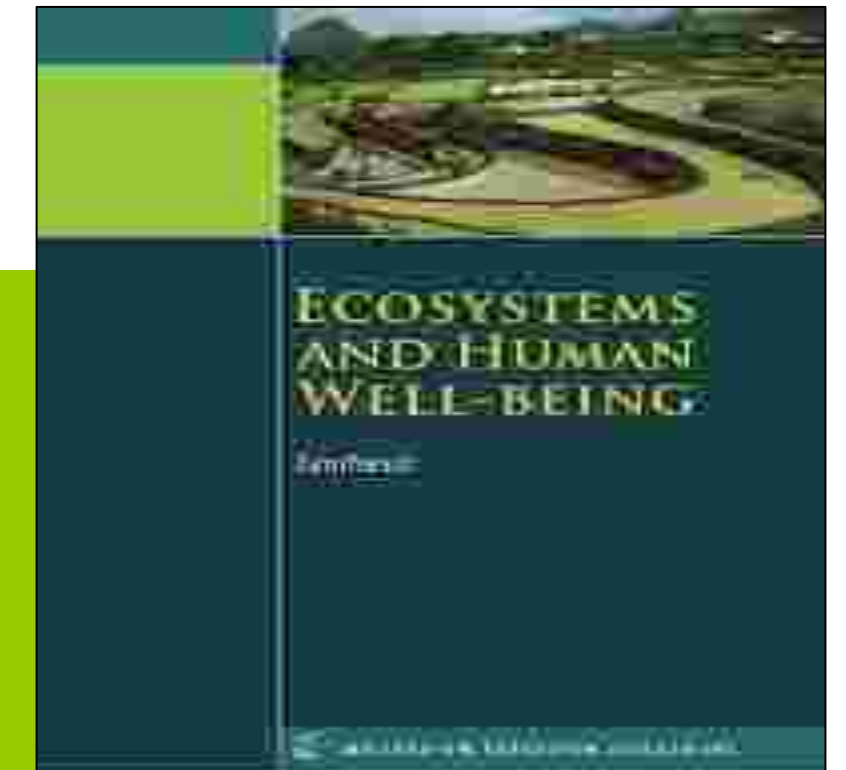
H2020-Naturvation

Nature-based Solutions | Paradigm shift

Natural Capital

“The elements of nature that directly or indirectly produce value for people.
Ecosystem services as nature’s contributions to human wellbeing”

Millennium Ecosystem Assessment (2005)



Green Infrastructure

“Strategically planned network of natural and semi-natural areas ... to deliver a wide range of ecosystem services”

European Green Infrastructure Strategy (2013)



Nature based solutions

“Actions [...] that aim to help societies address a variety of environmental, social and economic challenges.”

EC Expert Group report (2015)



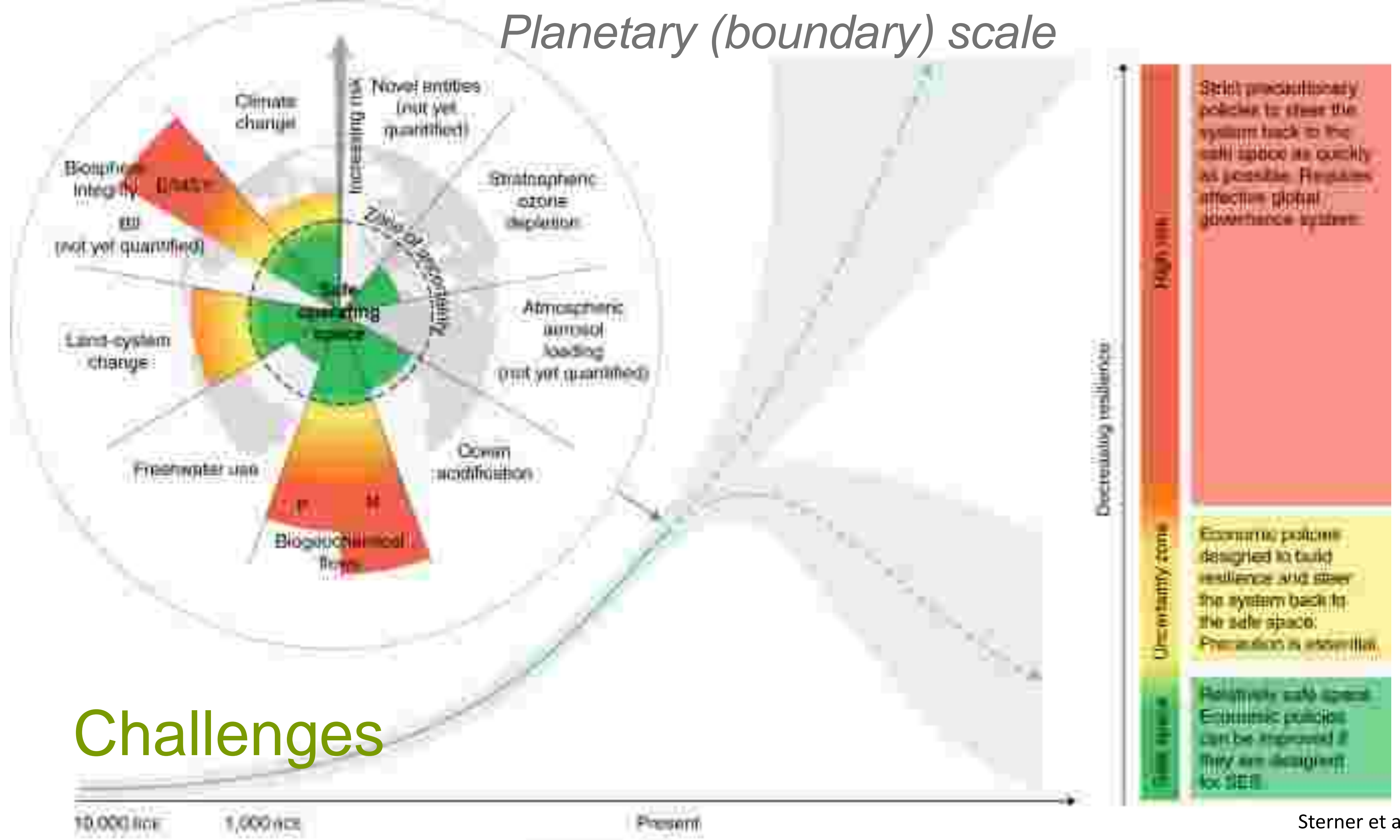
Anthropocentrism / Utilitarianism

Adapted based on
Baró et al. (2016)

