



# **WELCOME** TO THE ULI COASTAL FORUM

Toronto | May 17, 2023



SPRING MEETING



**Cam Collyer**

Principal, People and Place  
Consulting



**Charles Ormsby**

Sustainability and Climate  
Services Leader, Arup Canada



**Brandon Palin**

Senior Director, Public Sector  
& International Development,  
Ecopia



**Moderator: Sara Neff**

Head of Sustainability,  
LendLease

**Measuring  
Performance  
and Incentivizing  
Resilience in  
Coastal  
Communities**



# “Sponginess!”

## Global Sponge Cities Snapshot

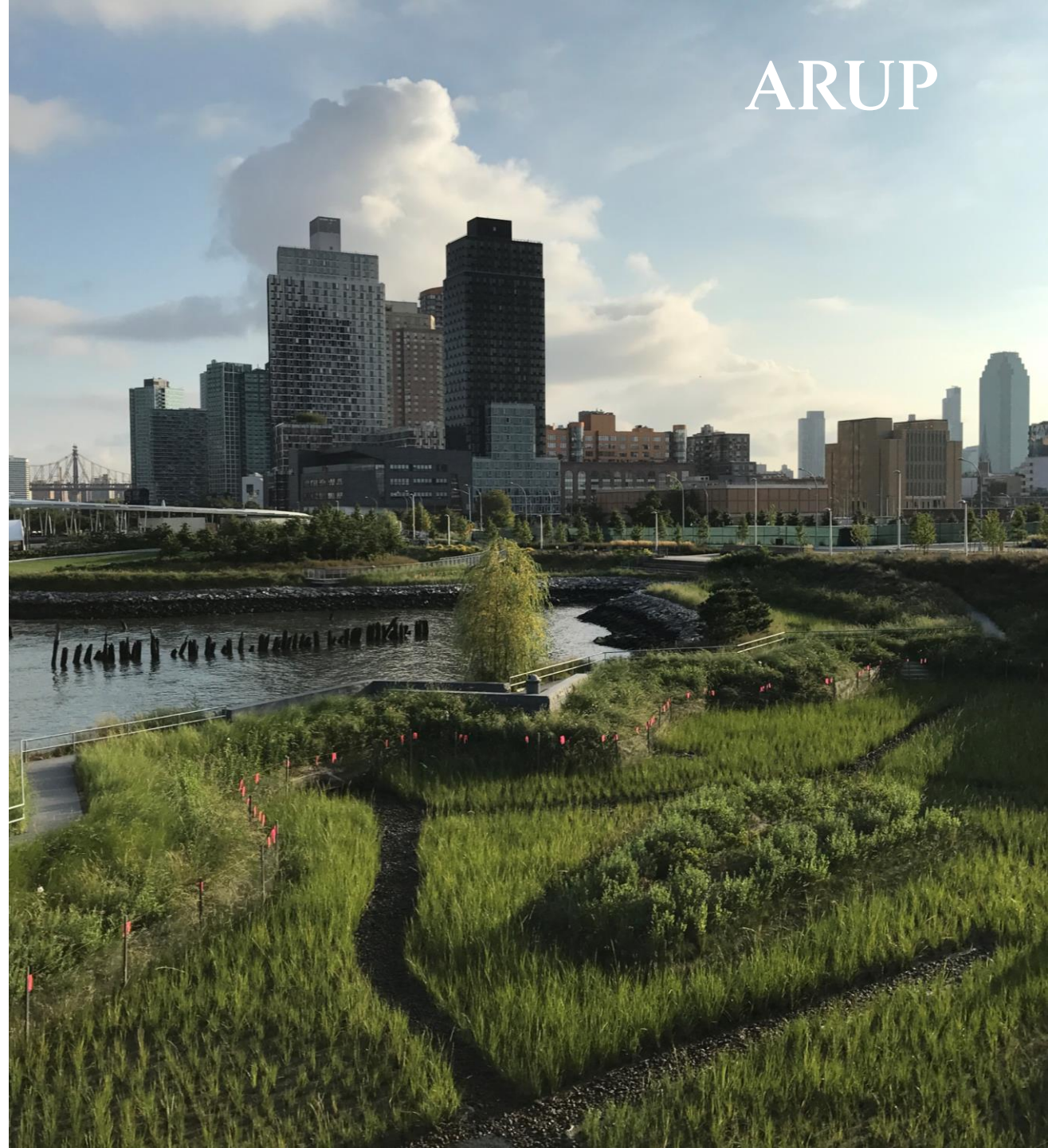
