How

?

Nature-based solutions in an urban context

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A PARTNER WITH
The Beijer Institute of Ecological Economics
Kungl. Vetenskaps-Akademien

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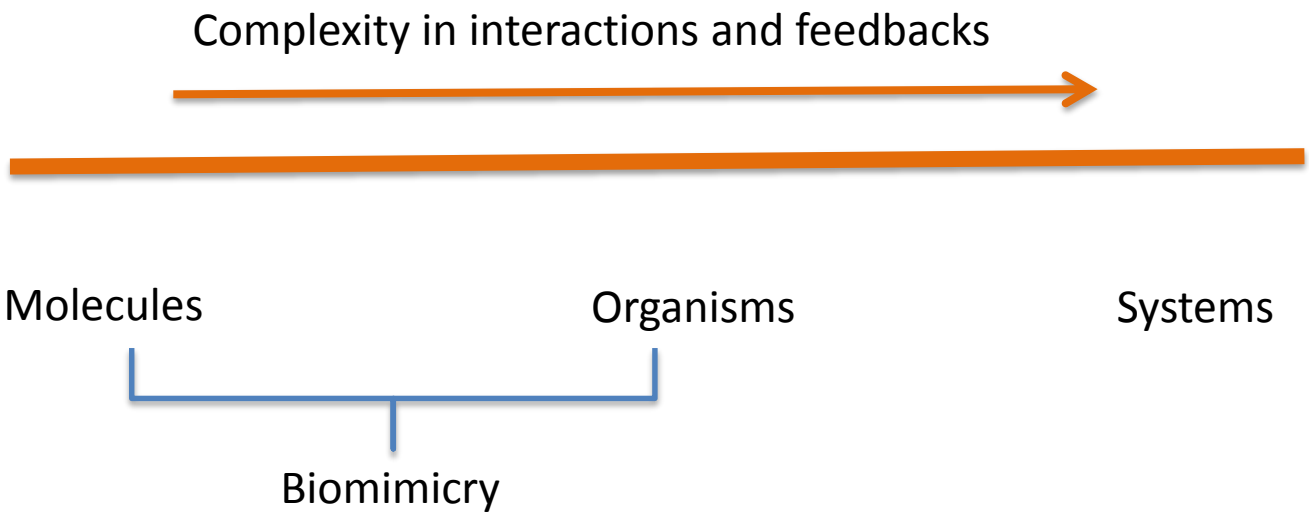
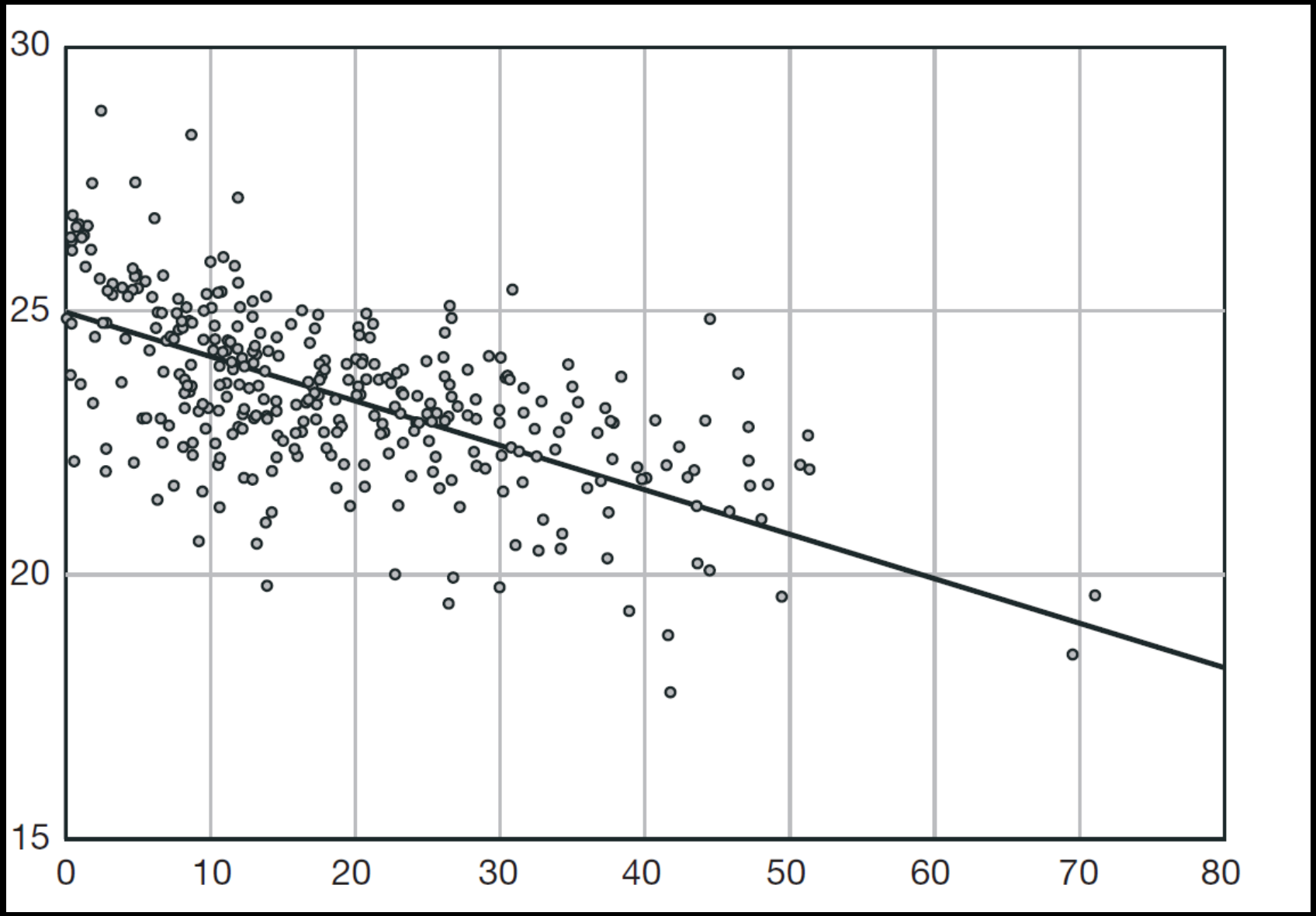
Nature based solutions