Benefits



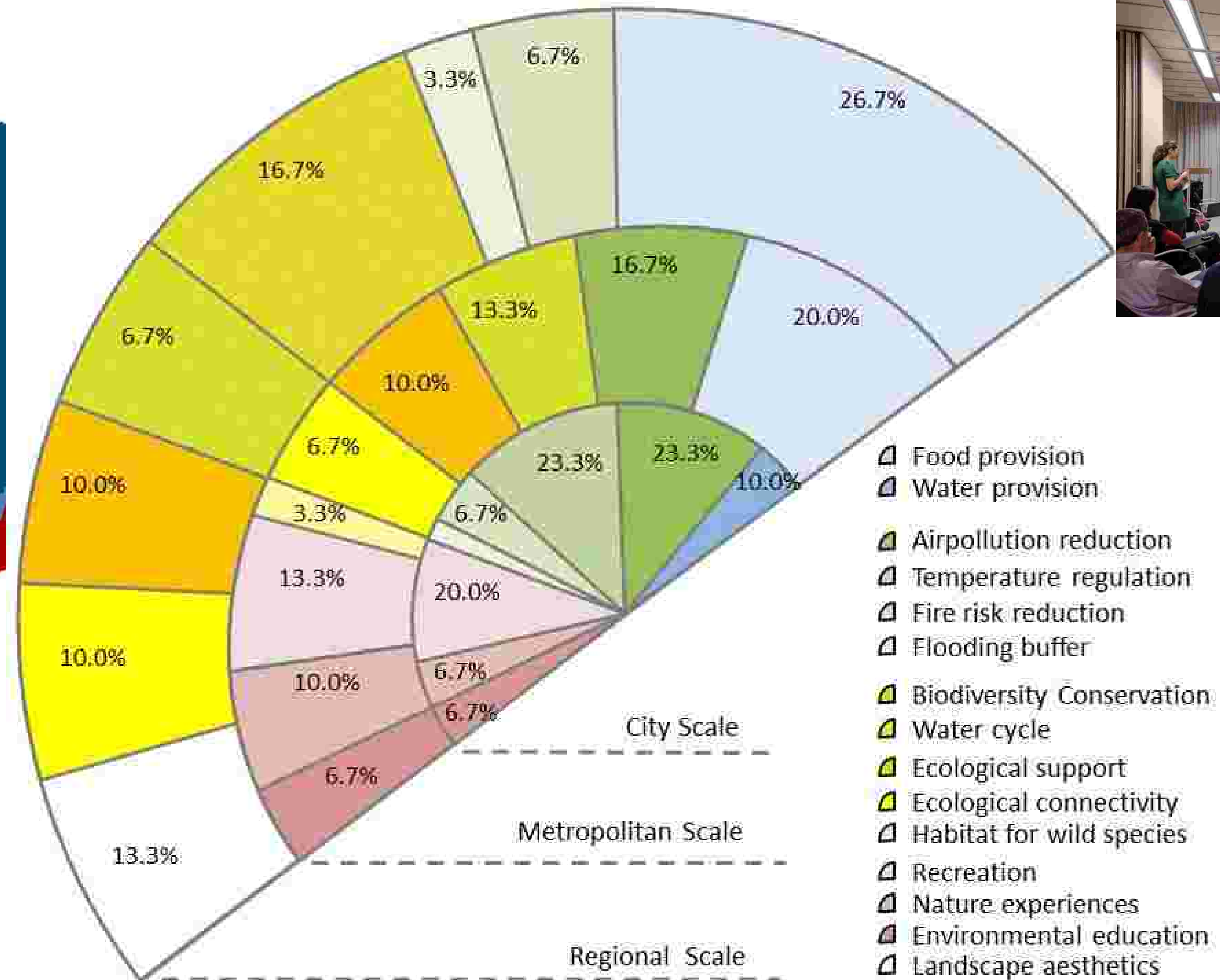
Planetary (boundary) scale



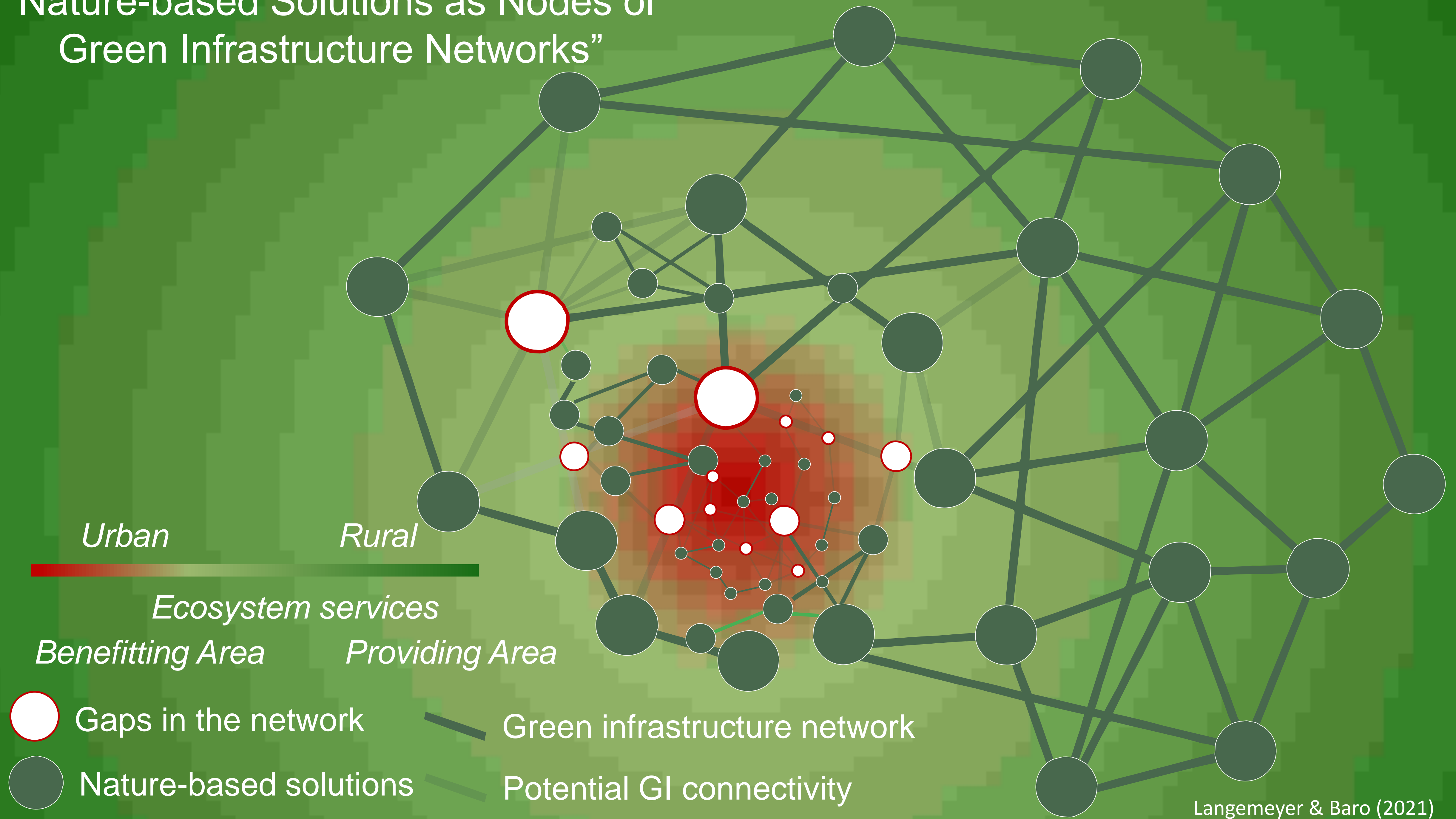
