

Milestone One

Tutorial Group P2-04

The purpose of visualisation
is insight, not pictures.

- Ben Shneiderman

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Visual #1

All the World's Emission in One Chart

- Infographic by VisualCapitalist



Introduction

- Designed by VisualCapitalist
- Features a globe-like shape split into multiple segments (country)
- Each segment represents one of the top 30 highest producers of carbon emissions



Data

- **Data Types:**
 - Country Name (Nominal)
 - Carbon Emissions in % (Ratio)
- Highlights top "heavy hitters" countries (contributes approx. 50%)



Task

- Illustrate where most of the world's carbon emissions originate from
- Allow comparative viewing of the country's carbon emissions



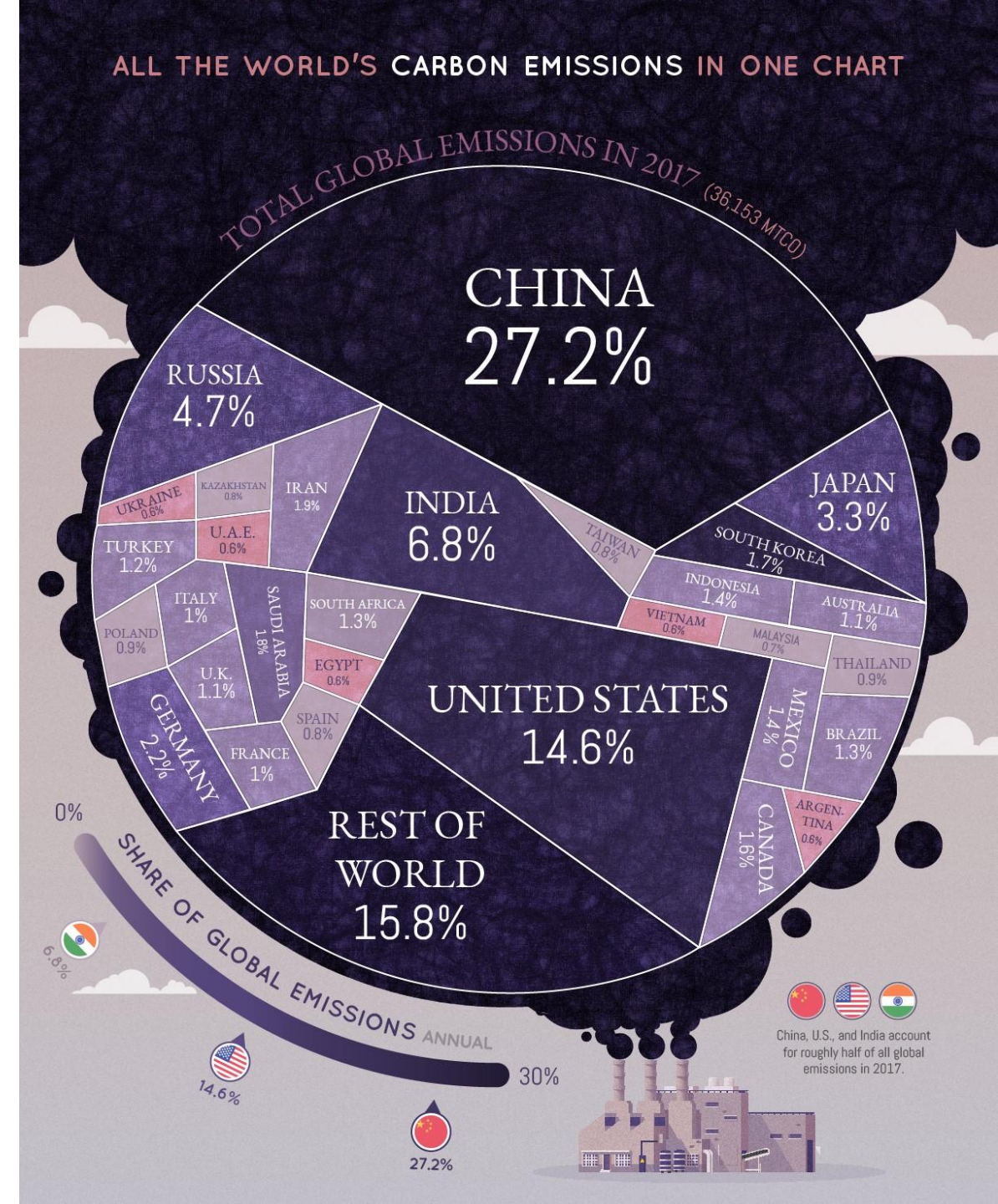
Good idioms

- Country names are prominently displayed next to their % data
- Segment sizes are directly proportional to carbon emissions %
- Effectual use of the colour channels to denote shares of carbon emissions



Bad idioms

- “Incomplete” legend used (**Pink** is omitted / **Light Grey** (0%) have higher % than **Pink** segments)
- Inconsistent colour scale (e.g., South Korea)
- Inconsistent segment sizes (e.g., different sizes for Ukraine, U.A.E, Egypt, Argentina & Vietnam)
- Segments were neither grouped by region nor by their carbon emissions %



Bad idioms

- Information on the number (count) of countries represented is not available
- No standardisation of font style (e.g., [Malaysia](#))
- Error in Unit of Measure of “Metric Tons of Carbon Dioxide” – the correct unit of measure is “MTCO₂e”



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Font for “Malaysia” is different from the other countries?