**Chuck Ormsby, PEng ENV SP**

**Climate and Sustainability Services Leader**

**Arup Canada**

May 17, 2023

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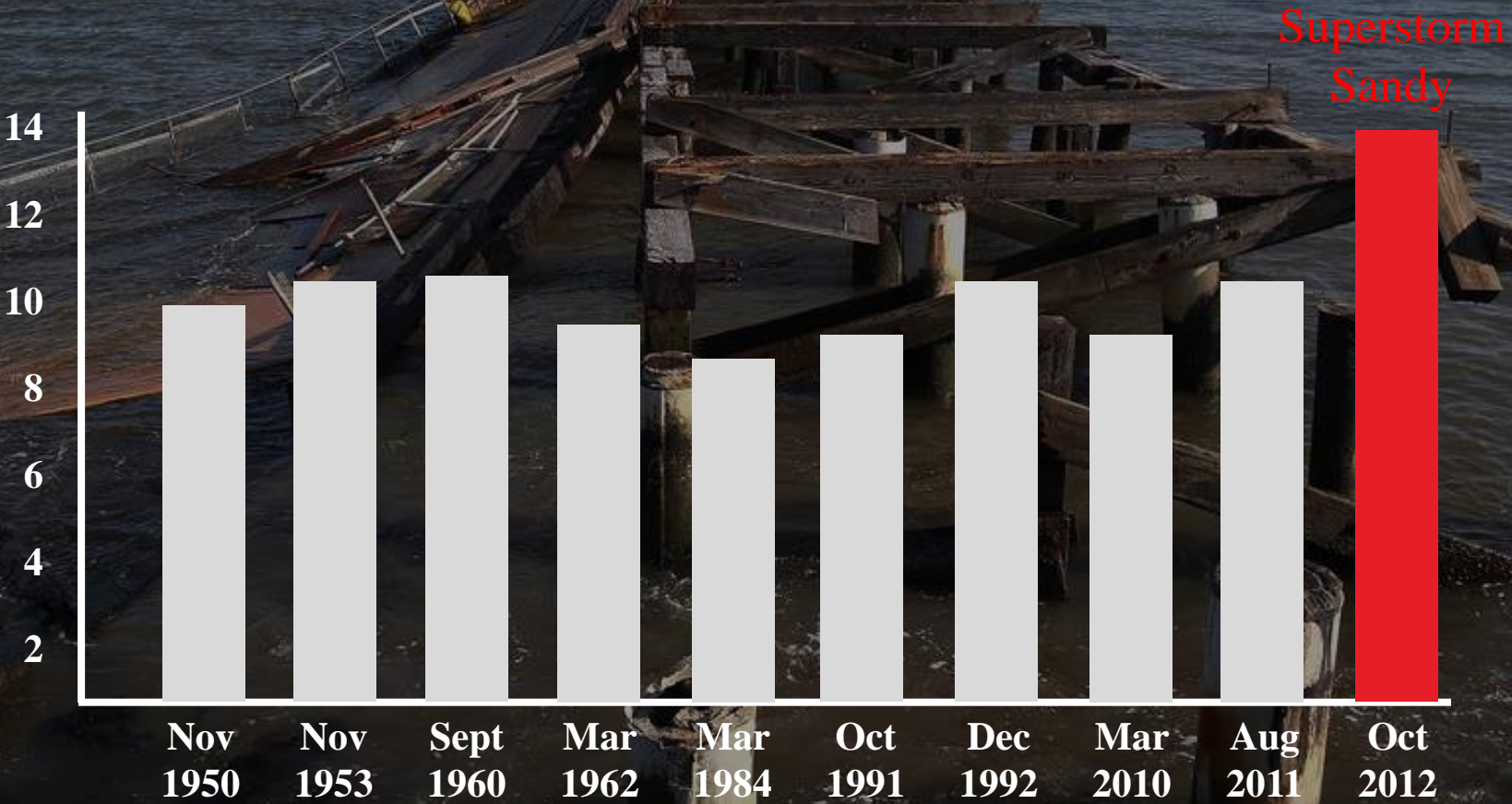
The United Nations' Intergovernmental Panel on Climate Change (IPCC) predicts that water-related risks will increase with every degree of global warming, with around 700 million people currently living in regions where maximum daily rainfall has increased. New York is expected to face a 4-11% increase in its average rainfall, as well as rising sea levels of 11in to 21in, by the 2050s.



