

# **An integrated approach to Sponge Cities: Water management and beyond**

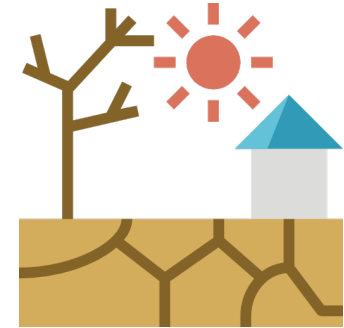
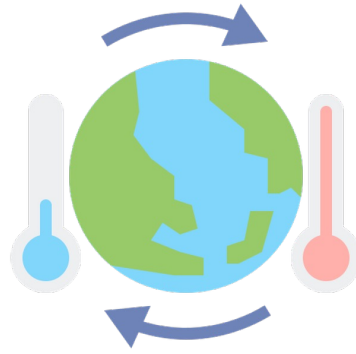
**Juliana Goncalves** | BK, TU Delft

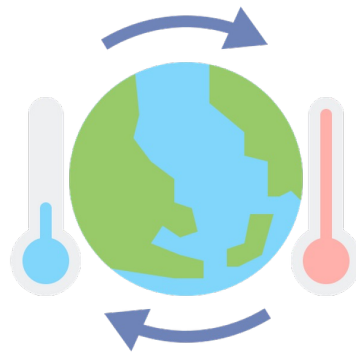
Lunch Lectures Climate Action  
Programme | March 2023



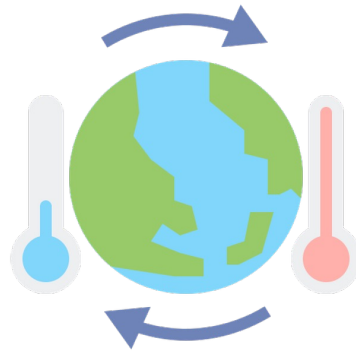
**Do you know what Sponge City means?**

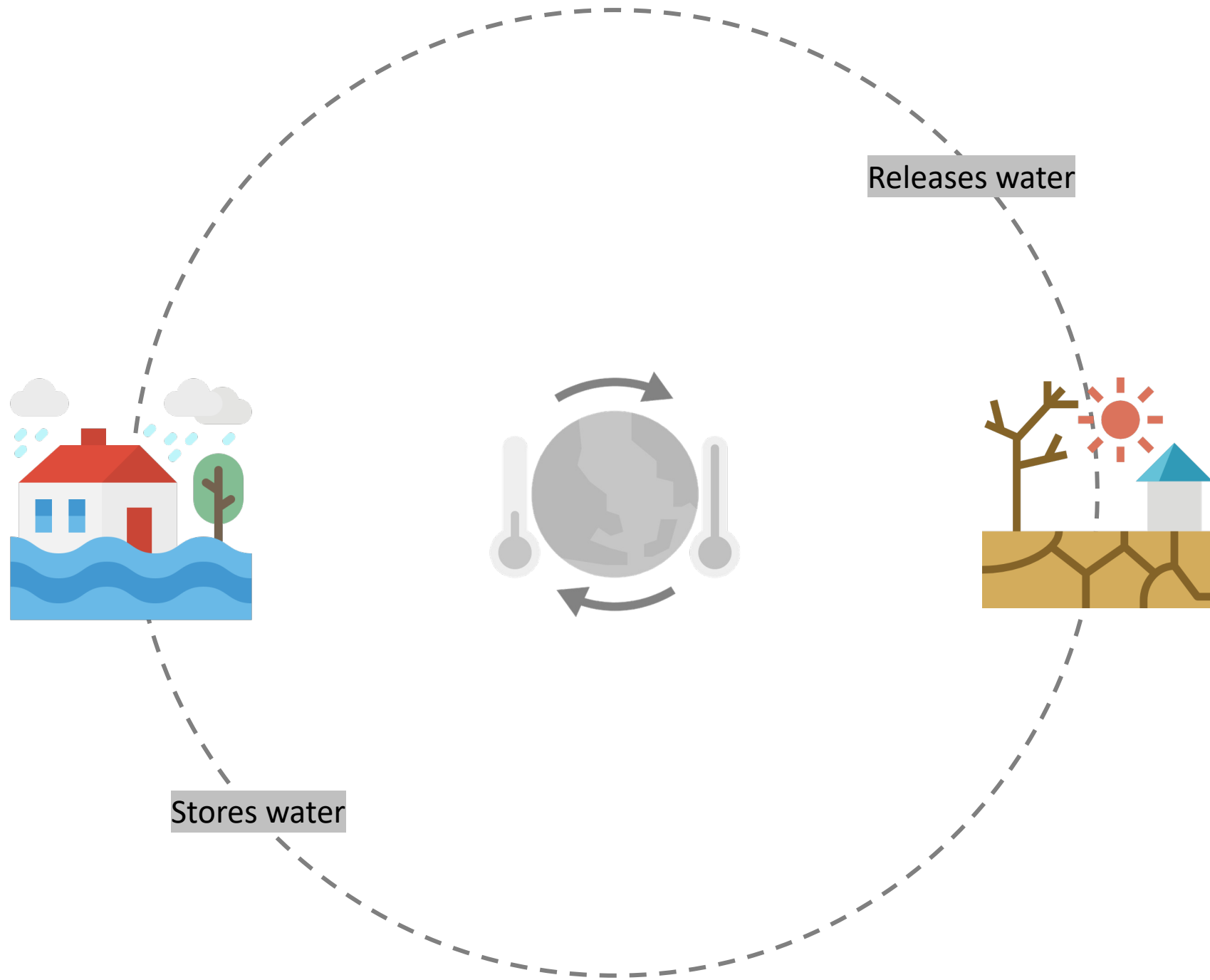












# **Why do we need an integrated approach to Sponge Cities?**

A quick look into Sponge Cities literature



**1,444** results from Web of Science Core Collection for:

Q "Sponge cities" (All Fields) or "Sponge city" (All Fields)

