[CV-04-033] Narrative and Storytelling

Abstract

Maps are powerful storytellers. Maps have a long history combining spatial relations with cartographic language to locate, analyze, ground, and express stories told across time and space. Today, “story maps” are increasingly visible in cartography, GIScience, digital humanities, data visualization, and journalism due to the volume of available data and increasingly accessible mapping tools. Perhaps, most importantly, maps present world views and much larger (often hidden) stories or “meta-narratives.” These underlying stories often emerge from dominant perspectives that are deeply informed by power structures like racism, patriarchy, ableism, etc. and further generate uneven geographies. Attention to power in narrative and storytelling reveals and gives voice to alternative storylines and perspectives that can be woven together across time and space. In this entry, I introduce multiple conceptualizations of maps and stories from cartography and data journalism to feminist mapping, Black geographies, and decolonial mapping to illustrate the power of narrative and storytelling in mapping. I argue that understanding the power of narrative and storytelling in mapping is an essential skillset for students and professionals alike.

Keywords: historical GIS, history, humanities, mapping stories, narrative mapping, power, situated knowledge, visual storytelling

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Explanation

1. Definitions
2. Overview
3. Defining Story and Narrative
4. Narrative and Storytelling in Cartography
5. Maps and Stories in Data Journalism
6. Power and Privilege in Mapping Stories
7. Where to Begin?

1. Definitions

discourse: the “how” or strategies of expression that may include but are not limited to written or graphical language (Pearce 2008; Chatman 1978)

narrative: the combination of story and discourse (Pearce 2008; Chatman 1978)

narrative map: the presentation and structure of spatial storied elements expressed with cartographic language that shape interpretation and meaning (Pearce 2008; Roth 2020)

power: maps, stories and storytellers are embedded within systems of power, defined by Black feminist scholars as interlocking or intersecting systems of power like racism, patriarchy, and ableism (Combahee River Collective 1979; Collins 1991).

situated knowledge: in terms of storytelling and visualization, situated knowledge acknowledges that all stories and data come from somewhere and no single story or dataset tells all (Haraway 1980; D'Ignazio and Klein 2020).

story: the content or the "who, what, when, and where" of an account or representation (Pearce 2008; Chatman 1978)

story map: defined in a variety of ways, story maps have been defined by Caquard (2011) as reference maps that locate people, places, and events, and, more colloquially by Roth (2020), as interactive multi-media displays that rely on maps (both static and dynamic) in combination with graphs, video, photos, and texts and the ability for viewers to linearly scroll through the story.

2. Overview

Maps and stories go hand in hand. In the simplest conceptualization, maps can be descriptive locating people, places, and events, and can be used in reference to written or multimedia stories. Maps also can tell stories through their analytical capacities, illustrating patterns, trends, and relationships between datasets and their geographies. They are dynamic, showing flows of people or sequences of events over time and space. Maps are imaginative, creating fictional and fantastical geographies of other possible worlds. Their design and aesthetic generate emotive responses and levels of trust that cannot be ignored. Finally, despite contemporary debate (Denil 2017), maps are powerful storytellers. They present world views and much larger (often hidden) stories that shape perceptions of space. These underlying stories often emerge from dominant perspectives that are deeply informed by power structures like racism, patriarchy, ableism, etc. and further generate uneven geographies. Given this power, maps also conceal just as much as they reveal, typically sticking to a single dominant storyline. Importantly, maps can, in fact, center power relations and give voice to stories that have been made invisible. Maps can be situated and multidimensional, weaving multiple stories and perspectives across space as a means to challenge power structures.

Harnessing these powers, maps, storytelling, and buzz words like "story maps" are increasingly visible in cartography, GIScience, digital humanities, data visualization, and journalism. The rise of storytelling in data journalism, for example, has led to the use of maps and data visualization as a means to extract complex information into more relatable and legible online stories. Following suit, online mapping platforms like Esri Story Maps, the Knight Lab StoryMap, and Google My Maps in addition to open-source tools have emerged allowing users to locate, embed, and share personal stories in interactive, multimedia maps. These tools have made mapping, particularly "story mapping," more accessible than ever to everyday mapmakers or at least to anyone privileged with resources and Internet access (see **Collaborative Cartography**). Stories and storytelling tools are everywhere in mapping. Yet, they are not new concepts. Maps have a long history of expressing spatial stories with cartographic language requiring meaningful engagement.

In this entry, I introduce multiple conceptualizations of maps, narrative, and stories from cartography and data journalism to feminist mapping, Black geographies, and decolonial mapping to reveal the power of mapped stories. I begin by unpacking two key terms—story and narrative—and conclude by stressing the importance of power in storytelling and narrative for both students and professionals supporting more equitable, contemporary mapmaking practice.

