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Kathmandu, Nepal 14–16 November

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Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights



Exploring the Urban Green Infrastructure Index: A Case Study of Zagreb, Croatia

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Introduction

- Concept(s) of Green Infrastructure
- LAS and Green Infrastructure?!/Geoinformation Infrastructure role in property valuation
- Case study: the City of Zagreb
- Results
- Conclusion



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Concept(s) of Green Infrastructure

- part of sustainable and resilient development strategies, especially within cities
- *The European Commission defines green infrastructure as a strategically planned network of natural and semi-natural areas, managed to provide ecosystem services and conserve biodiversity across urban and rural areas. Unlike general green spaces, green infrastructure specifically refers to spaces that deliver ecosystem services—such as supporting, provisioning, regulating, or cultural services (EC, 2013).*
- GI helps mitigate climate change risks, reduce urban heat island effects, lower flooding risks, it supports biodiversity through habitat preservation and restoration...



Connection between LAS and Green Infrastructure?!

- To gather social/ecological/economic benefits strategic planning and development is needed!
- LAS – Land Administration System: recording ownership and other land/property rights, property valuation is an important part of the LAS
- Modelled using the **LADM – Land Administration Domain Model** (conceptual model)
- Green Infrastructure can be seen as one of the **factors influencing physical/urban planning**. It can be **determined automatically using existing geoinformation infrastructure; monitored for trends based on temporal data**. In this way it becomes possible to implement some theoretical principles directly with each update of the existing spatial planning document...





Geoinformation Infrastructure role in property valuation

- Geoinformation infrastructure provides tools to access geospatial information via various web services: land/property information, zoning, POIs...
- Mass property valuation in public purposes - geoinformation based, clear, spatially referenced basis for transparent and open valuation procedure
 - can be used to identify and manage hotspots



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Case study: Zagreb, Croatia



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Source: Wikipedia/Encyclopedia Britannica

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Zagrebačka
infrastruktura
prostornih podataka
**ZG
GEO-
PORTAL**

TEMATSKÉ KARTE METAPODACI MREŽNE USLUGE GEOHUB VIJESTI MZIPP KONTAKT

Various open and non-open OGC web services: WFS, WMS...