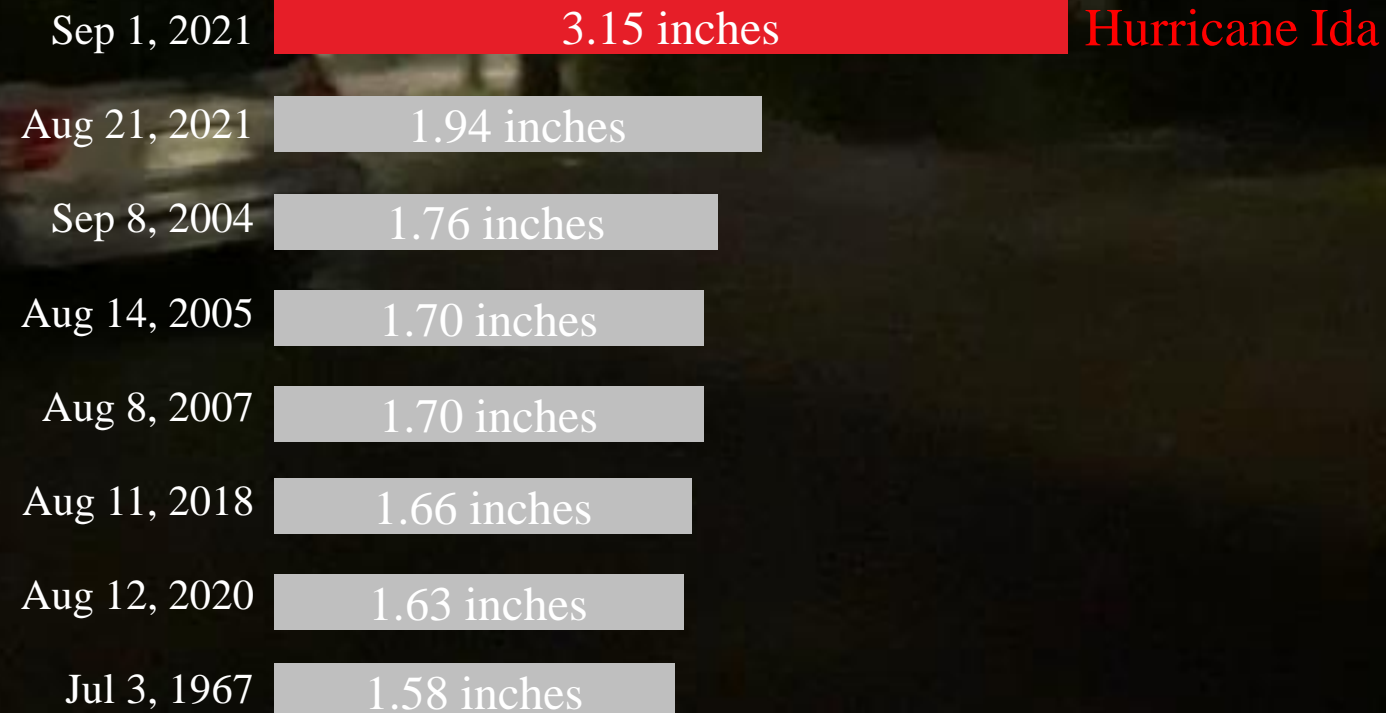




# Sandy smashes previous NYC storm surge records



# Ida smashes previous NYC rainfall records







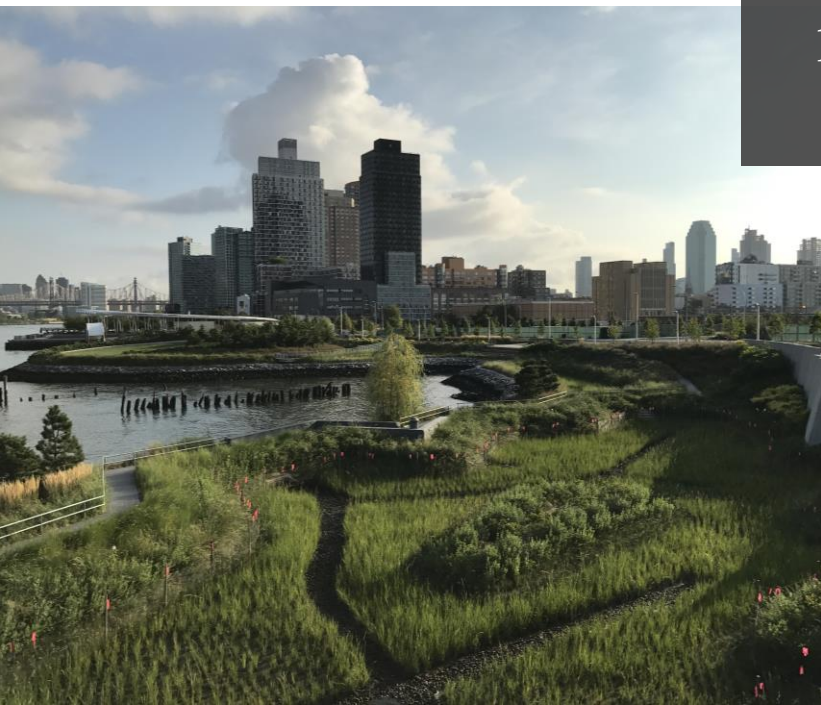








Arup have designed 974 green infrastructure practices managing 12 million liters of stormwater runoff from 36 hectares in NYC





“Urban blue + green streets cut pollution & clean the environment”

**Sustainable Stormwater Management**  
**A Green Street Project**

Plants and mulch in a stormwater planter help filter and clean runoff from the street. The plants also help absorb some of the water, reducing the amount that flows into the stormwater system. The City of Seattle is installing stormwater planters on city streets to help reduce pollution and improve water quality. The City is also installing permeable pavement in some areas to help absorb water and reduce runoff.

Street runoff flows through curb cuts into these stormwater planters. The flow slows while plants filter and clean the stormwater, which then soaks into the ground. During very heavy rain, some water will flow back into the street and into the next stormwater planter. Water that flows out of the last planter will drain into the street side.

Project supported by  
2002-07

Seattle Department of Public Works  
2002-07

Seattle Department of Public Works  
2002-07





“Urban green + blue creates better microclimates, cooling and shade”

THOMAS AM, PUGH A, MACKENZIE R, WHYATI JD, (2012)  
‘EFFECTIVENESS OF GREEN INFRASTRUCTURE’  
(LANCASTER ENVIRONMENT CENTRE)



“A green + blue environment stimulates better physical health”





Using digital tools to understand the natural absorbency of cities to cope with increasingly heavy rainfall