Urban heat waves

Estimated 70.000 excess deaths as a result of a heat wave in Europe in 2003 (Robine et al 2007)

Cooling effect of trees



Saatchi et al 2010

Nature based solutions and **potential for climate change adaptation and mitigation**

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Not everything that looks grey is grey. Sometimes slight and easy changes can have a high impact.

There is a **high potential for nature based solutions** in every city.

Looking inside urban built-up areas we find a high potential for climate change adaptation, mitigation, risk management and public health provision.

Wurster, Artmann (2014). **AMBIO**, Vol. 43

Special Issues

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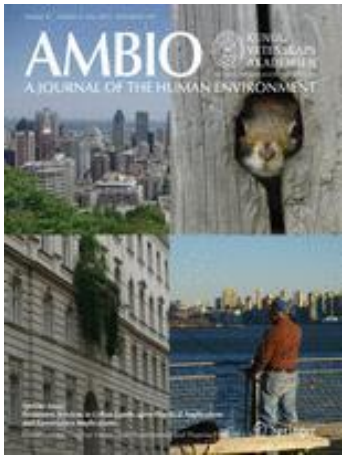
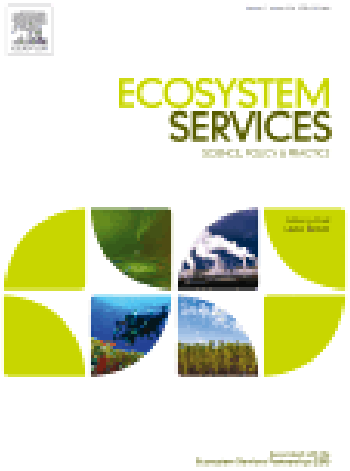
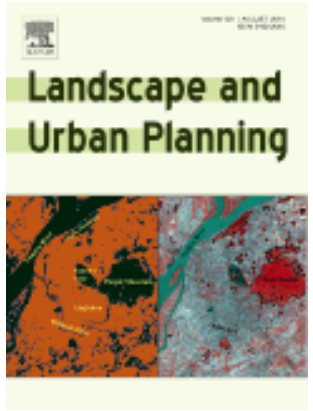


