Redesigning Climate Risk Visualization: From Facility-Level Heatmaps to Global Insights

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A. Motivation

The original visualization (by Four Twenty Seven using Mapbox) mapped heat stress scores for corporate facilities using a dense dot heatmap.
- Limited scope (only heat stress)
- Lack of transparency in scoring
- Poor readability in high-density areas
- Low emotional or policy relevance

B. Theory

- Affective Visualization Design (Lan, Wu, Cao, 2024): Emotion increases engagement, memory, and comprehension
- FAIR Data Principles (GO FAIR, 2019): Data should be Findable, Accessible, Interoperable, Reusable.

C. Strategy

- Used the Global Climate Risk Index dataset (Kaggle, sourced from Germanwatch)
  → Transparent, peer-reviewed, globally cited
- Built visualizations in Amazon QuickSight
  → Easy geospatial visualization
  → Supports FAIR and affective design principles

E. Redesign Flow

- Original Map Review
- Theory Integration
- Dataset Upgrade
- Tool-Based Redesign
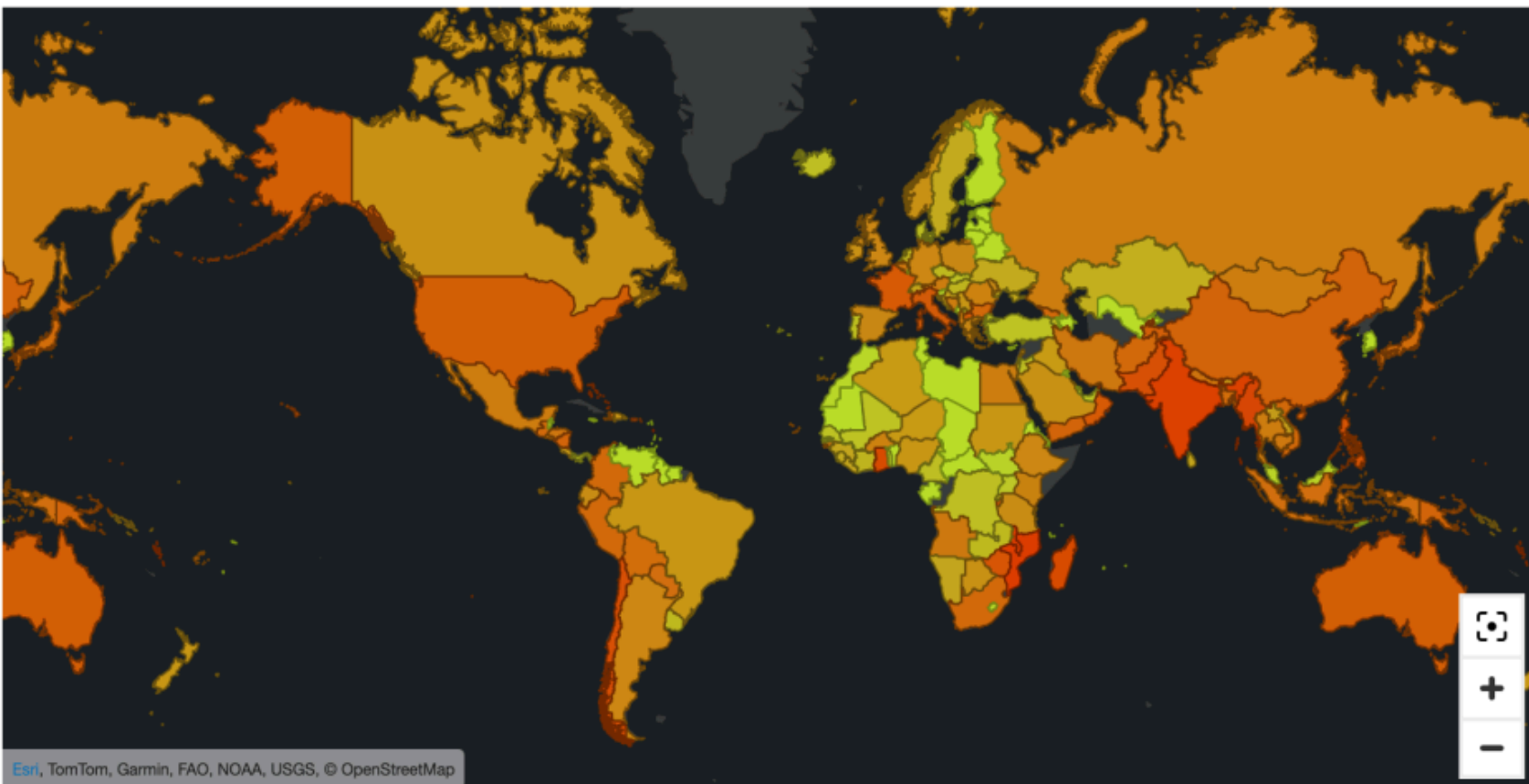- Impact: Emotion + Fairness + Clarity
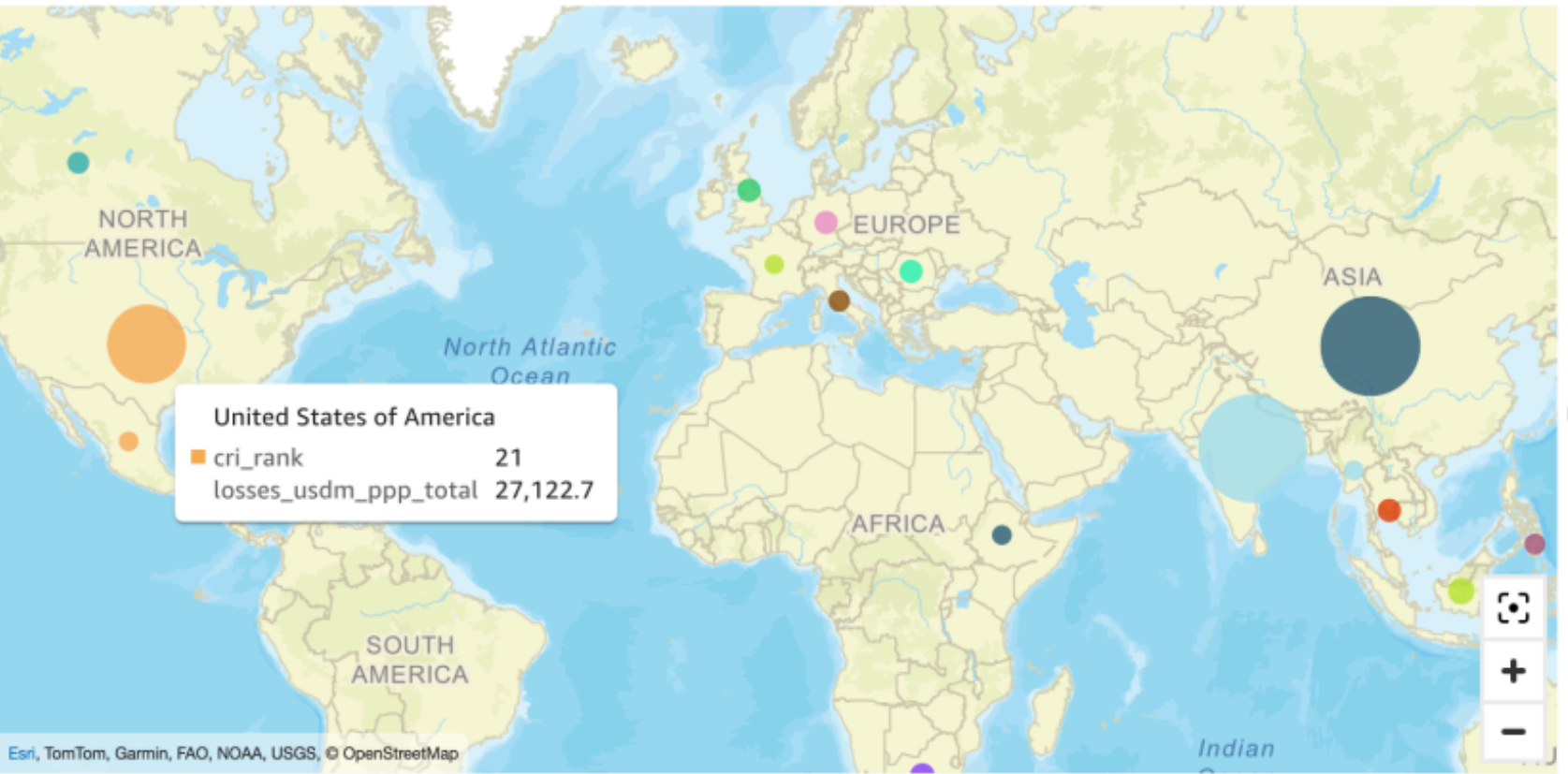
D. Results

