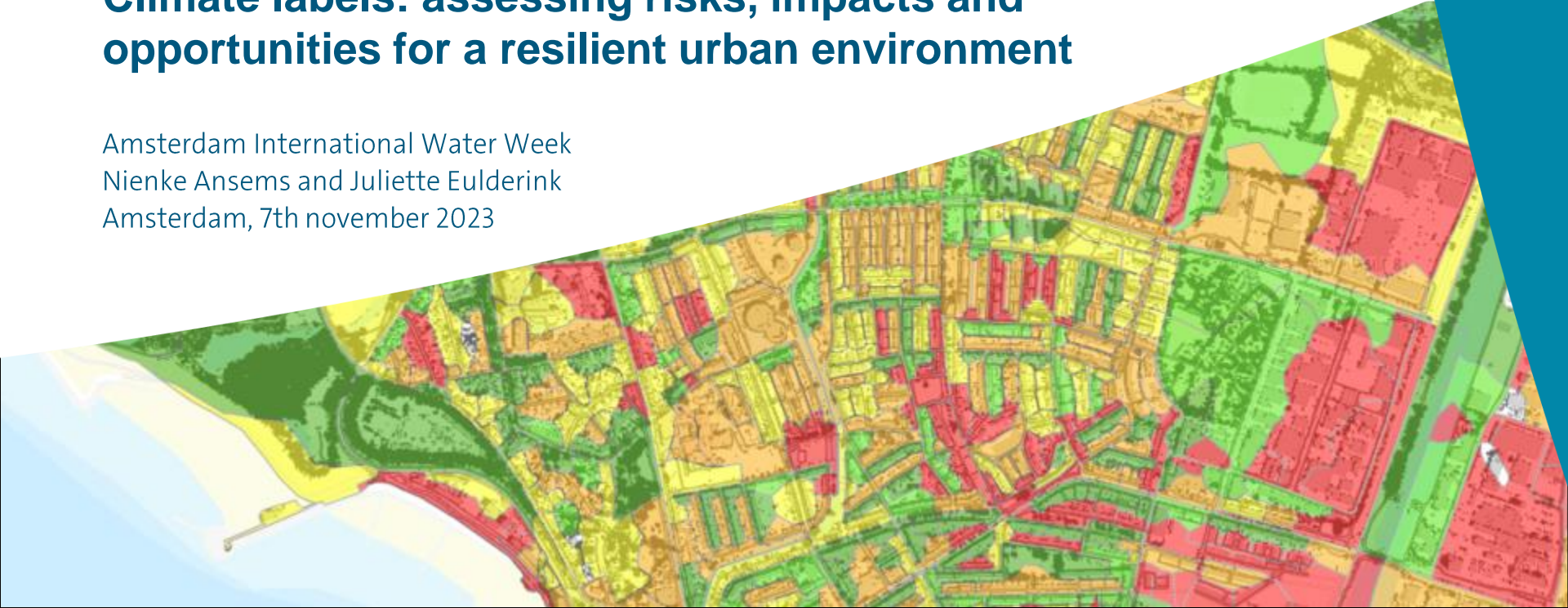


Climate labels: assessing risks, impacts and opportunities for a resilient urban environment

Amsterdam International Water Week
Nienke Ansems and Juliette Eulderink
Amsterdam, 7th november 2023



