

# PORTFOLIO

FELIPE CAMACHO



MAPS



WEB HISTORIES



POSTERS



COPERNICUS MASTER  
IN DIGITAL EARTH



With the support of the  
Erasmus+ Programme  
of the European Union



PARIS  
LODRON  
UNIVERSITÄT  
SALZBURG



Palacký University  
Olomouc

# PORTFOLIO

**FELIPE CAMACHO**



Felipe Camacho Hurtado



<https://felipecamachoh.github.io/>

My name is Felipe Camacho, Geoscientist from Universidad de los Andes in Bogotá (Colombia). With the support of the Erasmus + Programme of the European Union, I have been enrolled in the **"Copernicus Master In Digital Earth"** double Master Programme since 2022.

During my first year, at the Paris Lodron University of Salzburg, I developed skills focused on Remote Sensing, Data analysis, and processing of spatial data, using software like ArcGIS Pro, eCognition, Google Earth Engine (GEE), and programming languages that include Python, JavaScript, CSS, and HTML.

Then, in the second semester of 2023, I moved to Olomouc city in the Czech Republic, to complete the second and last year of the double master program at the Palacký University Olomouc, focused on cartography and geovisualization. There I developed skills related to color management, design, cartographic production, and the usage of software including Adobe catalog (illustrator and Indesign), blender, and more.

This Portfolio is a showcase of the outstanding cartographic products that I have designed the last few months and also show the learning curve and constant improvement. Please, do not hesitate to contact me if you have any inquiry.

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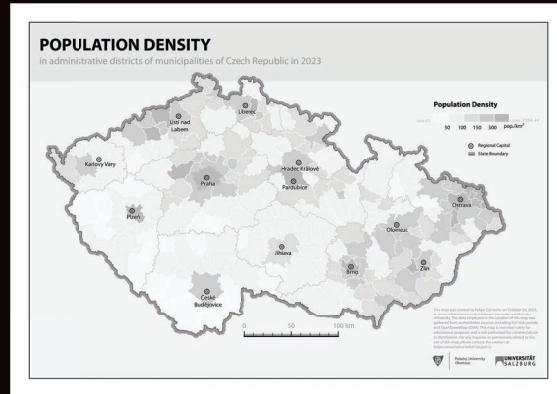
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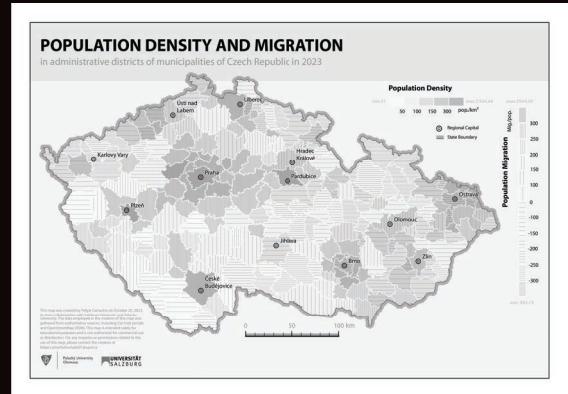
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# MAPS

POPULATION DENSITY IN  
CZECH REPUBLIC, 2023



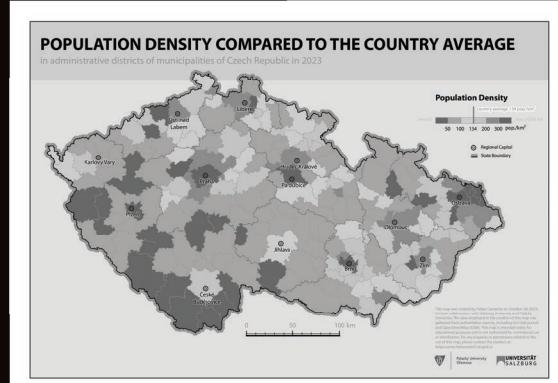
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IN CZECH REPUBLIC, 2023



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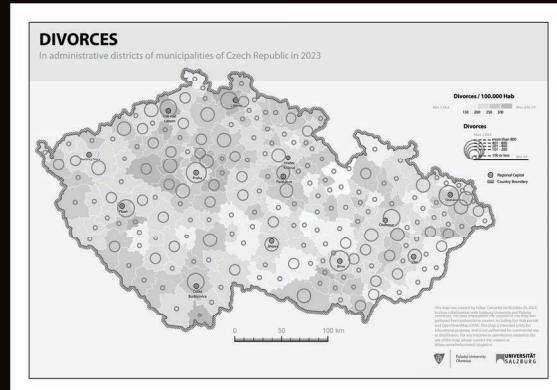
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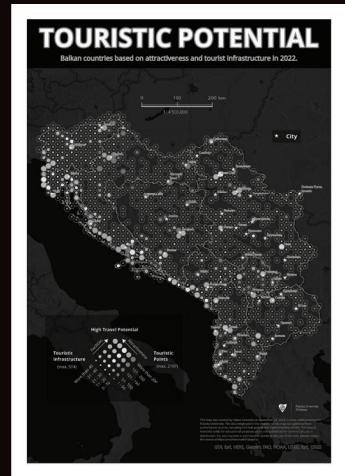


POPULATION DENSITY COMPARED TO THE  
COUNTRY AVERAGE, CZECHIA 2023

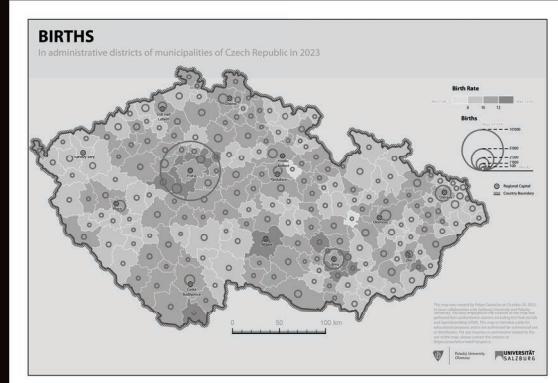
## DIVORCES IN CZECH REPUBLIC, 2023



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## POPULATION DENSITY IN CZECH REPUBLIC, 2023

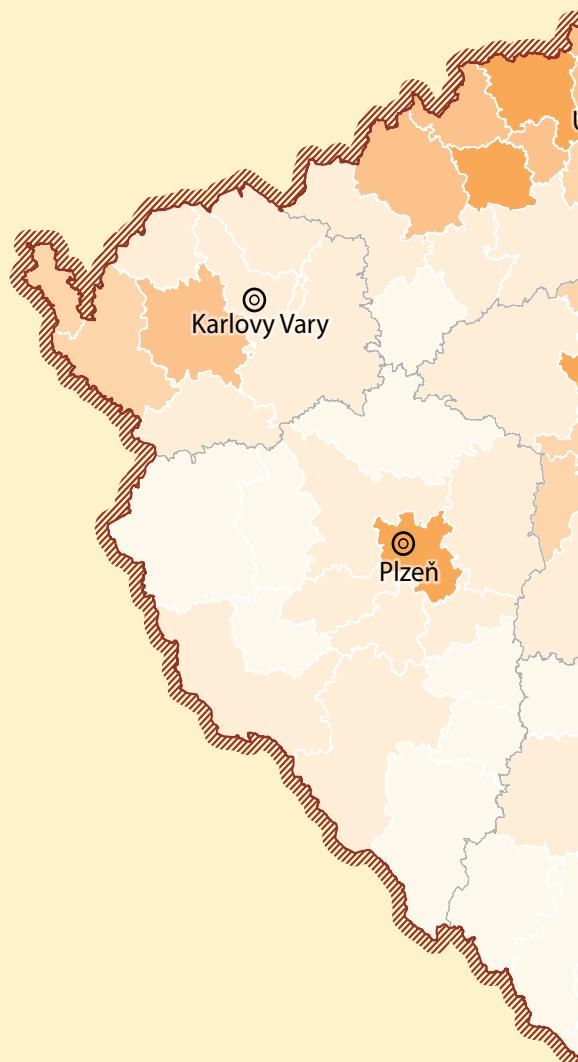
The map is a simple choropleth map that shows the population density in administrative districts of the Czech Republic in 2023. The highest color saturation represents the highest population density, and the lightest color saturation represents the lowest population density.