3. Defining Story and Narrative

Story and narrative are transdisciplinary terms that move across various fields (e.g., humanities, social sciences, sciences) beyond cartography. Geography, often home to GIScience and cartography, has routinely turned to stories to examine the production of power and, more recently, as modes of alternative knowledge production (Moore 2017; Bley et al. 2021). Stories and narratives span written, auditory, tactile, and visual forms (Chatman 1978). Both, story and narrative, are highly relevant to cartography and have rich histories (Pearce 2008; Caquard 2013 and 2015; Knowles et al. 2015). Yet, the two terms are commonly conflated with one another.

Denil (2017, 6) draws on the Compact Edition of the Oxford English Dictionary to define **story** as “an allegation; a statement; and account or representation of a matter; a particular person’s representation of the facts in a case.” Stories are authored from a particular perspective and whether they are represented by text, dialog, or visual variables (see **Symbolization & the Visual Variables**), stories represent content. More simply stated, story is structured content or storied elements that answer questions like who, what, when, and where (Segel and Heer 2010). Chatman (1978) defines these story elements as attributes consisting of characters, setting, actions, and happenings. In this role, the map serves as a container or diorama combining characters and events in particular places.

Chatman (1978, 19) defines **narrative** as the combination of story and discourse. If story is the content (e.g., who, what, when, where), **discourse** is the “how” or ways a story is represented and shared. Discourse transforms maps and stories into visual expressions by presenting them in particular ways. Discourse elevates and shapes stories through place-based techniques among others (MacFarlane 2007; Pearce 2008). Narrative is not static as it is transformed through each design iteration, encounter, and retelling (Pearce 2008 and 2014; see **Cartography and Art**).

4. Narrative and Storytelling in Cartography

Maps embrace the spatial and temporal dimensions of stories, geolocating people, places, and events in time and space (Caquard 2011). Mapped stories like those found in news articles often provide geographic context serving as supplements to a given story by pinpointing key events in time and space. They also can show dynamism, change, or flows within a story using both static and interactive techniques (see **Spatiotemporal Representation**). In other cases, the map comes before the story by creating imaginative geographies and serving as an organizational device for works like Tolkien’s The Lord of the Rings.

As mentioned above, narrative expresses storied elements in particular ways. Maps rely on cartographic language or visual variables to encode meaning and relationships into graphic elements (MacEachren 1995; see **Cartography and Science** and **Symbolization & the Visual Variables**). Maps are powerful modes of communicating information and storied elements because of their expressive capabilities. As such, **narrative maps** can be defined as the presentation and structure of spatial storied elements expressed with cartographic language that shape interpretation and meaning (Pearce 2008; Roth 2020). Here, I outline a variety of techniques have been utilized by cartographers to embed stories and generate visual narratives.

Figure 1 presents a reference map of Wisconsin where the visual variable of color (red) is used to highlight “Tribal Lands and Communities” in the state of Wisconsin. The visual variables “shape” and “size” are used to symbolize and differentiate three city types. As part of cartographic language, visual variables shape meaning and create visual hierarchies (i.e., where to look first, second, third) that draw the reader in and across the medium. Maps like Figure 1 also carry meta-narratives. In this case, the current tribal lands in Wisconsin are visually brought to the foreground to highlight datasets and people that are too often erased from Wisconsin’s history. A critical lens further exposes the power of white settler colonialists and their ability to carve up Indigenous territory across the state and the world. For instance, the inset of Figure 1 illustrates varying governmental strategies of extraction and control through boundary drawing impacting the peoples of the St. Croix Ojibwe and Lac Courte Oreilles Ojibwe Reservations.



Figure 1. In this example, the visual variable of color (red) is used to highlight “Tribal Lands and Communities” in the state of Wisconsin, communities that are frequently erased from state maps. Further, the inset map demonstrates governmental strategies for carving up and controlling Indigenous lands and peoples. Source: Meghan Kelly and Tanya Buckingham Andersen in the UW–Madison Cartography Lab.

