USING INFOGRAPHICS TO COMMUNICATE HAZARDS RESEARCH

Carson MacPherson-Krutsky, University of Colorado Boulder

Infographics are a useful way to tell your research story and engage your audience. Drawing from previous research and design guidelines, this check sheet is designed to assist extreme events researchers in using infographics to communicate their work. Read below to discover key considerations, useful tips, and helpful resources for turning your findings into beautiful visuals that convey key takeaways (Figure 1).

WHAT IS AN INFOGRAPHIC?

- Formed from the terms "information" and "graphic," an infographic can be simply described as something that "uses visual cues to communicate information" (Lankow, 2012, p. 20).
- Infographics can include flowcharts, graphs, maps, and many other types of visual representations of information.

WHY USE INFOGRAPHICS TO COMMUNICATE YOUR RESEARCH?

- For millennia, humans have been using visuals to communicate information–think cave paintings or hieroglyphs. This is because visuals can often convey complex information more quickly and intuitively than text and tables. When created with intention and care, infographics can be powerful tools to help people better understand research methods and findings.
- Because disaster research findings have significant real-world implications, infographics can be used to translate technical concepts into formats that are more accessible to a wider audience (Figure 2).

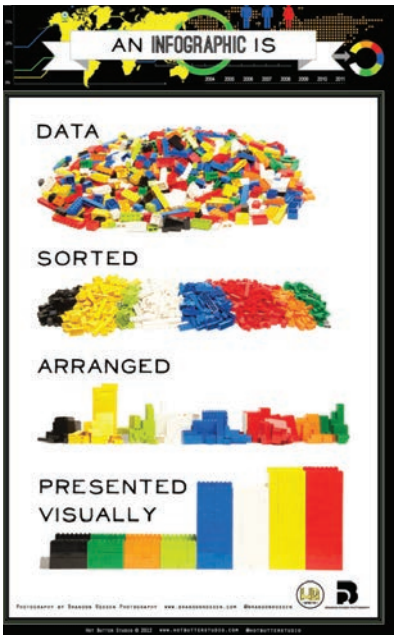

Figure 1. (Above) An infographic defining what an infographic is. (Rossen, B. (2012). *An Infographic is* [digital image]. Hot Butter Studio)

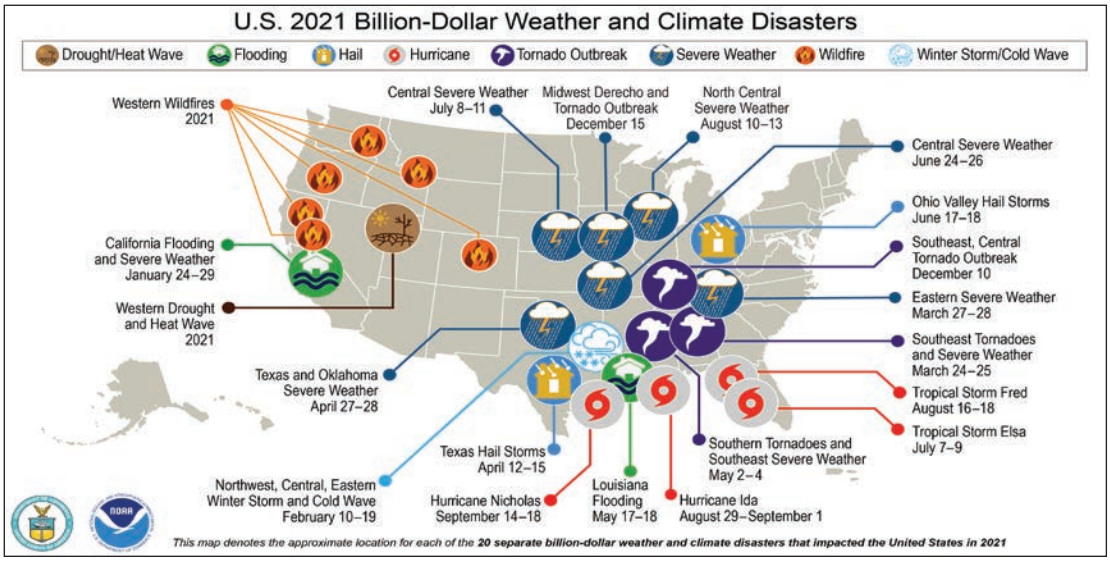

Figure 2. (Left) This infographic shows spatially the number of billion-dollar weather and climate disasters that impacted the United States in 2021. Though this information is available in a spreadsheet, seeing the location and type of disaster helps viewers spot trends for the year. Easy to interpret hazard icons are used to indicate type of disaster (NOAA National Centers for Environmental Information (NCEI) (2021). U.S. Billion-Dollar Weather and Climate Disasters. DOI: 10.25921/stkw-7w73.)

