Climate Adaptation Services

Towards a level playing field for physical climate risk assessments

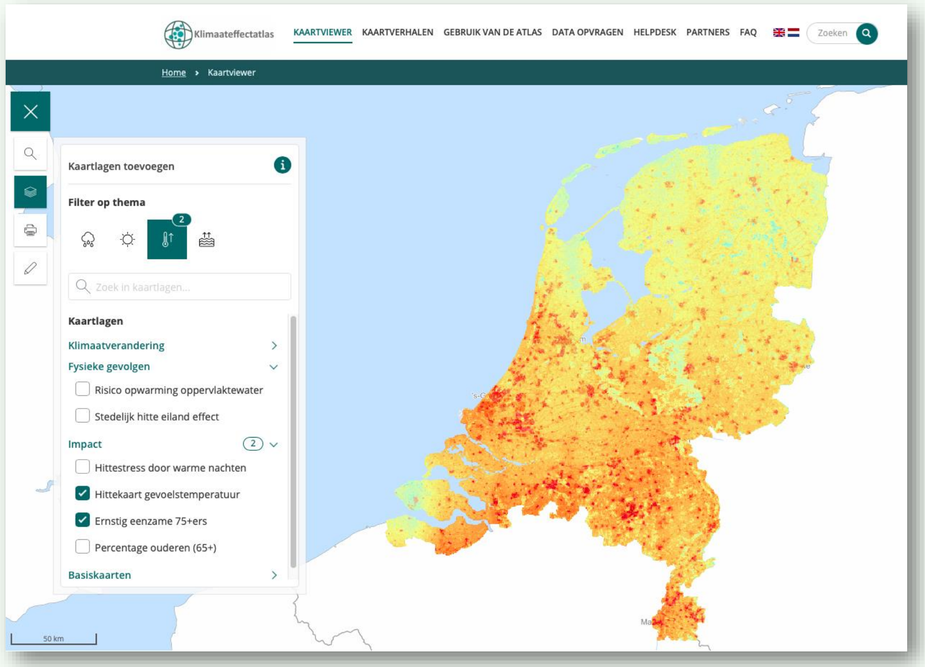
Insights from the Dutch real estate sector

Felix van Veldhoven – felix@climateadaptationservices.com

CLIMATEFIT Launch webinar - May 7th 2024

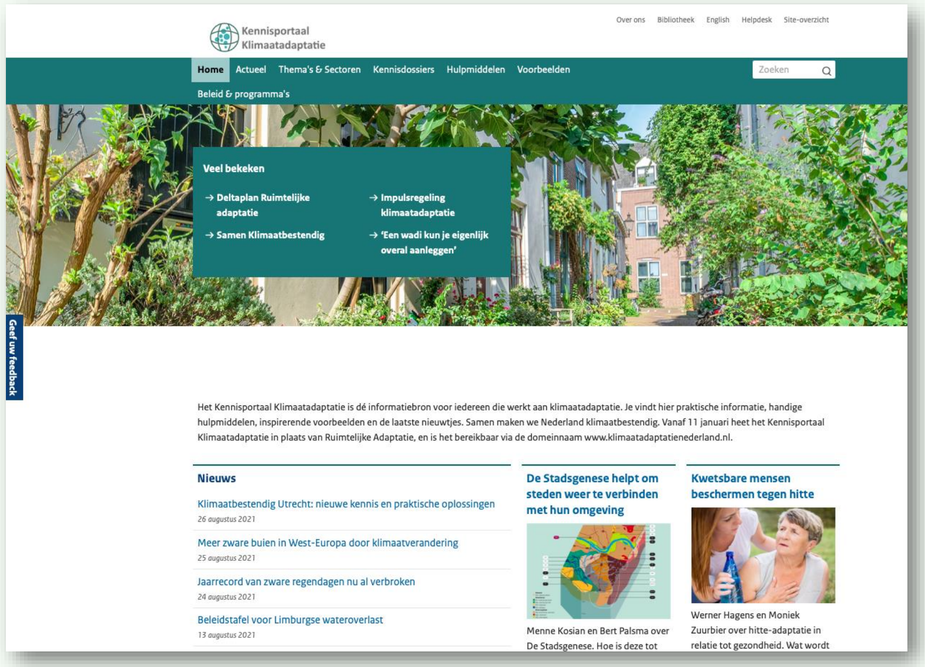
Two cornerstones of the Dutch knowledge infrastructure

Dutch Climate Impact Atlas
klimaateffectatlas.nl/en/



500 visitors per day;
1000 downloads in 2023.

Adaptation Knowledge Portal
klimaatadaptatienederland.nl/en



1300 visitors per day
250.000 in 2023.

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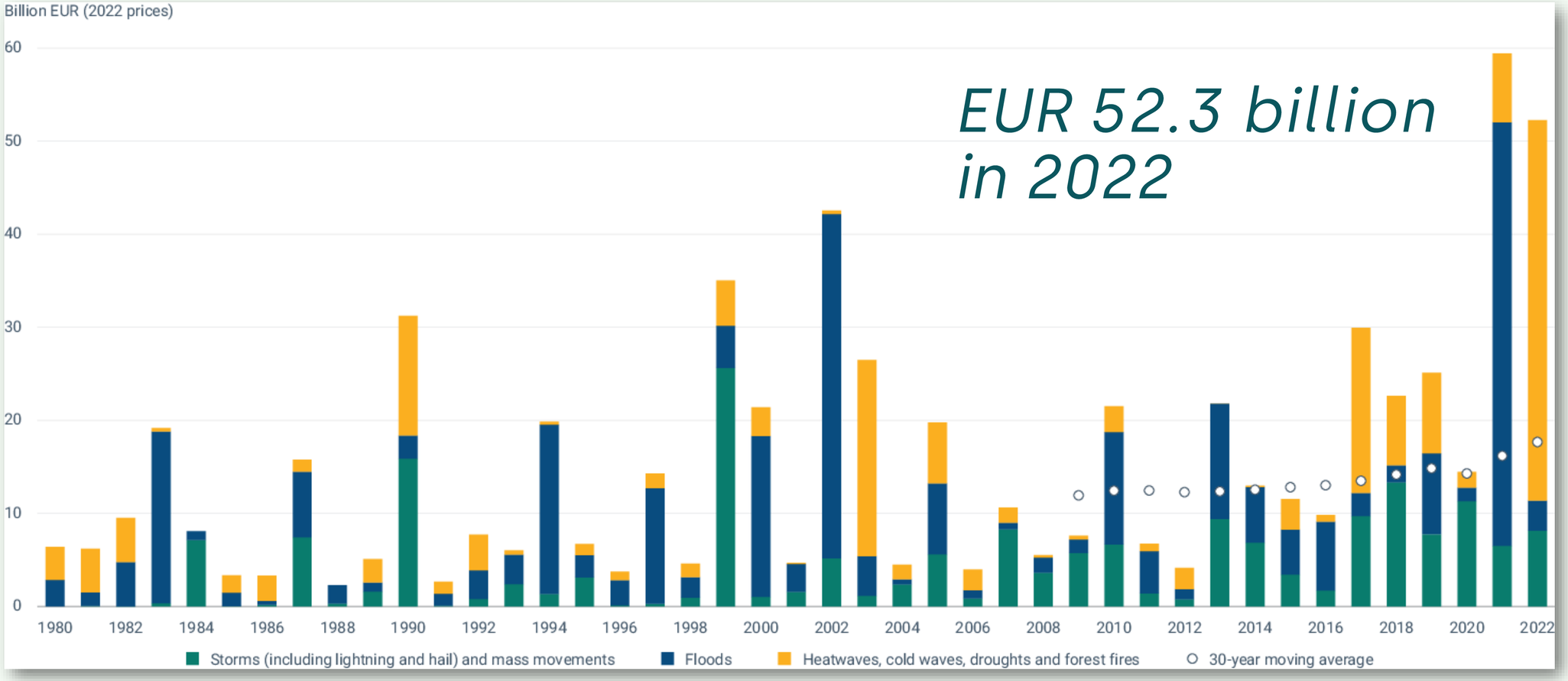
Economic losses from weather- and climate-related extremes in Europe