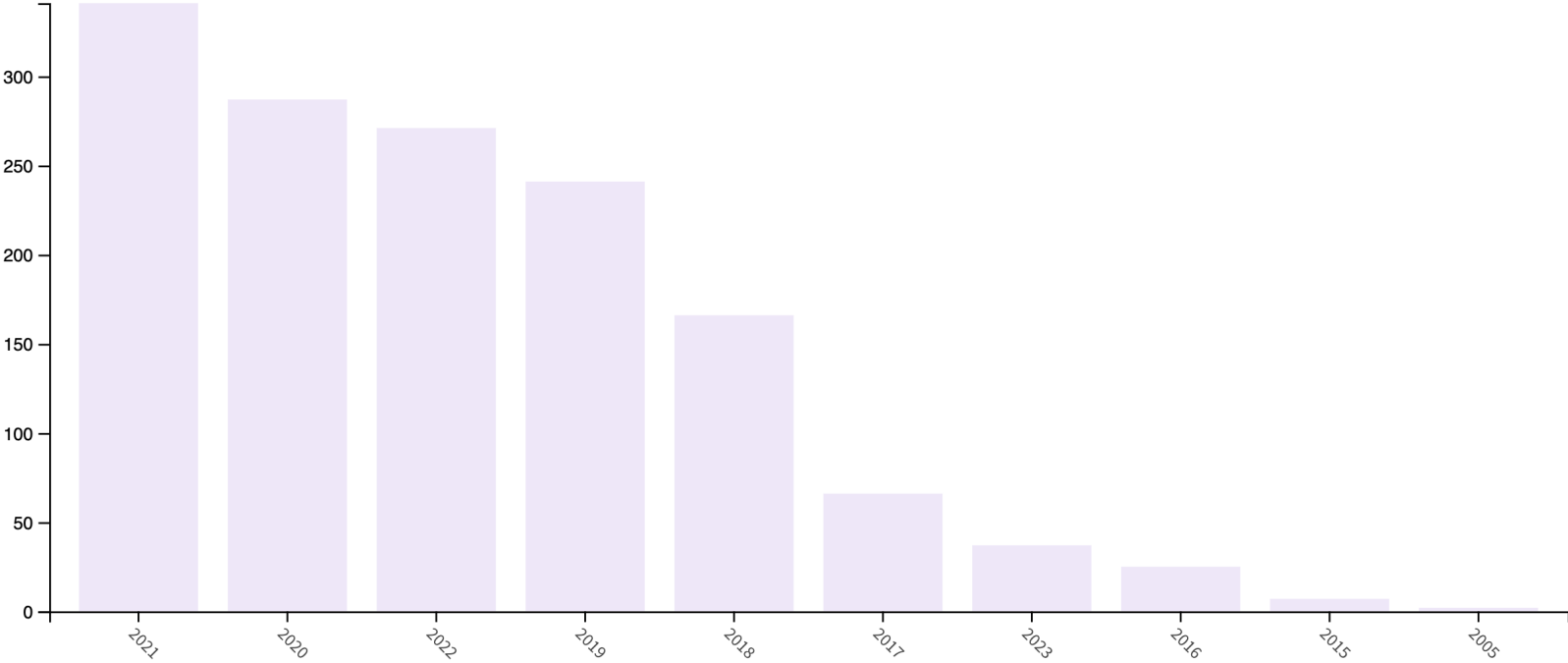
**36,891** results from Web of Science Core Collection for:

Q "smart cities" (All Fields) or "smart city" (All Fields)

**Total  
results**

1,444 results from Web of Science Core Collection for:

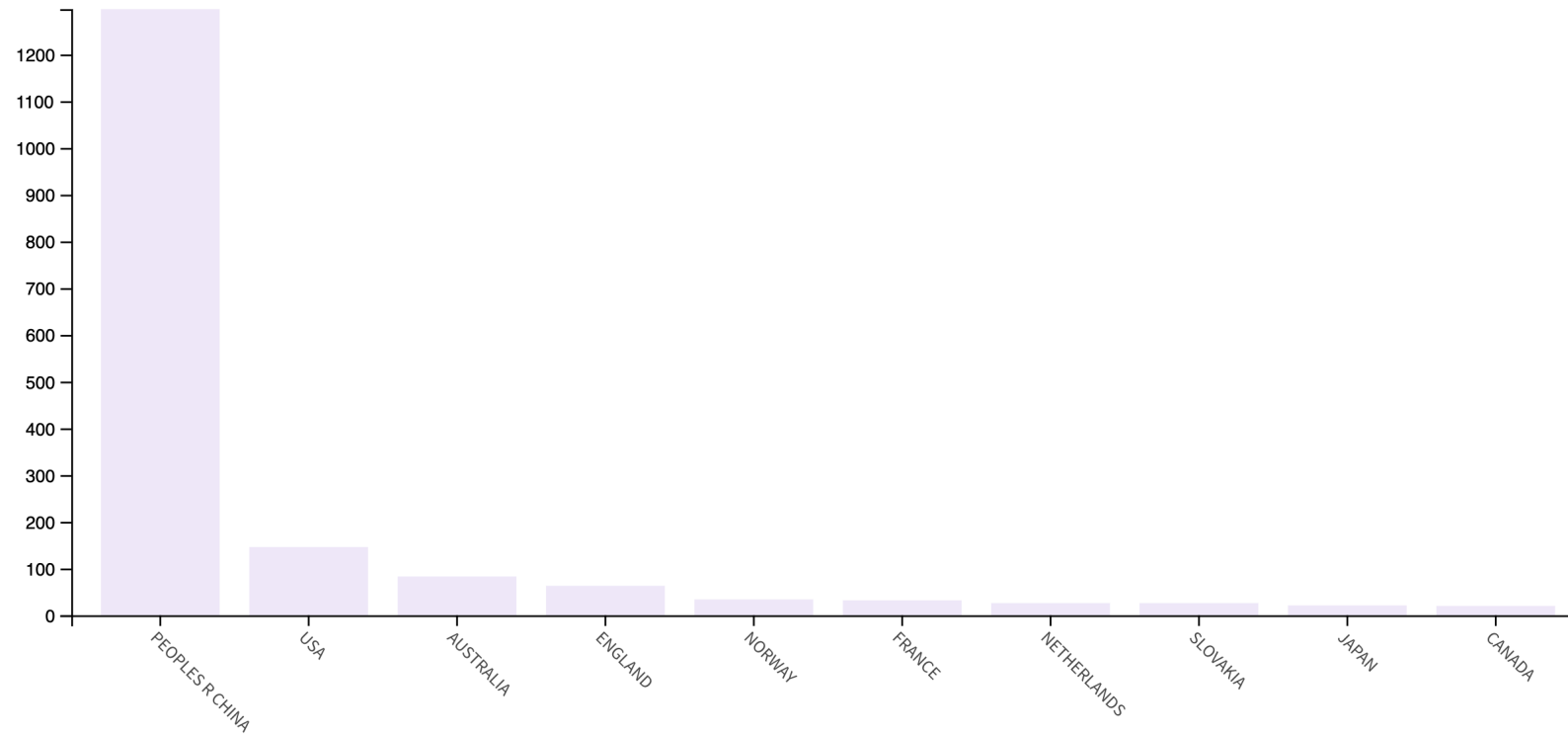
Q "Sponge cities" (All Fields) or "Sponge city" (All Fields)