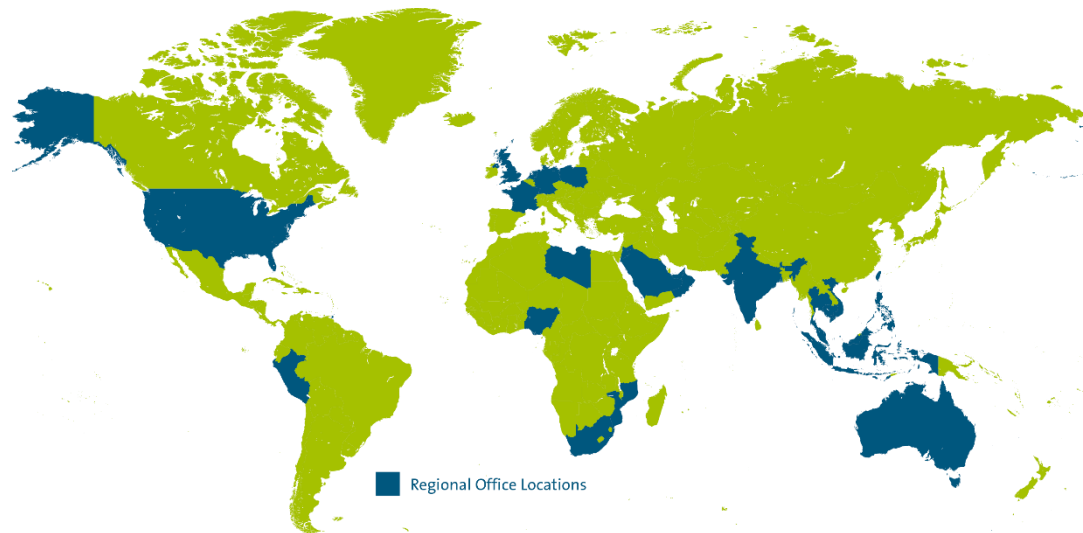
WHO WE ARE

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We take responsibility for having a **positive impact** on the world and we constantly challenge ourselves and our clients to develop sustainable solutions to local and global issues.

By **combining** engineering, design and consultancy with software and technology, we are delivering more added value to our clients.
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6,000+
colleagues

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50
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on projects in
100+
countries

