

ECOSERV-POL workshop on urban ecosystem services

NINA's experience on urban ecosystems and their services

18 November 2022

Yennie K. Bredin
Bart Immerzeel



Agenda

- Who are we and what is NINA?
- NINA's knowledge on urban ecology, biodiversity and condition
- Introduction to ecosystem services
- NINA's knowledge on urban ecosystem services
- Discussion

Who are we?

- Yennie K. Bredin – Research Scientist
 - ▶ PhD in Ecology (Ås, 2021)
 - ▶ Forest ecology, biodiversity, stakeholder views, and links between society and nature. Knowledge base about biodiversity in urban ecosystems, ecosystem services and values.
- Bart Immerzeel – Research Scientist
 - ▶ PhD in Environmental Sciences (Ås, 2021)
 - ▶ Research focus on ecosystem services, spatial analysis, non-market valuation. Co-lead in Horizon Project SELINA.



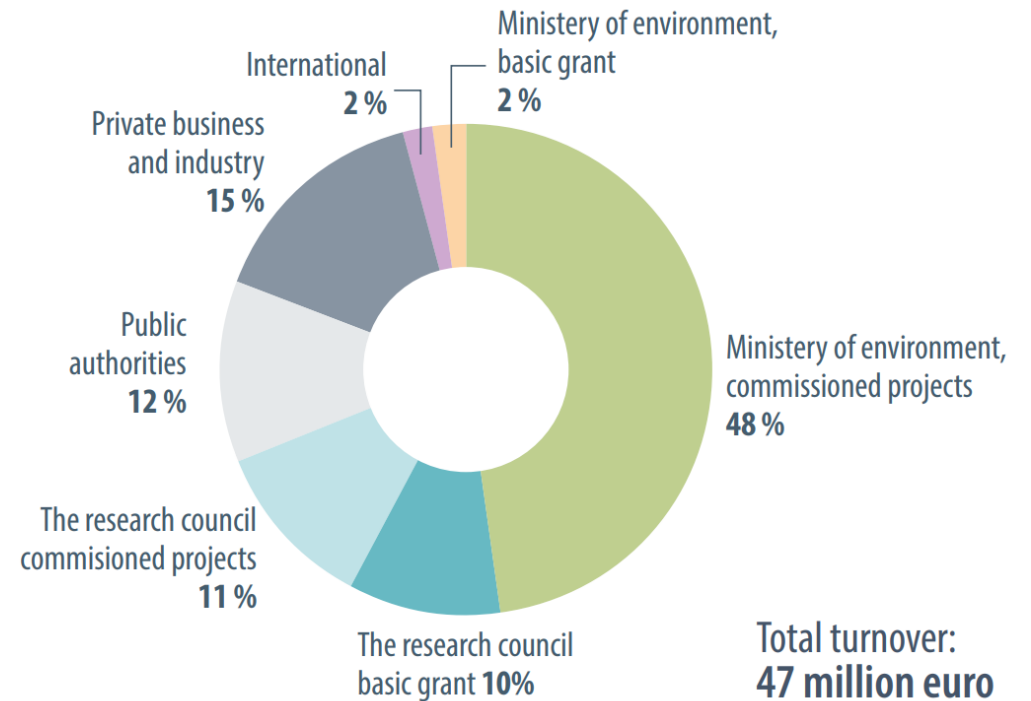
What is NINA?

- The Norwegian Institute for Nature Research (www.nina.no)
- Norway's leading institution for applied ecological research, with broad-based expertise on the genetic, population, species, ecosystem and landscape level, in terrestrial, freshwater and coastal marine environments.
- Over 300 people working in biology, genetics, ecology, economy and social sciences



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Our international network

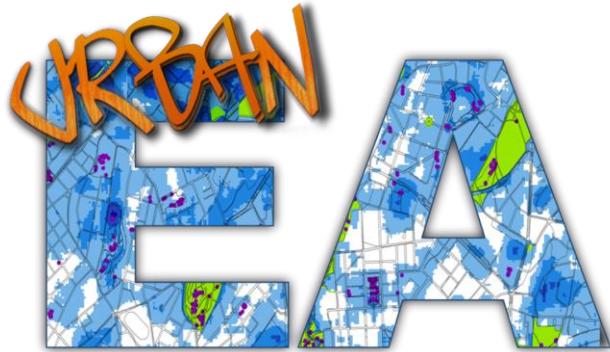


NINAs authorship

1 963 peer reviewed publications on Web of Science 2000 – 2019

114 countries

NINA projects on urban ecosystems



PLANET4B



Knowledge base on urban biodiversity and ecosystem condition



Good ecological condition



- Defined by ecosystem structure, function, productivity
- Should not significantly deviate from reference state