Recent research topic/field

**1,444** results from Web of Science Core Collection for:

Q "Sponge cities" (All Fields) or "Sponge city" (All Fields)

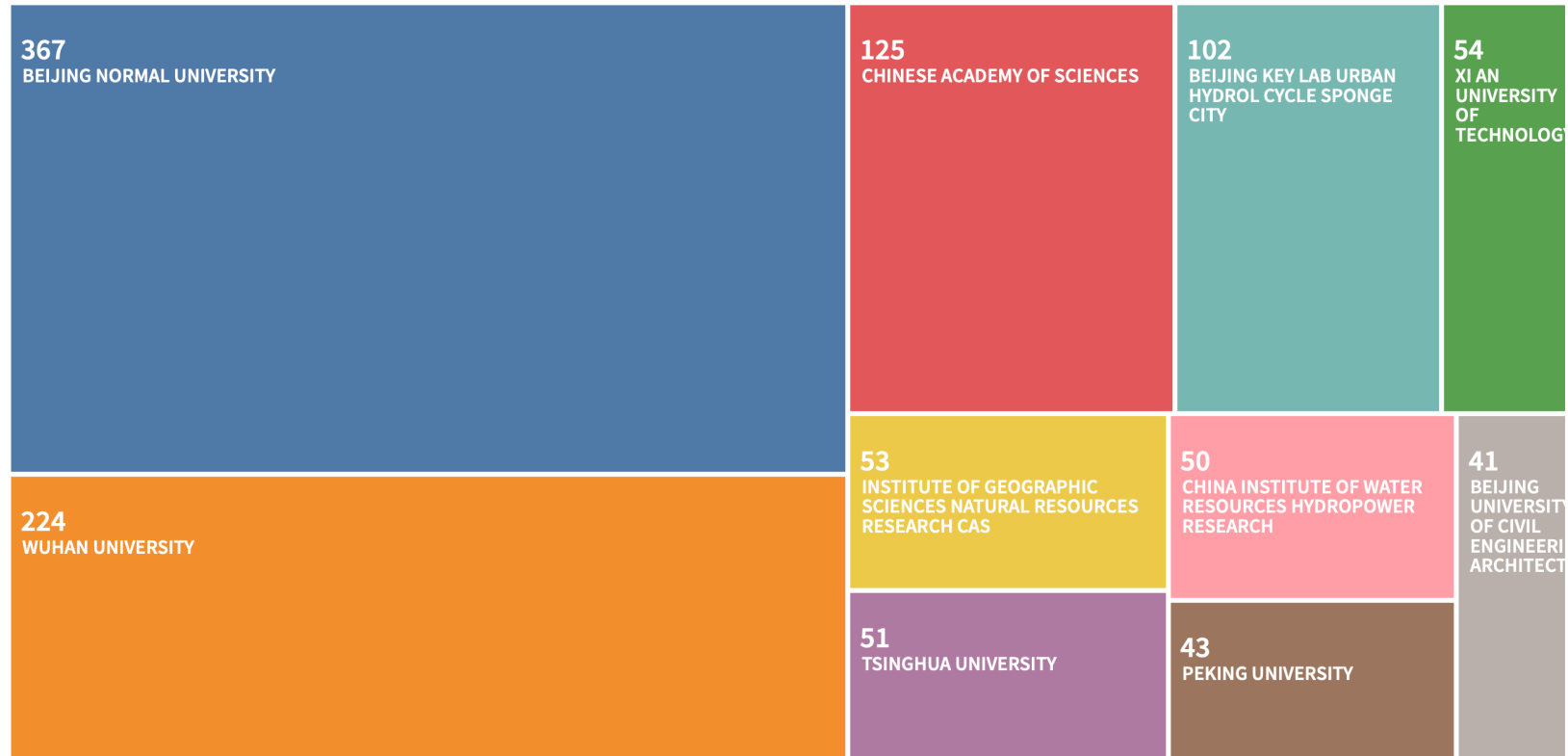


Strong geographic concentration

**1,444** results from Web of Science Core Collection for:

🔍 "Sponge cities" (All Fields) or "Sponge city" (All Fields)

