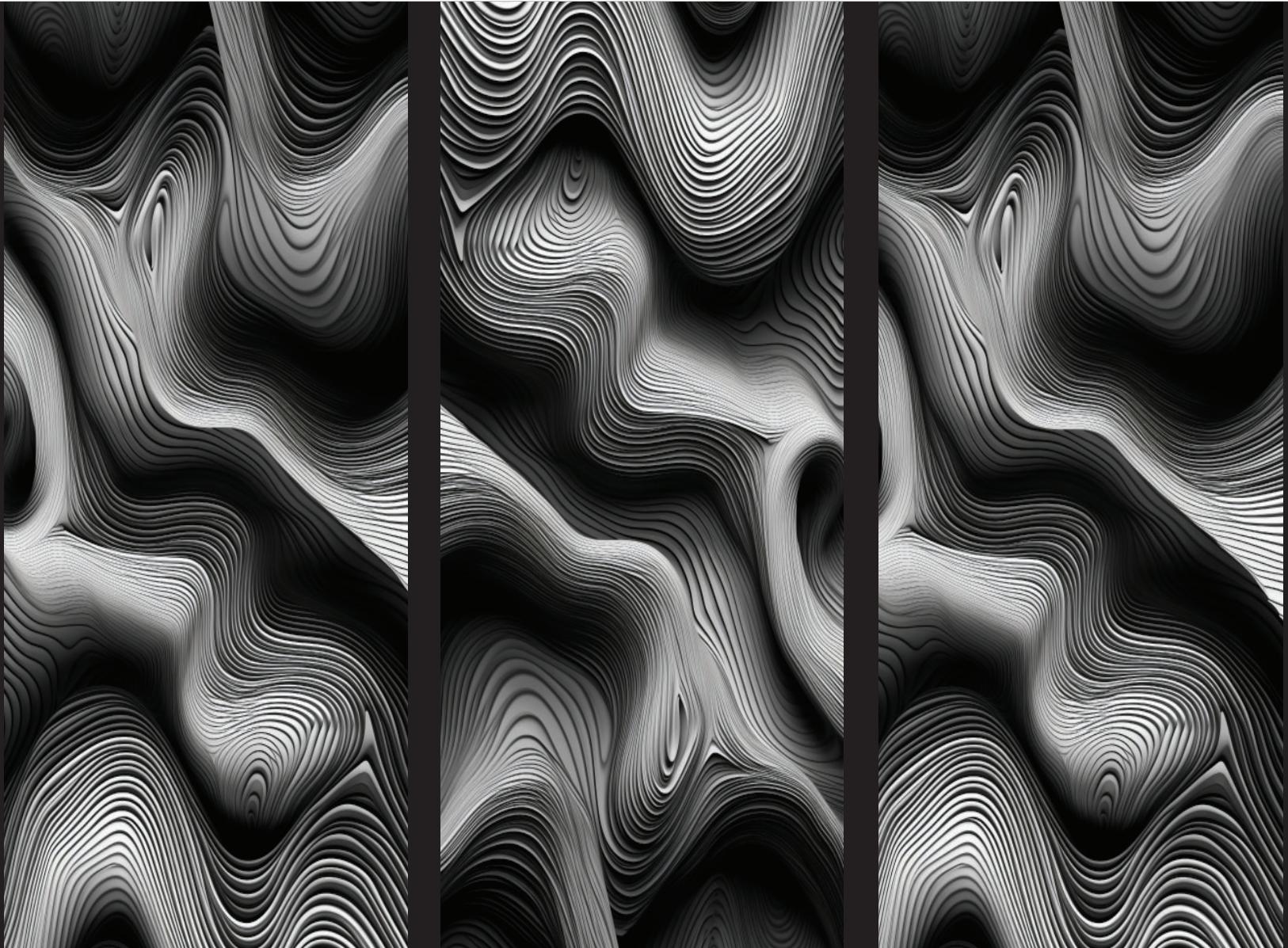


PORTFOLIO



Cartography

Madeline Mulder

2022 - 2024

CONTENTS

Welcome to my cartography portfolio, where the art and science of mapmaking come together to tell compelling stories of landscapes, journeys, and information.

In this collection, you will discover a diverse range of maps that showcase my proficiency in various mapping techniques, from traditional topographic maps to innovative thematic visualizations. Each map is a testament to my dedication to precision, clarity, and the seamless integration of design elements.

As you explore this portfolio, you'll find maps that not only navigate the physical terrain but also delve into the realms of thematic mapping, illustrating patterns, trends, and narratives that go beyond the surface. My goal is not only to provide functional maps but to create visual experiences that resonate with audiences and convey a deeper understanding of the world around us.

Whether it's depicting the intricate details of a cityscape, mapping environmental changes over time, or visualizing demographic shifts, I approach each project with a commitment to excellence and a passion for storytelling through cartography.



ABOUT ME

1

General Cartography

This section contains maps that are focused on portraying a broad geographic area and contain a variety of geographic features and reference information.

2

Thematic Cartography

This sections contains maps that emphasize or represent specific themes or topics which highlight patterns, trends, or variations in the chosen theme across geographic space.

3

Poster Project

This section contains a semestral project composed of a printed poster introducing tourists to the Washington D.C. area.

I am a passionate cartographer with a keen eye for detail and a love for translating geographical data into visually stunning and informative maps.

My educational journey, which began with a degree in geography and a minor in data science from William & Mary, has equipped me with a solid foundation in both the art and science of cartography.

Presently, I am enrolled as a Master's student in the Copernicus Master in Digital Earth double Master's program, a distinguished educational initiative under the European Union's Erasmus+ program. As part of this comprehensive two-year, full-time integrated European Master of Science program I spent the first year of rigorous studies learning about geoinformatics in Salzburg, Austria and have subsequently relocated to Olomouc, Czechia, for the second year, where my academic focus has shifted to advanced studies in cartography and geographic communication.

During my educational journey and working experience, I delved into the intricacies of spatial analysis, map design, and geographic information systems, honing my skills to meticulously craft maps that not only navigate terrains but also tell captivating stories. Thank you for taking the time to explore my work. I invite you to journey through this collection of maps, each crafted with precision, purpose, and a genuine love for the art of mapmaking.



Software & Skills



Google Earth Engine



ArcGIS Suite



QGIS



Python



Adobe Illustrator



Postgresql & SQL

GENERAL CARTOGRAPHY



1

Welcome to the General Cartography section of this portfolio, where the art and science of mapmaking converge to offer a comprehensive exploration of diverse geographic landscapes. General cartography, as showcased here, serves as a foundational tool for navigation, education, and understanding the fundamental characteristics of different regions.