Condition is evaluated based on 7 properties for ecosystems

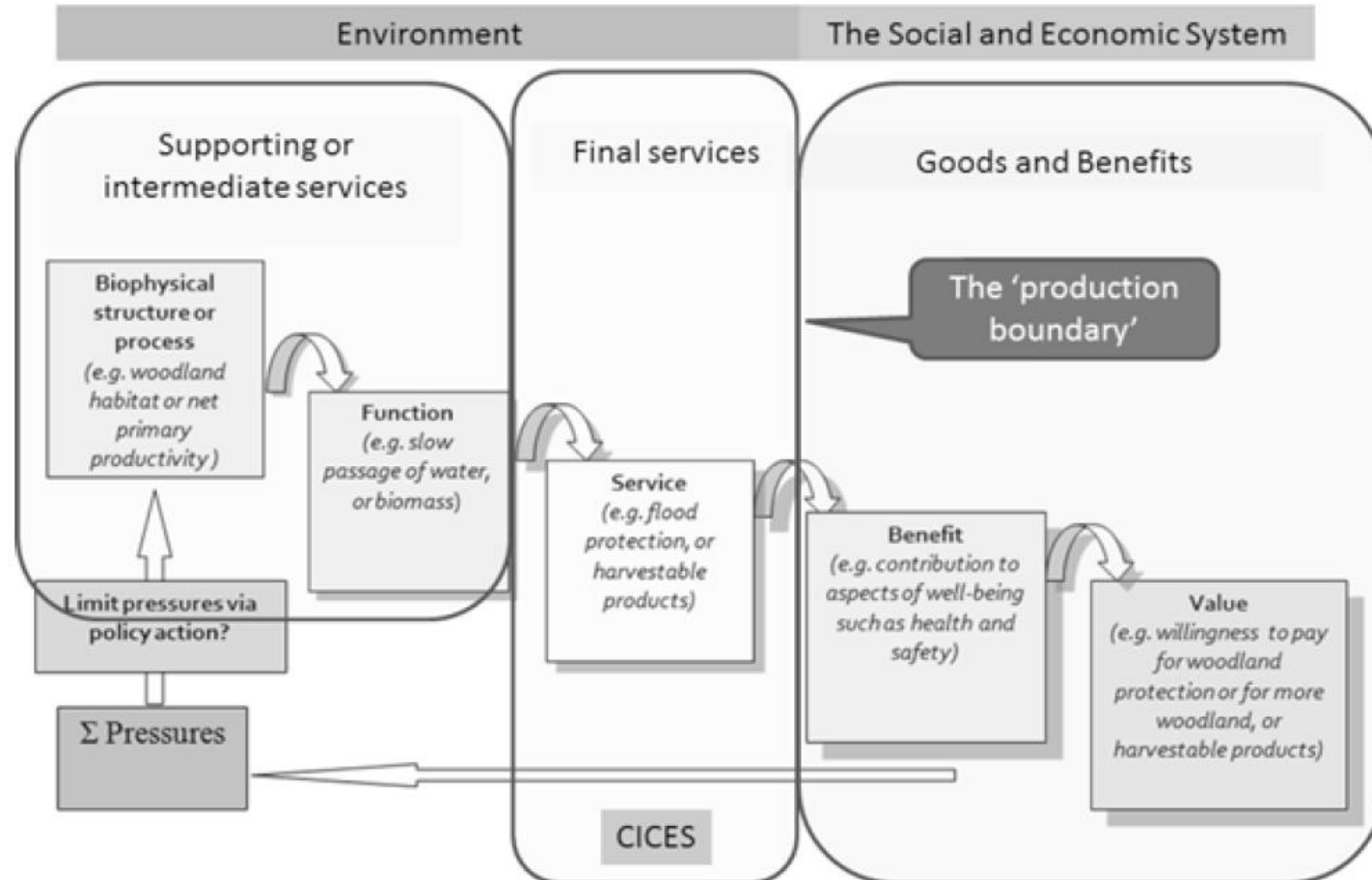
1. Primary production
2. Distribution of biomass among trophic levels
3. Functional composition within trophic levels
4. Functionality of functionally important species, species that construct habitats and biophysical structures
5. Patterns in landscape ecology are compatible with the survival of species over time
6. Biological diversity: genetic diversity, species composition, species turnover
7. Abiotic conditions

Knowledge about biodiversity and ecological condition in urban ecosystems



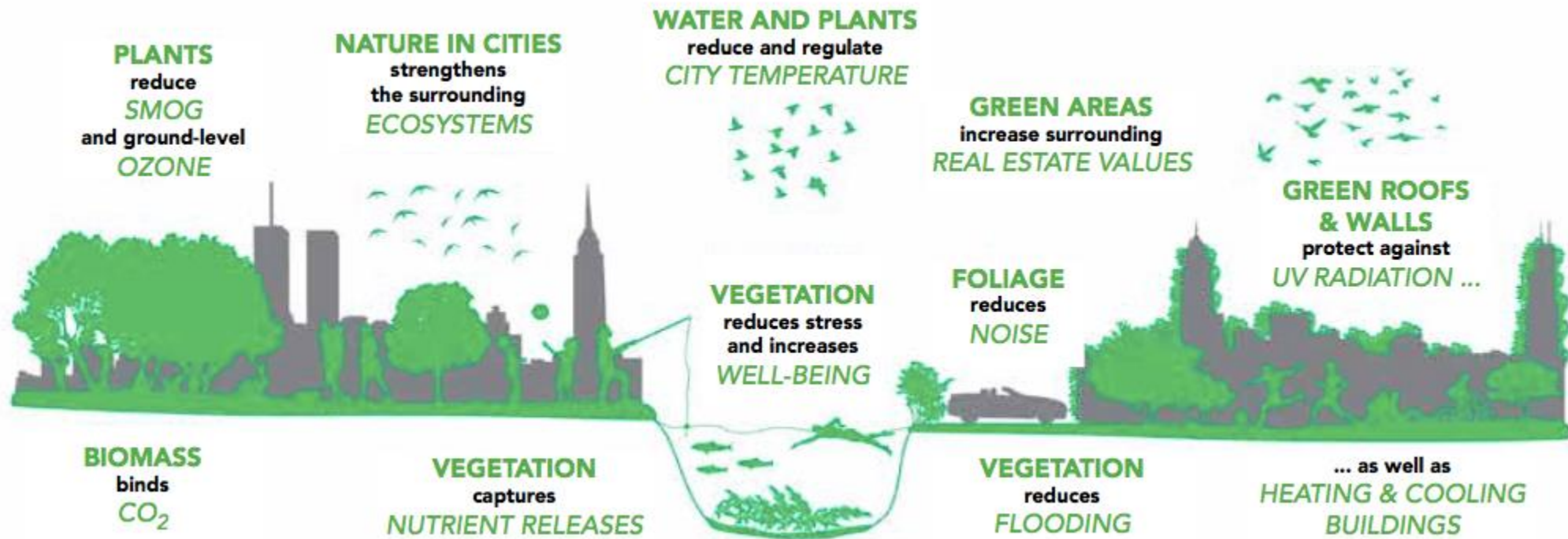
- Small pockets or remnants of nature within an urban matrix with:
 - 1) fewer native species
 - 2) more non-native species
 - 3) more homogenised communities
 - 4) species with high tolerance to pollutants & stress
- Poor ecological condition