EEA, 2023

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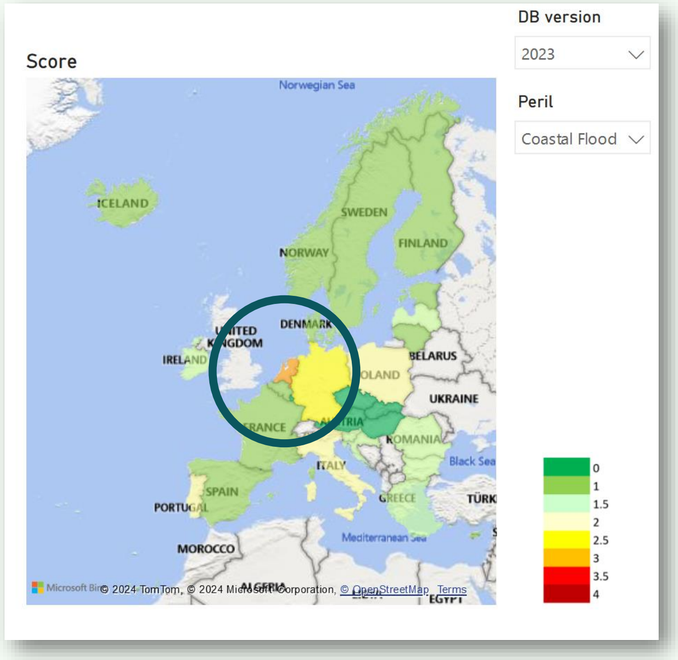
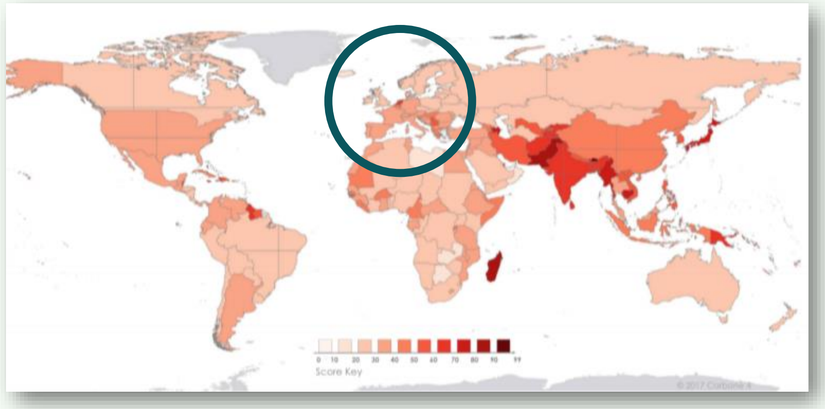
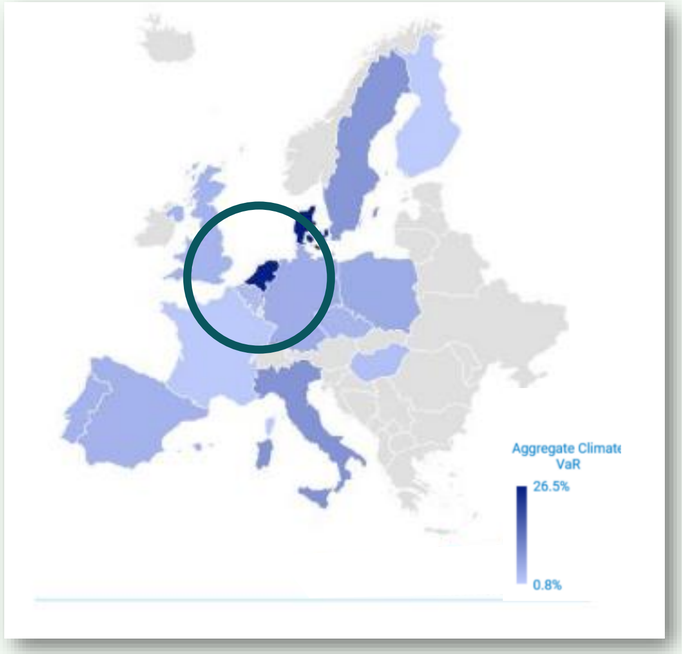
Coastal flooding: the Netherlands in the red zone?