The most densely populated district is Praha, with a population density of 2554.44 people per square kilometer, followed by Brno with a population density of 1637.95 people per square kilometer. The least densely populated district is Sušice, with a population density of 31.2 people per square kilometer.

The map also shows the location of the regional capitals and state boundaries. The regional capitals are the largest cities in each of the Czech Republic's 13 regions. The state boundaries are the borders between the Czech Republic and its neighboring countries.

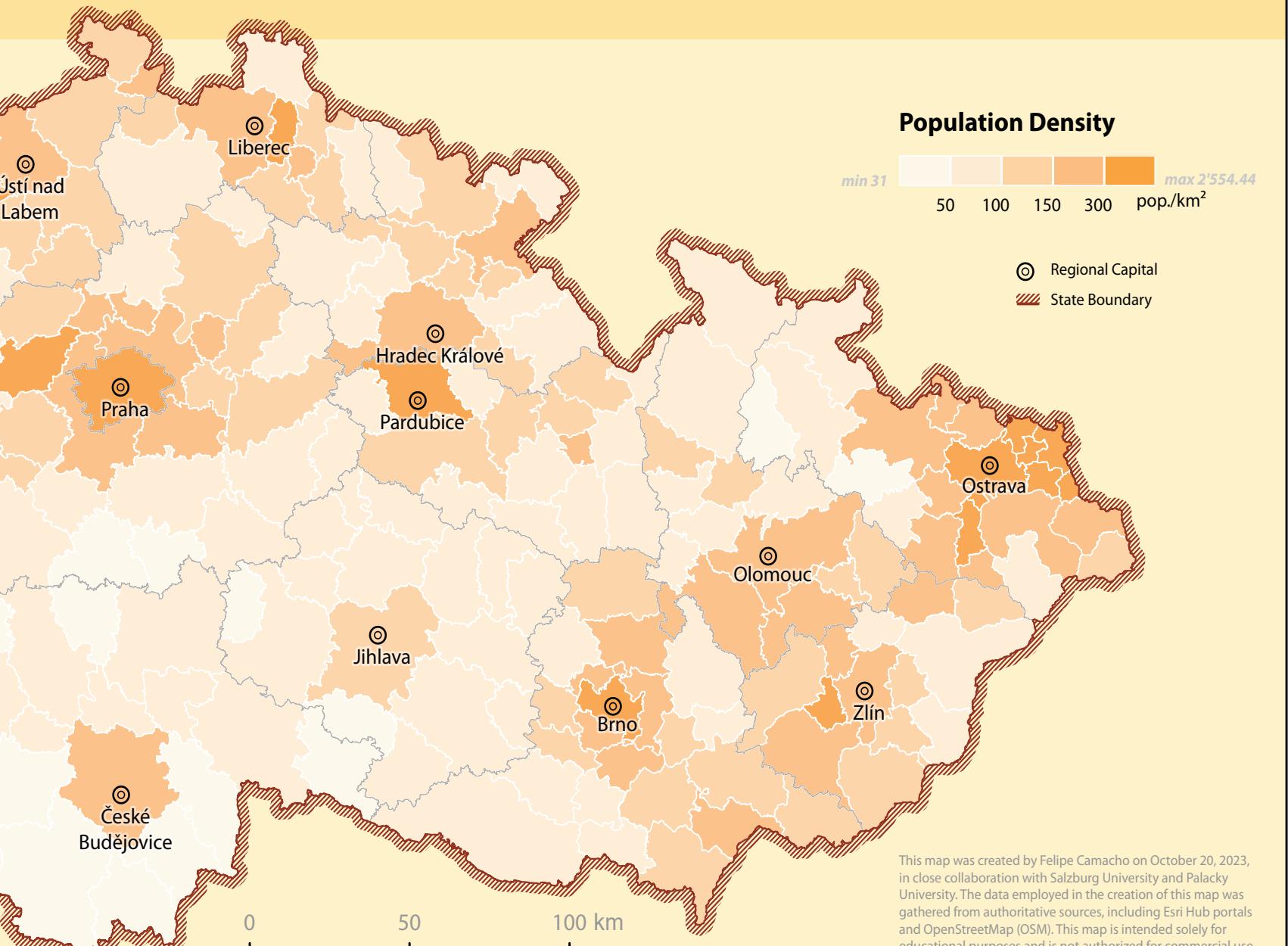
# POPULATION DENSITY

in administrative districts of municipalities



# DENSITY

Municipalities of Czech Republic in 2023



This map was created by Felipe Camacho on October 20, 2023, in close collaboration with Salzburg University and Palacky University. The data employed in the creation of this map was gathered from authoritative sources, including Esri Hub portals and OpenStreetMap (OSM). This map is intended solely for educational purposes and is not authorized for commercial use or distribution. For any inquiries or permissions related to the use of this map, please contact the creators at felipe.camachohurtado01@upol.cz