The concept of Ecosystem Services



Haines-Young & Potschin 2017. CICES 5.1

Urban ecosystem services



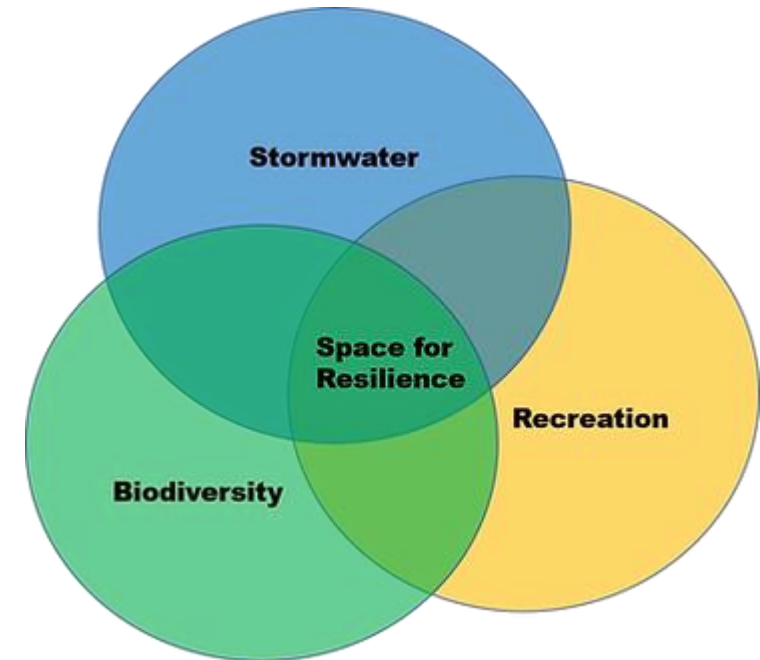
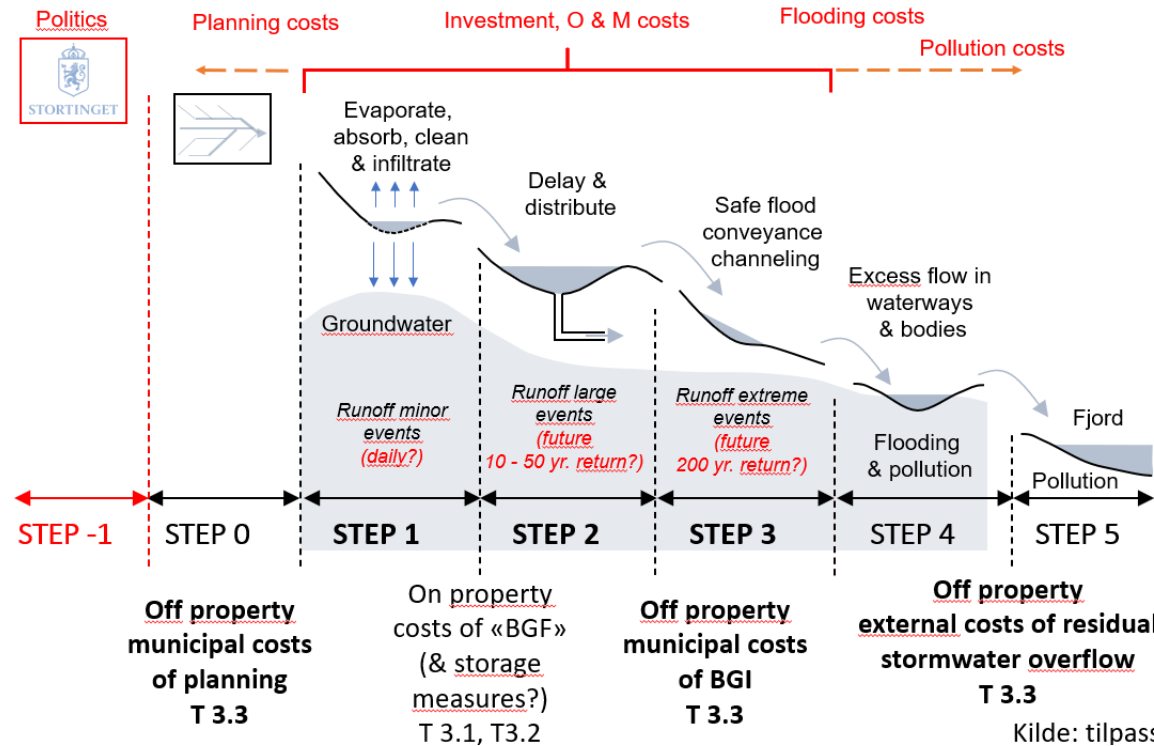
Source: [C/O City](#)

SPARE – Space for Resilience

- Insufficient space for resilient function of biodiversity, stormwater and recreation in our cities
- Socio-political barriers and lack of collaborative and integrated management
- Knowledge gaps on BGI performance and benefits