EIOPA, 2023



Commercial provider, 2019



Commercial provider, 2022

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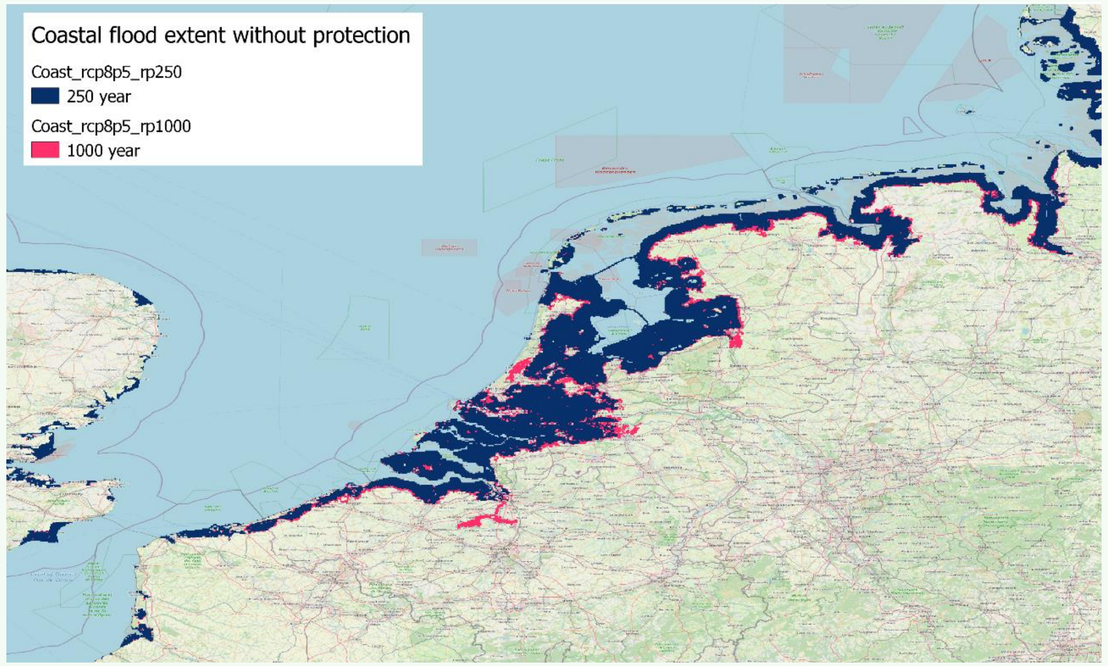
Coastal flooding: taking protection into account

Before



After

Scussolini et al., 2016; Tiggeloven et al., 2020

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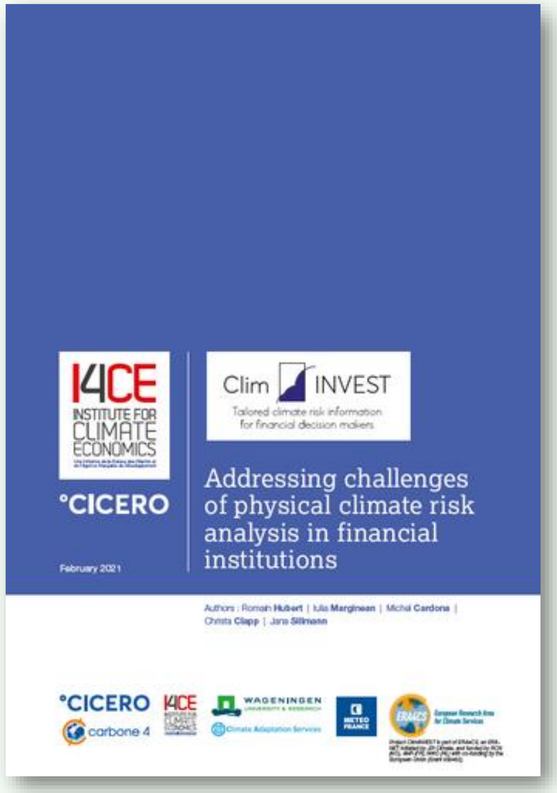
VU

