Beyond the Wow! Helping public audiences make sense of scientific visualizations.

COSEE NOW
Webinar Part 1 5/17/10

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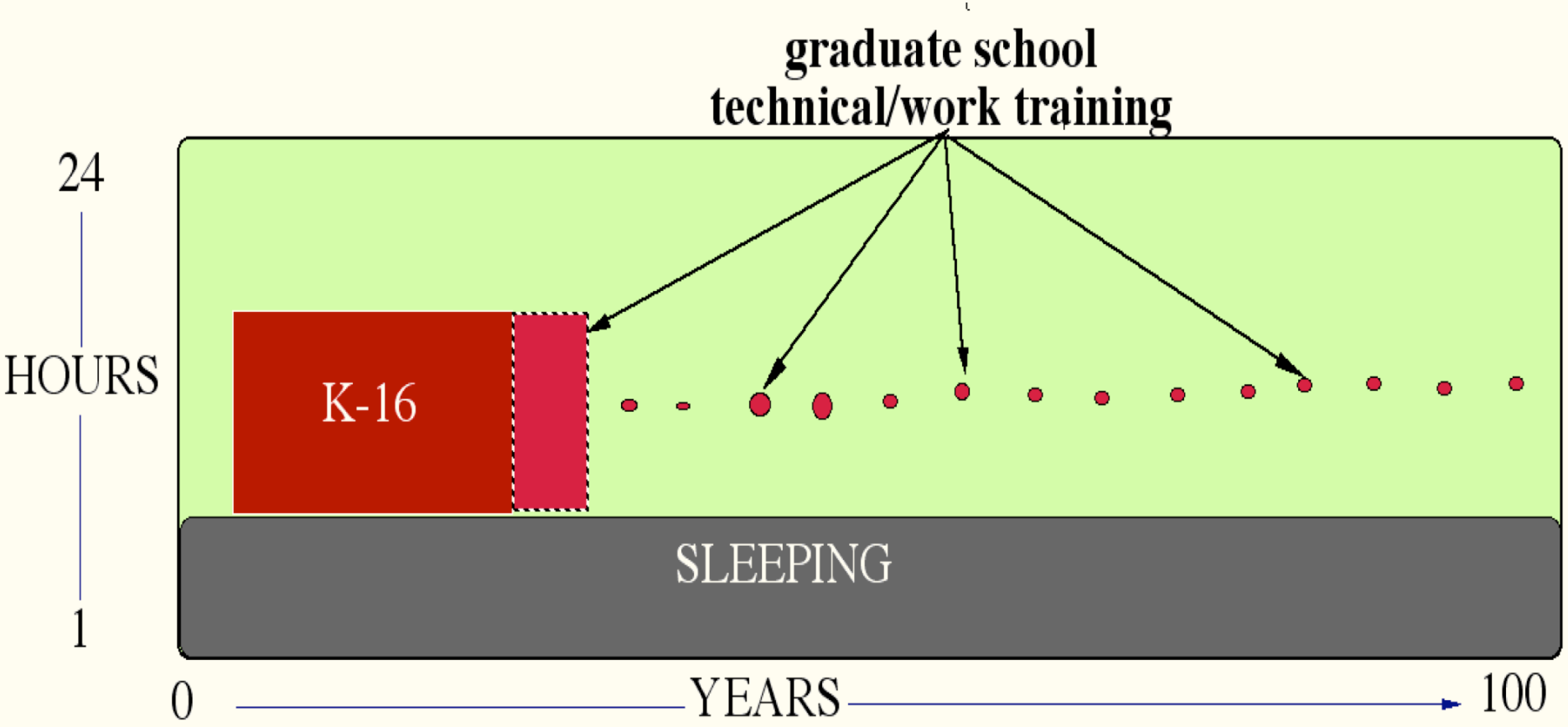
COSEE Pacific Partnerships
Centers for Ocean Sciences Education Excellence

Sea Grant Oregon

97% (or more) of your life spent outside of school or formal education/training



90% Get Ocean Sciences Info Like This

NATIONAL GEOGRAPHIC™

Google™

Definitions First

Experts/Novices

Definitions First

Learning

Definitions First

Scaffolding

Definitions First

Visualization

We'll be throwing these terms around today.

A. Experts/Novices
B. Learning
C. Scaffolding
D. Visualizations

My approach is that learning happens when novices take on the physical and psychological tools of experts. No one is born an expert, so learners need scaffolding into using visualizations and other tools of science.

Oregon Sea Grant Free-Choice Learning Visualization Research Team

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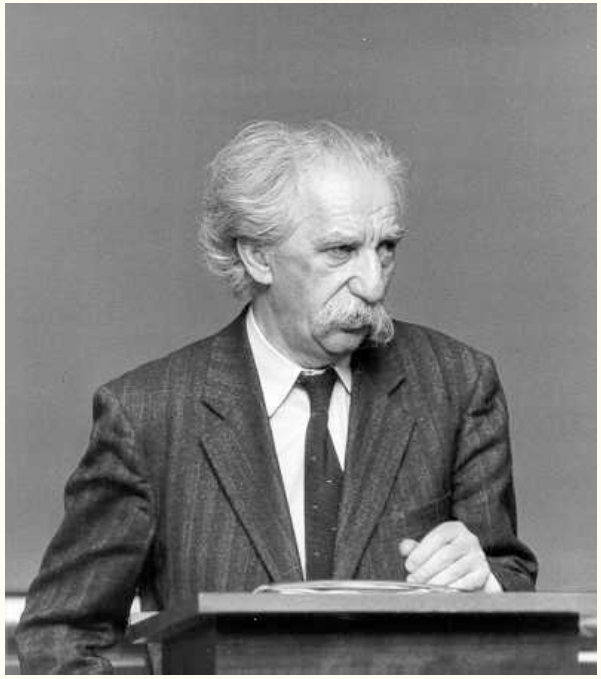
Katie Stofer

Sarah Mikulak

Every visualization serves 2 functions:

- To transmit information accurately
- To allow people to use it as a tool for making meaning and personal sense.