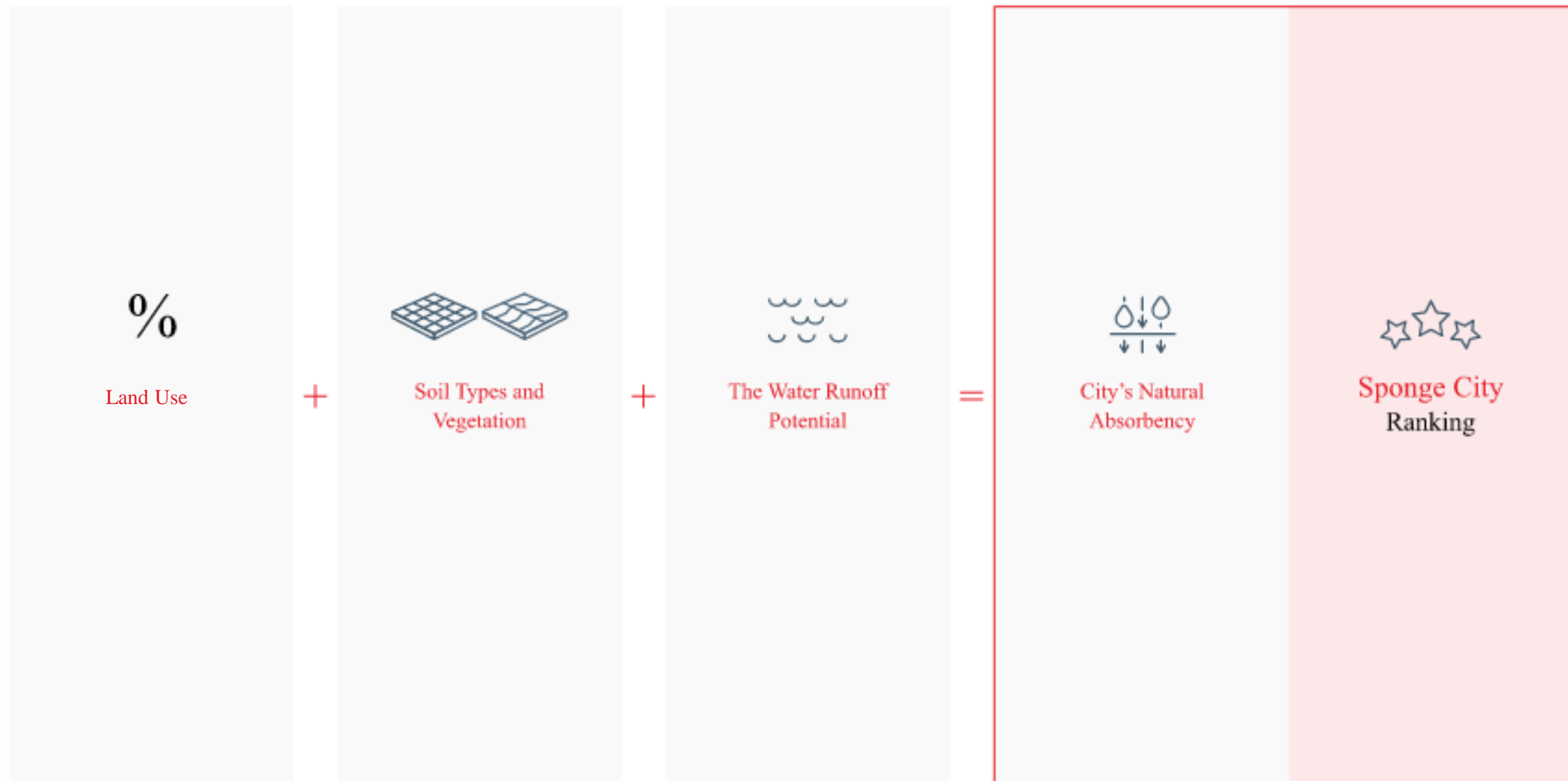




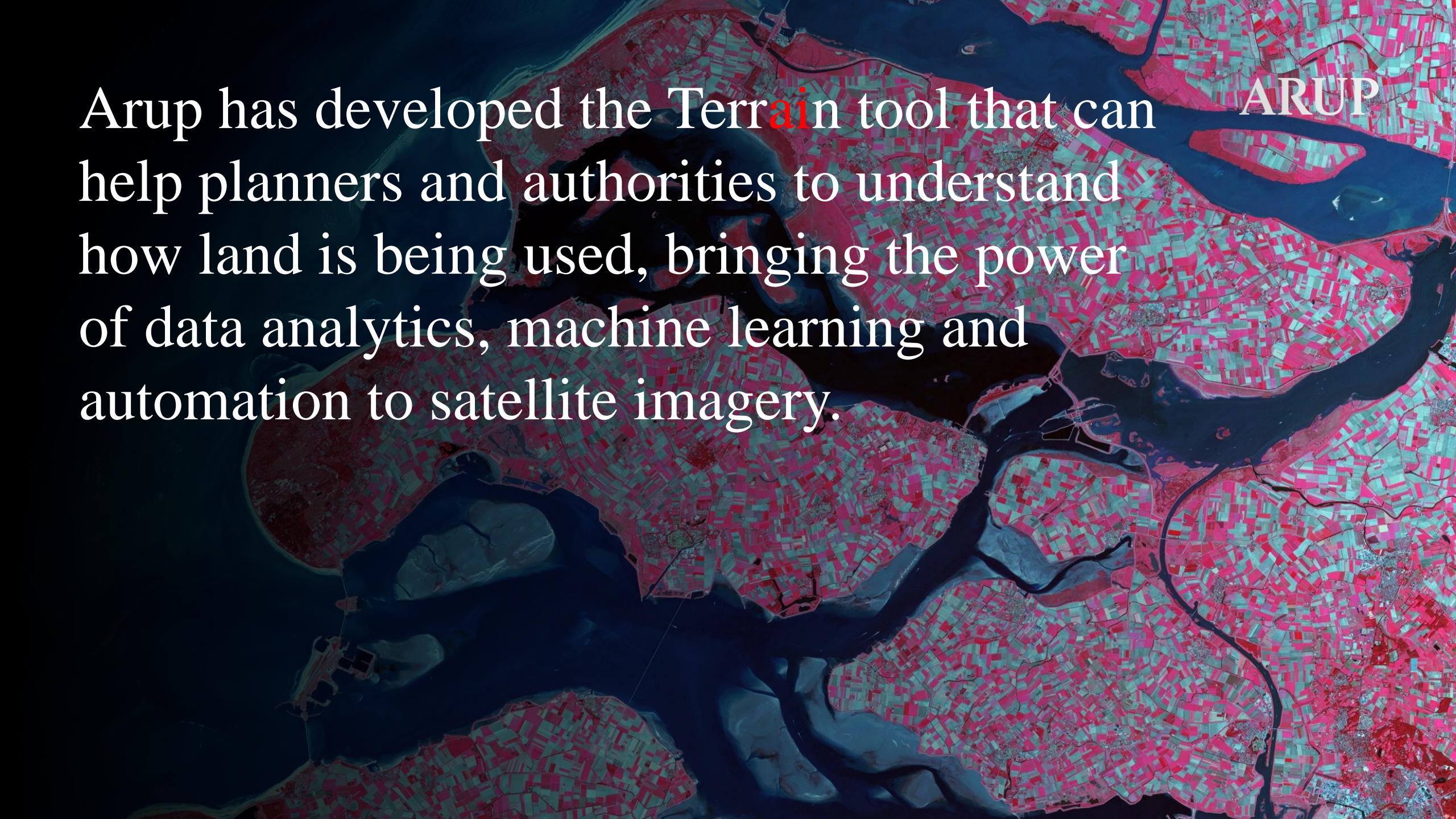
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# Arup Global Sponge Cities Snapshot









Arup has developed the Terrain tool that can help planners and authorities to understand how land is being used, bringing the power of data analytics, machine learning and automation to satellite imagery.

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The snapshot is aimed at getting cities thinking more about nature as an asset, as infrastructure – to be protected and enhanced.