Black box approaches are blowing up

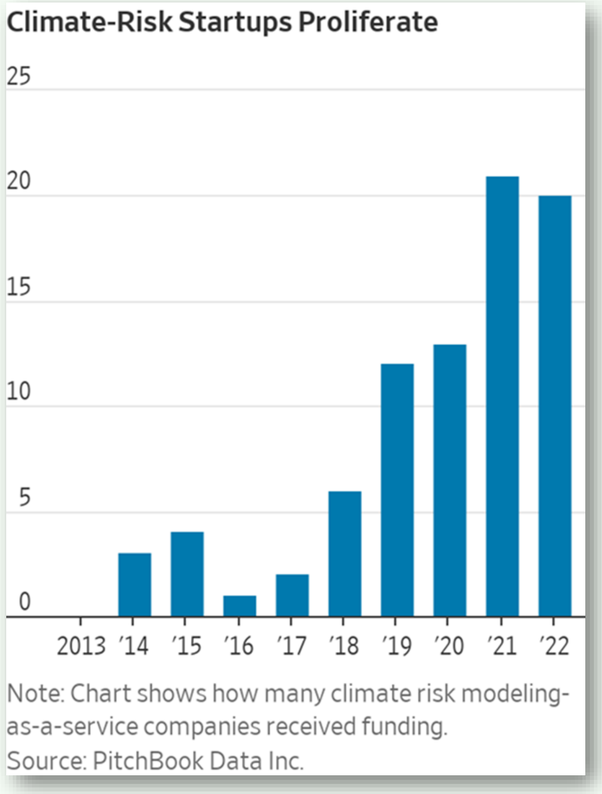
Lack of climate change expertise

Large number of providers and methods

Different climate risk assessments do not correlate well



Hubert et al., 2021



WSJ CLIMATE & ENERGY, 2023

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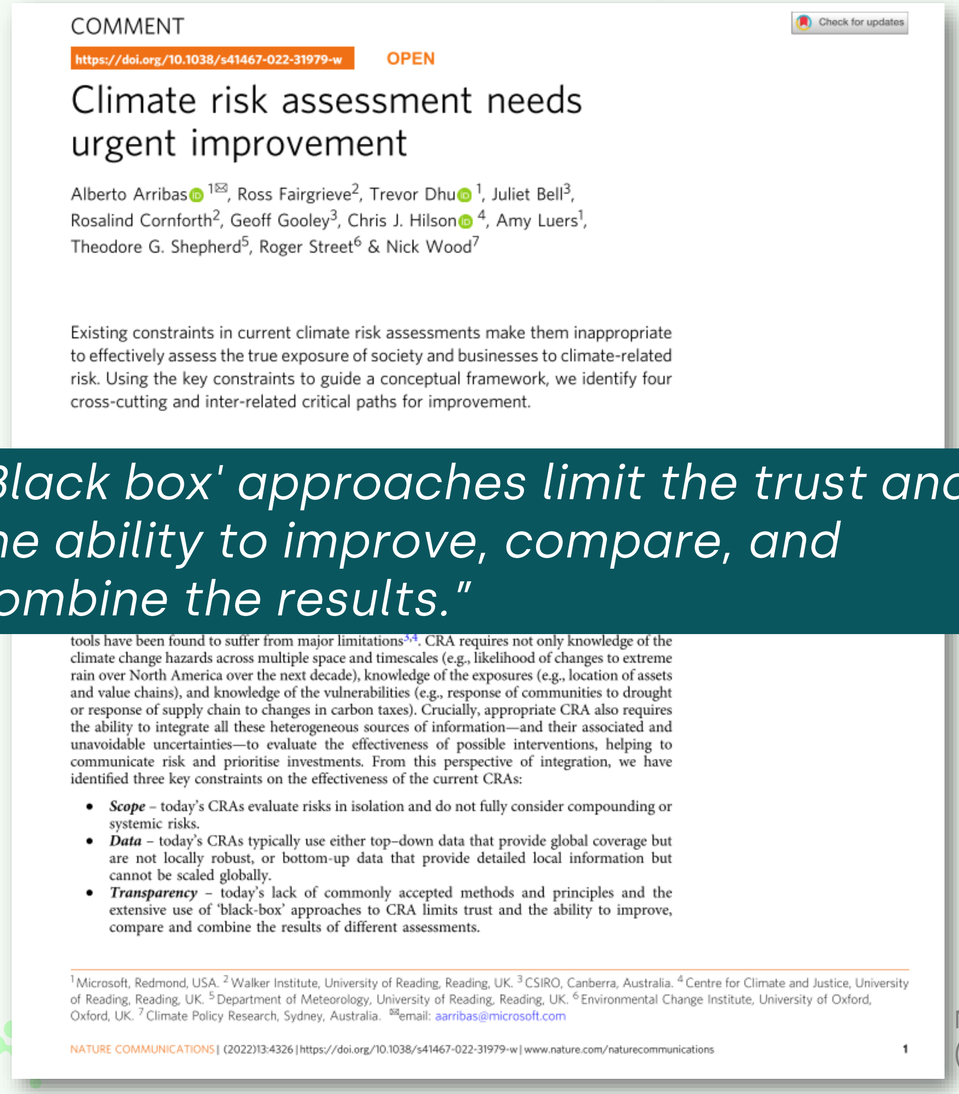
Black box approaches are blowing up



COMMENT

Check for updates

https://doi.org/10.1038/s41467-022-31979-w OPEN

Climate risk assessment needs urgent improvement

Alberto Arribas[1✉], Ross Fairgrieve[2], Trevor Dhu[1], Juliet Bell[3], Rosalind Cornforth[2], Geoff Gooley[3], Chris J. Hilson[4], Amy Luers[1], Theodore G. Shepherd[5], Roger Street[6] & Nick Wood[7]

Existing constraints in current climate risk assessments make them inappropriate to effectively assess the true exposure of society and businesses to climate-related risk. Using the key constraints to guide a conceptual framework, we identify four cross-cutting and inter-related critical paths for improvement.

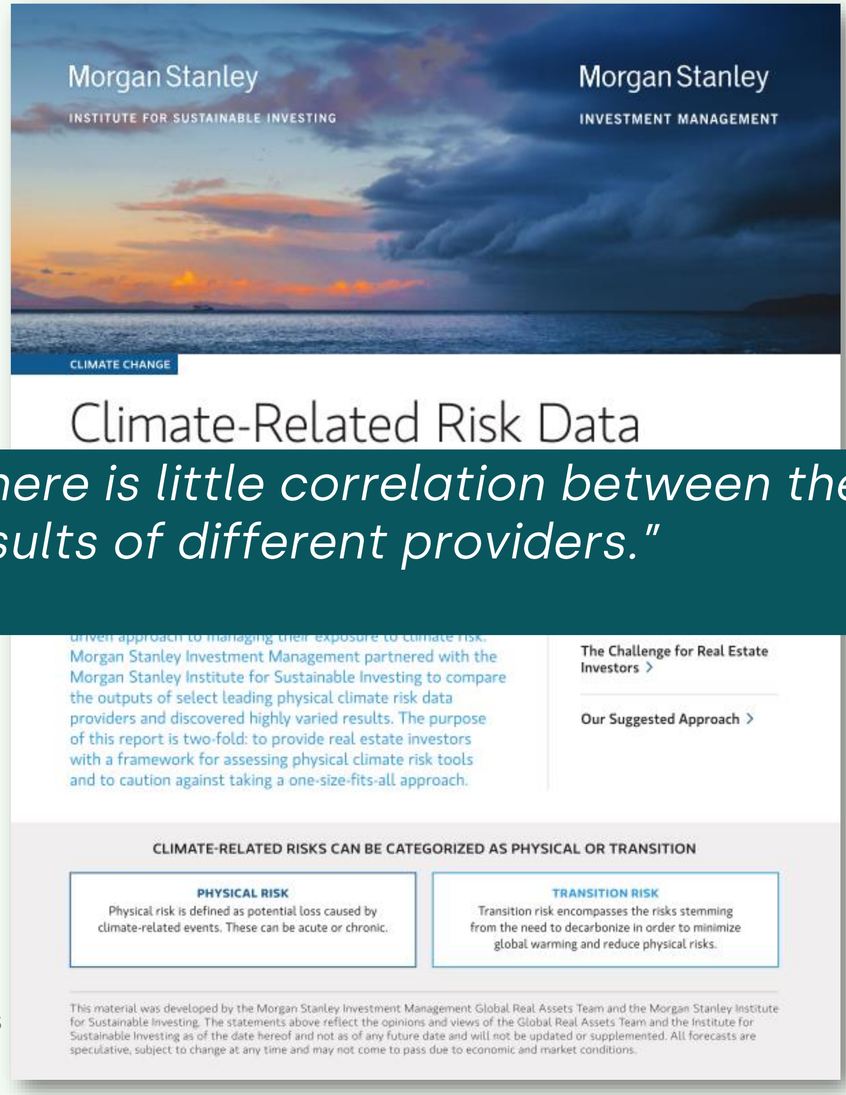
tools have been found to suffer from major limitations[3,4]. CRA requires not only knowledge of the climate change hazards across multiple space and timescales (e.g., likelihood of changes to extreme rain over North America over the next decade), knowledge of the exposures (e.g., location of assets and value chains), and knowledge of the vulnerabilities (e.g., response of communities to drought or response of supply chain to changes in carbon taxes). Crucially, appropriate CRA also requires the ability to integrate all these heterogeneous sources of information—and their associated and unavoidable uncertainties—to evaluate the effectiveness of possible interventions, helping to communicate risk and prioritise investments. From this perspective of integration, we have identified three key constraints on the effectiveness of the current CRAs:

- ***Scope*** – today's CRAs evaluate risks in isolation and do not fully consider compounding or systemic risks.
- ***Data*** – today's CRAs typically use either top–down data that provide global coverage but are not locally robust, or bottom-up data that provide detailed local information but cannot be scaled globally.
- ***Transparency*** – today's lack of commonly accepted methods and principles and the extensive use of 'black-box' approaches to CRA limits trust and the ability to improve, compare and combine the results of different assessments.

