Lithuania - Nature in Urban Settings and Benefit for Health
(November 11-12, 2020)

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Green Spaces & Health: the GreenUr project

November 11, 2020 on-line workshop

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Introduction

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- What is the evidence of the effects of green spaces on health?
- Challenges in the estimation of the impacts of green spaces on health on health
- WHO project for a tool

Conclusions

Evidence of the health effects of green spaces

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Systematic reviews

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Topic:1

Green space

"green space*"or "greenspaces*" or "public park*" or "green infrastruct*" or greenway* or"green area*"or"nature conservation area*" or "nature garden*" or "natural space*" or "nature space*" or "natural experience" or "urban nature" or "urban forest*" or "urban green vegetation*"or "urban green belt*" or "urban agriculture land*" or "urban green heart*" or "urban tree*" or "street tree*" or "green block*"or "community garden*" or "backyard garden*" or "green corridor*"or "grass-coverd"or "tree-coverd"

AND

Topic:2

Health

"health" or "well-being"or "wellbeing"or "quality of life"or "life satisfaction"or "neurolog -ical heath" or"mental health"or"psychological health"or "emotional health"or "disease*" or "illness"or"mental illness"or "stress*" or "happiness"or "loneliness" or "self-esteem" or "depress*" or "memory"or "attention"or "longevity"or "mortality risk*"or "cancer" or "heart rate*"or "chronic disease" or "obesity"or "diabetes" or "cardiovascular disease*"or "Metabolic syndrome" or "hypertension "or "Hyperlipidemia"or "Circulatory disease"

Web of Science Core Collection
Timespan:All years 1900-2019
Updated 2019-10-01

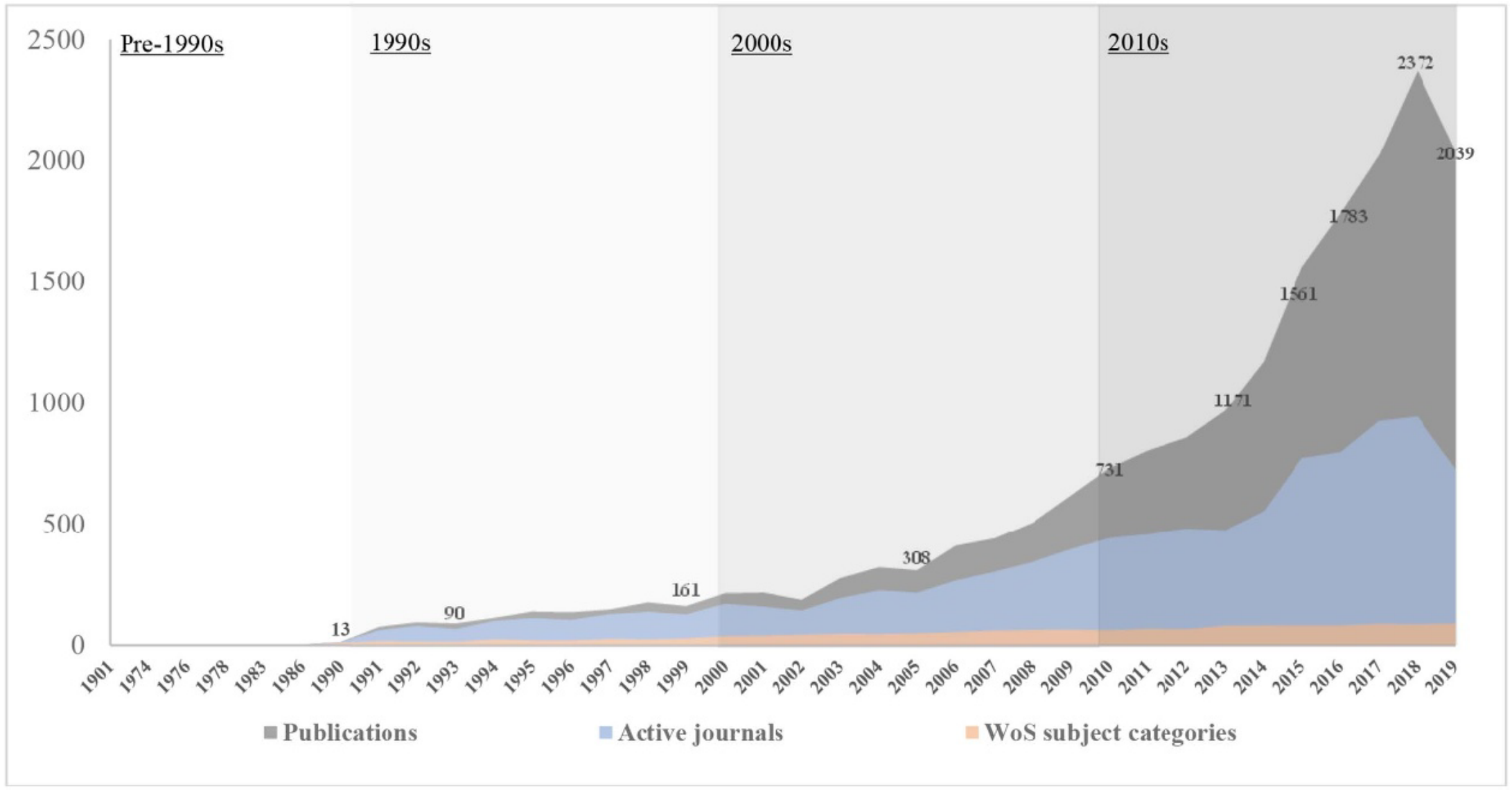
→ **30,319** documents
From 1901 to 2019