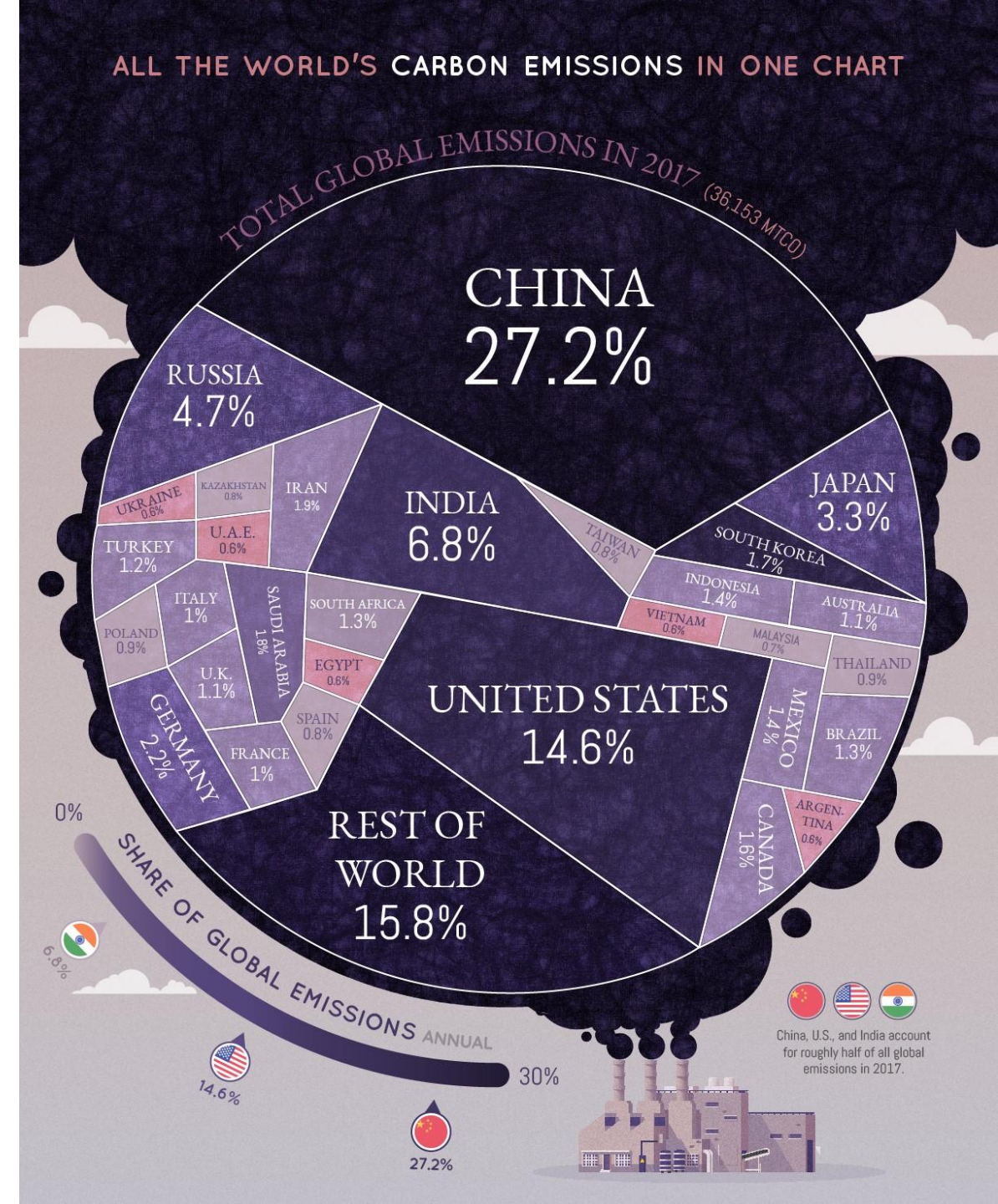


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Design Violations

- Law of Proximity
- Law of Similarity
- Law of Common Region
- Law of Prägnanz (Simplicity Law)



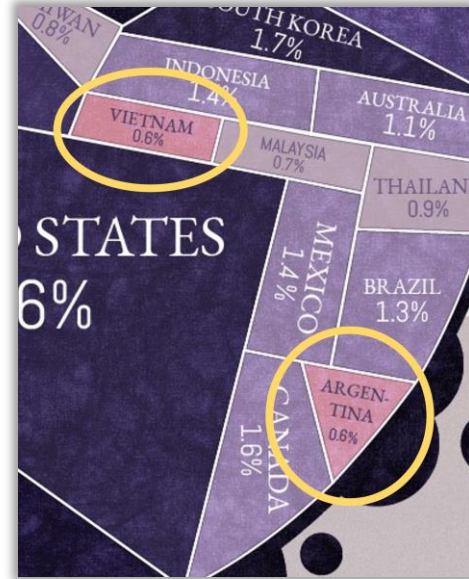
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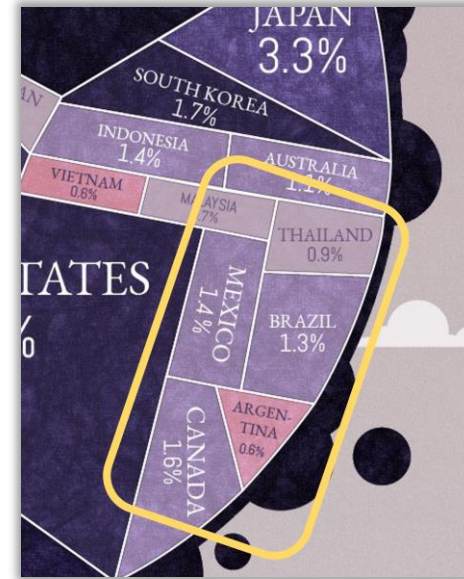
Law of Proximity