In addition to being used as thematic and reference maps like Figure 1, maps have also been explored as primary modes of storytelling much like film, literature, and art (Caquard,

2014). Maps have the capacity to spark the imagination, ground narratives in place, and express lived experiences pushing the bounds of conventional mapmaking practice (Pearce 2008; Knowles et al. 2015). Feminist interventions in GIS have also validated the importance of qualitative data including the use of stories in mapping (Kwan 2002; Cope and Elwood 2009). In Borders: An Atlas of Syrian Border Crossings, Kelly (2019) uses visual variables—line weights and line arrangements—to express varying experiences of border crossings, both geopolitical borders and informal, everyday borders. For example, lines increase in thickness as experiences intensify and shift from solid lines to gapped lines as the porosity of borders change (Figure 3). Further, each line is labeled based on an individual's experience of that particular border. Individual stories are presented one page at a time and summarized stories (Figure 4) are presented in small multiple displays to illustrate shared and dissimilar border experiences. Following Pearce (2014), the viewer then assembles and interprets each map or page in the atlas illuminating an ongoing, evolving narratives. See Pearce (2008 and 2014) and Westerveld and Knowles (2018) for exemplars of narrative mapping.

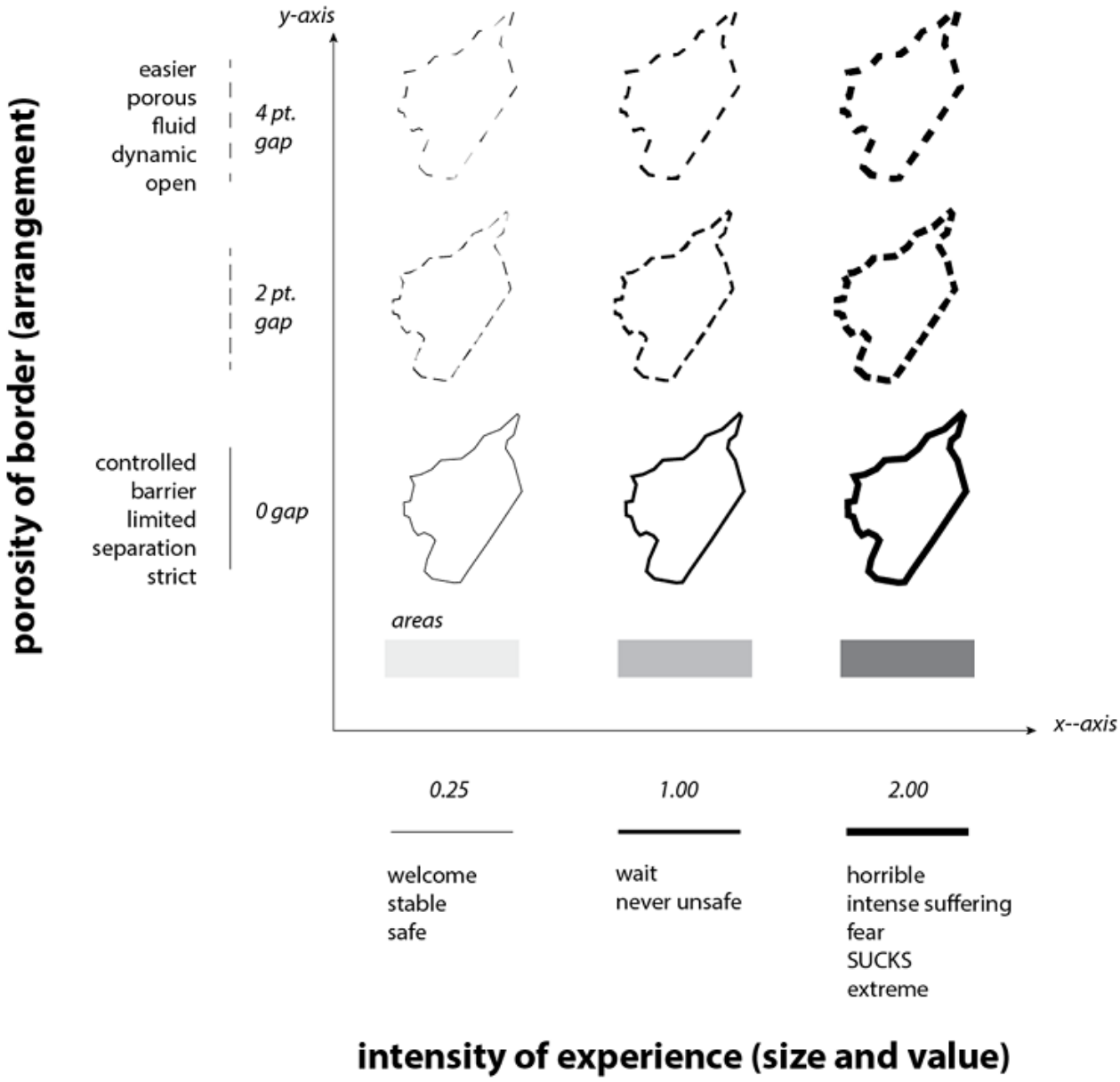


Figure 2: The map key from Borders: An Atlas of Syrian Border Stories (Kelly 2019) illustrates narrative mapping techniques that encode layers of meaning into border symbols using visual variables like size, value, and arrangement. For example, lines increase in thickness as experiences intensify and shift from solid lines to gapped lines as the porosity of borders change. Source: author.