In this collection, you will find a series of meticulously crafted maps that provide a broad overview of various elements shaping our world. From the majestic contours of mountain ranges to the intricate network of rivers, political boundaries, and bustling urban centers, these maps aim to capture the essence of geographic features in a visually engaging manner.

新幹線 BULLET TRAIN

Japan, 2018

The Shinkansen (新幹線), also known as the "Bullet Train," is a high-speed railway network with 7 separate lines renowned for its incredible speed, efficiency, and safety. The Shinkansen is not just a mode of transportation; it represents a cultural icon and a source of national pride. The sights that can be seen from the Shinkansen can be quite diverse and captivating, depending on the route. Some of the highlights include the scenic countryside, soaring mountains, and stunning skylines.

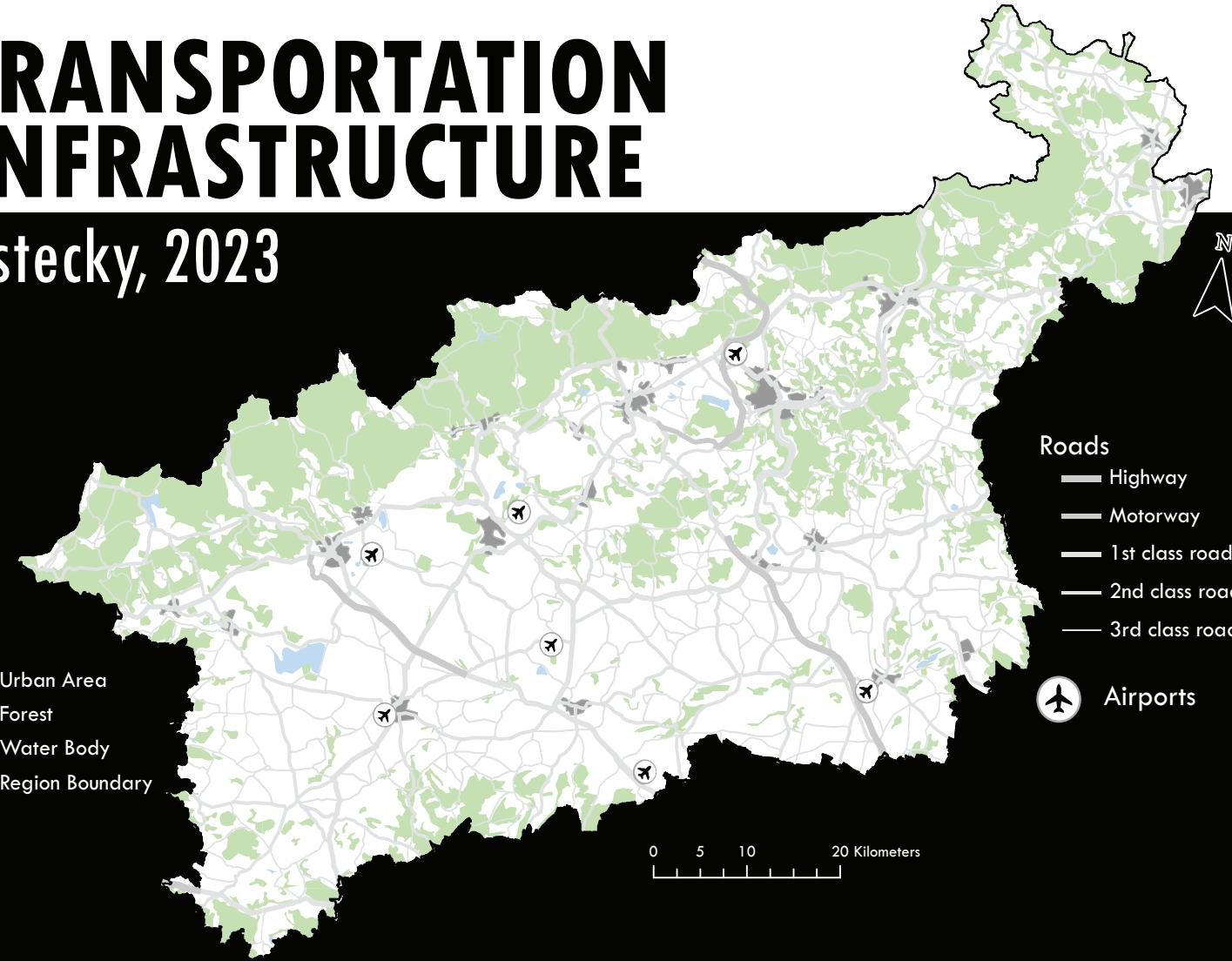


Bullet Train Route Through Japan, 2018

This map shows the route of and major cities serviced by the Bullet Train through Japan in 2018 before all of the lines were completed. The map was designed in a vintage style and the symbol for a mountain was created specifically for this map using Adobe Illustrator.