Skewed representation. Adjacent segments do not correlate with each other



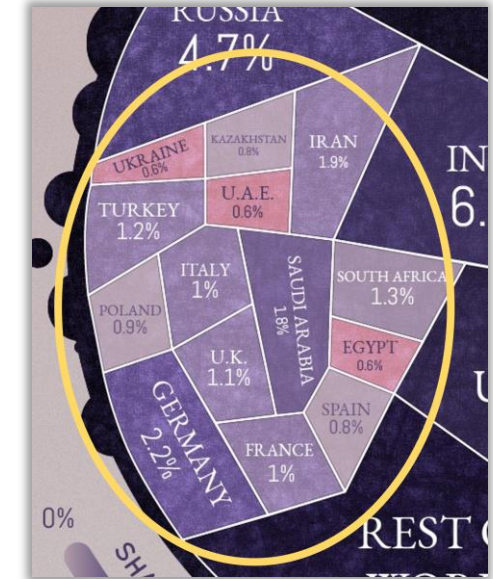
Law of Similarity

Segments with identical percentages look completely different from each other



Law of Common Region

Segments are neither grouped by volume nor by their geographical location



Law of Prägnanz

Complex shapes and sizes make it difficult to interpret the percentages.

Proposed Improvements

- Use bar graphs or pie charts to better accentuate the differences
- Standardise the font styles and country name representations (United States vs U.K. & U.A.E.)
- Position the names of the countries upwards



Proposed Improvements

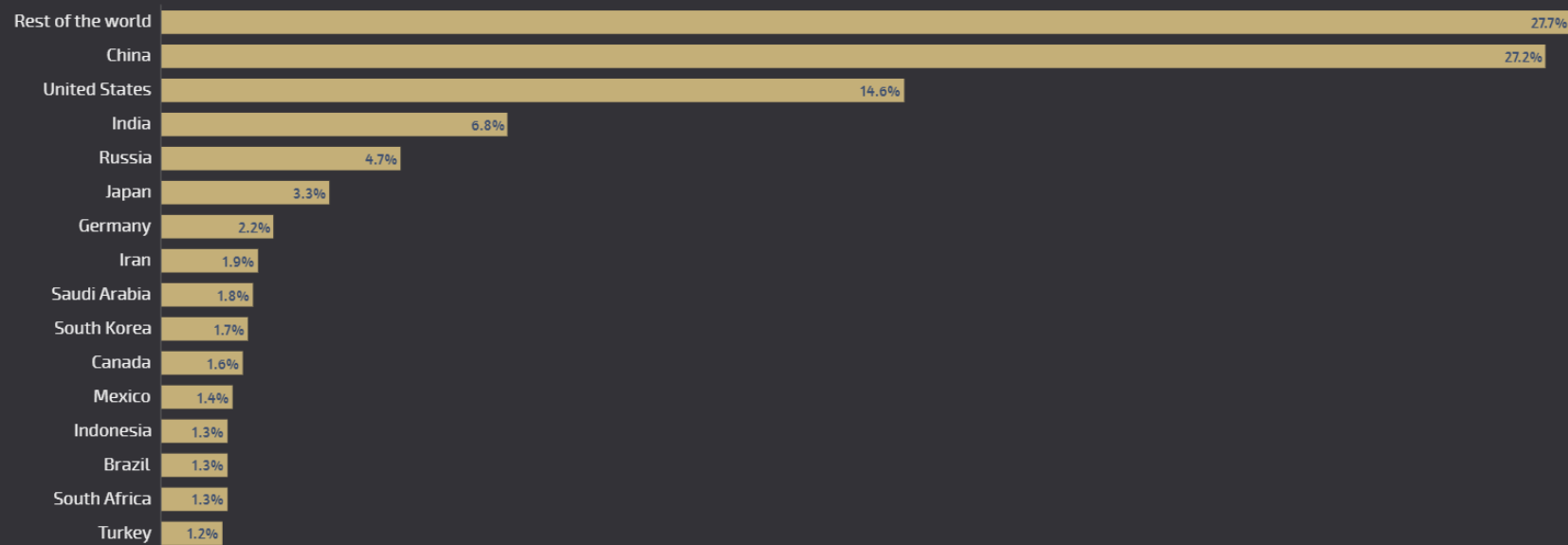
- Include all colours utilised in the chart legend
- Group the countries by their similarities. (e.g., by region, by carbon emissions (%), etc.)
- Indicate the total number of countries represented in the infographic



Proposed Revised Infographic

All the World's Carbon Emissions

Carbon Emissions by Country (%)



Note: Chart shows top 15 countries by carbon emitters volume (%)

Source



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Visual #2

Which Countries Have the Worst Air Pollution?