SPARE – Space for Resilience



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Ecosystem Accounting



Ecosystem accounts

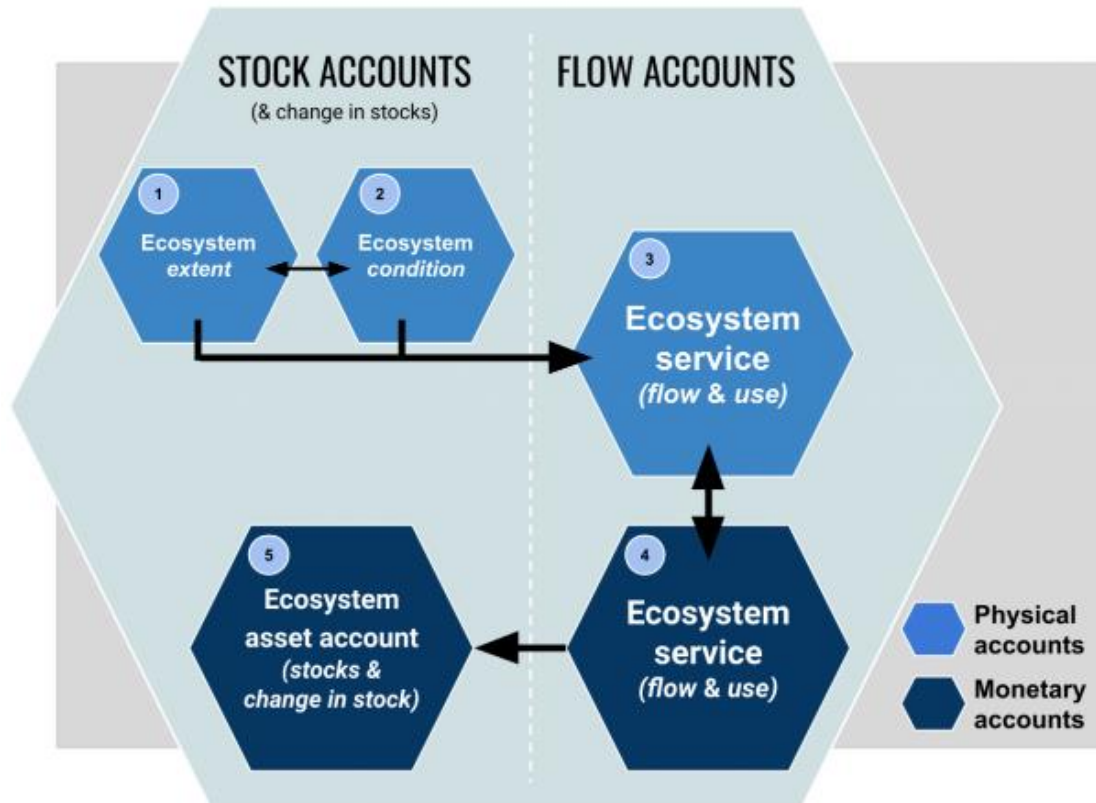


Figure 1: Ecosystem accounts and how they relate to each other

Source: United Nations 2021

- National statistics
- Spatially explicit (addresses spatial structure of ES)
- Contributions of nature to the economy
- Internalize benefits of nature
- Can be used to internalize costs of degradation
- Applications at other levels (than national accounts)

