

IMS

GLOBAL CHANGE INTERSECTORAL MODELING SYSTEM

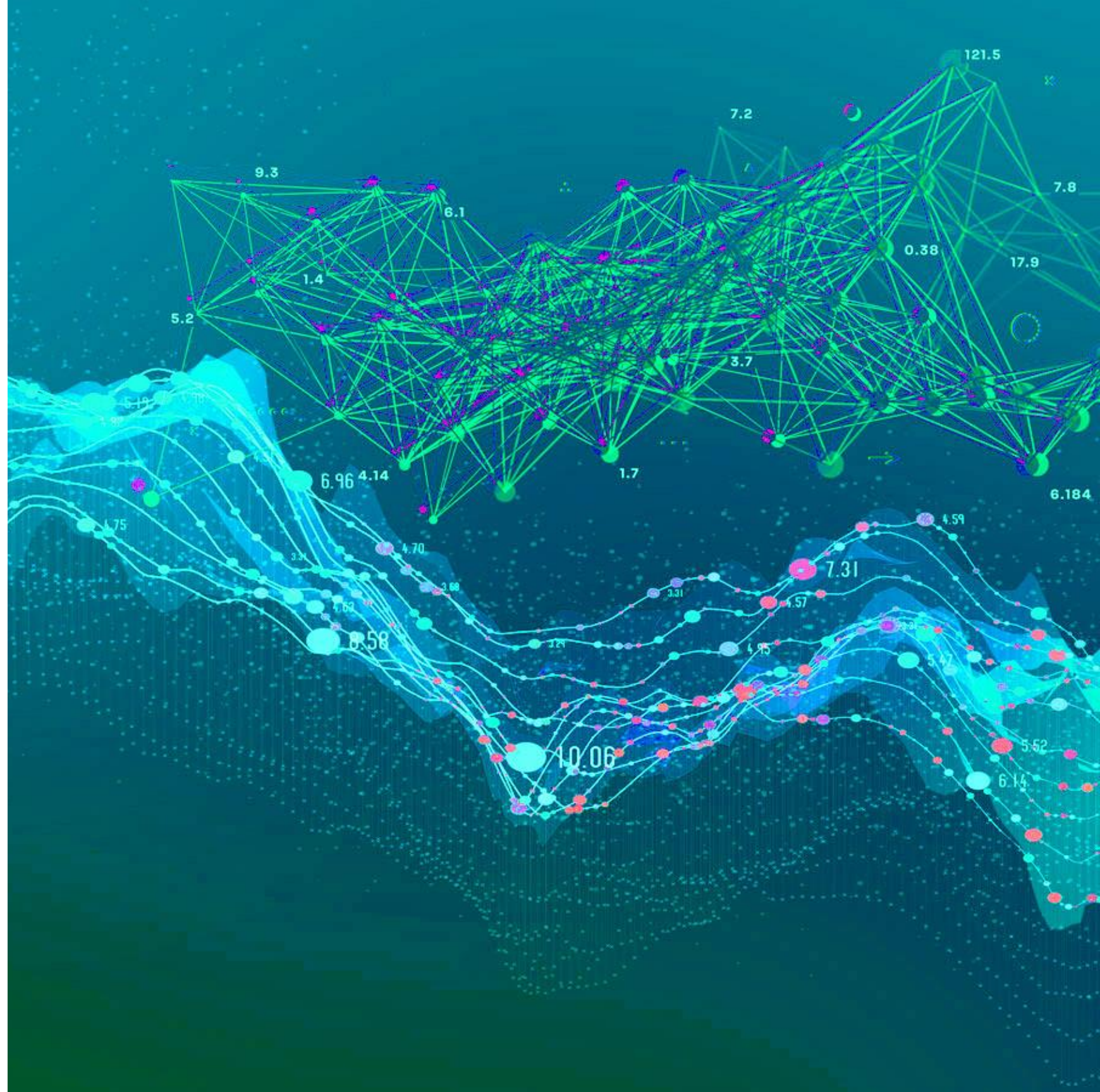
Foresight – Global Change Analytics: Communicating complex science through interactive dashboards

April 25, 2023

**Zarrar Khan, Taryn Waite,
Hassan Niazi, Mengqi Zhao, Chris Vernon**



PNNL is operated by Battelle for the U.S. Department of Energy





IMS Agenda

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- Introduction
- Motivation
- Scope
- Design