Barcelona | City to regional scale



Challenges

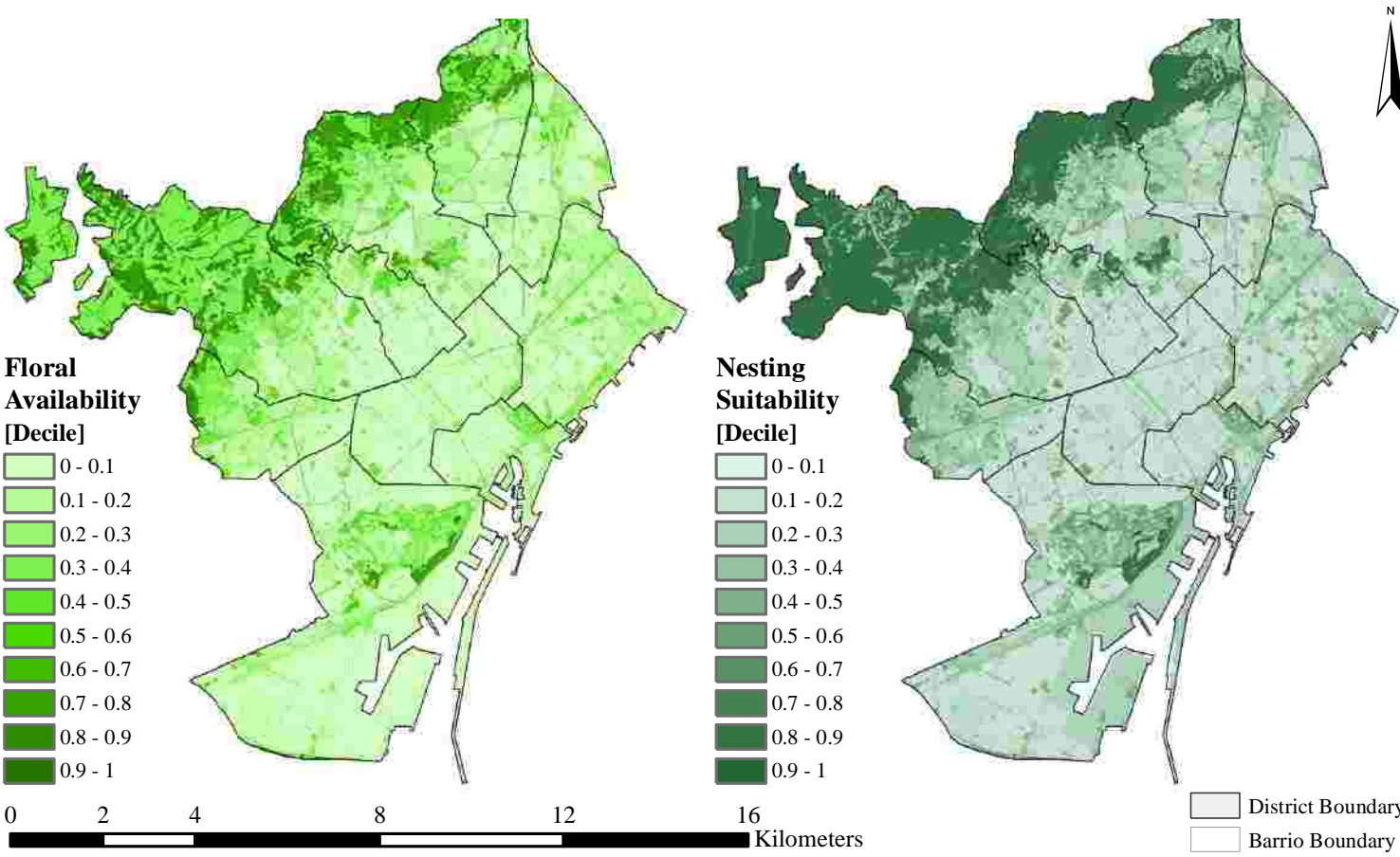


“Nature-based Solutions as Nodes of Green Infrastructure Networks”