- Original design
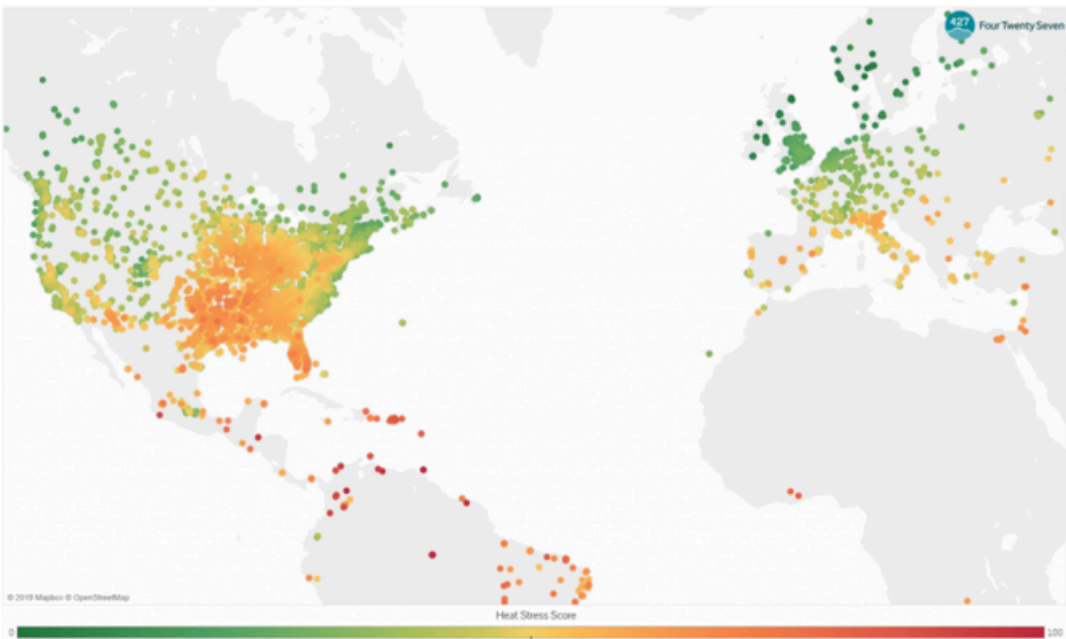
- Redesign

Score of the country on the Climate Risk Index (Integer)

Total Losses in USDM PPP (Integer) Caused by Climate Risks

正在显示 RW_COUNTRY_NAME 中的前 20 个和 CRI_RANK 中的前 20 个

United States of America	
cri_rank	21
losses_usdm_ppp_total	27,122.7

Crisis Rank
10 13 16 19 20 21 23 33 36 39 4 52 53 6 61 64 65
66 77

F. Conclusion & Impact

- Broadened climate impact scope
- Strengthened emotional engagement
- Improved accessibility for non-technical audiences
- Enabled informed decision-making across global contexts

References

AWS. 2023. "Best Practices for Amazon QuickSight." AWS Community. https://community.aws/content/2qtjtkhao6IdTyHrmDEVQublzcq/best-practices-for-amazon-quicksight.

Lan, Xingyu, Yanqiu Wu, and Nan Cao. 2024. Affective Visualization Design: Leveraging the Emotional Impact of Data. arXiv preprint. https://arxiv.org/abs/2308.02831.

GO FAIR. 2019. "The FAIR Principles." GO FAIR Initiative. https://www.go-fair.org/fair-principles/.