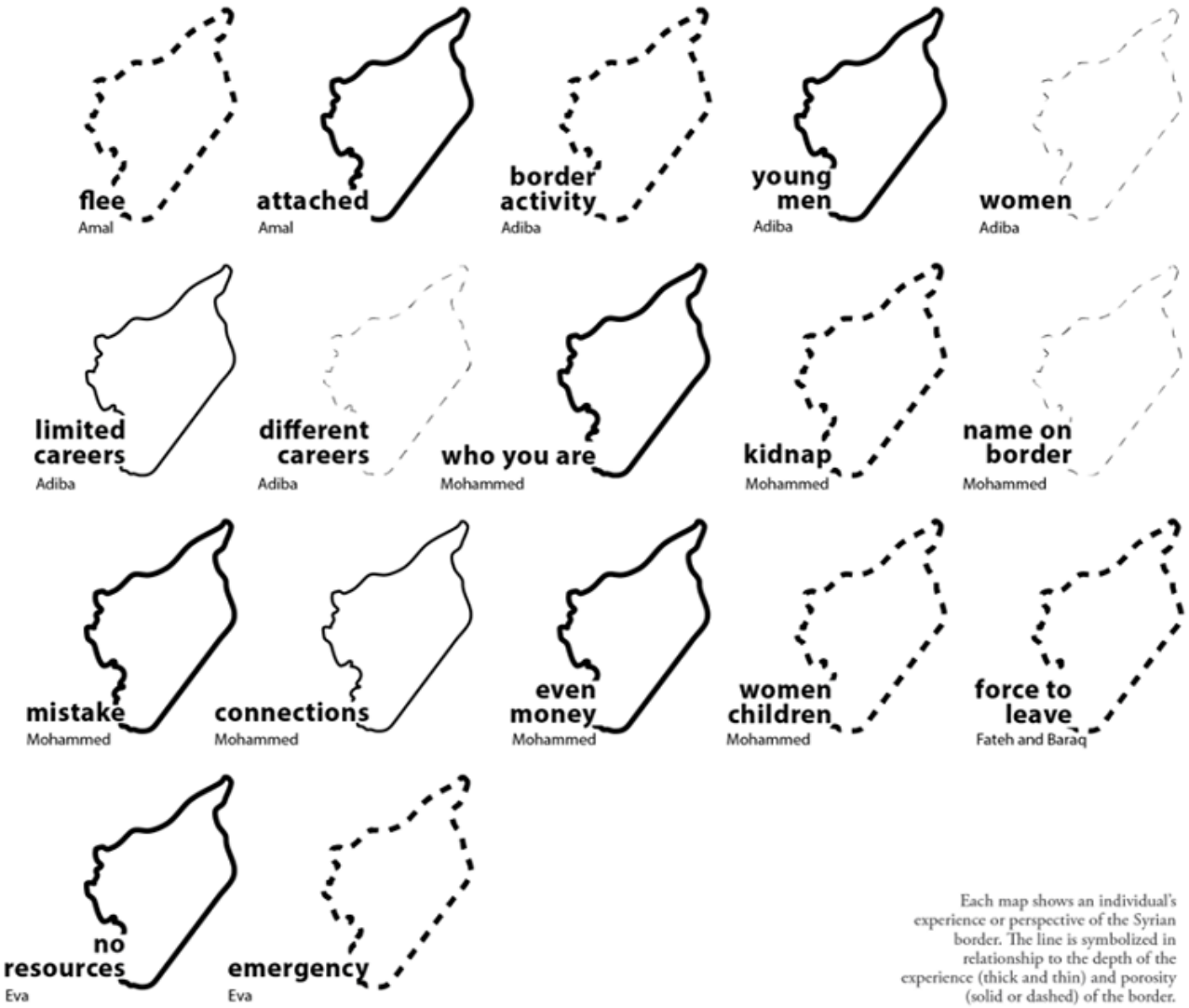


Figure 3: This small multiples map from Borders: An Atlas of Syrian Border Crossings (Kelly 2019) applies narrative mapping techniques outlined in Figure 3 to seventeen experiences with the Syrian border illustrating shared and dissimilar experiences of the Syrian border. Each border label provides a snapshot of an individuals' border experience. Source: author.