## Institutions

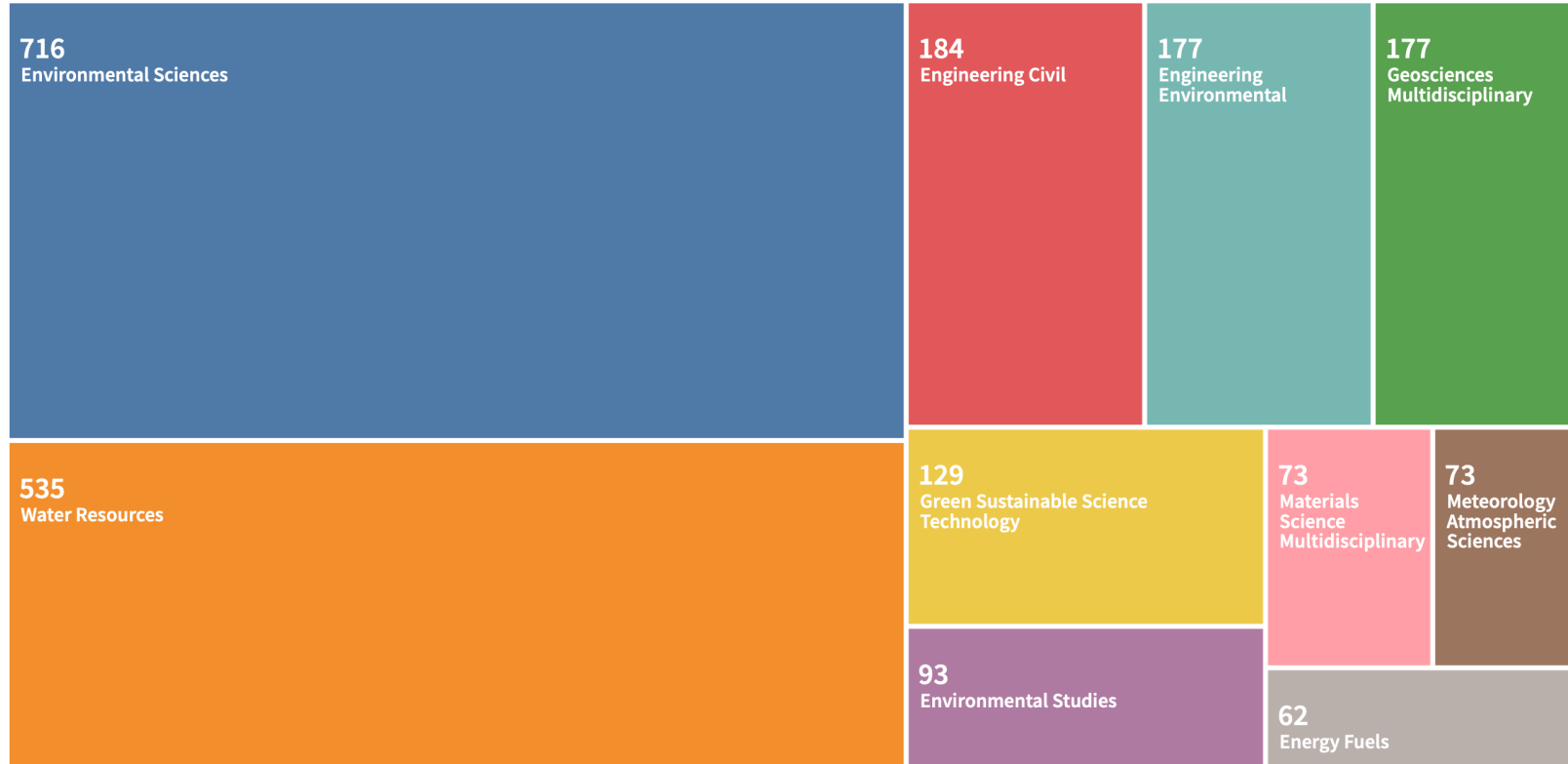


10 institutions account for ~1000 publications

**1,444** results from Web of Science Core Collection for:

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## WoS categories

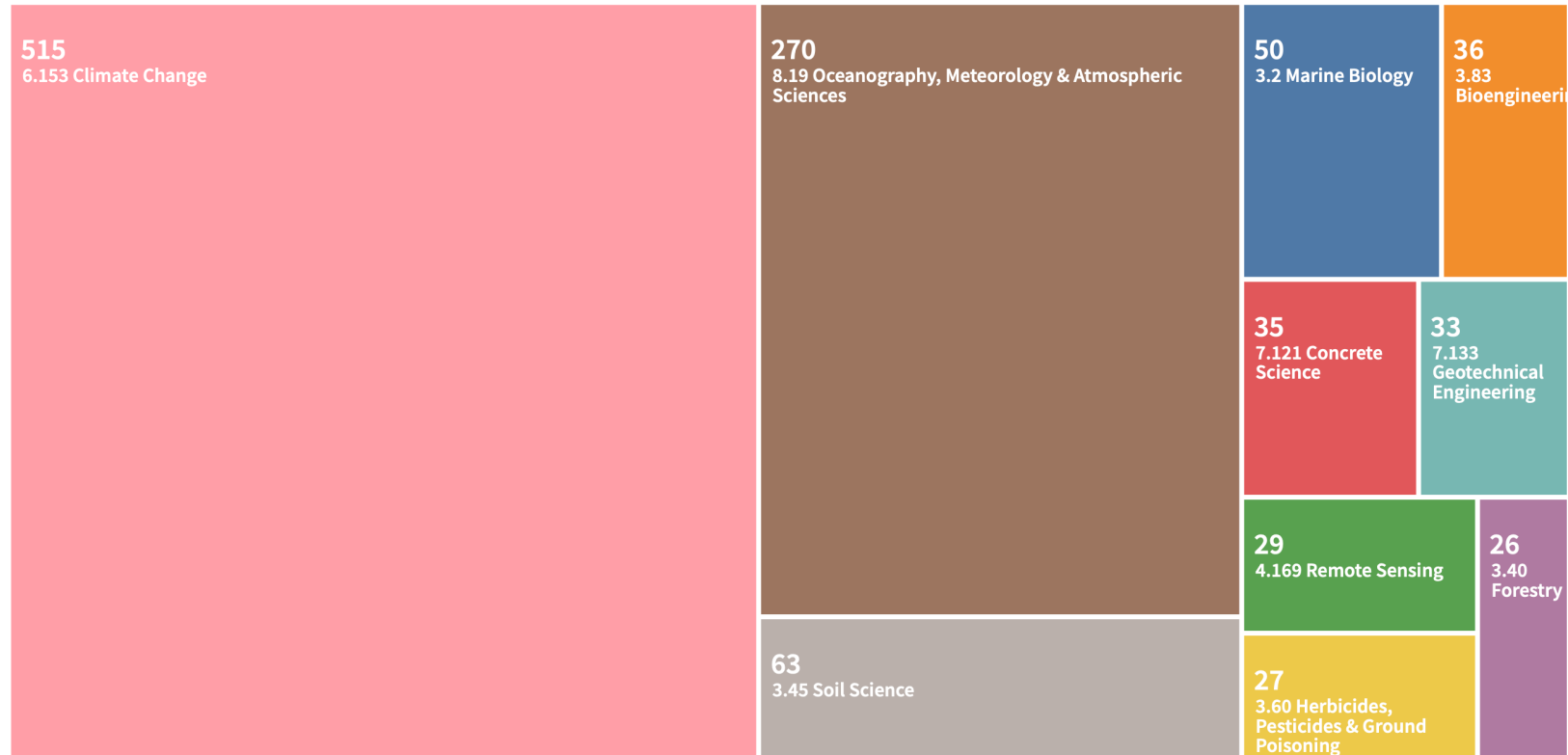


Focus on engineering/environmental sciences

**1,444** results from Web of Science Core Collection for:

Q "Sponge cities" (All Fields) or "Sponge city" (All Fields)

## Citation topics



~50% of SC literature is related to the topic of Climate Change

# Climate change + Cities

Nature-based Solutions  
Social Ecology  
Urban Resilience  
...

Wetlands

Urban gardens

Green roofs and  
facades

Bio-filtration

Exposed water bodies



The background is a faded architectural rendering of a city plan. It shows a network of streets, building footprints, and green spaces. A prominent feature is a winding waterway or canal that flows through the city, with several smaller ponds and wetland areas integrated into the urban layout. The rendering is in a light, muted color palette, primarily greys, greens, and blues, which serves as a backdrop for the text.

# **Why do we need an integrated approach to Sponge Cities?**

Nature-based Solutions, Social Ecology, Urban Resilience, ...