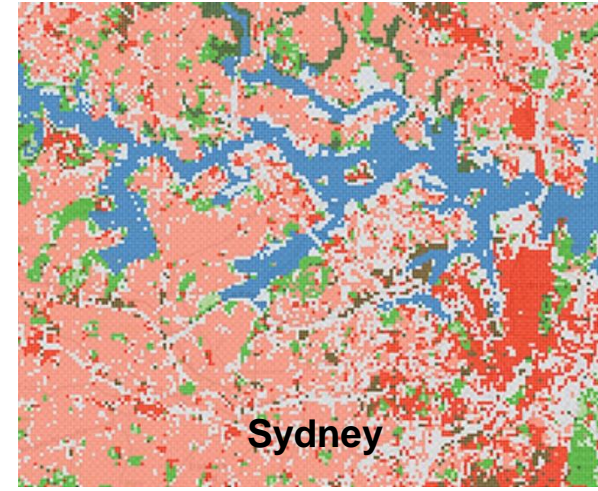
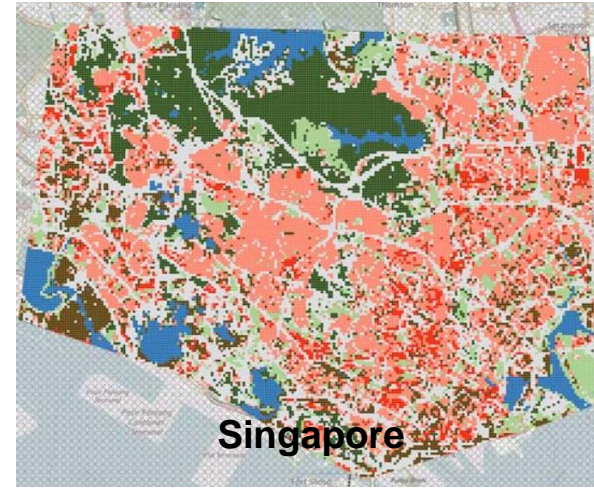
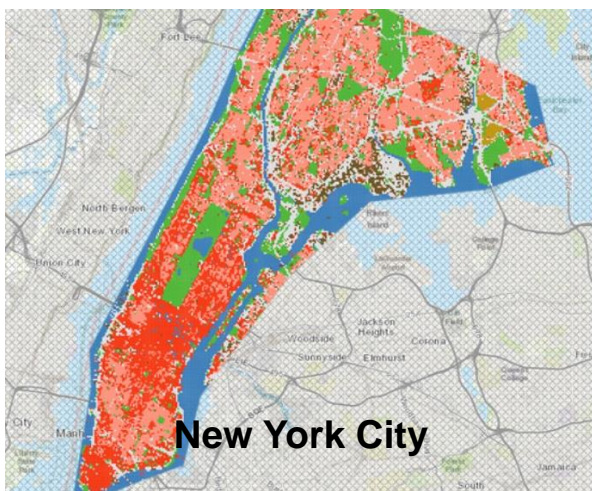
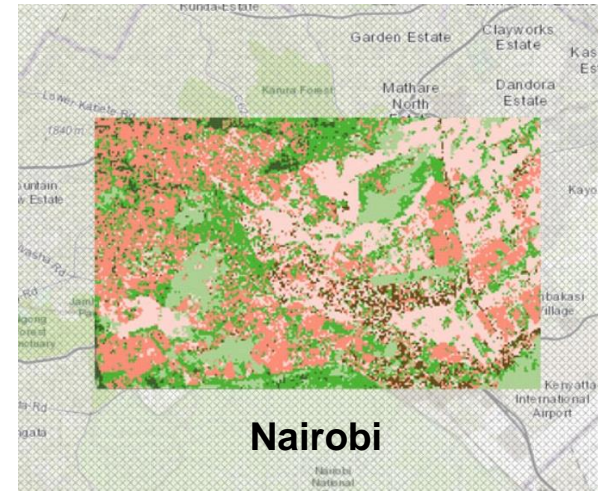
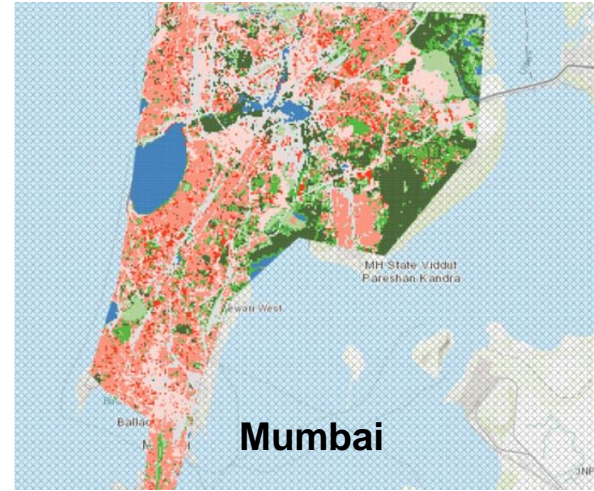
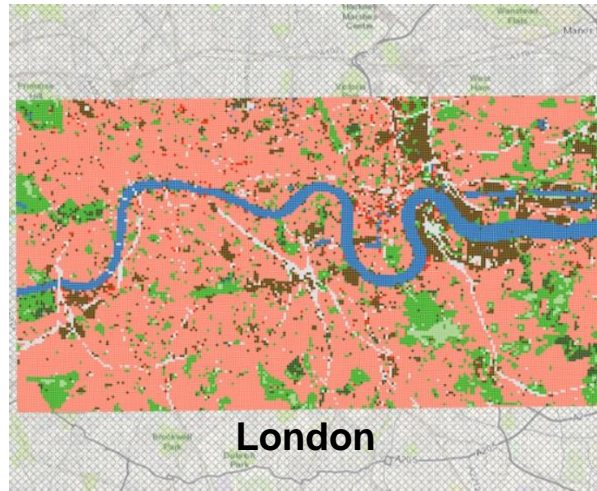
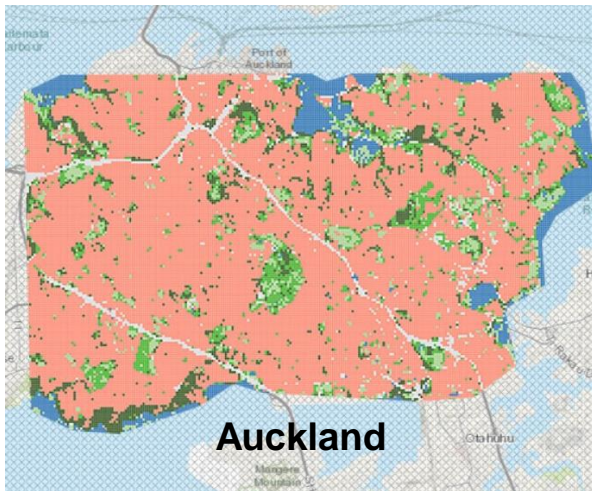




