Visualizing Data for Stakeholders from Varying Backgrounds

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Scientists and their various stakeholders often speak different "languages" when making sense of visualizations[1], due to varied backgrounds and experiences[2]. **How can we use their various meaning-making strategies to create visualizations to communicate between these groups?**
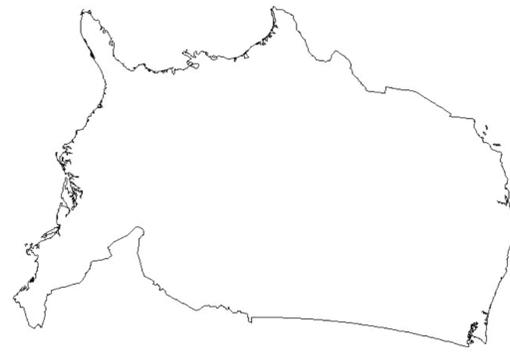
How long does it take you to locate Florida? Colorado? Unfamiliar orientation or lack of context can distract from meaning-making

Scientists' experience allows them access to shared meanings in colors, vocabulary, and geography that slow laypeople down. **Removing non-essential "jargons"[3] allows stakeholders to focus on the important information in the data: the patterns.**

Don't make it hard for your audience to find the meaning you intend or assume they have the same background as you. **Foreground and highlight what's important.**

The "rainbow" color scheme has several issues that confound interpretability.

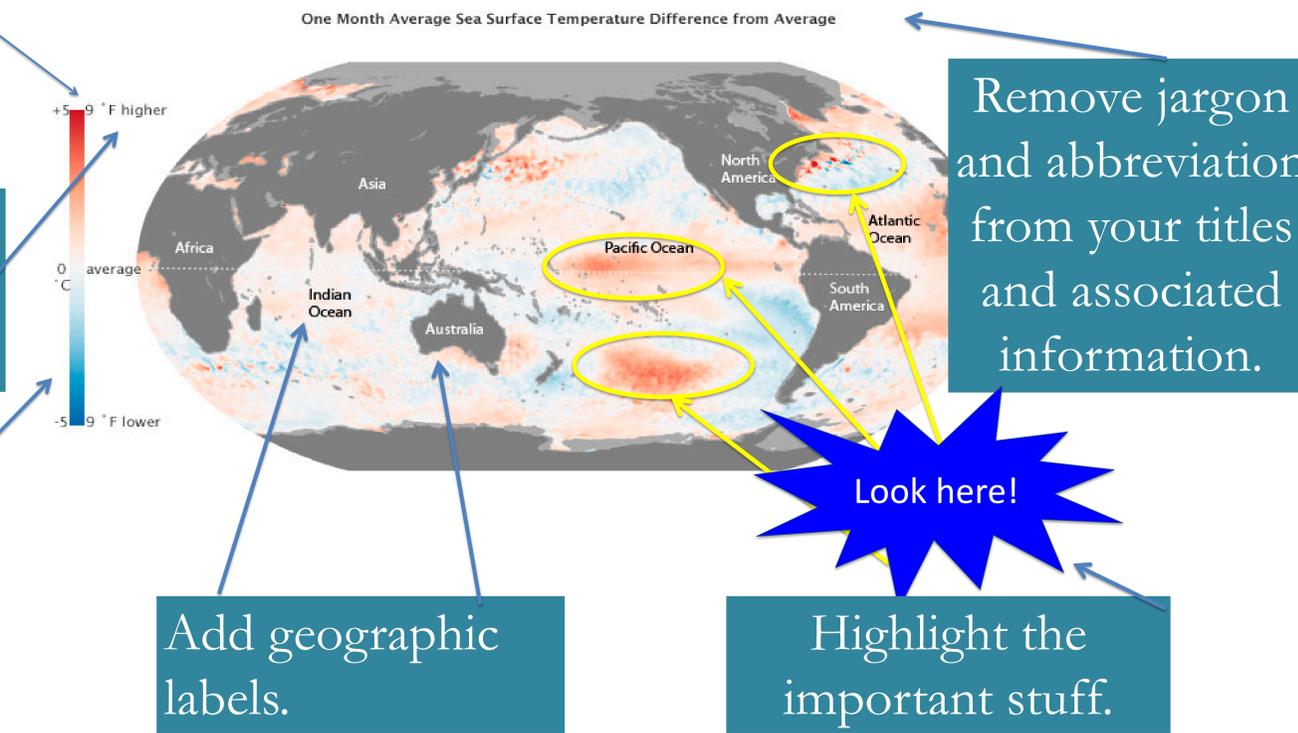SSTAnomaly

−5   0 (˚C)   +5
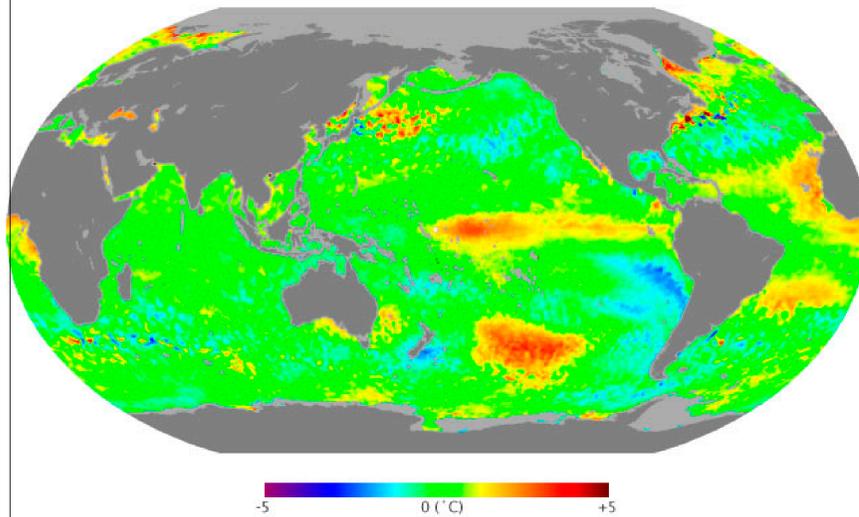
Yellow-green is perceptually most obvious to the human eye, but it is used to represent middle (unimportant) values. It uses six colors to represent two (or three) types of values, and those six colors do not represent equally-wide ranges. It has no cultural anchor for laypeople. Color-blind people cannot use it.

Western readers look for given information (key) on the left, new info to the right or down.

Add familiar units alongside the scientific ones for lay audiences.

Use colors that are familiar to your audience and only use as many as you need.

An audience-centered design:

One Month Average Sea Surface Temperature Difference from Average

+5   9 ˚F higher

0   average
˚C

−5   9 ˚F lower

Asia
Africa
Indian Ocean
Australia
North America
Atlantic Ocean
South America
Pacific Ocean

Look here!

Remove jargon and abbreviation from your titles and associated information.

Add geographic labels.

Highlight the important stuff.

Better design helps stakeholders easily and quickly access your intended meaning instead of focusing on or getting confused by peripheral details.[4] Try it with graphs!

1. Phipps, M. and Rowe, S. (2010). Seeing satellite data. *Public Understanding of Science. 19* (3), 311-321.
2. Piaget, J. (1967). l'Épistémologie et ses variétés. *Encyclopédie de la Pléiade. Logique et connaissance scientifique*. Paris: Gallimard.
3. Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*(2), 89-100.
4. Stofer (2013). *Visualizers, Visualizations, and Visualizees: Differences in Meaning-Making by Scientific Experts and Novices from Global Visualizations of Ocean Data.* Doctoral Dissertation. Oregon State University.