→ Article & Review Only
Exclude irrelevant categories
Time slice: pre-1990s,1990s, 2000s, 2010s

→ **18,961** documents

Zhang et al., 2019:

Number of publications by year



Zhang et al., 2019:

Evidence of effects of green spaces on health

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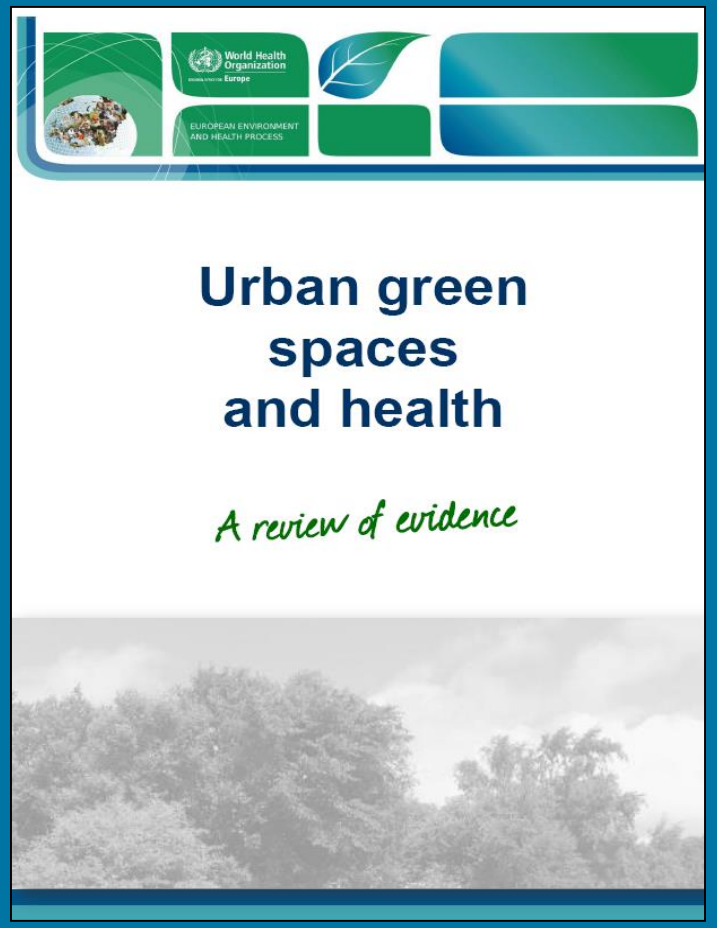
- Improved mental health and cognitive function
- Reduced cardio vascular morbidity
- Reduced prevalence of type2 diabetes
- Improved pregnancy outcomes
- Reduced mortality ...