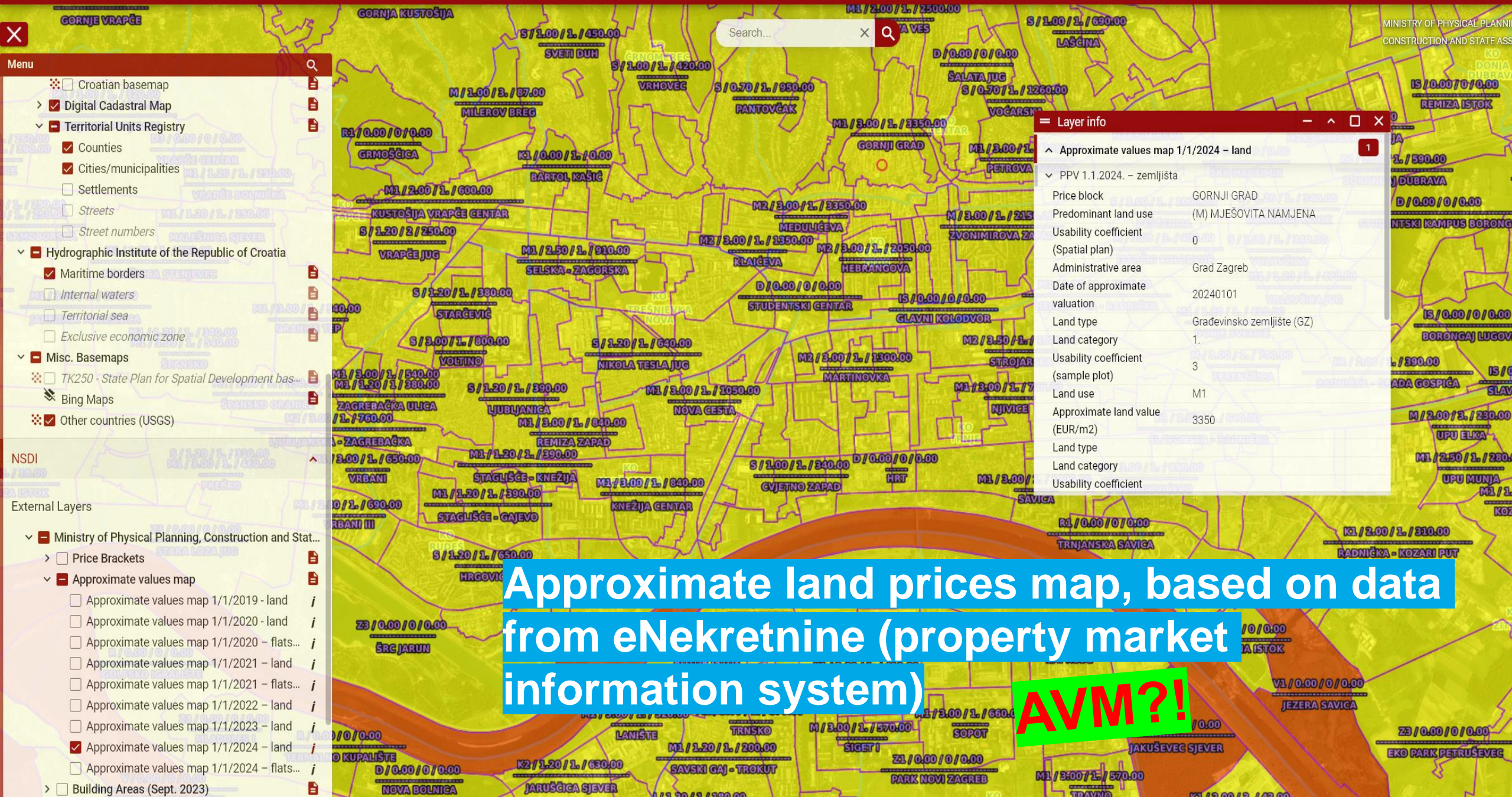
- cadastral parcels
- zoning
- POIs

<https://geoportal.zagreb.hr/>

The screenshot displays the ZG Geoportal website interface. At the top, there is a navigation menu with links for 'TEMATSKÉ KARTE', 'METAPODACI', 'MREŽNE USLUGE', 'GEOHUB', 'VIJESTI', 'MZIPP', and 'KONTAKT'. Below the navigation is a large banner image of Zagreb, Croatia, with a yellow highlight over the URL <https://geoportal.zagreb.hr/>. Underneath the banner are five circular icons representing different services: 'GEOPORTAL PREGLEDNIK', 'KATALOG METAPODATAKA', 'MREŽNE USLUGE', 'GEOHUB', and 'MOBILNA APLIKACIJA'. Below these icons is a grid of 12 service thumbnails, each with a title and a corresponding map or data visualization. The thumbnails are: 'GLAVNI PREGLEDNIK', 'KATASTAR I REGISTAR PROSTORNIH JEDINICA', 'PLANIRANJE I RAZVOJ', 'KOMUNALNI POSLOVI I PROMET', 'ZAŠTITA OKOLIŠA', 'ZAŠTITA SPOMENIKA KULTURE I PRIRODE', 'POLJOPRIVREDA, ŠUMARSTVO I LOVSTVO', 'JAVNI I DRUŠTVENI SADRŽAJI', 'ENERGETSKI ATLAS', and 'ZG3D: 3D MODEL GRADA ZAGREBA'. On the right side of the page, there are two red arrows pointing downwards, one with a person icon and the other with a gender equality icon.