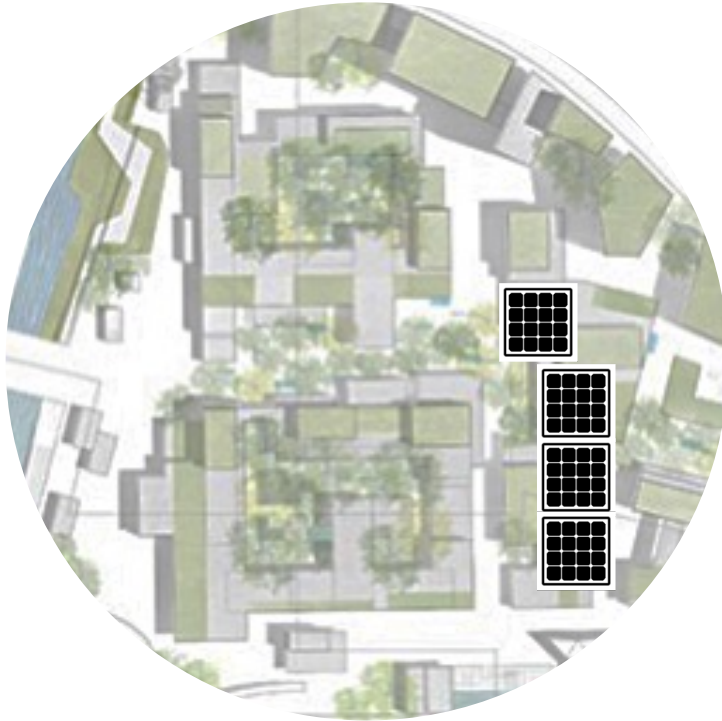
Proposition

**The sponge  
*function* is part  
of a bigger  
socio-ecological  
complex system**

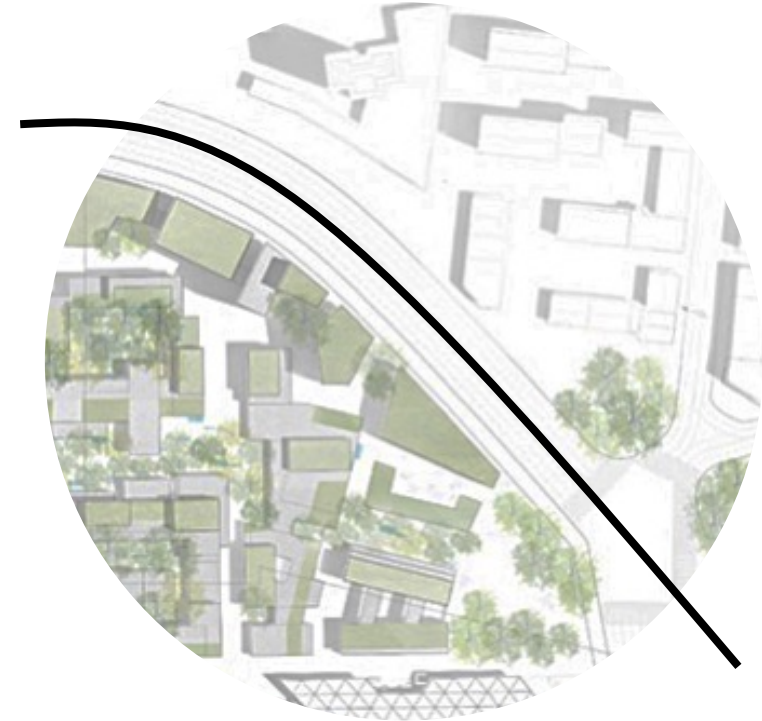




# An integrated approach enables



Synergies & trade-offs  
*Between “competing” goals*



Distribution of benefits  
*Sustainability, Resilience, Justice*

