



Nature's integration
in cities' hydrologies,
ecologies and societies

Nature-based solutions for improved water management and biodiversity conservation

McKenna Davis, Ecologic Institute

Digital Blue Green Event, 14 March 2023



NICHES: *Nature's integration in cities' hydrologies, ecologies and societies*

- ◆ Biodiversa / WaterJPI
- ◆ April 2022 - March 2025
- ◆ 5 EU and 1 US partner
- ◆ Cities as co-design arenas

- ◆ Aim: Explore the potential to **mitigate and treat combined sewage overflow (CSO)** through **nature-based solutions (NBS)** to reduce negative impacts on aquatic ecosystems.



BERLIN



ROTTERDAM



BARCELONA & AMB



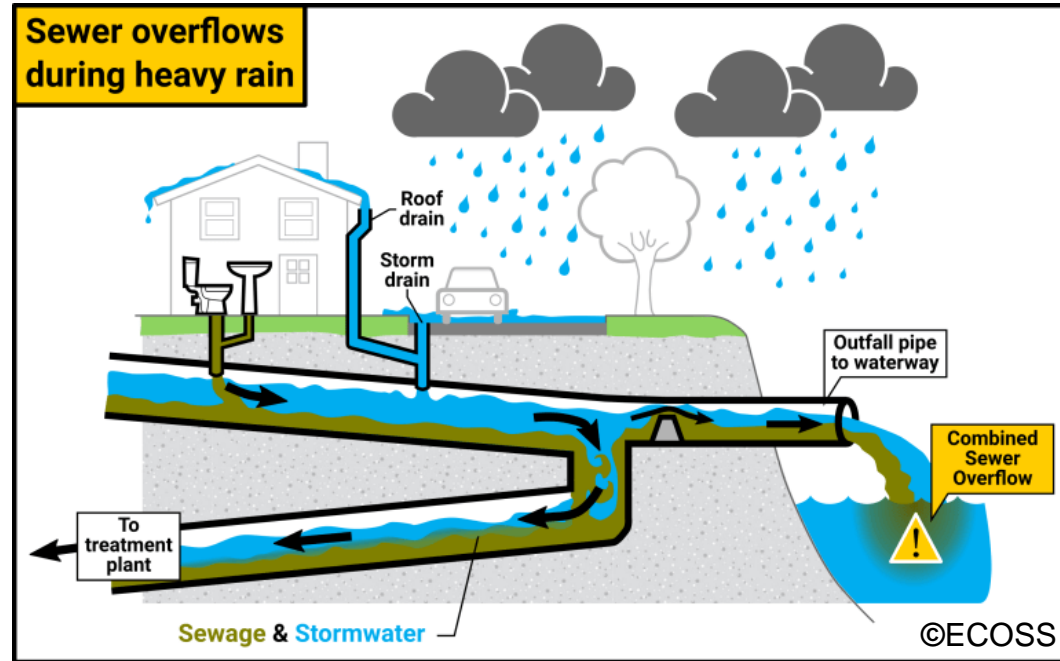
BOSTON



SHEFFIELD

Urban water management: Key challenges

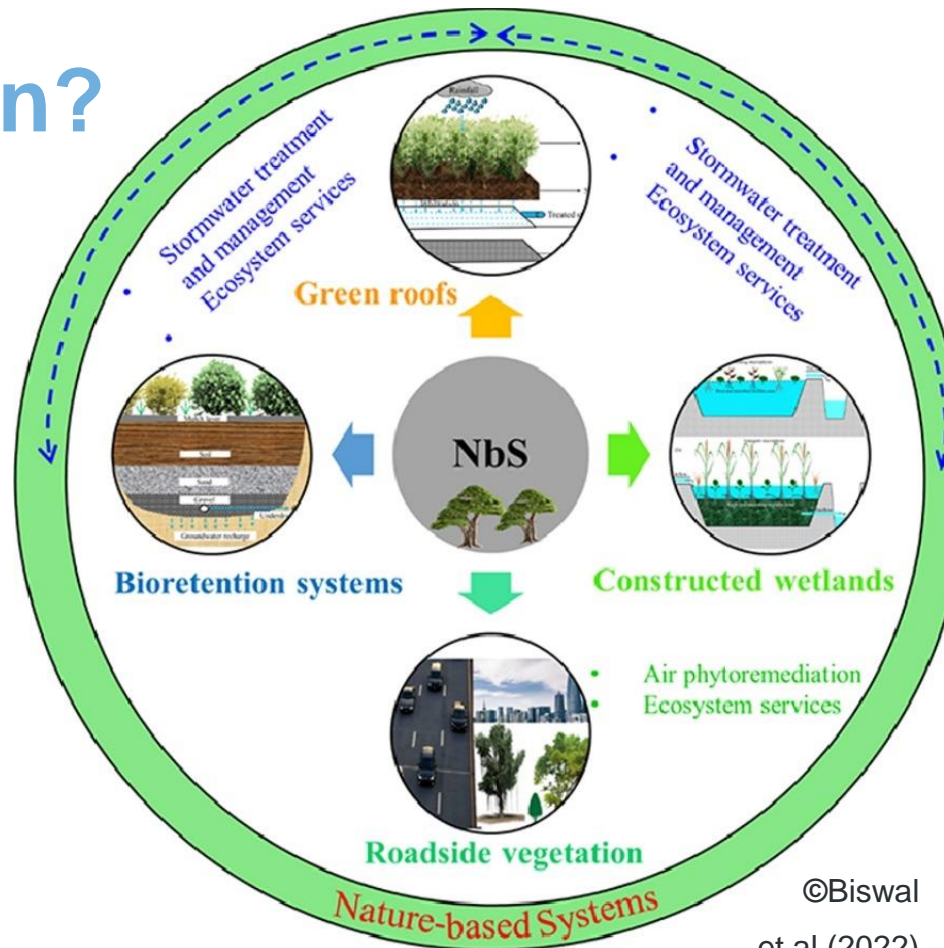
- Heavy rainfall events
- Urban surface sealing / increase of impervious surfaces and reduction of green areas
- Frequency and volume of combined sewer overflows, resulting in high water pollution
- Economic, social and biodiversity/environmental impacts



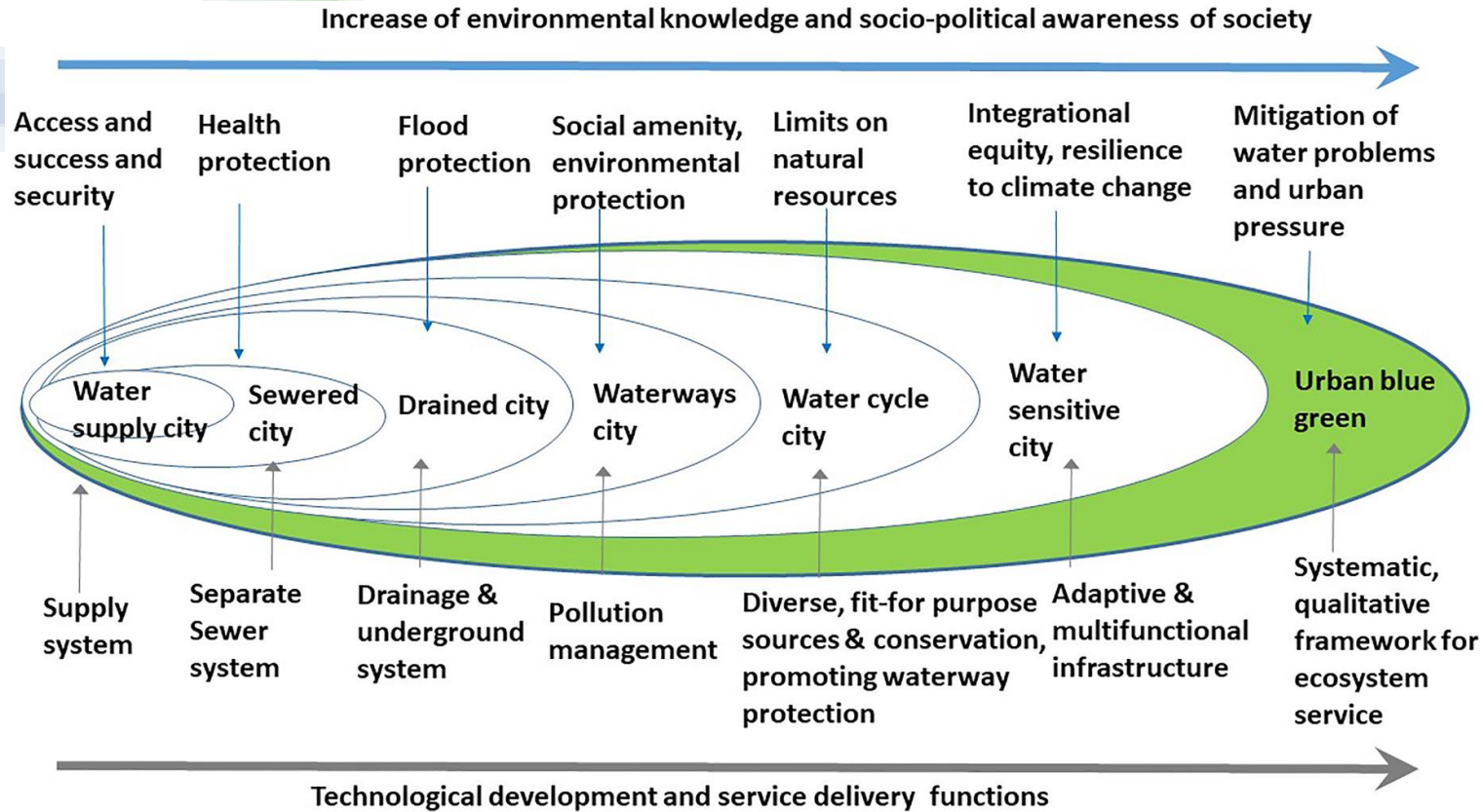
<https://ecoss.org/combined-sewer-overflow-stormwater-pollution-gsi-explainer/>