CONVERGE | Natural Hazards Center | CU Boulder
483 UCB | Boulder, CO 80309-0483 | (303) 735-5844
converge@colorado.edu | hazards.colorado.edu

QUESTIONS TO ASK YOURSELF WHEN DEVELOPING AN INFOGRAPHIC

Not all infographics are created equal. To ensure you make an infographic that provides relevant, helpful, and compelling information, review the following key questions:

- ***Who is your target audience?***

  The first step in successful communication is to know your audience. What will they pay attention to? What will they understand? How will they access this information? Identifying your target audience will help you make decisions about the format and what content is appropriate. Considerations may include reading level, jargon, imagery, measurement units, colors, and other factors.

- ***What are one to two key messages or results you want to convey in your infographic?***

  Trying to include too much information in one graphic can lead to confusion. It may be helpful to write down a couple of sentences that capture your takeaway(s) and refer to them as you are developing the infographic. To do this, start by asking yourself, "why do I care about this information and why might others?" Adding a clear and catchy title is another way to cue your viewers into what your infographic is all about.

- ***What is the optimal amount of information needed to get your message(s) across?***

  "Make every mark count" - Dennis Kuronen, as cited in Katz, 2012, p. 43

  Keeping your infographic streamlined and simple can help ensure that your audience walks away with the right takeaway(s) and isn't overwhelmed with the information presented. When adding a new piece of information or design element, ask yourself, "does this help to explain the key message(s)?" If not, do not include it. For example, gridlines on graphs are often unnecessary and add excess ink to a figure; data labels can offer a cleaner alternative (Wong, 2013).

- ***How should I organize the information and content in my infographic?***

  Well-designed infographics have a logical flow of information with the highest priority content typically placed so it is the first thing people see (e.g., title) and supporting information being the last (e.g., data source, technical notes, citation). This is called visual hierarchy and is an important concept in any design (See Figures 4, 5, and 6). Visual hierarchy can be achieved through use of color, size, location, and shape. Using numbers or arrows can be a good way to help indicate information flow. The balance of information types is also something to consider. Is your graphic too text heavy? Is it primarily images? How can you include the right amount of text and images to get your key message(s) across?

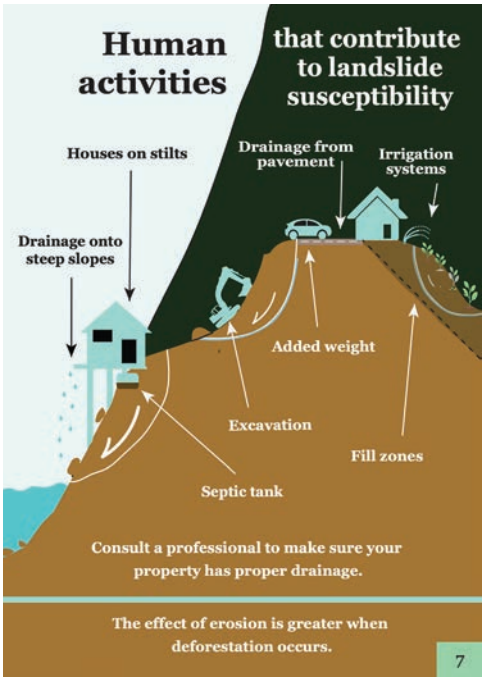

Figure 3. A title in large font quickly cues the reader to the content of this graphic. Labels in smaller fonts and arrows provide additional insights. Limited and contrasting colors help the viewer quickly identify different components of the image. (Natural Hazards Center, U.S. Geological Survey, and the University of Puerto Rico (2020). *Landslide Guide for Puerto Rico [Guidebook]*)