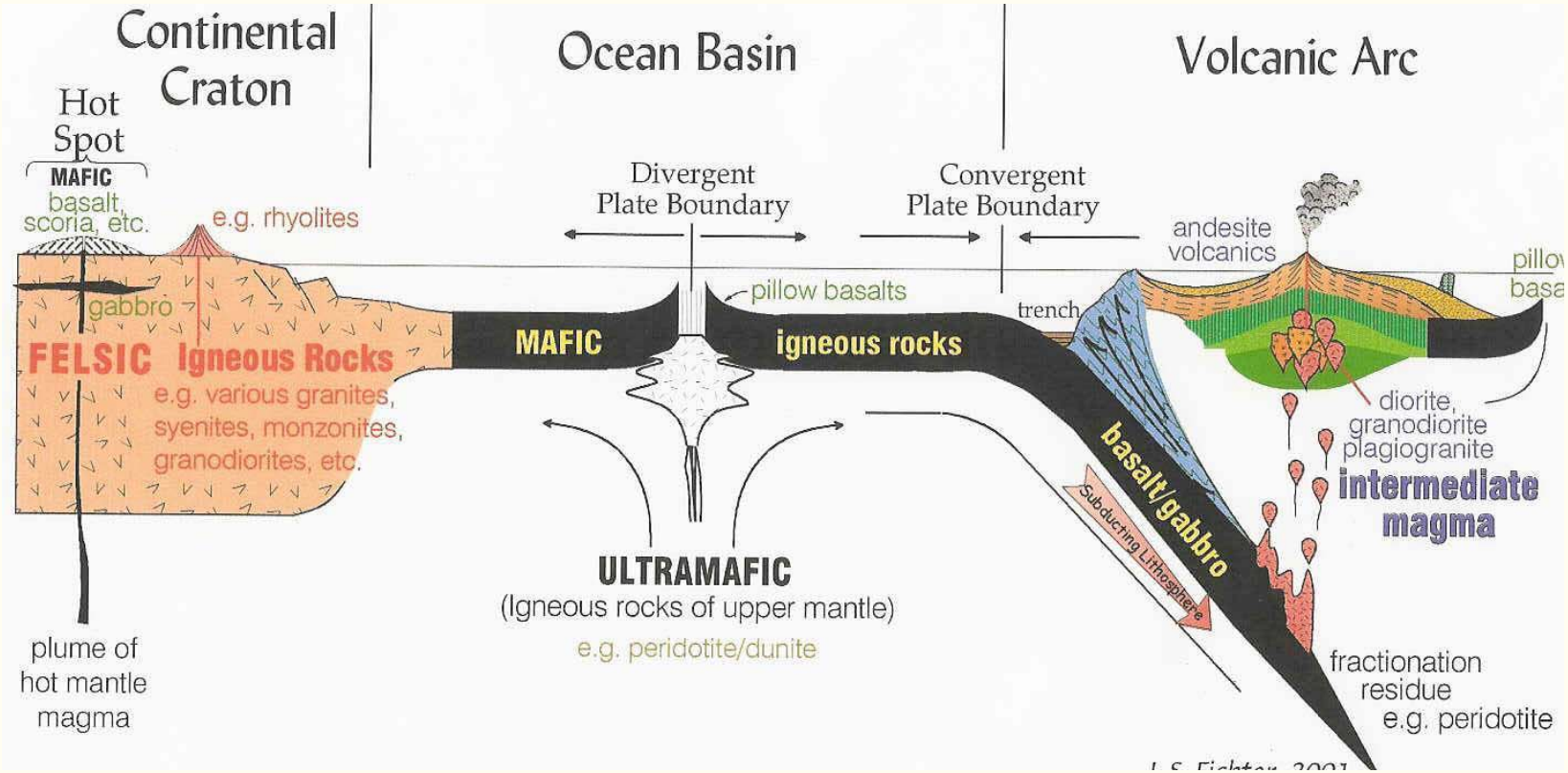


Yuri Lotman

Рис. 35. Ташкент, 1929 г. Лев Семенович ведет занятия в Первом САГУ.