[1] Microsoft, Redmond, USA. [2] Walker Institute, University of Reading, Reading, UK. [3] CSIRO, Canberra, Australia. [4] Centre for Climate and Justice, University of Reading, Reading, UK. [5] Department of Meteorology, University of Reading, Reading, UK. [6] Environmental Change Institute, University of Oxford, Oxford, UK. [7] Climate Policy Research, Sydney, Australia. ✉email: aarribas@microsoft.com

"Black box' approaches limit the trust and the ability to improve, compare, and combine the results."

Nature communications (2022)



Morgan Stanley

INSTITUTE FOR SUSTAINABLE INVESTING

Morgan Stanley

INVESTMENT MANAGEMENT

CLIMATE CHANGE

Climate-Related Risk Data

driven approach to managing their exposure to climate risk. Morgan Stanley Investment Management partnered with the Morgan Stanley Institute for Sustainable Investing to compare the outputs of select leading physical climate risk data providers and discovered highly varied results. The purpose of this report is two-fold: to provide real estate investors with a framework for assessing physical climate risk tools and to caution against taking a one-size-fits-all approach.

The Challenge for Real Estate Investors >

Our Suggested Approach >

CLIMATE-RELATED RISKS CAN BE CATEGORIZED AS PHYSICAL OR TRANSITION

PHYSICAL RISK

Physical risk is defined as potential loss caused by climate-related events. These can be acute or chronic.

TRANSITION RISK

Transition risk encompasses the risks stemming from the need to decarbonize in order to minimize global warming and reduce physical risks.

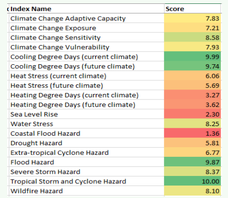
This material was developed by the Morgan Stanley Investment Management Global Real Assets Team and the Morgan Stanley Institute for Sustainable Investing. The statements above reflect the opinions and views of the Global Real Assets Team and the Institute for Sustainable Investing as of the date hereof and not as of any future date and will not be updated or supplemented. All forecasts are speculative, subject to change at any time and may not come to pass due to economic and market conditions.

"There is little correlation between the results of different providers."

Morgan Stanley (2021)

Little correlation in outcomes between different providers

	Dataprovider 1	Dataprovider 2	Dataprovider 3
Inland Flooding	9.87 (Low)	Low	Medium
Drought	5.81 (Medium)	-	Low
Extreme Heat	5.69 (Medium)	Low	Low
Sea Level Rise	**2.30 (High)**	**None**	**High**
Storm/extreme wind	8.37 (Low)	-	High
Earthquakes	-	None	-
Hurricanes & Typhoons	10.0 (None)	None	-
Water Stress	8.25 (Low)	Medium	-
Climate Change adaptive Capacity	7.83	-	-
Climate Change Exposure	7.21	-	-
Climate Change Sensitivity	8.58	-	-
Climate Change Vulnerability	7.93	-	-
Cooling Degree Days (current climate)	9.99	-	-
Cooling Degree Days (future climate)	9.74	-	-
Heat Stress (current climate)	6.06	-	-
Heating Degree Days (current climate)	3.27	-	-
Heating Degree Days (future climate)	3.62	-	-
Coastal Flood Hazard	1.36	-	-
Extra-tropical Cyclone Hazard	6.77	-	-
Wildfire Hazard	8.10	Low	-



Index Name	Score
Climate Change Adaptive Capacity	7.83
Climate Change Exposure	7.21
Climate Change Sensitivity	8.58
Climate Change Vulnerability	7.93
Cooling Degree Days (current climate)	9.99
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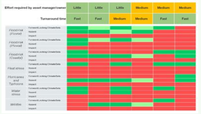
Drought Hazard	5.81
Extra-tropical Cyclone Hazard	6.77
Flood Hazard	9.87
Severe Storm Hazard	8.37
Tropical Storm and Cyclone Hazard	10.00
Wildfire Hazard	8.10



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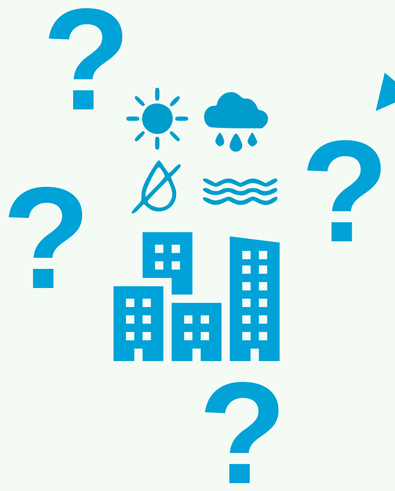
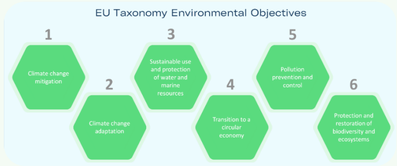
apg

EU strengthens regulations for companies: climate risk analyses become mandatory



Corporate Sustainability Reporting Directive (CSRD)

Sustainable Finance Disclosure Regulation (SFDR)



Taxonomy Regulation (EU Taxonomy)

Task Force on Climate-Related Financial Disclosures (TCFD)

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Framework for climate adaptive buildings

www.dgbc.nl/framework-climate-adaptive-buildings-259

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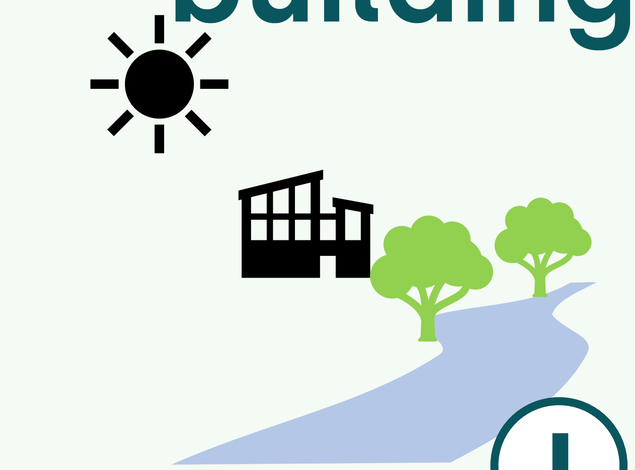
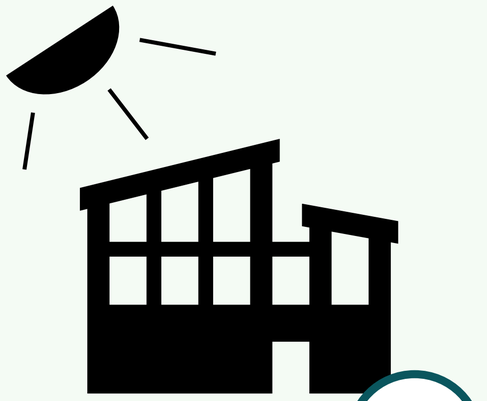
Framework for climate adaptive buildings