Ecosystem services assessments

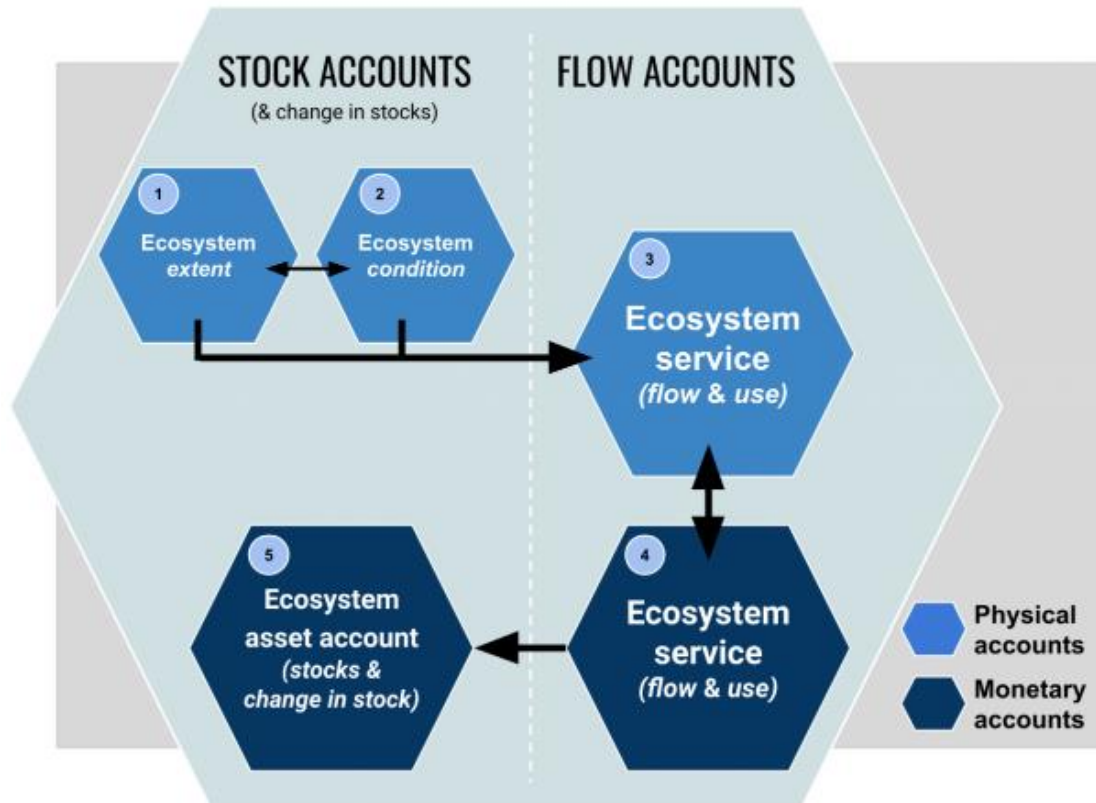
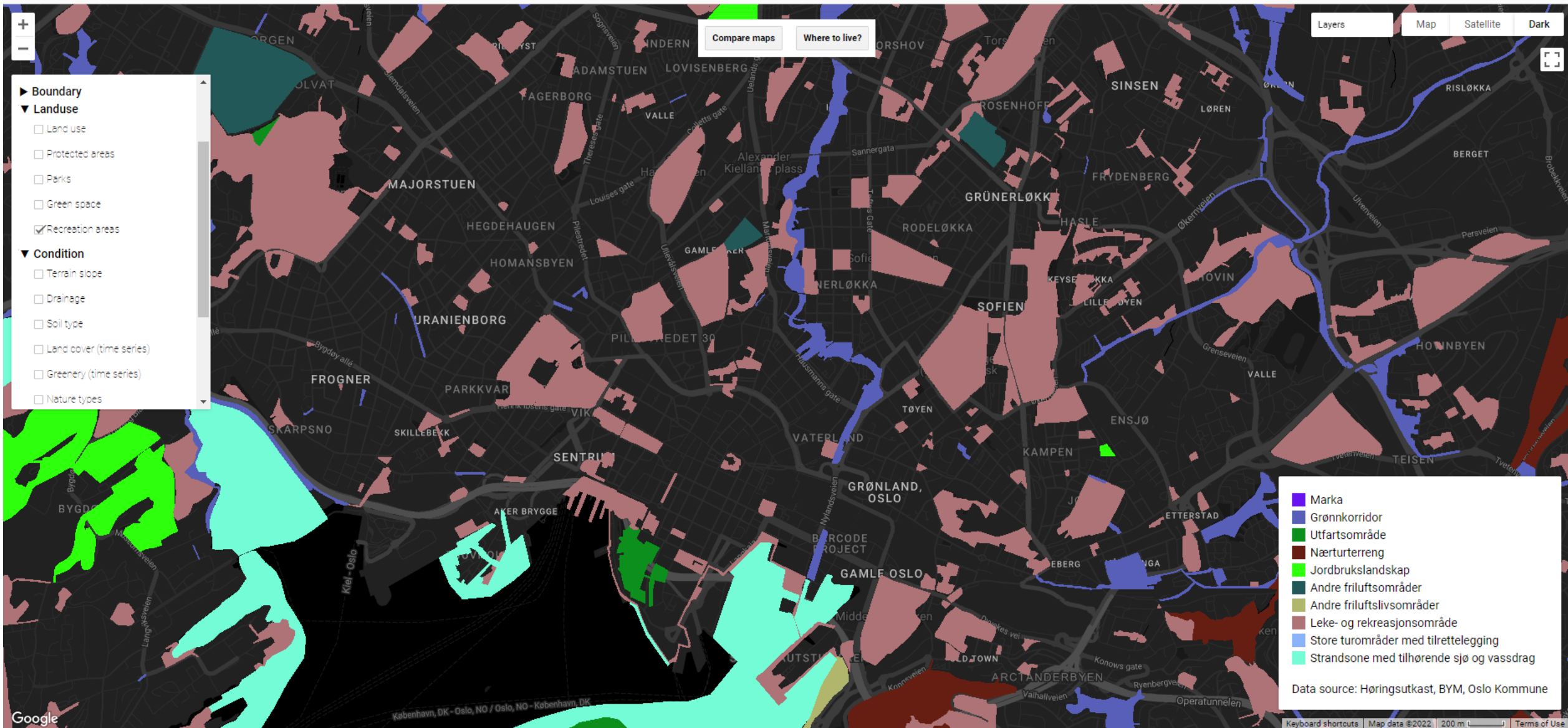


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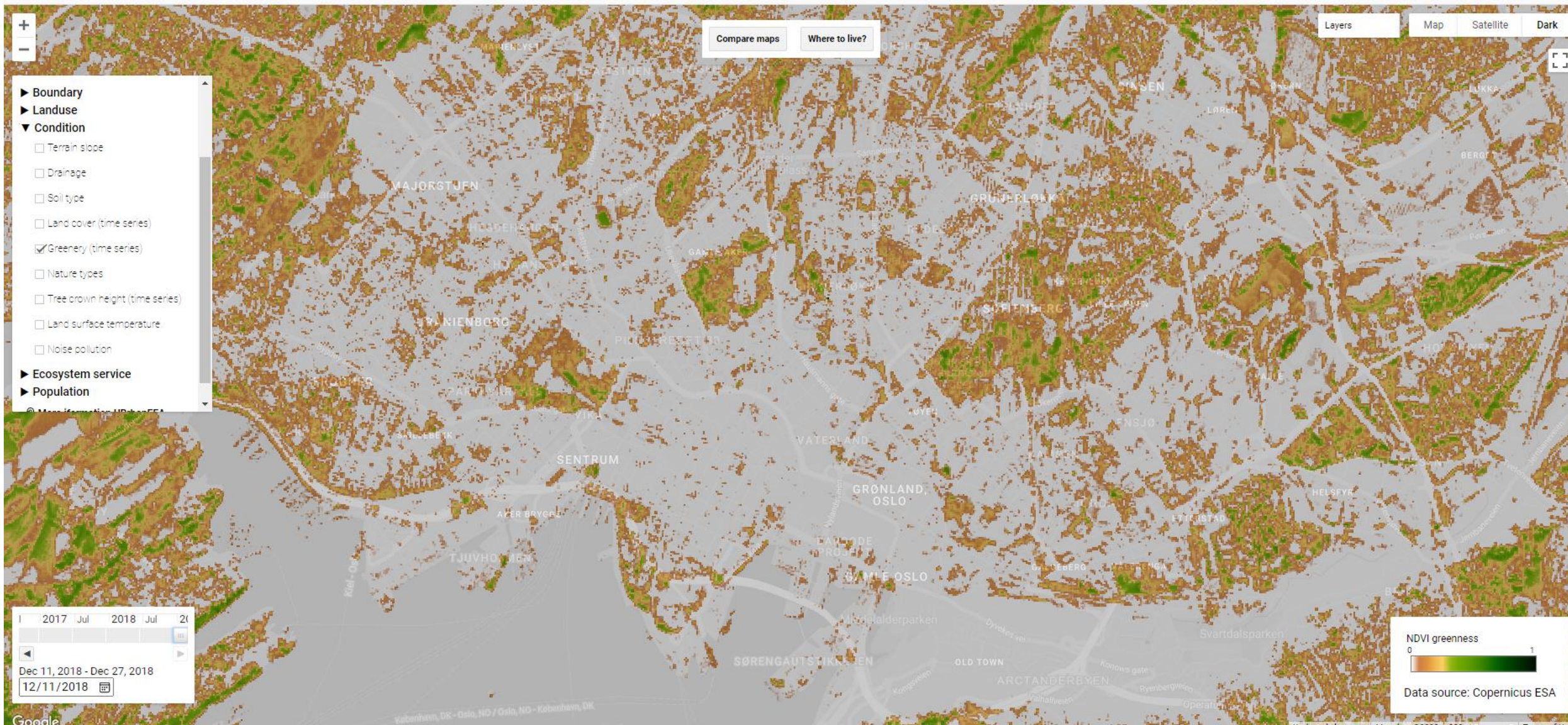
- Assessing the generation of benefits from ecosystems for human-well being.
- Ecosystem area
- Ecosystem condition
- Ecosystem services flow (biophysical & monetary)