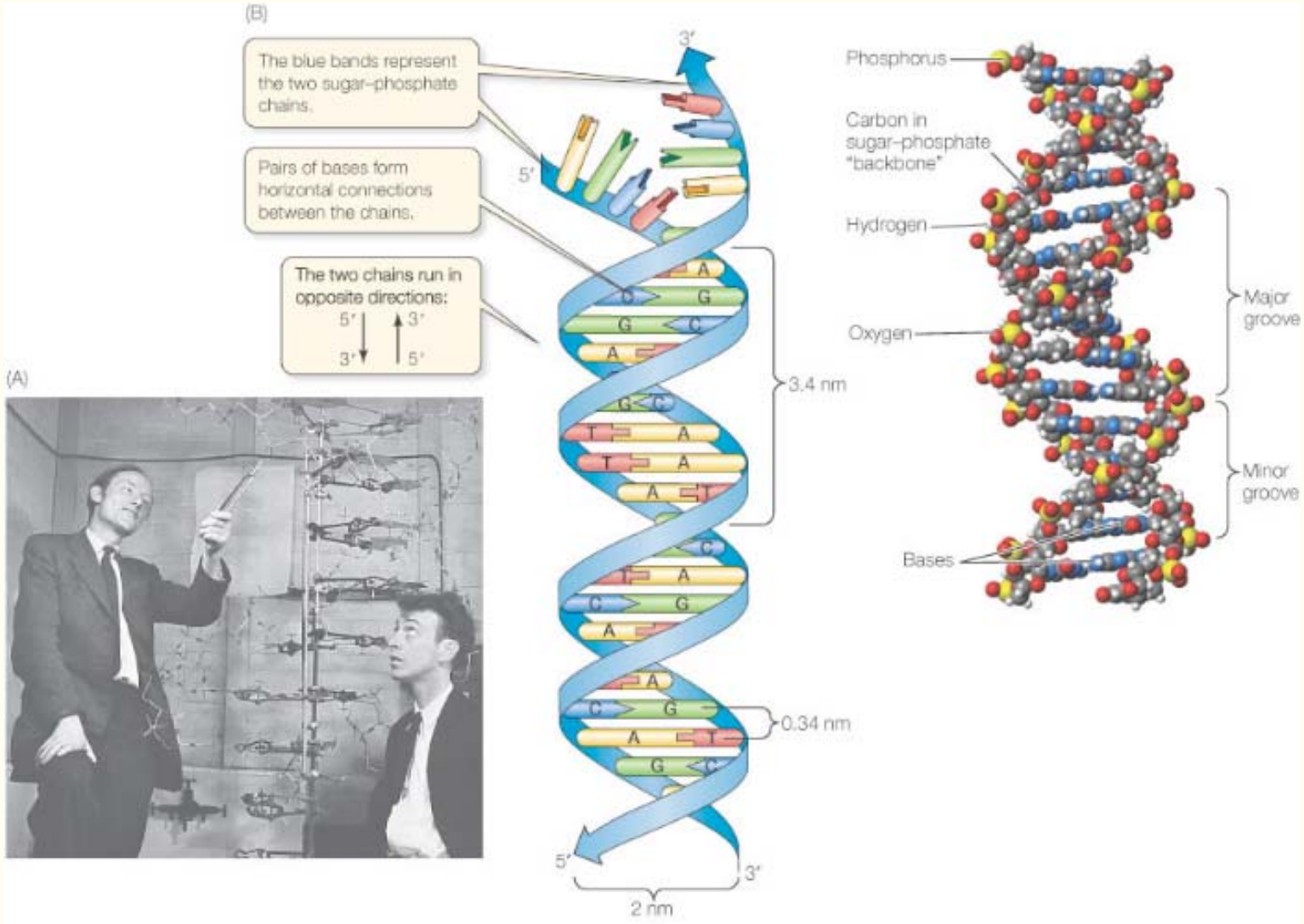
Lev Vygotsky

Visualizations are tools for communication and cognition.



L.S.Fichter, 2001

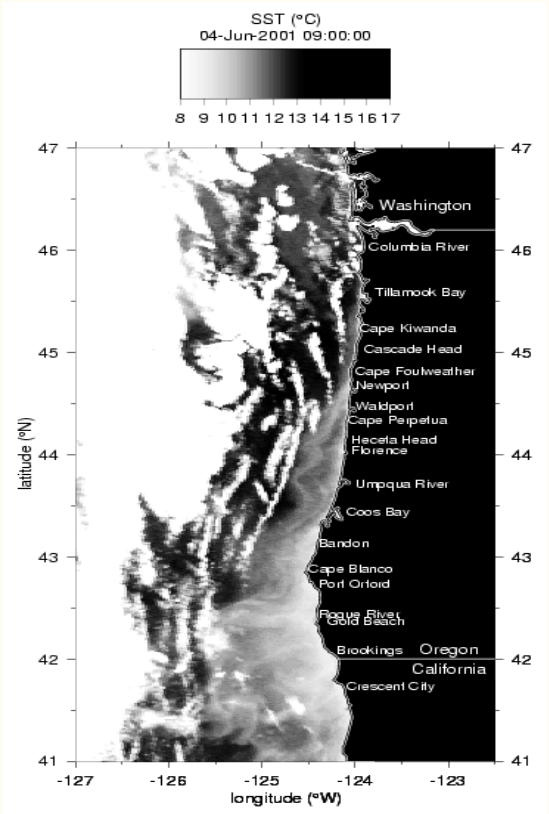
Visualizations are tools for communication and cognition.



David Sadava, © 2008 Sinauer Associates

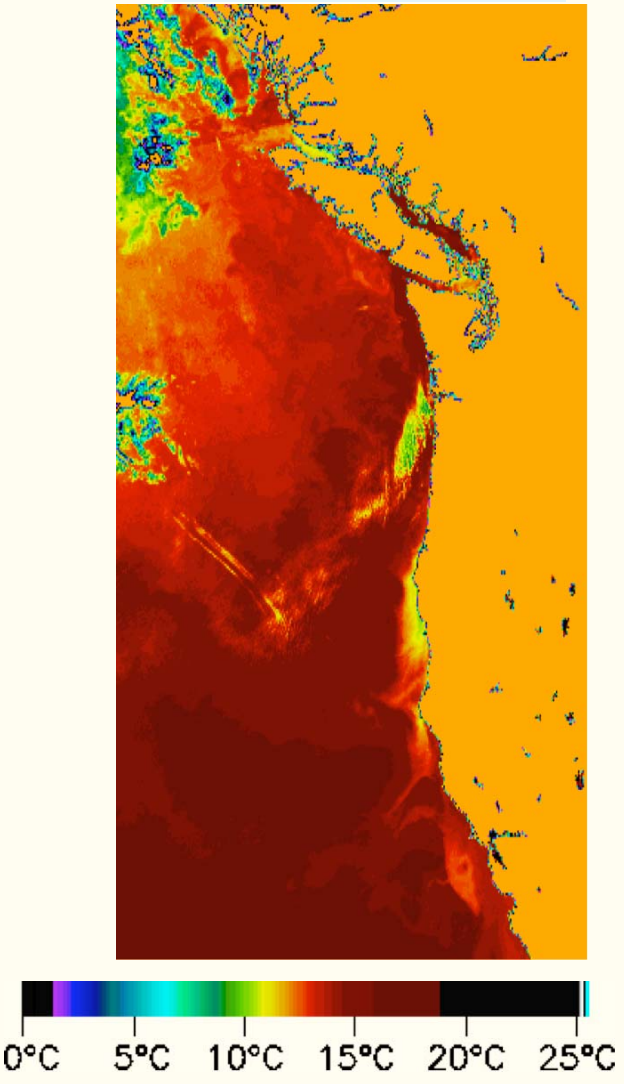
Seeing Satellite Data

- What do people see when they look at satellite data?
- What are people interested in learning about satellites and satellite data?
- Are there simple things we can do to help people see the data in a satellite image?

