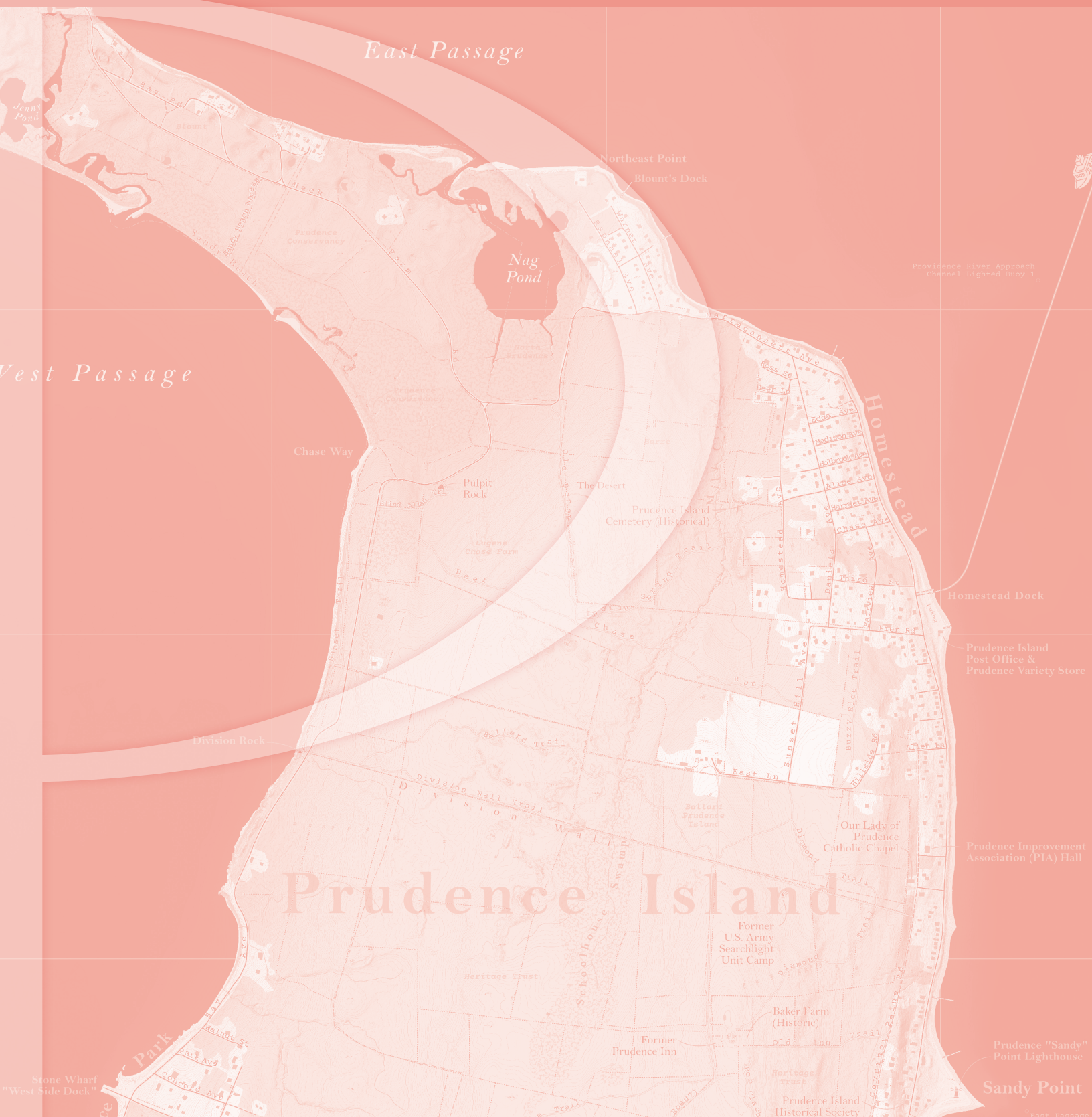
Cartographic Perspectives

The Journal of nacis

Number 109, 2026



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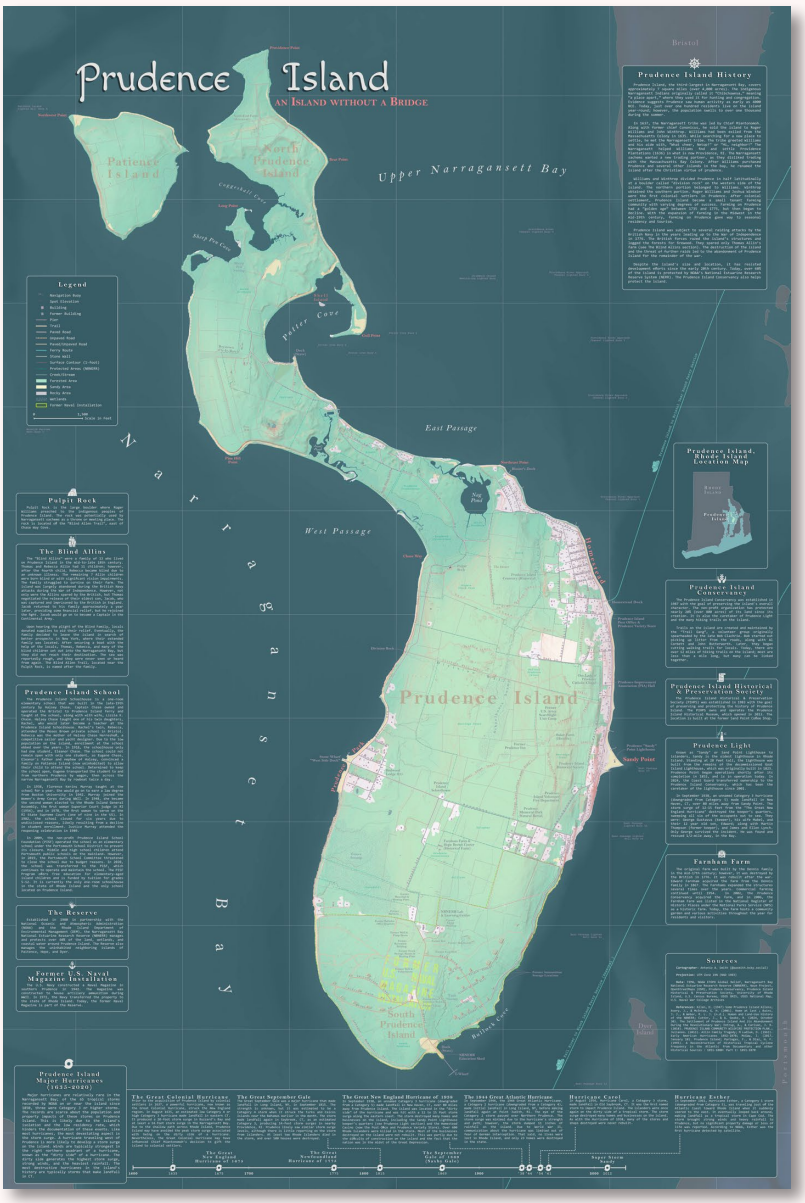
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ABOUT THE COVER

The cover of this issue of *Cartographic Perspectives* features a large-scale reference map of Prudence Island by Antonio Antoine Smith (pronounced Antwan). This map explores the history of a small, isolated community in Rhode Island that began as a colonial settlement after the island was sold to white settlers by the Narragansett people. You can learn more about Antonio's work at **AntonioAntoine.com**.



Cartographic Perspectives

The Journal of nacis

ISSN 1048-9053 | www.cartographicperspectives.org | @nacis

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LETTER FROM THE EDITOR

First and foremost, I would like to apologize for the brief delay in delivering issue 109 to our readers. For those wondering, we aim to have the fall issue out around the time of the NACIS conference. The delay this year was not due to a lack of excellent content, as you'll see shortly; but rather our efforts to address a few ancillary issues we think will bring real value to our community.

The most important of these is a **readership survey** that we would like to encourage every reader to consider taking. One of the more humbling aspects of running a journal with nearly four decades of publication history—one that includes some of the more influential pieces in modern cartography—is the knowledge that what I write here may end up read by interested parties decades down the line. In that case, I regret to inform you we likely won't be taking into consideration your responses to this survey; but, if you're able to respond by the end of 2026, I assure you we will.

At the editorial board meeting during the NACIS conference, we had much to discuss, particularly around the ways that generative artificial (or is it now "super"?) intelligence has reshaped, and will continue to reshape, both the practice of cartography and our study thereof. Specifically, we asked ourselves how the journal should deal with the use of generative AI in submissions. As may be expected, opinions ran the gamut; but, with respect and care, we found a path forward we're planning to institute. I expect to announce and publish it with our upcoming winter issue (110, the last of 2026).

Now, as to this issue, it is filled with the wide range of high-quality cartographic work that defines our journal. Each of the three research articles is one that I've been looking forward to sharing with our readership. Roth et al. provide an empirical investigation of what types of maps have been appearing in popular news media over the past years. Following up on some of the authors' own works (notably Roth 2021 and Kelly 2022), this study finds "a decrease in the use of maps in news stories and a simplification of these maps from 2014 to 2021" (43), which unsurprisingly aligns with pressures to lower costs, increase speeds, and—of course—enact the "cartographic silencing" found in some conservative media (Fish and Kreitzberg 2023, 2492). In particular, I was interested in the decline in news map interactivity, and I am curious as to how the availability of automated coding through LLMs may impact newsrooms moving forward (though this is not an endorsement of such).

The Mapes and Spence piece is, to me, just a wonderful cartographic study. It builds from the principle that we design spaces based upon our societal and cultural values and that mapping said spaces can reveal those values. Embracing counter- and critical mapping traditions, it ground-truths equity in access to bathrooms on a college campus. Methodologically interesting and sound, topically relevant, and well written, it's a piece I am delighted to share with our readers.

Finally, we have a piece by Inwood et al. that explores the educational comics of the Student Nonviolent Coordinating Committee from the 1960s, which they argue "represent an example of an insurgent counter-mapping of political power and the imagining of Black socio-spatial futures" (6). While the authors acknowledge that these comics do "not look like 'traditional' maps," it is that very difference which made them "all the more powerful" (22). From newsrooms to bathrooms to voting rights, taken together these articles demonstrate the range and power of cartography—both in its praxis and its study.

In addition, we have a mix of section content on offer. De Róiste follows up on our **special issue** on ethics in cartography by tying that frame directly to education: starting from the principle that "geographic context matters" (69), she develops a praxis in which "a good educator is in a constant state of becoming rather than achieving" (75). As I, once more, muddle towards the end of a too busy term, those words struck a chord. We then have six book reviews ranging from *Maps on Vinyl* (a "fun excursion through a compilation of cartographic artifacts," 96) to a new entry into Belt Publishing's "(City) in 50 Maps" series (*Pittsburgh in 50 Maps*, which balances "the serious and the silly," 89). Other books include *Around the World in 200 Globes*, *Drink Maps in Victorian Britain*, *The Spice Ports*, and *Shelter: An Atlas*. Reviewers found much to enjoy in each, and I hope at least one ends up on your shelf.

As always, I remain honored to serve as editor of *Cartographic Perspectives* and look forward to hearing from our readers through both the **survey** and any other means.