5. Maps and Stories in Data Journalism

Data journalists and popular media sources like the New York Times, BBC, and Washington Post (among others) have taken up visual storytelling as a primary mode of communicating news media. Changes and advancements in online mapping tools and platforms that rely on open and proprietary data portals have drastically increased everyday exposure to data-driven visual stories through online media (Cairo 2017). Additionally, data is being produced at unprecedented levels. Visual representations like maps provide a succinct and easily digestible ways to consume information quickly (Gershon and Page 2001). Because of these factors, maps are more prominent, accessible, relevant, and influential than ever (Cairo 2017). Despite their importance in data journalism, Wallace (2016) reminds us that

maps are just one tool within the data journalism toolkit. While their presence has increased, maps are not siloed storytellers (i.e., they do not “work” in isolation). They are frequently used in tandem with data visualizations, photos, videos, and text producing multimedia visual stories that express varying stories in ever-evolving ways (Cairo 2017; see Table 1 for examples).

Visual storytelling can be defined as “communicating a sequence of events related to the experience of characters as a way to document or explain” through graphics instead of, or, in addition, to language (Roth 2021). Online visual stories in data journalism incorporate a range of multimedia, including text, photos, videos, audio, charts, graphs, infographics, and of importance here, maps (both static and interactive). Visual storytelling in data journalism, for example, collate and visualize these media in a variety of ways. Segel and Heer (2010) frame these story structures as genres and identify recurring strategies of implementation. Roth (2021) adapts and expands these genres to mapping contexts and further outlines map design strategies that embrace visual storytelling techniques (see Roth 2021 on design tropes). Below and in Table 1, I highlight three of Roth’s (2021) genres that are increasingly relevant to data journalism today.

Table 1. Description of Three Visual Storytelling Genres Adapted to Cartography by Roth (2020) from Segel and Heer (2010).

Genres	Descriptions (Roth 2021)	Examples
Static visual story	Static visual stories rely on conventional news maps that supplement journalistic reporting. These maps often provide spatial reference or support reporting with data-driven analysis. Much like the addition of photos, news maps provide visual interruptions in the body of text-based stories.	• “Climate Change Turns the Tide on Waterfront Living” (Morrison 2020); https://www.washingtonpost.com/magazine/2020/04/13/after-decades-waterfront-living-climate-change-is-forcing-communities-plan-their-retreat-coasts/ • “Spring is Springing Earlier and Earlier” (Tierney 2018); https://www.washingtonpost.com/graphics/2018/national/early-spring/
Longform infographic 	Longform infographics rely on underlying maps as the primary mode of visual storytelling. Most suited for online and mobile environments, readers vertically scroll through the map to understand the story. Resembling traditional strip maps, longform infographics constrain the reader to a particular map extent and scale to guide the reader through a story and landscape.	• “Travel the Path of the Solar Eclipse” (Karklis, Meko, Emamdjomeh, Lu, Berkowitz 2017); https://www.washingtonpost.com/graphics/national/mapping-the-2017-eclipse/ • “A Rogue State Along Two Rivers” (Ashkenas, Tse, Watkins, and Yourish 2014); https://www.nytimes.com/interactive/2014/07/03/world/middleeast/syria-iraq-isis-rogue-state-along-two-rivers.html • “Borderline: Navigating the invisible boundary and physical barriers that define the U.S.-Mexico border” (Karklis, Gerhart, Fox, Emamdjomeh, School 2018); https://www.washingtonpost.com/graphics/2018/national/us-mexico-border-flyover/

Genres	Descriptions (Roth 2021)	Examples
Multimedia visual experience 	Multimedia visual experiences combines maps, both static and dynamic, with photos, graphics, audio, and video to create a multifaceted storytelling experience. This genre relies on web-technologies and the readers ability to scroll and pace themselves through the story. "Snowfall" is often considered the first multimedia visual experience in the news. This genre has become increasingly utilized as web-technologies and templates become more accessible.	• "Snowfall: The Avalanche at Tunnel Creek" (Branch 2012); https://www.nytimes.com/projects/2012/snow-fall/index.html#/?part=tunnel-creek • "What the Tulsa Race Massacre Destroyed" (Parshina-Kottas, Singhvi, Burch, Griggs, Gröndahl, Huang, Wallace, White, and Williams" 2021); https://www.nytimes.com/interactive/2021/05/24/us/tulsa-race-massacre.html • "Devoured: How China's largest freshwater lake was decimated by sand mining" (Scarr and Sharma 2021); https://graphics.reuters.com/GLOBAL-ENVIRONMENT/SAND-POYANG/qzjpqxxabvx/

