

Visualizing Science: Tips

Why: Visualization is a type of communication that can be used to **engage, inform, inspire** a science-savvy, but not specialized, audience.

When: Visualization can be used when images tell the story more efficiently and effectively than complicated descriptions, when the visual helps to clarify a concept, or when a direct and immediate comparison is useful. It can also be used as an engaging tool: a beautiful, eye-catching visualization is an open door to learn more about the science behind it.

How: A. Motion tips (Video, Animation) | B. Static Tips (Photography, Graphics, or Illustration)

These are just a few tips to keep in mind and in no way these are exhaustive.

A. Motion tips (Video, Animation)

Plan ahead: Taking the time to really think through your video/animation at the beginning of the process will save you a huge amount of time later. A treatment, storyboard, or outline will help you focus and figure out what you need. A simple way to make an outline is to make two columns: list the narration or main points on the right with potential corresponding visuals on the left.

Identify your message: Define exactly what your goals are, what your core message is, and what story you want to tell. Don't try to say it all. What is your big idea? What do you want the public to learn, to remember, to be intrigued about, and to potentially take action on?

Get to the point: Let us know quickly what the video is about, to keep our interest. Imagine we turned it off after 15 seconds. Would we get anything out of it? Would we know what it is about?

Compose for impact: Photography composition applies to basic video and animation composition as well: become familiar with the rule of thirds and the golden ratio (Golden Ratio vs Rule of Thirds [Video](#)). Straighten horizons, focus sharply on your main subject, and avoid cutting objects and people off at awkward positions, such as at the ankles. Once you understand the rules, play with them to surprise viewers.

Keep your audience in mind: What information or message would be most interesting to the audience you want to reach? What do they care about, what do they already know? Choose simple vocabulary and use analogies. You may need to add annotations to a visual to help a public audience understand what they are seeing.

Beware the talking head: If you have someone on camera talking about something, make sure you have lots of accompanying visuals. Use the medium—if all people need to do is listen, this could be a radio program! Reward your audience for watching. Consider breaking up longer interviews with graphics or images.

Write for broadcast: Writing for video is different than writing for print. If you are reading from a script, keep language simple and sentences short. Read it out loud before recording to see if it feels natural, flows, and makes sense. Measure your speed, you'll need to speak a little slower than in normal conversation. Give the audience time to absorb the information (or read the captions).

Keep it short: Try to keep your video to 2-3 minutes, and definitely under 5 minute. You'll get more views and keep your audience's attention. If you're producing a visualization, 30 seconds (or less) may be all you need. Sometimes less is more!

Check it : Ask someone you know outside of your field to watch the video and give you feedback!

B. Static Tips (Photography, Graphics, or Illustration)

Think it through: Taking the time to really think your image through at the beginning of the process will save you a huge amount of time later. Science happens on all scales, from macro to micro.

Identify your message: Define exactly what your goals are, what your core message is, and what story you want to tell. **Don't try to say it all.** What is your big idea? What do you want the public to learn, to remember, to be intrigued about, and want to dig deeper into?

a) Photography specific:

Photographs can show the process of science, what science helps to address, who does science, whom science serves, and, through the photographer's lens, how we feel about the world we live in. A good visual will go far. In fact, sometimes a good visual is all you need.

Compose for impact: Become familiar with the rule of thirds and the golden ratio (Golden Ratio vs Rule of Thirds [Video](#)). Straighten horizons, focus sharply on your main subject, and avoid cutting objects and people off at awkward positions, such as at the ankles. Once you understand the rules, play with them to surprise viewers.

Capture a moment: Snap a shot at the height of the action. Often candid shots, in which people in the frame are not playing to the camera, are more effective than posed or group shots. They show an authentic, unscripted moment in time.

Tell a story: Photographs are complex, conveying multiple messages in a single frame. Ask yourself what story your photograph tells.