- Infographic by Matt Dzugan

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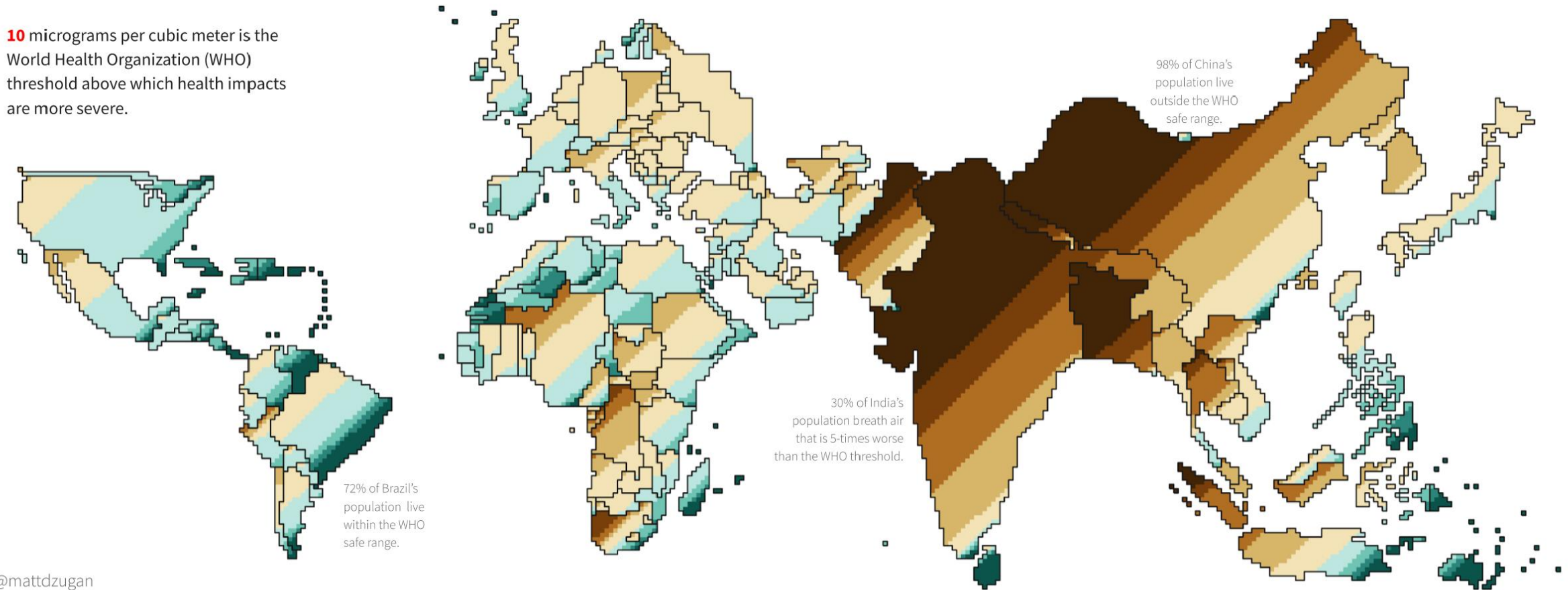
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Countries are resized according to their population to represent **people** rather than **land**

Fine Particulate Matter (PM2.5) Concentration with Dust and Sea-Salt Removed

0 2.5 3.3 5 **10** 20 30 40 50
micrograms per cubic meter

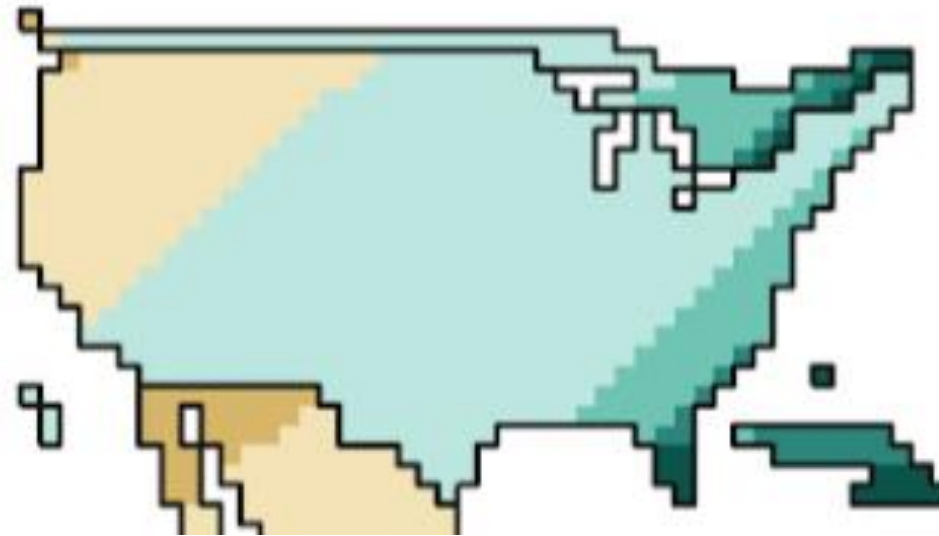
10 micrograms per cubic meter is the World Health Organization (WHO) threshold above which health impacts are more severe.



@mattdzuan

Population data: Center for International Earth Science Information Network - CIESIN - Columbia University. 2018. Gridded Population of the World, Version 4 (GPWv4): Population Count, Revision 11. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC)
Air quality data: van Donkelaar, A., R. V. Martin, M. Brauer, N. C. Hsu, R. A. Kahn, R. C. Levy, A. Lyapustin, A. M. Sayer, and D. M. Winker. 2018. Global Annual PM2.5 Grids from MODIS, MISR and SeaWiFS Aerosol Optical Depth (AOD) with GWR, 1998-2016. Palisades NY: NASA Socioeconomic Data and Applications Center (SEDAC).
Map: Max Roser (2018) - "The map we need if we want to think about how global living conditions are changing". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/world-population-cartogram' [Online Resource]'

