Item 9

Green Infrastructure Research Update

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Presentation contents

- Climate change risk to GM’s green infrastructure (GI)
- Update on the GM GI Explorer
- Recommendations

Blackheath, London, August 2022. Source: PA Wire / PA Images

Greenwich, London, August 2022. Source: https://www.bbc.co.uk/news/uk-62432844

Richmond Park, London, August 2022. Source: Malcolm Park / Alamy

Richmond Park, London, August 2022. Source: https://www.bbc.co.uk/news/uk-62432844

Climate change projections for Greater Manchester

Variable	2050s high emissions scenario - 50th percentile projection
Annual mean temperature	+ 2.4 °C
Warmest day in summer	+ 3.1 °C
Summer mean precipitation	-20%
Winter mean precipitation	+ 14%

Projected changes to Greater Manchester's climate relative to 1961-1990. (Source: Cavan 2011)

There is also an increased risk of extreme weather events across the year.

Exposure of GM's grassed areas to low water availability in June 2018

- Model suggest that much of GMs grassed areas were water stressed in June 2018.
- Grasses react to water stress by firstly curling up to reduce leaf surface area, then slowly wilting and ultimately turn to brown dry grass.
- The capacity of these grassed areas to provide cooling functionality was therefore lost.

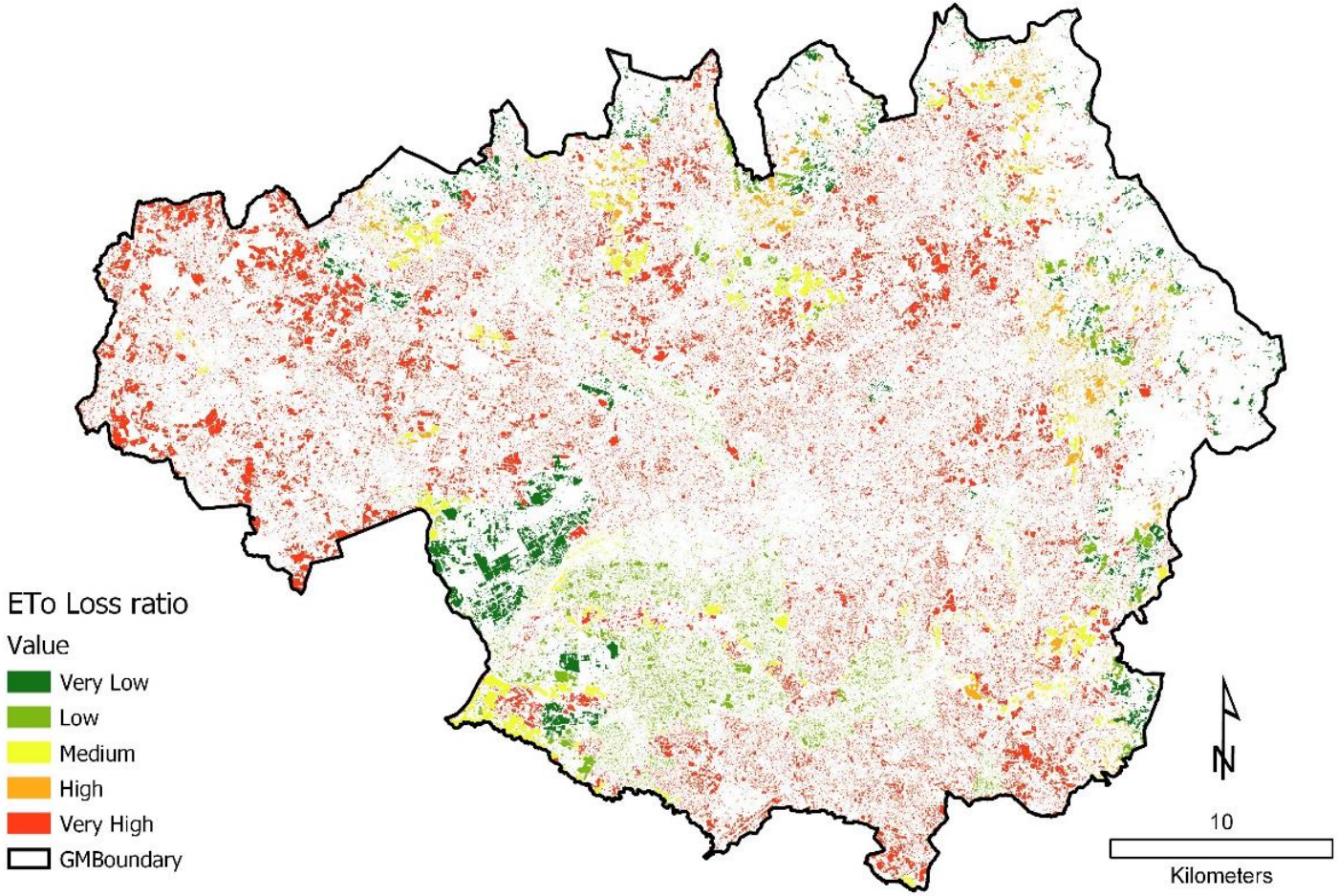


Figure 2: Evapotranspiration (Eto) loss ratio for grassed areas across Greater Manchester for June 2018. (Source: Carter et al 2024)

Risk to GM's grassed areas from low water availability in June 2018

- Clear spatial variation in extent of risk.
- Sensitivity and adaptive capacity factors moderate and/or intensify risk.
- Spatial variation in risk level is driven by:
  - Soil type
  - Extent of built environment (& potential for water infiltration to soils)
  - Degree to which groundwater is accessible (by depth from surface)