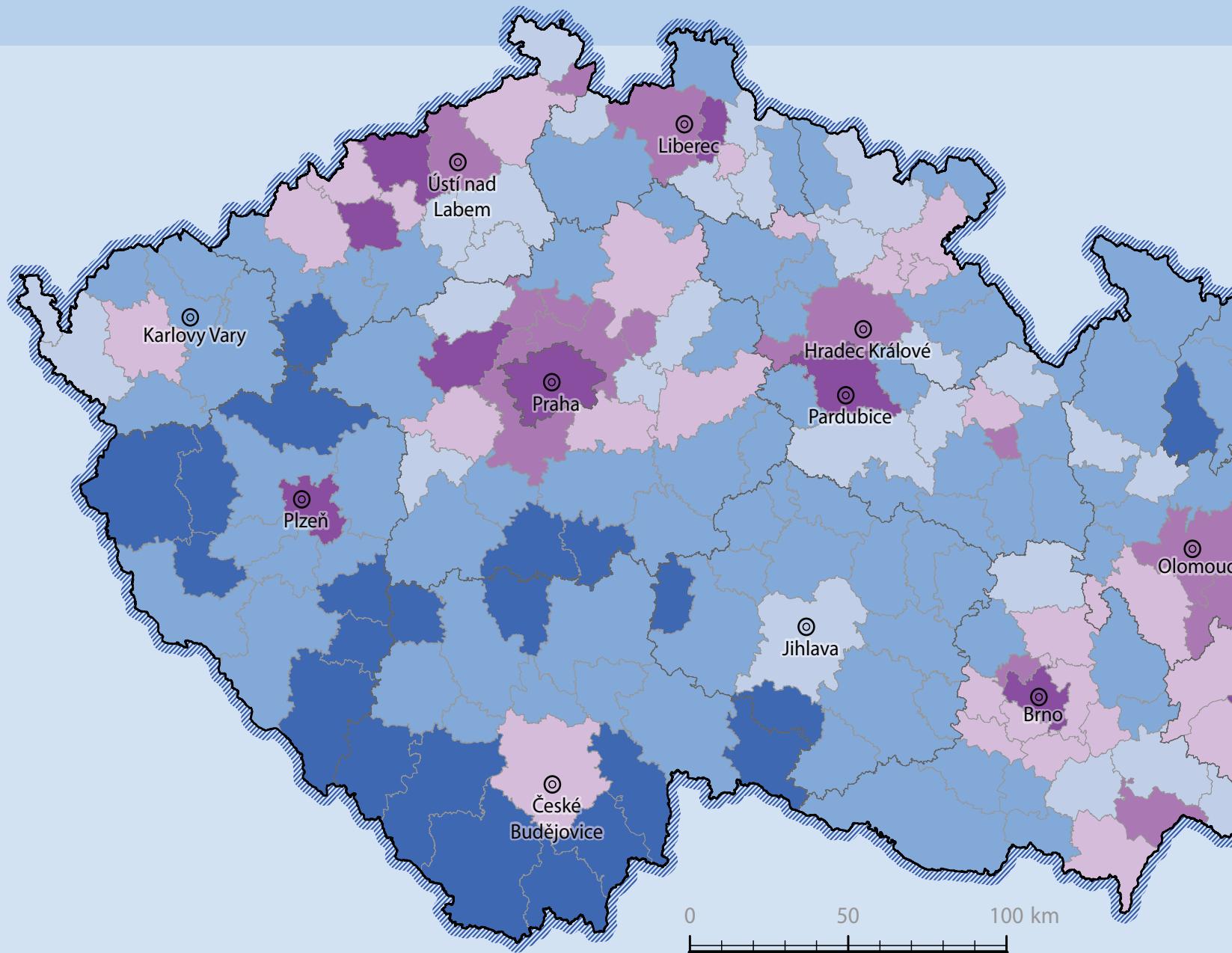


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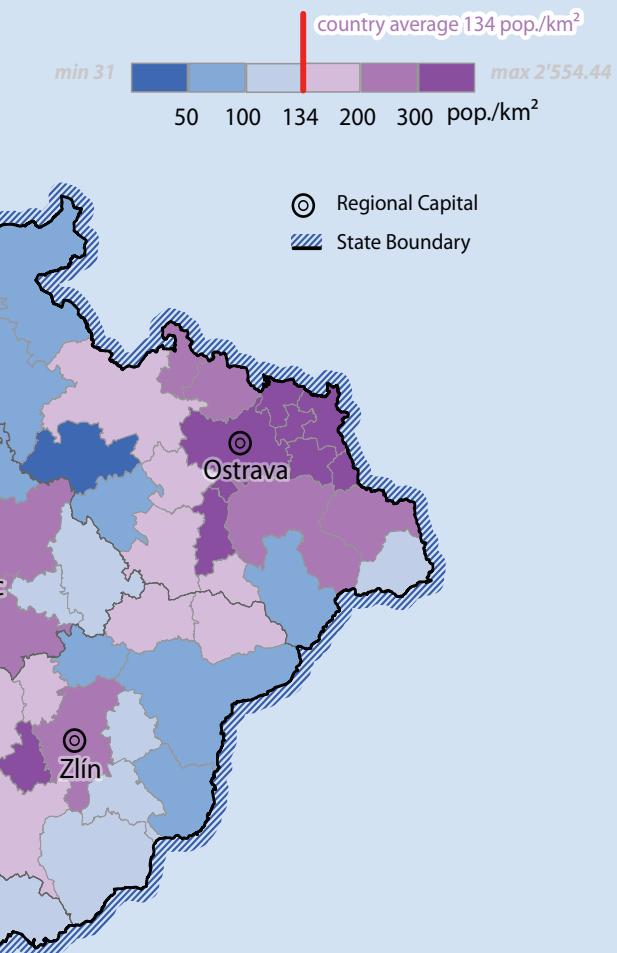
# POPULATION DENSITY COMPARED TO THE COUNTRY

in administrative districts of municipalities of Czech Republic in 2023



# COUNTRY AVERAGE

## Population Density



This map was created by Felipe Camacho on October 20, 2023, in close collaboration with Salzburg University and Palacky University. The data employed in the creation of this map was gathered from authoritative sources, including Esri Hub portals and OpenStreetMap (OSM). This map is intended solely for educational purposes and is not authorized for commercial use or distribution. For any inquiries or permissions related to the use of this map, please contact the creators at [felipe.camachohurtado01@upol.cz](mailto:felipe.camachohurtado01@upol.cz)



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## POPULATION DENSITY COMPARED TO THE COUNTRY AVERAGE, CZECHIA 2023

The map is a qualifying choropleth map that uses a divergent color range to classify the population density of the Czech Republic of 2023 into two groups: above and below the average population density, which is 134 people per square kilometer.

For this purpose, the administrative districts below the average are represented using a blue hue, where the lower the value, the higher the intensity, while the administrative districts above the average, they are represented using a purple hue, where the higher the value, the higher the saturation of the purple color.

As a result, 68 administrative districts have a population density above the average and 138 below the average.

## POPULATION DENSITY AND MIGRATION IN CZECH REPUBLIC, 2023

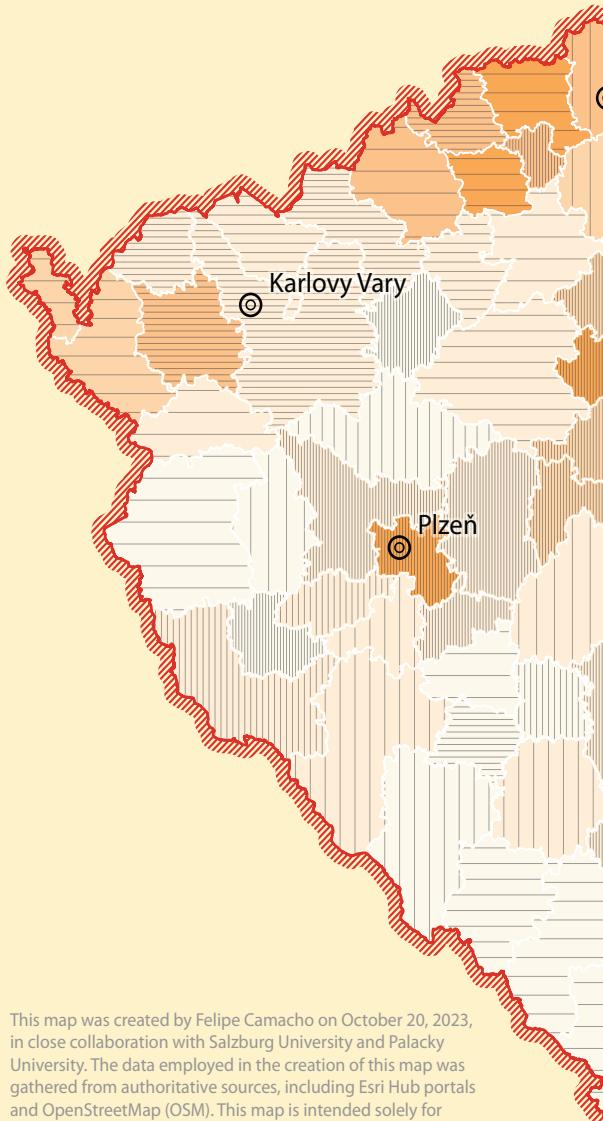
In this map, the population density and migration in the Czech Republic in 2023 are shown by using a selective choropleth map. This cartographic allows the capture of two characteristics that together form a single phenomenon, as it is immigration and emigration.

For representing the different population density values, the color hue varies based on the amount of this parameter, while the migration phenomena are represented by the infill hashed effect, where a vertical dash effect corresponds to immigration, and a horizontal dash effect corresponds to emigration.

As a result, it can be observed that the two administrative districts with the most incoming people were Rícaný and Černošice, with 2044.95 and 1846.96 immigrants per 100.000 inhabitants. On the other hand, Karviná and Orlová are the administrative districts with the most emigrations, with -832.26 and -905.73 people per 100.000 inhabitants, respectively.

# POPULATION DENSITY

in administrative districts of mu...