Best,
Jim Thatcher

REFERENCES

Fish, Carolyn S., and Katie Quines Kreitzberg. 2023. "Mapping in an Echo Chamber: How Cartographic Silence Frames Conservative Media's Climate Change Denial." *Annals of the American Association of Geographers* 113 (10): 2480–96. **https://doi.org/10.1080/24694452.2023.2227672**.

Kelly, Meghan. 2022. "Narrative and Storytelling." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. **https://gistbok-topics.ucgis.org/CV-04-033**.

Roth, Robert E. 2021. "Cartographic Design as Visual Storytelling: Synthesis and Review of Map-Based Narratives, Genres, and Tropes." *The Cartographic Journal* 58 (1): 83–114. **https://doi.org/10.1080/00087041.2019.1633103**.

DOI: 10.14714/CP109.1989

PEER-REVIEWED ARTICLE

SNCC Cartoons as Counter-Mapping Black Futures: On Creative Geographies of the Civil Rights Movement

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In the mid-1960s, the Student Nonviolent Coordinating Committee (SNCC) created a series of educational comics. We argue these comics represent the melding of artistic geographies with an early form of GIScience, and thus push geography to include an expanded set of activities within its understanding of what constitutes GIScience. We argue these comics are a form of radical placemaking and represent how Black geographies are at the center of broad struggles for justice. By incorporating the knowledge of Black geographies within GIScience, we can extend our understanding of geography more broadly. This impacts our understanding of how political geography can center and be responsive to Black liberation struggles.

KEYWORDS: Critical GIS; participatory mapping; graphic narratives; GIScience

1965 was a pivotal year in the long, painful, and often violent struggle for civil and social rights in the United States. Driven by the efforts of the Student Nonviolent Coordinating Committee (SNCC) and the Southern Christian Leadership Conference (SCLC), two prominent civil rights organizations, thousands of people from across the United States converged on rural Alabama and undertook a march from Selma to the state capitol, Montgomery, to pressure President Lyndon Johnson and the United States Congress to pass legislation ensuring the right to vote (Combs 2013). The effort was met with a violent reaction by the white power structure in Alabama, and on March 7, 1965, civil rights marchers were beaten by local and state police forces on the Edmund Pettus Bridge (Emmons 2018). "Bloody Sunday" led to widespread demonstrations and eventually to the passage of the 1965 Voting Rights Act, which expanded the right to vote across the American South and extended the franchise to include African Americans who had long been excluded from the polls. In the wake of this victory, SNCC faced another challenge: how do you educate thousands of newly enfranchised African American voters on the power of the vote and the many local and statewide offices they would be asked to vote for? Layered on top of this challenge was a reality that voters in rural Alabama, and indeed throughout the Deep South, were often illiterate and lacked basic civic knowledge or education, which was denied them because of the realities of segregation in the US South (Staimpel 2021, Gillespie 2014). To meet this challenge, SNCC created a series of comic-like books to educate locals about their power to elect local and statewide officials and take charge of their communities (Perlstein 1990).

Us Colored People, Sheriff, and *Board of Education* are the fruits of that effort. These political education comics and other storytelling aids produced by SNCC used basic but evocative illustrations and combined knowledge of elected offices with suggestions of how Black men and women could challenge their oppression by exercising the right to vote and even filling political offices previously off limits to them (Table 1). SNCC's comics highlight a creative and important, if understudied, organizing strategy centered around understanding and redefining the unjust political landscape of Alabama. Crucially, we contend that these pamphlets and comics represent an example of an insurgent counter-mapping of political power and the imagining of Black socio-spatial futures. While the 1965 Voting Rights Act ensured, on paper, a right to vote, it did not rid oppressed communities of long-entrenched racist orders that would continue to intimidate and manipulate Black voters and take advantage of their electoral inexperience (Finkelman 2015). Embracing the idea of African Americans as independent political agents capable of reworking the distribution of rights and resources within

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their own communities, SNCC had a tradition of using education, communication, and artistic innovations to support Black Southerners in their efforts to understand, navigate, and resist the white supremacist power structure (Inwood and Alderman 2021). These innovations, such as the comics discussed here, are indicative of how geography was and remains central to understanding the US civil rights struggle *and* represents an example of how "Black matters are [and always have been] spatial matters" (Hawthorne 2019).

Perhaps as geographically significant, we argue these comics represent an early and unrecognized form of GIScience when we release the concept from its industrial and technocratic moorings. It is important to recognize the capacity of GIScience, and mapping in general, to serve within Black storytelling and place-remaking practices that center liberation over scientific or commercial conventions (Kelley 2021, Alderman and Inwood 2024). Comics are inherently spatial structures that engage cartographic elements, explicitly and implicitly, and "offer new and

Comic Title	Description	Hyperlink to PDF
Us Colored People	Comic follows "Mr. Blackman" as he gains political consciousness, registers to vote, and becomes sheriff, showing how ordinary people could replace oppressive public officials.	https://www.crmvet.org/docs/lcfo_us_colored.pdf
Sheriff	Comic explains the sheriff's duties and powers, including control of racialized violence. LCFO candidate Sidney Logan featured on the cover.	https://www.crmvet.org/docs/lcfo_sheriff.pdf
Board of Education	Comic breaks down school board roles, budget oversight, and how local control can improve Black community schools. LCFO candidates Hinson, Strickland, and Logan featured on the cover.	https://www.crmvet.org/docs/lcfo_educ.pdf
Tax Assessor	Comic explains the power of the tax assessor in property valuation and how their assessments affect tax payments. Portrays a Black female serving in the role. LCFO candidate Alice Moore featured on the cover.	https://www.crmvet.org/docs/lcfo_assesor.pdf
Tax Collector	Comic illustrates job responsibilities of the tax collector, how taxes fund public services, and accountability in civic finances. LCFO candidate Frank Miles featured on the cover.	https://www.crmvet.org/docs/lcfo_tax.pdf
Coroner	Comic outlines the coroner's duties, their power to subpoena, investigate murders, and replace the sheriff if necessary. LCFO candidate Emory Ross featured on the cover.	https://www.crmvet.org/docs/lcfo_coronor.pdf

Table 1. SNCC Political Education Comics: Titles, Purposes, and Archival Links (Source: SNCC Digital Gateway & Civil Rights Movement Archive).

unpredicted ways to theorize about maps" (Peterle 2015, 69). The efficacy of SNCC's comics, like any maps and especially those within Black cartographic traditions, comes from their power to guide readers and users, not just in a physical and strict locational sense, but also in raising their political awareness and embodying alternative ways of seeing and being in the world (Yessler and Alderman 2021). Rendered in the pages of these 1960s educational comics was a recognition of the way power is inscribed in the landscape *and* how the use and exercise of political power in the United States is wholly reflective of race and racism. SNCC's comics were drawn and disseminated by their creators to connect individual Black voters into larger voting blocs and to enact political power by remaking the power structure in rural Alabama through local and statewide elections. They infused the comics with a daily geographic knowledge derived from Black lived political experiences and needs, and worked to translate it into usable and accessible data that a broad swath of the population could readily understand (Fraser 2019, Tomiuc et al. 2022). We contend that their mobilization of information and communication holds significant lessons for geographers in the twenty-first century.

By studying SNCC's efforts, our work deepens scholarly and public understanding of SNCC's creative geographies and explores the development and use of comics by civil rights organizations. We argue these comics represent the melding of artistic geographies with an early form of GIScience and extend our understanding of the social structures and relationships that undergird white supremacy and African American resistance. This pushes geography to incorporate an expanded set of representations and activities within the framework of GIScience and impacts our understanding of how political geography can center and be responsive to Black liberation struggles (Bledsoe et al. 2017, Ogborn 2023, Alderman et al. 2021). We argue these comics are a form of radical placemaking and represent how Black geographies are at the center of broad struggles for justice, and by incorporating the knowledge of Black geographies within GIScience, we can extend our understanding of geography more broadly. The fight for justice, which we document in this manuscript, has contemporary resonance, and the creative practice of SNCC may offer examples that can impact how we think about civics and civic culture today.

BACKGROUND

THE EVOLUTION OF GISCIENCE: TOWARD PROBLEM-SOLVING

The field of GIScience has long been defined by technological innovations, and the use of those (primarily computer-based) innovations to understand complex phenomena (Goodchild 2010). Many of these developments are associated with business and government interests in geographic data (e.g., Swann 1999, Crampton 2015, Hanchard 2024). The attentions of large corporations and the military-industrial complex are often seen as handmaidens to empires, and the use of GIS technologies is sometimes mired in controversy (Bryan and Wood 2015). The early field of GIScience, and efforts to define and describe its significance, tended to emphasize quantitative methods, computational techniques, and a broadly conceived positivistic framework. Perhaps most famously, Michael Goodchild described GIScience as "the science behind the [geographic information] systems" (1992, 6), and early efforts in the field focused around fundamental questions that at their heart were interested in geospatial software and spatial data modeling. Crucially, this perspective tended to focus attention on how GIScience was a storehouse of knowledge, and emphasized the technical challenges associated with this emerging field. This initial framing of the field casts GIScience as a computational, information science, which sought to establish GIScience's legitimacy within a broadly understood positivistic framework.

While these early efforts defined GIScience narrowly, more recent works, especially interventions from feminist, critical, and participatory perspectives, have sought to expand the epistemological and methodological limits of the field. This includes the advent of critical GIS and its focus on the broader societal impacts of GIScience (Sui 2015, Burns 2021, Keighren et al. 2015, Puente and Vélez 2024), and the integration of qualitative methodologies into GIScience (Cope and Elwood 2009, Taylor et al. 2020). There have also been more recent efforts to improve our awareness of human differences, and to understand how those differences influence the impacts of GIScience and the ways we come to see and understand

the world (Conte and Napolillo 2024). Arguing that treating GIScience as a purely technical or positivist enterprise overlooked the value-laden nature of knowledge, critical scholarship in the field has emphasized that all knowledge is situated and as a result has questioned the broader positivistic foundations of the discipline. Fully developing critical GIS, according to Lally (2022, 337), requires moving beyond disciplinary and professional certainties, definitions, and norms: it is about acknowledging that "we do not know what GIS can do" and recognizing that what counts as "GIS emerges in the doings and practices of GIS," especially in community mapping projects that make visible the current limitations and future possibilities for expanding how we conceptualize and apply GIS more broadly. Lally (2022) advocates for a critical GIS characterized by a geographic imagination, openness to encounters with a variety of participants, experimentation with GIS foundational ideas, and embedded within situated social practices and struggles. This embrace of a more open, experimental, and socially responsive approach to what GIS is and the work it can do certainly motivates our discussion of SNCC comics.

Parallel to the rise of critical GIS was a blossoming of critical cartography—a perspective that interrogates the power relations embedded in maps and advocates for alternative mapping practices. Pioneers like J. B. Harley had shown that far from being neutral scientific documents, maps are social constructions that have historically served state and colonial power, often silencing or "erasing" certain peoples and places. Building on this insight, critical cartographers in the 2000s began examining how mapping could be turned toward emancipatory ends. Crampton and Krygier (2005), for instance, describe an evolving field of critical cartography devoted to emancipatory and subversive mapping practices emerging outside the realms traditionally controlled by state and corporate institutions. In other words, maps, and by extension geographical information systems, could be made by communities, activists, and artists in order to challenge dominant knowledge structures rather than uphold them.