Challenges

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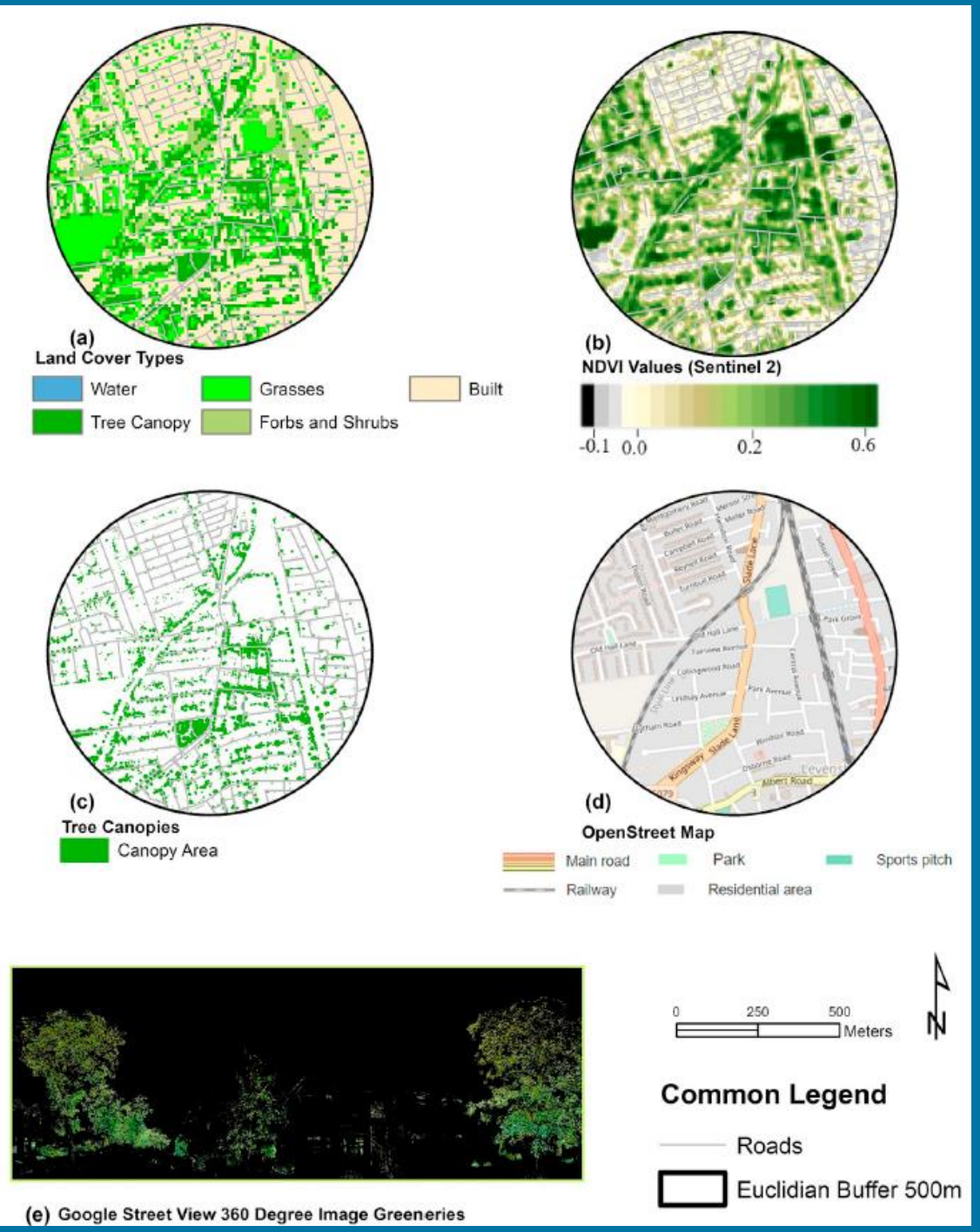
The spatial dimension of green spaces

Examples of different representations of greenspace/greenness according to data type and source (a) Land use and land cover types derived from classification of remotely sensed satellite imagery (Source: Dennis et al., 2018) (b) remotely sensed vegetation indices such as the Normalised Differential Vegetation Index (c) digitised tree canopy cover (Source: City of Trees, 2011) (d) OpenStreetMap standard layers, (e) Google Street View image showing only the green pixels indicating vegetation (Labib et al. 2020:3).



(Labib et al. 2020:3)

Challenges in the estimation of the impacts of green spaces on health

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- How to define/classify urban green space coverage?
- What is the best indicator for green spaces?
- How to relate green space and health?
- Is there any minimum/threshold levels for exposure to green space?
- How effective urban green space interventions are in promoting physical, psychological and social benefits?