WHERE WE LEAD



Climate resilience



Renewable energy
and decarbonisation
of industry



Maritime



Intermodal
transportation



Water technology



Light industry



Sustainable mobility



Tunnels and structures

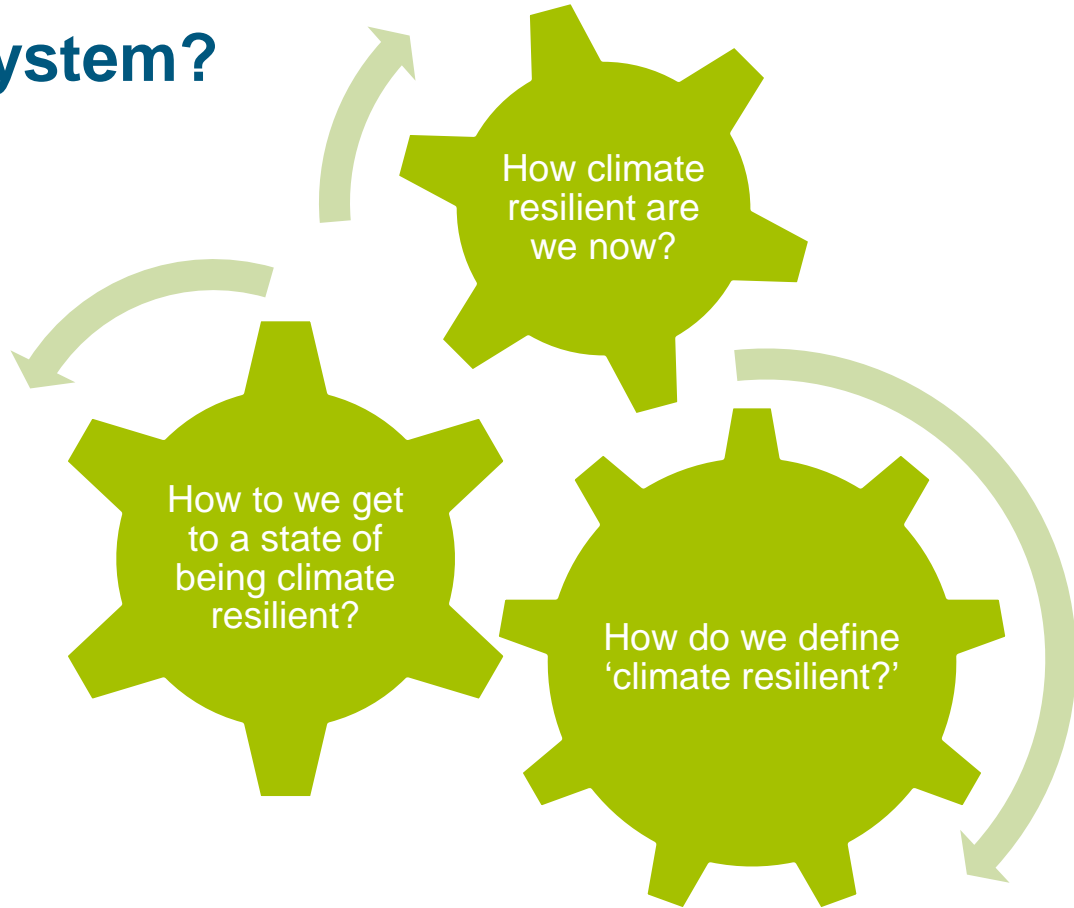


Data centres

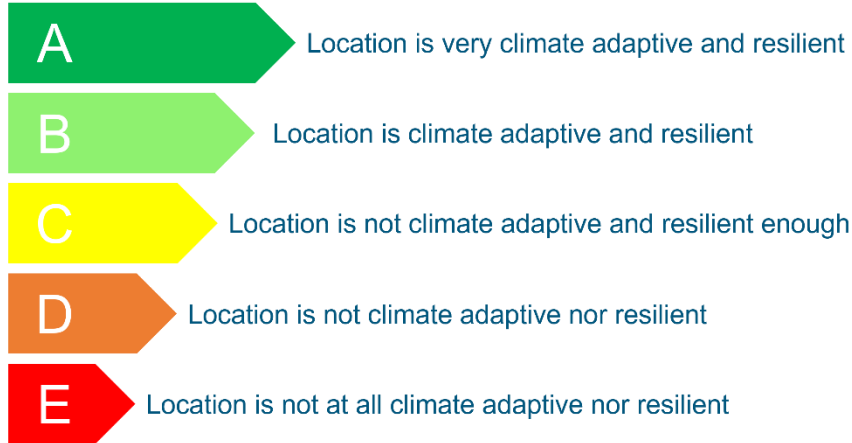
The journey towards climate resilience



Why a scoring system?