What is important about the SNCC comic book series is how SNCC activists engaged in many of the broader questions that currently define debates in GIScience, critical cartography, and mapping. For example, take several of the core tenets of GIScience: that it is used to solve problems by creating representations of where things are, and those representations are grounded in existing communities. As we demonstrate in this article, SNCC was engaged in complex problem-solving through a geographic understanding of the communities in which they were working. Inwood and Alderman (2021, 2020) have shown through their work on civil rights geographies that SNCC's research department was engaged in counter-mapping white supremacy, and they have examined the informational and research praxis that was so foundational to the work SNCC was doing in the deep southeastern United States. Their work on SNCC raises questions about the need for a more complex reading of the development of GIScience, one with a longer history that includes how spatial analysis developed alongside broader struggles for justice and took visual forms that were intimately geospatial, even if they do not look like conventional data and maps from a strict industrial or technological perspective.

Crucially, we argue that we need to see that the evolution from an earlier era of computational GIScience to the present critical cartographies represents a trajectory of opening GIScience up to critique, to plural epistemologies, and ultimately to alternative modes of geographic knowledge production. Counter-mapping and critical cartography, especially as employed in Black geographies and other social justice contexts, have shown that maps can be tools of liberation as much as tools of empire. By challenging dominant knowledge structures and embracing situated, resistive, and creative mappings, they have carved out intellectual space within GIScience for ethics, reflexivity, and empowerment. SNCC's comic maps of the 1960s may not have been recognized as "GIScience" at the time, but in retrospect they embody exactly the kind of expanded GIScience that critical geographers call for; one that merges rigorous spatial thinking with art, narrative, and community engagement to foster new understandings of place and power. Such integrations underscore that the future of GIScience lies in its ability to continually redefine what mapping is for and who it serves.

The SNCC comics we interpret in this paper are emblematic of the organization's counter-mapping and geospatial activism. The comics—along with training workshops and the mass distribution of other educational materials—were meant to challenge the electoral basis of racist social and spatial structures by offering creative, non-conforming cartographic interventions. These interventions were meant to guide African Americans in understanding how their communities were organized and operated politically and how, when deploying that knowledge, Black

social actors and groups could remap their place of power within their state and region. Counter-mapping is understood within human geography, critical humanities, and community organizing as a discrete spatial storytelling practice not necessarily dependent upon or entirely situated within GIS (Mogel and Bhagat 2007). However, we also feel it is important that we view counter-mapping as a critical subset of GIS and make room intellectually and politically for SNCC comics and to use this artistic-activist innovation to open and complicate narrow conceptualizations of cartography and GIS. Doing so, as we suggest elsewhere (Alderman and Inwood 2024), is a necessity since "Diversifying GIS is not just about widening the demographics of talent in the field, but doing greater justice to the full range of histories and identities that have comprised cartographic performance and recognizing the many years of Black contributions to mapping along ethical and social justice lines" (312).

As we noted previously, we often associate GIScience with technological developments related to spatial data, with those definitions of data conforming to white- and masculine-centric Western epistemologies. However, as we also document, GIScience scholars have been keen to move beyond seeing GIS as a set of technological advancements and instead to see GIScience as a way of thinking and understanding the world. We argue in this paper that SNCC and their work open spaces to see how GIScience is exercised through geographic praxis grounded in a Black tradition of resistance. This broadens the history of the field of GIScience and, if taken seriously, brings geographic understandings long-ignored by the discipline to the forefront. If we take Hawthorne's (2019) admonition that Black matters are spatial matters, it necessarily follows that the broader pan-African experience expands the scope and scale of our understanding of geographic praxis and theory. This also raises questions about how we know and represent geographic data.

SNCC'S GEOGRAPHIC PRAXIS: COUNTER-MAPPING WHITE SUPREMACY

Although largely neglected by geographers until recently, SNCC embraced a geographic praxis of rigorously tracking, analyzing, and visualizing information about where things are and how things in one location are related to what happens in other locations. SNCC produced and used conventional and unconventional maps, detailed community-level reports, place-based photography and education, and other creative forms of spatial representation—all of which formed a series of Black counter-mapping practices. This counter-mapping not only documented white supremacy in the deep southeastern United States, but also advanced understanding of the broad economic relationships it formed, as well as how it created landscapes of inequality in the region and nation (e.g., Inwood and Alderman 2020, Alderman et al. 2023, Alderman and Inwood 2024). In their several studies of SNCC's insurgent geospatial work, Derek Alderman and Joshua Inwood call for a retheorization of the broad development of geographic thought and practice that makes room for wider freedom dreams and struggles of Black oppressed communities during the Civil Rights Movement. The research praxis developed within SNCC and other civil rights organizations represented an organic, grassroots intellectualism that arose and existed in parallel to broader developments in the discipline of geography. Instead of seeing these developments as happening outside of or independent from each other, it is more productive to see how geographic thought includes these broader freedom struggles and is informed by them.

SNCC's comics-based communications emerged from the organization's emphasis on counter-mapping, continuing a resistant tradition of Black GIScience that, in its own right, has expanded what counts as a map, who is a mapmaker, and what political work maps can and should do (Alderman and Inwood 2024). The comic book series represented a counter-mapping in two ways. First, they rendered in black and white a vision of the political world in which white supremacy did not dominate. The comics outlined a picture of Southern communities in which Black voices, lives, and rights most assuredly had a legitimate place—a remapping of who belonged and mattered in the South and America. Second, the very fact that these were drawings challenged or countered what counted—then in the 1960s and even today—as politically actionable expressions of geographic knowledge. As Kelley (2021) argues so effectively, Black geographic knowledge has long existed in creative cultural productions—including artistic expression—not confined to the official tenets of geography, cartography, and GIScience. Drawing inspiration from the ideas of Katherine McKittrick, Nimoh (2025) notes that these alternative creative practices are about unmapping the exclusion of Black communities and spaces by traditional, white-dominated cartographies, while also

remapping to create knowledge guides and forms of storytelling necessary for Black survival in the face of that racism.

SNCC's political education through comics was one innovation among many mobilized by civil rights workers to understand, challenge, and counter-map the spatiality of white supremacy. For example, around the same time SNCC's research department was producing comics for voters, it generated another educational document titled *Mississippi: A Colony of Standard Oil and Sears, Roebuck*. The document begins by tracing and analyzing the interconnections between Standard Oil and the Sears Company at a time of rapidly expanding US hegemony. SNCC's activist-researchers write:

> The political and economic power of the men who run and profit from Sears, Roebuck & Co., and the Standard Oil of California stretch like the tentacles of an octopus deep into Mississippi and Alabama, the black ghettos of Harlem and Watts and Chicago, the dictatorships of Brazil and South Africa, Venezuela and Spain, the Middle East, Vietnam, the Dominican Republic and many other strongholds of oppression. (Student Nonviolent Coordinating Committee 1965, 1)

What immediately stands out from this document is how it relates to broad economic analysis and expansion of American global hegemony through multi-national corporations that, at the time, were also a focus of crucial work emerging within critical geography (e.g., Magdoff 1969). SNCC's analysis mirrors the kinds of work that were starting to take hold in geographic research within the decade (e.g., Harris 1972, Ginsburg 1973, Persky 1972, Brookfield 1972, Blaut 1974, Leeds 1975) and is indicative of the kind of insurgent geographies that were vital to the civil rights struggle.

SNCC researchers were documenting the ways economic and political conditions in Mississippi were not accidental, but the direct result of a set of economic and political policies that were designed to keep people in poverty—what James Blaut described a decade later as a set of "social and political institutions enforced by violence" and designed to extract the maximum amount of value from Black communities (1974, 39). More recently, Clyde Woods documents in his book, *Development Arrested*, that the "colonial aspect of community development" in Mississippi has always been vital to understanding how the region developed and the enduring legacies of the US plantation economy in the region (1998, 282). Woods's cogent analysis mirrors SNCC's, and reflects the realities of white supremacy. All of this work—Blaut, Woods, and SNCC—represents a kind of regional analysis that opens up space to understand how the making of space and place in Mississippi constitutes and reflects the broader racial economy (Inwood 2023). This also redefines how we as geographers value the work of SNCC. While the civil rights organization is not traditionally seen within the context of geography, it nonetheless brought cutting-edge analysis, critical education, and information gathering about a region that was and remains central to the American racial project (Alderman et al. 2023).

Mississippi: A Colony of Standard Oil and Sears, Roebuck highlights the kind of geographic analysis that was foundational to the intellectual project of understanding American racial capitalism and is an analysis that would have found a home in the burgeoning field of critical geography that was starting to take hold in geographic thought and practice. SNCC researchers, for example, broke down the number of workers employed by both the Standard Oil and Sears corporations in different areas of Mississippi and the conditions of poverty in those communities, as well as levels of political repression and racial violence in this region of the United States. By documenting the largest shareholders of these corporations and mapping out their connections to other boards of directors and other international corporations, SNCC created a power map of socio-spatial networks and relationships that connected racism in Mississippi with different regions of the world; it was a map that clearly transcended conventional cartographic forms and geospatial data practices of the 1960s. These geographic data, and their mapping, represent a holistic and dynamic way of understanding the South and its connections to economic and geographic theory, but they also expose the spatial interrelations between people and places that appear, on their surface, to have nothing to do with one another. This ability to expose the imbricated nature of capitalism with poverty and racism speaks to a sophisticated geographic analysis that many contemporary practitioners of geography would find familiar and which SNCC's research department was pioneering at the time.

For example, the SNCC research document points out the political connections between Sears and Standard Oil, the Mississippi Economic Council (MEC), and the state Chamber of Commerce, which are responsible for drafting almost all the legislation related to business in Mississippi.

In Mississippi, local and statewide chamber offices often worked hand in glove with ardent segregationists. They provided the economic foundation for the state's more violent extremists to resist the desegregation of Mississippi (McMillen 1994). This analysis reflects an early version of power mapping—mapping the dense, spider-web of lines of corporate and government power and influence in order to visualize the links between different entities all complicit in maintaining white supremacy (Crampton 2001).

At the heart of SNCC's counter-mapping against white supremacy was a realization that racism, as social and spatial reality, was not merely a *thing* but a set of relations and connections that could be tracked and mapped. Understanding where these political connections existed was crucial for understanding the economics behind white resistance to civil rights and analyzing how to take on these systems by identifying their weak points, where pressure could be mobilized to force change. SNCC was constantly looking for the specific pressure points where protests and boycotts could be applied to cripple the system of segregation and white supremacy that had long held the region's Black people back. Perhaps nowhere is this reality more exposed than in a section that includes a discussion of prominent Mississippi legislators and their connections to Sears and Standard Oil, including legal connections and efforts of these legislators through their law firms to represent the interests of these corporations in the state. The research document finishes by stating:

> The point to this analysis is that corporations . . . do not simply operate factories and department stores, pay wages, and issue dividend checks. It should be obvious that the fact that Sears and Standard Oil have invested money in Mississippi influences the politics of Mississippi. Sears and Standard, as far as we can see, have chosen to support the Mississippi way of Life, which has degraded and broken so many millions of poor people in the state. (Student Nonviolent Coordinating Committee 1965, 5)

Returning to the development of GIScience, the above passage is instructive. Recently, Zhao (2022, 1586) argues for the need to move beyond seeing GIScience as "an isolated object" or field of study; instead, it is necessary to "situate [GIScience] in an experiential structure between its user and the perceived place" under study. SNCC was engaged in this very kind of analysis and was focused on how the South's broader economic and political landscape was produced and how that landscape impacted the lives of everyday men and women in the region.