Static visual stories utilize news maps to supplement text-based journalistic reporting. Similar to the use of photos in reporting, static news maps are partitioned from the text of a news article. They rely on cartographic design principles and often introduce the story's setting with references maps (like Figure 1). Additionally, static news maps also can analytically support a given story by providing data-driven analysis. The prevalence of data in the twenty-first century given its volume, velocity, and variety (i.e., key characteristics of big data) has introduced new challenges as well as opportunities for mapping and storytelling. Collecting, distilling, and communicating complex, multivariate information is a transdisciplinary and universal challenge faced in the information age. These challenges are further exasperated by questions of privacy, aggregation, classification, and erasure. Yet, big data and data analysis, more broadly, provide another avenue for storytelling in cartography (see Straumann et al. 2014; see **Big Data Visualization**). Such stories task mapmakers to extract key messages and contextual information in meaningful ways. Figure 4, for example, combines sea level rise projections shaded in blue with present-day flood loss areas in purple in Norfolk, Virginia. Together, these two datasets illustrate the current and future impacts of climate change and flooding on coastal communities. As introduced above and expanded upon below, data and even big data are not neutral and can never provide objective stories. Analytics or data-driven mapped stories provide just one storyline amongst broader narratives.

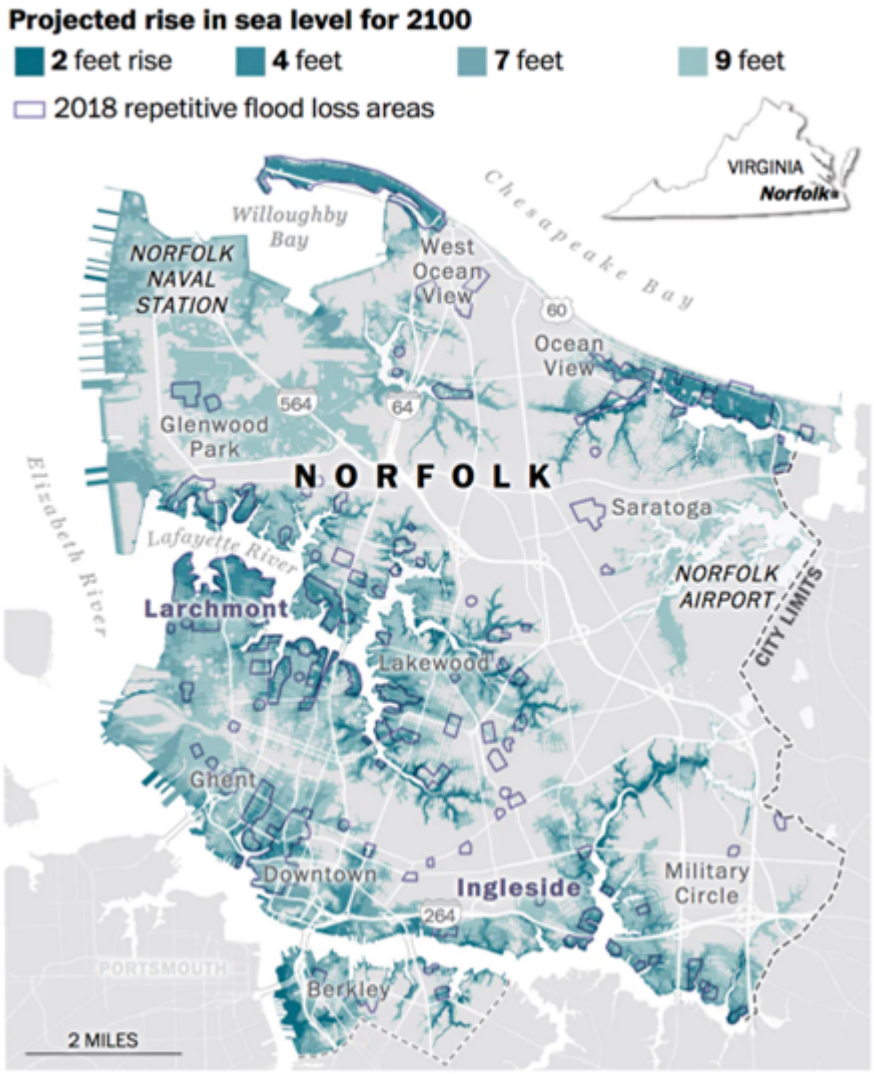


Figure 4: This map takes a data-driven story approach to convey the current and future impacts of climate change on coast communities. This map combines sea level rise projects shaded in blue with repetitive flood loss areas outlined in purple in Norfolk, Virginia. Source: author.