“Pixelated” USA

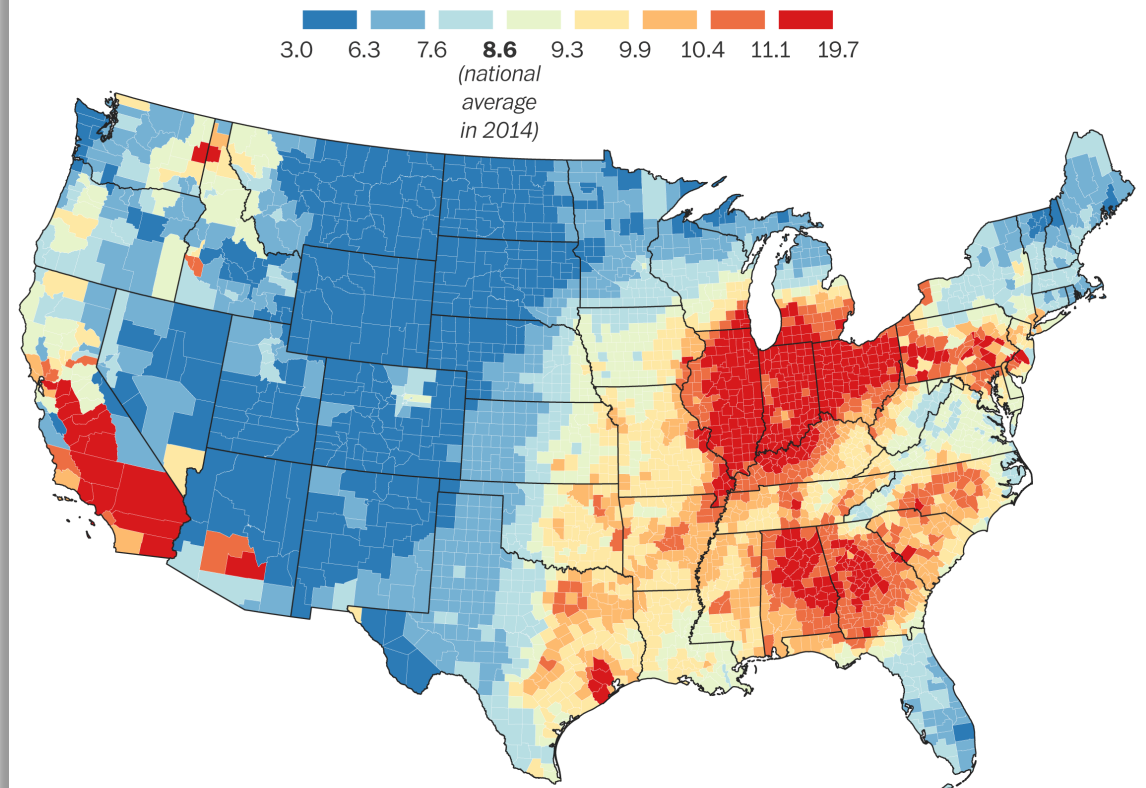


**No correlation between “Pixelated” USA
and the actual air pollution situation in USA**

Actual air pollution in USA (2014)

The map of American air pollution

Daily average small particulate matter (PM2.5) concentration in 2014



Source: Robert Wood Johnson Foundation County Health Rankings

THE WASHINGTON POST

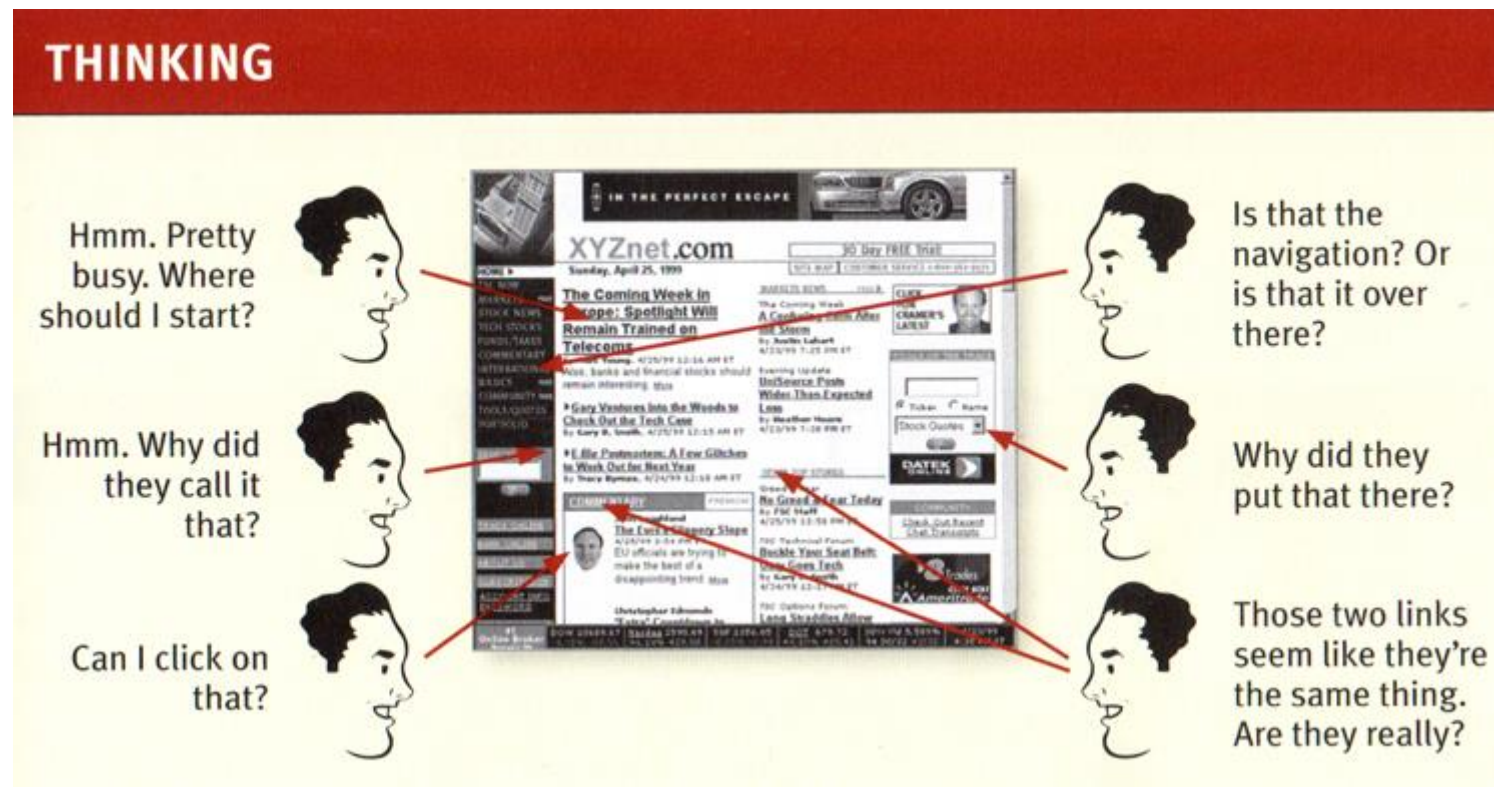
Krug's First Law of Usability – Don't make me think!