I

Building environment score

Estimating the climate effects on the **surroundings of a building**

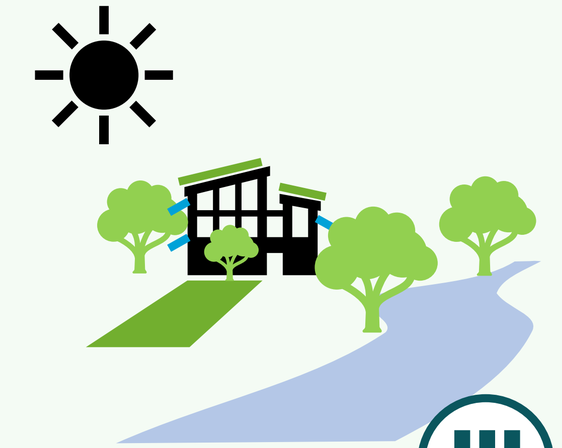


II

Building score

Estimating the **vulnerability** of a building to various climate effects, by looking at **building-specific properties**

Climate Risk score



III

Measures

Defining and implementing **measures** that reduce risk

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Framework for climate adaptive buildings

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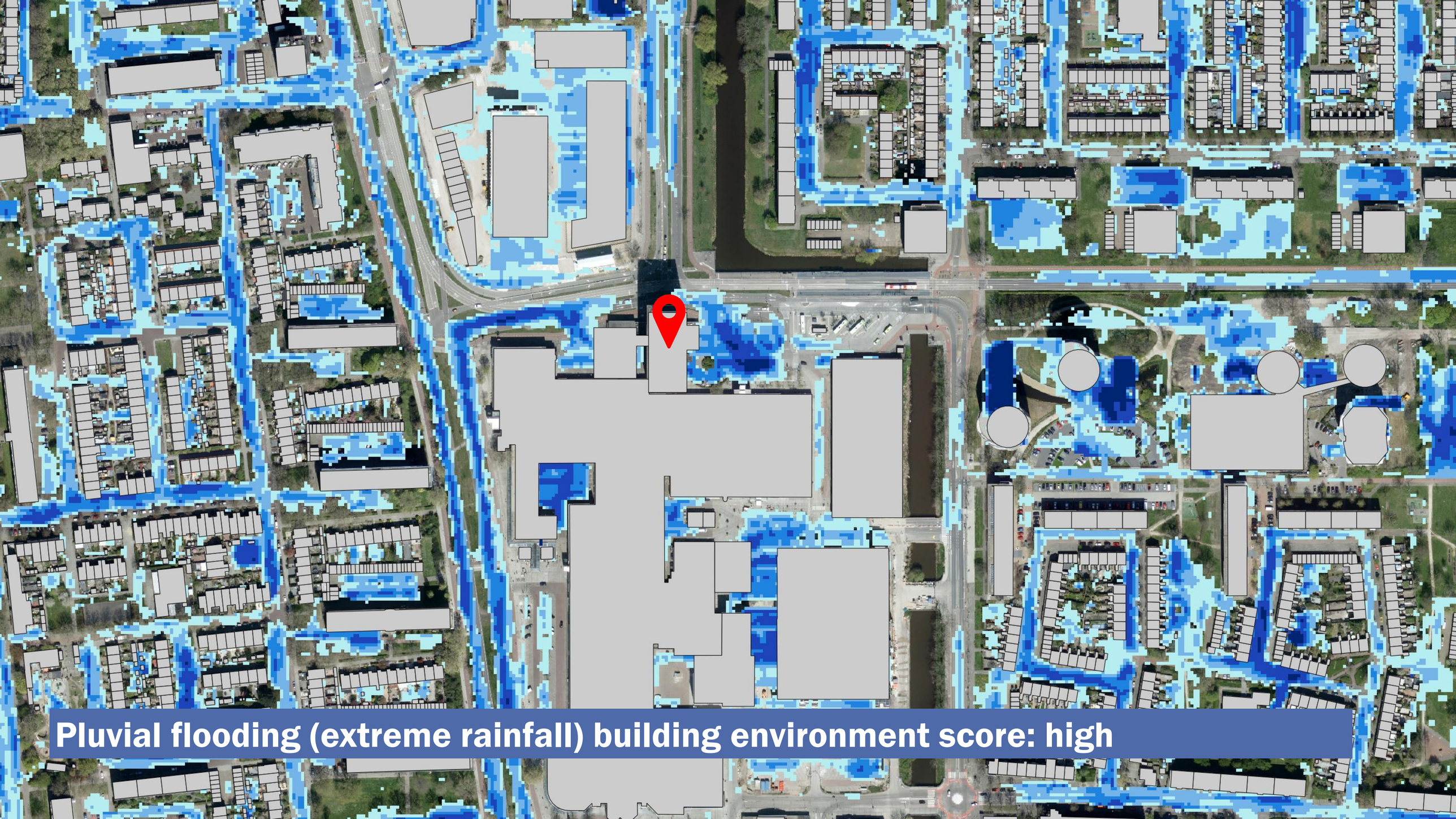
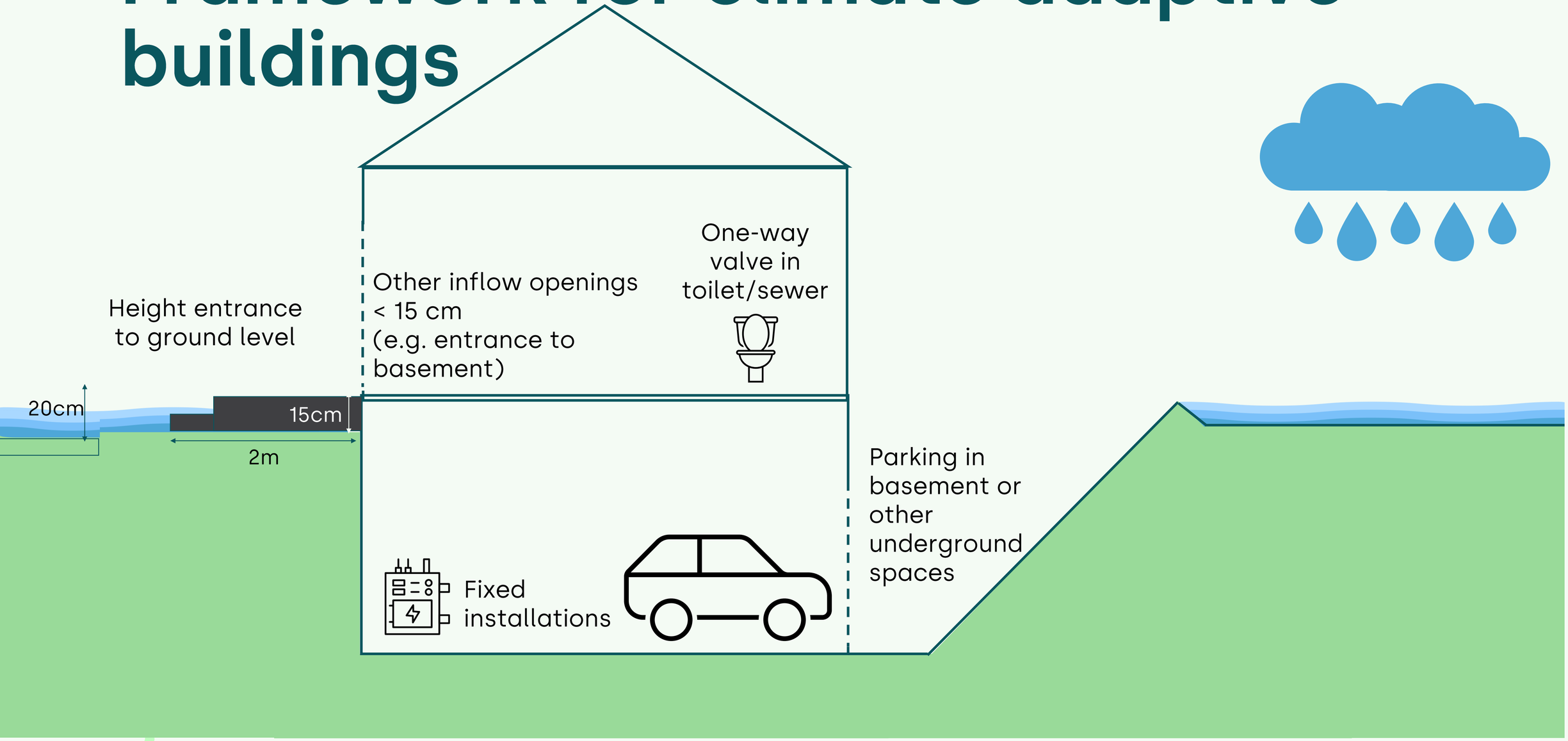
www.l1nieuws.nl – May 3rd 2024