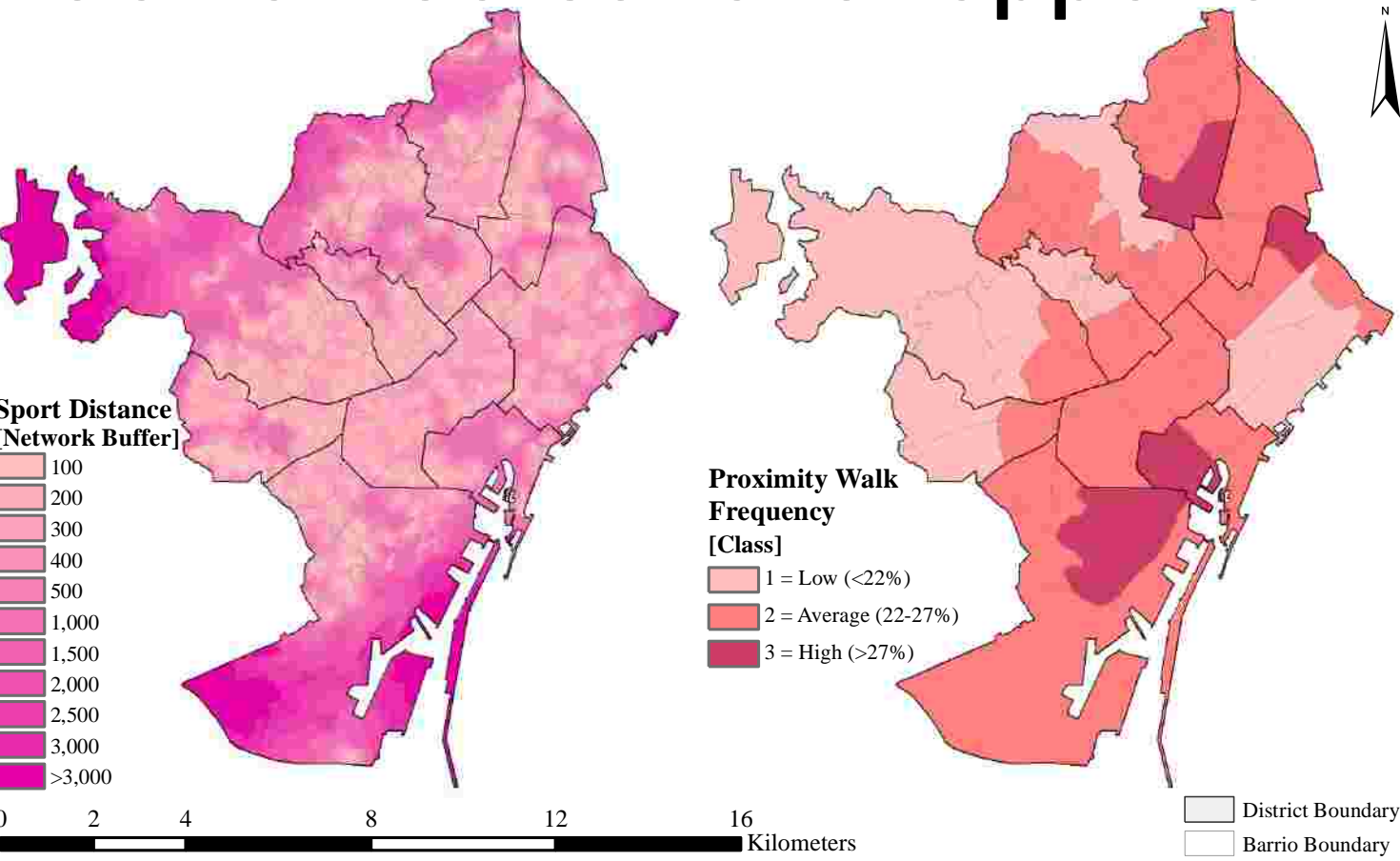


Nature-based Solutions | Paradigm shift

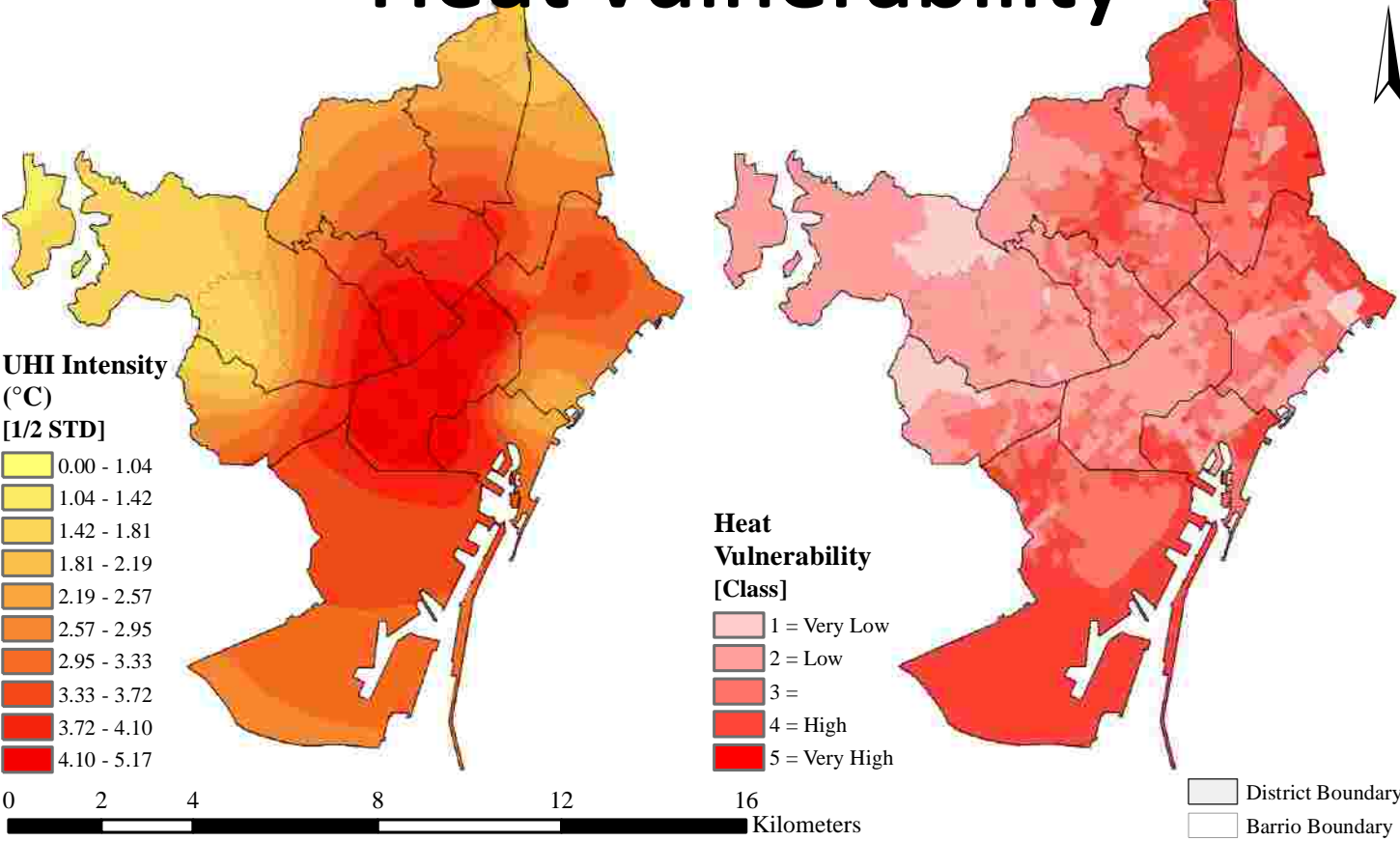