Nature as the solution?

- Increase permeable surfaces
- Absorb rainwater to reduce runoff
- Treat contaminated water by collecting and removing pollutants
- Multifunctional to deliver wider environmental and societal benefits
- Locally adapted, sustainable, cost-effective

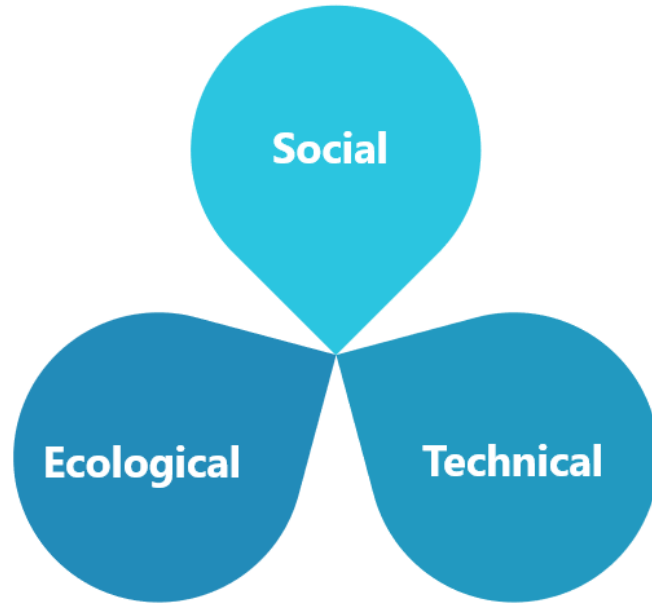


Shifting water supply and management approaches



NICHES: Transitioning to a new 'normal'?

Rethinking urban water management through a **social-ecological-technical systems** (SETS) lens...



NICHES: Transitioning to a new 'normal'?

Social

- Multi-scale and multi-actor governance & co-design of solutions
- Integrated policy approaches
- Participatory science / citizen science
- Stakeholder needs and vulnerabilities
- Institutional knowledge and capacity

NICHES: Transitioning to a new 'normal'?