TRANSPORTATION INFRASTRUCTURE

Ustecky, 2023



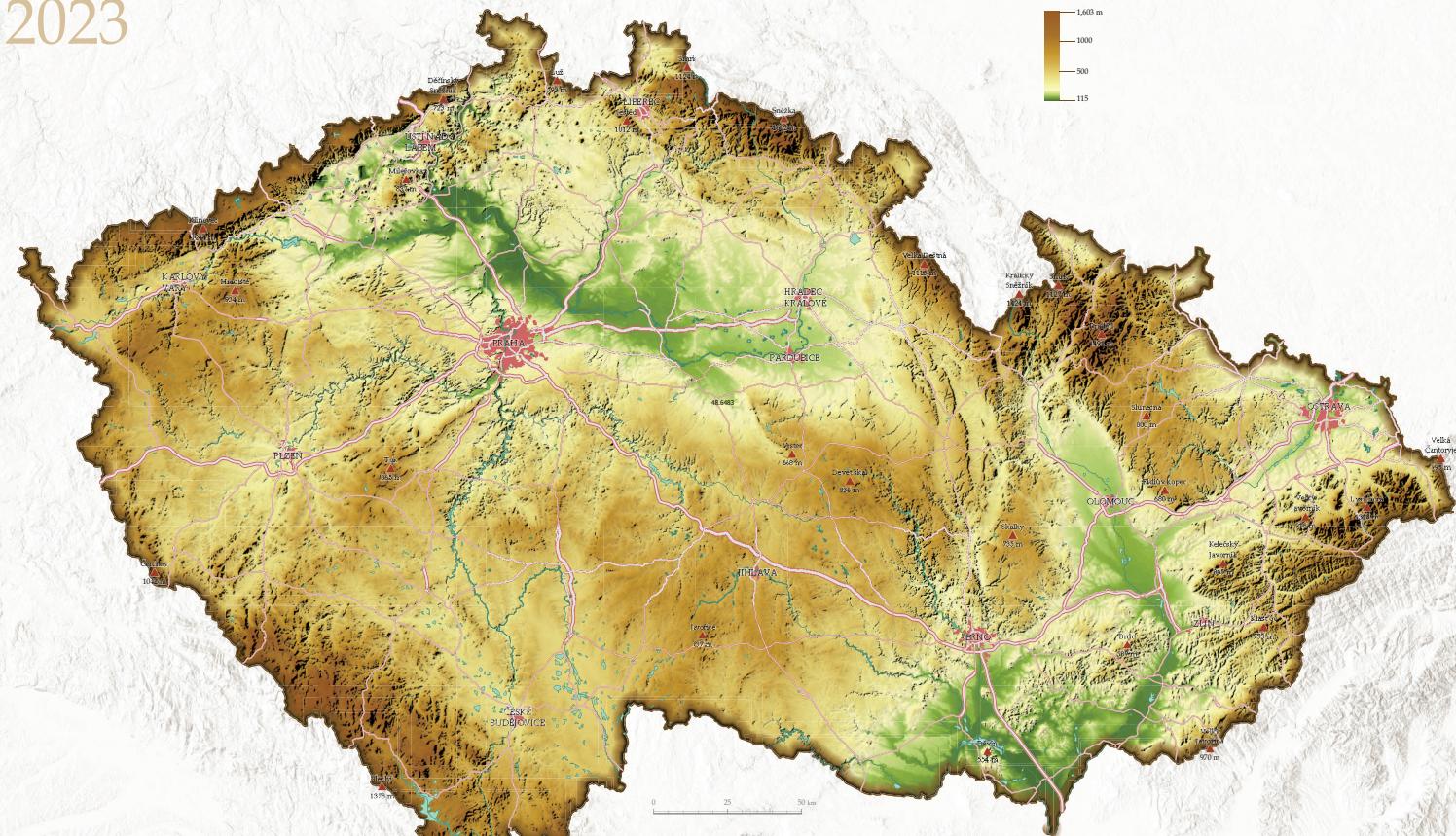
Transportation in Ustecky, 2023

This map depicts the diverse transportation and natural phenomena of the Ustecky region in northwest Czechia. The map captures the meandering network of roads and highways, offering a comprehensive view of the region's connectivity. Ustecky's water bodies and forests also offer insight into how these natural features influence transportation routes.

Author: Madeline Mulder ; Data: ArcCR database ; Olomouc, 2023

CZECHIA

2023

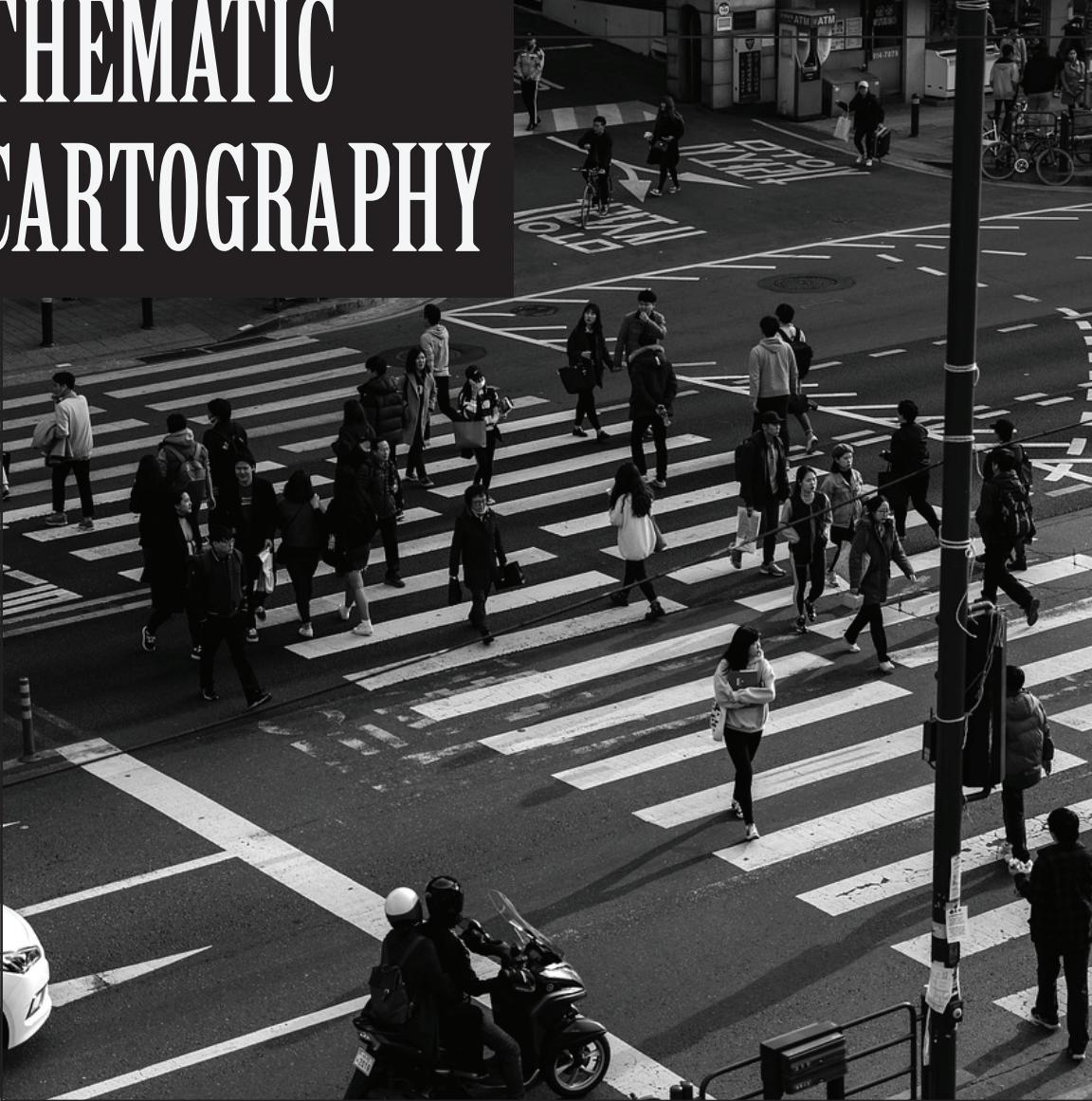


Topography of Czechia, 2023

This map shows the topography of Czechia in 2023. Lower elevations are depicted in green, transitioning to a deepening shade of brown as the elevation rises. Large urban areas and the tallest peaks in the country are also shown.