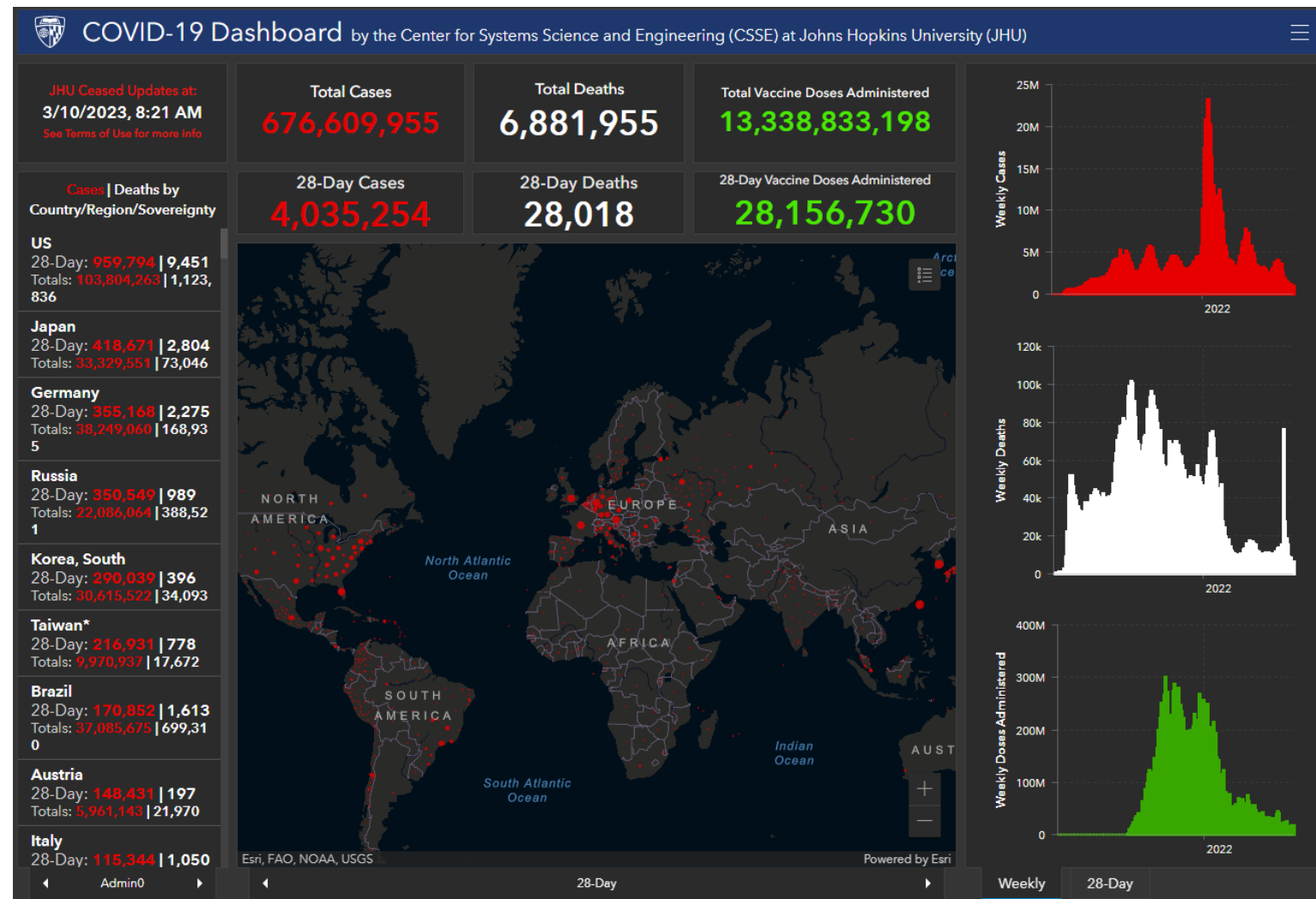
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Introduction

IMS Introduction - Dashboarding

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What is a dashboard?

- Live visual interface that displays key data and metrics
- Linked to a database
- Provides a snapshot of important information in real-time or near-real-time
- Enables quick identification of areas of concern and trends
- Helps inform decision-making and drive action.

<https://coronavirus.jhu.edu/map.html>



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Introduction – Slido Survey

Join at

[www.Slido.com](https://www.slido.com)

#4138202



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If you weren't a human what would you like to be?

ⓘ Start presenting to display the poll results on this slide.



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If you weren't a human what would you like to be?

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purple sulfur bacteria

Domino's tater tots

GCAM

Domino

bengal tiger

vulcan

tree

Trex

Marshall

dolphin

A Cat

crow

a river

A Whale

a god

biochar

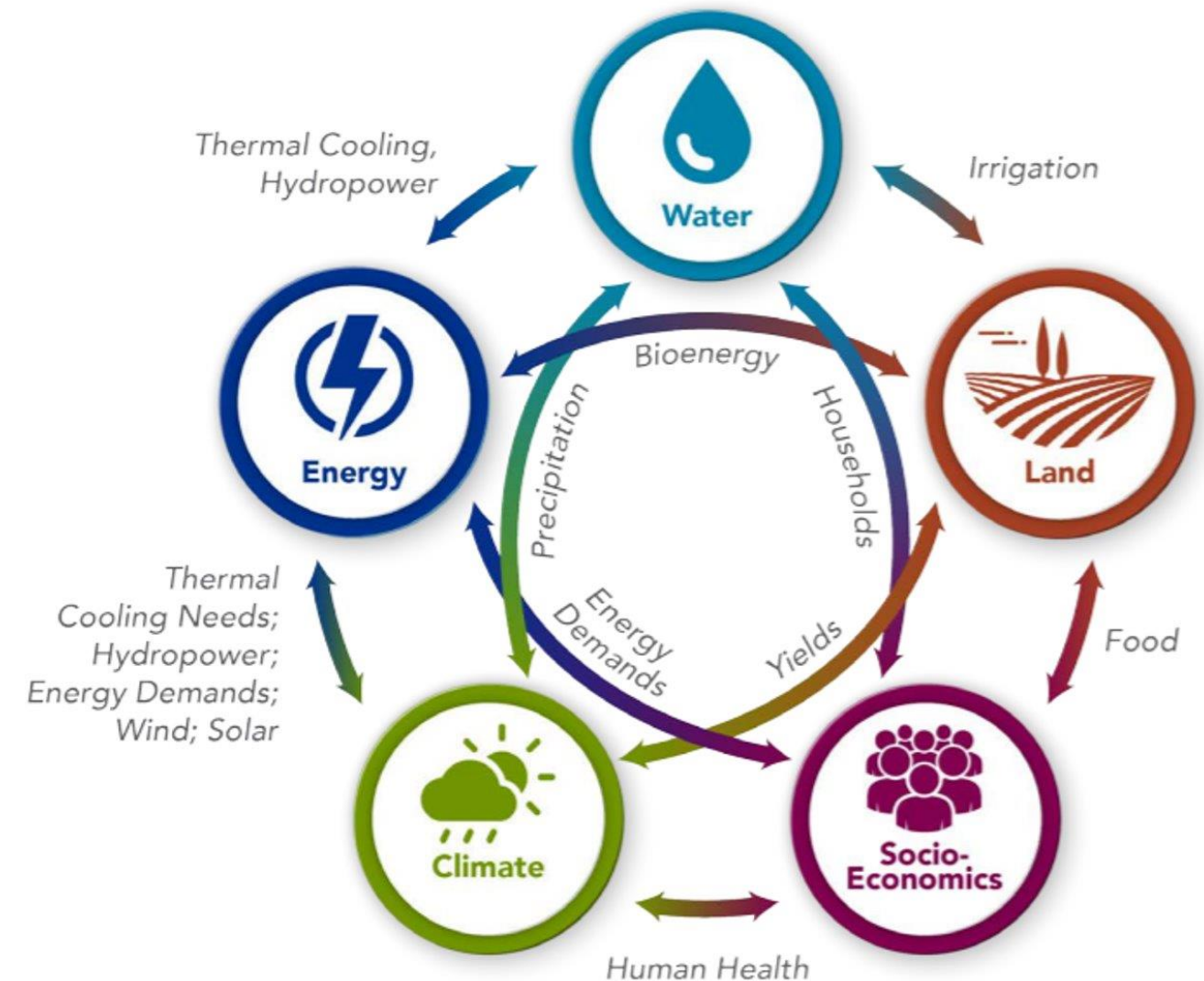
Eagle

IMS Integrated Assessment Modeling (IAM)

