Designing Touchscreen Interfaces to Afford Engagement with Scientific Data

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Problem: How do we design interfaces to enable exploration?

- Increase in technological advances have led to more ways to display scientific content. [3]
- We know little about design implications for large-scale interactive displays to afford learning.
- Especially with children, prior work on exhibit interactions in this space is limited. [1]
- There is potential for different ways of learning and engaging with material. [2]

Figure 1. Adults and children interacting with large-scale interactive displays [1]. Courtesy of the TIDESS project.

Method: Use design-based research to prototype our ideas

- *Goal: to* discover ways that improve engagement.
- Develop partially functional mockups to test parts of a design or display element.
- Use **iterative prototyping** to refine the prototype.
- Design 4 tasks for users to complete that cover functional aspects of prototype.

1. Use touch to explore this interactive visualization as you would if you were showing it to someone else.
2. Open the information box for South America. and tell us how the information there compares to the ocean data displayed in general.
3. Find the Gulf of Mexico and use the colors to tell us how ocean
4. Find the Eastern Pacific Ocean basin and use the colors to tell us how ocean temperatures in the basin are different from long-term baseline ocean temperatures for that basin.

We went through 3 major design iterations, and we *piloted* 3-5 people between each iteration.

Iteration 1

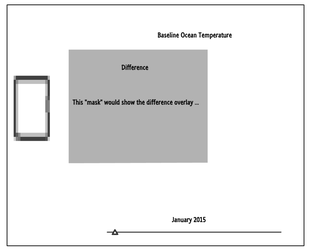

Figure 2. Carousel element mockup. Courtesy of the TIDESS project.

- Implemented using **Open Exhibits SDK**
- Introduced toggle button to **cue maps**
- Replaced toggle button with carousel to **encourage swipe**

Iteration 2

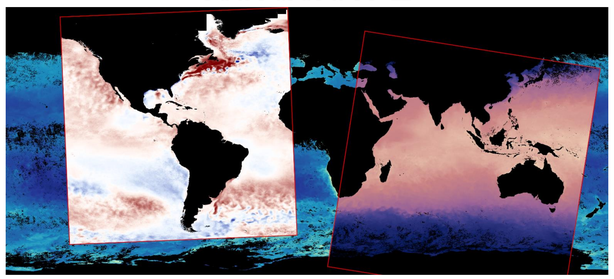

Figure 3. Maskview mockup. Courtesy of the TIDESS project.

- Developed new **design element**, maskview, to display both maps

Iteration 3

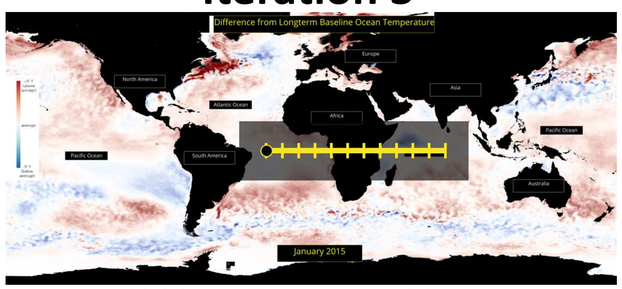

Figure 4. Hold slider mockup. Courtesy of the TIDESS project.

- **Introduced gesture**, long-hold and swipe, to change maps

Impact: Find design insights

- Develop recommendations for creating interfaces meant for **public settings**.
- Knowledge on how children view and engage with large-scale interactive interfaces.

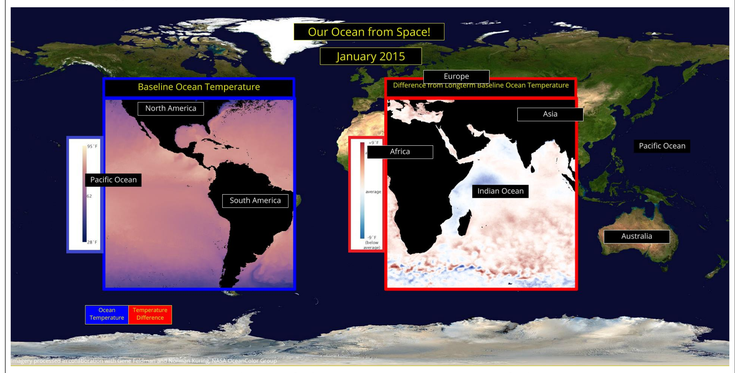

Figure 5. Screenshot of the current version of the prototype. Courtesy of the TIDESS project.

Future Work: Prototype sphere

- Conduct **lab study** to discover ways to improve engagement with the prototype.
- Analyze results from the study to propose design insights.

Figure 6. PufferSphere M model. Courtesy of http://www.pufferfishdisplays.co.uk/products/pufferesphere-m/.

References

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