AUTHOR: MADELINE MULDER; DATA: ©ARCČČ, ARCDATA PRAHA, ZÚ ČSLÚ, 2016; CLOMPLIC, 2023

THEMATIC CARTOGRAPHY



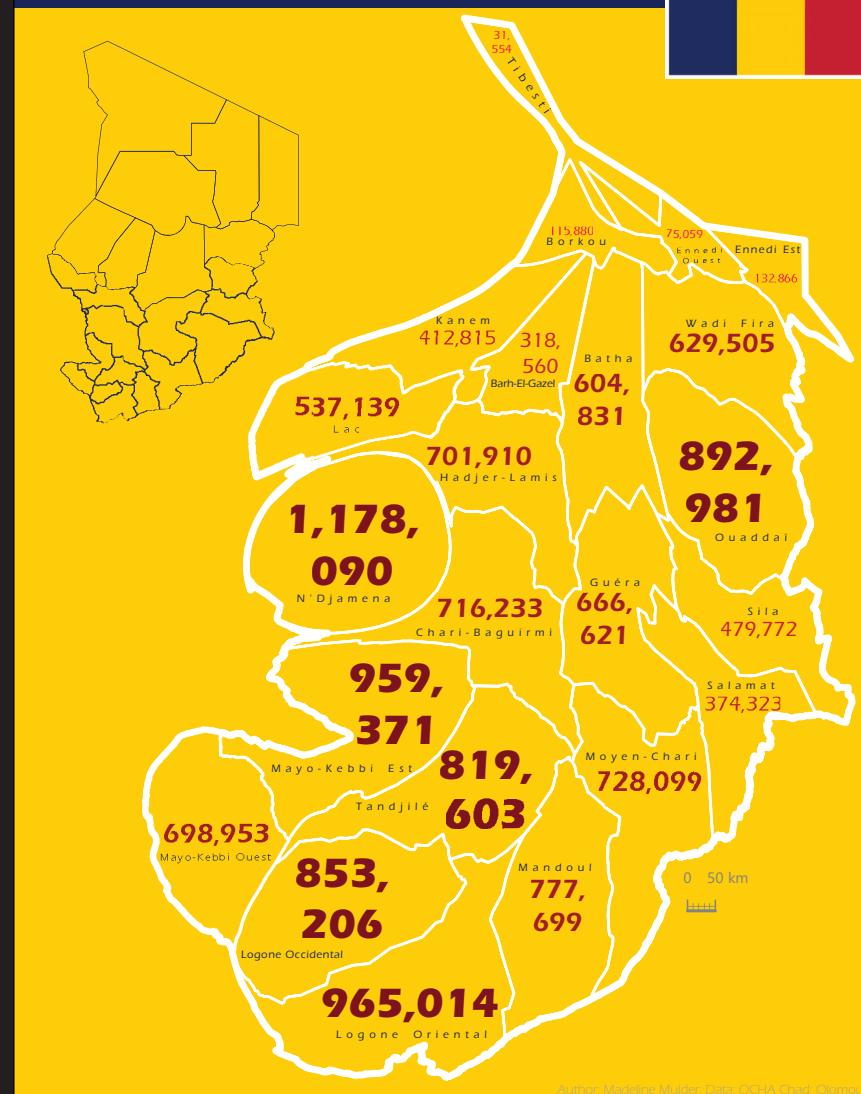
2

In the Thematic Cartography section of this portfolio maps transform into powerful narratives illuminating specific topics and themes. In this section, each map becomes a storyteller, weaving together data and design to unravel compelling tales about the intricacies of our world.

From population distribution to infrastructural patterns, economic landscapes to cultural diversity, these maps delve into the heart of specific themes, using visual techniques to elucidate patterns, trends, and relationships across geographic spaces. Every map reveals the richness and complexity of the chosen themes that shape our understanding of the diverse forces shaping our planet.

POPULATION

Chad, 2015



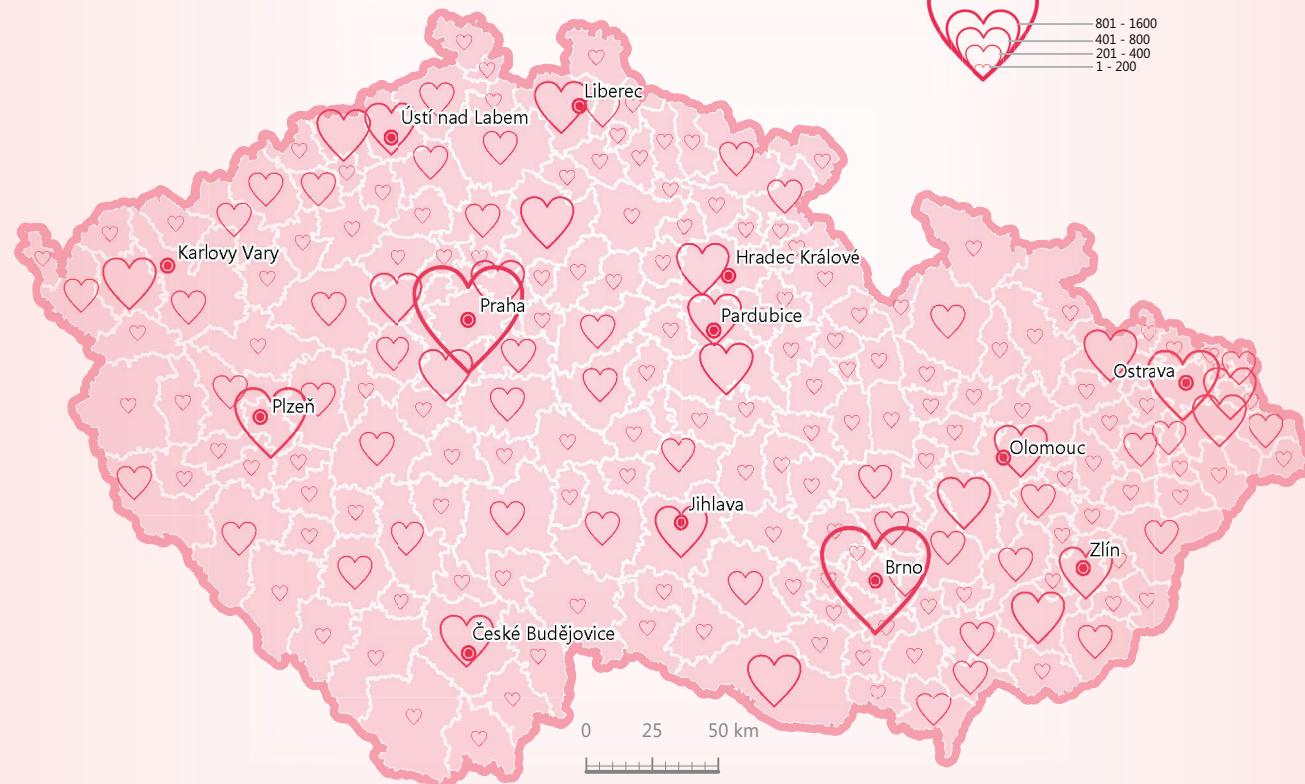
Population of Regions in Chad, 2015

This is a cartogram showing the population of the 23 regions of Chad in which the shape and size of the regions have been distorted based on the population count of each region. The exact population of each region is visualized using graduated color and size for the population total.