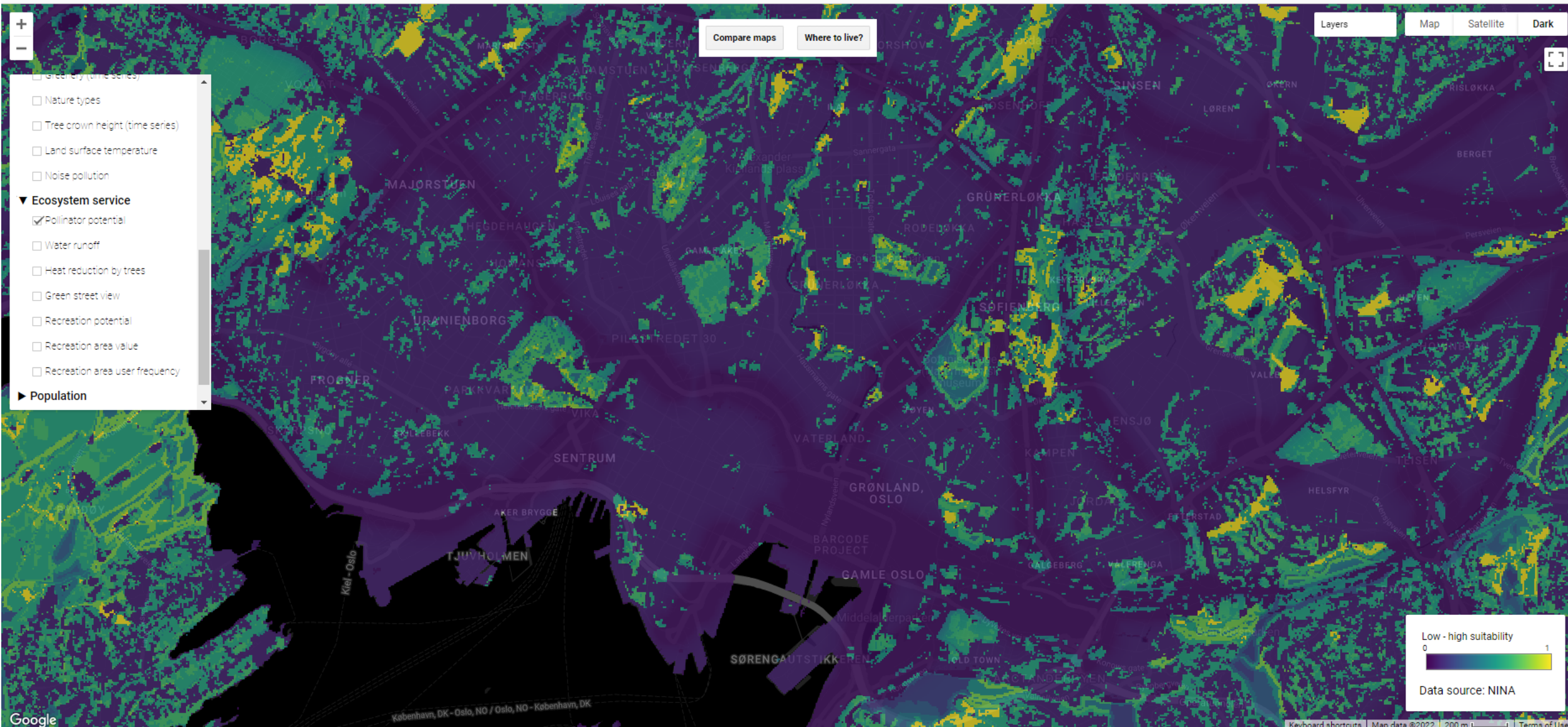
<https://nina.earthengine.app/view/urban-nature-atlas>



