

## **Deltares**

International knowledge exchange on Nature Based Solutions for groundwater recharge

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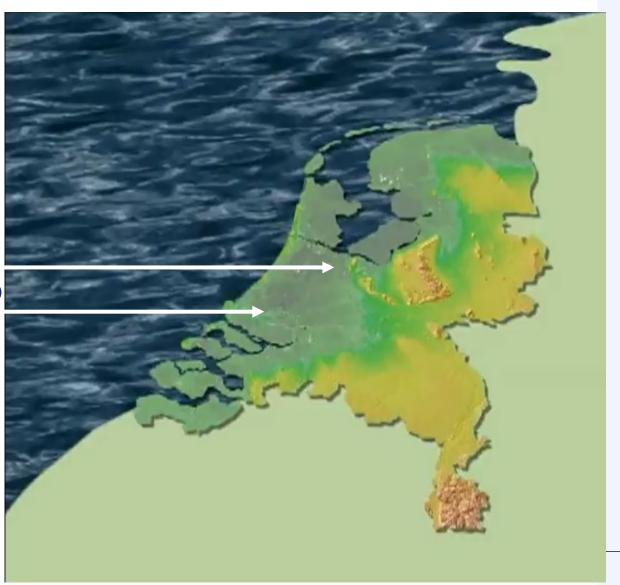
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### Introduction

- What are the challenges?
- Where to find solutions?
- ClimateScan.org, why does it work?

Deltares



## Challenges urban climate: Netherlands









Flooding



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promided for hopmater
b) Immuten
1 Immu

Heat stress
Tropisch Nederland, 1975.



Water quality



Subsidence

Dutch examples of problems in the urban areas: flooding, degradation of waterways, heat stress, drought leading to lower groundwater table and subsidence with results as damage of buildings.

Drought

# Challenges urban climate: International



Flooding



Water quality



Air quality



Heat-stroke warnings could be issued in weather forecasts for the 2008 Clympic Comes, the Xintua news agency said, after the temperature in the capital second to its highest Market in more than 30 years.

Beijing stazled in 97.2-degree Getstus (98 Pahrenhelt) heat on Saturday, the highest for the

#### Heat stress



Urbanisation

# Challenges urban climate

- Climate change is a global problem but adaptation measures are implemented locally.
- Stakeholder participation and social acceptance vital in adaptation.
- Tangible adaptation measures are required.



Bioswales for Urban Water Management



Sponge City



Sustainable Drainage System (SuDS)