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- Represents socio-economics, energy, water, agriculture, land-use, and climate systems.
- GCAM used to capture long term (2100) multi-sector global dynamics
- Solved using a market-equilibrium approach to balance demands and supplies in regional markets for different commodities.
- One of the selected models used by the IPCC in all its reports

Global Change Analysis Model (GCAM)





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Motivation



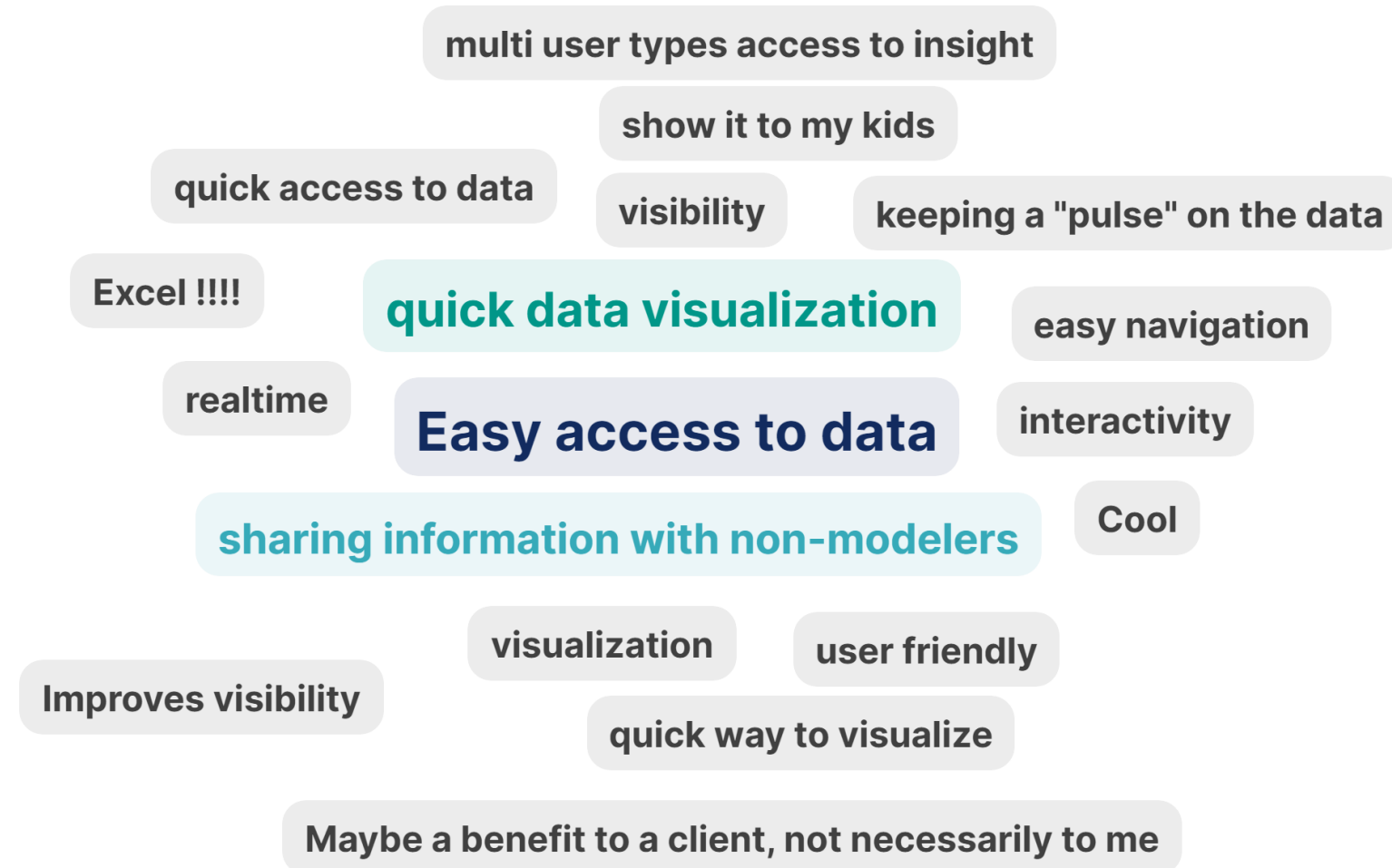
What do you think are some benefits of a dashboard?



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What do you think are some benefits of having a dashboard?

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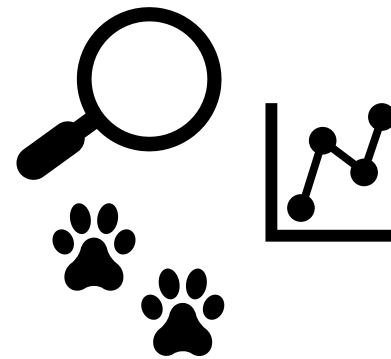
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Motivation – Need



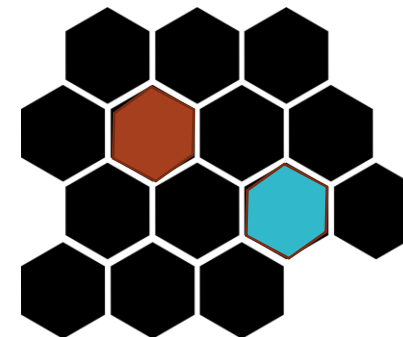
**Tracking Indicators
& Trends**



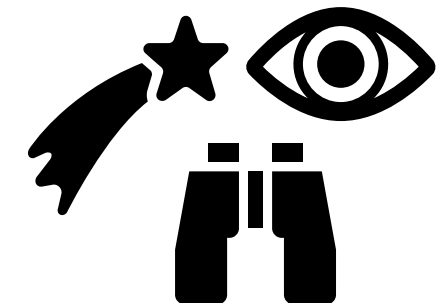
Accessible Insights



**Institutional Hive-Mind
Avoid SINGLE-USE research**



Visibility





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Scope

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Who do you think is your potential audience?