Lack of habitat



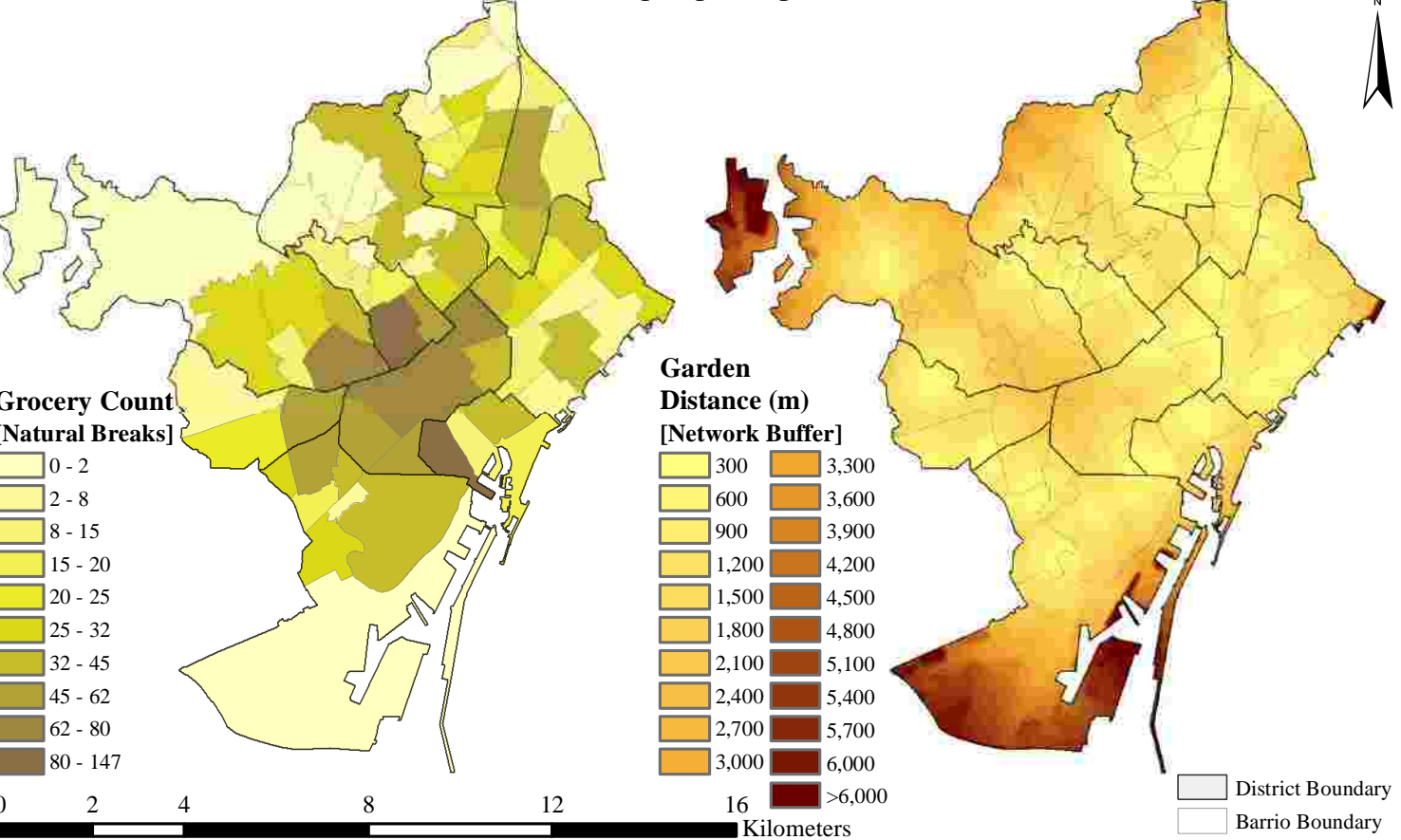
Lack of recreational opportunities



