Summer School – Urban Climate (24-28 July, 2023)

Location: Vrije Universiteit Brussel, Etterbeek Campus

Venue: Morning session Building I, Room I.1.03. Technical session Building B, Computer Room B 0.006.

Date	Monday 24/07	Tuesday 25/07	Wednesday 26/07	Thursday 27/07	Friday 28/07
09h00-10h30	Welcome – Introduction to GeoCLIC Prof Dr Jonathan Chan VUB-ETRO Urban environment and climate and GIT Program technical Objectives: 1. Derivation of LST map from RS (Landsat/MODIS) 2. Local Climate Zone 3.Spatial Metrics for urban morphology Questions and logistics	Concept - LST (Land surface temperature) derivation from RS data Introduction to Surface Temperature products	Technical Session: Continue with LCZ generation 1. Completion of LCZ map 2. Presentation and fine-tuning	Dr Marta Sapena DLR Technical Session: Spatial Metrics for urban morphology and climate modelling (cont.d)	All partners/teachers Presentation of final results and analyses Assessment and evaluation of Summer school
10h30- 12h30 With break	Broad understanding of RS data, satellite images processing levels and data download	LST map derivation of Landsat data			
12h30-14h00	Lunch break				
14h00-17h30 With break	Landuse and Landcover classification with remotely sensed data. Accuracy assessment of classification map	Local Climate Zone, its origin and applications (guest speaker) Introduction to World Urban Database and Access Portal Tools https://www.wudapt.org/	Dr Marta Sapena DLR (Germany Space Agency) Theory Session 1. Spatial Metrics for urban morphology 2. Applications and relationships with socio-economic and environmental factors	Task completion	Multiplier event – Stakeholder meeting Venue: Bldg. I. Auditorium I.0.0.3 Keynote: Prof M. Kuffer Round Table Panel: Dr. Martine de Maziere, General Director of Belgian Royal Institute for Space Aeronomy.

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					Dr. Marta Sapena-Moll, Research scientist at the German Aerospace Center (DLR) Dr. Christine Bingen, Soap Box science Brussels and BIRA-IASB Annekatrien Debien, Head of Brussels office, Spacetec Alessia Mauta, Head of Satellite Operation Services, Rhea Group Monica Miguel-Lago, EARSC Project Manager
		Technical Session: LCZ Generator to create an LCZ map of your city 1. Derivation of LCZ (classes) 2. Data training and production 3. Assessment	Technical Session: 1. Data preparation 2. Metric calculation 3. Modelling 4. Output interpretation		
				Social Dinner 7.30 p.m. La Luck Bruxelles https://la-luck.com/bruxelles/en/	

GeoCLIC Guest Participant List

UPV	UNIZG	HSWT	UNIC	VUB registered students
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Logistics in Brussels

From Airport to City center and hotels :
Public Transport
Simplest way is go to LEVEL (-1) at Airport, take a train to Central Station (Gare Centrale). Purchase a train ticket either at a machine, or service desk, around 10 euros. At Central Station, there are connections with metro and buses.
To get to Aparthotel Adagio Access Brussels Delta, at Central Station, take metro **Line 5** (direction Herrmann-Debroux) to **DELTA**. From DELTA metro station, it will be 5 mins walk.

Taxi
If you are a group of 4/5, Uber taxi could be a choice if the price is around 50 euro. It's only around 20-30mins to Adagio. But you need to arrange before hand, or need a Uber App with bank card already verified in order to book.

For participants of the Multiplier event 28th Friday afternoon, the easiest is to go straight to Etterbeek Train Station (get a train connection either from the airport, or at the Central Station), then it is 5 mins walk.

Tickets for public transport
At major metro stations, or some bus stops, you can find GO machine (photo below)
The cheapest is a 10-trip ticket, it allows changes in a single trip metro-bus-tram.
Explanation in English:
https://www.stib-mivb.be/abon_tickets.html?l=en
https://www.stib-mivb.be/article.html?l=en&_guid=d0707200-2683-3410-479e-b21a51d668f0

Note that as hotel Adagio is not centrally located, there aren't many shops around. But you may explore a little the neigborhood of ULB if you have energy. Find Av. de l'Université, on googlemap. Only 15 mins walk. It is a vibrant student area.

