

# High Resolution Thermal Stress mapping In Africa: Decision Maps for Urban Planning in Johannesburg

All presentations and papers download: <https://www.climatescan.nl/projects/2537/detail>

Floris Boogaard<sup>1,2</sup> Marieke de Groen<sup>5</sup> Gillian Maree<sup>6</sup> Jeroen Kluck<sup>2,4</sup>

<sup>1</sup>Hanze University of Applied Sciences Groningen, Zernikplein 7, P.O. Box 30030, 9700 RB Groningen, The Netherlands

<sup>2</sup>Tauw bv, Postbox 133, 7400 AC Deventer, The Netherlands

<sup>3</sup>Amsterdam University of Applied Sciences, Weesperzijde 190, 1097 DZ Amsterdam, The Netherlands

<sup>4</sup>AquaLinks Research and Implementation, Johannesburg, South Africa/Gauteng

<sup>5</sup>City Region Observatory (GCRD)

Corresponding author: [Floris@noordruimte.nl](mailto:Floris@noordruimte.nl)



dr.ir. F. (Floris) Boogaard PhD  
Professor Spatial Transformations  
Hanze University of Applied Sciences Groningen  
(The Netherlands)

[Floris@noordruimte.nl](mailto:Floris@noordruimte.nl)



## Introduction

Science



practice Models



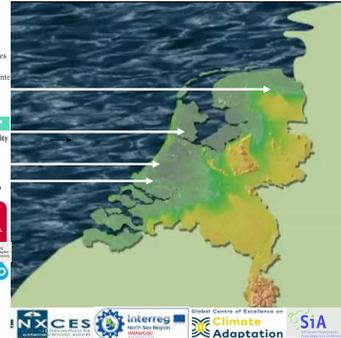
Verification engagement



Education



Local stakeholders



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## Content

1. Introduction
2. Challenges
3. Tools: climatemaps
  1. Heatstressmaps
    1. The Netherlands
    2. Asia
    3. Africa
4. Next steps
  - Solutions and more info
  - Find us, working together?

Analysis  
Ambition  
Action

**Analysis** Analysing your area  
**Ambition** Formulating your ambition  
**Action** Policy and Implementation

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## Combined solutions for Challenges in urban climate

Floodings

waterquality

Heatstress

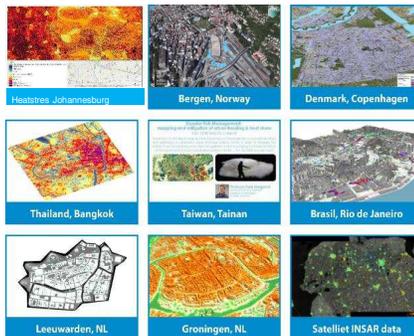
Drought

Airquality

Other factors...

## Urban Climate models

- Flooding
- Heatstress
- Drought
- Damage (cost)
- Subsidence
- Pollution
- Waterquality
- (im)mobility
- Opinion (social media)
- .... etc



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## Heat resilient city

Hitteopgave

Hitte in de stad

Ontwrichtlijnen ← Maatregelen

VOOR HETSEKSETOER

- Heatmaps, heatgoal
- Heatmeasures
- Heat design guidelines

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## Asia: use of heatstressmaps

**High resolution decision maps for urban planning: a combined analysis of urban flooding and thermal stress potential in Asia and Europe**

*Flore Bouvard<sup>1,2</sup>, Greta Figheloni<sup>3</sup>, Tai-Cheng Chang<sup>4</sup>, Arsen Khachik<sup>1,2</sup>, Ting-Jing Lin<sup>5</sup>*  
<sup>1</sup>Urban Climate Adaptation Center, Shanghai, P.R. of China, 20024  
<sup>2</sup>Center for Urban Climate, Tsinghua University, Beijing, P.R. of China, 100084  
<sup>3</sup>Department of Architecture, National Tsing Hua University, Taiwan  
<sup>4</sup>Department of Architecture, National Tsing Hua University, Taiwan  
<sup>5</sup>Department of Urban Planning, National Tsing Hua University, Taiwan

- Share best practices

Heatstress Tainan (Taiwan)

Heatstress map in Ayutthaya (Thailand)

## Africa: Why Johannesburg? Focus area for climate change adaptation



**Focus areas:**

- Climate change adaptation governance
- Water scarcity
- Floods and stormwater
- Heat waves, human and environmental health
- Informal settlements and urbanisation
- Infrastructure

A large African city within the Gauteng City Region in which heat stress is already 'officially' acknowledged as one of the six focus areas for climate change adaptation (Climate Change Adaptation Framework (draft 2018, Prof. Coleen Vogel et al.))