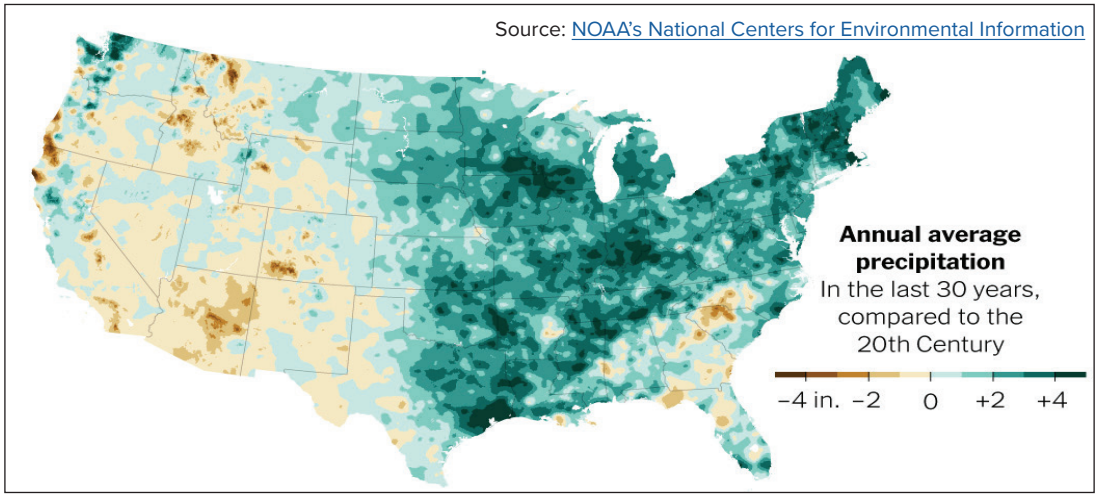

Figure 4. The infographic to the left uses spatial data to demonstrate precipitation differences across the United States. They use a bolded font and a legend to clearly communicate the information presented. A diverging color scheme helps to differentiate areas that have less precipitation (in tans) and areas that have more (in greens). (New York Times. (2021). *Change in annual average precipitation, in inches* [digital image]. The New York Times Newspaper)