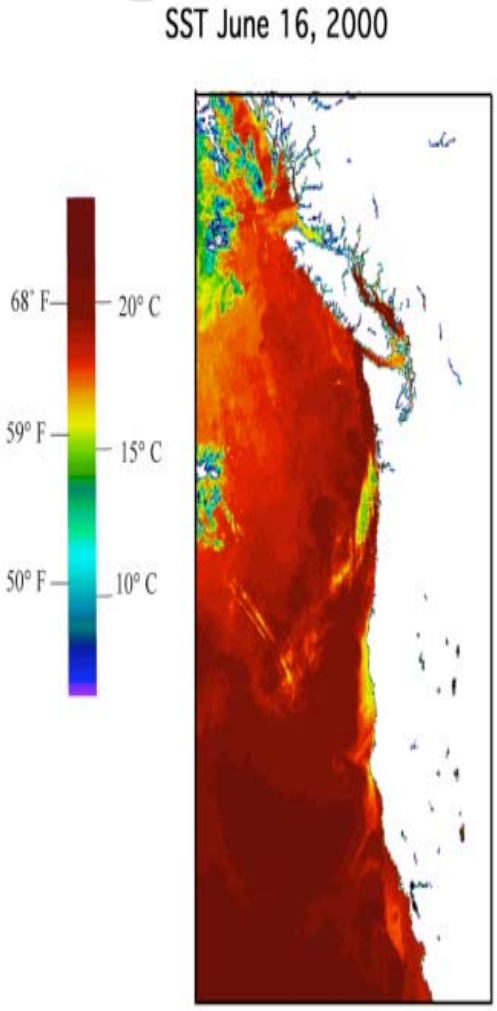


Shawn Rowe
Molly Phipps

SST June 16, 2000



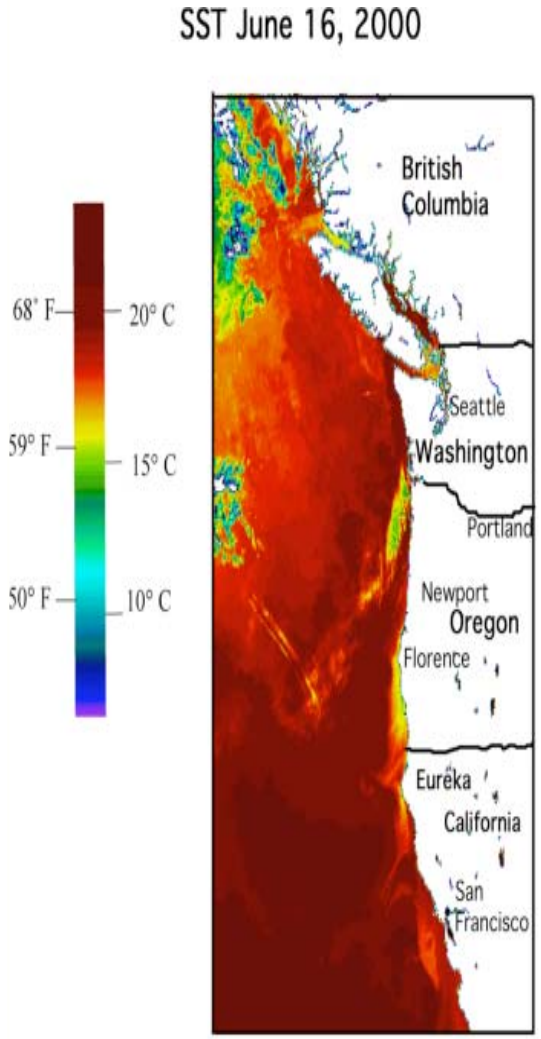
People don’t know to look at the legend, so leverage our habits.



1. Move the color bar to take advantage of the tendency to look for given information on the left and new information on the right.

2. Add Fahrenheit scale.

Add place names for conceptual anchors.

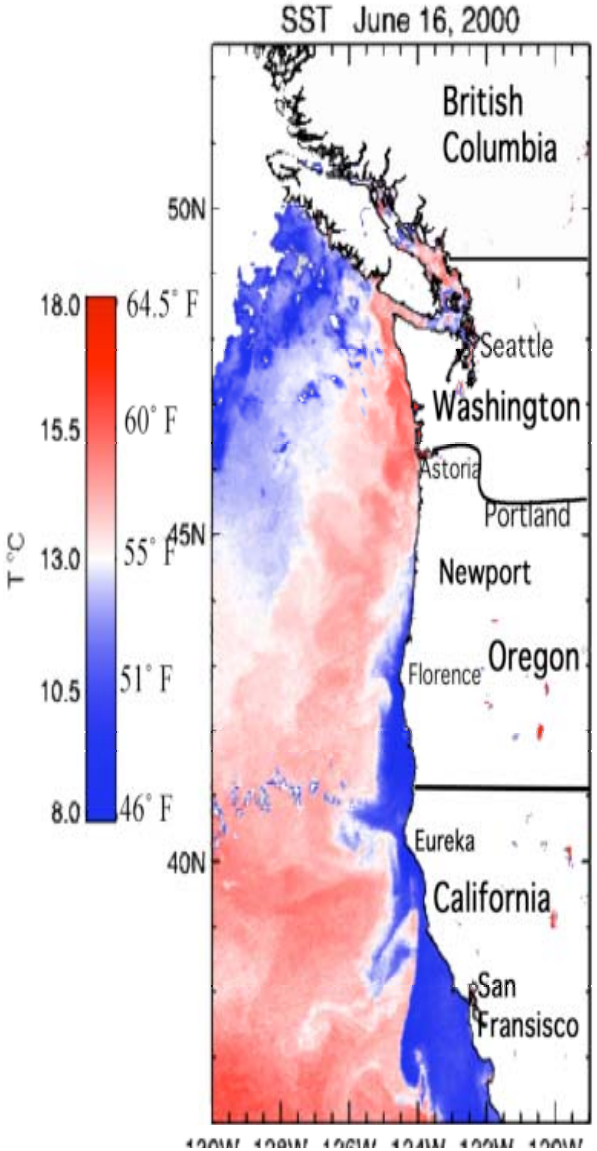


Place names allow people to activate their prior knowledge and experience while orienting within the image.