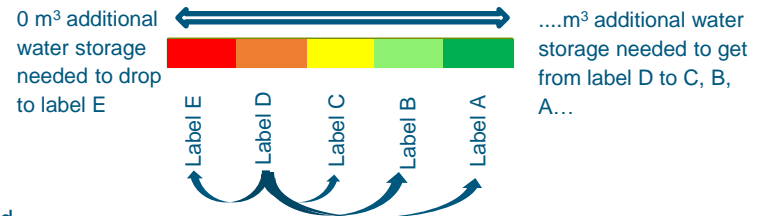


Climate scoring system: the concept of climate labelling

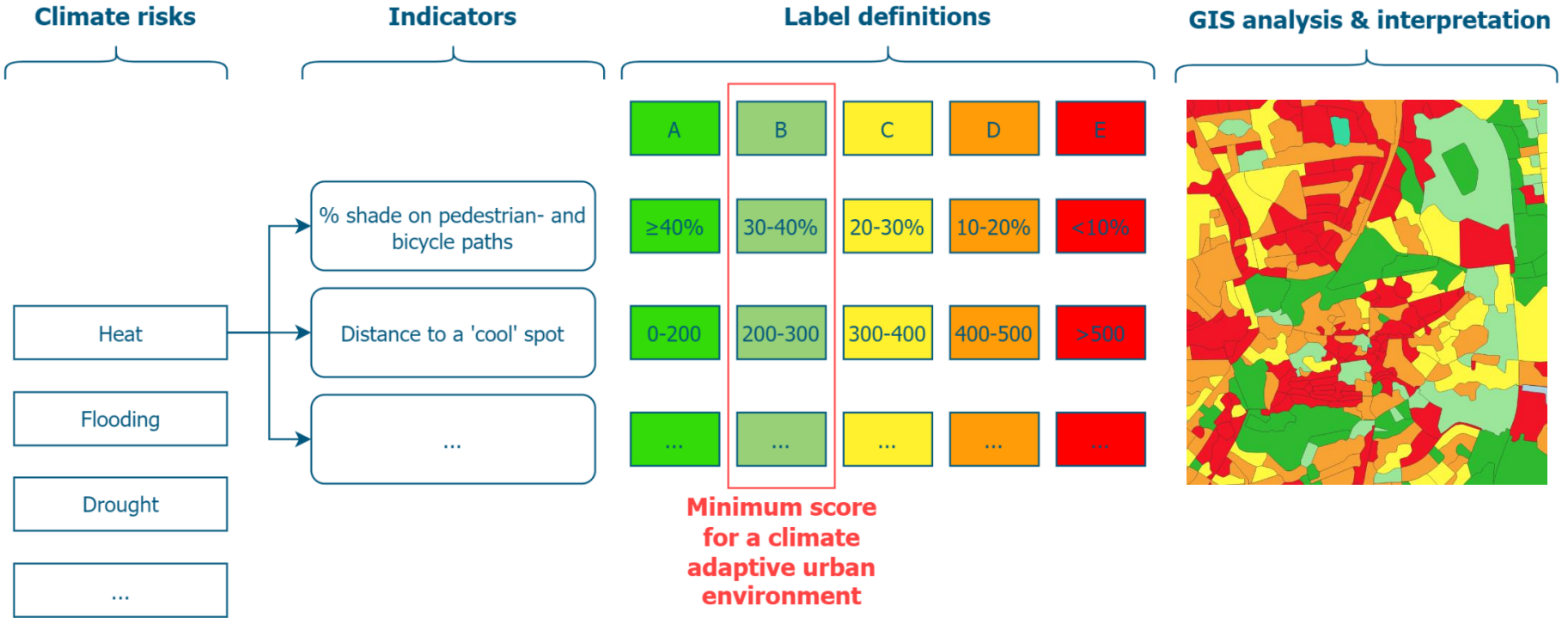


- Visual, clear sense of urgency
- Gives city-planners and policy-makers perspective for action
 - Can even be used to communicate with citizens
- Allows monitoring of adaptation efforts (i.e. moving from D to B...)
- Difference between current label and target label (ambition) defines what adaptation measures are necessary (design criteria)