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Who do you think is your potential audience?

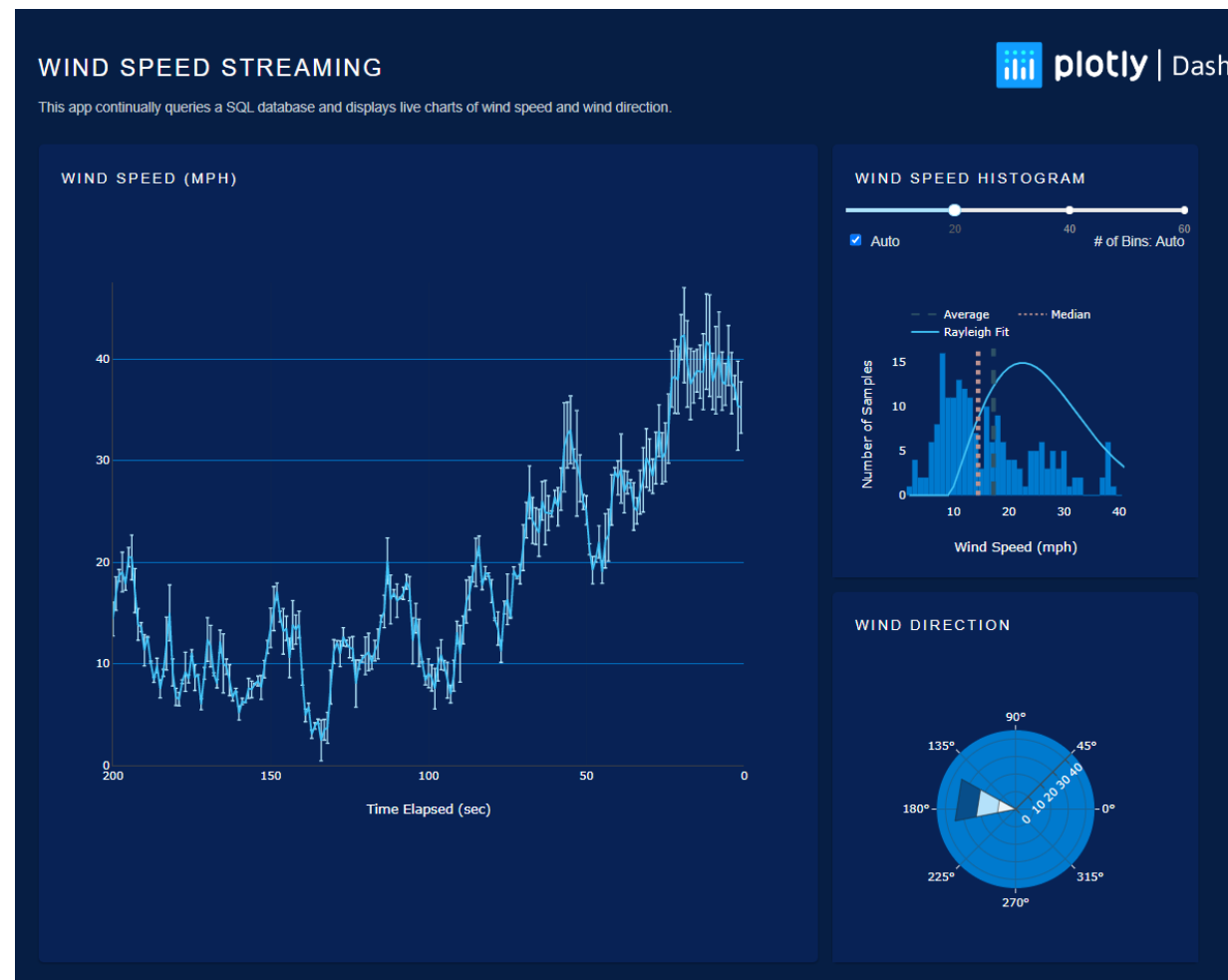
JGCRI 13 Apr 2023



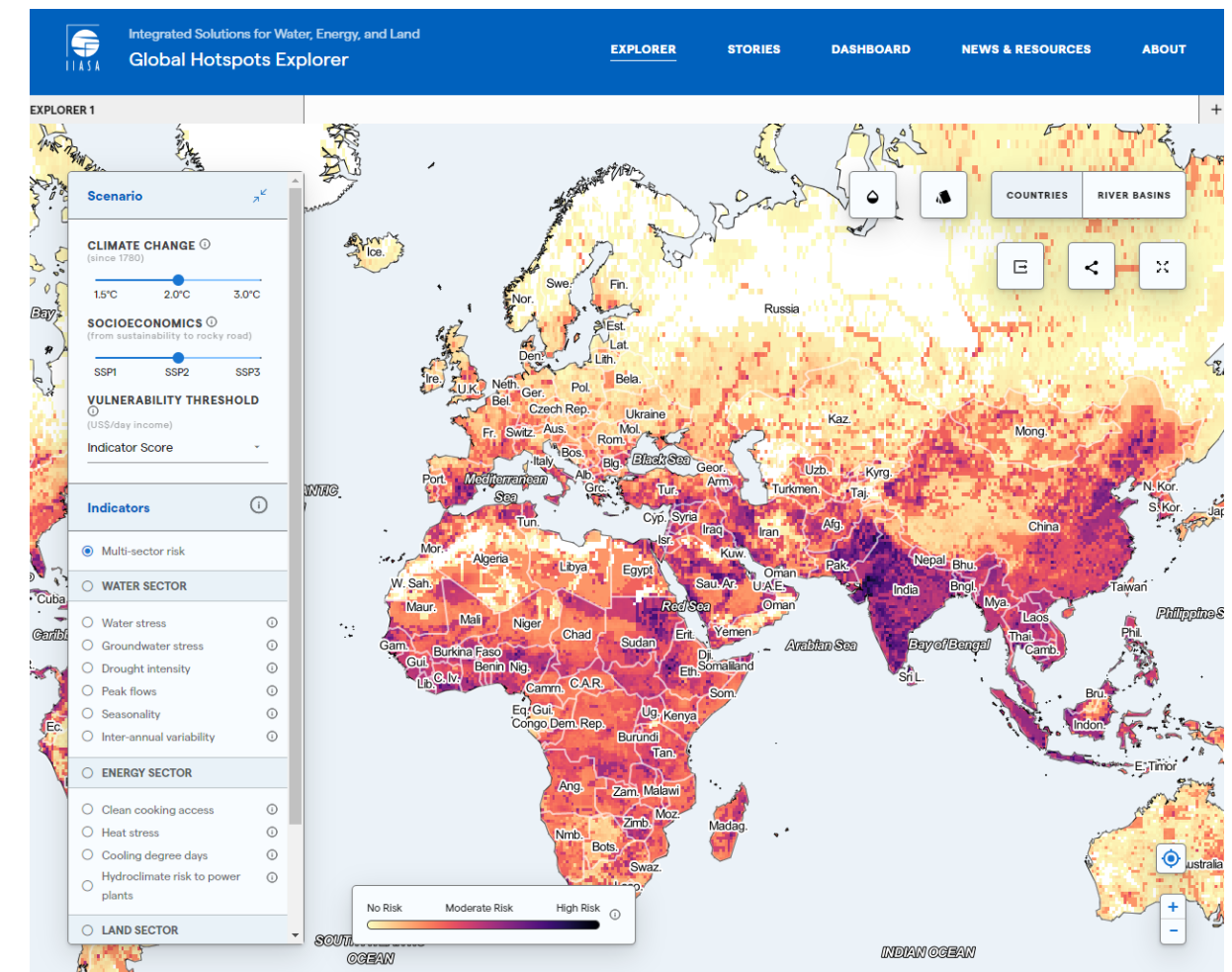
IMS Scope: Audience

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What information we show and **How** we show it will depend on the audience



<https://dash.gallery/dash-wind-streaming/>



[IIASA Hotspot Explorer](#)