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## Why Johannesburg? Variety



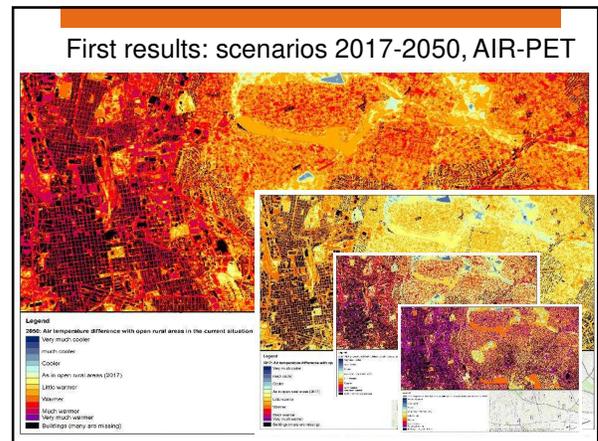
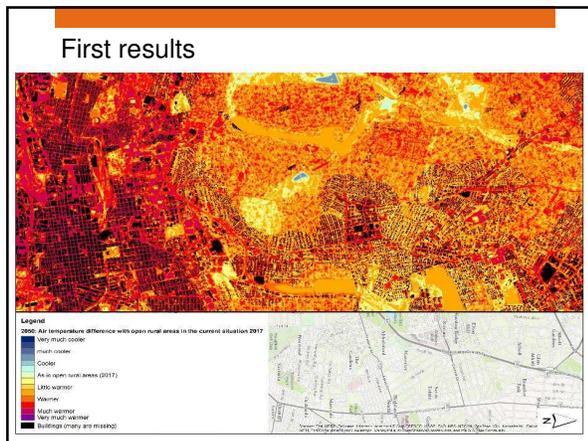
Photo credit: Johnny Miller, Unequal Scenes (Bloubastrand / Kya Sands)

Momentum: Rapid urbanization / densification, and busy with:  
 Busy with **Open Space Planning plans**,  
 Busy with **Stormwater Design Manual**,  
 Starting with **Green Infrastructure Strategy** share your talent. move the world.

## Needs for heat stress map: 'green, health, planning'

- **Climate Change Adaptation manager:** "We need information to inform our tree planting programme"
- **Researcher:** "Clinics in poor areas have higher number of illnesses during hot periods. Is this influenced by city fabric?"
- **Large commercial developer:** "We are building a new city, are we adding to heat stress?"
- You?

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Next steps:

- **Verification of the map:** "heatscans, city climatescans and social media"
- **From analyse to act:** "Climatescan, 'climate in our street', engagement with stakeholders."
- ..... Example of engagement and verification



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Verification Johannesburg Weather data installed (TAHMO) automatic weather stations



aqualinks TAHMO  
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Verification of the map: "heatscans, city climatescans and social media"

**Cityscan for climate adaptation**  
The wicked problem scan: example Rotterdam

The City Climate Scan methodology: to measure, map, scan and assess different parameters that provide insight into the vulnerability of urban areas and neighborhoods.

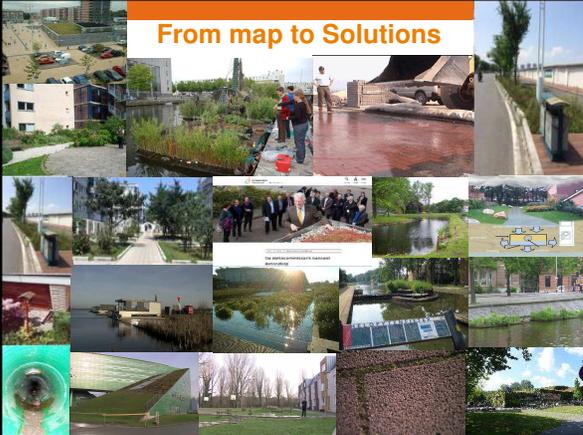
**A317 City Scan Method**

Author/s: Rick Heikoop, Rotterdam University Of Applied Sciences, Netherlands



TNO, Tauw, indyma

From map to Solutions



TS 828 Urban climate resilience European-African knowledge exchange toolbox: [www.climatescan.nl](http://www.climatescan.nl)

Author/s: Floris Boogaard, Hanze University Of Applied Science, Netherlands

Internationaal, citizen science

The climate is right up your street

The value of observations in residential streets

A book of examples



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Conclusions, next steps

- Combined climate GIS maps (heat stress and urban flooding) indicate vulnerable locations to the effects of climate change.
- Maps are quick-scan tools for urban planners who need to make early decisions.
- Measures to prevent flooding and to reduce urban heat can often be combined and carried out at the same time.
- In the European and Asian cities the tools have been proven useful and the maps will be applied in the African process with verification and engagement of stakeholders.
- Challenges and further developments: mapping other climate related issues in dense urban areas e.g. Africa.
- Work on this together?

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