Pluvial flooding (extreme rainfall) building environment score: high

Framework for climate adaptive buildings



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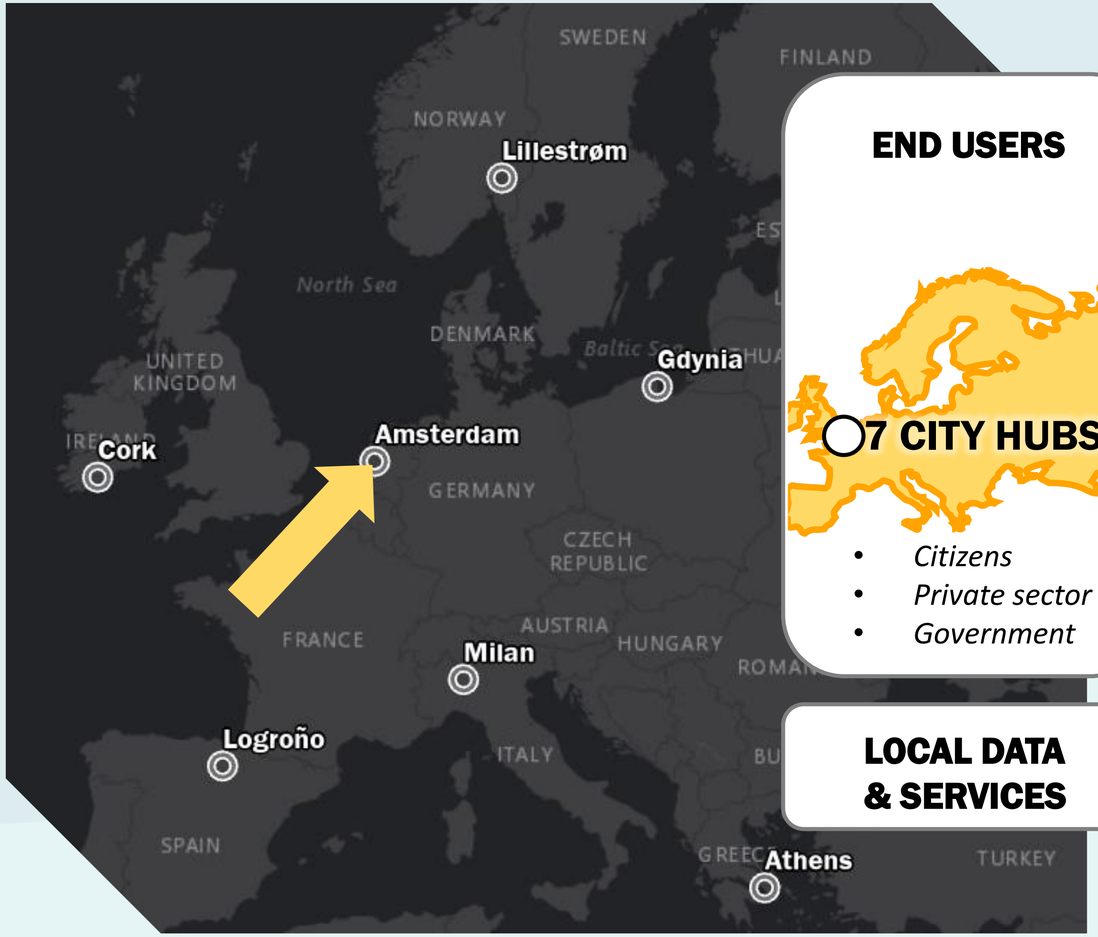
reachout-cities.eu