# Integrating across



Disciplines & sectors



Scales

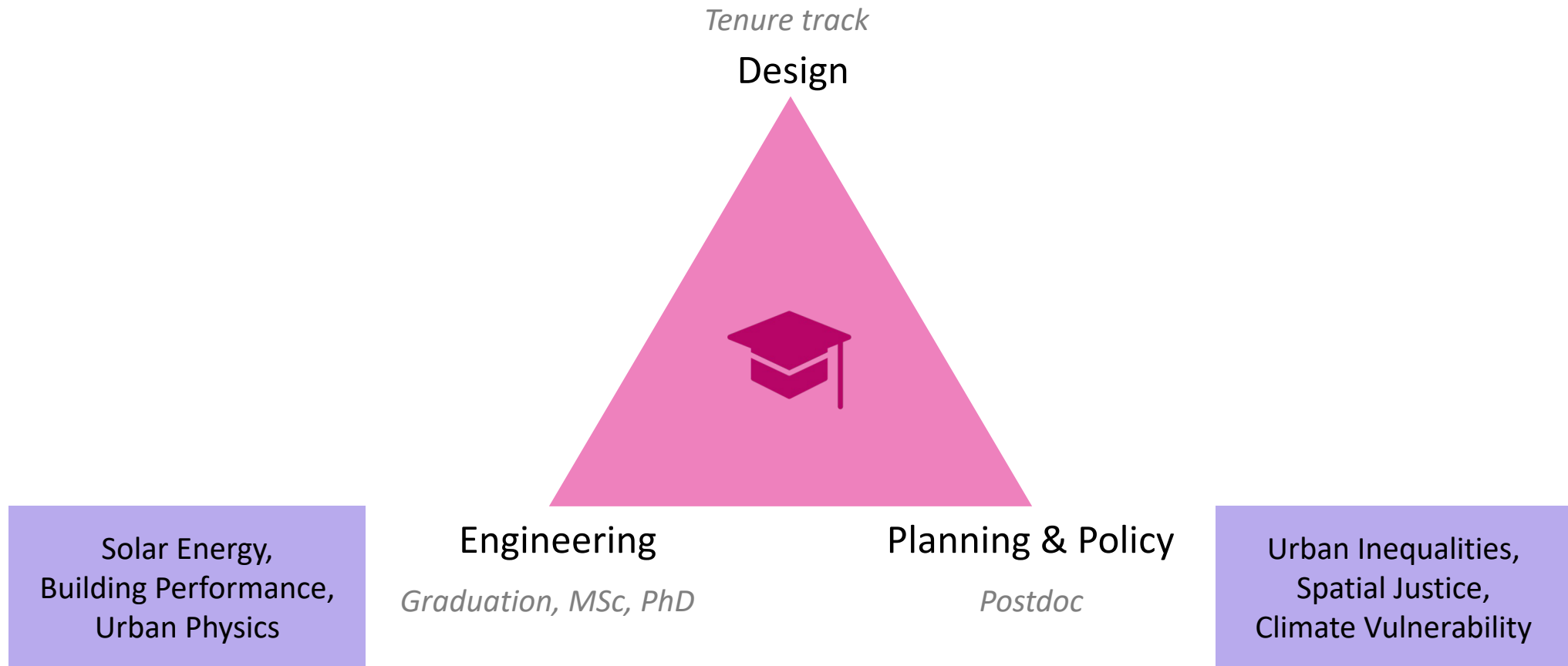


Stakeholders

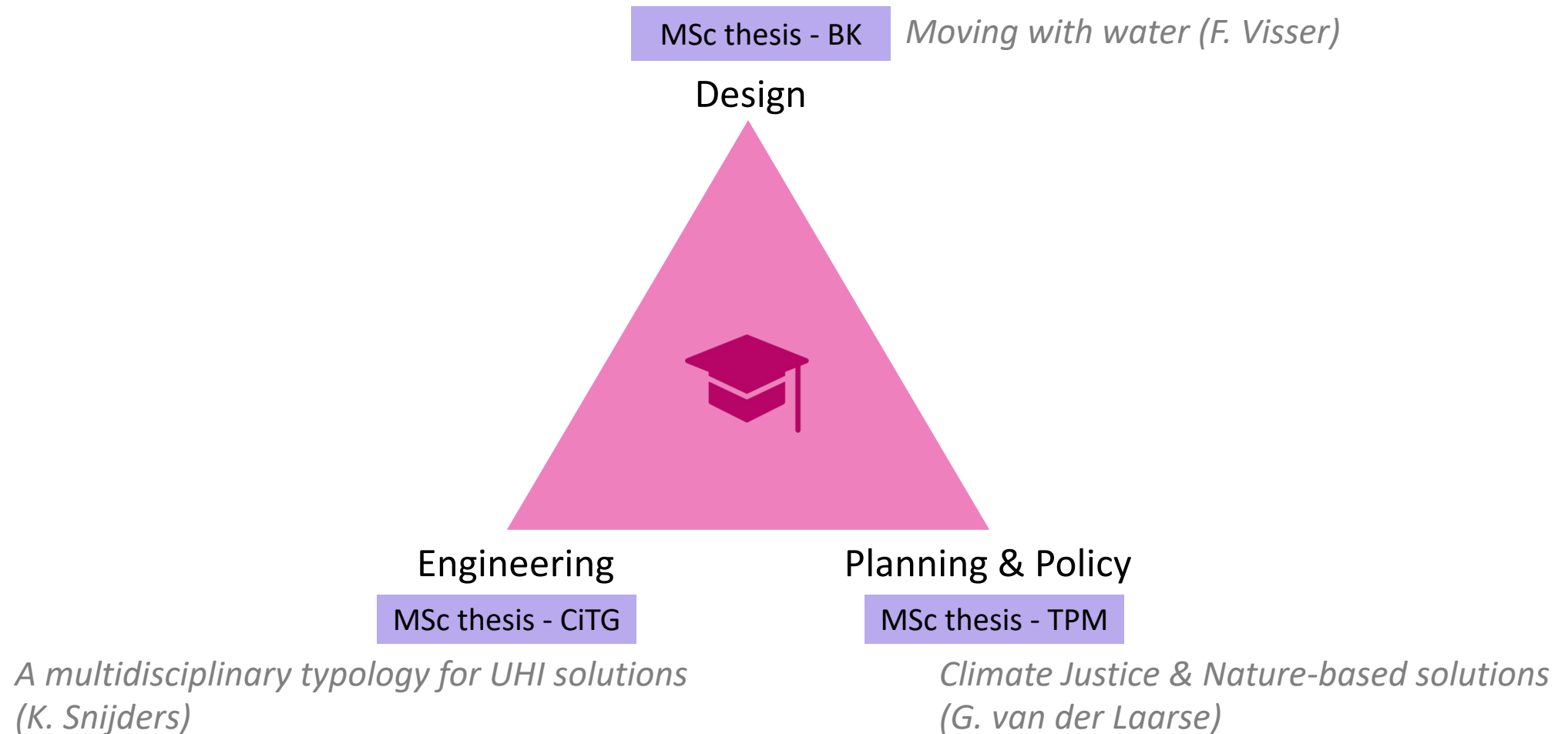


Knowlegde

# Across disciplines



# Across disciplines



# Across scales



Vision-driven strategy-based approach using urban planning and design as an upscaling vehicle