Additionally, the documents that SNCC produced are written in a way that communicates knowledge with community members who need information to make important decisions about the direction of their communities. *Mississippi: A Colony of Standard Oil and Sears, Roebuck* is not just a research document or paper about corporate support of racism. Rather it is a geospatial practice, a way of mapping racialized economic power—where it existed, and where oppressed communities can challenge it. Maps, according to Wood and Fels (1992), are propositions or arguments about how the world is understood, and similarly, SNCC's *Mississippi* document communicated a clear geospatial argument to everyday men and women about how their world operated unjustly and how they might take political power into their own hands. Like many of SNCC's informational and educational weapons, including its educational comics program, *Mississippi: A Colony of Standard Oil and Sears, Roebuck* shared information with communities in ways that are accessible and relatable; reaffirming what Zhao (2022) discusses as the situated knowledge between those who use GIScience and places with grounded, material conditions.

This point connects with more recent attempts in academic geography to push the field to think about how geographic knowledge can be communicated more clearly and persuasively and how GIScience can positively impact and serve society and communities (Mark 2003). The question of how GIScience impacts society has taken on added urgency in a moment defined by global climate change, the rise of reactionary politicians and politics, and the spread of worldwide conflict and militarism (Nelson et al. 2022). As Nelson et al. write in their piece on the culture of science, we need to ask: "Does the culture of science . . . truly reflect the needs and desires of all of humanity, or is science better at service to some segments of society than others?" (Nelson et al. 2022, 1). SNCC's GIScience work in the heart of the Deep South demonstrates that methods and analysis are not dependent on computer advances as much as they are dependent on advances in storytelling—which requires knowing the communities you work in and the needs they have, and understanding how to communicate information in ways that are easily understood and acted upon by those communities.

TELLING STORIES WITH GISCIENCE

Storytelling and cartography are intimately related, and this relationship goes back to some of the earliest traditions of cartography (e.g., Harley and Woodward 1989, Crampton 2001, Roth 2021). As technologies have changed and the amount of data available to mapmakers has increased, how we represent the world through science and cartographic traditions has also changed. This has brought new challenges for mapmakers and geographers who (re)interpret the world through maps. Slayton and Benner (2021) argue, "To tell a good story is human, but to build a story with convincing evidence takes practice." The work of cartographers and other geospatial scientists is thus not just about creating an informative map; rather, the work is about creating aids to understanding political, social, and physical places and the movements possible therein. What is imperative is ensuring that these aids are consumable, understandable, and create empathy for the place and subject.

We understand GIScience as fundamentally about storytelling, allowing us to see the practice continuing a millennia-long tradition of passing information from group to group (Sax 2006). Storytelling has never been merely an entertainment tool; instead, it has always been a strategy to condense a plethora of information into manageable and memorable chunks by making artistic or stylistic choices (Sax 2006). As the US became more multicultural, as identity and the different freedoms of movement tied therein became more convoluted, strategies to understand these dynamics became all the more important; GIScience became not only a method to understand movement but a way to tell one's own story, and define one's own identity through mapping (Sax 2006). Storytelling about race in the Jim Crow South became, in itself, an act of mapping, as it solidified the nuanced and particularly local ways individuals dealt with this social system. These individuals combined this oral tradition with photos or illustrations engaged with storytelling practices of memory aids, giving anchors on which to hang particular pieces of knowledge. The combination of the oral, visual, and holistic practice of storytelling makes GIScience effective; a narrative gives meaning to data, and visual aids give concrete examples of numbers and locations. To be effective, GIScience must, thus, engage in storytelling that is resonant to wider communities, especially those whose lives and wellbeing depend so heavily on the enacted information. While post-truth politics may appear to be a recent development, the reality is that challenging white supremacy has always been a battle over information, and pushing back against racist control and misrepresentation of stories about oppressed communities; and producing narratives that assert their humanity, contributions, and rights.

COMMUNICATING POWER THROUGH THE USE OF COMICS

Wright (2019) notes that scholars are often trained to produce knowledge—whether through their research or teaching—in ways secluded from the masses. This, in turn, does not aid in liberating communities or creating new cartographies, nor does it allow for communicating information in easily digestible ways, or making that information into an actionable social resource for those communities. Information often sits behind paywalls or tuition schemes, and the venues we work in often reproduce racial and gender hierarchies and can reinforce geographic inequalities that are rooted in much longer histories of oppression and exclusion. SNCC is an instructive intervention because its knowledge production praxis was tied so intimately to the needs of oppressed communities. SNCC was not about just documenting the long history of segregation or white supremacy. Nor was it interested in reporting on the racialized economy to generate headlines. Rather, SNCC workers sought to produce information in service to a greater struggle and to give Black citizens the evidence they needed to be able to strike against the broad structures and individual agents who were oppressing them. The creative cartographic practices of SNCC are an important moment of reflection for GIScience and geography in general, an invitation to think through how and in what ways we produce knowledge and how it impacts the creation of more equitable and just communities.

To understand the depth and breadth of SNCC's engagement in the communities they worked in and with, it is necessary to trace the origins of the group's founding. SNCC arose out of the frustrations of Ella Baker and student leaders within other civil rights organizations as they sought an alternative to the Civil Rights Movement's hierarchical and patriarchal structure. SNCC was formed

during a conference at Shaw University in North Carolina in 1960. The group was grassroots in nature and focused on empowering local communities to advocate for themselves. SNCC often worked in the most dangerous communities in the rural South, where the threat of violence was an ever-present reality. These communities were riven with a corrupt white power structure that did not suffer challenges; SNCC workers were often harassed, intimidated, and sometimes even beaten or murdered in their effort to bring about equality and economic empowerment in Black, underserved communities.

The early leadership of SNCC was aware of the danger, and they worked to create a structure that could survive the loss of leadership. As a result, there was an early focus on information gathering and documenting so that a new cadre of leadership could easily step in and continue the work in the event of the assassination of one or more leadership positions. As part of their efforts, SNCC workers trained students in non-violence and undertook community organizing throughout the region, including Georgia, Mississippi, and Alabama. Given the geographically diverse nature of the struggle, SNCC was also interested in the spread of intelligence and in educating a movement through power maps, freedom schools, freedom libraries, freedom theaters, and other forms and places of knowledge production and dissemination strategies that became foundational to SNCC's work.

Perhaps SNCC activist and organizer Mary King captures this sentiment best: "Communication goes to the very heart of how non-violent struggle works" (quoted in Murphree 2003, 24). What may appear as routine or even boring tasks, such as gathering people for a march, or researching the best place for a march to take place, or coordinating volunteers, actually involve a geographically complex set of questions that point to the kind of deep analysis and geospatial work that was central to the effectiveness of the Civil Rights Movement. As we demonstrate in the next section, the cartoons, comics, and pamphlets were central to this project and illustrate how SNCC produced a variety of informational praxis that communicated how communities operated and the vital and important role elected officials played in the political lives of community members.

CREATIVE CARTOGRAPHIES

As we will demonstrate, the creative cartographies and comics SNCC produced were meant to be easily reproduced and understood by people from a wide variety of backgrounds. In many cases, the pictorial representations and textual descriptions contained in the comics could be understood by people who lacked basic literacy skills—a reality for many of the sharecroppers and poor farmers in the Deep South, resulting from the inequalities produced through white supremacy. They were also an excellent medium for SNCC to spread information, and were effective, in that they sparked less-coordinated protests amongst groups and individuals who recognized "a sense of injustice and had to act on it" (Eig 2023, 220). Comics are helpful for those who are politically disadvantaged and forcibly written off the map or isolated from political agency and organizing because comics are often easier to read and appeal to visual learners (Yessler and Alderman 2021). Comics can also meld different disciplines, bringing scientific and cartographic practices out of the ivory tower and bringing knowledge to the masses through creative artistic representations (Hatfield 2000). Lastly, comics, in general, get the intellectual into the physical by visualizing the movement of a person or concept. These representations often solidify concepts for readers and turn abstract ideas into real, concrete representations (Peterle 2015). To understand the broad implications, we want to turn to a specific analysis of each of the SNCC-produced comics.

US COLORED PEOPLE

White supremacy within the US is a combined spatial and social system that is geographically diffused and reflects specific geographic realities in different regions and places (Pulido 2023). Historically, these practices have included segregation laws, forced prison labor, sundown towns, the use of legal and extra-legal violence, redlining, restrictive covenants, and the selective enforcement of rules, regulations, and laws. Since the means of oppression are spatialized, resistance to these myriad oppressions is also necessarily spatialized. SNCC's geospatial practices and counter-mapping were focused on self-emancipation through a range of grounded, community-centered activities (Kelley 2021). Centering this vision of geographic information praxis challenges our field of geography to "conceive of mapping and its ethical possibilities in more creative and community-centered ways outside of the strict convention of industry standards, professionalized practices, and academic definitions and categories" (Alderman and Inwood 2024, 309).

Perhaps no finer example of these realities exists than the comic ***Us Colored People***, written and illustrated by SNCC

workers Courtland Cox and Jennifer Lawson in 1965. The comic, according to Cox and Lawson, was produced for the Black citizens of Lowndes County, Alabama, to "get people to believe in their [own] power to affect change" (quoted in SNCC Digital Gateway 2025a). Lowndes County was perhaps the most dangerous and inhospitable place for Black activism in Alabama and one of the most violent counties for civil rights in the nation at that time. Located in the center of Alabama's Black Belt region—long home to cotton and agricultural production in the state—a white power structure ran the county and focused on the violent repression of Black freedom. Lowndes County was also home to the Lowndes County Freedom Organization (LCFO). Founded in 1965 to register Black voters—Lowndes County had an 80% Black population, but not a single Black person was registered to vote—the LCFO was a precursor to the Black Panther Party, and featured a black panther as its symbol. It was an independent political party that provided an alternative to the corrupt and white supremacist Democratic Party, which ran the county and was an arm of the white power structure in the state.