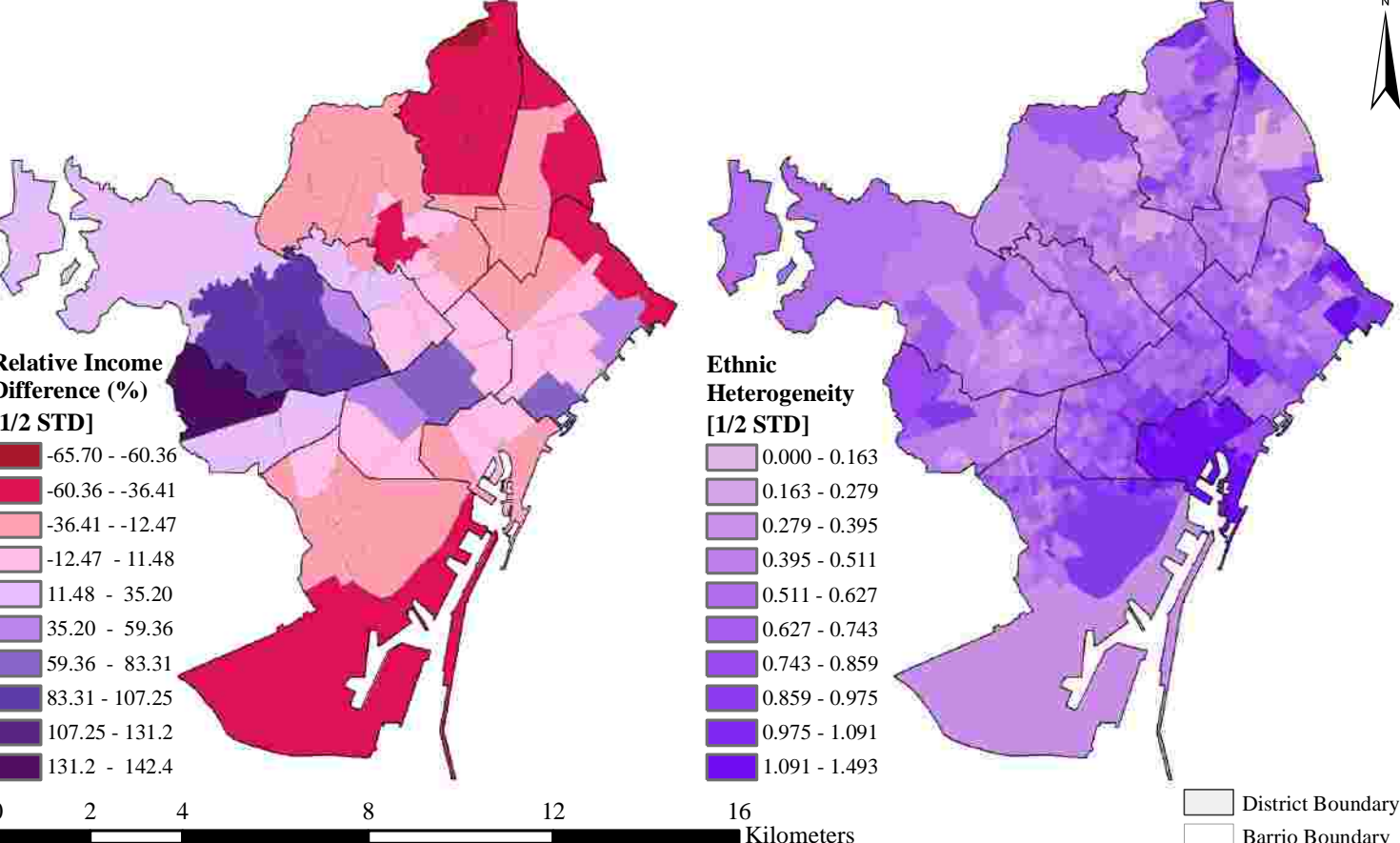
Heat vulnerability



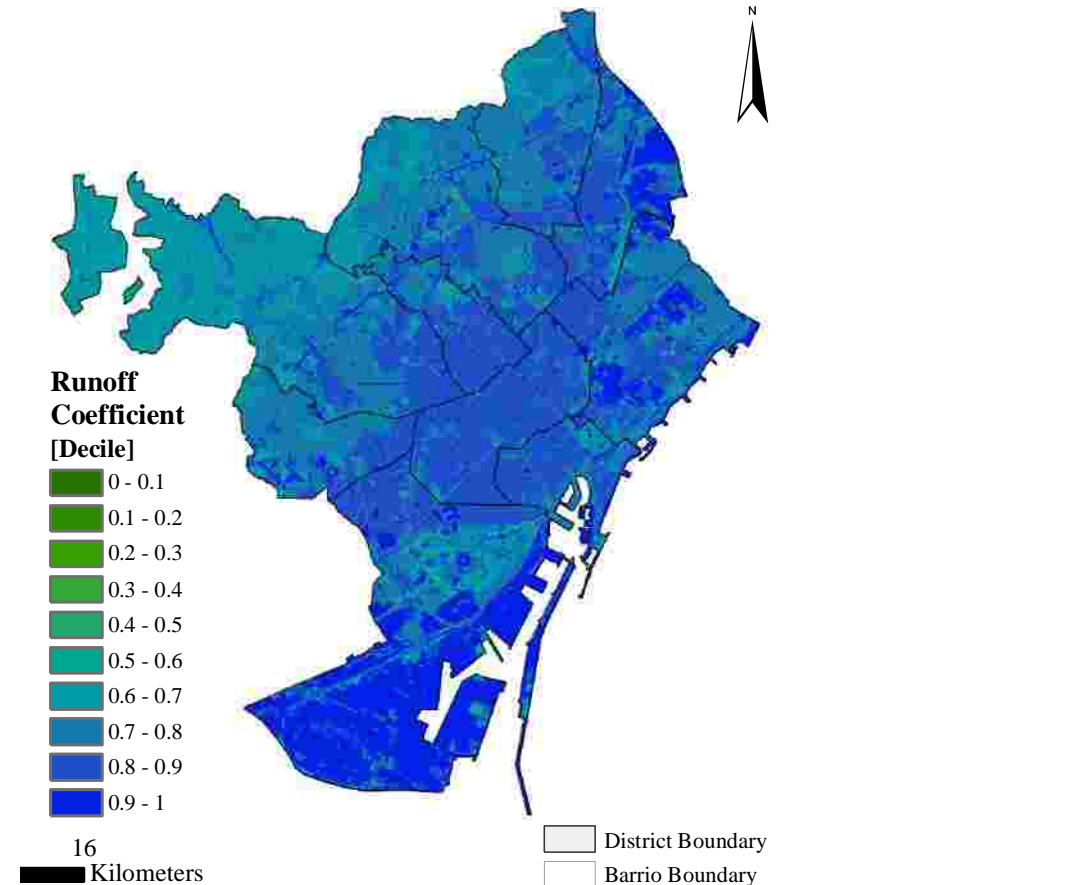
Food supply insecurity