Scales

*Socio-technical solutions → City pilots → City → Replicability*



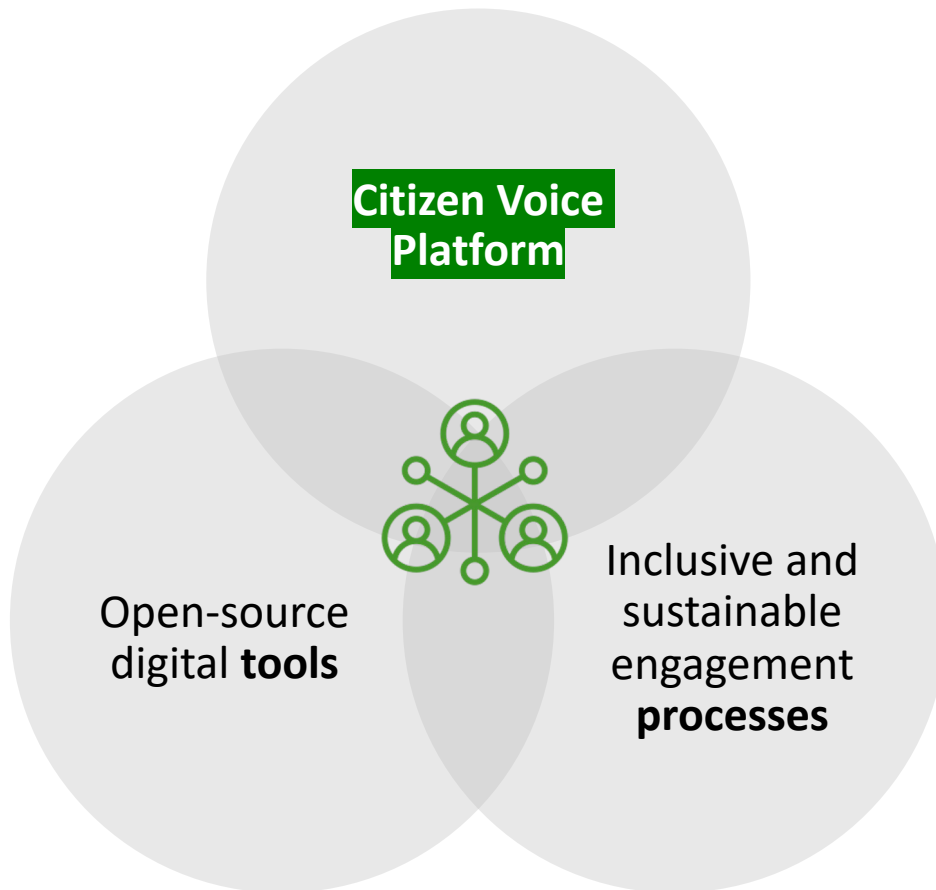
Engineering

Urban planning & design

Governance & policy



# Across stakeholders



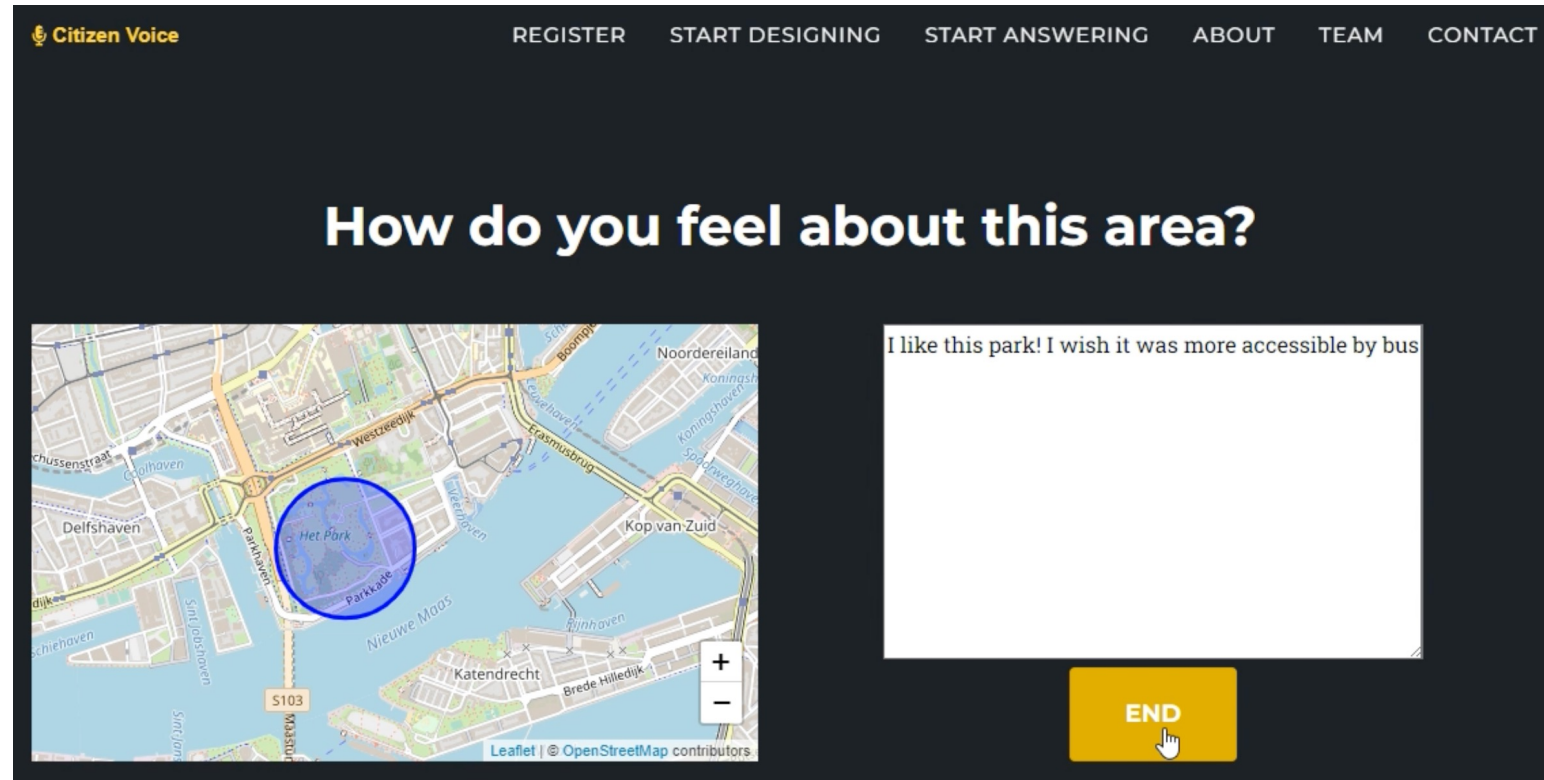
- Engage citizens in decision-making
- Understand their preferences
- Collect evidence of their lived experiences
- Communication channels between stakeholders
- ...