Example for flooding: required volume (m³) water storage

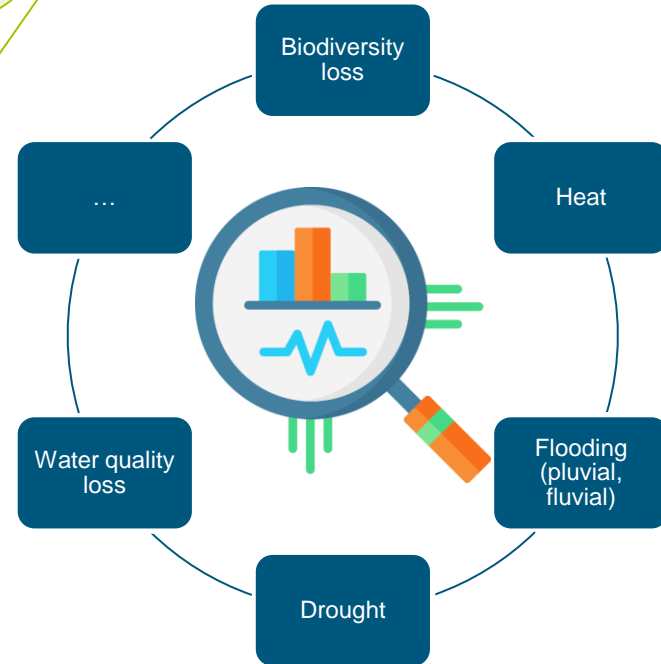
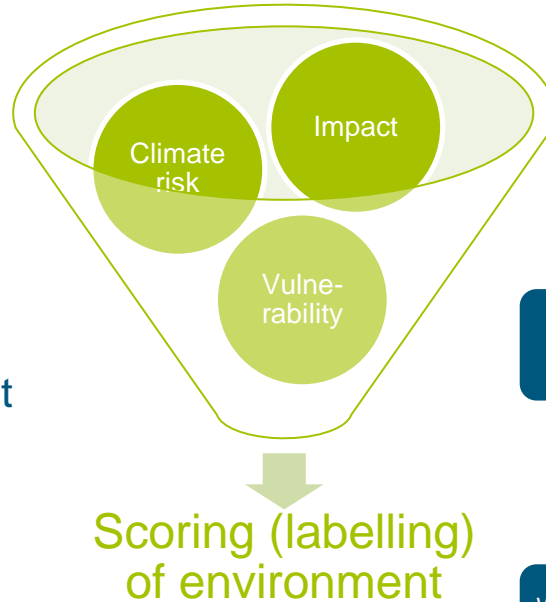


Climate labels: the concept



Indicators of climate risk, vulnerability and impacts

- What do we want to measure and monitor?
- We want to gain (quantitative) insights:
 - About **risks and impacts** – to highlight urgency
 - What areas are at risk, what impacts can be expect?
 - That are **actionable for city-planner**:
 - what need to adapt, and how? → climate adaptive design



Climate impact analysis

- Methodology: from climate effect to climate impact
- The social and economic impact from doing nothing
 - Approach according to a social cost-benefit analysis (SCBA).
- Identify, quantify and, where possible, monetize effects



1. Identifying relevant climate risks

- Using existing climate effect datasets



2. Quantify climate risk and associated effects

- Using municipality or city geo-data and public data sources



3. Quantify consequences (impacts: Financial, livability, health, mobility, etc.)

- Using key figures from literature and qualitative assessments

Concept: climate impacts

- The impact of climate change is different for every area. Depending on demographics, area layout, etc...
- Climate impact analyses allow for better alignment of climate effects with broad social tasks and environmental visions and sense of urgency