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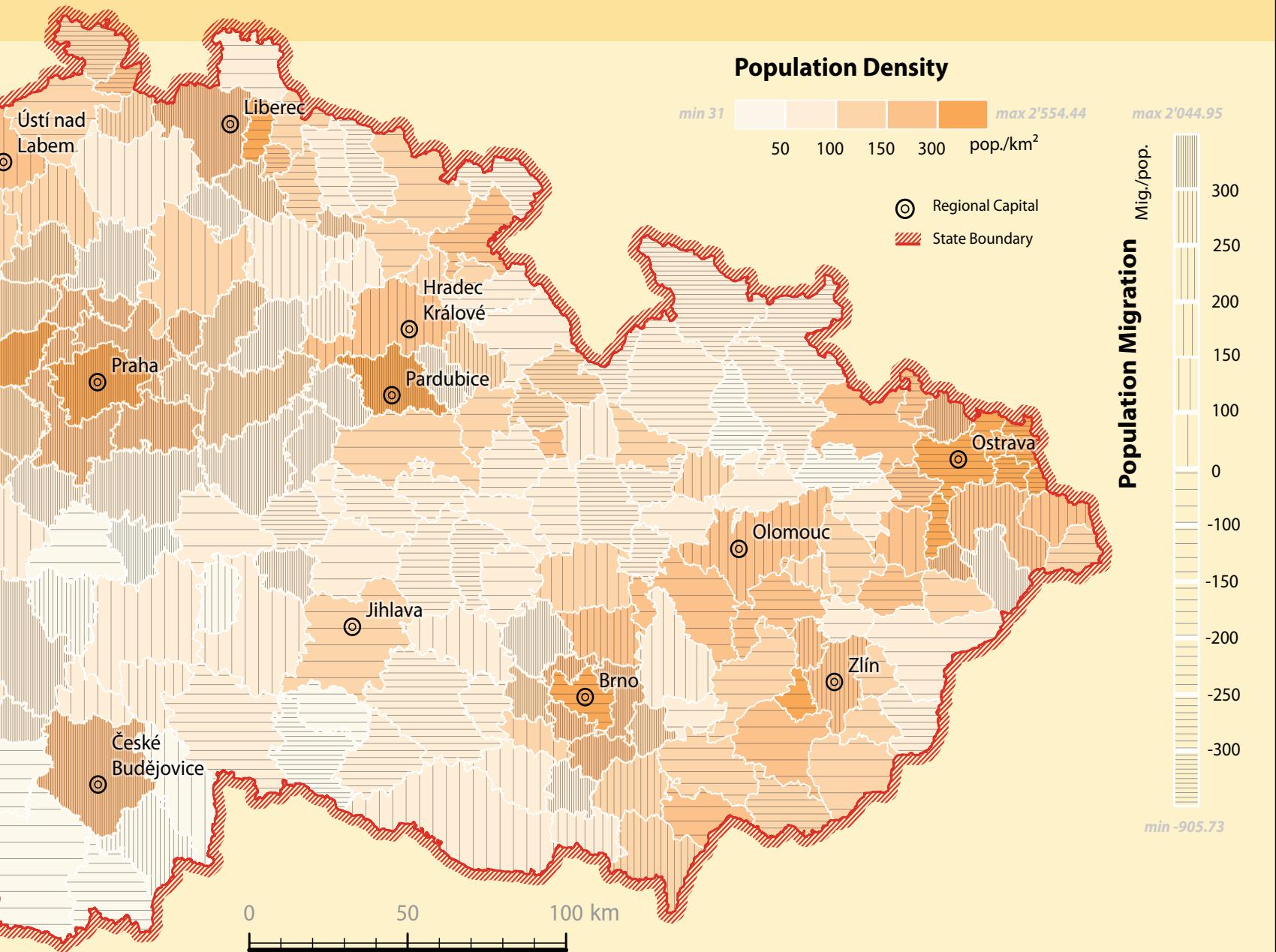


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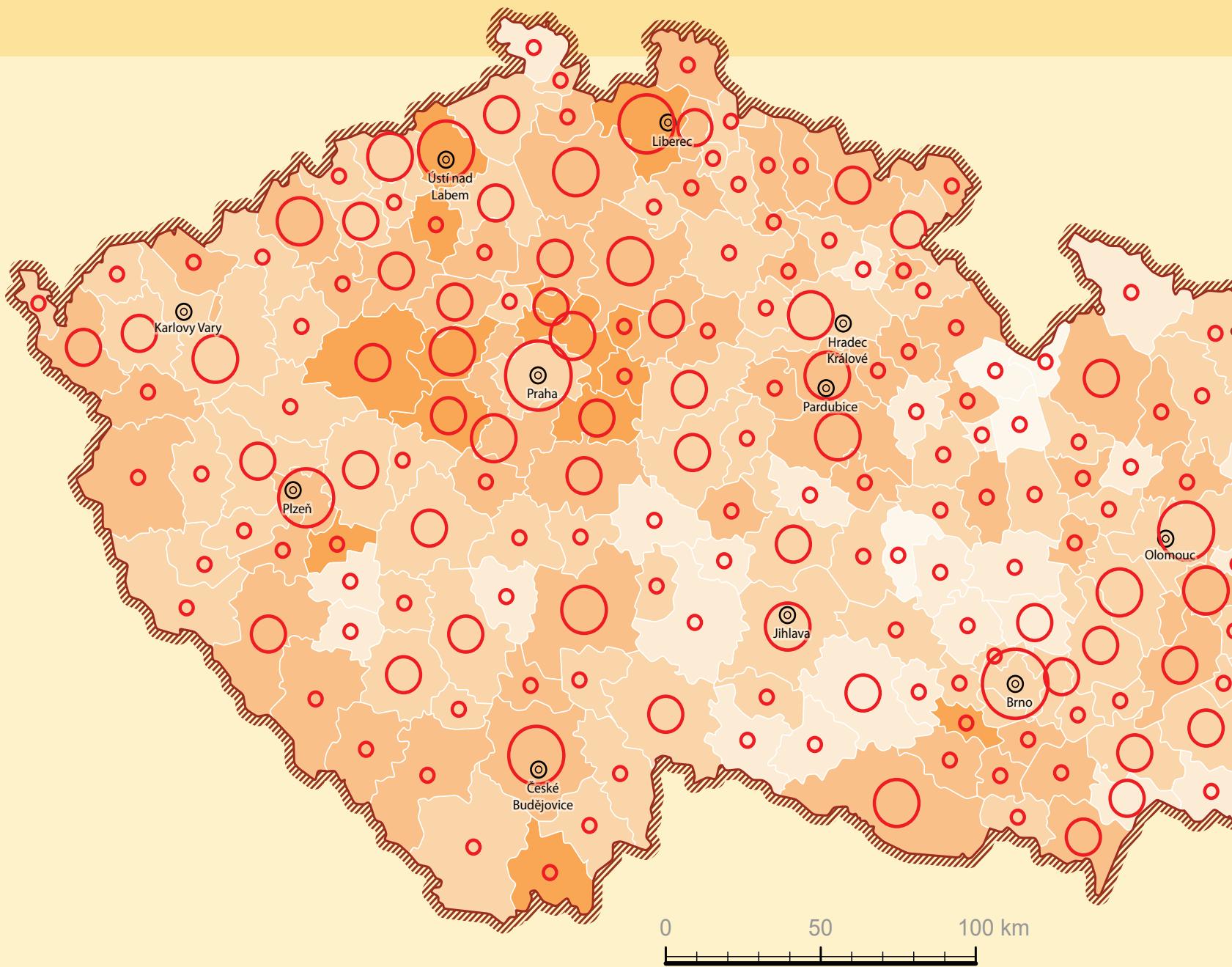
# DENSITY AND MIGRATION