Autor: Maxime Maud, Date: 04/04/2015, 09:00:00

MARRIAGES

CZECHIA, 2023



Author: Madeline Mulder; Data: ArcCR 500; Olomouc 2023

Marriages in Czechia, 2023

This map presents the number of marriages in Czechia using graduated heart symbols wherein each of the symbols falls into one of the five value groups which show the range in the number of marriages per administrative district.

TOURIST POTENTIAL

In South-Eastern European Countries



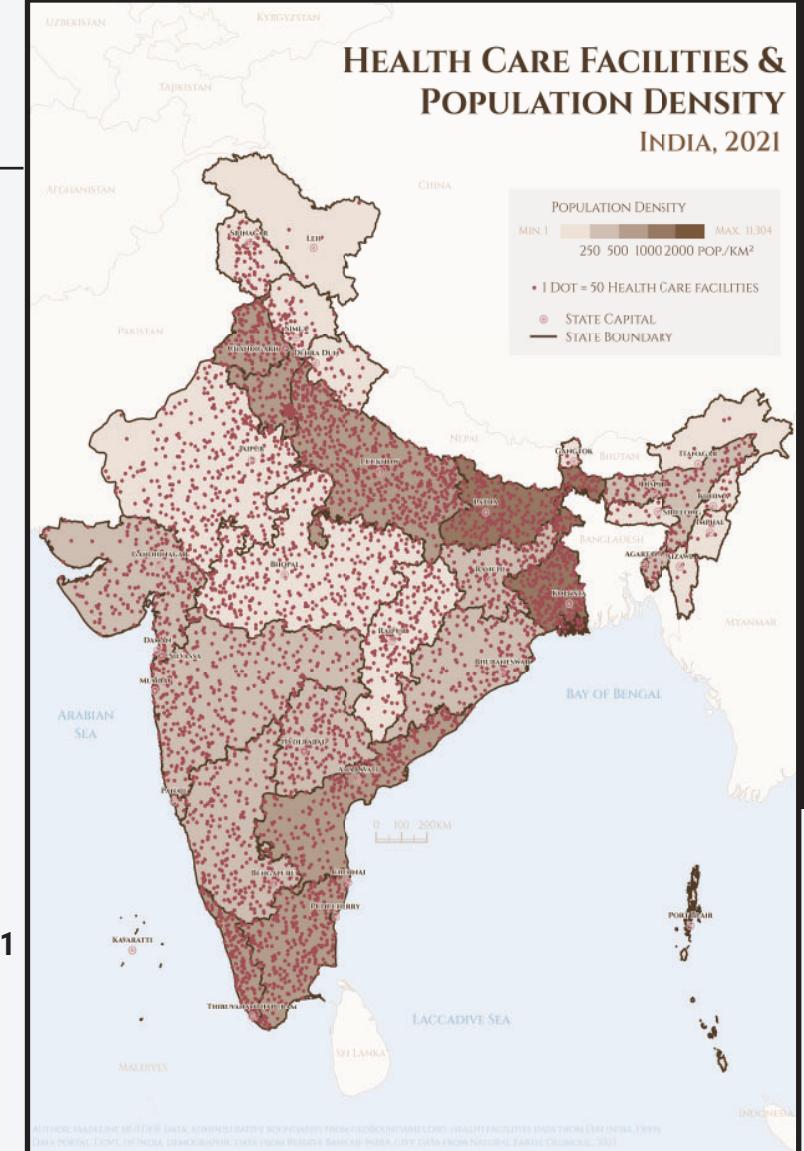
Tourist Potential of the Balkan Region, 2023

This multivariate map shows the tourist potential of the Balkan region based on the amount of tourist infrastructure and attractions within each aggregated area using the Wurman dots method. The size of the dots indicates the number of tourist attractions whereas the color of the dot indicates the amount of tourist infrastructure in the area.

Health Care Facilities in India, 2021

This map uses both the dot density and choropleth methods to explore the relationship between the number of health care facilities across the country and the population density of the state and union territories.