Us Colored People centers around the main character, Mr. Blackman, a stand-in for Black readers who could project their identities into the comic character's journey. The comic focuses on Mr. Blackman's political awakening as he first becomes aware of politics, then registers to vote, and later becomes county sheriff (SNCC Digital Gateway 2025a). While modern and more well-known comic figures like the Black Panther or Batman are heroic, their methods of struggle are not replicable for anyone not possessed of unlimited money or super-human strength and intelligence (Peltier 2024). Mr. Blackman, on the other hand, was critical to representing identifiable social and spatial pathways to political and economic liberation, and the characters are grounded in local, specific, and identifiable geographies. The choice of a comic was intentional; as Cox explains, "We knew that people were not going to sit down and read law books" (quoted in SNCC Digital Gateway 2025a). Instead, they deployed straightforward and seemingly simplistic graphics and narrations in SNCC comics to depict the broad political power structure in the county and, specifically, the political awakening that was occurring as the civil rights struggle intensified. *Us Colored People* and other SNCC education comics were characterized by a plain layout of storyboard panels organized in a simple grid or block format to guide readers. Minimizing the number of words used and using a lot of white space to reduce visual clutter or noise further eased reading and comprehension. Hand-drawn illustrations within the comics focused less on capturing intricate detail in favor of graphic austerity, bold lines and high-contrast black-and-white visuals that suited cheap reproduction and distribution, essential to Civil Rights Movement work. Characters and symbols in the comics were stylized to convey moral clarity and emotional resonance, with heroes and oppressors easily distinguishable.

The raw and no-nonsense approach to producing SNCC comics reflected in part the fact that Lawson, by her own admission, was a "self-taught, amateur artist." But more importantly, it was about intentionally crafting a message that resonated with and would not intimidate oppressed and poorly educated Black communities in Alabama. Cox, when interviewed by SNCC activist turned journalist and professor Charles Cobb, described how the visual design of the comics was meant to widen their access and to convince Black folks that politically claiming and remaking their community was doable:

> But you . . . are not just saying register to vote; you're not just saying engage in the political process. You are saying, take over the county. So most people . . . who are illiterate and probably not highly education [*sic*], will be much afraid of that discussion. . . . Getting people who have never run for political office or never even voted to say we can be sheriff or tax assessor or probate judge . . . you need to tell them that this is not something that's really, really difficult. The education materials . . . were designed to . . . get the people who are running for office to see that this is something that can be done . . . create an imagery that allows people to think this is real. (SNCC Digital Gateway 2025b)

The opening page of *Us Colored People* features a four-panel depiction of the geographical setting of the main character, Mr. Blackman. Each panel features a different geographical scale, beginning with the broad nation and moving on to the state and then the county-level representation. In the first panel, we can see how the comic writers relied on known storytelling practices, such as beginning the story with the phrase, "Once upon a time. . .." The page layout engages with geography directly and scale jumps,

the practice of tracing economic and political links between the local, regional, and international (Smith 1992).

By positioning segregation next to panels showing the Statue of Liberty in front of an outline of the United States and moving towards an outline of Alabama filled in with a Confederate battle flag and the image of Black workers picking a crop in a field and then moving towards an image of Lowndes County, Alabama, the authors are engaged in an important relational form of mapping. First, they are placing the struggle in Lowndes County within a broader geography and, as other SNCC documents and writings illustrate, connecting the battle in the rural South to a broader economic and political geography of oppression. This comic is a visual, geospatial representation of a broad set of arguments and documents SNCC organizers and leadership were making. Second, in a not-so-subtle way, SNCC writers and comic creators focus specifically on the contradictions and hypocrisies of a country that was supposedly founded on the idea of liberty but which kept Black people in their place through violent enforcement of Jim Crow segregation. In addition, by focusing on the political organizing that was taking place in the South and specifically by including an image of a black panther, SNCC writers were setting the stage for readers to understand how the Lowndes County Freedom Organization could work to undermine the reality of white supremacy. Crucially, these images work without having to follow the accompanying text. By visually demonstrating how segregation manifests in the United States and connecting those realities to agricultural production and broader histories of enslavement, the cartoon writers focus on the foundational moments of America and the connection to contemporary economic policies. They also show how the realities of America are contradictory, and with political organizing, the realities of liberty and freedom can be attained.

As the comic book develops its storyline, Mr. Blackman, the main protagonist, navigates the segregated landscape of Alabama. In one poignant scene, Mr. Blackman navigates the process of registering to vote at a local courthouse, and even though he is continuously denied the right to vote, he highlights voter suppression tactics and laws. These panels show in vivid detail the struggles of one person trying to navigate the realities of voter suppression in the South. However, as Mr. Blackman continues on his journey, other Black people begin to notice and offer support. As this support builds, more and more people undertake the process of registering to vote. This culminates in a seven-panel spread on page seven, illustrating protestors gathering at a local courthouse. As the light fades in the background, more and more protestors draw near, signaling not only the passage of time but the sun setting on the realities of white power in the American South. Crucially, while centered in Lowndes County, Alabama, the comic has currency beyond Alabama and represents myriad struggles in the South. Working as a body of geospatial knowledge, this cartoon thus connects the battle in Alabama with other struggles and helps create a broader solidarity. We argue that this is a form of power mapping that seeks to navigate and expose the epicenters of white power and oppression and centers the struggle for civil rights within the context of a white power structure that used the law to keep Black people in conditions of poverty and denied basic human and legal rights to Black people.

As the storyline of *Us Colored People* develops, the movement for freedom picks up its pace and energy. It also shows the reaction of white officials to the freedom aspirations of Black people in the region. A section titled "the white folks threatened us" depicts the efforts of white officials threatening and intimidating Black protestors. It also depicts the white reaction to protests, showing how some Black people were kicked off their land and forced to live in tent cities in Lowndes County. Because most of the protestors were sharecroppers in the region, a common tactic used by white people was to evict protestors from their homes and rented land as punishment for participating in civil rights protests or being active electorally. This was especially harsh, as many of the people were poor and did not have the resources to move or to start over, and they found themselves homeless. In response, SNCC and other civil rights groups set up a tent city in Lowndes County to house homeless civil rights protestors and those caught up in the white reaction (Stack and Alderman 2024).

The final panels illustrate how an empowered and enfranchised Black community could push back against these realities and show African Americans who are "SICK and TIRED of being SICK and TIRED!" As the comic book ends, it depicts a group of Black people who are now "the majority of voters in the county" and demonstrates how political organizing in the region can change and challenge the lived realities of segregation. Thus, this readable and relatable educational comic is not just an illustrative

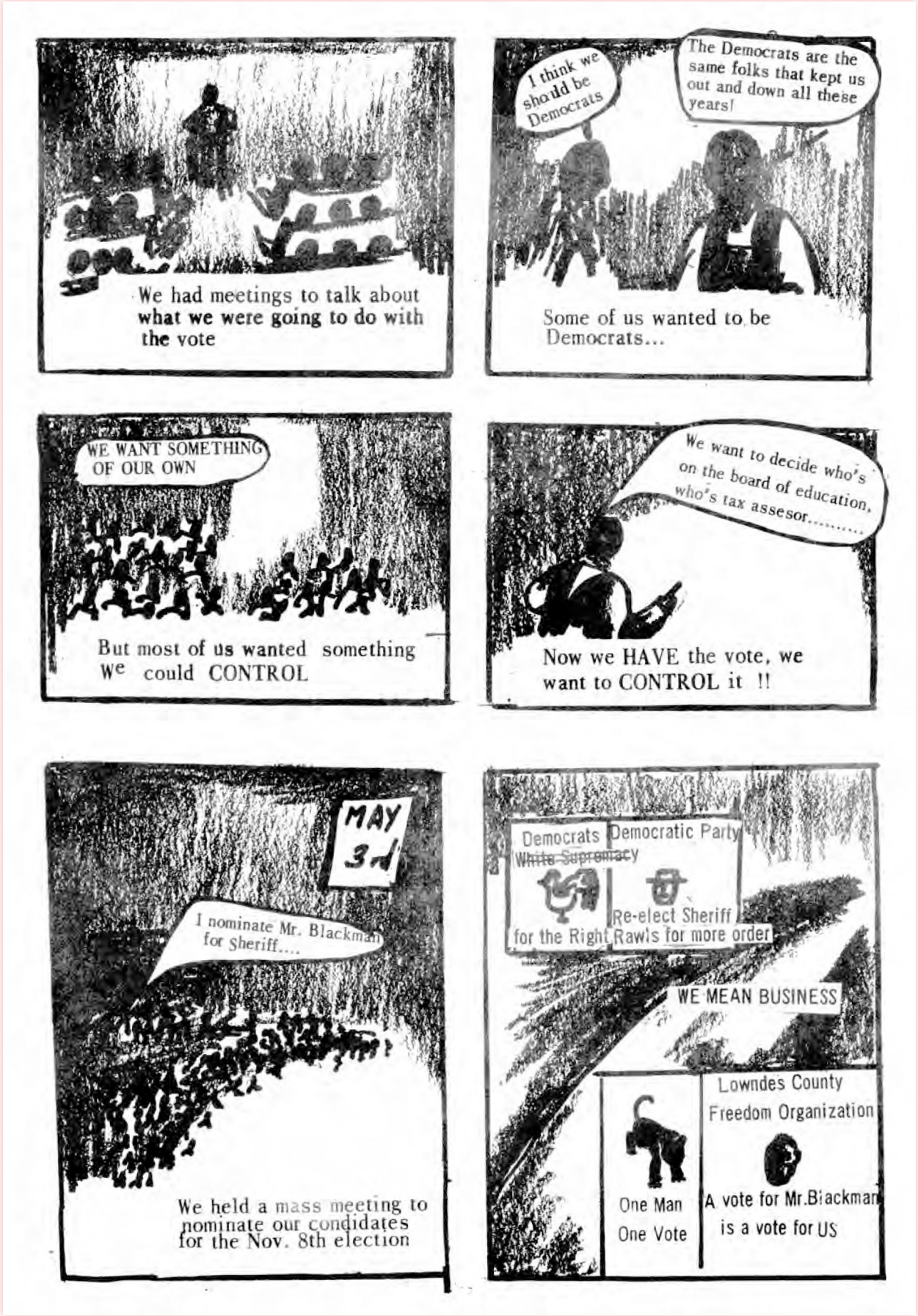


Figure 1. Page from SNCC political education comic, *Us Colored People*. Created by Courtland Cox and Jennifer Lawson, 1965. Source: **https://www.crmvet.org/docs/lcfo_us_colored.pdf**.

narrative; rather, it is working as a form of GIScience by counter-mapping the locations, consequences, and scalar relations that make up the political power structure underlying Alabama, the South, and America (Figure 1). And like good GIScience, it is seeking to create an actionable body of data important to problem-solving, one which shows the routes and solidarity necessary for political organizing to undermine and destabilize the existing white power structure, while guiding communities to see how that power structure is connected to a much longer history and broader geography of racial oppression.

SHERIFF

Created in 1966, ***Sheriff*** is one of the most important and illuminating comics created by SNCC. In terms of life and death in small Southern towns, no elected official had more power over the wellbeing of Black people than the local sheriff. By focusing on this position, SNCC was not only illuminating how local politics worked but also pushing for a reorganization of how law enforcement related to the communities they were ostensibly elected to serve. The front page of the comic book shows a photo of Sidney Logan, a candidate for sheriff at the time, and the interior pages go through the duties and powers of the office. In illustrating these duties, SNCC directly connects the oppression of civil rights workers and Black communities with the workings of local government and law enforcement. When producing the *Sheriff* comic and others like it to explain civic processes and responsibilities of elected leaders, Lawson and Cox carried out a collaborative and reflective process guided by more than just their own creativity and their guessing about the needs of the mobilized Black community. Lawson recounts how she and Cox chose visual imagery and dialogue for the comics "to reflect what we heard people [in Lowndes County] saying and the way that people there talked and articulated these same issues." The hope was to create a map grounded in real conversations that felt familiar and accessible, and mirrored the concerns of the local communities in which SNCC was organizing (SNCC Digital Gateway 2025b).