WHO TOOLS

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WHO on Tools 1

General features:

1) Neither commercial or private

2) Being a simple and transparent tool in terms of methodologies and algorithms.

3) Presenting a user-friendly interface, with the target group of public health or environmental specialists with little, or no, preparation in modeling and statistical methods and epidemiology.

4) Guiding the user in HIA of the most important and best recognized effects of environmental stressors.

5) Being functional also outside Europe or Northern America.

6) Supporting educational and training purposes.

7) Providing an incentive to collect data if there is lack of them or improve data collection.

8) Providing easy to interpret outputs

9) Training without charging fees

WHO on Tools 2

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Additional examples of specific features:

- Providing values for all necessary parameters for HIA, counterfactual, baseline health data which can be, as an option, changed by the user.

- Whenever possible, using inputs on morbidity / mortality and age structure from WHO data bases (through pre-programmed links or data imports, where available), giving an option for data entry by user.

- Providing contextual HELP function (short hints for the tool operation, longer hints / references to the statistical and epidemiological interpretation).

WHO on Tools 3

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Availability

- Some tools are in WHO webpage
- Some tools are linked from WHO webpage
- Some tools are used and mentioned in documents
    - some are endorsed or a project
    - some are endorsed for a period of time
    - some are used but not endorsed

WHO internal procedure

- Official expert meetings to approve the development of the tool and internal consultation with other colleagues working in similar or affected areas of work
    - Request from partners
    - Do not duplicate existing products
    - Health has to be the main goal of the tool
- Official expert consensus meeting to approve the final version of the tool
- Legal approval of the product, in general and of 1) Disclaimer, 2) Terms of Use and Acknowledgments text
- PUB approval of all the texts, such as Glossary, and all accompanying documents
- WEB approval of creation of the new webpage and the way to download the software

What is GreenUr ?

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A user-friendly software to measure green space availability, to raise awareness on the importance of green space and health and to promote further research.

- Can also be used for supporting educational and training activities related to environment and health
- GreenUr is co-funded by the German Ministry of Environment, Nature Conservation, Building and Nuclear Safety (BMUB). The Climate & Clean Air Coalition also contributed to the development of the project in the years 2017-2018.

GreenUr

Location: city name, street address, lat & long, zoom by box

Population
- By age
- By social characteristics
- Activities
- Time spent in GS

Green space:
Parks/gardens
Public/private
Trees

Data source:
NDVI
Land- use data from satellite source and/or "Open Street Map"
Other

1) **General impacts** or
2) **mediated** mechanisms

Quality of GS

1) General impacts

2) Mediated

Example of scenarios

Scenario 1 = existing GS effects

Scenario 2 = increase of GS (random or specific area)

Scenario3 = decrease of GS (random or specific area)

Total green space availability: assessment

Total greenness

Populations exposed: distance from GS

WB **Mental health, wellbeing and social** effects

AT Opportunities for **active transport** and **leisure activity**

ES **Ecosystem services** and environmental effects

Health impacts:
- All cause mortality
  - CVD mortality
- Other health effects
  - Reduced type 2 diabetes
  - Better pregnancy outcomes

1) reduced depression and stress
2) change in self-reported health
3) increased social interaction

1 Increase of active transport, reduction of sedentary habits
(Output for: WHO HEAT tool: http://www.heatwalkingcycling.org/)