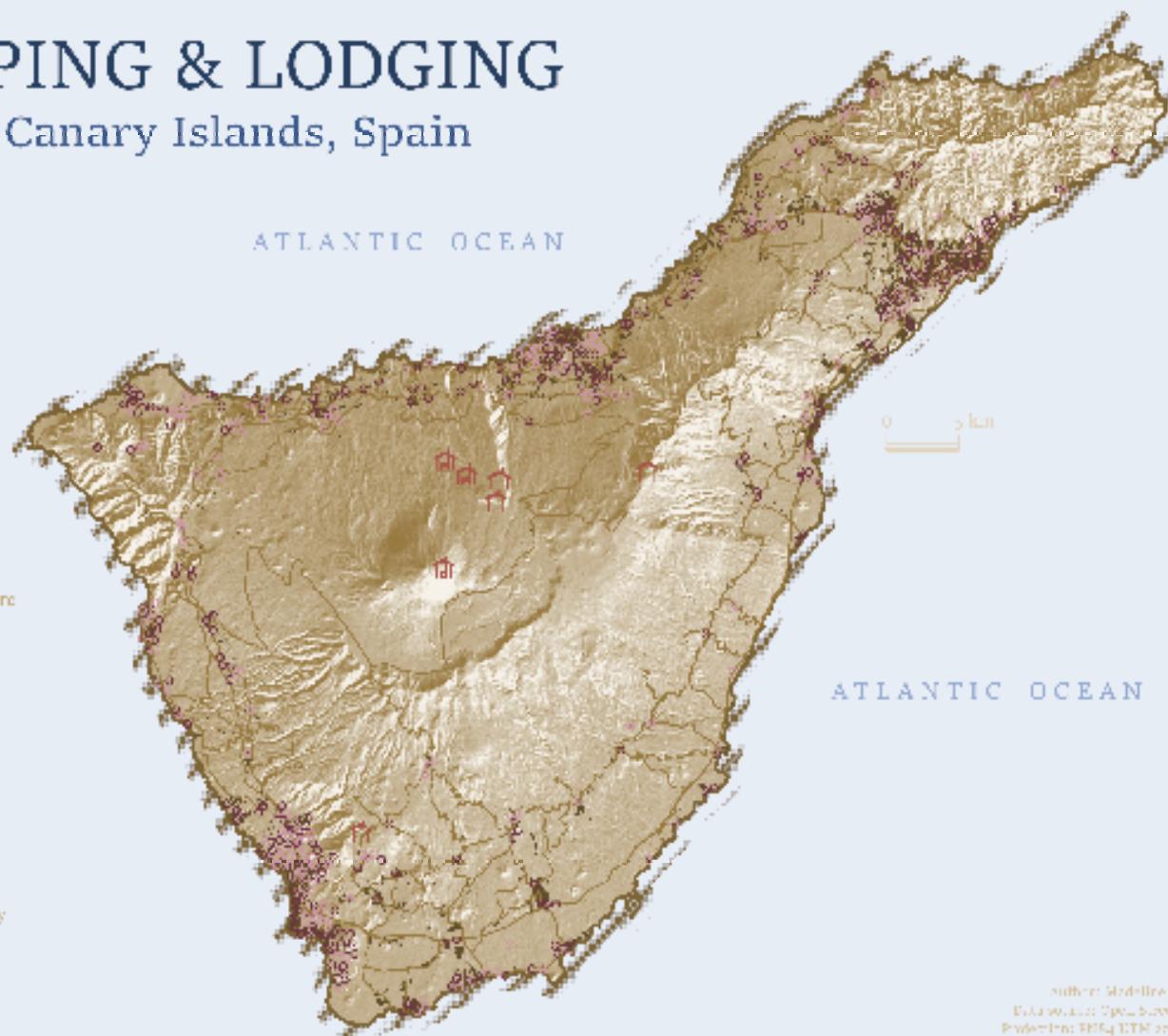
HEALTH CARE FACILITIES & POPULATION DENSITY INDIA, 2021





SHOPPING & LODGING

Tenerife, Canary Islands, Spain

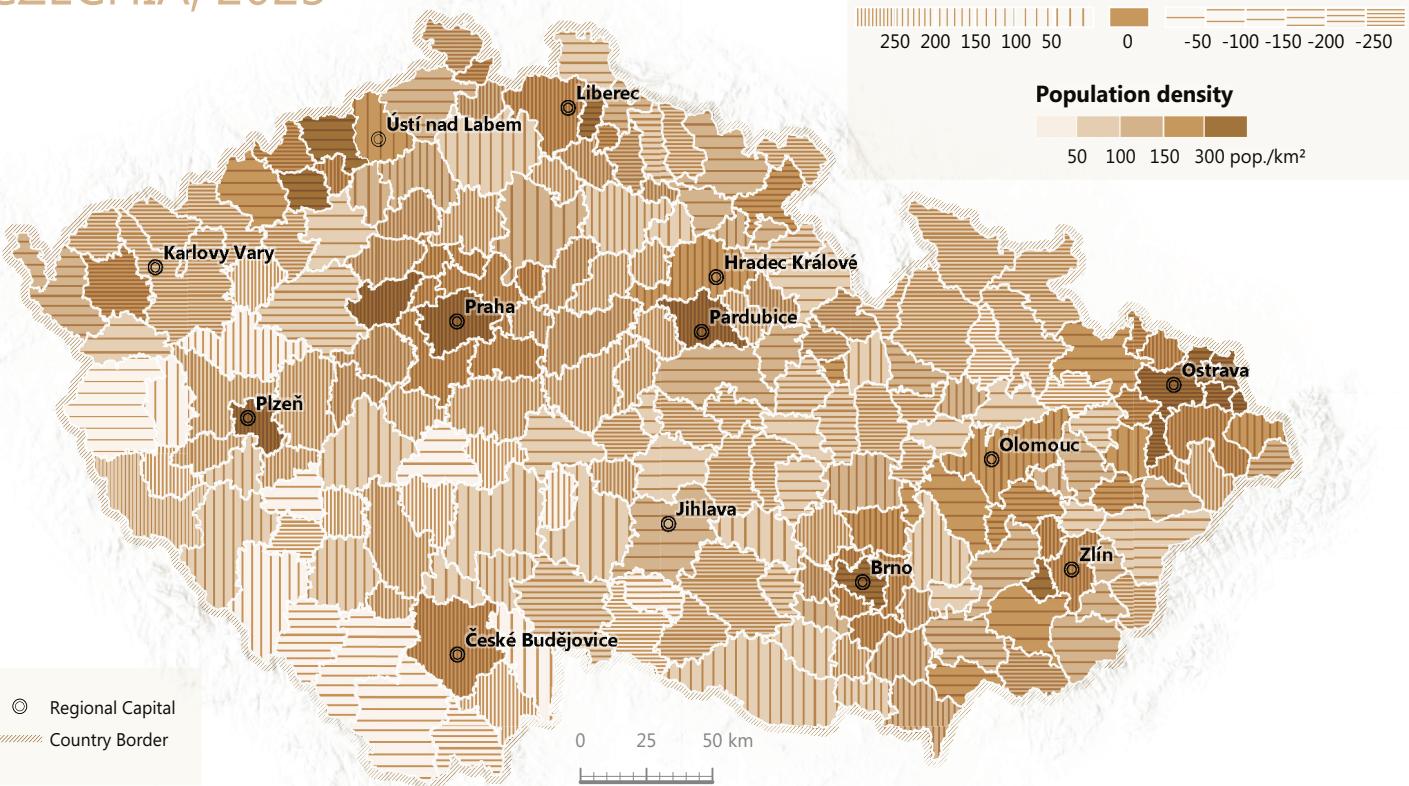


Shopping and Lodging in Tenerife, 2023

This map was created as part of a practical exam in which all of the data was collected, analysed, and visualized in less than 90 minutes. The task was to create a basic topographic map and visualize the shopping and lodging options in a previously undiscovered location using Open Street Map and OpenTopology data with special attention given to the design of the symbols for various features.

POPULATION DENSITY AND MIGRATION

CZECHIA, 2023



Population Density and Migration in Czechia, 2023

This is a choropleth map that uses the same method visualized in two different styles to represent two different characteristics which together make up a single phenomena. The population density is represented by the intensity of the brown color while the migration characteristic is visualized using a diverging hashed pattern with immigration represented by vertical lines and emigration represented by horizontal lines.