The most important portions of the *Sheriff* comic book can be found on the first and final pages. The first page is a three-row spread and begins not with a person but a place and a series of objects—the courthouse and a sheriff's star and gun. For many Black Southerners, these symbols were the focus of civil rights protests *and* the most visible and vital symbols of white power in the region. Given the isolated nature of many Southern towns, the sheriff in each town had almost unlimited power over the lives of the residents in the county. The image is captioned, "The sheriff keeps the peace in the county." This emphasis is central to understanding the role of the sheriff while also exposing the hypocrisy of a white power structure that focused on keeping "the peace" by eliminating threats to white power. From there, the comic goes on to describe the duties of the sheriff, including suppressing riots, stopping fights, breaking up unlawful assemblies, and forming posses to go and arrest people (Figure 2). The management of violence is a strong theme in the description of the sheriff's duties as detailed in the SNCC comic and its visual imagery and text. It reflects the dangerous realities of living in the Deep South for Black communities and how the comic envisioned such knowledge as key to Black survival.

Crucial to understanding the power of this comic is how it subtly shifts the balance of power in the region; that is, how it counter-maps what the county might look and feel like for marginalized communities with greater Black political participation. In these images, the sheriff is a Black man, and he is seen arresting white people, breaking up Ku Klux Klan rallies, and forming a posse of other Black men. A key piece of how this fits into a broader discussion of GIScience is how these visual images express an analysis of political power and make an alternative proposition for understanding and living in a world of under- and unserved community needs. We acknowledge that for many GIScience practitioners, it would be easy to dismiss these images as something other than GIScience, but when you place these images within a broad and evolving definition of the field, these comics express a set of geographical processes. Recall from the previous section that our modern definitions of GIScience begin from the standpoint that GIScience is about defining where things are and how they are interrelated to one another. The *Sheriff* comic book does this in two ways. First, by focusing on the most visible expression of white power in the region, SNCC expresses how the position of sheriff relates to the lives and fortunes of Black people in the region.

As the comic book continues, it focuses on the central role that local sheriffs play in the South regarding elections. The sheriff has a set of legally sanctioned duties, including listing all poll inspectors in local newspapers, giving thirty days' notice of when elections will be held, setting up

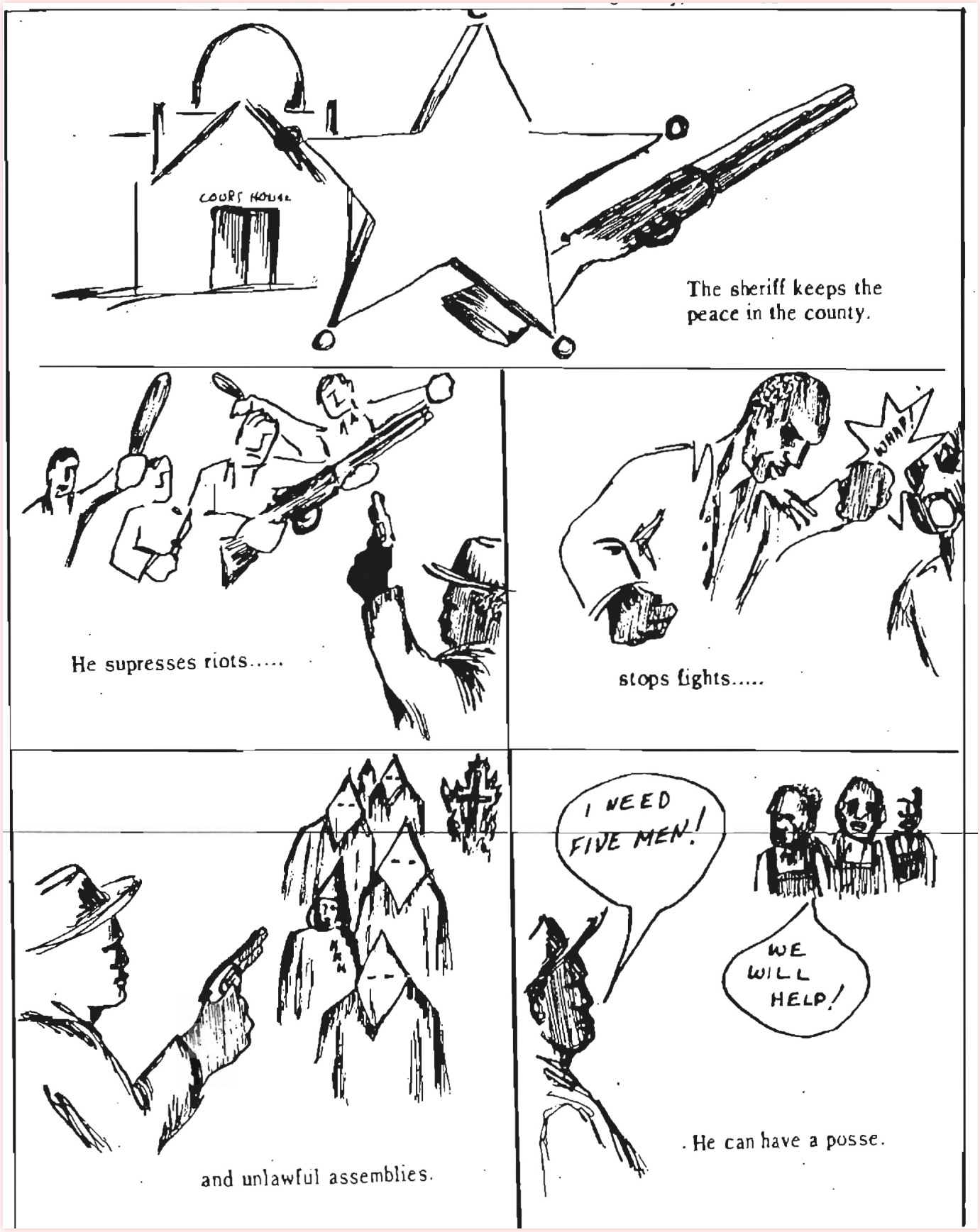


Figure 2. Page from SNCC political education comic, *Sheriff*. Created by Courtland Cox and Jennifer Lawson, 1966. Source: **https://www.crmvet.org/docs/lcfo_sheriff.pdf**.

polling places, and guarding the ballots once those votes are cast. Throughout this comic, by connecting the role of the sheriff to these prescribed political duties and then discussing how those duties relate to the lives of everyday men and women, SNCC comics represent a sophisticated political analysis of power—but expressed in ways that are relatable to a largely illiterate community of sharecroppers. A key piece of GIScience is how we visually represent data to audiences in ways that are understandable and resonant enough to tell a socially consequential story based on evidence and community needs. This can be a challenge that practitioners of GIScience are well acquainted with. For SNCC, this challenge revolved around expressing political power in digestible ways while also building political capacity to organize Southern towns and villages.

BOARD OF EDUCATION

Created in the same year as *Sheriff*, the ***Board of Education*** comic book uses several of the same strategies to create a set of methods for exerting local control over local school boards. In the first pages of the pamphlet, multiple candidates for local school boards are introduced to the reader. As the comic continues, it deploys modest but evocative drawings to explain the role of the local school board and how the board operates, including the fact that the school board is in charge of all of the schools in the county and that they have the power to spend money on schools in ways that they deem necessary. The *Board of Education* comic also explains how the school board gets money from the federal government and local and state taxes. This panel also uses a set of symbols—gas, gin bottle, property, tractor, and a license plate—to demonstrate that local people generate many of the taxes generated for the schools. In so doing, SNCC is building an important argument about the political geography of rights: since local people generate the money for the schools, they should have a say in how that money is spent. From there, the comic continues to educate readers as to how the school board replaces someone if they leave early. In one crucial text-only panel, the qualifications needed to serve on the school board are listed, including a statement in all capital letters that "YOU DO NOT HAVE TO HAVE A TEACHING CERTIFICATE" to serve on the board. Instead, the comic book explains that candidates "need to have good moral character, be known for honesty, have at least an elementary education, have a public spirit, and be committed to public education."

The most crucial page of *the Board of Education* is the final page, which depicts the power of the board to set the qualifications for, and hire, teachers (Figure 3). This was crucial in the segregated South, as white-dominated boards of education often denied teaching positions to qualified Black teachers, and would sometimes hire unqualified teachers for Black schools. The white power structure in the rural South was also concerned with cotton production, and the school board had the power to end the school year early or to reorganize the calendar such that Black kids were in the fields working while white kids remained in school. By connecting the power of the school board to life in small Southern communities, SNCC exposed how segregation was not some kind of large, faceless law but was instead enacted by myriad peoples from across the South, and how the power over Black life was actually in the hands of a select few whites. This point is emphasized by the comic's concluding line (again in all caps) "THE COUNTY SCHOOL BOARD CAN DETERMINE THE LIFE OF YOUR CHILDREN." Running through this and other political education comics is a remapping of the material wellbeing of Black communities. SNCC represented in clear terms that registering to vote and electing people of color to political office were seen as key to bringing greater fairness in the distribution of resources and opportunities to those long oppressed, and not simply the abstract exercise of civil rights.

This final sentence of the comic book speaks to another important way it constitutes a form of GIScience. Geospatial scientists and practitioners increasingly recognize that their data, technologies, maps, and knowledge creation are not merely neutral or valueless analytical tools, but can help renegotiate the terms of life for harmed communities—whether it is using data visualization to advocate for anti-eviction housing justice (Graziani and Shi 2020) or to fill the information need of humanitarian efforts following a natural disaster (Solís et al. 2021). Kwan (2007) cautions against a GIScience that is separated from an embodied and ethical engagement with practices of social life, recognizing that maps and data are always embedded within the social power of affirming or devaluing lives and life chances. SNCC's use of comics to counter-map a version of the Alabama political landscape in which Black children's lives and educations might matter more is instructive of a geospatial ethics of growing urgency today.