- Health
- Safety
- Livability
- Accessibility
- Reputation damage
- Financial

wijk	wateroverlast: 70 mm2u schade in euro (*1.000.000)	wateroverlast: 100 mm2u schade in euro (*1.000.000)	droogte: bodemdaling schade in euro (*1.000.000)	droogte: grondwaterdaling schade in euro (*1.000.000)
Laakkwartier en Spoorwijk	2,2	24,4	14	98,7
Benoordenhout	4,5	23,9	1,9	199,7
Centrum	6,4	23,5	0,5	33,7
Schildersbuurt	2,5	3,9	1,1	0,0
Scheveningen	3,2	17,4	0,0	0,0
Stationsbuurt	11,3	10,7	2,4	1,2
Benoordenhout	0,4	9,0	1,0	71,1
Transvaalbuurt	0,5	3,9	0,3	1,4
Valkenboskwartier	0,2	8,9	0,0	0,0
Pleinen- en Stalenkwartier	0,5	8,9	0,0	0,0
Geenen- en Stalenkwartier	0,5	6,9	0,3	0,0
Vateringse Yeld	2,3	3,1	0,4	2,3
Bovenst	0,3	5,6	2,1	23,8
Morgenstond	1,4	7,3	0,7	14,1
Zeeheldenkwartier	0,5	6,6	0,2	0,0
Loosdalen	0,4	4,3	0,1	0,0
Rustenburg en Oostbroek	0,0	2,7	1,4	5,0
Moerwijk	0,5	6,9	1,2	1,4
Ypenburg	0,1	0,3	0,2	0,0
Bomen- en Bloemenbuurt	0,5	4,3	0,5	0,3
Beldorck Park	0,5	1,5	0,0	0,0
Leidschevenen	0,2	1,5	0,4	2,2
Archieprijbuurt	1,0	11,3	0,0	1,0
Leenenburg	2,4	2,4	0,0	0,0
Duinoord	0,4	4,2	0,0	0,0
Valdeek	0,5	5,1	0,0	0,0
Muskenbuurt	0,5	4,0	0,1	0,0
Binckhorst	2,1	4,4	0,6	3,3
Duindorp	0,0	4,5	0,0	0,0
Gloenten- en Fruitmarkt	0,0	4,1	0,0	0,3
Mariahoeve en Marlot	1,2	4,4	4,2	0,0
Bolhemmen en Meer en Bos	0,1	1,3	0,9	0,0
Vilvenspark	1,6	3,7	0,0	0,9
Fontepark	5,1	3,2	0,1	0,1
Hoornwijk	1,7	7,8	0,1	0,7
Zorrevliet	0,4	5,0	0,0	0,0
Kijkduin en Dokenburgh	2,6	4,2	0,1	0,0
Kraaenesteen en Vlootland	0,2	1,4	0,2	0,0
Vestbroekpark en Duttendel	0,5	3,5	0,3	0,0
Zuiderpark	1,2	0,8	0,1	0,2
Voerwijk	0,2	1,5	1,3	0,0
Haagse Bos	0,1	1,4	0,0	0,3
Van Stolkpark en Scheveningse Bosjes	0,4	1,5	0,0	0,0
Oorddalen	0,1	0,0	0,0	0,0

Example result: accessibility emergency services

- Emergency services (ambulance) need to be able to use main emergency routes to reach patients in a time-efficient manner
- If these roads are impassable due to water on the streets, help may come too late. The analysis shows that for a short heavy rain event (70 mm/1 hr) 4% of these main routes becomes impassable for services.