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Design



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Design: Dashboard Elements

- **Content**

- Relevant
- Digestible

- **Layout**

- Grouped data
- White Space

- **Color**

- Sparingly
- Deliberately
- Flat UI
- Accessibility

- **Fonts**

- Consistent
- Max 3 sizes

- **Visualizations**

- Chart choices
- Placement
- Cross-filtering

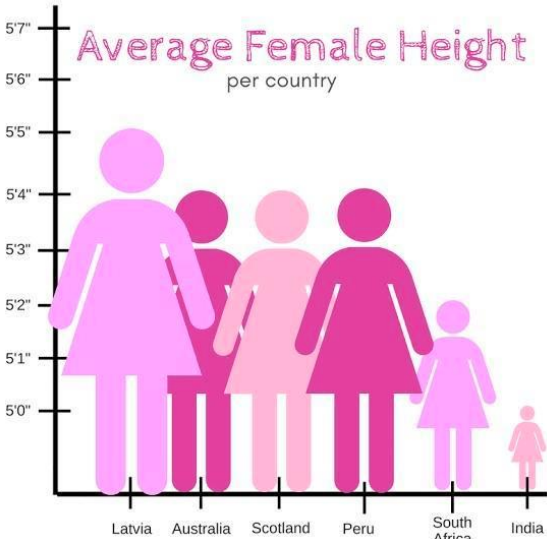
- **Responsiveness**

- Multiple OS