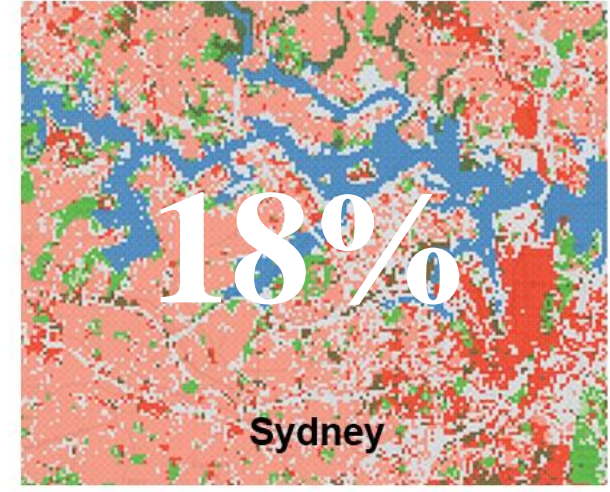
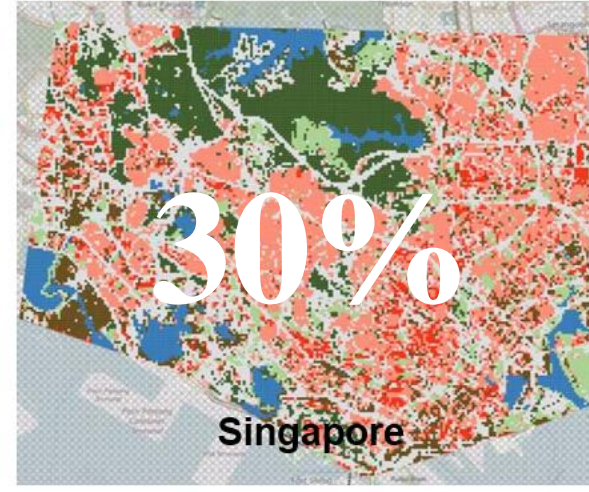
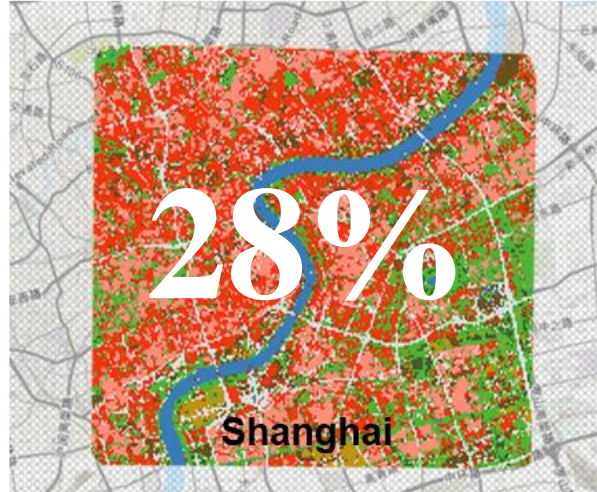
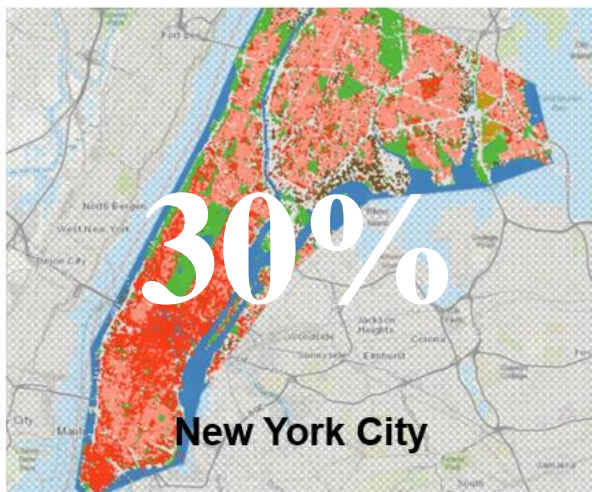
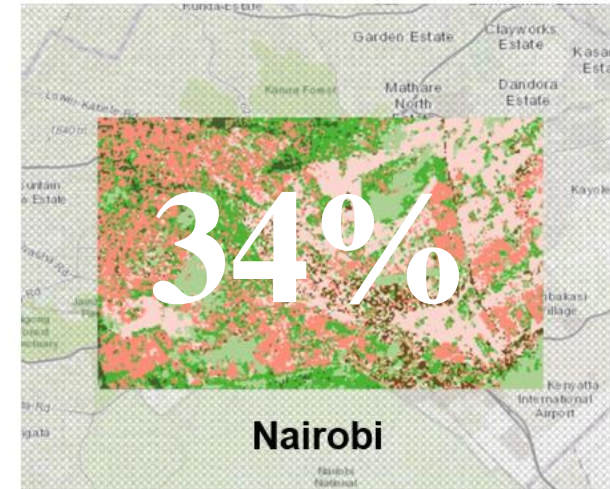
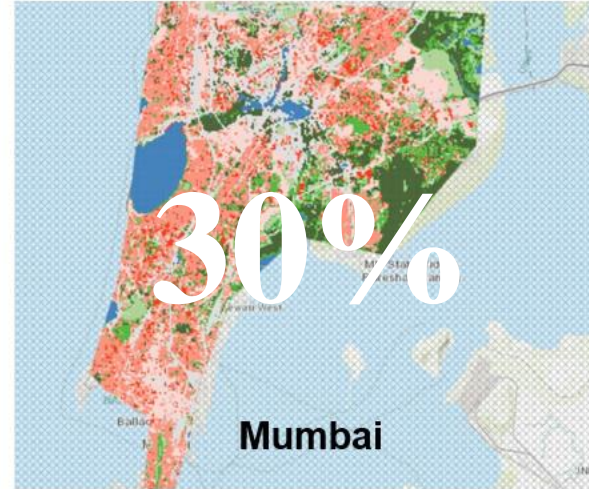
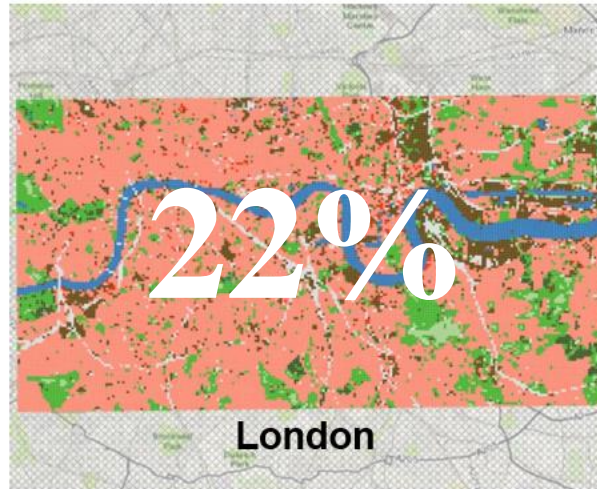
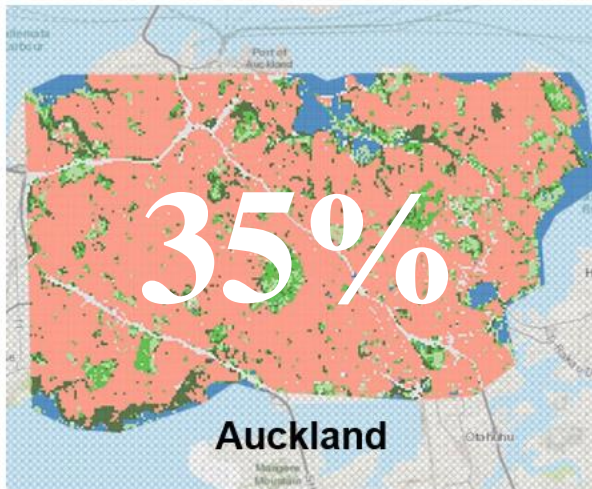