Ecological

- Water quality & quantity
- Biodiversity protection
- Ecosystem structure and functioning
- Nature-based solutions & green and blue infrastructure

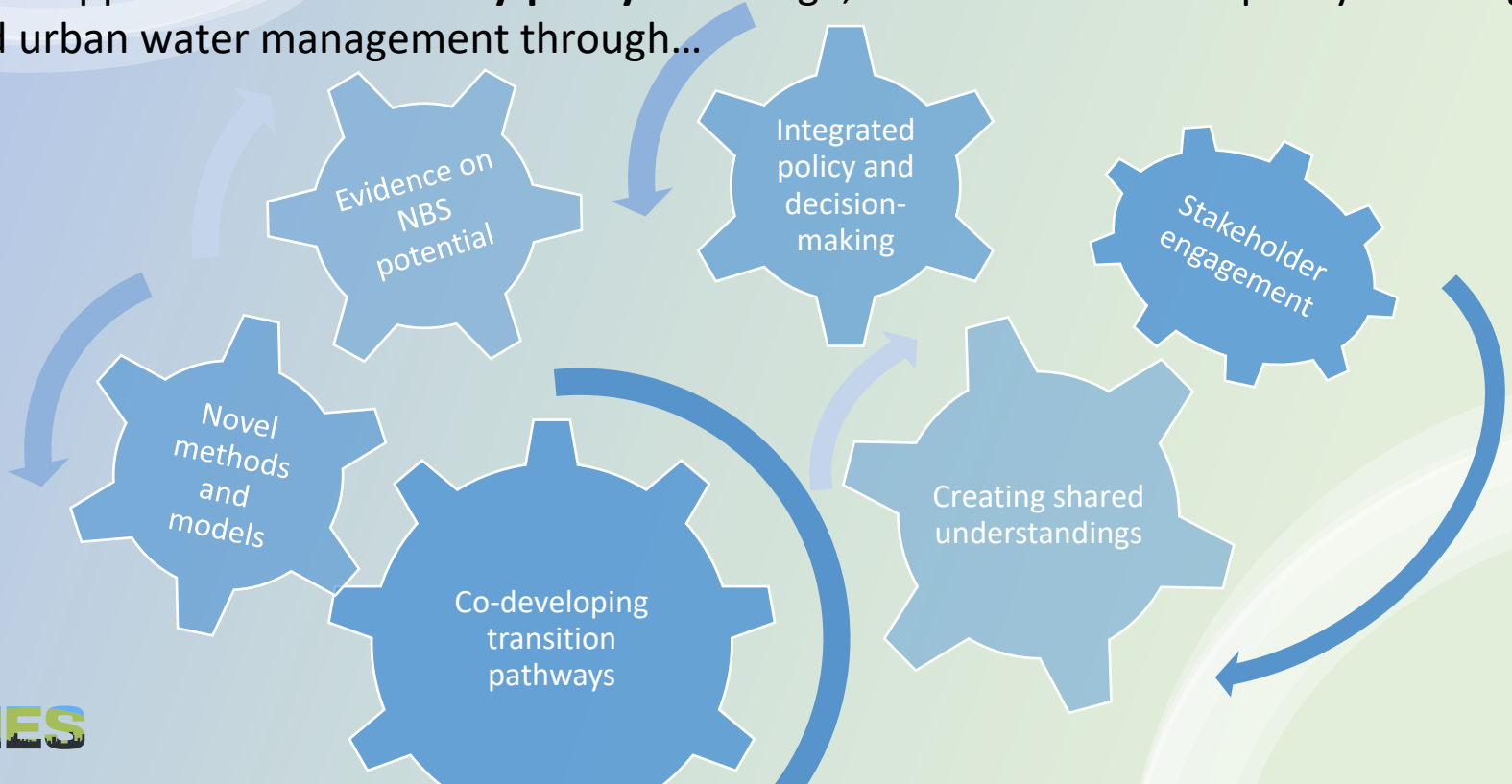
NICHES: Transitioning to a new 'normal'?

Technical

- Mitigation (absorption) & treatment (overflow)
- Models/scenarios for evidence-based decision-making → urban retrofit of NBS
- Sustainable hybrid (mixed grey-green) solutions, integrating engineered elements

Vision and pathways to impact

NICHES supports **science-society-policy** exchange, awareness and capacity building around urban water management through...





Nature's integration
in cities' hydrologies,
ecologies and societies

 niches-project.eu

 @NICHESproject

  NICHES Project

 projecte.niches@uab.cat

**Thank you, and stay tuned for
upcoming project results and news!**

mckenna.davis@ecologic.eu