<u>Our Venue is at Building I. And Technical Session at Building B.</u>
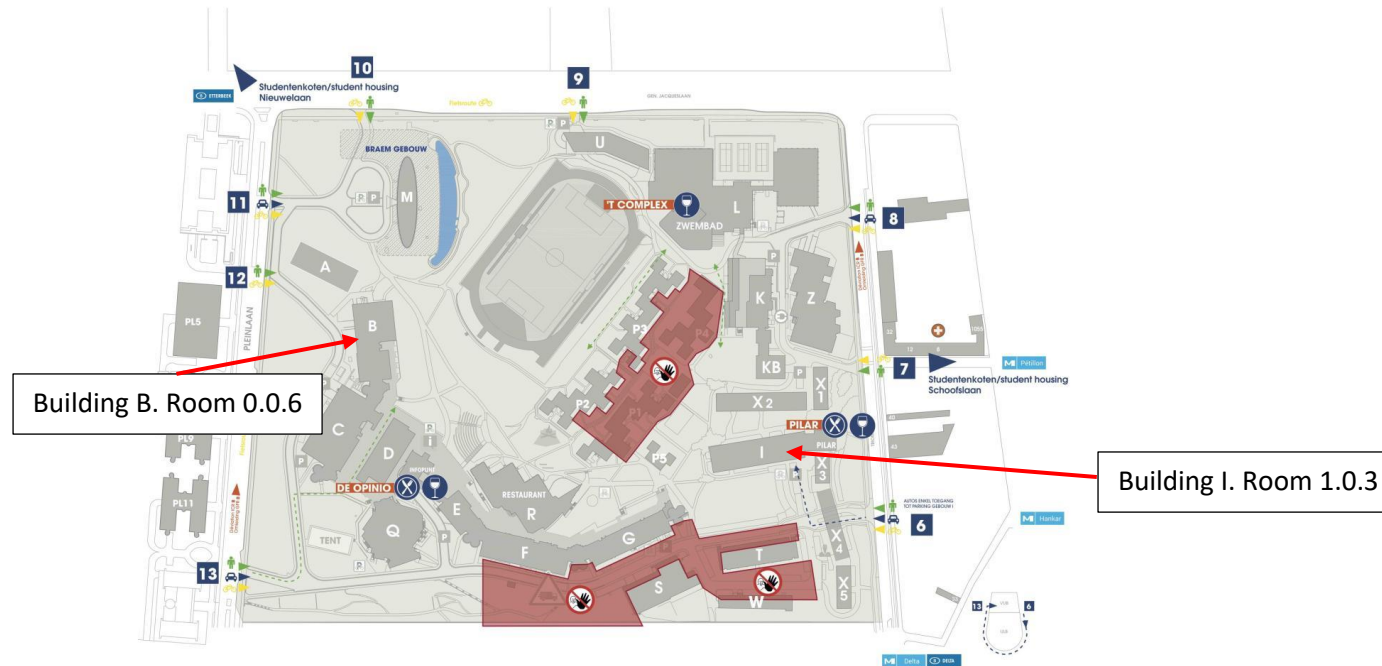
Preparatory Materials:

1. Land Surface Temperature

NASA ARSET: Land Surface Temperature-Based Surface Urban Heat Island Mapping (4 Parts)

Access to all materials (video, PPT, Q&A transcript) https://appliedsciences.nasa.gov/join-mission/training/english/arset-satellite-remote-sensing-measuring-urban-heat-islands-and

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Satellite Remote Sensing for Measuring Urban Heat Islands and Constructing Heat Vulnerability Indices
Part 1: Land Surface Temperature-Based Surface Urban Heat Island Mapping
Presenters: Sean McCartney & Amita Mehta
-Overview of ARSET
-Background on UHI
-Demonstration of using Landsat LST and Aqua MODIS for measuring SUHI -Lab time for participants to analyze LST and SUHI for their area of interest
-Question & Answer Session
Part 2: Integrating Socioeconomic Data with Satellite Imagery for Constructing Heat Vulnerability Indices Section 1
Presenters: Kathryn Conlon, Evan Mallen
-Review previous session and introduce guest speakers
-Introduction to common methods used to create heat vulnerability indices (HVI)
-Techniques for effectively using HVI results to inform exposure and mitigation efforts
-Case studies showing how heat vulnerability mapping informed urban planning
-Question & Answer Session
Part 3: Integrating Socioeconomic Data with Satellite Imagery for Constructing Heat Vulnerability Indices - Section 2
Presenters: Kathryn Conlon, Evan Mallen
-Review previous session
-Demonstration on constructing HVI
-Lab time for participants to construct HVI
-Question & Answer Session
Part 4: Using High-Resolution, Satellite Derived Hot-Humid Heat Estimates and Gridded Population Data to Map Extreme Heat Exposure Worldwide
Presenter: Cascade Tuholske
-Review previous session and introduce guest speaker

-Introduction to Wet Bulb Globe Temperature -Overview of Global High Resolution Daily Extreme Urban Heat Exposure (UHE-Daily), v1 (1983−2016)
-Overview of Annual Global High-Resolution Extreme Heat Estimates, 1983-2016
-Jupyter Notebook Demonstration
-Questions and Answer Session

2. Local Climate Zone

All materials can be accessed via https://www.wudapt.org/

Background of Local Climate Zone:
Concept of LCZ Framework. Stewart and Oke (2012) Local Climate Zones for Urban Temperature Studies. BAMS. V.93. Issue 12. 1879-1900.
https://www.wudapt.org/lcz/lcz-framework/
https://journals.ametsoc.org/view/journals/bams/93/12/bams-d-11-00019.1.xml

Data Sheets. Understanding of LCZ classes:
https://www.wudapt.org/wp-content/uploads/2021/05/Stewart_PhD_2011_LCZ_Sheets.pdf

Guidelines for Digitizing Training Areas:
https://www.wudapt.org/digitize-training-areas/

Using the LCZ generator:
https://lcz-generator.rub.de/

3. Spatial Metrics for Urban Morphology

Overview readings/ Links:
- Sapena et al., (2020) Analyzing Links between Spatio-Temporal Metrics of Built-Up Areas and Socio-Economic Indicators on a Semi-Global Scale. ISPRS Int. J. Geo-Inf.

- Sapena et al., (2021) Estimating quality of life dimensions from urban spatial pattern metrics. Computers, Environment and Urban Systems