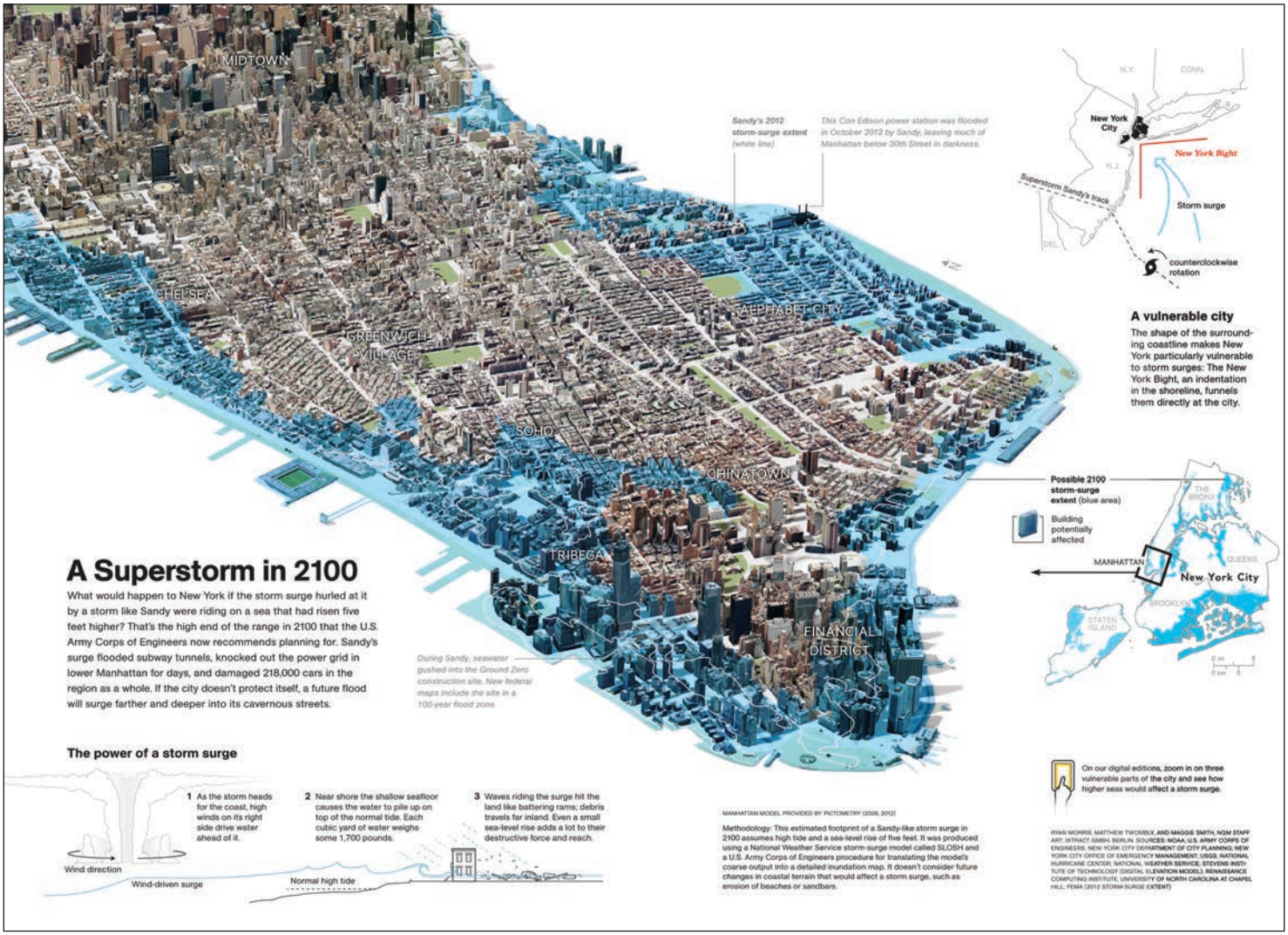

Figure 5. National Geographic Magazine has been publishing highly impactful infographics for decades. This one overlays a modeled storm surge level for the year 2100 over the topography of New York City. In addition to the main image, supporting facts and notes are provided around the edges of the infographic. Labels and inset maps are used to help viewers with context. Notice the use of font size, color, labels, and balance of information types. It clearly communicates that a significant portion of the city could be inundated with water. (Morris, R., Twombly, M., & Smith, M. (2013). *A Superstorm in 2100* [digital image]. National Geographic Magazine)

- ***How can I ensure my infographic accurately represents the data and information included?***

  Books have been written about how infographics can and have been used to mislead viewers (Cairo, 2019; Huff, 2010). For example, tilted pie charts can distort figures and make them difficult to interpret and truncated graph axes can skew data point relationships. As researchers, it is critical to be as transparent and clear as possible about what the data represent and display them accurately. Make sure you include all relevant information to adequately interpret the data as well as original data sources and contact information in case viewers have questions.

- ***Which colors are most effective?***

  Color choice is a critical step in the infographic design process. Colors can help draw attention to specific aspects, invoke emotions, indicate the flow of information, and so much more. Best practices in design recommend selecting the fewest colors possible to get your message across, ensuring that they are easy to differentiate (see Figure 5, above, which uses blue for water and keeps other colors muted), and choosing colors that are accessible and culturally appropriate (see section below for additional notes on color choice).

- ***How can I make my infographic accessible and culturally relevant?***

  Accessibility is important for any communication activity. Did you know 1 in 12 (8%) men are colorblind? To make sure your infographic is accessible, use color schemes that are colorblind-friendly and add detailed alternative

text to describe the infographic and the main takeaway(s). In addition, think about cultural diversity when preparing your infographic. For example, Western cultures read information left to right and top to bottom, but this is not true of all cultures and therefore may shape how you lay out the content of your graphic.

MOVING FORWARD

If you have information to share and specific answers to the questions above, congratulations! You are on your way to creating a great infographic. Once you have made your graphic, ask a couple of trusted friends or colleagues to review it and provide feedback. Can they identify the main key takeaway(s) you intended? Was it easy to interpret the information? Getting input can be a great way to test your assumptions and make sure you have succeeded in developing a well-crafted and helpful infographic. Many tools exist to help you create infographics, choose great colors, and learn more about effective research communication. See resources below to dive deeper and start creating!

