REDESIGNING :
ENHANCING CLIMATE RISK COMMUNICATION

AUTHOR
Qirui Zhao

AFFILIATIONS
Duke Kunshan University

INTRODUCTION

The goal of this project is to optimize the visualization of Cooling Degree Days in the article Leveraging the Cloud for Rapid Climate Risk Assessments(2019). We will conduct a critical analysis of the current visualization, select appropriate tools for improvement, and showcase the enhancements to create more effective and aesthetically rich data visualizations.

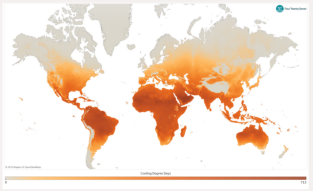

Figure: Cooling Degree Days of Leveraging the Cloud for Rapid Climate Risk Assessments.

CRITIQUE

This critique of the cooling degree visualization applies a structured method based on visual perception theory and data ethics. The process begins with identifying the infographic's intent—to communicate global cooling energy demand under climate change scenarios. It then analyzes visual encoding strategies (color, layout, resolution), evaluates perceptual clarity and assesses compliance with the FAIR data principles. The critique incorporates theoretical references from Edward Tufte (1983), Colin Ware (2021) and Wilkinson(2022). Based on these evaluations, specific recommendations are made to enhance interpretability, accessibility, and data transparency.

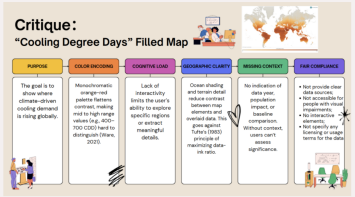

Figure: Critique of Cooling Degree Days.

REDESIGN AND INTEGRATION

For my visualization critique and redesign, I chose Amazon QuickSight to improve the original filledmap visualization. QuickSight's interactive dashboard capabilities and cloud integration made it ideal for addressing issues in the original map, such as poor perceptual clarity, limited interactivity, and the absence of contextual information. I added features like dynamic filtering, tooltip customization, and enhanced legends, allowing users to explore the relationship between discount, quantity, and profit in an engaging way. Unlike the static heatmap, the redesigned version supports hover values, regional or customer segment filters, and drill-down views, making insights more accessible and actionable.

I also addressed a color issue from the original visualization by applying a diverging color scale, which clearly distinguishes value zones. Background elements such as dataset descriptions and contextual labels improve cognitive accessibility and data transparency. The redesign enhances both visual clarity and interactivity, offering a user-centered approach to data visualization.

Key improvements include a color gradient from red to yellow to blue, making the Climate Risk Rank easier to interpret and more accessible to visually impaired users. The dark mode reduces background clutter and enhances contrast, while metadata links and relevant licenses ensure the data is open and compliant with FAIR principles (Findable, Accessible, Interoperable, Reusable). These changes improve both the visual experience and user interaction, ensuring transparency and usability.

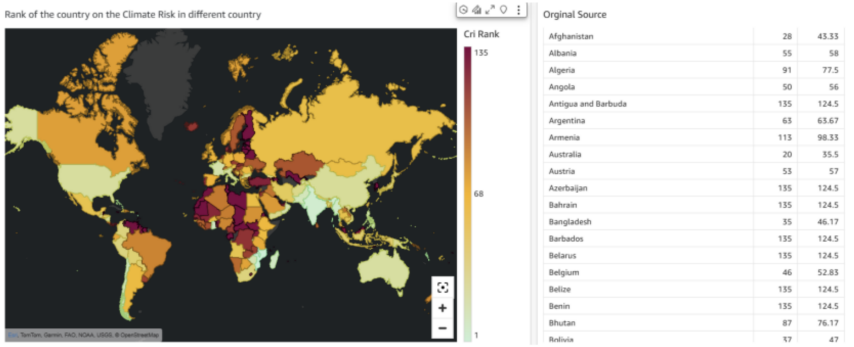

Figure: Simulation - Enhancing Climate Risk Communication.

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