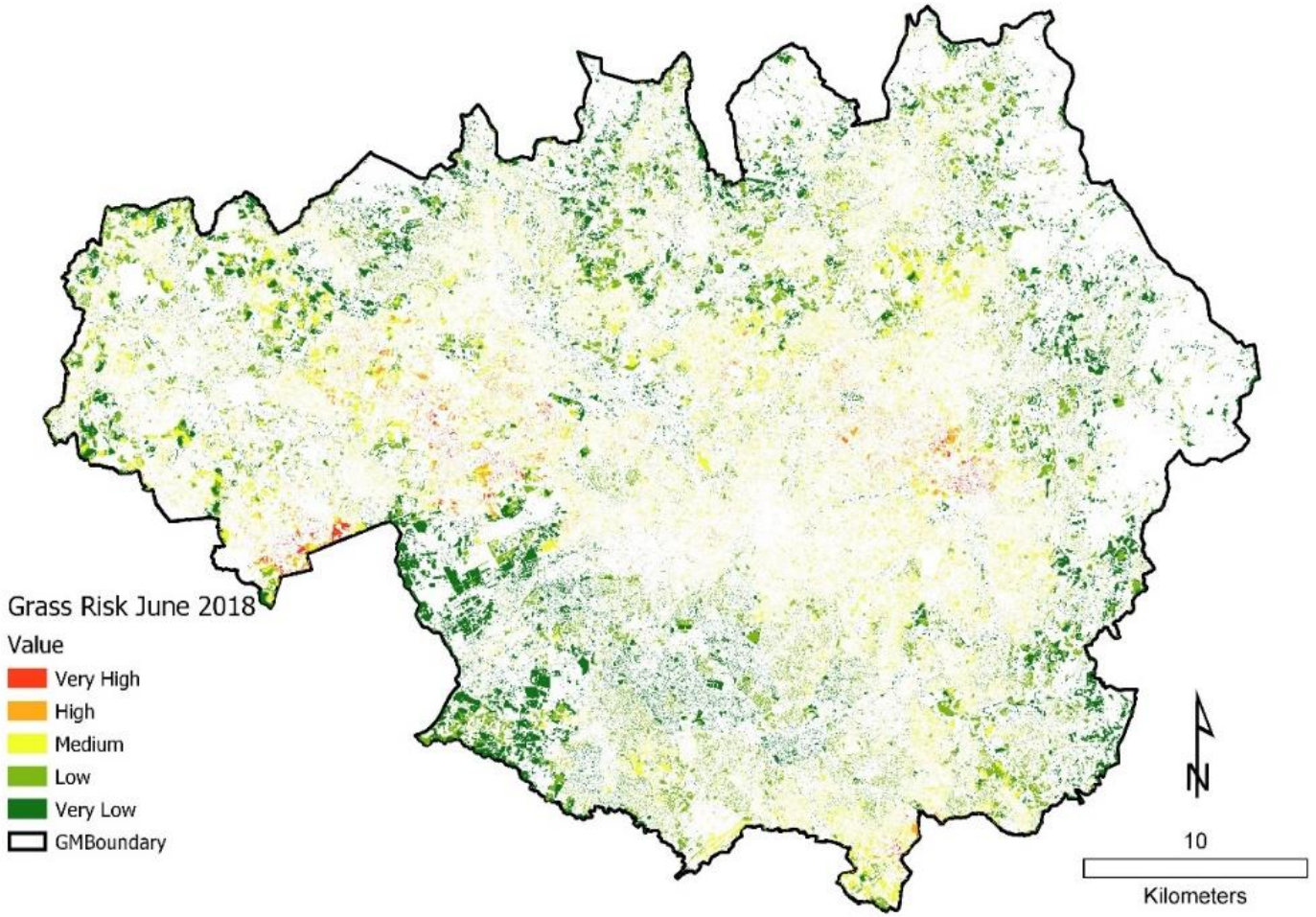


Figure 3: Risk to Greater Manchester's grassed areas from low water availability conditions in June 2018. (Source: Carter et al 2024)

Socioeconomic inequalities concerning access to high functioning GI resources

- Grass patches located within neighbourhoods with higher levels of deprivation often have higher average risk values than grass patches located within less deprived areas.
- These results align with socioeconomic inequality concerning access to high functioning urban GI resources.