Bereikbaarheid
hulpdiensten

Waterdiepte

A: < 1 cm

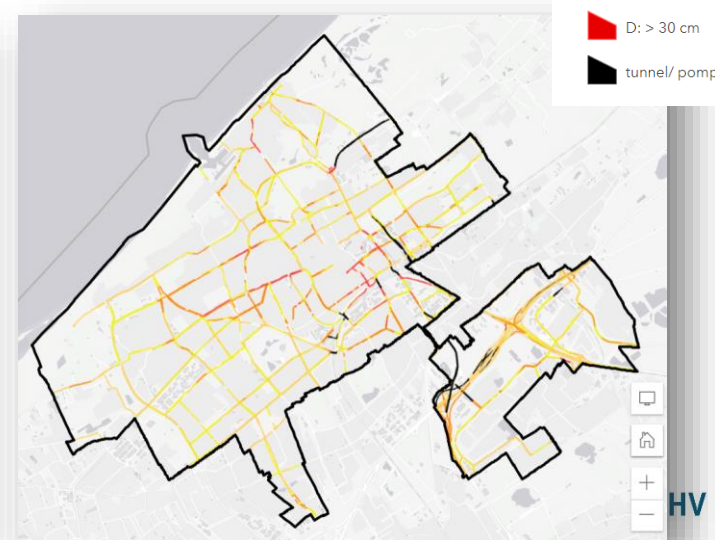
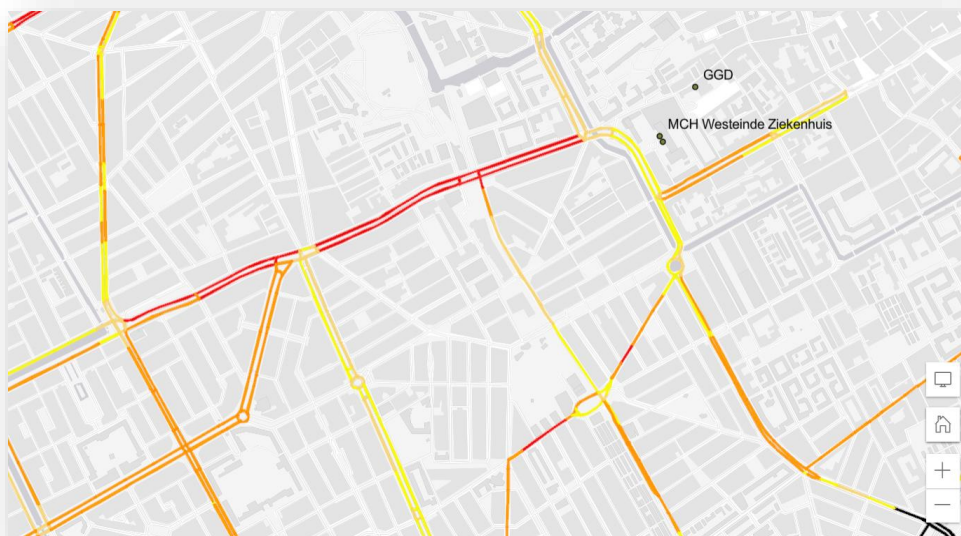
A: < 1 cm

B: 1 - 10 cm

C: 10 - 30 cm

D: > 30 cm

tunnel/ pomp



The GIS analysis

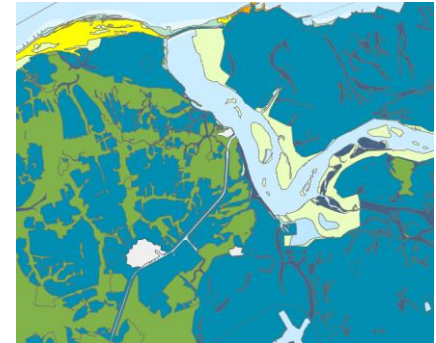
- Using public datasets, client datasets and models
- Interpreted according to label definitions using 90% confidence band at the requested scale (city, neighborhood, street, building...)