Author: Madeline MULDER; Data: ArcCR 500; Olomouc, Czechia, 2023

POSTER PROJECT



3

As part of my studies, I have taken many classes focused on the intricacies of designing maps. One class in particular focused on the process of preparing maps for print. This section showcases culmination of the work undertaken during that semester.

The assigned task involved crafting a printed poster with a focus on my country of origin. I chose to focus specifically on my home city of Washington D.C. The resulting poster serves as a guide, introducing viewers to the nuances of the region, spotlighting optimal transportation modes, and pinpointing prime tourist destinations, notably the iconic National Mall. Additionally, the poster incorporates an array of data visualizations and design elements to enrich the overall cartographic experience.

WASHINGTON, D.C.



TOURIST GUIDE

Welcome to Washington D.C., where history, culture, and urban charm intersect. Washington D.C. is commonly referred to as simply "DC" and belongs to the larger DMV area which is comprised of Washington D.C., as well as 21 neighboring counties in Maryland, Virginia, and West Virginia. One of the best ways to navigate this exciting region is through the extensive DC Metro system.

Washington, D.C. was established as the capital of the United States in 1790, as a symbol of the new nation's aspirations. However, Washington, D.C. is not just the political hub of the country; it is also a cultural powerhouse. The Smithsonian Institution, a collection of world-renowned museums and galleries, stands as a testament to the nation's commitment to art, history, and scientific exploration. The National Mall, flanked by monuments and memorials like the Lincoln Memorial and the Vietnam Veterans Memorial, serves as a poignant reminder of the nation's history and sacrifices.

WINDING DC: THE METRO

Beyond its political and cultural significance, D.C. thrives as a diverse and vibrant city, boasting a thriving food scene, eclectic neighborhoods, and a blend of modernity with historic

! WAY TO GET AROUND

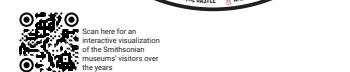
Friendship Heights
Tenleytown



At the core of DC's allure lies the National Mall, a sprawling green expanse flanked by monumental landmarks. Here, the Smithsonian museums stand as bastions of knowledge and discovery. Each institution not only constitutes rich narratives and interactive exhibits, promising an unforgettable journey through art, science, and history, but also offers part-visiting all of the monuments and landmarks that line the National Mall is all of them free! [Get your free ticket](#)

SEUMS ON THE NATIONAL MALL

NATIONAL HISTORY | NATIONAL GALLERY OF ART



The infographic features a large map of the Washington, D.C. metropolitan area (the DMV) with Maryland, Virginia, and Washington, D.C. highlighted in red. A red circle marks the location of Takoma, Maryland. Two inset photographs are shown: one of the National Cathedral and another of the White House. A legend identifies the symbols: a red square for Washington, D.C., a red shaded area for the County in the DMV, a grey square for State, and a white area with a blue outline for Water. A scale bar indicates distances up to 20 km.

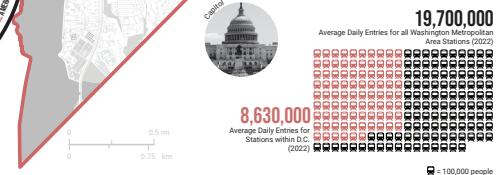
Total Population of DMV Counties by State (2020)

State	Counties	Population
Virginia	15	3,028,026
Maryland	5	2,552,594
Washington	1	670,050
West Virginia	1	58,310



The DC Metro, officially known as the Washington Metropolitan Area Transit Authority (WMATA), serves as the backbone of transportation in the nation's capital. With its distinct red, blue, orange, yellow, green, and silver lines, the Metro network spans Washington, D.C., Maryland, and Virginia, linking key landmarks, neighborhoods, and suburbs.

Commuters and tourists alike rely on the Metros efficiency and accessibility, enjoying the convenience of a system that operates trains at frequent intervals, especially during rush hour. The DC Metro system serves as a gateway to the nation's capital, making the National Mall and other key attractions, such as the historic neighborhoods of Georgetown and Dupont Circle



Washington D.C. Tourist Guide

This poster was printed in the A2 format (420 x 594 mm). It contains three maps and three data visualizations, one of which is interactive, which introduce both local and international tourists to Washington D.C.

**1**

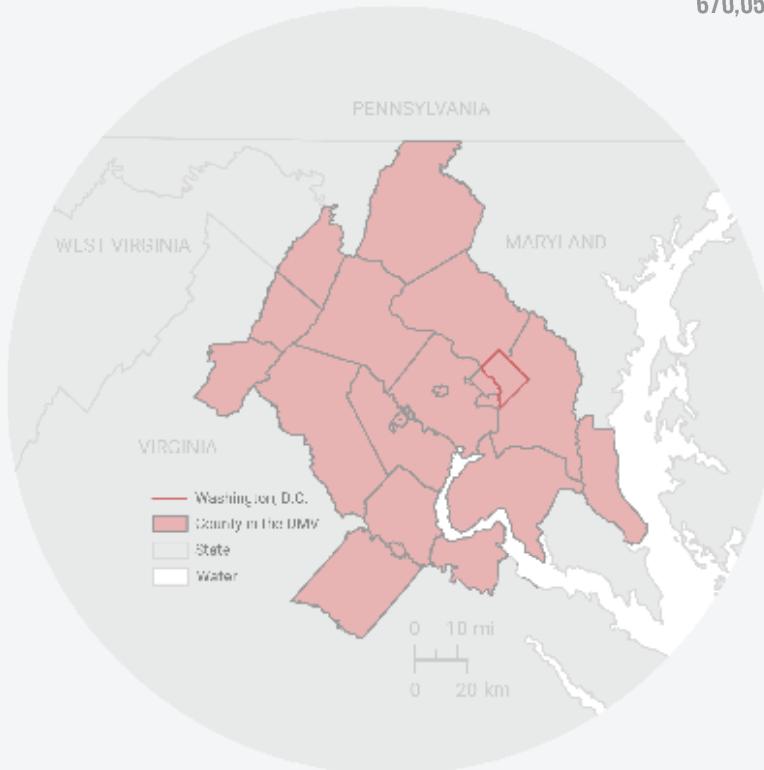
DMV Area

This map and data visualization introduce the viewer to the the greater Washington D.C. area known as the DMV which includes Washington D.C. as well as some counties in both Maryland and Virginia. The map shows the geographic extent of the DMV area while the accompanying graph shows the population of the counties that makes up the DMV by state.

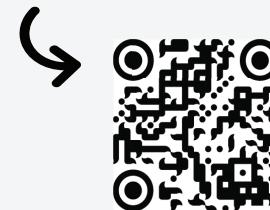
2

The National Mall

This map highlights one of the most popular tourist attractions in Washington D.C: The National Mall, a large park home to numerous monuments, memorials, and museums. Each red symbol represents a museum, whose name can be found alongside the matching symbol in the surrounding circle.