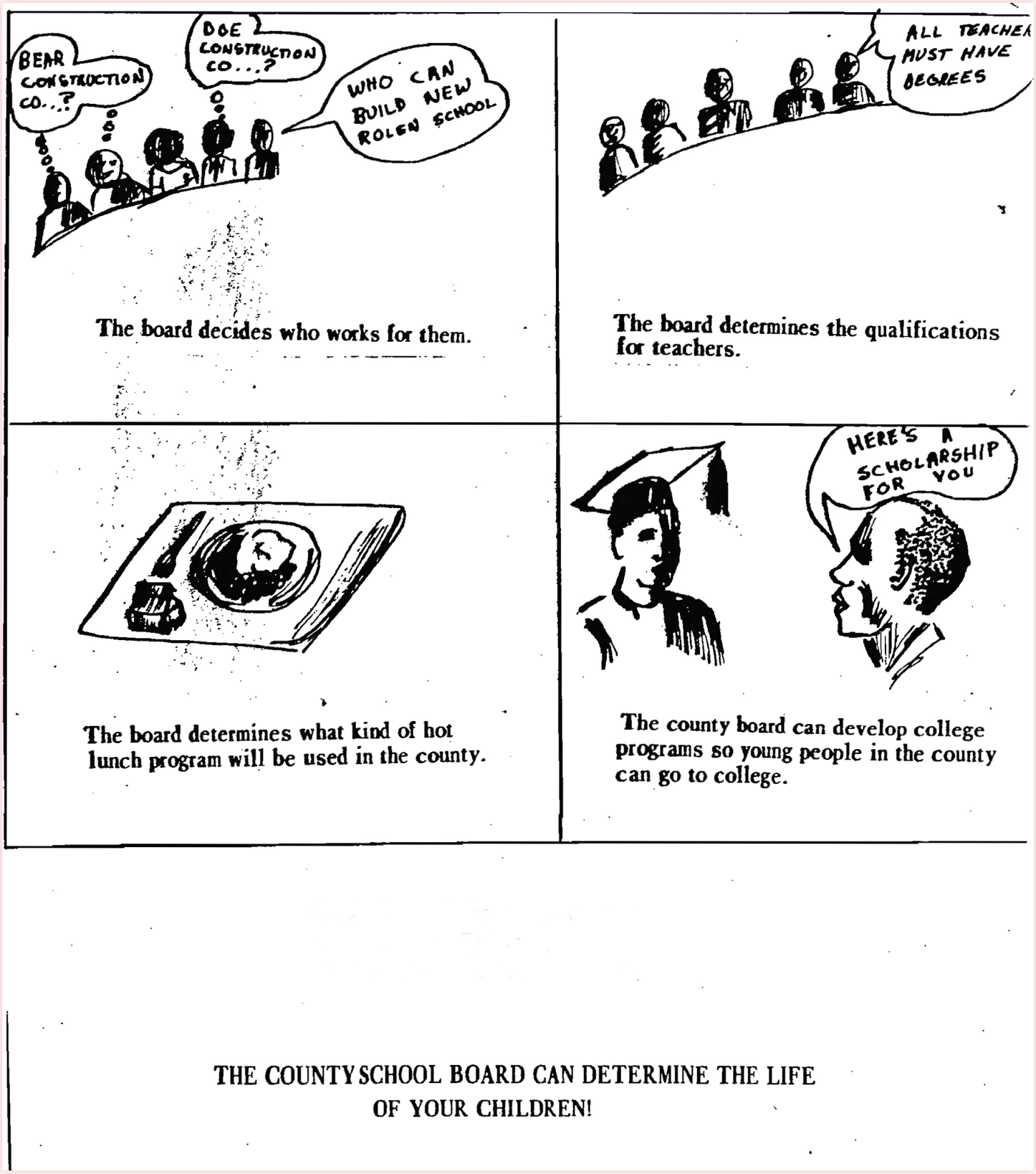


Figure 3. Page from SNCC political education comic, *Board of Education*. Created by Courtland Cox and Jennifer Lawson, 1966. Source: **https://www.crmvet.org/docs/lcfo_educ.pdf**.

SIGNIFICANCE OF COMICS

SNCC's use of comics reflects a nuanced organic intellectual understanding of the many forms that maps can take, engaging in counter-mapping practices to document those deliberately left undocumented, unprotected, and unaccounted for by the systems of power that were built on their exploitation (McKittrick 2006). Counter-mapping is not the only inclusive GIS practice in which these comics engage. They also are formed from, and in turn foster, participatory GIS (PGIS), a practice that is "focused on integrating local knowledge that is multivalent, equivocal, and often conflictual within a reductionist GIS technology" (Harris 2016, 318). PGIS seeks not to create so-called unbiased work but rather to better represent the nuances and cultural meanings of space and place, using the participation of members of the public (Harris 2016). SNCC engages with PGIS by using its members' intensely specific, local experiences in Lowndes County to create these comics, which could then be extrapolated into plans for movement and organization across the American South, which operated on much the same code of white supremacy. The power of these comics, then, is in their storytelling, which allows them to be effective counter-maps. Individual, personal, and local experiences are documented in a visual, narratively efficient way to communicate the lived experiences of those bodies of color experiencing oppression. These tactics thus engage in both PGIS in their information gathering and dissemination and counter-mapping by showing who and what is hidden. These comics remained overlooked because of the same narrow, white, Western sense of knowledge that now seeks to recognize their contributions to GIS. They did not look like "traditional" maps, which made them all the more powerful; they were both overlooked as information tools while simultaneously being what we now recognize as the most powerful combination of information dissemination, combining storytelling and visuals in a nuanced, empathetic, and sympathetic manner which created a detailed understanding of where one stood in the physical, political, and social space of the Jim Crow South.

We have suggested that SNCC's use of comics for political education represents a form of GIScience. The characterization is of greater value to us in the discipline of geography than it is for a civil rights organization already well known for its grassroots, creative, and community-centered approach to Black political mobilization and place-remaking. SNCC veterans already know how revolutionary their practices were in inspiring new generations and styles of activism still felt today. Realizing the value of SNCC for geographic academics and professionals requires recognizing and learning from the traditions of Black geographic thought and analysis that have operated parallel to, while remaining sadly unappreciated within, the formal canons of our field. Broadening what counts as GIScience to include SNCC and what some might see as their unconventional approaches to storytelling and mapping and data creation and use is about improving geospatial practices. In a field where advances in geographic knowledge are still so strongly identified with technological advances, GIScience is well served to invest in storytelling innovations to serve and communicate clearly with communities about how their lives connect in transformative ways to wider relational geographies of opportunity and disparity. We argue that these issues frame the moral and social responsibility that GIScience owes the world. It was an informational responsibility well articulated by a youth-led Civil Rights Movement in the 1960s, even as many geographic scientists at the time were "secluded from, if not deaf to, the geographic imaginations, socio-political needs, and cartographic senses of marginalized communities" (Alderman and Inwood 2024, 313–14). SNCC's brand of GIScience does not represent an isolated moment, but one chapter in a broader history of Black-led counter-mapping, restorative cartographies, radical geospatial intelligence, visual storytelling, and embodied productions of geographic knowledge. We hope that this discussion can inspire more efforts not just to recognize and assimilate these geospatial traditions but to allow them to transform how GIScientists communicate, how they serve the communities in which they work, and further expand the field's possibilities beyond the academic-industrial-military complex.

Finally, thinking both within but also well outside the domain of GIScience, we believe that geographers are well served to explore the efficacy of comics as a means of translating ideas and findings into evocative visual forms and readable words that can make a decided difference to the decisions and debates happening in communities. This argument is already being made eloquently by other geographers—who as part of the creative turn in the field—have begun to recognize and articulate the legitimacy of comics as a way of distilling and translating geographic knowledge to wider audiences (Sou and Hall 2021, Sou and Hall 2023). Pushing back against traditional views that see

comics as not serious academic work, these scholars suggest that creating comics is a more democratic and participatory form of scholarship. Comics have the potential to maximize the impact and accessibility of our storytelling while also challenging dominant narratives—in public and scientific discourse—that can treat marginalized groups in reductive and dehumanizing ways. Importantly, as geographers and GIScientists explore the possibilities of comics as part of the field's tool kit, it is not a project we should do alone, without consulting and learning from freedom struggles and, in particular, SNCC's now over half-century lesson of crafting information, data, and maps that meet people where they are, and situating our science within the needs and abilities of communities.

REFERENCES

Alderman, Derek H., and Joshua Inwood. 2024. "On the living Black atlas: learning geospatial ethics from the African American freedom struggle." *The Cartographic Journal* 61: 306–14. **https://doi.org/10.1080/00087041.2023.2256131**.

Alderman, Derek H., Bethany Craig, Joshua Inwood, and Shaundra Cunningham. 2023. "The 1964 Freedom Schools as Neglected Chapter in Geography Education." *Journal of Geography in Higher Education* 47 (3): 411–31. **https://doi.org/10.1080/03098265.2022.2087056**.

Alderman, Derek, Joshua Inwood, and Ethan Bottone. 2021. "The mapping behind the movement: On recovering the critical cartographies of the African American Freedom Struggle." *Geoforum* 120: 67–78. **https://doi.org/10.1016/j.geoforum.2021.01.022**.

Blaut, James. 1974. "The Ghetto as an Internal Neo-Colony." *Antipode* 6 (1): 37–41. **https://doi.org/10.1111/j.1467-8330.1974.tb00617.x**.

Bledsoe, Adam, LaToya E. Eaves, and Brian Williams. 2017. "Introduction: Black Geographies in and of the United States South." *Southeastern Geographer* 57 (1): 6–11. **https://doi.org/10.1353/sgo.2017.0002**.

Brookfield, Harold. 1972. *Colonialism development and independence: The case of the Melanesian islands in the South Pacific*. Cambridge: Cambridge University Press.

Bryan, Joe, and Denis Wood. 2015. *Weaponizing maps: Indigenous peoples and counterinsurgency in the Americas*. New York: Guilford Publications.

Burns, Ryan. 2021. "Transgressions: Reflecting on critical GIS and digital geographies." *Digital Geography and Society* 2: 100011. **https://doi.org/10.1016/j.diggeo.2021.100011**.

Combs, Barbara. 2013. *From Selma to Montgomery: The long march to freedom*. New York: Routledge.

Conte, Simona, and Marta Napolillo. 2024. "GIS²: a Geographical Information System as a help against the Gender Inequality Society." womENcourage 2024, June 26–28, 2024, Madrid, Spain. **https://womencourage.acm.org/2024/wp-content/uploads/2024/06/womencourage2024-posters-final38-comprimido.pdf**.

Cope, Megan, and Sara Elwood. 2009. *Qualitative GIS: A Mixed Methods Approach*. New York: Sage Publications.

Crampton, Jeremy W. 2001. "Maps as social constructions: power, communication and visualization." *Progress in Human Geography* 25 (2): 235–252. **https://doi.org/10.1191/030913201678580494**.

———. 2015. "Collect it all: National security, big data and governance." *GeoJournal* 80: 519–531. **https://doi.org/10.1007/s10708-014-9598-y**.

Crampton, Jeremy, and John Krygier. 2005. "An introduction to critical cartography." *ACME: An International Journal for Critical Geographies* 4 (1): 11–33. **https://doi.org/10.14288/acme.v4i1.723**.

Eig, Jonathan. 2023. *King: A Life*. New York: Farrar, Strauss, and Giroux.

Emmons, Caroline. 2018. "Selma's Bloody Sunday: Protest, Voting Rights, and the Struggle for Racial Equality by Robert A. Pratt." *Journal of Southern History* 84 (2): 517–518. **https://doi.org/10.1353/soh.2018.0075**.

Finkelman, Paul. 2015. "The necessity of the Voting Rights Act of 1965 and the difficulty of overcoming almost a century of voting discrimination." *Louisiana Law Review* 76 (1): 181–223.

Fraser, Benjamin. 2019. *Visible cities, global comics: urban images and spatial form*. Jackson, MS: University Press of Mississippi.

Gillespie, Deanna. 2014. "'First-Class' Citizenship Education in the Mississippi Delta, 1961–1965." *The Journal of Southern History* 80 (1): 109–142.