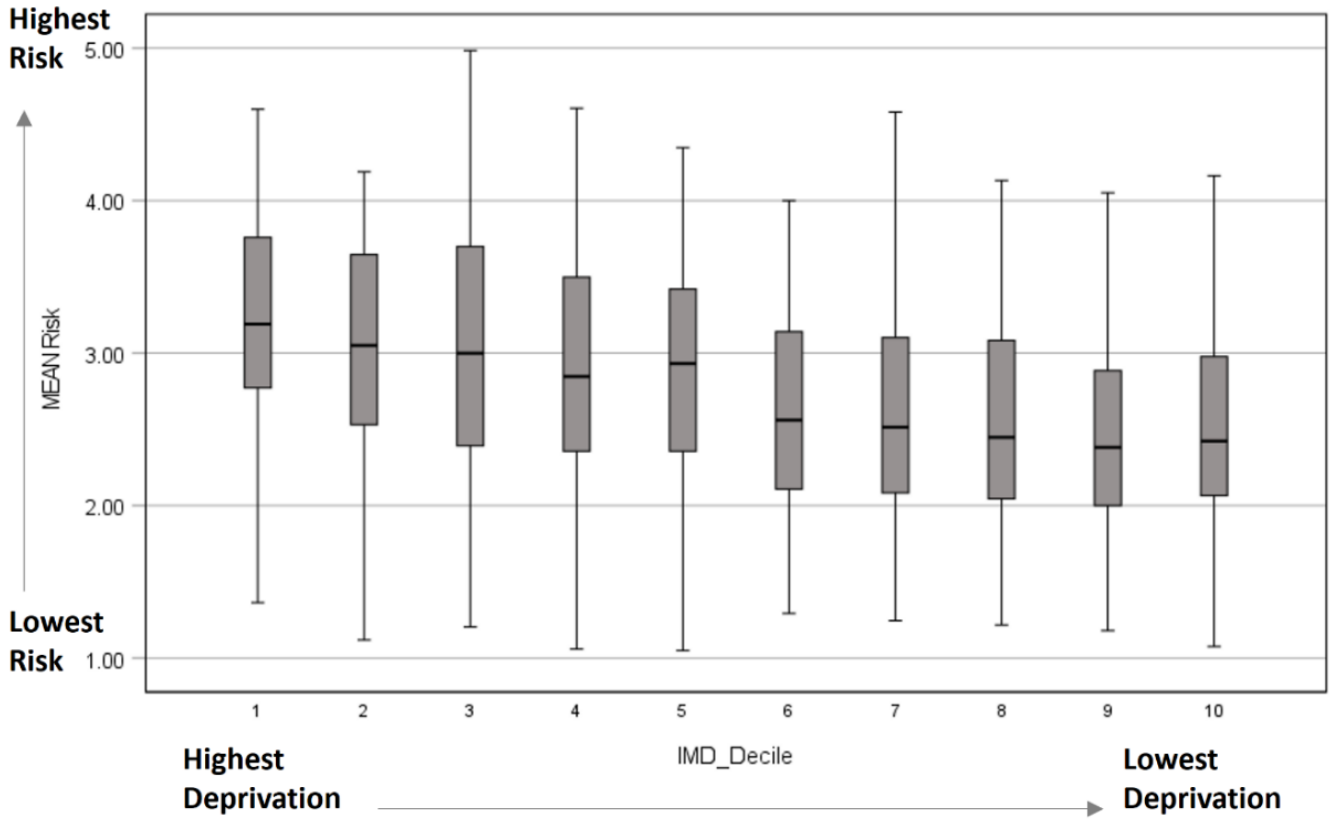


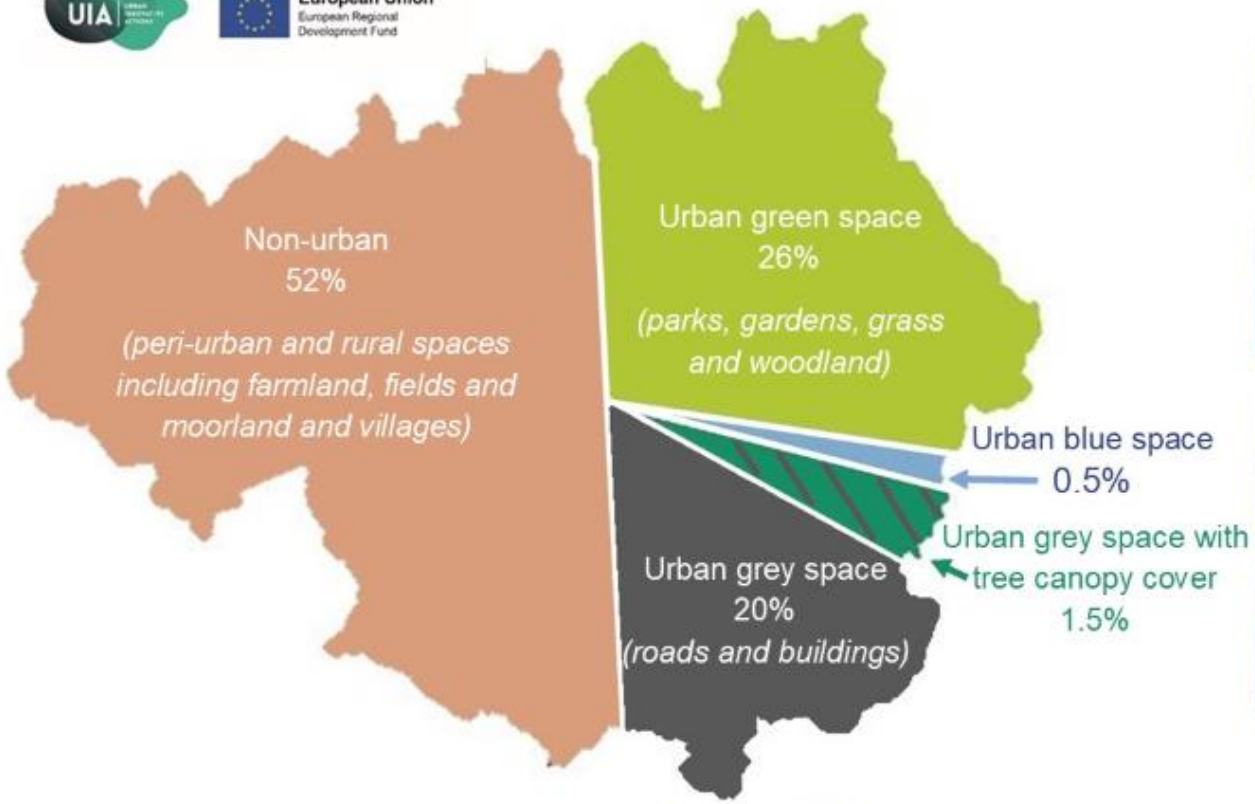
Figure 4: Average risk values for grass patches located in neighbourhoods with varying socioeconomic deprivation levels. (Source: Carter et al 2024)