April 2014
Open access



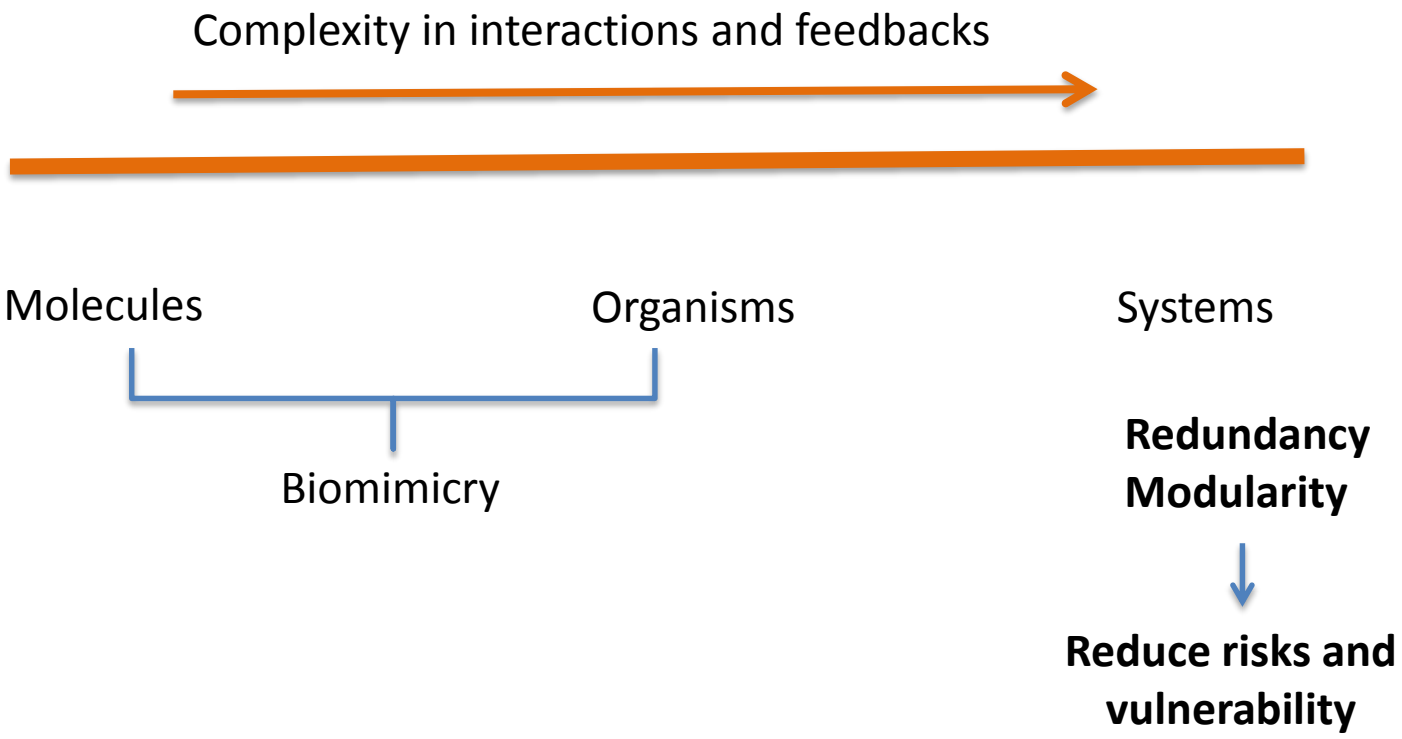
October 2014

Spring 2015

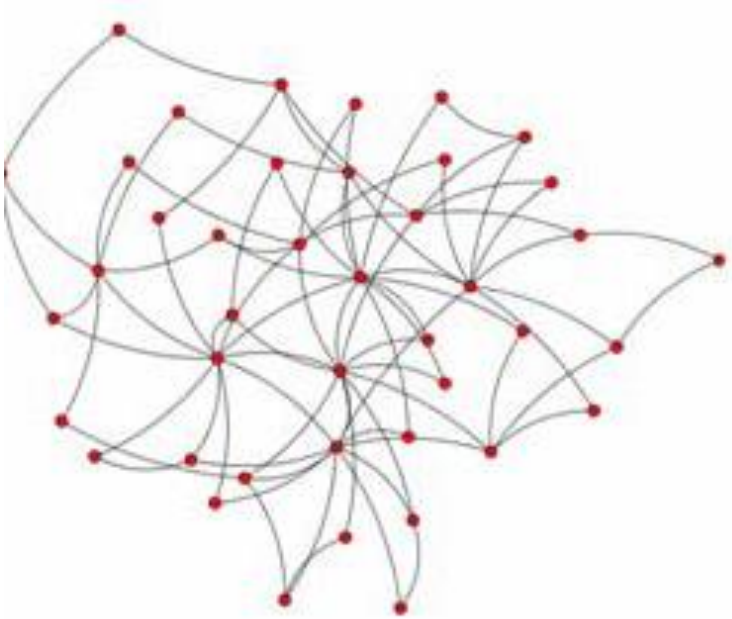


Fall 2015

Nature based solutions

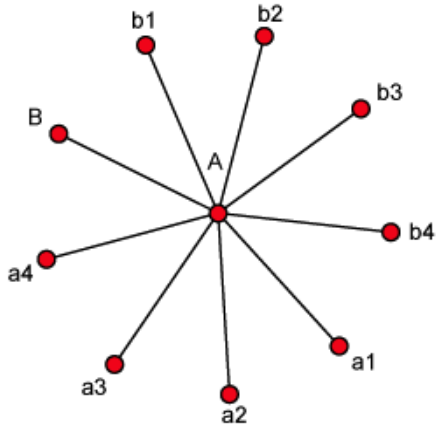


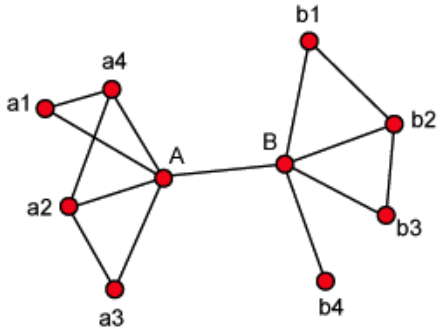
Vulnerability and Efficiency



Efficiency

Robustness





Self-organized network
(high redundancy)

Designed networks
(low redundancy)

Elmqvist et al ms

Vulnerability as a Cost of Efficiency

- Low redundancy (low overlap) among agencies, organisations, and in management, may lead to increased vulnerability – failure to address novelties - e.g. surprises related to climate change

- Polycentric governance (Ostrom et al. 2010)

Smart City – the ordered and highly connected city

Modularity

the degree to which a system's components may be separated and recombined.

High modularity
Low connectivity
(highly connected locally)

Intermediate modularity

Low modularity
High connectivity
(highly connected globally)

Intermediate modularity contribute to the robustness of an ecosystem by limiting the spread of e.g. disturbances or disease
(e.g. May 1972, Pimm 1979, Rozdilsky et al. 2004, Teng & McCann 2004, Montoya et al 2006, Webb and Bodin 2008).

Three urban landscapes

High modularity

Intermediate modularity

Low modularity

Sprawling

Highly compact

Sprawling urban growth needs to restricted, but there are also limitations and vulnerabilities with highly compact cities (Elmqvist et al ms)