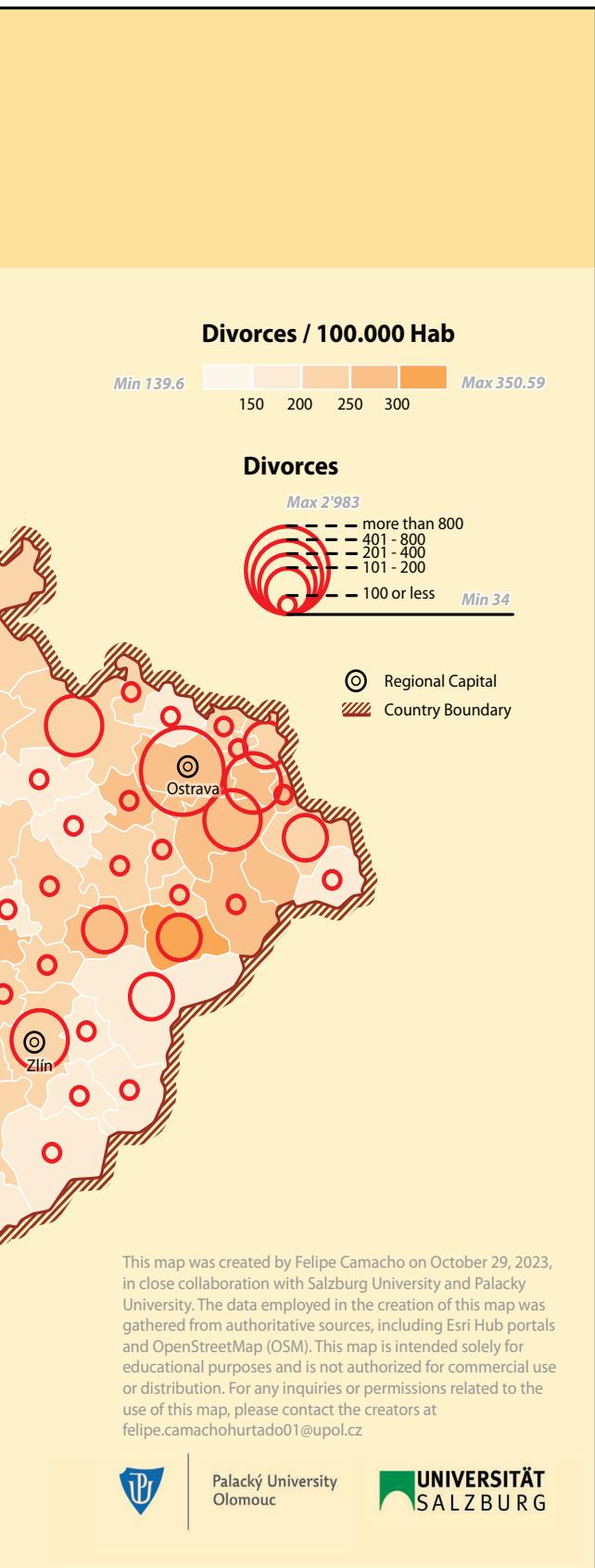
Municipalities of Czech Republic in 2023



# DIVORCES

In administrative districts of municipalities of Czech Republic in 2023





## DIVORCES IN CZECH REPUBLIC, 2023

In this map, the choropleth and graduated symbols cartographic methods are combined to show the number of divorces in the administrative districts of the Czech Republic in 2023:

In the first place, using different variations of color intensities, where the higher intensity corresponds to higher values, the number of divorces per 100.000 inhabitants is represented.

In second place, after aggregating the data to each administrative district capital, graduated symbols as red circles, show the range values of divorces for each corresponding district.

As a result, 3 districts evidence more than 800 births, 5 between 401 and 800 births, 20 between 201 and 400 births, 45 between 101 and 200 births, and 136 less or equal to 100 births

## BIRTHS IN CZECH REPUBLIC, 2023

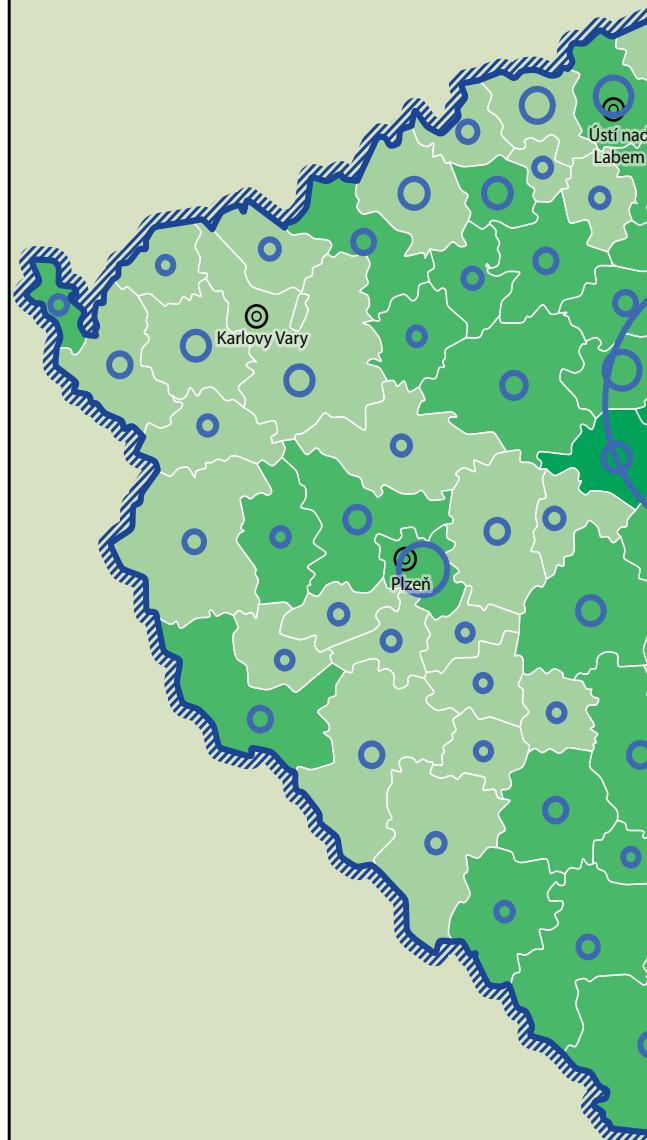
As in Map No. 4, for this map two cartographic methods were combined: Choropleth and Proportional Symbols methods. By combining those methods, the birth rate in each administrative district of municipalities of the Czech Republic in 2023 was represented.

With the choropleth method, the number of births normalized to the municipality area is represented using a sequential color range with different green hue saturations, where the minimum value is 7.58 births and the maximum is 16.65 per square kilometer.

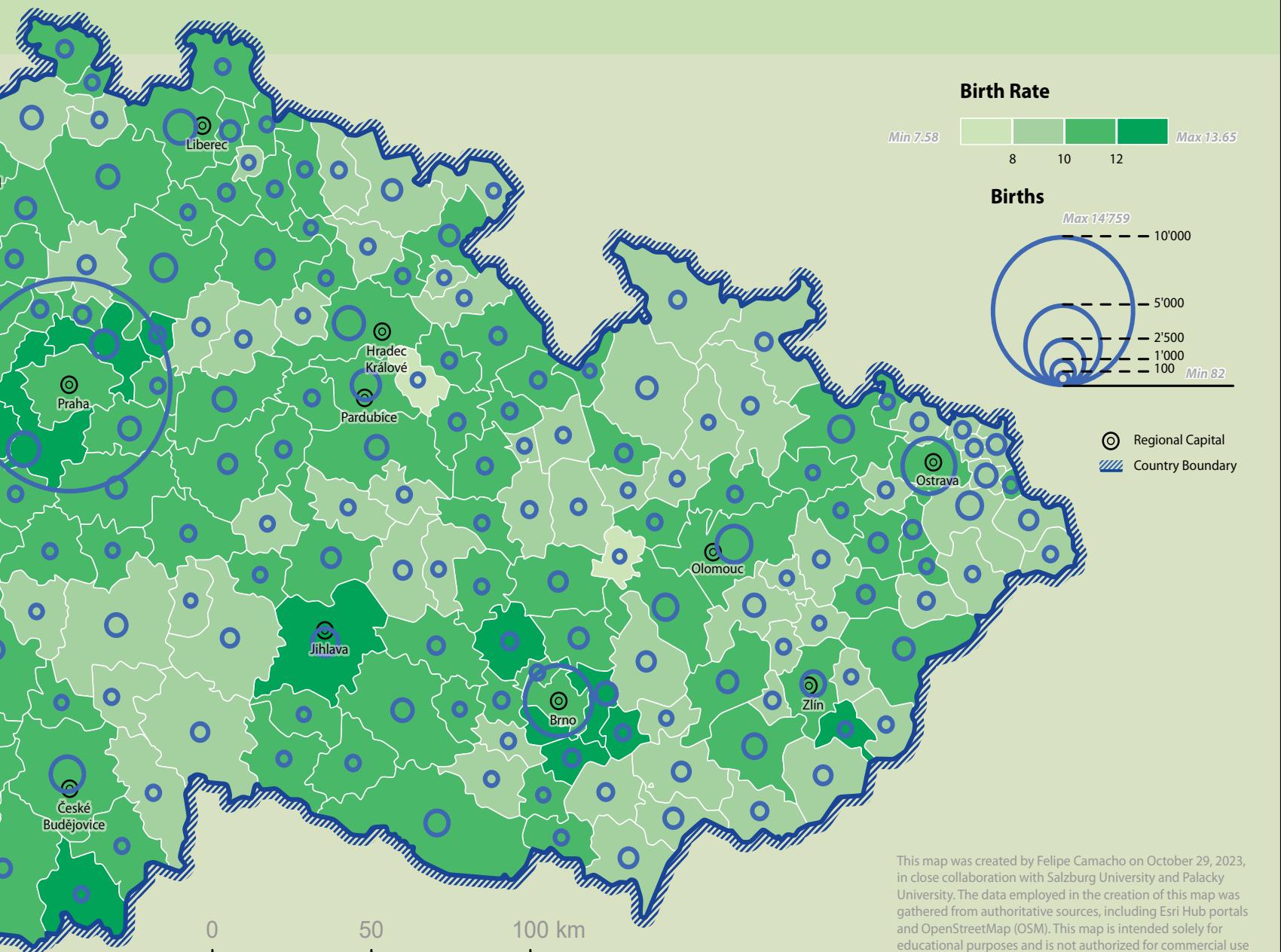
In addition, using proportional symbols, the absolute number of births for each district is shown, using blue circles. It can be observed that the top 3 districts with more births are Praha, Brno, and Ostrava, with 14759, 4405, and 3275 births respectively.