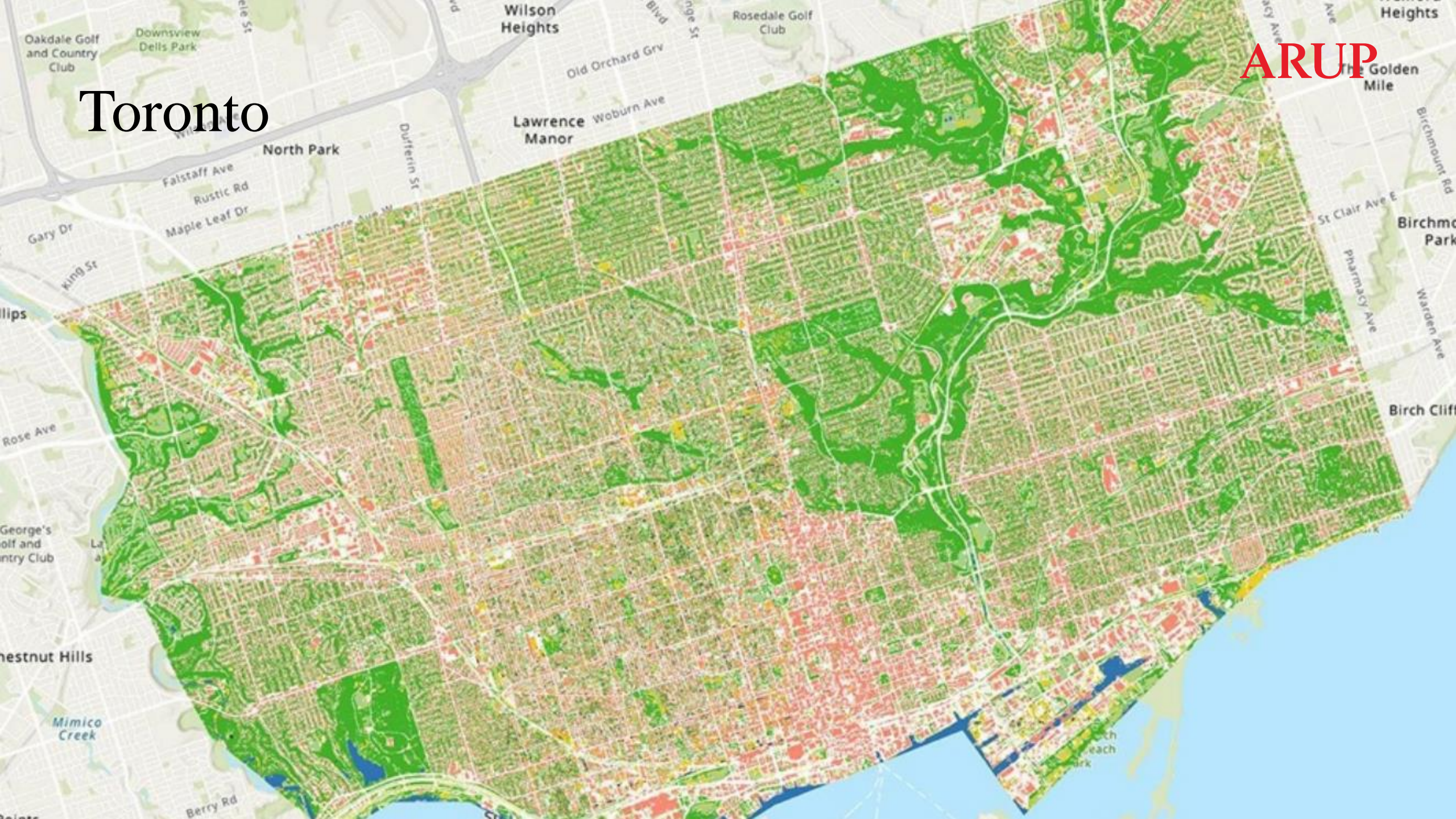


City	Sponge Ranking	Overall % 'sponginess'	Green-Blue Area %	Soil Classification and Runoff Potential	Notes
Auckland	1	35%	50%	Moderately-high runoff potential (<60% sand and 10-20% clay)	
Nairobi	2	34%	52%	High runoff potential (<50% sand and >40% clay)	Shallow soils and depth to bedrock
Singapore	3	30%	45%	Moderately-high runoff potential (<60% sand and 20-50% clay)	
Mumbai	3	30%	45%	High runoff potential (<50% sand and 20-40% clay)	shallow soils and water table and/or depth to bedrock