- Multiple devices
- Screen sizes

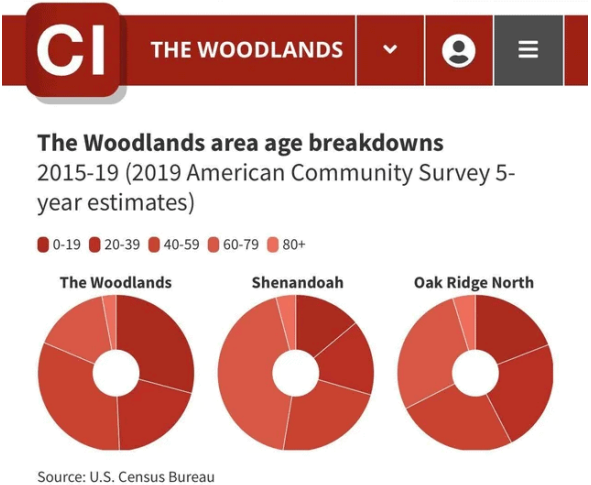
- **Data**

- Availability
- Transparency

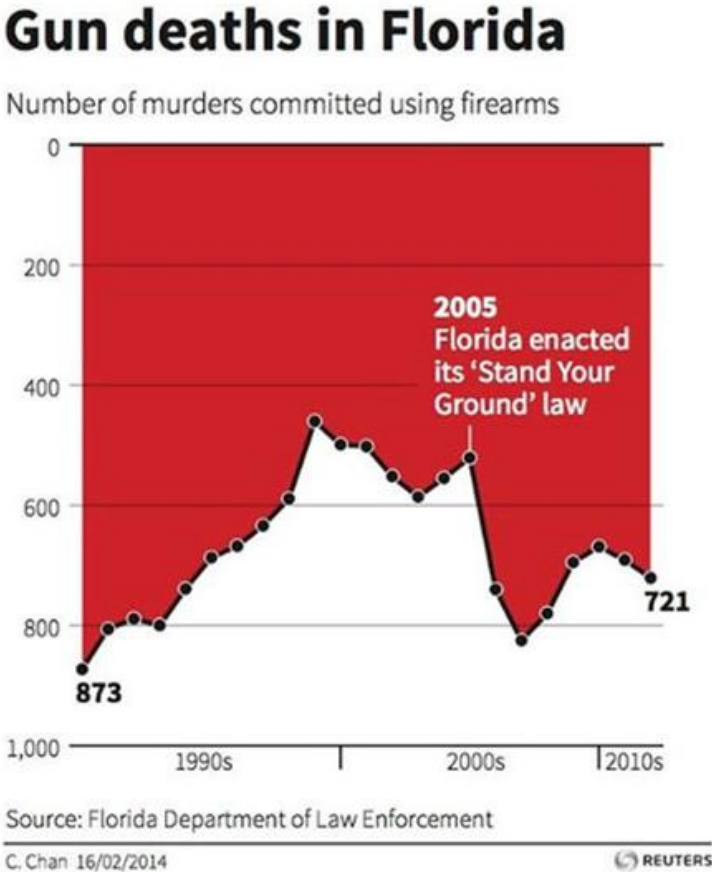
Cropped Y Axis



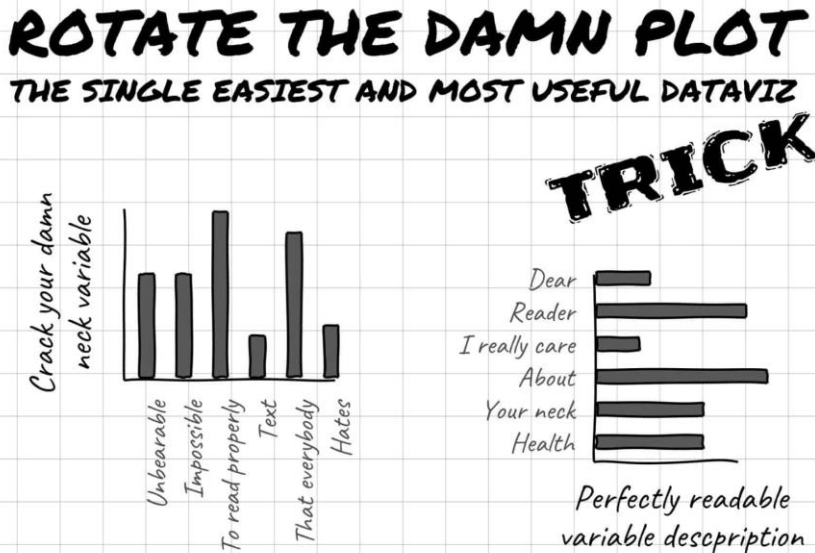
Color Scale Choices



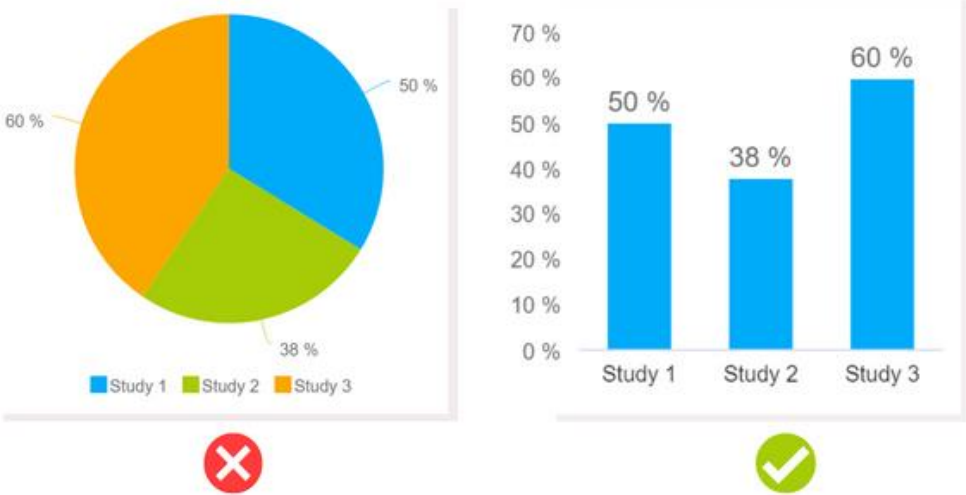
Misrepresenting Data



Readability

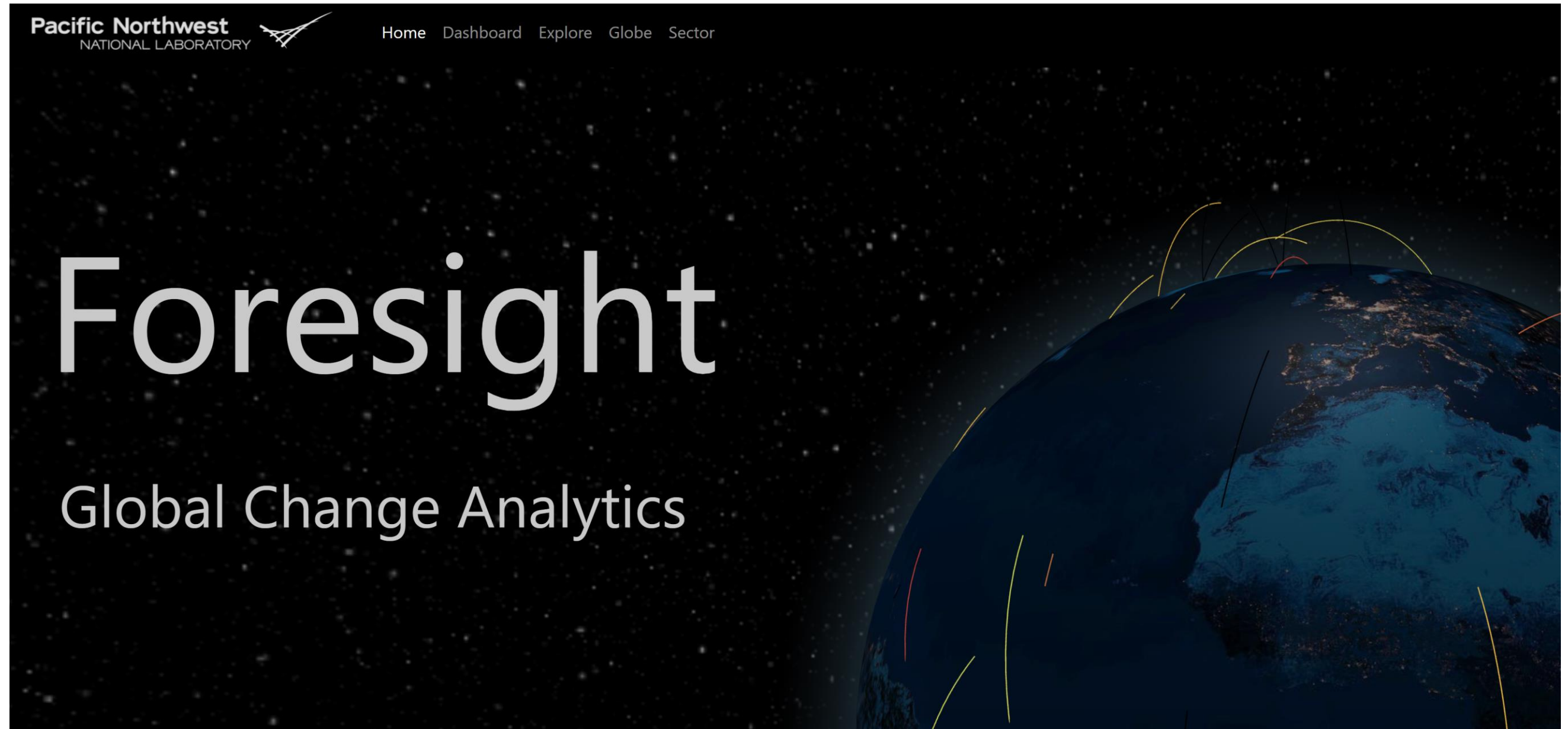


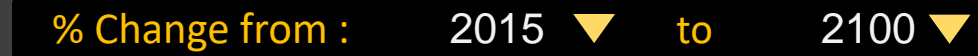

Using inappropriate charts



IMS Preview Foresight

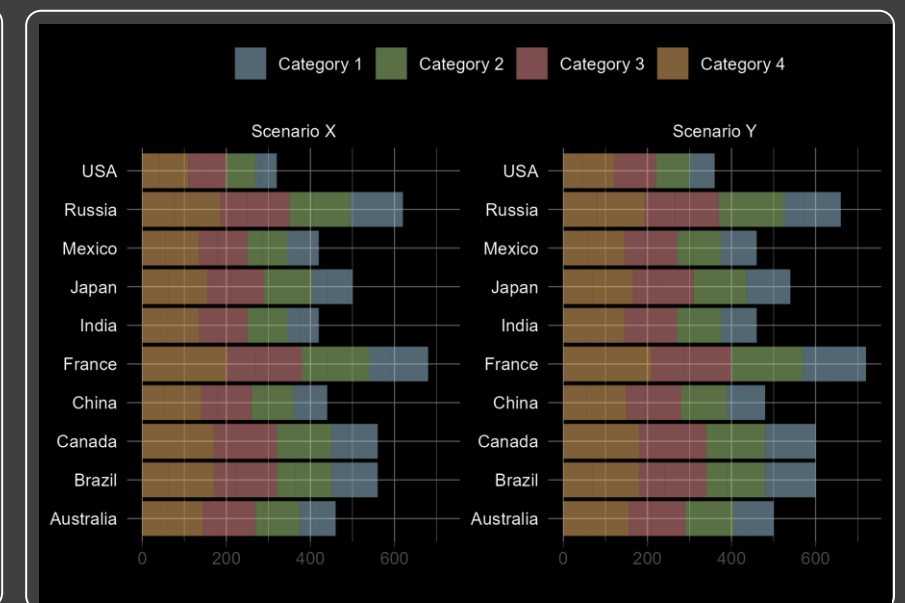