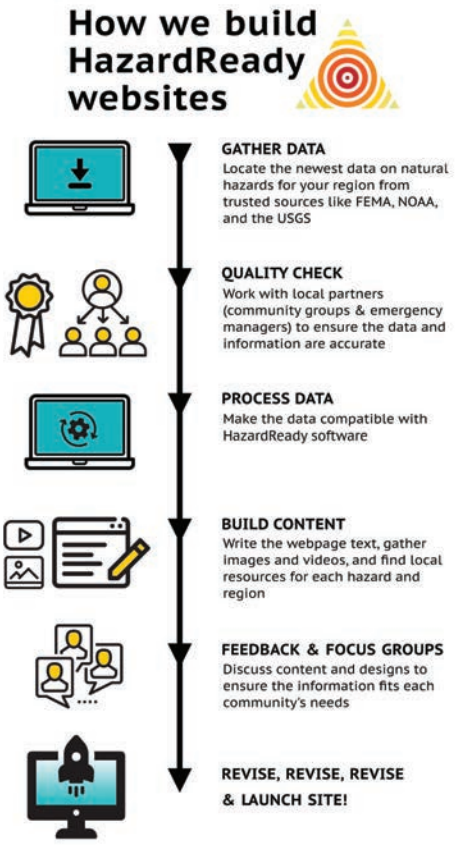

Figure 6. A flow chart showing a process for developing a hazard information website. This infographic uses limited and contrasting colors, icons, arrows, and headings to guide viewers through the content (MacPherson-Krutsky, C. (2019). *How we Build HazardReady websites* [digital image]. Hazard Ready, LLC.)

RESOURCES TO GET STARTED AND LEARN MORE

Online Tools for Creating Infographics:

- **Canva**: https://www.canva.com/search/templates?q=infographic - A web tool for making visual graphics (e.g., flowcharts or information panels). It has options to import premade graphs, but you cannot add data to the website. Best for flowcharts or diagrams.
- **Easelly**: https://www.easel.ly/home - A web tool for making infographics. The app includes templates and options for importing data. Free and low-cost student options are available.
- **Piktochart**: https://piktochart.com/ - A web tool for making infographics. The app includes templates and options for importing data. Free and low-cost student options are available.

Color and Content Help:

- **ColorBrewer:** https://colorbrewer2.org/#type=sequential&scheme=-BuGn&n=3 - A helpful website for picking colors for spatial information. It includes options for selecting colorblind-friendly color schemes.
- **iWantHue Color Scheme Generator:** https://medialab.github.io/iwanthue/- A color scheme generator with colorblind accessibility options.
- **How to Pick More Beautiful Colors for Your Data Visualizations:** https://blog.datawrapper.de/beautifulcolors/ - A blog from a data visualization expert that takes a deep dive on how to select colors for data visualizations.
- **Hemingway Editor:** https://hemingwayapp.com/ - A tool to check reading level and content flow.

Accessibility Resources:

- **Web Accessibility in Mind:** https://webaim.org/resources/designers/#infographic - A website with tips for how to make information and graphics accessible.
  - See guidance for writing good alternative text for images: https://webaim.org/techniques/alttext/
- **Universal Design:** https://universaldesign.ie/what-is-universal-design/the-7-principles/- Universal Design aims to make information accessible to as many people as possible. This website is a resource to learn more about key principles and how to achieve them.
- **Universal Design Center:** https://www.csun.edu/universal-design-center/accessible-infographics-and-flyers-checklist - A checklist to see if your flyer or infographic meets accessibility standards and best practices.
- **Coblis - Color Blindness Simulator:** https://www.color-blindness.com/coblis-color-blindness-simulator - Upload your infographic to see how people with different types of color blindness will see it.

Examples of Inspiring Infographics:

- ***New York Times* Graphics:** https://www.nytimes.com/spotlight/graphics - Creators at the *New York Times* are experts at infographics. Take a look at their examples to get inspiration.
- **Information is Beautiful:** https://informationisbeautiful.net/ - A website showing examples of diverse types of infographics.

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CONVERGE | **Natural Hazards Center** | **CU Boulder**
483 UCB | Boulder, CO 80309-0483 | (303) 735-5844
converge@colorado.edu | hazards.colorado.edu