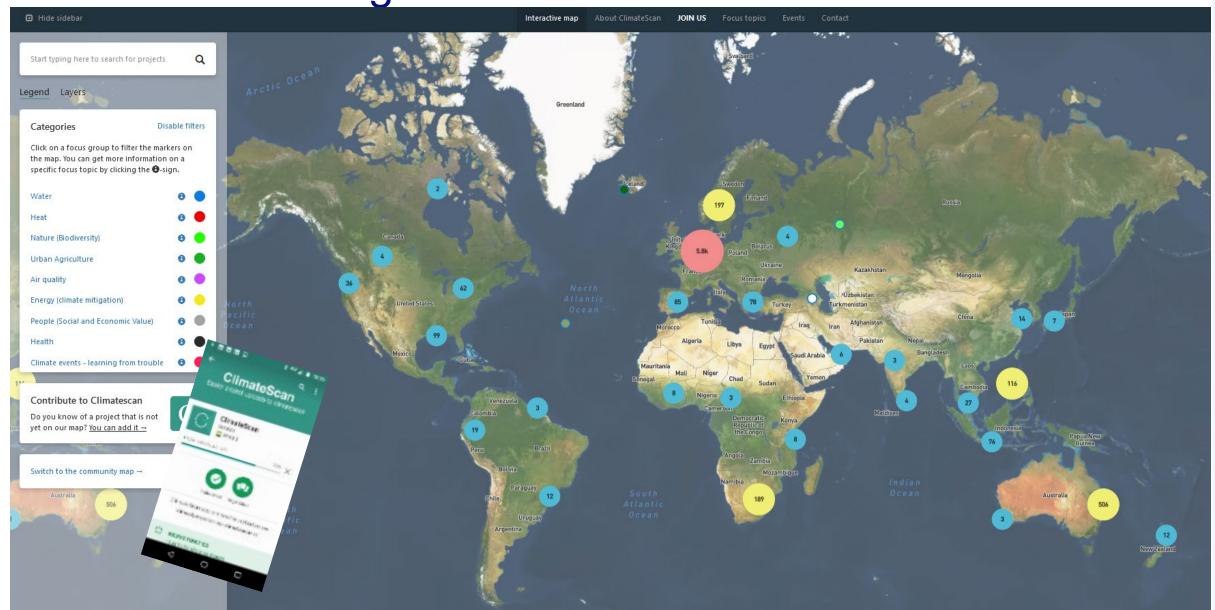
Rain Garden



### Where to find solutions?



ClimateScan.org



## ClimateScan.org

- Stakeholders like to have tools that are (top 5):
  - 1. 'do it yourself' citizen science;
  - 2. Free (no cost, free photo and film material);
  - 3. Provide more detailed information (exact location);
  - 4. Interactive (inter)national examples;
  - link to scientific research on SuDS (publications, links to EU projects etc);



- Other platforms connected to specific projects.
- Inspires stakeholders to make their cities more resilient to climate change and promote groundwater recharge.

# Top views ClimateScan.org

### Why?

- Also small municipalities without platform
- Research related
- Multifunctional
- Small and simple (cheap, space)
- **Quality Footage**
- Bio friendly



1 Swale & playground, Dalfsen



2 Grid Pavers, Someren





3 Bio Swale Harkstraat, Amsterdam 4 Bio Swale, Veldbiezenweg Zwolle



5 Bio Swale, Alphen



6 Gully free road to swale, Almelo



7 Grid Pavers, Zoeterwoude



8 Raingardens & GP, Reestraat Arnhem

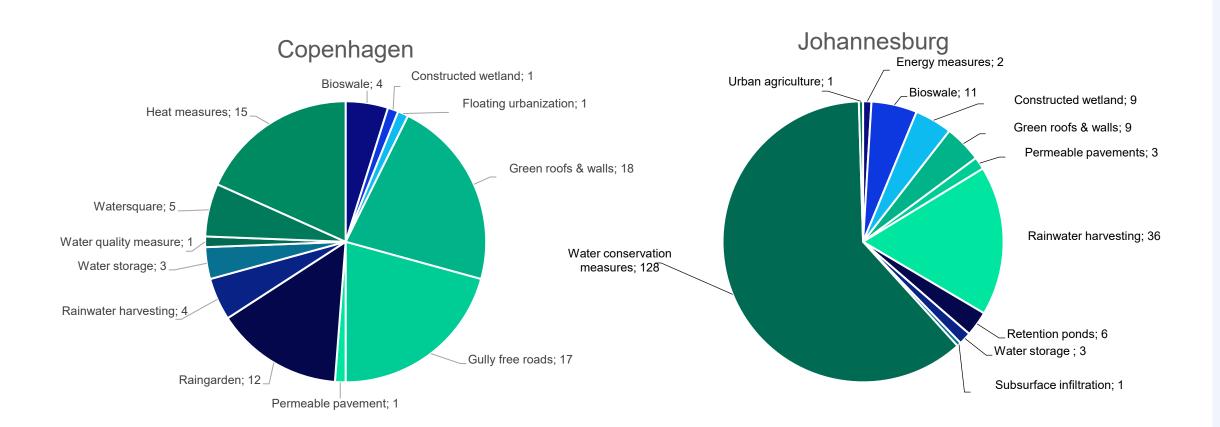


9 Waterharmonica, Moerenburg



10 Raingarden, Amsterdam

# Determine DNA of (green) cities







Riga, Latvia (2019)

Oldenburg, Germany (2020)

Rotterdam, The Netherlands (2020)

Chur, Switzerland (2019)

Gdansk, Poland (2021)

Coimbra, Portugal (2022)

The Netherlands Cities:

Groningen (2014,2017-2022)

Rotterdam (2017-2019,2022)

Leeuwarden, Hoogeveen, Kampen, Apeldoorn, Arnhem, Tilburg, Nijmegen, Eindhoven (2015-2022)

Regions:

GrensMaas (2020, 2022)

Drents Overijsselse Delta (2021) **EUROPE** Noord Holland, Zeeland and Brabant(2021) **ASIA North AMERICA** Mae Phaem, Thailand (2014, 2015) New Orleans, USA (2022) Manila, Philippines (2016) Vancouver, Canada (2022) Tainan, Taiwan (2016) Kanpur, India (2016) Semarang-Surabaya-Ambon, Indonesia (2017-2020)Cebu-Manila, Philippines (2017, 2018, SOUTH 2019) **AMERICA** Peru (2019, 2022)



**AFRICA** Niger River, Mali (2018)

South Africa (2020)

# Final message