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**SELECTED: YIELDS** 

Spatial Comparison

Top 10 Countries – By Subsector

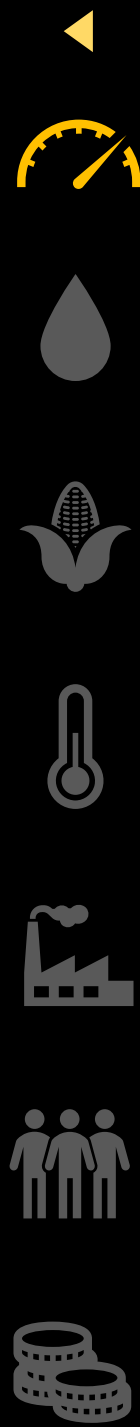


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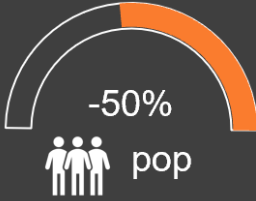
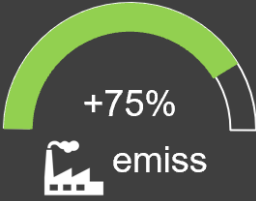
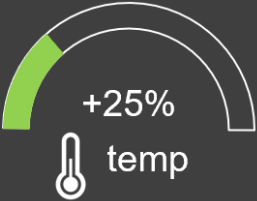
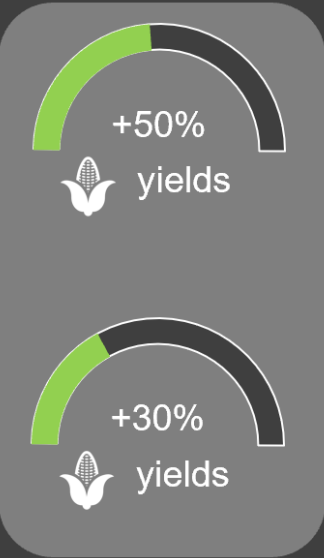
What are your first impressions when you see this dashboard (design, content, takeaways etc.)?