The design of a web page or anything that you design **should be self-evident and obvious**. The users should be able to “get it” instantly after looking at the screen.

More the users spend time in thinking about what all components/elements are about, the **more hurdles we introduce** in their process of exploring (or experiencing) the product and costs users their precious time.

- @aniket.ambekar, Medium.com

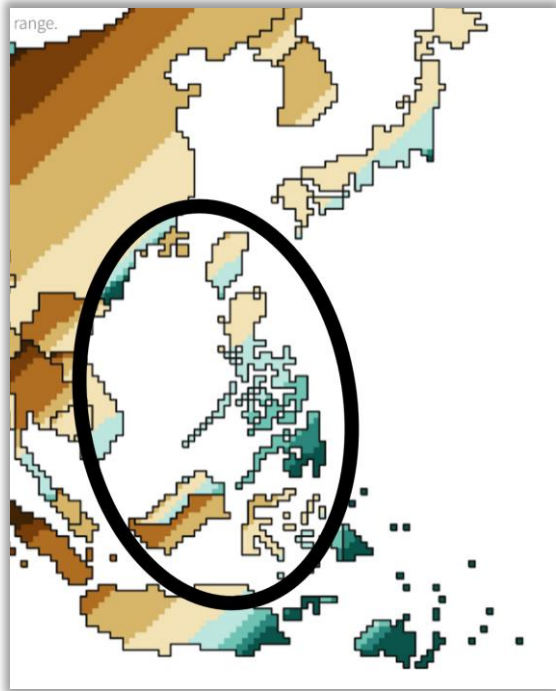
Krug's First Law of Usability – Don't make me think!



Extracted from: Don't Make Me Think: Revisited by Steve Krug

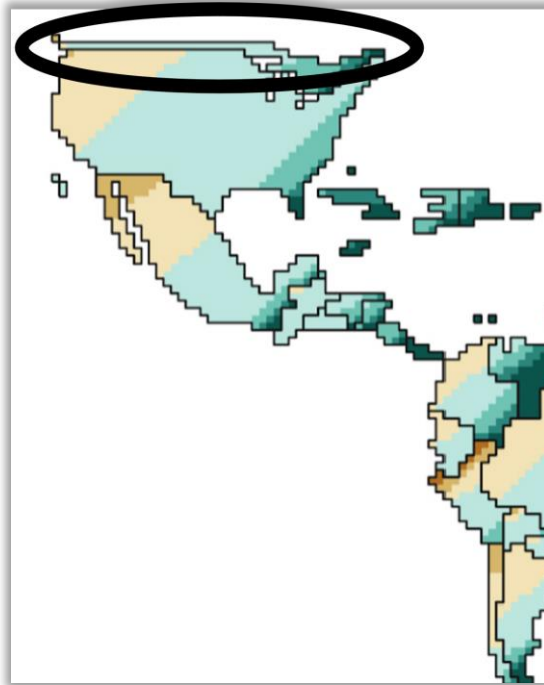
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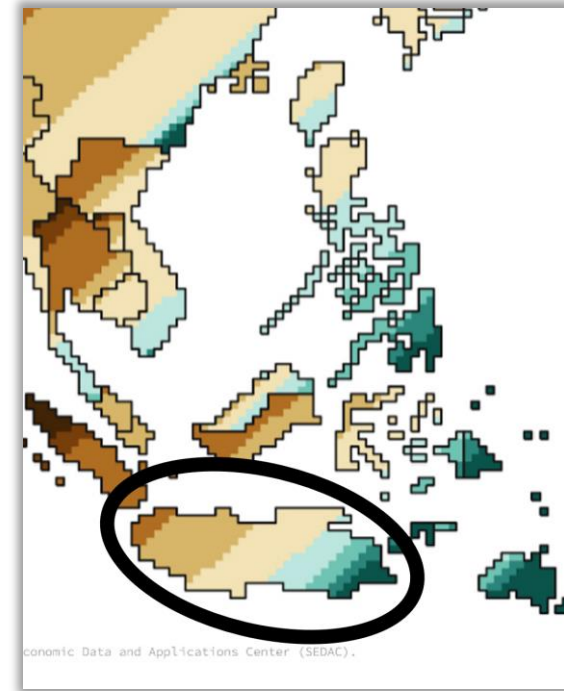
Law of Prägnanz