Unlike static news maps, **longform infographics** rely on underlying maps as the primary mode of visual storytelling. Longform infographics are particularly useful for online and mobile viewing where readers scroll through the news story by scrolling through a landscape. The Washington Post, for example, harnessed a longform news map to following the path of the 2017 solar eclipse as it crossed the continental United States. In “A Rogue State Along Two Rivers,” The New York Times similarly used this genre to trace ISIS control along the Euphrates and Tigris rivers. While relatively new to online visual storytelling, the longform news map draws inspiration from static strip maps that reproject and reorient particular geographies to linearly guide readers’ eyes through particular geography. When used in print or online environments, this genre constrains the reader to a particular map extent and scale to guide the reader through a story and landscape.

Multimedia visual experiences bring maps, both static and interactive, together with “images, graphics, audio, and video [to] accompany and amplify a central textual

narrative." Multimedia visual experiences rely on web-technologies and vertical scrolling through the display. As the reader scrolls, storied elements are triggered providing a multimedia visual experience the blurs qualitative and quantitative approaches to storytelling. This genre does not rely solely on maps. Instead, maps become one of many elements within the overarching story. "Snowfall" (Branch 2012) is often considered the first multimedia visual experience in the news that relied on time consuming custom web development. This genre has become increasingly utilized as web-technologies and templates become more accessible. For example, platforms like ESRI StoryMap and Knight Lab along with open-source technologies have become increasingly accessible to journalists and everyday mapmakers. Because of this, multimedia visual experiences are a dominant genre in data journalism. Yet, we know little about their impacts (e.g., how multimedia visual experiences impact geo-literacy and story comprehension).

Maps and visual storytelling are increasingly relevant to data journalism. Stories become more relatable and connect readers and viewers through mapping. As such, it is important to understand the role of the maps and new forms or genres of storytelling. By examining the role of maps in visual storytelling in the news, journalists and mapmakers alike uncover new possibilities for narrative and storytelling that are only strengthened by considering the power and privilege of their making.

6. Power and Privilege in Mapping Stories

Maps are powerful storytellers (see **Cartography & Power**). They present world views that are more or less obvious. Even the most ubiquitous maps that are seemingly "objective," carry hidden agendas or meta-narratives and conceal marginalized stories in favor of stories from dominant positions of power (see discussion of Figure 1). Importantly, all mapping practices, no matter their criticality, are imbued within power structures. Yet, mapping practices grounded in feminist, Black, and decolonial thought (among other arenas) offer narrative and storytelling techniques that challenge such deeply rooted power structures and inspire more equitable, alternative possibilities. Here and in Table 2, I share two concepts that are instrumental to mapping stories: situated knowledge and power.

Situated knowledge recognizes that all knowledge is partial and uncertain (Haraway 1988; Collins 1991). In terms of storytelling, situated knowledge acknowledges that stories like spatial data come from someone somewhere and no single story or dataset tells all (D'Ignazio and Klein 2020). Further, situated knowledges are shaped by intersecting systems of privilege and oppression (Combahee River Collective 1979; Collins 1991). Maps, stories, and their makers are embedded within such systems of **power** that simultaneously and differentially privilege some while oppressing others. In mapping and storytelling, this manifests as mapped stories that emerge from dominant positions of power that exclude the perspectives from those that have actively pushed to the margins. Importantly, maps can, in fact, center power relations and give voice to stories that have been made invisible. Maps can be situated and multidimensional, weaving multiple stories and perspectives across space. As such, much can be learned on mapping stories from feminist, Black geographies, and decolonial mapping perspectives as they provide alternative mapping possibilities that build more just worlds (Costanza-Shock 2020; Kelly 2021).

Table 2. Descriptions and Examples of Key Terms Related to Power and Privilege in Mapping Stories.