1 Effects on air pollution (removal or increase): PM2.5
(Output for: WHO AirQ+ tool: http://euro.who.int/en/airqplus)

2 Effects on temperature
- Heating/Cooling effect

Effects on pollen

Effects on noise

Flood control

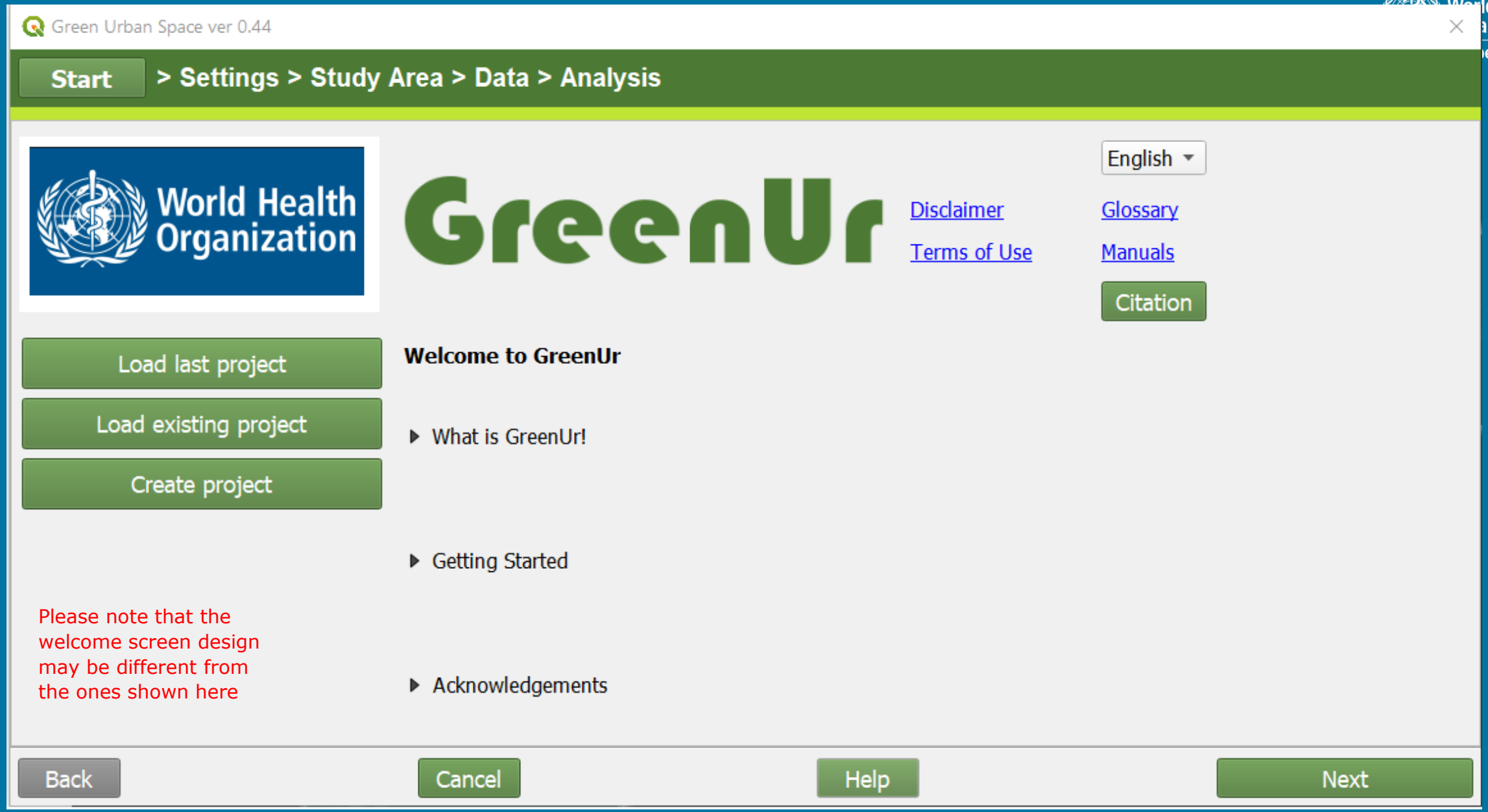
Effects on other air pollutants: O3, SO2, NO2, CO

Effects of Biogenic volatile organic compound (BVOC) on O3 and CO

Interventions

Work completed | Work partially finalized and to be carried out pending the availability of extra funds | Work excluded from the prototype development and to be re-discussed