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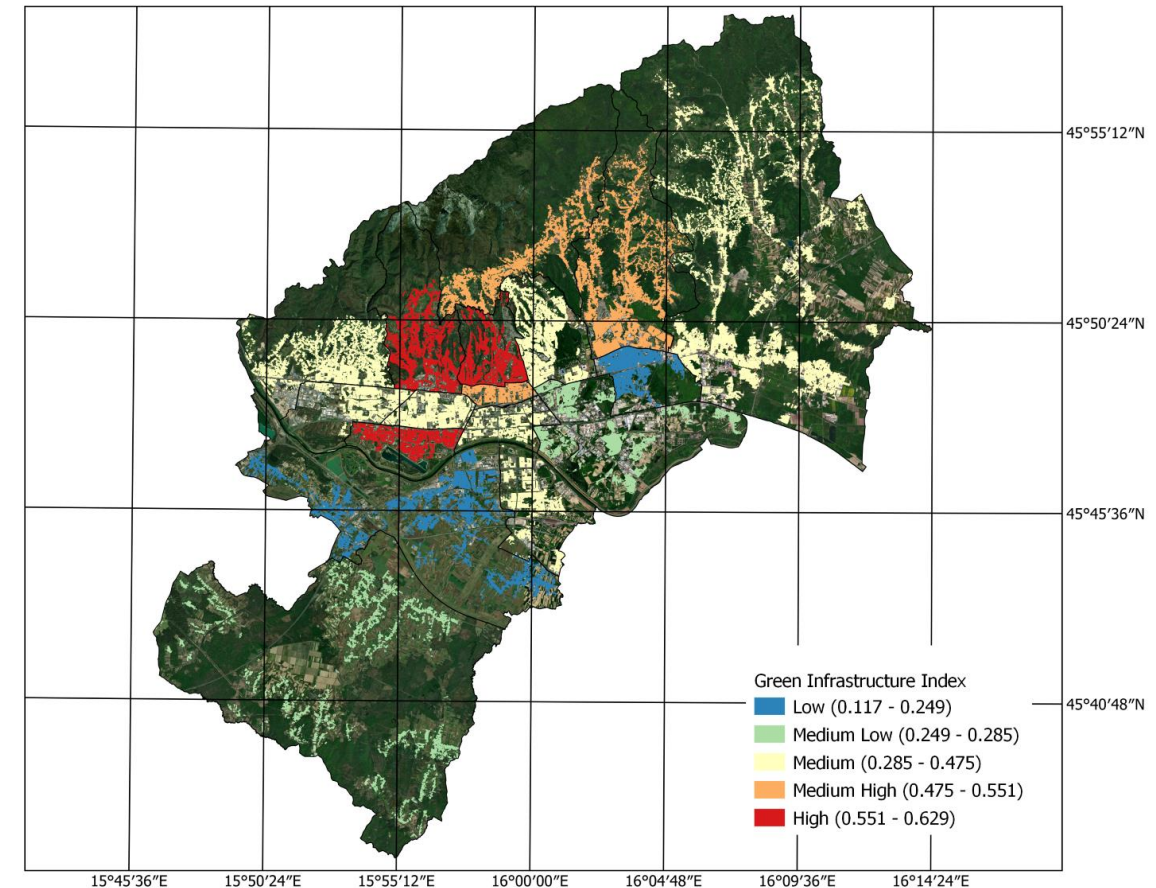
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Samanta Bačić PhD
thesis:
*„Development of
Valuation Model of
Urban Green
Infrastructure in
Land Management”,
2024*

developed & assigned
GI index to land
parcels, residential
and mixed-use zones,
local councils and for
city districts