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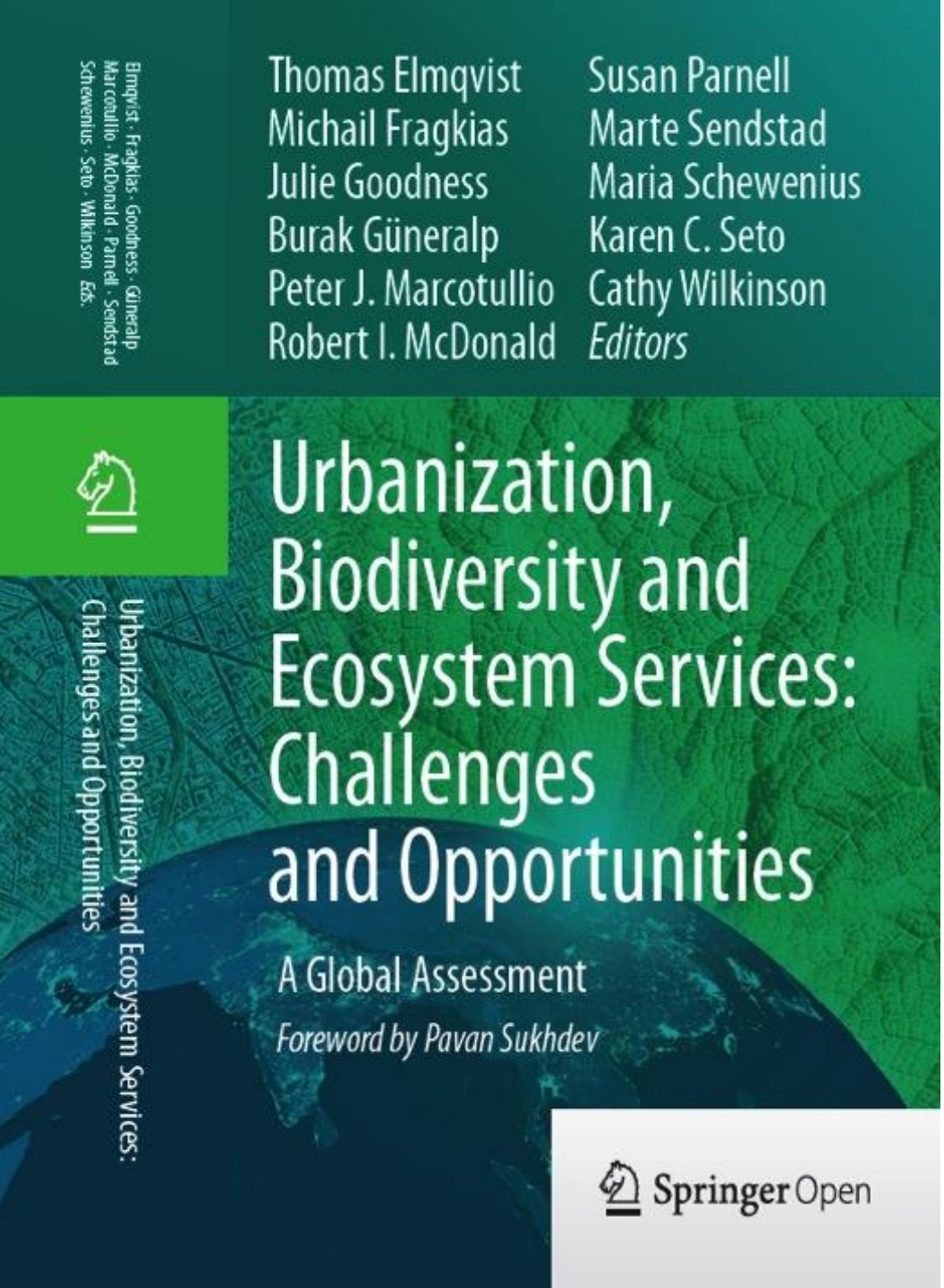
Global modularity (Digital)

Vol 464|15 April 2010|doi:10.1038/nature08932 nature

LETTERS

Catastrophic cascade of failures in interdependent networks

Sergey V. Buldyrev[1,2], Roni Parshani[3], Gerald Paul[2], H. Eugene Stanley[2] & Shlomo Havlin[3]



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Open Access Book

www.cbobook.org

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Research for Governance of Social-Ecological Systems
Stockholm University

Convention on Biological Diversity

UN HABITAT

DIVERSITAS
an international programme of biodiversity science

formas
The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning

GLOBAÏA

ICLEI Local Governments for Sustainability

biodiversa

UNESCO
United Nations Educational, Scientific and Cultural Organization

Thank you!

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