END USERS

7 CITY HUBS

- *Citizens*
- *Private sector*
- *Government*

LOCAL DATA & SERVICES

TRIPLE-A ADAPTATION TOOLKIT

ANALYSIS

AMBITION

ACTION

EU DATA & SERVICE PLATFORMS

Copernicus Europe's eyes on Earth
Climate Change Service
GEOSS Global Earth Observation System of Systems
esa

NATIONAL DATA & SERVICE PLATFORMS

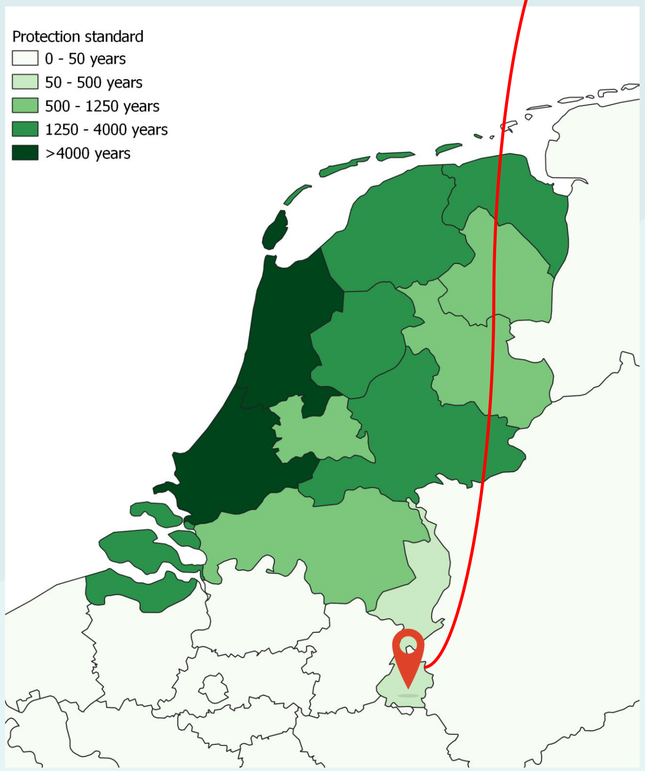
REGIONAL DATA & SERVICE PLATFORMS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036599.

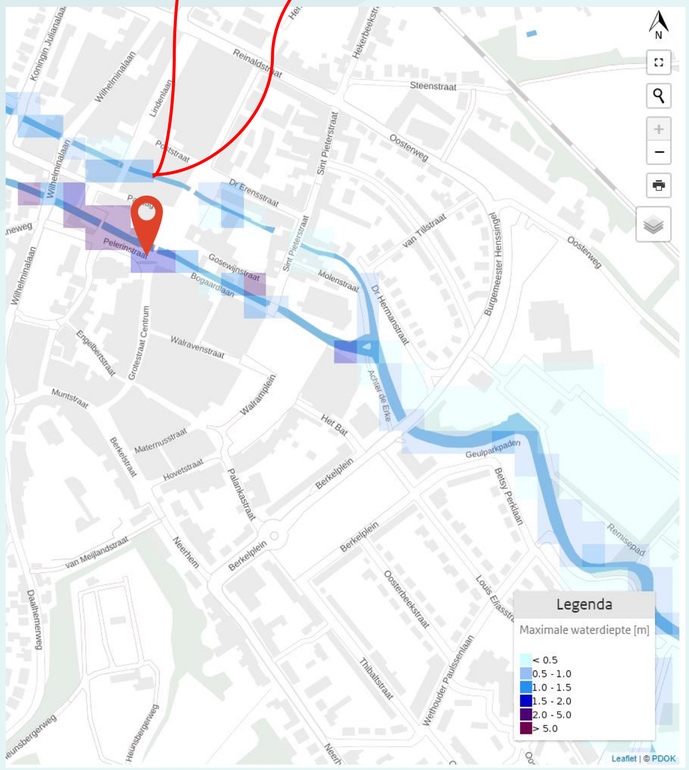
REACH OUT

Real Estate Asset Climate Testing (REACT) Tool

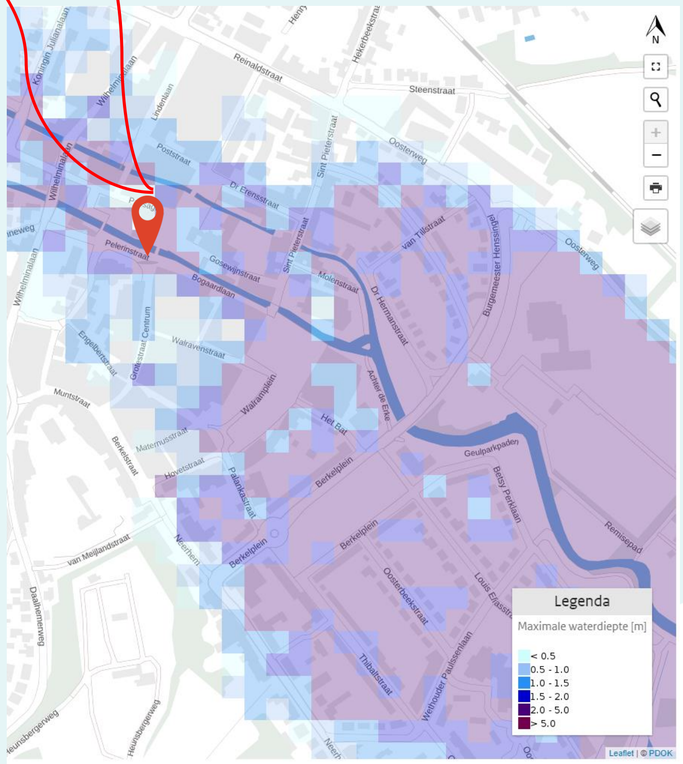
Asset	Country	Protection Standard	Start Probability	Start Water Level	Max Probability	Max Water Level	Size		
(name or number)	(dropdown)	(years)	(years)	(m)	(years)	(m)	(m2)	Risk (euro/yr)	
Lunchroom	Netherlands	250	10	1.8	1000	3.2	100	233	



Flood protection standards (FLOPROS)



1/10 year flood map (LIWO)*



1/1000 year flood map (LIWO)*

*Other options are: JRC or WRI

Call to action:
Work towards a level playing field for the disclosure of climate risk for real estate

Testing

Public release

DOI: 10.5281/zenodo.8333518

Are you interested in applying the tool?

Can you help us scale up?
Upscaling is of great interest, as many investors have assets in multiple countries

Thank you for attention

Please contact us:

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REACH OUT

shaping climate resilient cities

reachout-cities.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036599.