Matej Žgela, mag. geogr.

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CORE SKILLS

- Urban Heat Islands
- Urban Climatology
- Local Climate Zones
- Google Earth Engine
- QGIS/ArcGIS Pro
- Climate Modelling
- Remote Sensing/GIS
- Hyperspectral data
- Python

EDUCATION AND TRAINING

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

Sep 2021 – Oct 2021: Short-term specialisation 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

- **Žgela, M.**, Vavassori, A., Brovelli, M.A., Venuti, G., Tapete, D., Sacco, P., Thy, P.T.M., & Lam Dao, N. (2025): Geospatial Solutions for Urban Climate Adaptation: The LCZ-UHI-GEO Project between Italy and Vietnam, ISPRS Geospatial Week 2025, Dubai, United Arab Emirates, 6-11 April 2025, https://gsw2025.ae/
- Boras, M., Herceg-Bulić, I., & **Žgela, M**. (2025). Urban Heat Load in a Small Mediterranean City in Recent, Extreme and Future Climate Conditions—A Case Study for the City of Dubrovnik. International journal of climatology, 45(3). https://doi.org/10.1002/joc.8728
- **Žgela, M.**, Vavassori, A., Kolokoussis, P., & Brovelli, M.A. (2024): Assessing and validating spectral unmixing of hyperspectral PRISMA imagery in Milano with implications for urban climate, 75th International Astronautical Congress (IAC), Milan, Italy, 14-18 October 2024, https://dl.iafastro.directory/event/IAC-2024/paper/89598/
- **Žgela, M.**, Vavassori, A., & Brovelli, M.A. (2024): A geospatial approach for heat risk estimation by integrating remotely sensed and ground-based data in Milan, Italy, EMS Annual Meeting 2024, Barcelona, Spain, 1–6 Sep 2024, EMS2024-727, https://doi.org/10.5194/ems2024-727
- **Žgela, M.**, Vavassori, A., & Brovelli, M.A. (2024): Assessing PRISMA and DESIS hyperspectral imagery for urban climate implications in Milano, 2 Days of Geomatics – L'Aquila, July 15-16, 2024
- **Žgela, M.,** Lozuk, J., Jureša, P., Justić, K., Popović, M., Boras, M., & Herceg-Bulić, I. (2024). Urban heat load assessment in Zagreb, Croatia: a multi-scale analysis using mobile measurement and satellite imagery. Environmental monitoring and assessment, 196(5), 410. https://doi.org/10.1007/s10661-024-12538-w
- **Žgela, M.,** Herceg-Bulić, I., Lozuk, J., & Jureša, P. (2024). Linking land surface temperature and local climate zones in nine Croatian cities. Urban Climate, 54, https://doi.org/10.1016/j.uclim.2024.101842
- 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. (2022): 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, https://doi:10.5194/ems2022-299

- **Žgela, M**., Herceg-Bulić, I., & Lozuk, J. (2022): 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.
- 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. 21-37.
- Anderson, V., Gough, W.A., **Zgela, M**., Milosevic, D., & Dunjic, J. (2022): Lowering the Temperature to Increase Heat Equity: A Multi-Scale Evaluation of Nature-Based Solutions in Toronto, Ontario, Canada. Atmosphere, 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. (2021): 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, (online)
- **Žgela, M**. (2018). Urbana klimatologija - primjer toplinskog otoka grada Zagreba. Geografski horizont, 64 (2), 31-40. (In Croatian) https://hrcak.srce.hr/220514

DIGITAL SKILLS

- **Google Earth Engine** – satellite data retrieval and analysis (JavaScript programming)
- **Python** – spatial data analysis
- **QGIS, ArcGIS Pro** – spatial data analysis, visualisation and interpretation
- **Climate Modelling** – managing MUKLIMO_3 urban-climate model
- **GIMP**, **Inkscape, Adobe Express** – design, image editing

AWARDS

Tromp foundation travel award to young scientists (TFTAYS) 2024
For presenting in the area of biometeorology at the European Meteorological Society (EMS) Annual Meeting, Barcelona, Spain, title: A geospatial approach for heat risk estimation by integrating remotely sensed and ground-based data in Milan, Italy, https://doi.org/10.5194/ems2024-727

Outstanding Poster Award - MeteoXchange ECS Conference 2024
For presenting the poster: "Combining in-situ and remotely sensed data for comprehensive urban climate insights in Croatia".
https://www.emetsoc.org/awards/award/matej-zgela-2/

Tromp foundation travel award to young scientists (TFTAYS) 2022
For presenting in the area of biometeorology at the European Meteorological Society (EMS) Annual Meeting, Bonn, Germany, title: Comparison of land surface temperature of local climate zones in Croatia and estimation of the vulnerable population heat risk, https://doi.org/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

LCZ-UHI-GEO - Analysis of Local Climate Zones and Urban Heat Island using geomatic techniques (GIS and Earth Observation)

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

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