Matej Žgela, mag. geogr.

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PROFESSIONAL PROFILE

I am a motivated young geographer currently pursuing a PhD at Politecnico di Milano. I use remotely sensed data to better understand urban areas and their microclimate. Skilled with software for spatial data analysis, retrieval of various satellite data and urban-climate modelling.

Passionate about broadening my knowledge about various aspects of urban climatology, remote sensing, GIS and related fields.

CORE SKILLS

- **ArcGIS Pro**
- **Google Earth Engine**
- **Climate modelling**
- **Mobile meteorological measurements**
- **Urban Climatology**
- **Remote Sensing/GIS**
- **Local climate zones**
- **Urban Heat Islands**
- **Spatial Analysis**

EDUCATION AND TRAINING

Sep 2023 – present: PhD student in Environmental and Infrastructure Engineering at Politecnico di Milano
- Environmental and Hydraulic Engineering and Geomatics

Sep 2021 – Oct 2021: Short-term specialization at the Department of Geography, Tourism and Hotel Management, Faculty of Science, University of Novi Sad (Serbia)
- Urban climatology, biometeorology and heat load measurements of cities

Oct 2018 – Jul 2020: Master's degree in *Physical Geography with Geoecology* at the Department of Geography, Faculty of Science, University of Zagreb
- Master thesis title: Impact of land surface changes on heat features in the city of Zagreb based on Landsat data
- Average mark: 4,91 (out of 5)

Oct 2015 – Sep 2018: Bachelor of Geography
- Bachelor thesis title: Some heat features of local climate zones in the city of Zagreb

Mar 2018 – Apr 2018: Student mobility at Palacký University Olomouc (Czechia)

WORK EXPERIENCE

Dec 2022 – Aug 2023: External collaborator at Department of Geophysics, Faculty of Science, University of Zagreb

- External Collaborator on CroClimGoGreen project (Croatian climate variability and change - from global impacts to local green solutions)

Jul 2020 – Dec 2022: Project Associate at Department of Geophysics, Faculty of Science, University of Zagreb

- Analysis of heat features of urban areas; remote sensing of the urban environment; local climate zones; urban heat island; climate modelling; mobile temperature measurements

Feb 2020 – Mar 2020: Short-term internship at *Gekom - geophysical and ecological modelling* (Zagreb, Croatia)

- QGIS, Python (Jupyter Notebook), Google Earth Engine

Nov 2019 – Feb 2020: Student demonstrator at *Department of Geography - Faculty of Science* (University of Zagreb, Croatia)

- Held exercises in the Climatology course and assisted students with their assignments.

Apr 2018 – Jun 2018: Short-term internship at *Vitaprojekt d.o.o.* (Zagreb, Croatia)

PUBLICATIONS AND CONFERENCES

- Anderson, V.; **Zgela, M**.; Gough, W.A. (2023): Building Urban Resilience with Nature-Based Solutions: A Multi-Scale Case Study of the Atmospheric Cleansing Potential of Green Infrastructure in Southern Ontario, Canada. Sustainability 2023, 15, 14146. https://doi.org/10.3390/su151914146
- Milošević, D., Dunjić, J., Stojsavljević, R., **Žgela, M.**, Savić, S., Arsenović, D. (2023): Analysis of long- and short-term biometeorological conditions in the Republic of Serbia. Int J Biometeorol (2023). https://doi.org/10.1007/s00484-023-02482-8
- **Žgela, M.**, Herceg Bulić, I. (2023): Urban heat load assessment in Zagreb, Croatia: a multi-scale analysis using mobile measurements and satellite imagery, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-290, https://doi.org/10.5194/egusphere-egu23-290
- Boras, M., Herceg-Bulić, I., **Žgela, M**., Nimac, I. (2022): Temperature characteristics and heat load in the City of Dubrovnik. Geofizika. https://doi.org/10.15233/gfz.2022.39.16
- **Žgela, M**., Herceg Bulić, I., Lozuk, J., Jureša, P.: Comparison of land surface temperature of local climate zones in Croatia and estimation of the vulnerable population heat risk // EMS Annual Meeting Abstracts Vol. 19, Bonn, Germany, 2022. https://doi:10.5194/ems2022-299
- **Žgela, M**., Herceg Bulić, I., Lozuk, J.: Seasonal variations of land surface temperature in the city of Dubrovnik, Croatia // Short abstracts - Challenges in meteorology 8: The air we breathe, the air we forecast. Zagreb: Croatian Meteorological Society, 2022.
- Maradin, M., **Žgela, M.** (2022): Climatic significance of parks in urban areas // in: Parks – a link between cities and nature (ed. Siniša, G.; Somek, P.). Zagreb: Međimurska priroda – Javna ustanova za zaštitu prirode, Meridijani, 2022. 21-37.
- Anderson, V.; Gough, W.A.; **Zgela, M**.; Milosevic, D.; Dunjic, J. Lowering the Temperature to Increase Heat Equity: A Multi-Scale Evaluation of Nature-Based Solutions in Toronto, Ontario, Canada. Atmosphere 2022, 13, 1027. https://doi.org/10.3390/atmos13071027
- Nimac, I., Herceg-Bulić, I., Žuvela-Aloise, M., **Žgela, M.** (2022): Impact of North Atlantic Oscillation and drought conditions on summer urban heat load - a case study for Zagreb. International journal of climatology. https://doi.org/ 10.1002/joc.7507

- **Žgela, M.,** Herceg Bulić, I.: Surface urban heat islands of Zagreb and Split (Croatia) – local climate zone based definition // 8th International Meeting on Meteorology and Climatology of the Mediterranean, Balearic Islands, Spain, 2021. (online)
- **Žgela, M**. (2018). Urbana klimatologija - primjer toplinskog otoka grada Zagreba. Geografski horizont, 64 (2), 31-40. (In Croatian) https://hrcak.srce.hr/220514

ACTIVITIES

- Organizing urban heat island research campaigns in Zagreb, Croatia
    - Air temperature measurements using bicycles
- Member of the organization team of the conference *Seismic and climatic vulnerability of Dubrovnik city area* (3 – 4 May 2022)

DIGITAL SKILLS

- **ArcGIS Pro, QGIS** – spatial data analysis, visualization and interpretation
- **Google Earth Engine** – satellite data retrieval and analysis (Javascript programming)
- **Climate modeling** – managing MUKLIMO_3 urban-climate model
- **R, Python** – basics
- **GIMP**, **Inkscape** – design, image editing

AWARDS

Tromp foundation travel award to young scientists (TFTAYS) – for presenting in the area of biometeorology at the European Meteorological Society (EMS) Annual Meeting, title: Comparison of land surface temperature of local climate zones in Croatia and estimation of the vulnerable population heat risk, https://doi:10.5194/ems2022-299

ONLINE COURSES & ISSUED CERTIFICATES

- Satellite Remote Sensing for Measuring Urban Heat Islands and Constructing Heat Vulnerability Indices (issued Aug 2022 by NASA ARSET)
- Satellite Remote Sensing for Urban Heat Islands (issued Dec 2020 by NASA ARSET)
- EUMETSAT, CAMS and ECMWF online course - Monitoring atmospheric composition (issued Dec 2019 by EUMETSAT)

PROJECTS

CroClimGoGreen (Croatian climate variability and change - from global impacts to local green solutions)

- The main goal of this project is to research the urban heat island (UHI) of the city of Zagreb on the basis of measured data and using numerical simulations in the current and future climate.

Klima-4HR (Climatic vulnerability of Croatia and adaptation possibilities of urban and natural environments)