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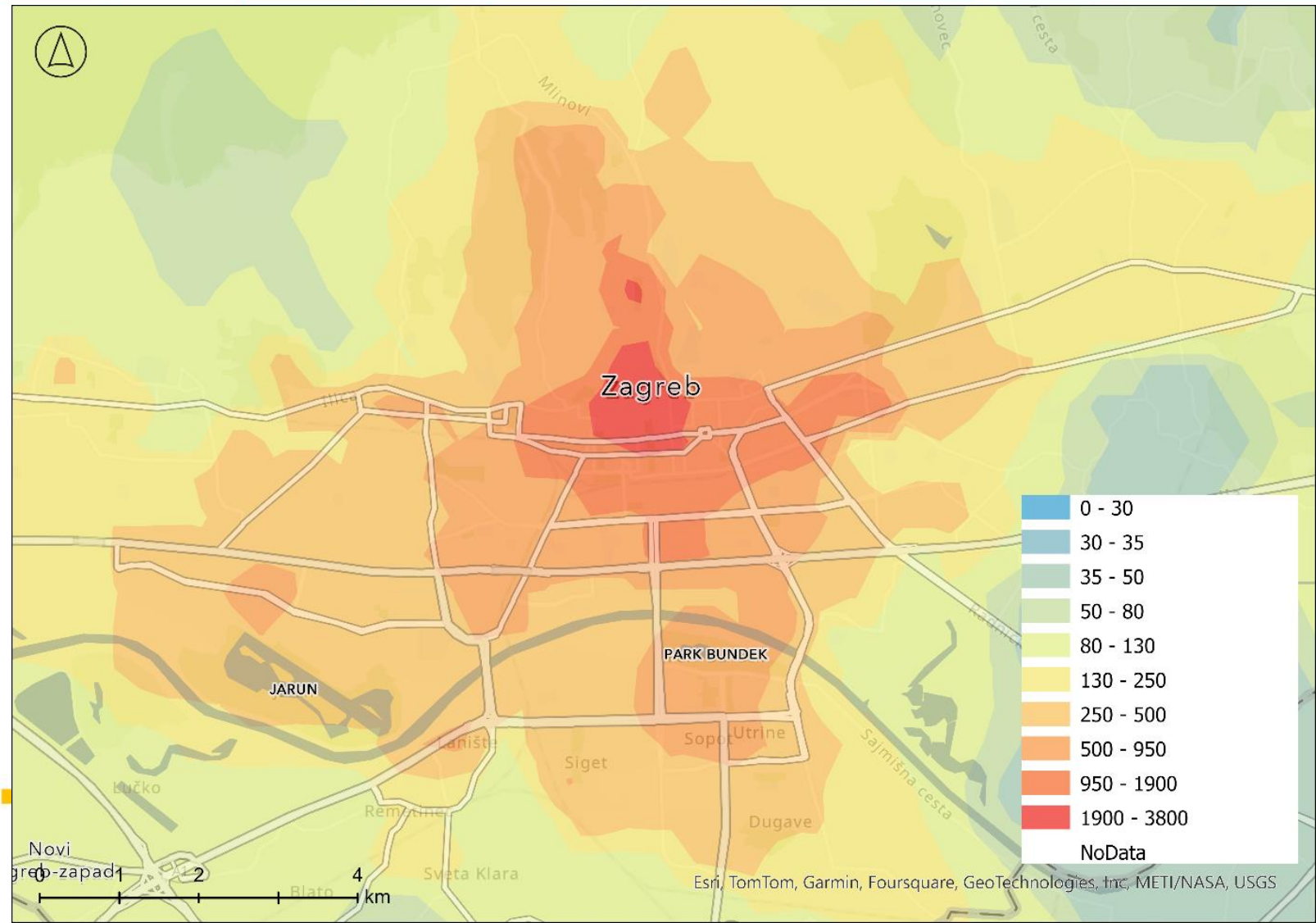
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Approximate land prices – EUR/sqm mixed/residential zone



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Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