Different shapes and sizes were utilised to fit the countries on the density map



Jakob's Law

Many countries were shrunk/enlarged and re-positioned to fit the diagram



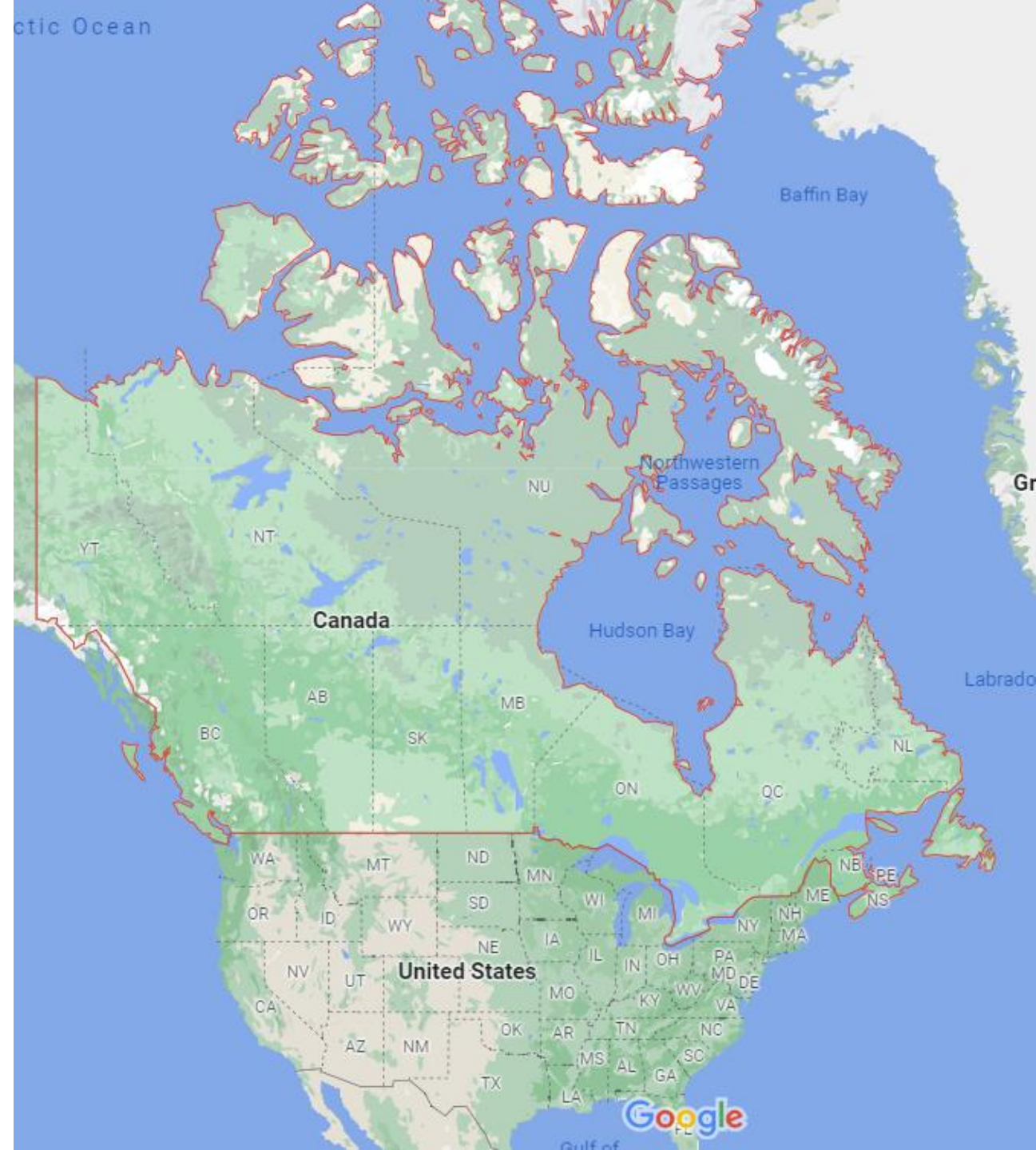
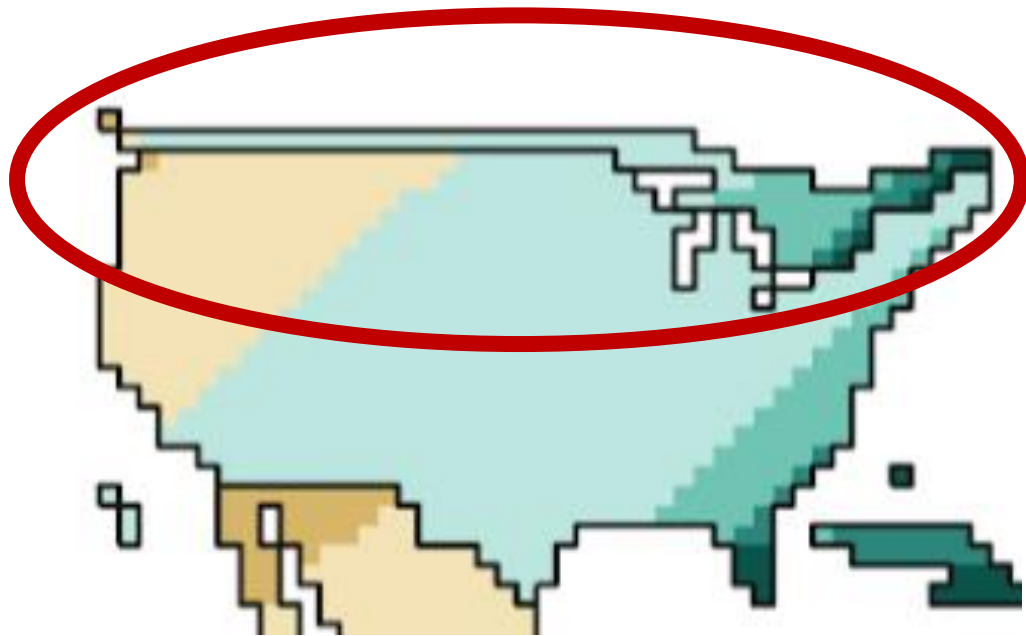
Krug's 1st Law of Usability