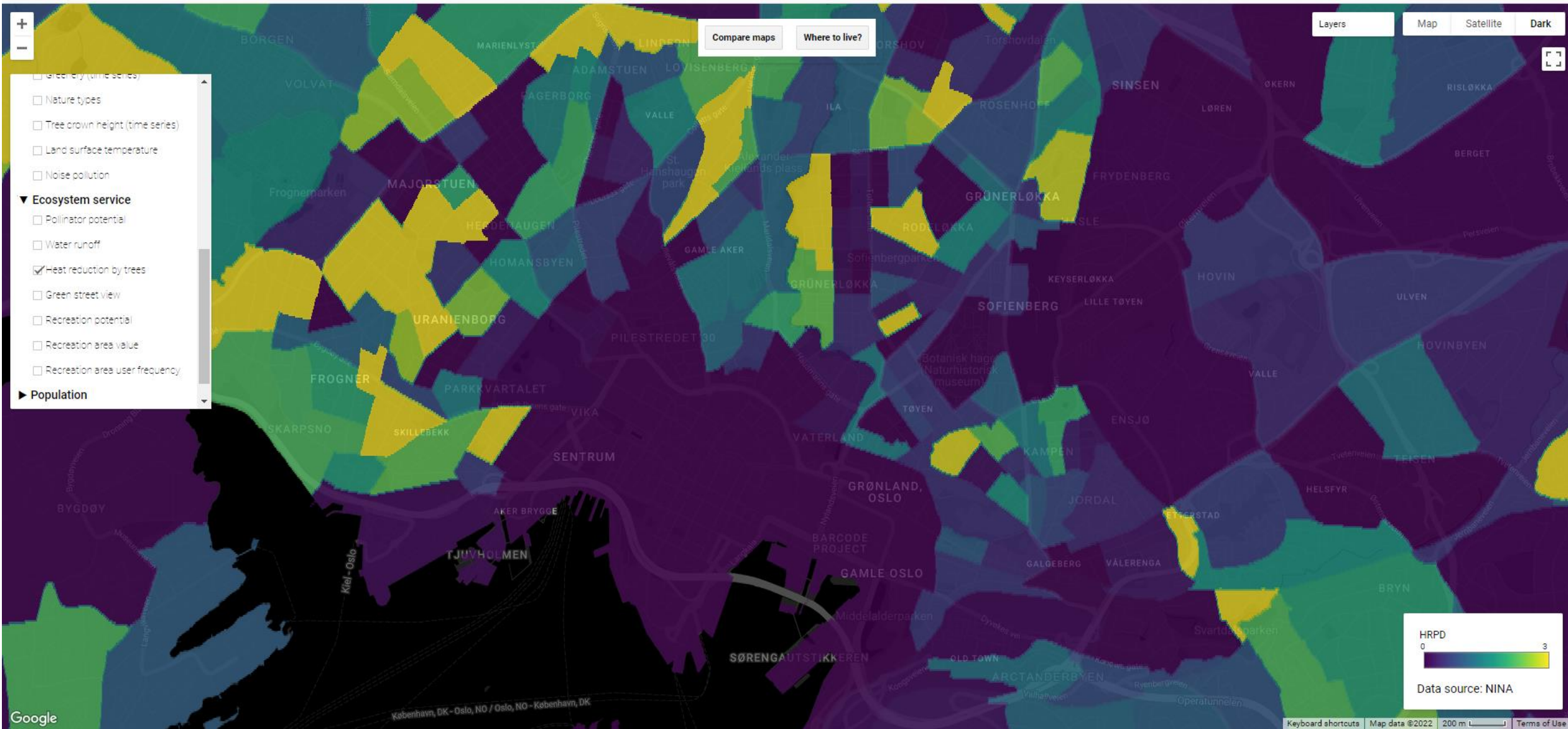
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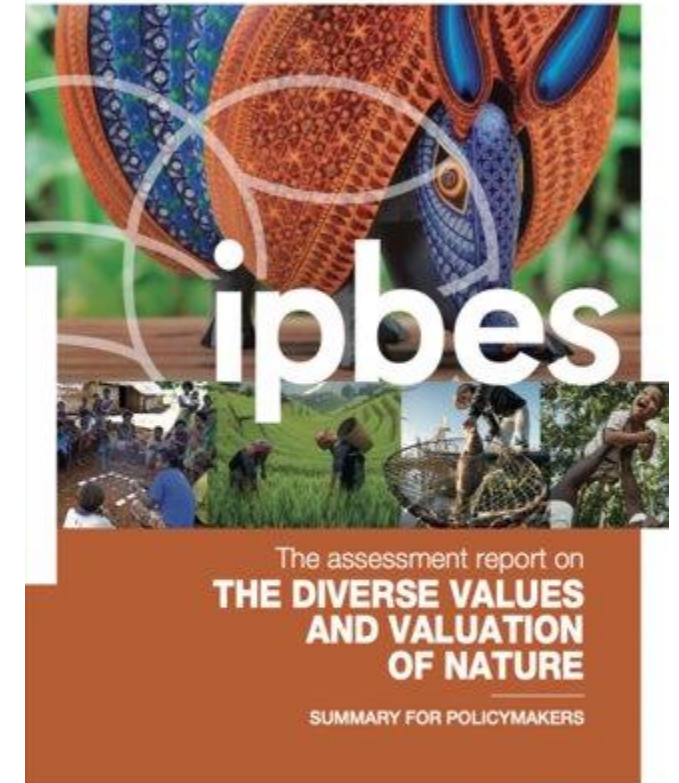