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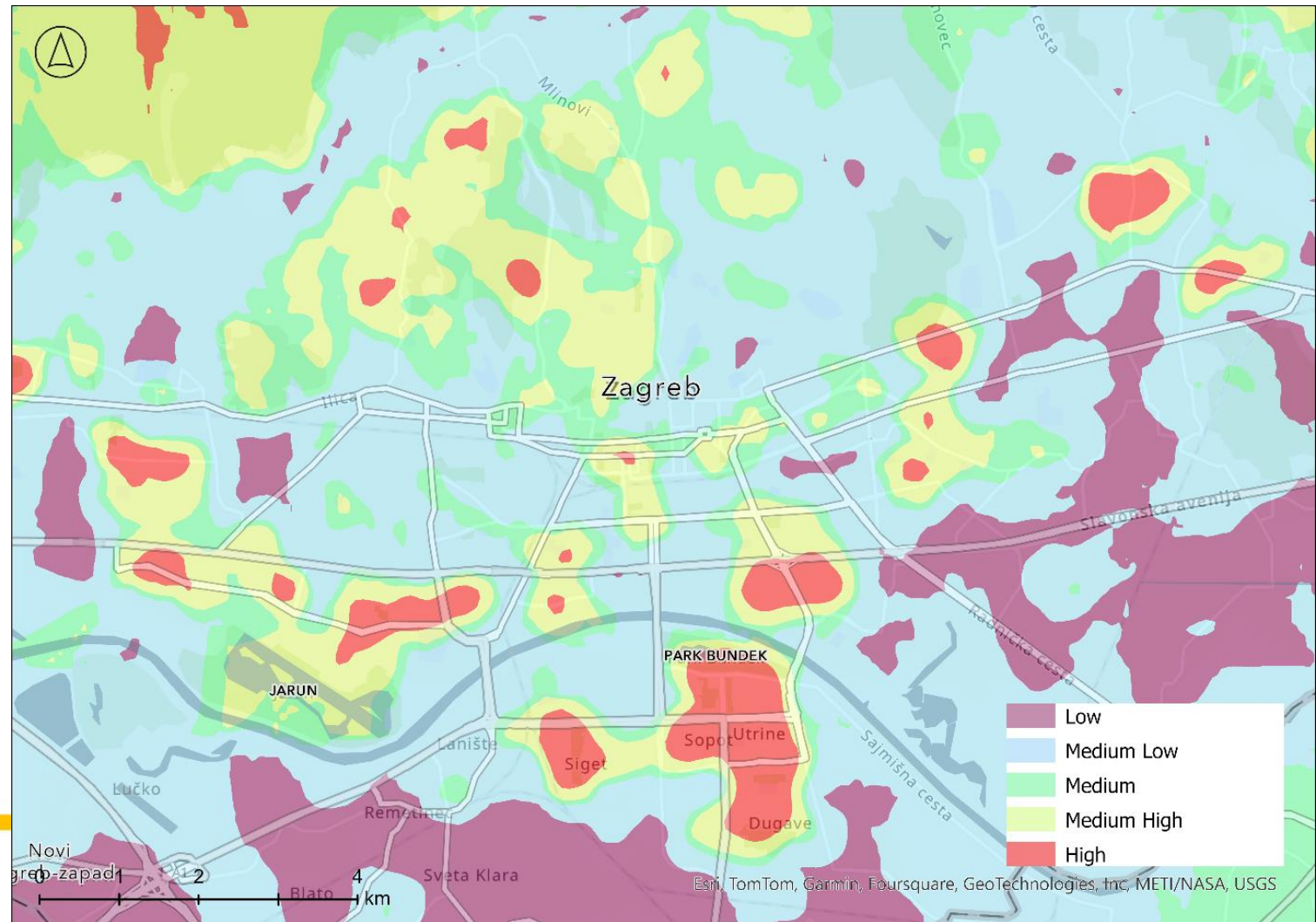
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Green Infrastructure index values

GI as a service



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GI vs prices



EUR/sqm

- 0 - 30
- 30 - 35
- 35 - 50
- 50 - 80
- 80 - 130
- 130 - 250
- 250 - 500
- 500 - 950
- 950 - 1900
- 1900 - 3800