Different colours across the scale are used. What do the colours mean?

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“Pixelated” Canada



Proposed Revised Infographic

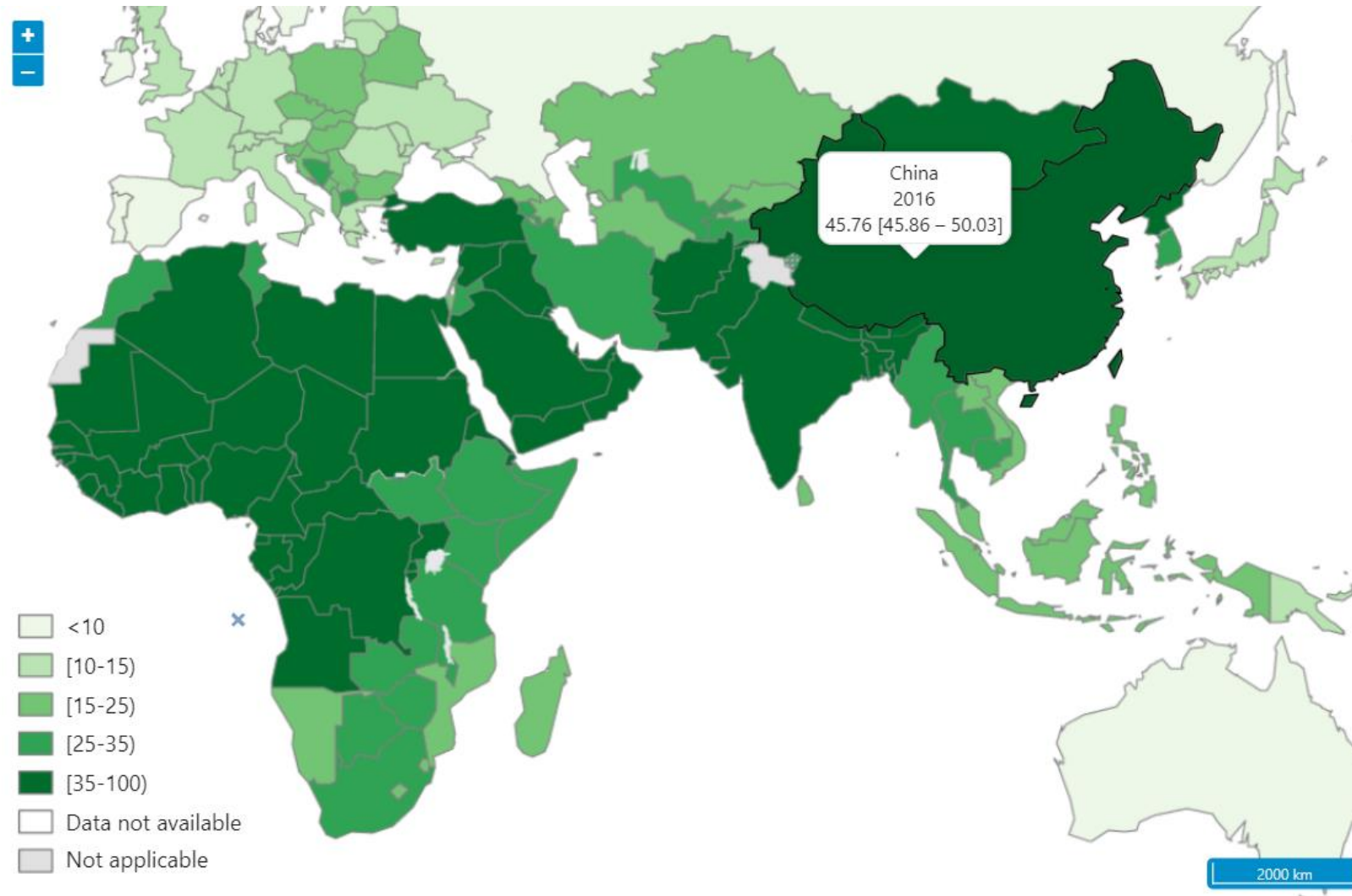


Image from [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/concentrations-of-fine-particulate-matter-\(pm2-5\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/concentrations-of-fine-particulate-matter-(pm2-5))

Thank you!