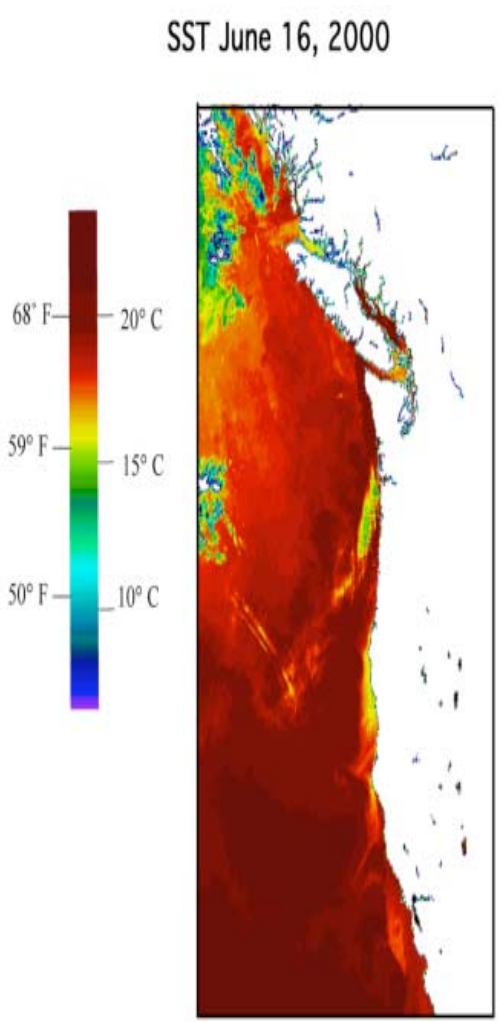
Change color scheme as a cultural lever.

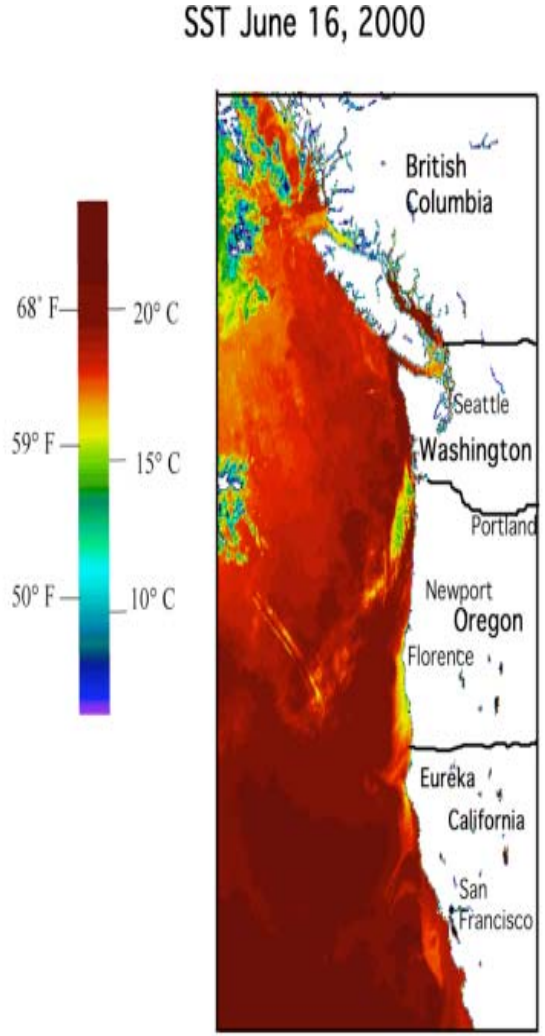
With this visualization, our visitors start to talk about their own experience at the ocean as well as the patterns they see in the image and whether those correspond to their experience.

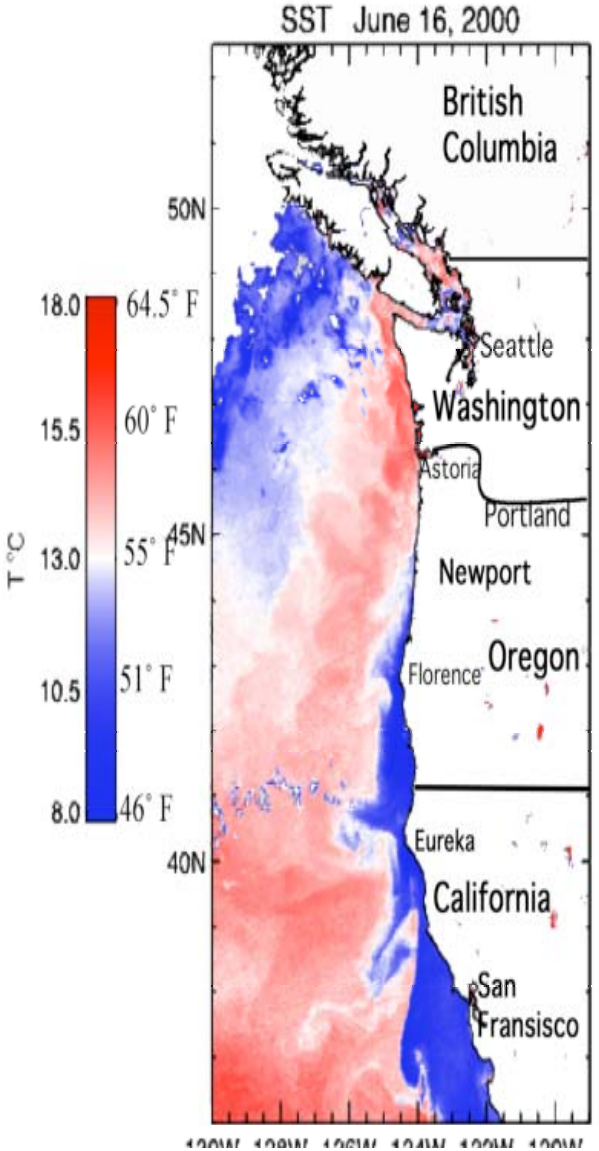
They begin to talk about seasonal differences in coastal ocean temperature.