- Low
- Medium Low
- Medium
- Medium High
- High

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Location factor: distance from city centre? (OSM roads layer)

- crowdsourced,
quite detailed
(not for all
locations outside
the cities)



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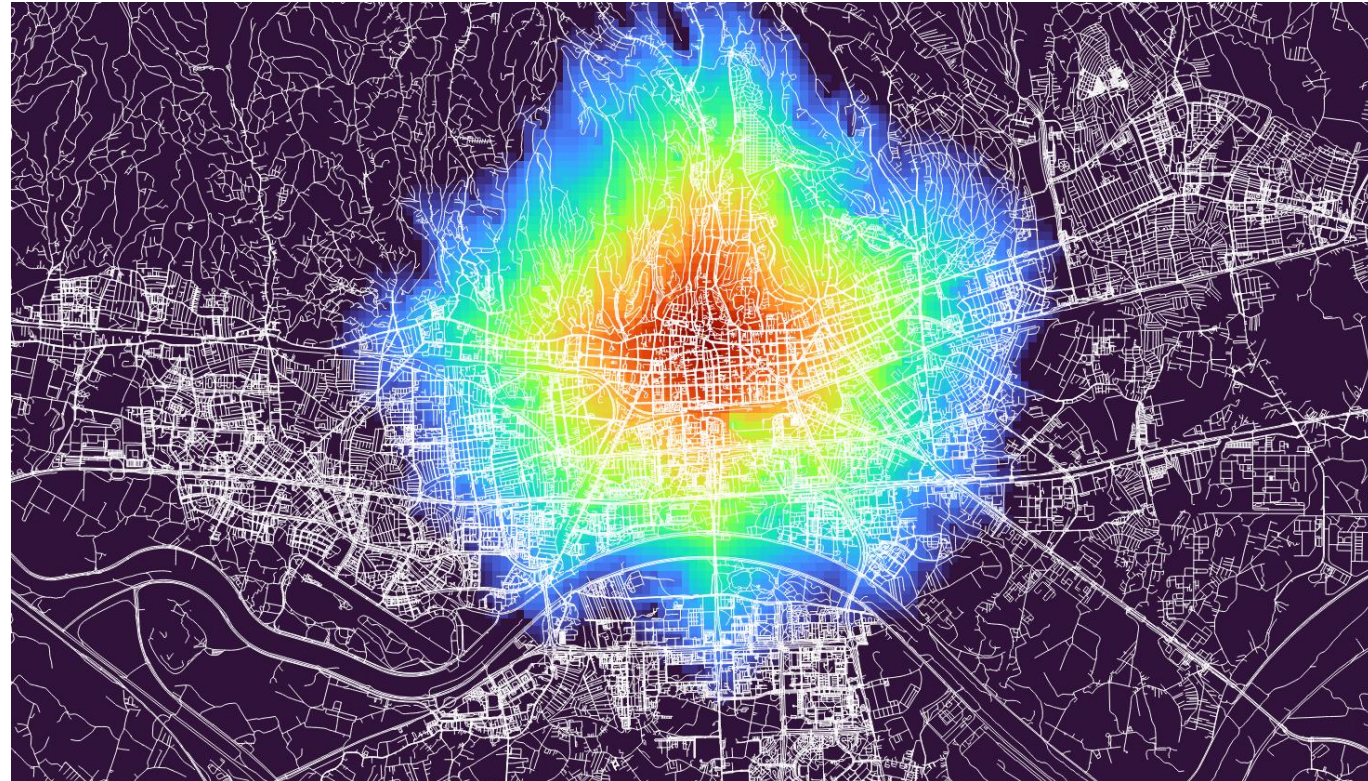
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Location factor?!:

distance from city centre (LRS) - assigned to all levels of data

- Other POIs have to be assigned



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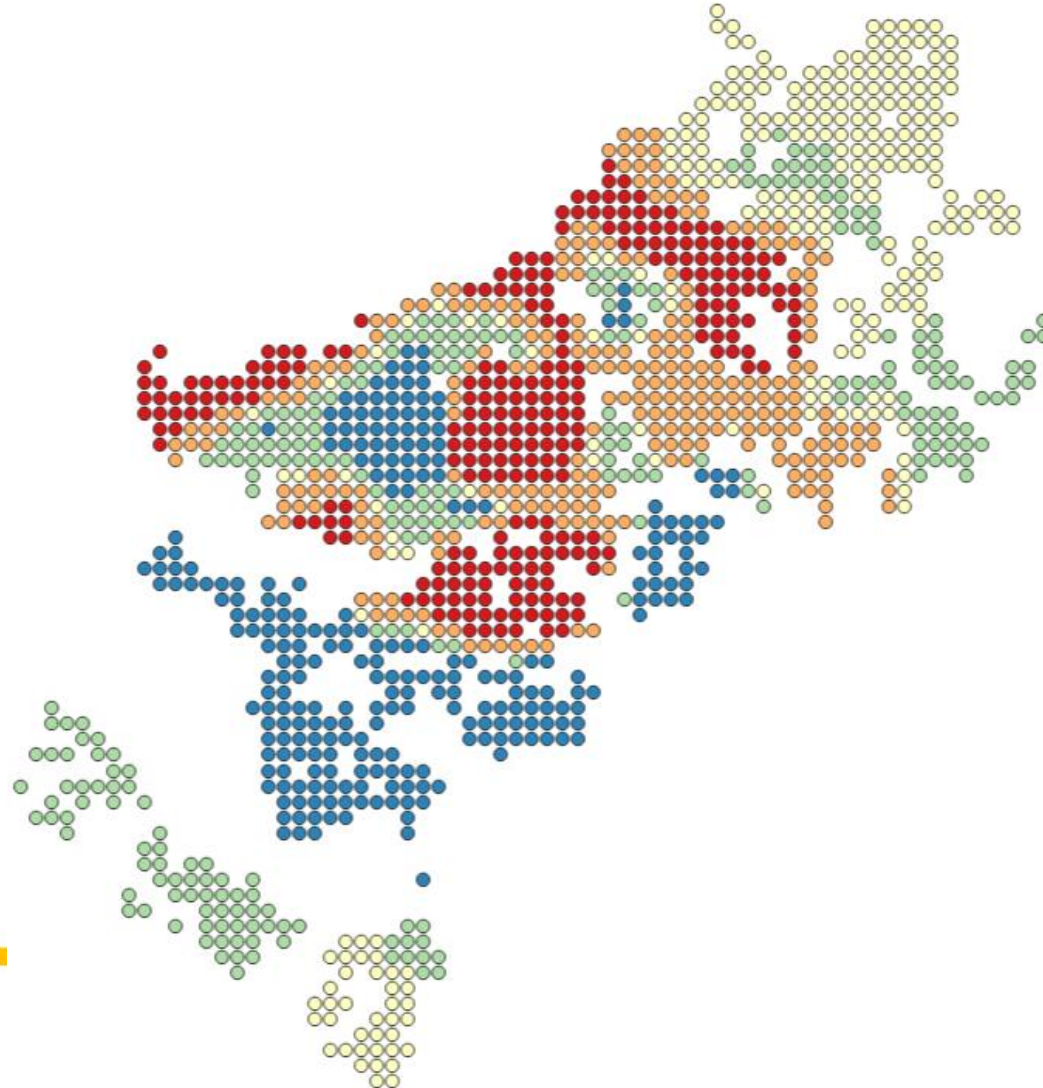
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Final First results?!

- MGWR analysis...
- Identify/assess missing valuation factors



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Instead of conclusion

- Importance of transparency
- The role of Geoinformation Infrastructure
- Temporal data – monitoring trends (fully automatized procedure!)
- Possible uses: property valuation, urban planning/land management
- Further research: develop & test AVM based on all available geospatial datasets...



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Thank you!

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