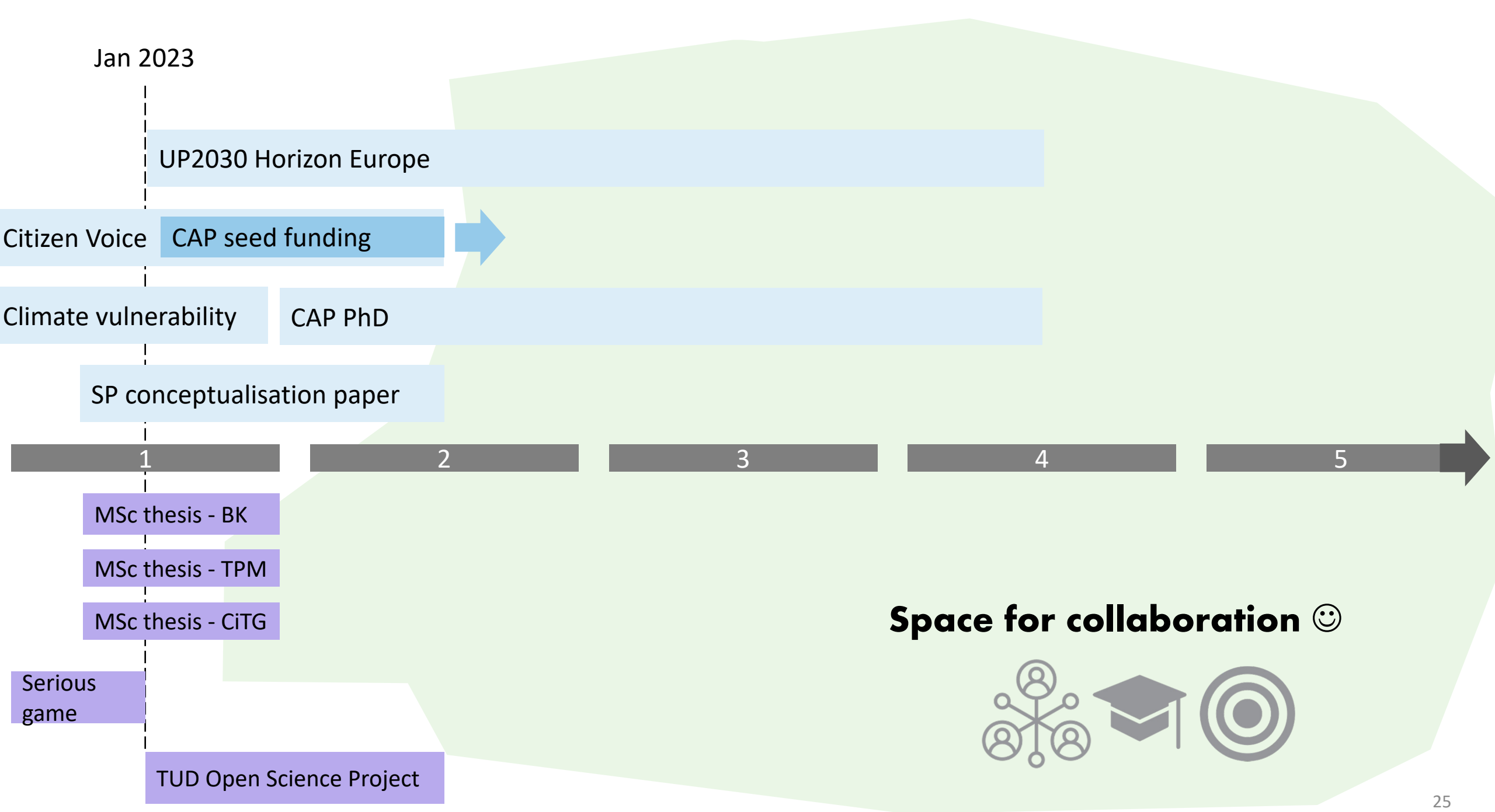


# Across stakeholders

## Funding & support

- 2022: A **pilot** of the Resilient Delta Initiative (SPRING/Convergence)
- 2022: **Call for Support** from the Digital Competence Centre @ TU Delft
- 2023: **Seed funding** - Climate Action Program @ TU Delft





## Get in touch

Juliana E. Goncalves

[juliana-g.com](http://juliana-g.com)

[j.e.goncalves@tudelft.nl](mailto:j.e.goncalves@tudelft.nl)

Thanks for your attention!