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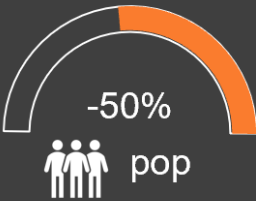
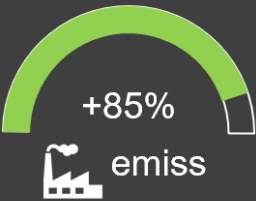
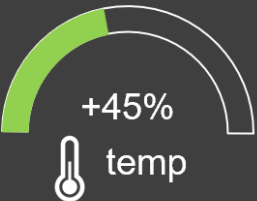
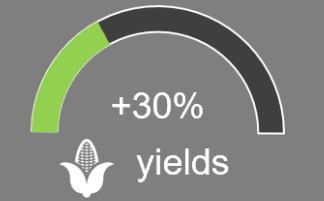


% Change from : 2015 to 2100

Scenario X

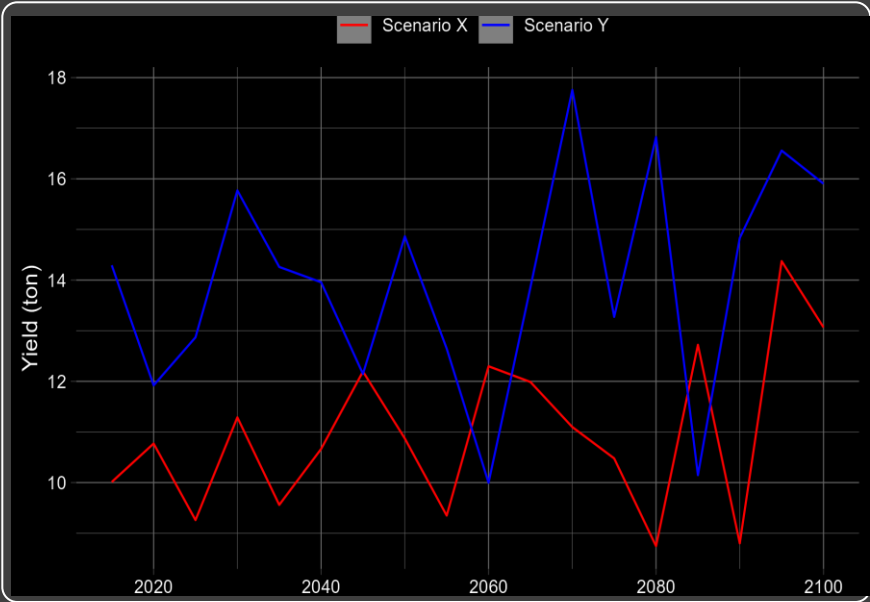


Scenario Y

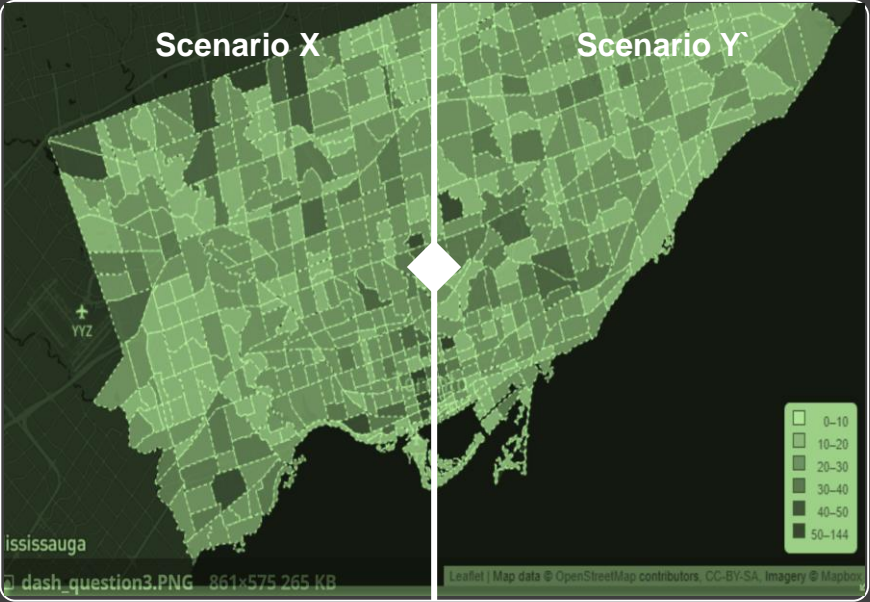


Selected: Yields (tons)

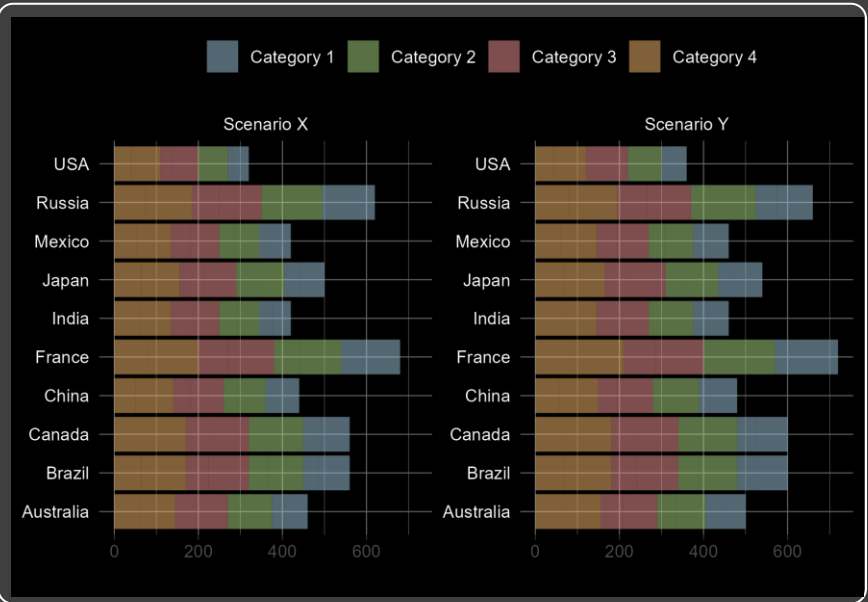
Global – All Scenarios



Map – Scenario X vs. Y



Top 10 Countries – By type



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What are your thoughts on improving this dashboard (design, content, takeaways etc.)?

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Thank You – Come talk to me!

POSTER

Wed, 26 Apr

08:30–10:15

Hall X4 | **X4.186**

GCIMS – Integration:
Reproducible, robust, and
scalable workflows for
interoperable human-Earth
system modeling