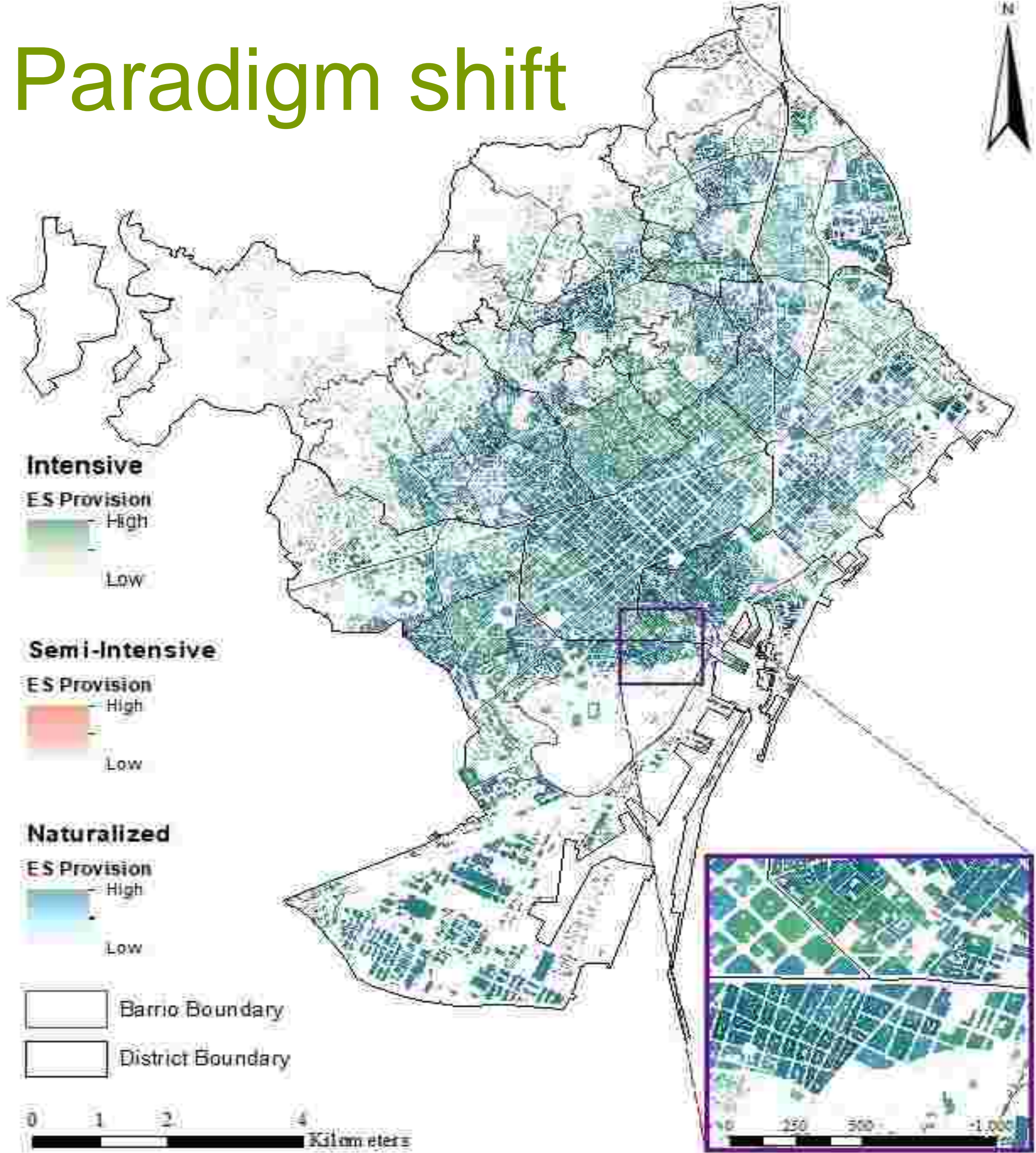
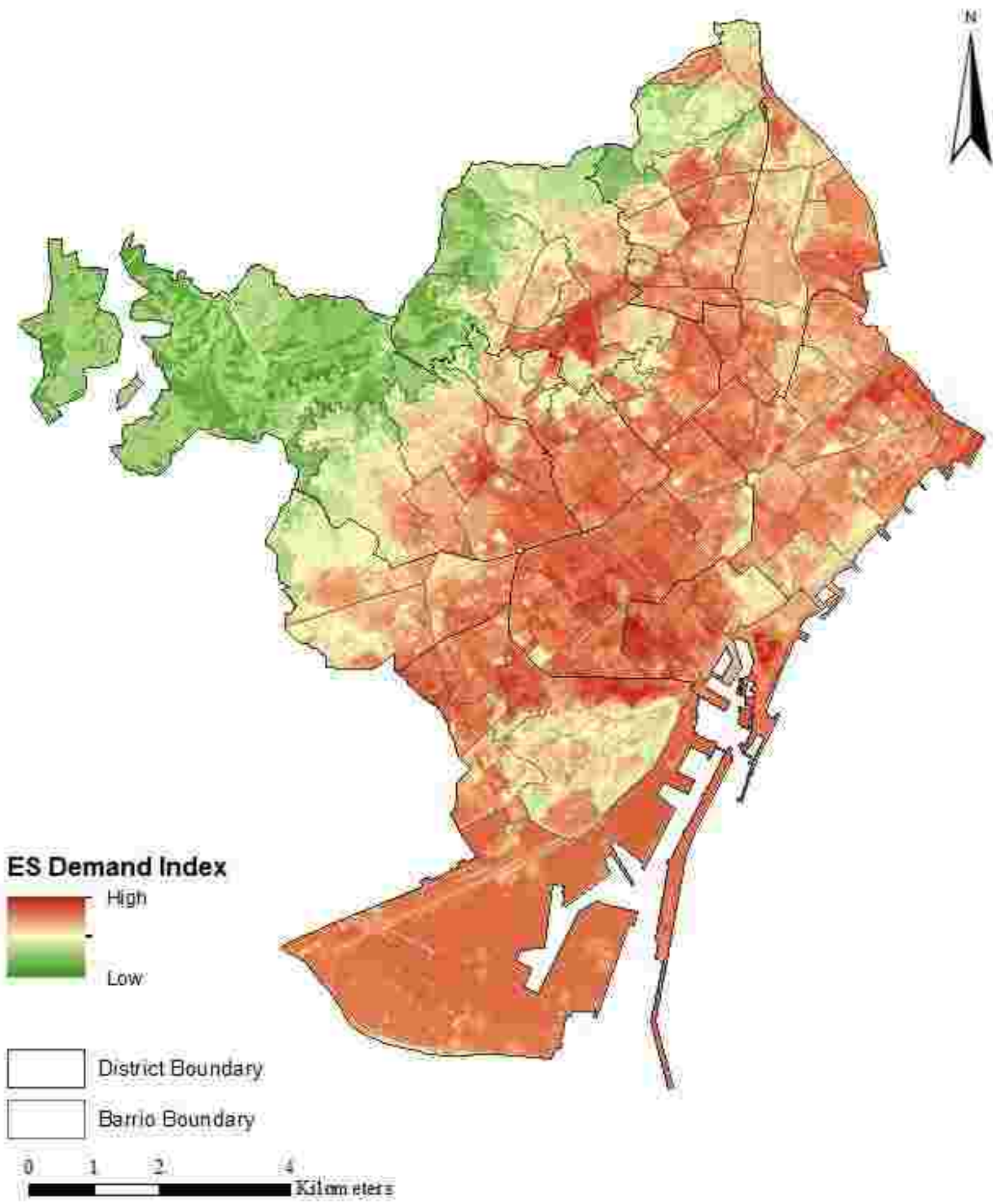
Lack of social cohesion