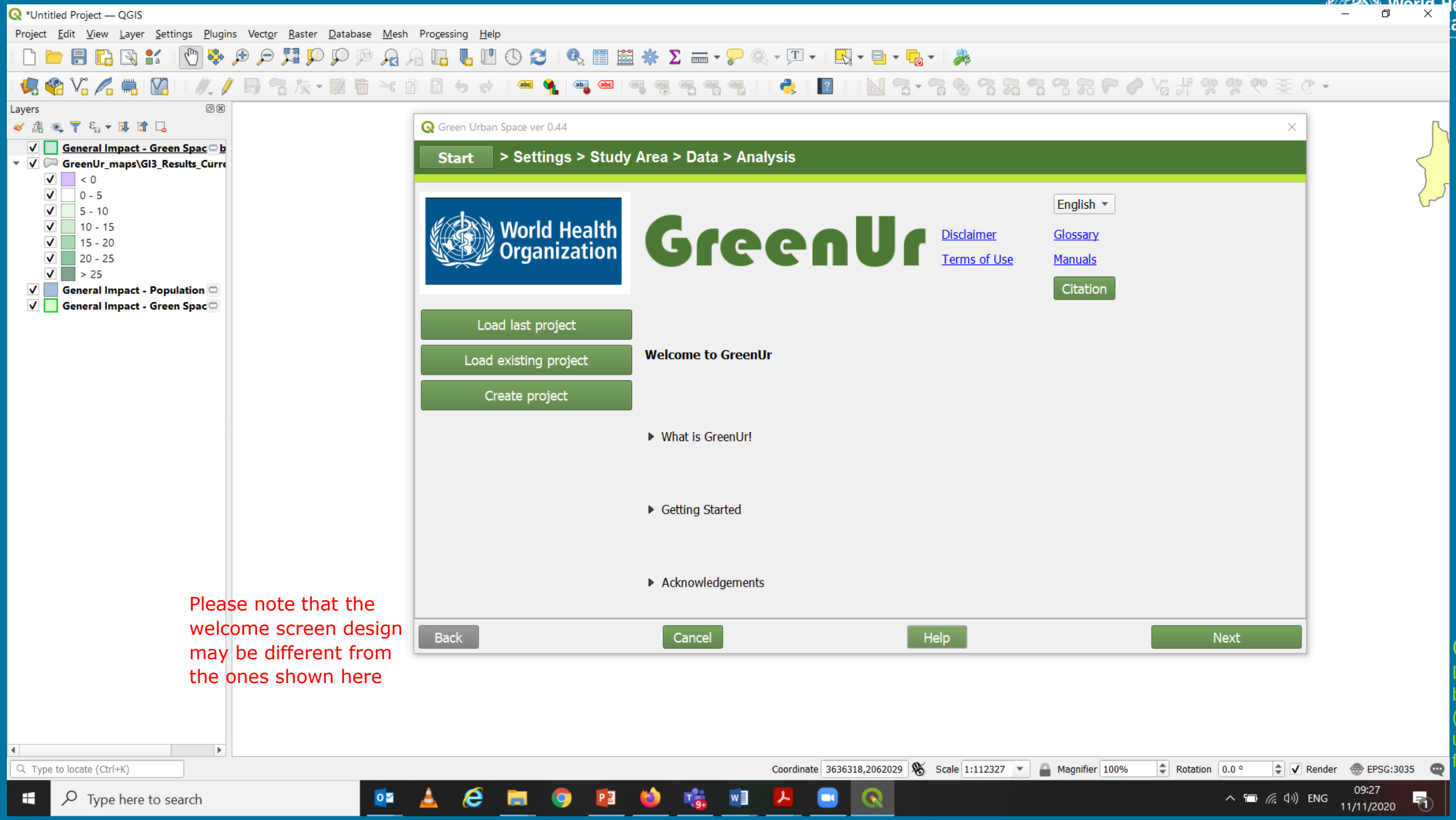
GreenUr welcome screen



Please note that the welcome screen design may be different from the ones shown here

GreenUr
Developed by WHO (available upon request for testing)

GreenUr operates within the QGIS environment



Please note that the welcome screen design may be different from the ones shown here

GreenUr
Developed by WHO (available upon request for testing)

Demo of GreenUr

GreenUr:
Pre-loaded vs user-supplied data

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Users can also:

- load their own data for green spaces not included in the list of available input or
- change default RRs

Current work on green spaces and health and GreenUr

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Revision of the 0.44 version

Test of the version in cities with big urban parks

Publication of a booklet on green and blue spaces and health with focus on mental health

Preparation of a report for the Urban Health Initiative of WHO

Review of projects that have planned to plant trees in Africa

Review of methods used for estimating the effects on air pollution

Conclusions

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Green spaces play a fundamental role in advancing the ecological sustainability of cities and promoting human health

Public health and environmental experts can play a role in advancing a more sustainable agenda.

Green Spaces and Health: some very recent references

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Thank you – Merci – Danke – Спасибо

Thanks to:

Matthias Braubach

Anika Weinmann, Charlotte Eberz and Markus Neteler

Thanks for support also to: Dorota Jarosinska, Francesca Racioppi, Nathalie Roebbel

Web sites

Environment and health: **euro.who.int/envhealth**

Some of activities presented are co-funded by the German Ministry of Environment (BMU) and the French Ministry of Health

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