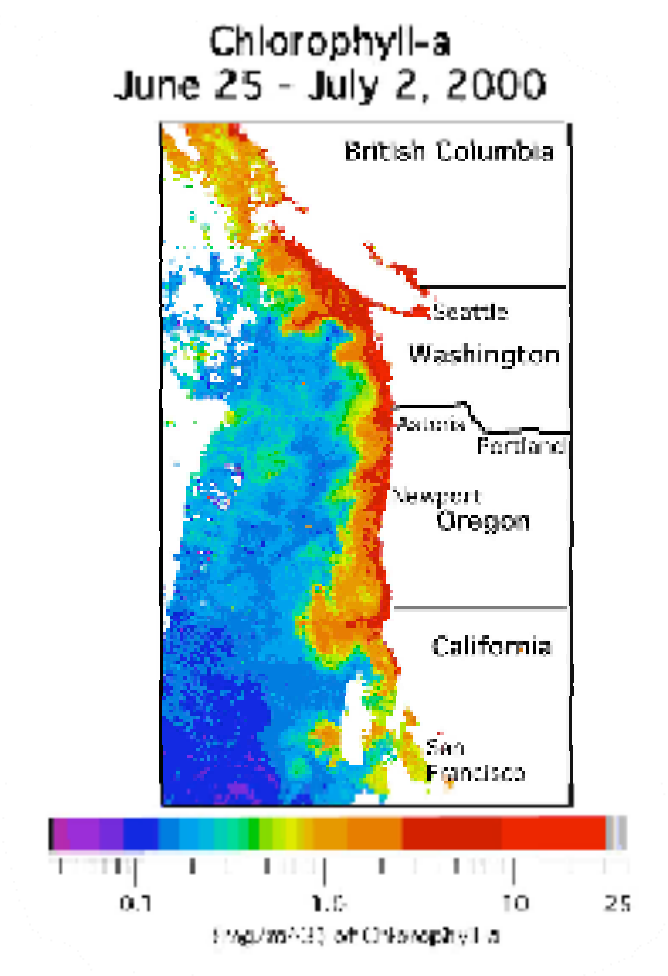
People can make sense of the content if they can make sense of the images.