New York City	3	30%	39%	Moderately-low runoff potential (40-70% sand and <10% clay)	
Toronto	3	30%	39%	Moderately-high runoff potential (<50% sand, 20-40% clay)	
Montreal	4	29%	36%	Moderately-high runoff potential (<50% sand and 20-40% clay)	
Shanghai	5	28%	33%	Moderately-high runoff potential (<50% sand and 20-40% clay)	
London	6	22%	31%	Moderately-high runoff potential (<50% sand and 20-40% clay)	
Sydney	7	18%	24%	Moderately-high runoff potential (>60% sand, 10-30% clay)	



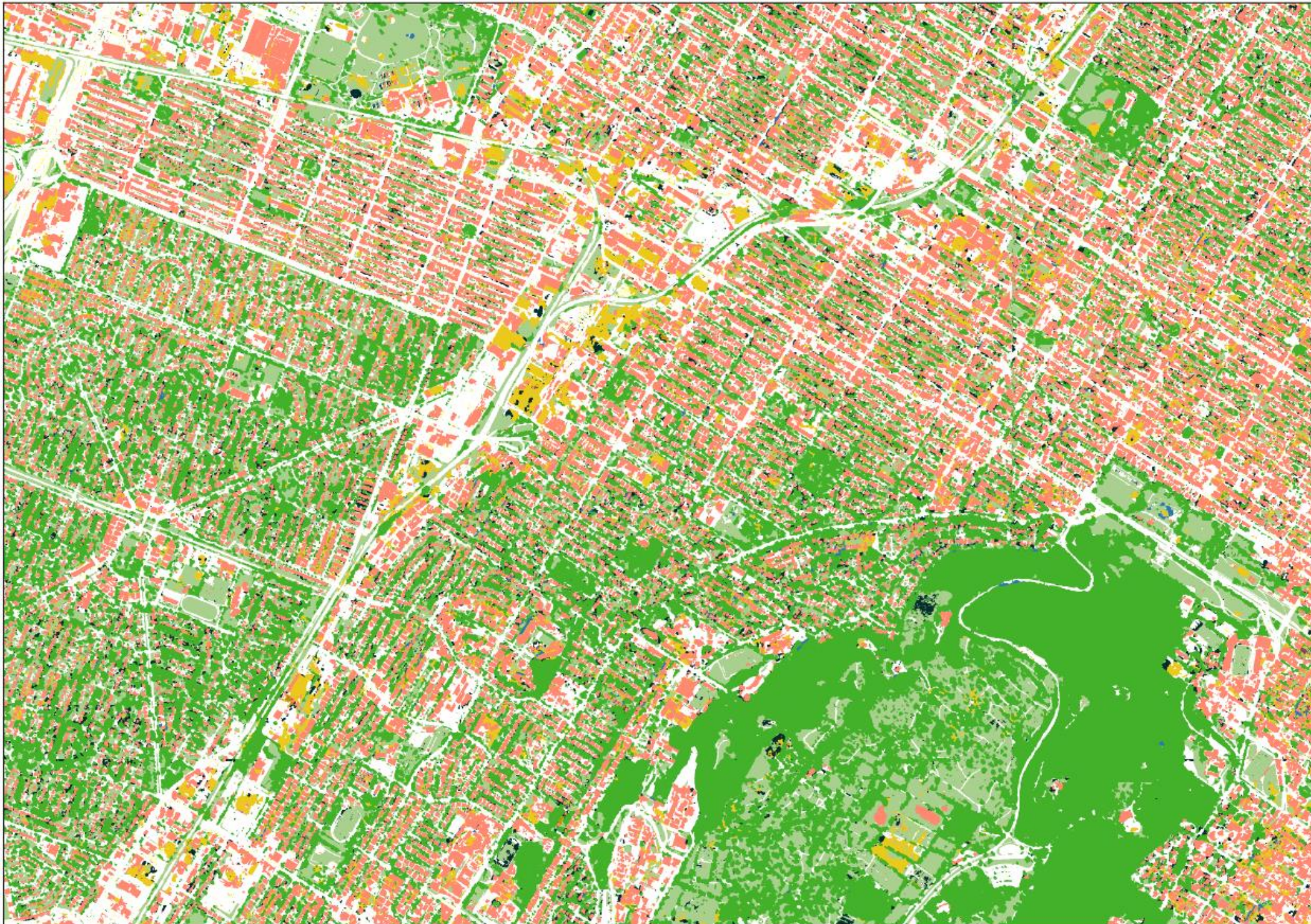
# Toronto

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