# BIRTHS

In administrative districts of mu-



# Municipalities of Czech Republic in 2023



This map was created by Felipe Camacho on October 29, 2023, in close collaboration with Salzburg University and Palacky University. The data employed in the creation of this map was gathered from authoritative sources, including Esri Hub portals and OpenStreetMap (OSM). This map is intended solely for educational purposes and is not authorized for commercial use or distribution. For any inquiries or permissions related to the use of this map, please contact the creators at [felipe.camachohurtado01@upol.cz](mailto:felipe.camachohurtado01@upol.cz)

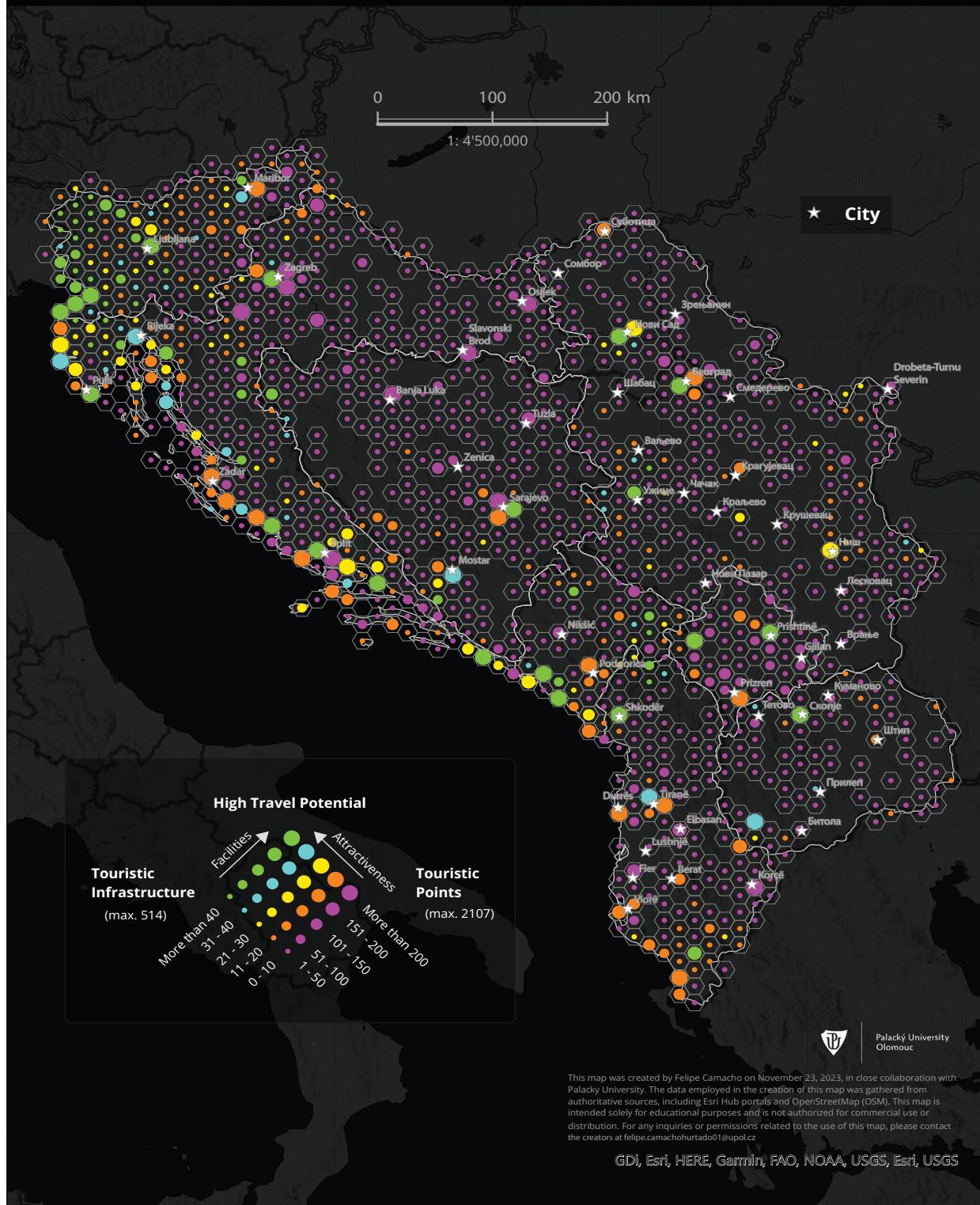


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# TOURISTIC POTENTIAL

Balkan countries based on attractiveness and tourist infrastructure in 2022.



## TOURISTIC POTENTIAL OF BALKAN COUNTRIES, 2022

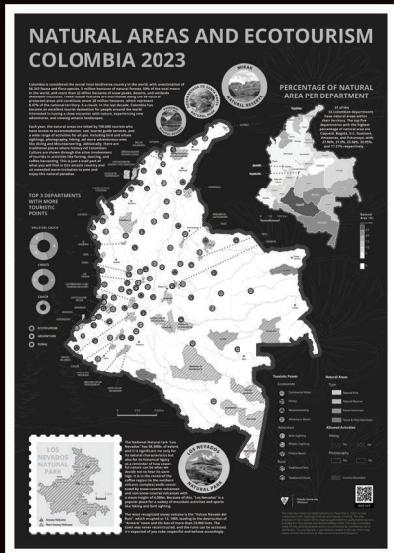
This map shows the potential for tourism in the Balkan countries based on attractiveness and tourist infrastructure in 2022.

It is a multivariate map in which Wurman dots are used to represent the number of facilities available in the Balkan countries and different color hues to represent the number of tourist points in each aggregated region.

This is a good example of how multivariate mapping is used to provide as much information as possible to the reader.