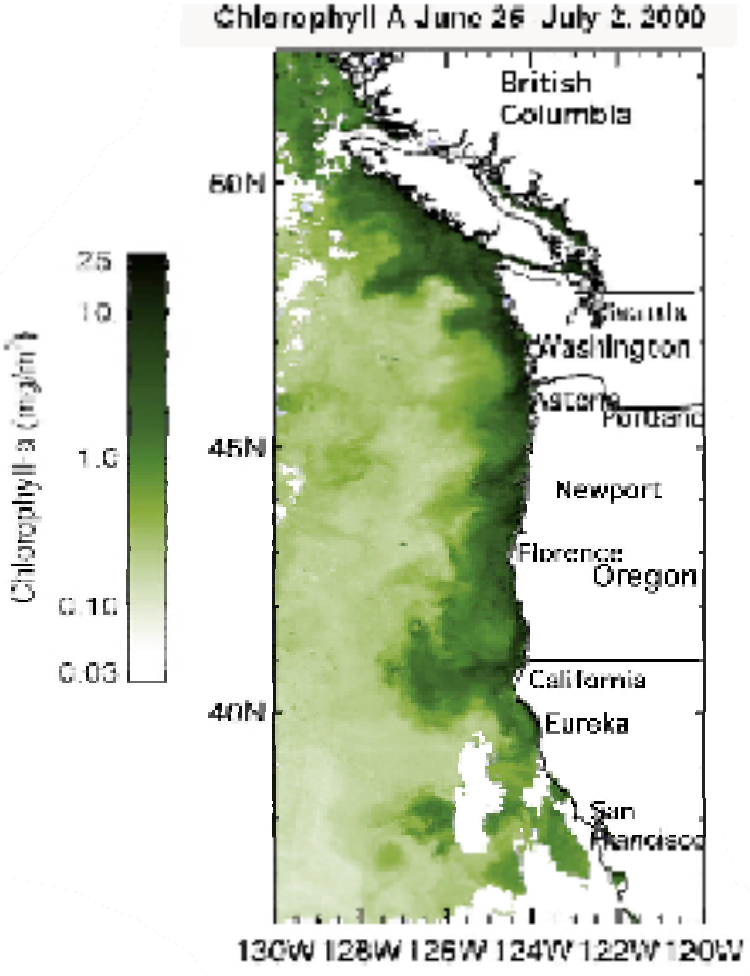






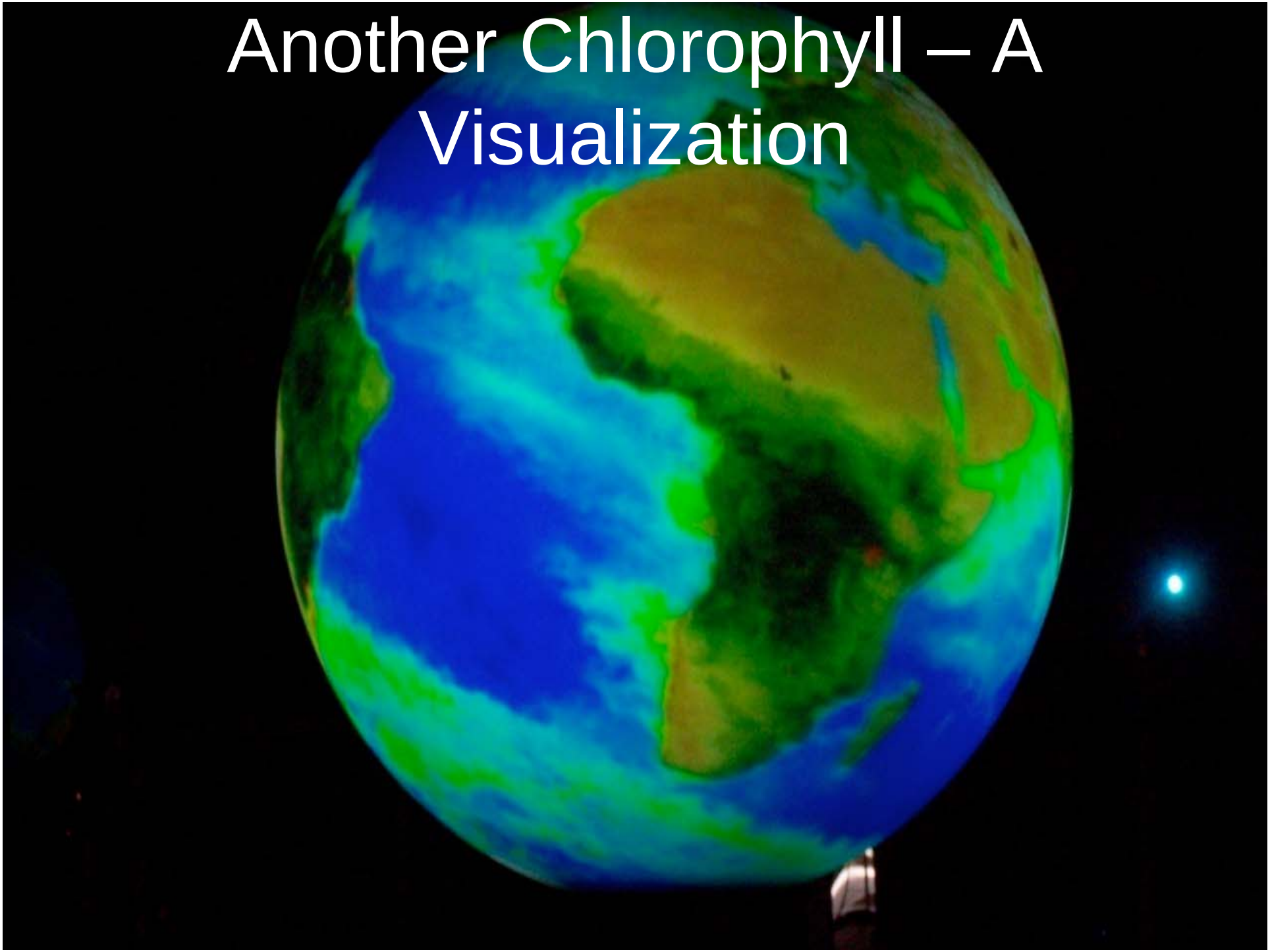
Seeing Chlorophyll-a Data



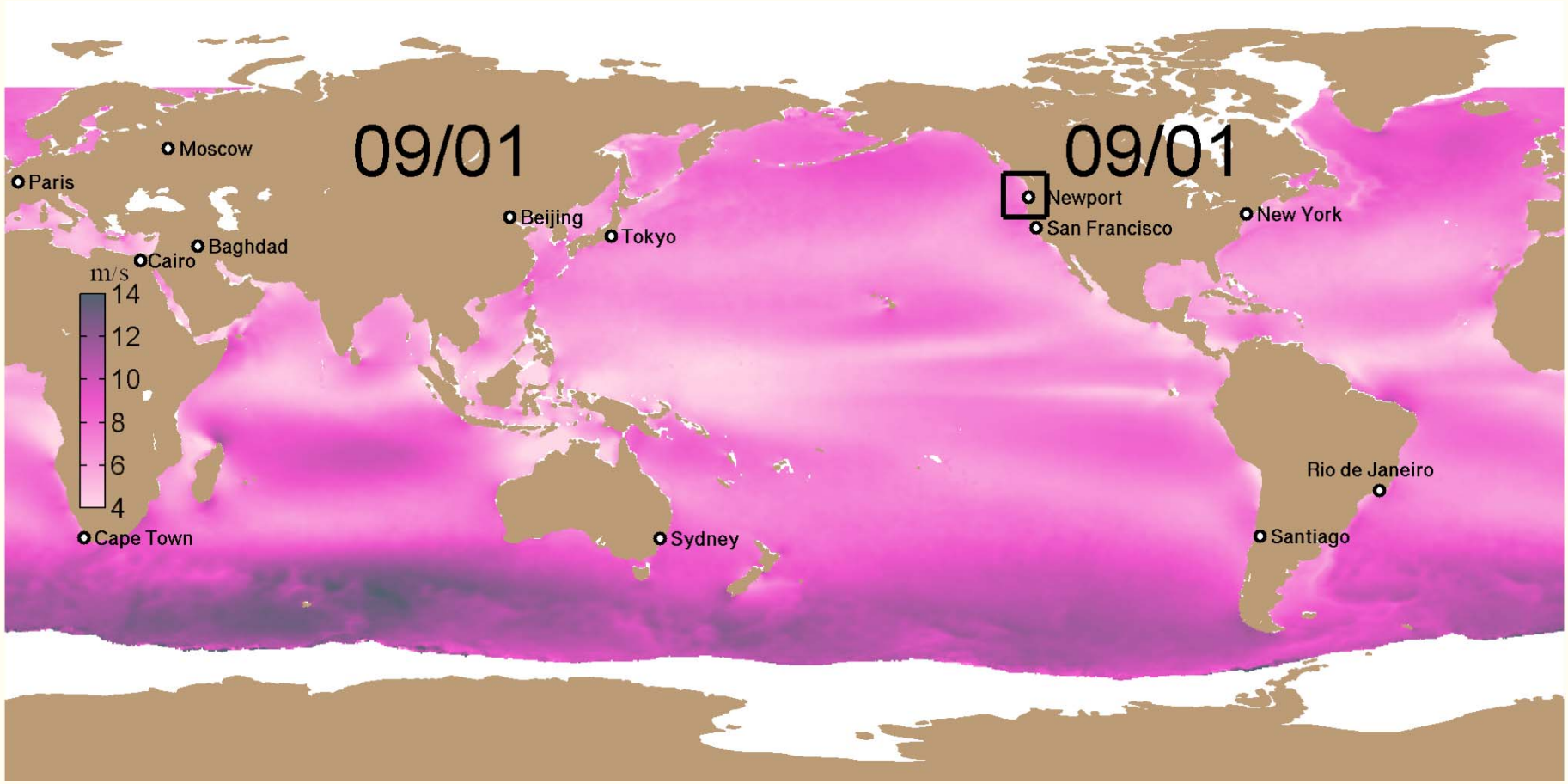


The visualization on the right makes more sense to audiences AND to scientists in interviews.