Greater Manchester urban green infrastructure

the ignition PROJECT
NATURE-BASED SOLUTIONS TO THE CLIMATE EMERGENCY

UIA

European Union
European Regional Development Fund



Around half of Greater Manchester is considered to be urban

Over half of Greater Manchester's urban areas are green or blue spaces

About half of this urban green space is private gardens and will include some grey areas

18% of Greater Manchester's urban areas have tree canopy cover

Further details of urban GI baseline available at **ignitionGM.com**

University of Manchester 2020

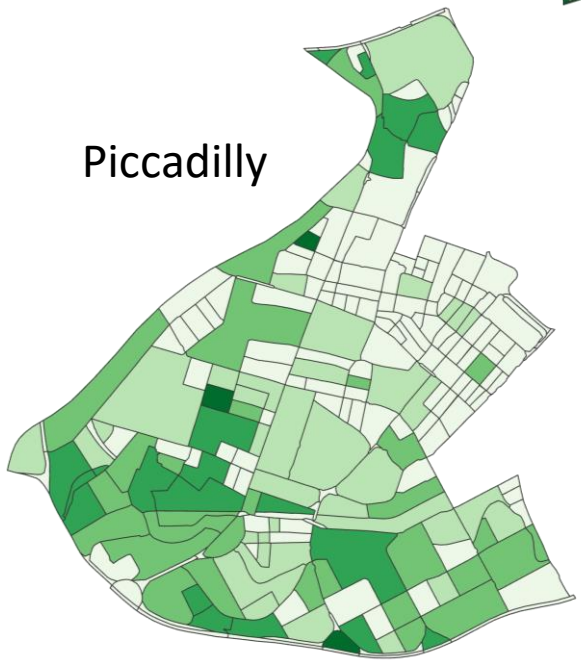
Update on the GM GI Explorer

Brief overview of GM GI Explorer:

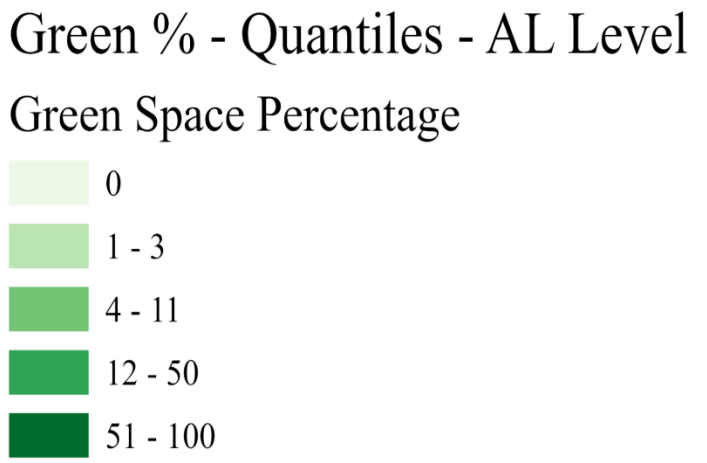
- Functions
- Innovations
- Potential applications
- Next steps

Ward level green space analysis

Gorse Hill



Piccadilly



Recommendations

Climate change risk to GI

- Take note that climate change is a risk to GM's GI and can compromise the functions provided by GI under certain weather conditions.
- Encourage the consideration of responses to lessen climate change risk when designing new urban GI (e.g. planting strategies, irrigation opportunities etc), particularly in areas where 'need' for GI is greatest.

The GM GI Explorer

- Take note that the GM GI Explorer remains in development, and that the University of Manchester is aiming to engage with GM colleagues on this resource over the coming months.
- Consider how the GM GI Explorer could support GI-related activity in GM.

References

- Carter, J.G., Labib, S.M., Mell, I. 2024. Understanding and Assessing Climate Change Risk to Green Infrastructure: Experiences from Greater Manchester (UK). *Land*, 13 (5), 697.
- Cavan, G. 2011. Climate Change Projections for Greater Manchester. EcoCities Project, University of Manchester.
- Department For Environment Food and Rural Affairs (Defra). 2023. Environmental Improvement Plan 2023 – First revision of the 25 Year Environment Plan. Defra, London.