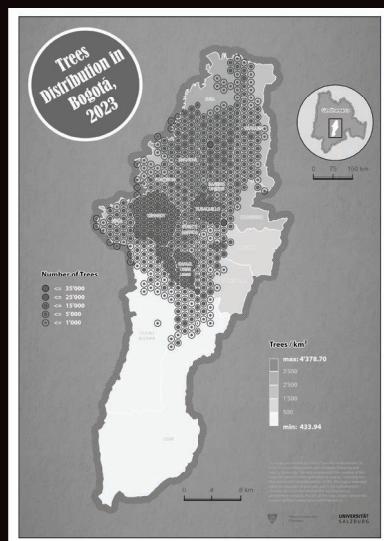
# POSTERS

## NATURAL AREAS AND ECOTOURISM COLOMBIA 2023

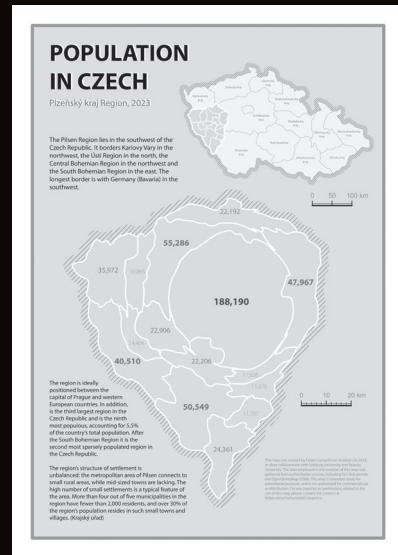


1

## TREES DISTRIBUTION IN BOGOTÁ D.C. 2023



2



3

POPULATION IN CZECHIA. PLZEŇSKÝ KRAJ  
REGION, 2023

## NATURAL AREAS AND ECOTOURISM COLOMBIA 2023

This poster presents a captivating overview of Colombia's ecotourism attractions, highlighting its diverse natural beauty, rich cultural heritage, and thrilling adventure opportunities.



# NATURAL AREAS AND ECOTOURISM COLOMBIA 2023

Colombia is considered the second most biodiverse country in the world, with an estimation of 56,543 fauna and flora species. 56 million hectares of natural forests, 50% of the total moors in the world, and more than 22 million hectares of snow peaks, deserts, and wetlands (Humboldt Institute). These natural features are distributed along the 59 natural protected areas and constitute almost 20 million hectares, which represent 8.47% of the national territory. As a result, in the last decade, Colombia has become an excellent tourist destination for people around the world interested in having a close encounter with nature, experiencing new adventures, and viewing amazing landscapes.

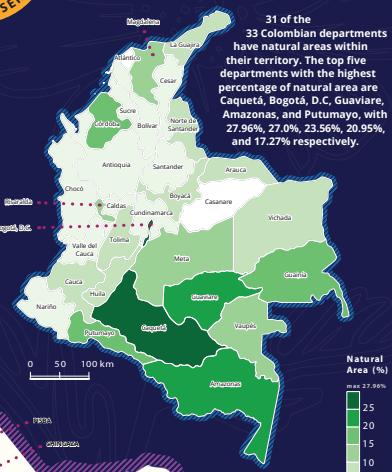
Each year, the natural areas are visited by 700,000 tourists who have access to accommodation, food, tourist guide services, and a wide range of activities for all ages. Including bird and whale sightings, photography, hiking, and more adventurous ones like diving and Mountaineering. Additionally, there are traditional places where history and Colombian Culture are shown through the active involvement of tourists in activities like farming, dancing, and coffee harvesting. This is just a small part of what you will find in this amazing country and an extended warm invitation to come and enjoy this natural paradise.

### TOP 3 DEPARTMENTS WITH MORE TOURISTIC POINTS



### PERCENTAGE OF NATURAL AREA PER DEPARTMENT

31 of the 33 Colombian departments have natural areas within their territory. The top five departments with the highest percentage of natural area are Caquetá, Bogotá, D.C., Guaviare, Amazonas, and Putumayo, with 27.96%, 27.04%, 23.56%, 20.95%, and 17.27% respectively.



#### Touristic Points

- Ecotourism
- Adventure
- Rural

#### Natural Areas

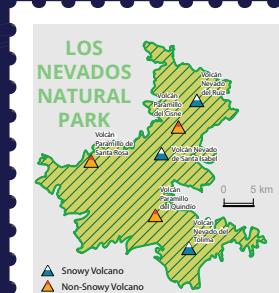
- Type
- Continental Water
- Diving
- Mountaineering
- Adventure Beach
- Ecotourism
- Adventure
- Rural

#### Allowed Activities

- Hiking
- Photography
- Whales Sighting
- Pristine Beach
- Traditional Farm
- Traditional House



WEB APP



The National Natural Park "Los Nevados" has 58,300ha of extent, and it is significant not only for its natural characteristics but also for its historical legacy as a reminder of how powerful nature can be when we decide not to hear its warnings. It is in the center of the coffee region (In the northern volcanic complex) and is constituted by snow-covered volcanoes and non-snow-covered volcanoes with a mean height of 4,000m. Because of this, "Los Nevados" is a popular place for a variety of mountain activities and sports like hiking and bird sighting.

The most recognized snowy volcano is the "Volcán Nevado del Ruiz", which erupted on 13, 1985, leading to the destruction of "Armero" town and the loss of more than 23,000 lives. The town was never reconstructed, and the ruins can be accessed. It's expected of you to be respectful and behave accordingly.



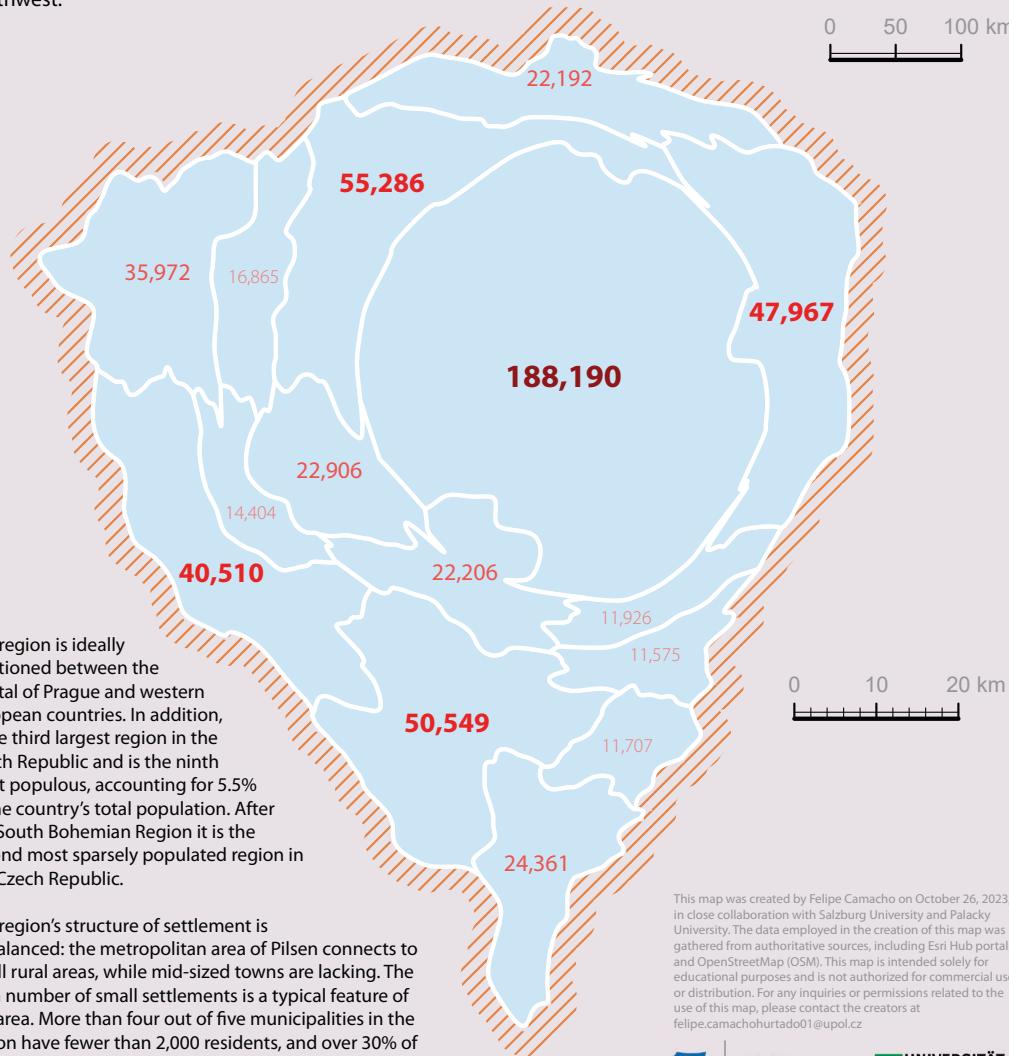
This map was created by Felipe Camacho on December 6, 2023, in close collaboration with Salzburg University and Palacky University. The data employed in the creation of this map was gathered from authoritative sources, including Estadísticas y Censos de Colombia (ECC) and OpenStreetMap (OSM). This map is intended solely for educational purposes and is not to be used for commercial use or distribution. For any inquiries or permissions related to the use of this map, please contact the creators at felipe.camachohurtado01@upol.cz