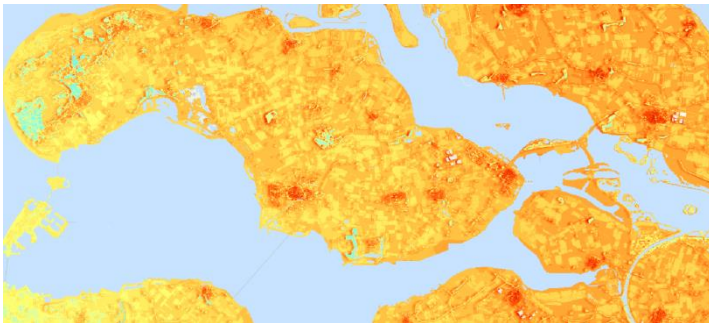
(1) Shade cover model



(2) Visible tree analysis



(3) Raw data of soiltype



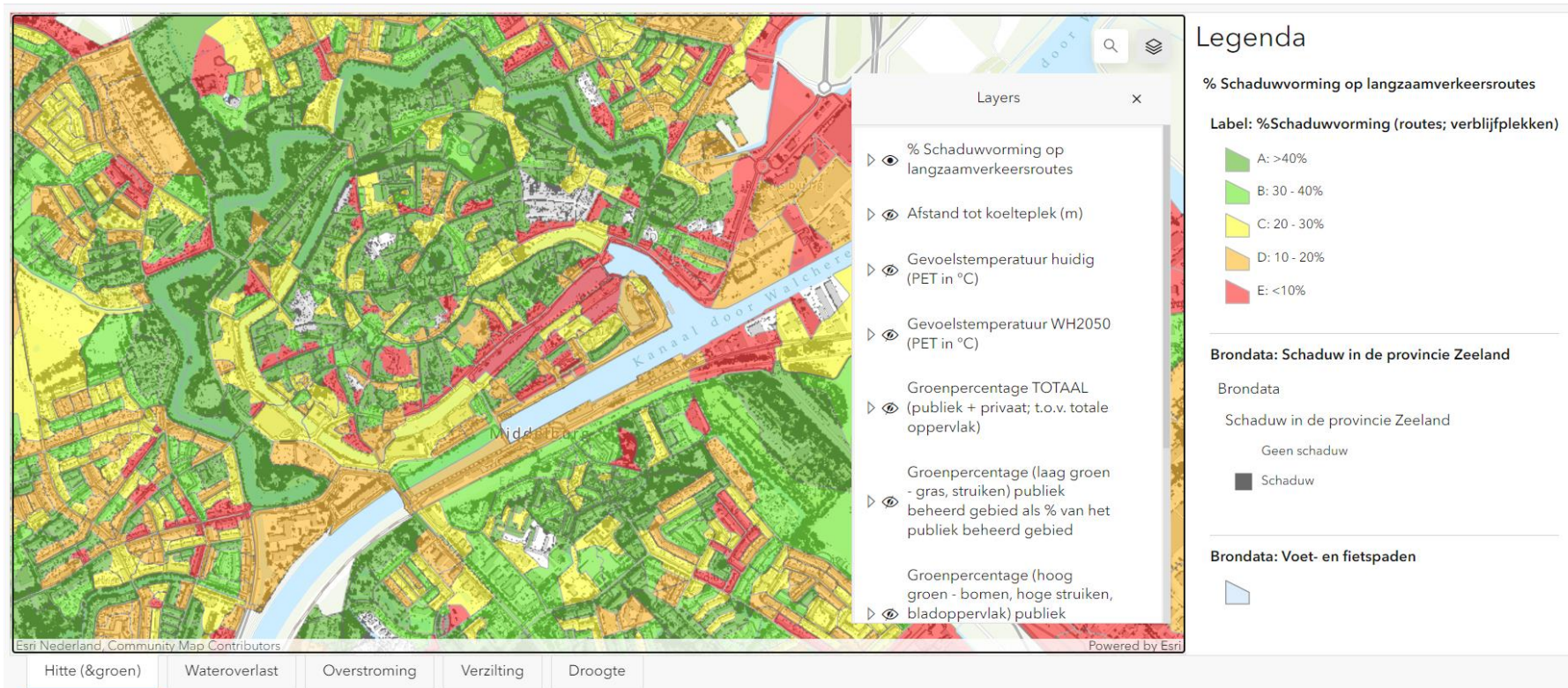
(4) Results PET model at provincial scale



(5) Results inundation model

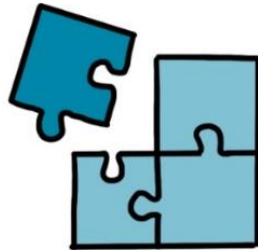
Results: Climate label maps for urban environment

■ Spatial risks: how do streets score per indicator?



Take-aways

- Climate impact analyses allow us to assess risks from different perspectives, and therefore align with other (public sector) domains.
 - Helps highlight sense of urgency in a broad sense
- Climate labelling helps to set (spatial) priorities and actionable targets
 - There is a need for different types of indicators for the tool to be useful for policy-makers, city-planners, etc....
- Developing interactive dashboards helps!
 - Allows users to combine data and analyses for risk analysis and decision-making



Thank you for your attention!

Any questions?

Do not hesitate to contact us!
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Juliette.Eulderink@rhdhv.com