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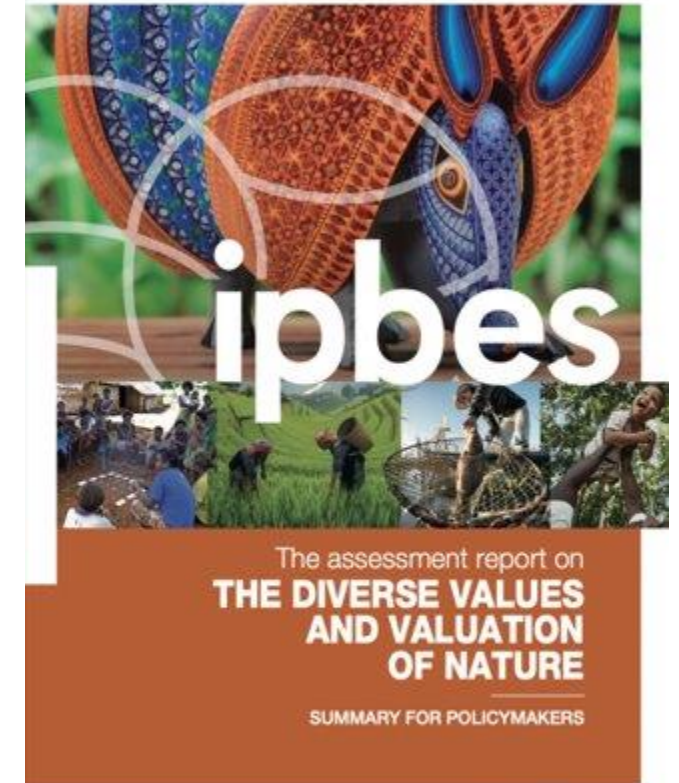
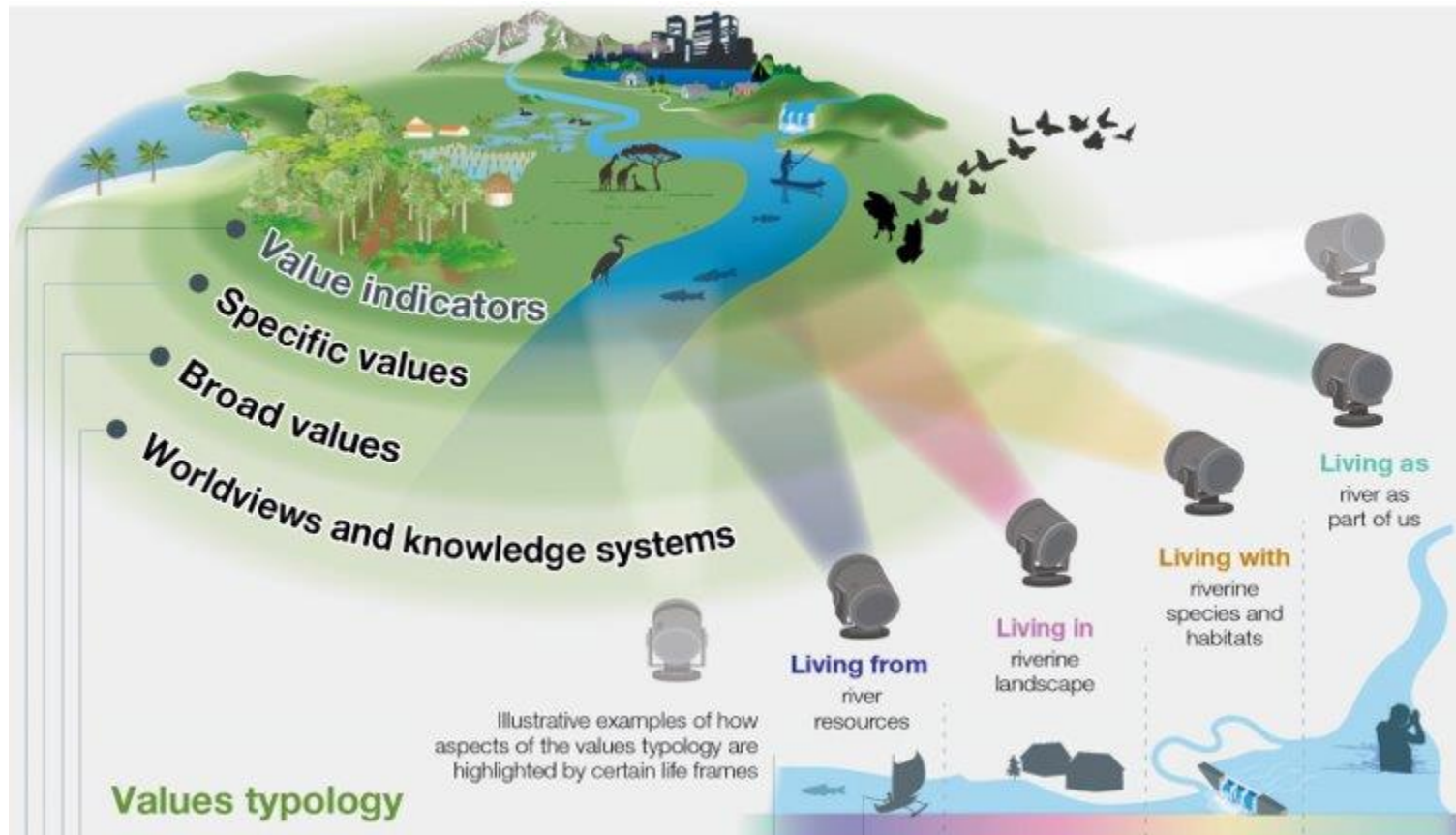


Plurality of values

- Nature as more than natural capital?
- IPBES on the values of nature
 - ▶ Decisions based on a narrow set of values - especially market values - are an important cause of the global biodiversity crisis
 - ▶ Many opportunities to take better account of the diverse nature values in decisions within politics and economics and which can lay the foundation for a fair and sustainable society



Plurality of values



In conclusion

- How to define urban ecosystems and reference conditions?
- Urban ecosystems as unique ecosystems
- New methods for measuring: focus on increased spatial and temporal resolution (within context of SEEA EA)
- Plurality of values
 - ▶ Living from, in, with and as nature
 - ▶ Green justice in cities