# POPULATION IN CZECHIA

Plzeňský kraj Region, 2023

The Pilsen Region lies in the southwest of the Czech Republic. It borders Karlovy Vary in the northwest, the Ústí Region in the north, the Central Bohemian Region in the northwest and the South Bohemian Region in the east. The longest border is with Germany (Bavaria) in the southwest.



The region is ideally positioned between the capital of Prague and western European countries. In addition, it is the third largest region in the Czech Republic and is the ninth most populous, accounting for 5.5% of the country's total population. After the South Bohemian Region it is the second most sparsely populated region in the Czech Republic.

The region's structure of settlement is unbalanced: the metropolitan area of Pilsen connects to small rural areas, while mid-sized towns are lacking. The high number of small settlements is a typical feature of the area. More than four out of five municipalities in the region have fewer than 2,000 residents, and over 30% of the region's population resides in such small towns and villages. (Krajský úřad)

## POPULATION IN CZECHIA. PLZEŇSKÝ KRAJ REGION, 2023

This poster displays a cartogram map with graduated numbers methods to represent the population density of the Plzeňský kraj region in Czechia

This map was created by Felipe Camacho on October 26, 2023, in close collaboration with Salzburg University and Palacky University. The data employed in the creation of this map was gathered from authoritative sources, including Esri Hub portals and OpenStreetMap (OSM). This map is intended solely for educational purposes and is not authorized for commercial use or distribution. For any inquiries or permissions related to the use of this map, please contact the creators at felipe.camachohurtado01@upol.cz



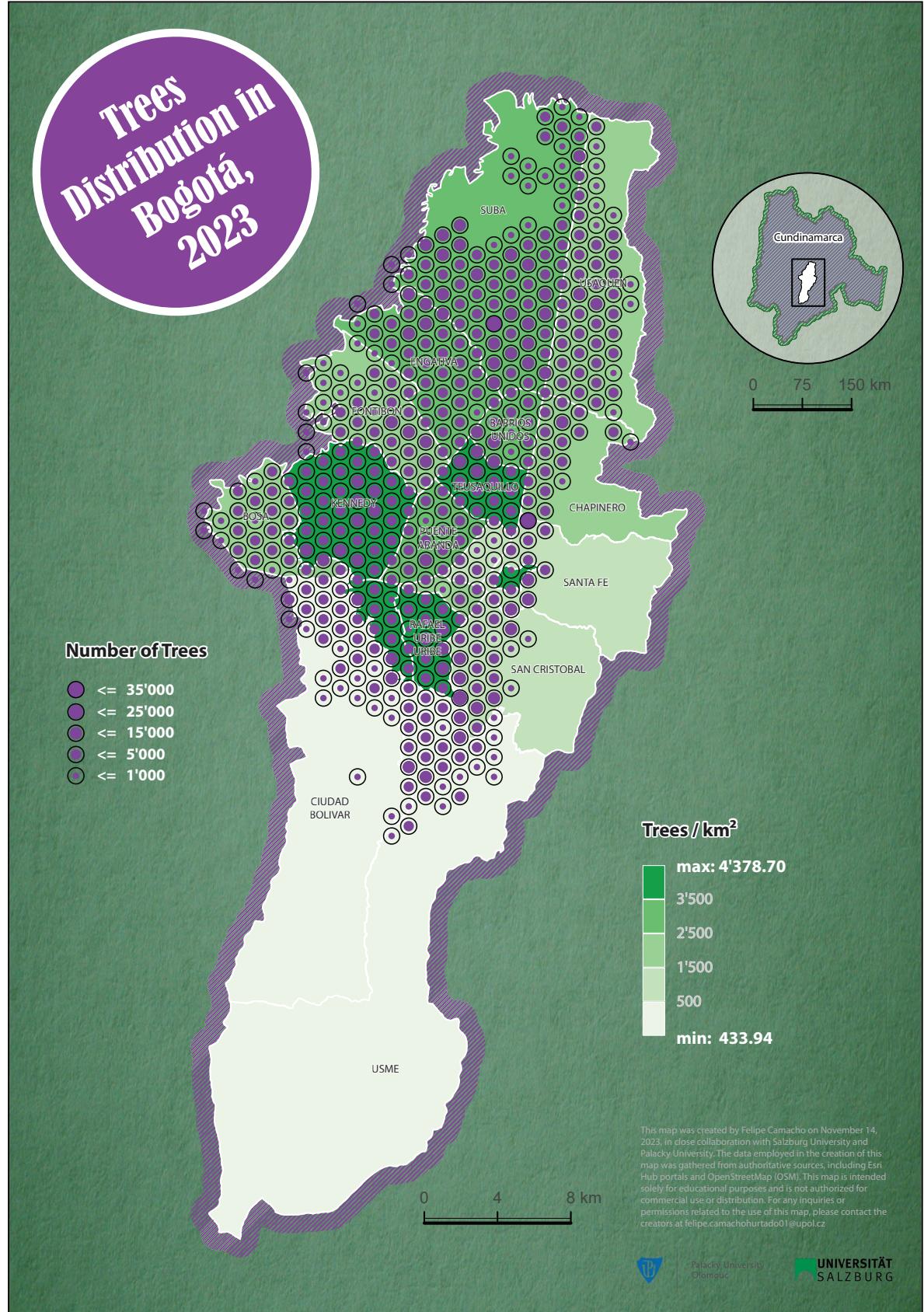
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# 3

## TREES DISTRIBUTION IN BOGOTÁ D.C., 2023

In this poster, the Wurmand Dots and Choropleth cartographic methods are used to visualize the trees distribution in 2023 for Colombian's capital.



# WEB

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1

HOTTEST SUMMER RECORDED  
IN JAPON, 2022



2

TERRAIN ANALYSIS IN LENGUAQUE,  
2022



In this StoryMap, different interpolation methods like Inverse Distance Weighted (IDW) carried out in ArcGIS Online, are explained to understand Japan's 2022 summer high temperatures.



In this StoryMap, different raster functions as Slope, Curvature, and Aspect, in addition to DTM, were generated to analize the soild and vegetation status in coal mines of Lenguaque.



# HISTORIES

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3

**SUITABLE BUILDINGS FOR  
SOLAR PANELS IN SALZBURG**



In this Storymap, suitable buildings for solar panel installation will be identified in Salzburg (Austria). Additionally, the importance and efficiency of green energy sources discussed.

4

**SALZBURG'S FLOODINGS IN THE  
UNTERSULZBACH RIVER, 2022**



In this Storymap, a Hydrological model will be applied to the Untersulzbach river, to determine runoff routing and catchments, for flooding prevention.



# **PORTFOLIO**

**FELIPE CAMACHO**

# **ACKNOWLEDGEMENTS**

This book is the result of the lecture during the winter semester of 2023 at Palacký University Olomouc. I am very grateful to the following individuals for preparing the courses and sharing their knowledge and advice with all the students: Professor Vít Voženíle, Doctor Radek Barvíř, Ph.D. candidate Jakub Koníček, and especially Doctor Alena Vondráková, who has been an inspiration during this cartographic learning process.

Thanks.

Felipe