Another Chlorophyll – A Visualization



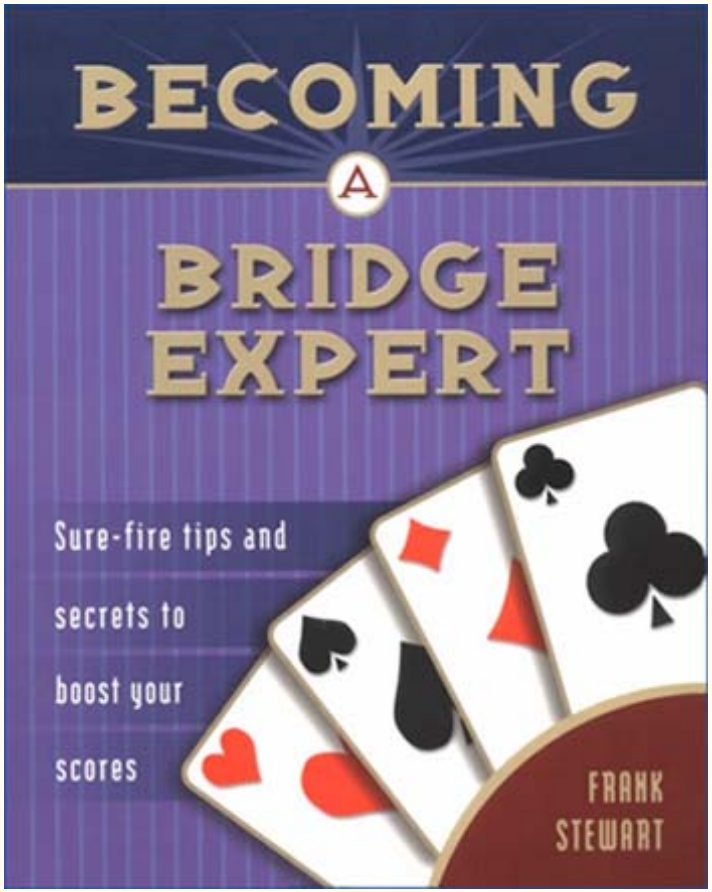
Our next hurdle is making wind speed data accessible.



We've talked about manipulating visualizations to make them more accessible to public audiences.

Now we are going to turn to ways of supporting people's interactions with visualizations so that they make meaning from them.

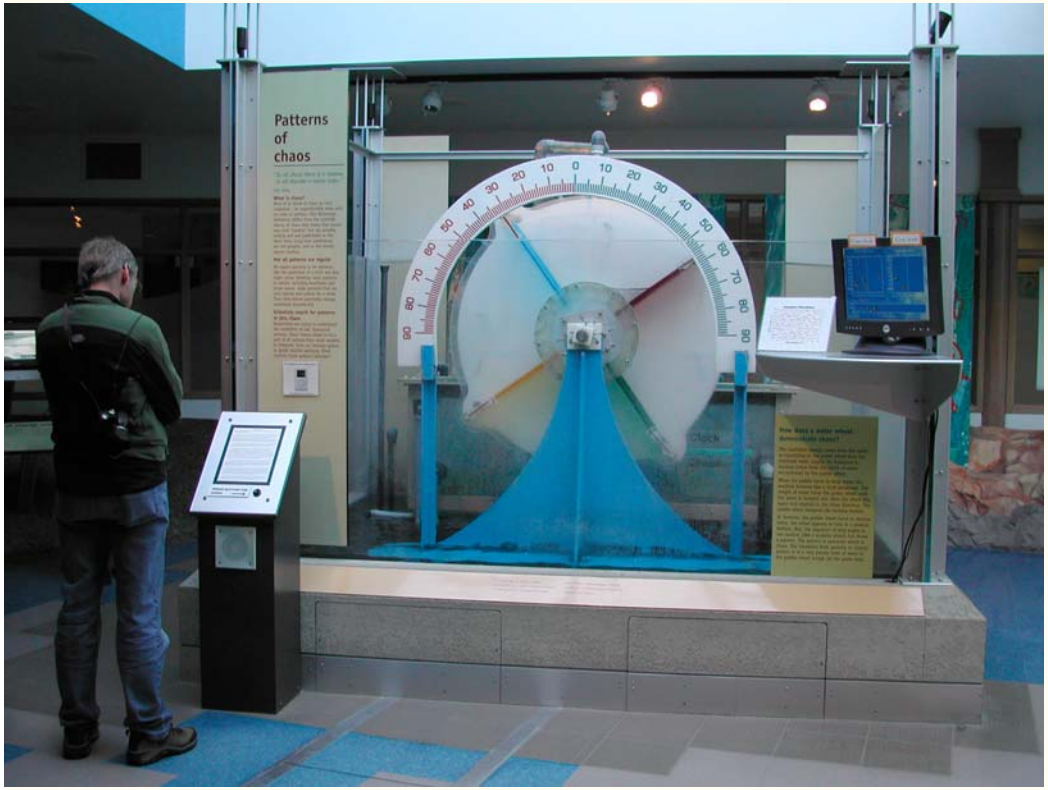
Experts use tools differently than novices do.



Experts learn to use tools by practicing with them over time.

This includes tools of thinking and communicating.

Novices need explicit directions to use visualizations like experts.



The HMSC VC Chaos Wheel

Video examples from Chaos Wheel

Videos demonstrate for audiences how to use the chaos wheel – a special kind of visualization – to understand the underlying principle. They do not explain the underlying principle itself.

Audiences who watched the videos and interacted with the exhibit were much more likely to be able to explain that scientific chaos and randomness are not the same thing than visitors who used only the exhibit or watched the videos.

Novices need explicit modeling to use visualizations.

Rhythms of our Coastal Waters on the NANOOS Website

This exhibit was designed to help audiences read and interpret graphs of salinity data.
It offers multiple entry points. The novice user can interact with graphing itself – learning how to read and construct graphs. The more expert user can go straight to making predictions and answering inquiry questions with real time data.

Assignment?!?

On the 25th, we will explore more research-based recommendations for creating and using visualizations with public audiences.

Between now and then, please try one of two things:

1) Make a new visualization (or adapt an old one) based on what we've talked about and try it out with some folks.

2) Show what you think is a good visualization to some non-experts and ask them to tell you what they see in it.

Post what you find on the web site Sage sent the link for.

Thank You

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