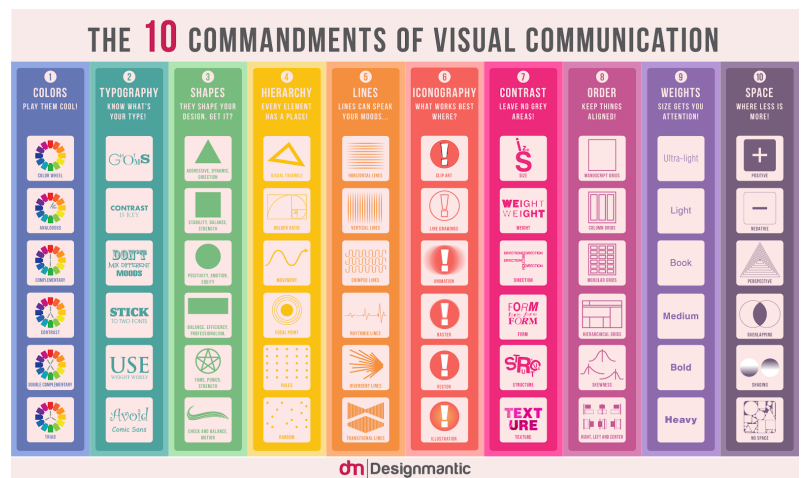
Stay true to your viewers: Use photo editing programs to enhance but not fundamentally change your image. Altering contrast and exposure, and adjusting color balance to make a scene closer to how we see it with our eyes, can enhance a photograph. Removing, moving, or otherwise altering specific elements of photographs in ways that look “real” misleads the viewer. Stay true to the scene, yourself, and the viewers.

B) Graphics or Illustration Specific

Organize your data: Start with a rough layout on a page with the title, the labels, the subheads, and some graphic to help streamline the process. If the organization is solid the design will flow better within it.

Find the right tools for your story: Depending on your need, you can use Illustrator / photoshop / inDesign or some online data visualization tools:[D3.js Data Drive Documents](#) // [CARTO](#) // [Timeline](#) // [RAW](#) // [Story Maps - ArcGIS](#) .

Use Colors wisely: Minimize the number of colors you use; play with the diversity of ranges within the same color; think about your background color and where you want the attention to go; make sure there is enough contrast to make text readable. Keep in mind the color blind audience: get some tips from this [blog post](#) and check your visual in this [color blindness simulator online tool](#).



Minimize your jargon: In a peer-to-peer situation, jargon can be used within a specific context and be very efficient. But not for a non-scientist, or someone outside your field! Your goal is to clarify your science, not dumb down the content. **Short sentences, public-friendly vocabulary, and limited use of numbers are tricks to keep in mind.** Also, consider that visual conventions common within your field may not be familiar to non-experts.

Check it : Ask someone you know outside of your field to give you feedback!

Making a geophysical visual for the broader public

A few things to keep in mind

Title

Short & Engaging

Caption

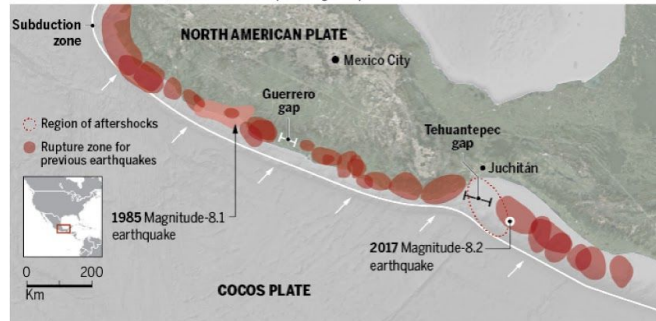
Short & Jargon free
Complementing what the visual can't say alone

Visual

Tells a story:
Where
What
When

On shaky ground

Last week's temblor may have relieved pressure in one of two "seismic gaps" in the subduction zone off Mexico's coast, where tectonic plates grind past one another.

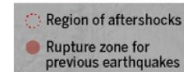


Credits: (Graphic) G. Grullón/Science; (Data) V. Kostoglodov; Mexico National Seismological Service



Color choices:

Subtle (not primary)
Limited number of color used
Use of transparency
Used to Highlight the main message



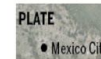
Legends:

Clear and not too many (some within the image)



Localisation:

Map instead of coordinates (If using coordinates limit the numbers)
Scale

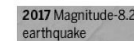


Geographical & geological references important for that story (ie: Capital, Tectonic plates)



Symbols:

Clear (not earthscience specific jargon)



Numbers:

Limited use of numbers

Identify your message:

Define exactly what your goals are, what your core message is, and what story you want to tell.

Don't try to say it all. What is your big idea?

What do you want the public to learn, to remember, to be intrigued about and want to dig deeper into?

Source of visual: <http://www.sciencemag.org/news/2017/09>
Annotation: EarthScope National Office/UNAVCO (2018)

Tools: Examples of some online data visualization tools:

[D3.js](#) [Data Drive Documents](#) // [CARTO](#) // [Timeline](#) // [RAW](#) // [Story Maps - ArcGIS](#)

Inspiration:

[Visualising Data](#) // [FlowingData](#) // [Information Aesthetics](#) // [infographics](#) | [GOOD Magazine](#) // [Brain Pickings](#) // [Tabletop Whale](#)

Counter inspiration:

[WTF Visualizations](#)