Term	Descriptions	Examples
Situated Knowledge	Top-down perspectives common is most maps along with the prevalence "big" data present maps as objective or universal facts. In reality, maps offer partial perspectives generated by a series of decisions related to data collection, map design decisions, and processes from which they are derived. Situated knowledge recognizes this partiality or uncertainty acknowledging that all knowledge is situated meaning that it comes from someone somewhere (Haraway 1988; Collins 2009). Mapmakers must recognize their own situatedness and the power structures that shape their positions (more on power below) as these position directly inform their work.	• Mapping Black Futures https://mbf.blackfuturesnow.to/ • Queering the Map https://www.queeringthemap.com/ • Coming Home https://umaine.edu/canam/publications/coming-home-map/ • A Design Challenge for Transforming Justice https://www.tandfonline.com/doi/full/10.1080/2373566X.2021.1986100 • Million Dollar Hoods https://milliondollarhoods.pre.ss.ucla.edu/ • Planned Destruction https://storymaps.arcgis.com/stories/600d5cb0e0454b1a809da6d4f31db8ca
Power	Maps are powerful because they are often perceived as objective and because they carry an authoritative aura. This power has been used to enact violence and generate differential geographies (e.g., the carving up of landscapes as seen in Figure 1). It is essential for mapmakers to be cognizant of the power that their maps wield. Black feminist thinkers understand this power as intersecting or interlocking systems like racism, patriarchy, classism, and ableism, to name a few, that shape people, places, relationships, social structures, institutions, and even maps and stories (Combahee River Collective 1979; Collins 1991; Costanza-Shock 2020). Mapmakers must continually grapple with the power structures that inform their work (Kelly and Bosse forthcoming).	

Black geographies scholars like Katherine McKittrick (2020) point to maps as "creative texts" that provide ways to imagine alternative and in/visible geographic stories. Mapping Black Futures is a community-driven interactive mapping platform that the creators call part-archive, -resource, and -storytelling. Mapping Black Futures (n.d.) provides two storytelling portals. The first is an interactive map that locates key places (past and present) that are significant to Black youth in Toronto, Canada. The second is a virtual community center that offers an immersive space "to socialize and experience their personal data points." The key to this immersive, pixelated environment is exploration as the interface is deliberately ambiguous illustrating the importance of community control over narrative. Narrative control is critical as mapmakers like LaToya Gray (2020) grow "wary of narratives being appropriated." Mapping Black Futures presents storytelling by situating and building collective knowledge about Black geographies and place-making in Toronto and by creating stories that must be uncovered, requiring time and meaningful

engagement. Like Mapping Black Futures, Queering the Map (LaRochelle, 2020 and n.d.) is another collective mapping and archival project that documents, shares, and preserves situated stories and experiences of queer places that are “pinned” to an interactive map. By sharing individual voices and storied snippets around the world, Queering the Map recognizes variation as well as common threads across experiences. Both examples demonstrate the power of narrative, voice, and the communities (Costanza-Chock 2020)

Finally, maps can subvert and challenge power structures through storytelling. Indigenous mapping practices have long been “erased, forgotten, and willfully ignored” from western mapping practices (Lucchesi 2018). Indigenous mapmakers have embraced decolonial maps to reframe spatial narratives and colonial histories of place. In Coming Home, for example, Pearce (2019; in Pearce and Hornsby 2020) create a map of Canada that foregoes colonial place names and instead recenters Indigenous place names that have been erased by colonial oppression. Pearce (2019, 175; Rose-Redwood et al. 2020) shifts conventional narratives by “normalize[ing] a map of Indigenous sovereignties,” which includes peoples, cultures, place names, and stories there-within. Similar to Coming Home, the maps created during the “A Design Challenge for Transforming Justice” (Bley et al. 2021) are additional mapping examples that challenge power structures with narrative mapping. In their design challenge, Bley et al. (2021) subvert conventional common policing visualizations like heat maps of crime by imagining “new ways of visualizing (in)justice and place in Milwaukee.” Their maps embraced multiple and relational perspectives and inclusive design practices while also contesting dominant racial narratives of criminality in the city. In sum, understanding situated knowledge and the power of narrative and storytelling in mapping are foundational to contemporary mapmaking practice for students as well as professionals. While out of scope for this chapter, recent work calls mapmakers to go one step further to grapple with and share the power structures our stories are imbued within as well as our positions as mapmakers and storytellers (Kelly and Bosse forthcoming; Peterle 2019).

7. Where to Begin?

Today, “story maps” are increasingly visible in cartography, GIScience, digital humanities, data visualization, and journalism. Given the rise of visual storytelling in data journalism along with the development of more accessible mapping tools, stories and narrative are everywhere in mapping. Yet, they are not new concepts. In this entry, I introduced multiple conceptualizations of narrative and storytelling in mapping stemming from cartography and data journalism to feminist mapping, Black geographies, and decolonial mapping to unravel mapping possibilities and the power of mapped stories. Because maps are powerful storytellers, we must understand the underlying power structures that shape them and the power that they wield. Doing so, allows us to re-envision and create alternatives maps and mapping practices and highlights the role of mapping and storytelling in reimagining more just, alternative worlds. We can begin by iteratively engaging with questions of situated knowledge and power as we narrate stories with maps.

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