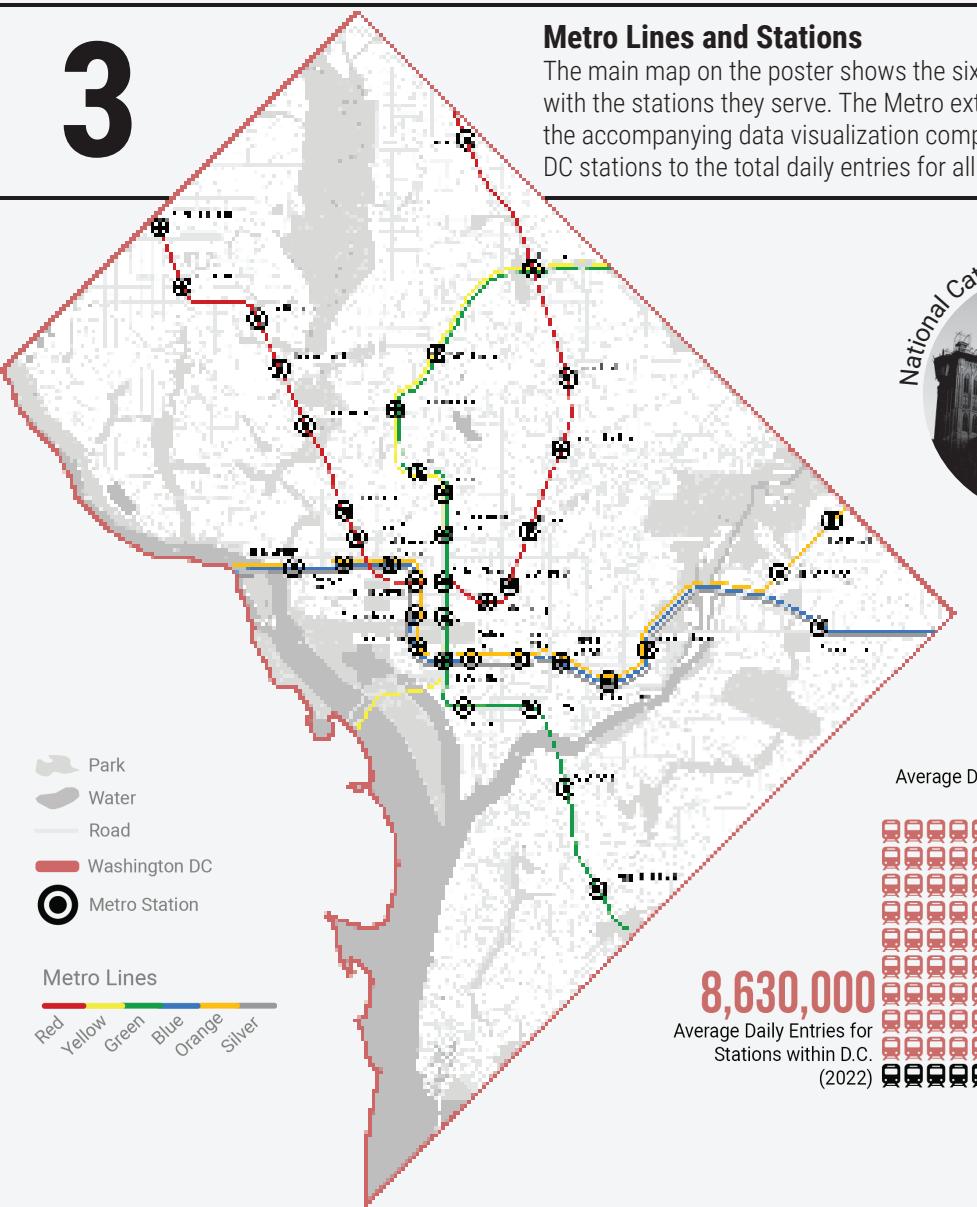
Scan here for an interactive
visualization of the Smithsonian
museums' visitors over the years



3

Metro Lines and Stations

The main map on the poster shows the six metro train lines that run through DC along with the stations they serve. The Metro extends into parts of Virginia and Maryland so the accompanying data visualization compares the amount of average daily entries for DC stations to the total daily entries for all metro stations in the system.



4

Scale

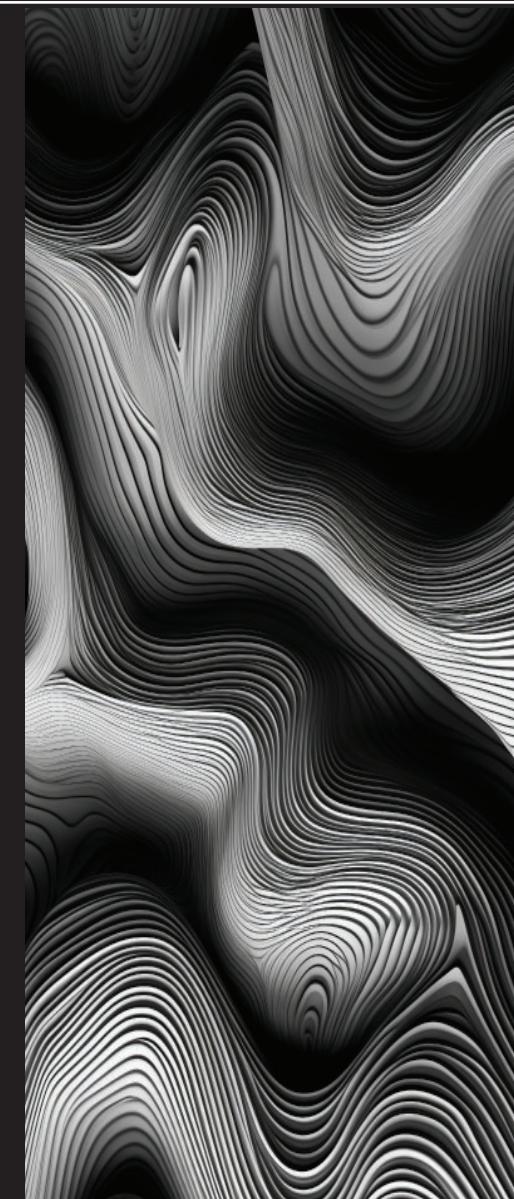
This poster was meant to serve both a US-based audience and an international audience so every scale created for each map has measurements in both metric and imperial units.





2022 - 2024

Madeline Mulder



PHOTOGRAPHY
CARTOGRAPHY

Cartography