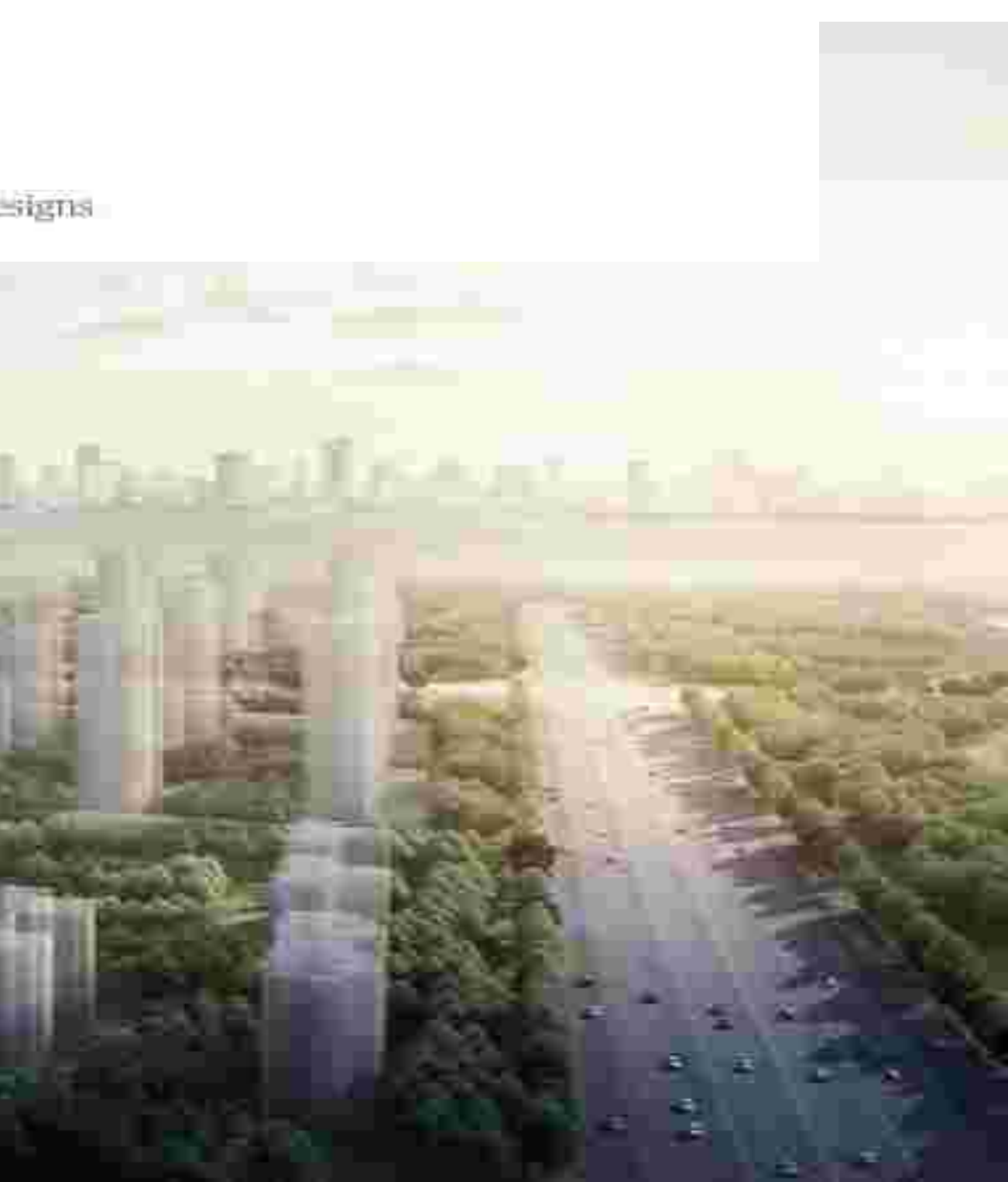
Stormwater runoff





Nature-based Solutions | Paradigm shift



Nature-based Solutions | A Panacea?

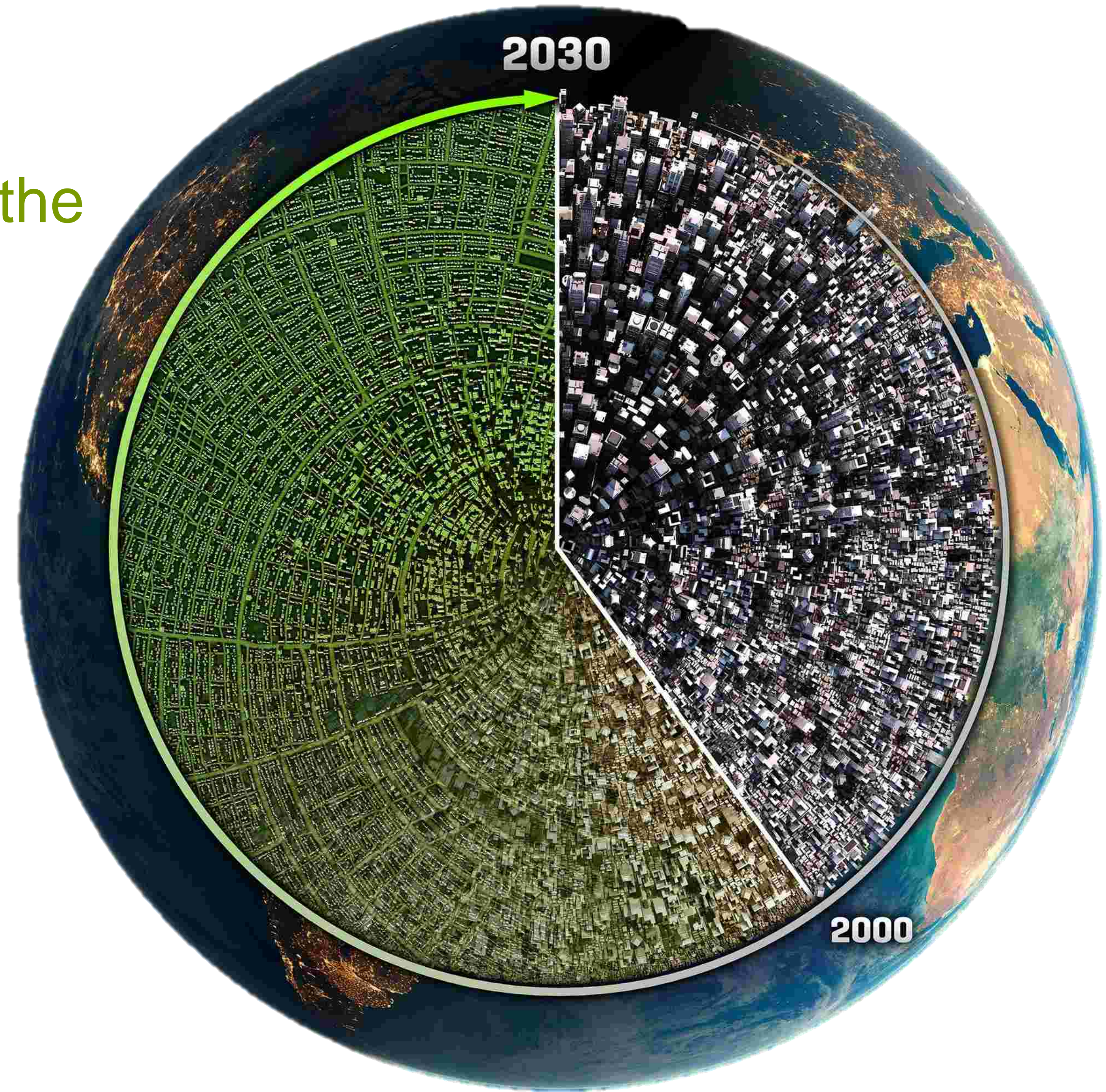


Nature-based Solutions | A Panacea?

		Air pollutant	Removal biophysical value (t year ⁻¹)	City-based emissions (t year ⁻¹)	Air pollution reduction relative to city based emissions (%)
		PM ₁₀	166.01	743.77	22.32
		NO ₂	54.59	10 412.94	0.52
		CO ₂ eq	19 036	4 053 766	0.47

Nature-based Solutions

- ... can become an important part of the solutions to global challenges
- ... will be essential for future human wellbeing on an urbanizing planet
- ... need to be integrated into green infrastructure planning



Source: Elmqvist (2014)



*Sveavägen Roofscape
(Stockholm, Sweden)*



*Champ Libre,
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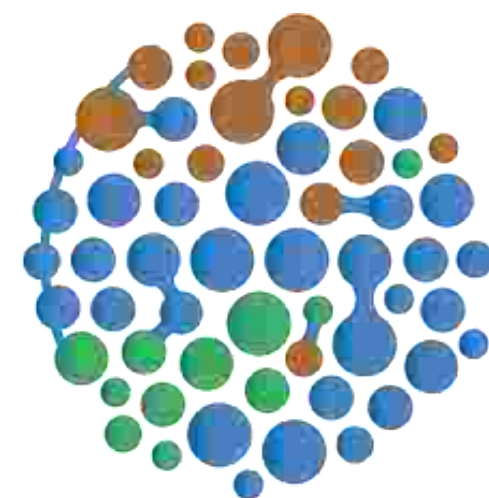
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