Ginsburg, Norton. 1973. "From colonialism to national development: geographical perspectives on patterns and policies." *Annals of the Association of American Geographers* 63 (1): 1–21. **https://doi.org/10.1111/j.1467-8306.1973.tb00900.x**.

Goodchild, Michael. 1992. "Geographical information science." *International Journal of Geographical Information Systems* 6 (1): 31–45. **https://doi.org/10.1080/02693799208901893**.

———. 2010. "Twenty years of progress: GIScience in 2010." *Journal of Spatial Information Science* 1: 3–20. **https://doi.org/10.5311/JOSIS.2010.1.2**.

Graziani, Terra, and Mary Shi. 2020. "Data for justice: tensions and lessons from the anti-eviction mapping project's work between academia and activism." *ACME: An International Journal for Critical Geographies* 19 (1): 397–412. **https://doi.org/10.14288/acme.v19i1.1776**.

Hanchard, Mathew. 2024. *Engaging with Digital Maps: Our Knowledgeable Deferral to Rough Guides*. Singapore: Palgrave Macmillan.

Harley, J. B., and David Woodward. 1989. "Why cartography needs its history." *The American Cartographer* 16 (1): 5–15. **https://doi.org/10.1559/152304089783875604**.

Harris, Donald. 1972. "The black ghetto as colony: A theoretical critique and alternative formulation." *The Review of Black Political Economy* 2 (4): 3–33. **https://doi.org/10.1007/BF03040520**.

Harris, Trevor M. 2016. "From PGIS to Participatory Deep Mapping and Spatial Storytelling: An Evolving Trajectory in Community Knowledge Representation in GIS." *The Cartographic Journal* 53 (4): 318–325. **https://doi.org/10.1080/00087041.2016.1243864**.

Hatfield, Charles. 2000. *Graphic interventions: Form and argument in contemporary comics*. Hartford: University of Connecticut Press.

Hawthorne, Camilla. 2019. "Black Matters are Spatial Matters: Black Geographies for the 21st Century." *Geography Compass* 13 (11): 1–13. **https://doi.org/10.1111/gec3.12468**.

Inwood, Joshua F. J. 2023. "The modern infrastructure landscape and the legacy of slavery." *The Professional Geographer* 75 (1): 44–51. **https://doi.org/10.1080/00330124.2022.2085120**.

Inwood, Joshua, and Derek H. Alderman. 2020. "'The Care and Feeding of Power Structures': Reconceptualizing Geospatial Intelligence through the Countermapping Efforts of the Student Nonviolent Coordinating Committee." *Annals of the American Association of Geographers* 110 (3): 705–723. **https://doi.org/10.1080/24694452.2019.1631747**.

———. 2021. "Performing the spadework of civil rights: SNCC's free southern theater as radical place-making and epistemic justice." *GeoJournal* 87: 3719–34. **https://doi.org/10.1007/s10708-021-10459-6**.

Keighren, Innes, Jeremy W. Crampton, Franklin Ginn, Scott Kirsch, Audrey Kobayashi, and Jörn Seemann. 2015. "Teaching the history of geography: Current challenges and future directions." *Progress in Human Geography* 41 (2): 245–262. **https://doi.org/10.1177/0309132515575940**.

Kelley, Elleza. 2021. "'Follow the Tree Flowers': Fugitive Mapping in Beloved." *Antipode* 53 (1): 181–199. **https://doi.org/10.1111/anti.12679**.

Kwan, Mei-Po. 2007. "Affecting geospatial technologies: Toward a feminist politics of emotion." *The Professional Geographer* 59 (1): 22–34. **https://doi.org/10.1111/j.1467-9272.2007.00588.x**.

Lally, Nick. 2022. "What Can GIS Do?" *ACME: An International Journal for Critical Geographies* 21 (4): 337–345. **https://doi.org/10.14288/acme.v21i4.1972**.

Leeds, Anthony. 1975. "Capitalism, colonialism and war: An evolutionary perspective." In *War: its Causes and Correlates*, edited by Martin A. Nettleship and Dale Givens, 483–513. The Hague: Mouton. **https://doi.org/10.1515/9783110810523.483**.

Magdoff, Harry. 1969. *The Age of Imperialism: The Economics of US Foreign Policy.* New York: NYU Press.

Mark, David. 2003. "Geographic information science: Defining the field." In *Foundations of Geographic Information Science*, edited by Matt Duckham, Michael F. Goodchild, and Michael Worboys, 1–17. London: Taylor & Francis. **https://doi.org/10.1201/9780203009543-7**.

McKittrick, Katherine. 2006. *Demonic Grounds: Black Women and the Cartographies of Struggle*. Minneapolis: University of Minnesota Press.

McMillen, Neil. 1994. *The Citizens' Council: Organized Resistance to the Second Reconstruction, 1954–64*. Urbana, IL: University of Illinois Press.

Mogel, Lize, and Alexis Bhagat, eds. 2007. *An Atlas of Radical Cartography*. Los Angeles: Journal of Aesthetics & Protest Press.

Murphree, Vanessa. 2003. "The Selling of Civil Rights: The Communication Section of the Student Nonviolent Coordinating Committee." *Journalism History* 29 (1): 21–31. **https://doi.org/10.1080/00947679.2003.12062617**.

Nelson, T. A., M. F. Goodchild, and D. J. Wright. 2022. "Accelerating ethics, empathy, and equity in geographic information science." *Proceedings of the National Academy of Sciences* 119 (19): e2119967119. **https://doi.org/10.1073/pnas.2119967119**.

Nimoh, Suzanne. 2025. "Airing the Ungeographic: Anacostia Unmapped and Black Geographies of Gentrification in Washington, DC." *ACME: An International Journal for Critical Geographies* 24 (3): 260–77. **https://doi.org/10.14288/acme.aa3oem-2360**.

Ogborn, Miles. 2023. "Cedric Robinson's Black Marxism and the uses of historical geography." *Journal of Historical Geography* 82: 81–90. **https://doi.org/10.1016/j.jhg.2023.09.009**.

Peltier, Elian. 2024. "A graphic novel finds a relatable hero in a modern African Woman." *The New York Times.* February 10, 2024.

Perlstein, Daniel. 1990. "Teaching freedom: SNCC and the creation of the Mississippi freedom schools." *History of Education Quarterly* 30 (3): 297–324. **https://doi.org/10.2307/368691**.

Persky, Joseph. 1972. "Regional Colonialism and the Southern Economy." *Review of Radical Political Economics* 4 (5): 70–79. **https://doi.org/10.1177/048661347200400503**.

Peterle, Giada. 2015. "Teaching cartography with comics: some examples from BeccoGiallo's graphic novel series." *J-READING Journal of Research and Didactics in Geography* 69–78.

Puente, Mayra, and Veronica Vélez. 2024. "Ground-truthing as Critical Race Feminista Methodology: toward an embodied and community-centered GIS in educational inquiry." *International Journal of Qualitative Studies in Education* 37: 1287–1306. **https://doi.org/10.1080/09518398.2024.2336479**.

Pulido, Laura. 2023. "Cultural memory, white innocence, and United States territory: the 2022 Urban Geography plenary lecture." *Urban Geography* 44 (6): 1059–1083. **https://doi.org/10.1080/02723638.2023.2203585**.

Roth, Robert. 2021. "Cartographic design as visual storytelling: synthesis and review of map-based narratives, genres, and tropes." *The Cartographic Journal* 58 (1): 83–114. **https://doi.org/10.1080/00087041.2019.1633103**.

Sax, Boria. 2006. "Storytelling and the 'information overload.'" *On The Horizon* 14 (4): 165–170. **https://doi.org/10.1108/10748120610708078**.

Slayton, Emma, and Jessica G. Benner. 2021. "Using Spatial Storytelling as an Approach to Teaching GIS and Spatial Literacy Skills." *Journal of Map and Geography Libraries* 16 (3): 300–316. **https://doi.org/10.1080/15420353.2021.1964673**.

Smith, Neil. 1992. "Geography, difference and the politics of scale." In *Postmodernism and the social sciences*, edited by Joe Doherty, Elspeth Graham, and Mo Malek, 57–79. London: Palgrave Macmillan UK.

Solís, Patricia, Jennings Anderson, and Sushil Rajagopalan. 2021. "Open geospatial tools for humanitarian data creation, analysis, and learning through the global lens of Youth Mappers." *Journal of Geographical Systems* 23: 599–625. https://doi.org/10.1007/s10109-020-00339-x.

Sou, Gemma, and Sarah Marie Hall. 2021. "Communicating crisis research with comics: representation, process, and pedagogy." In *Qualitative and Digital Research in Times of Crisis: Methods, Reflexivity, and Ethics*, edited by Helen Kara and Su-ming Khoo, 93–110. Bristol: Bristol University Press.

———. 2023. "Comics and zines for creative research impact: ethics, politics and praxis in geographical research." *ACME* 22 (1): 817–41. https://doi.org/10.14288/acme.v22i1.2120.

Stack, Katrina, and Derek H. Alderman. 2024. "Tent City/Freedom City geographies: Teaching beyond the 'Canon' of civil rights movement memory." *The Geography Teacher* 21 (1): 50–57. https://doi.org/10.1080/19338341.2024.2315533.

SNCC Digital Gateway. 2025a. "Political and Economic Education." Accessed July 24, 2025. https://snccdigital.org/inside-sncc/culture-education/political-economic-education/.

———. 2025b. "Our Voices: The Black Panther: Political Education." Accessed July 24, 2025. https://snccdigital.org/wp-content/uploads/2017/12/Lowndes_Transcript04.pdf.

Staimpel, Saskia. 2021. "Rebellious to Revolutionary: SNCC and its Transformative Activism." *Global Africana Review* 5 (1): 38–49. https://doi.org/10.17615/vv5g-9953.

Student Nonviolent Coordinating Committee. 1965. *Mississippi: A Colony of Standard Oil and Sears, Roebuck*. https://www.crmvet.org/docs/6511_sncc_ms-colony.pdf.

Sui, Daniel. 2015. "Emerging GIS themes and the six senses of the new mind: is GIS becoming a liberation technology?" *Annals of GIS* 21 (1): 1–13. https://doi.org/10.1080/19475683.2014.992958.

Swann, D. 1999. "Military Applications of GIS." In *Geographical Information Systems: Principles, Techniques, Management and Applications*, 2nd ed., vol. 2, edited by Paul A. Longley, Michael F. Goodchild, David J. Maguire, and David W. Rhind, 889–99. New York: John Wiley & Sons.

Taylor, Faith E., James D.A. Millington, Ezekiel Jacob, Bruce D. Malamud, and Mark Pelling. 2020. "Messy maps: Qualitative GIS representations of resilience." *Landscape and Urban Planning* 198: 103771. https://doi.org/10.1016/j.landurbplan.2020.103771.

Tomiuc, Anamaria, Alice Iliescu, and Daniel Popescu. 2022. "Urban Comics as a Research Method and Tool in Social Innovation. Case Study: ArtiViStory Collective." *Journal of Media Research* 15 (3): 74–92. https://doi.org/10.24193/jmr.44.5.

Wood, Denis, and John Fels. 1992. *The Power of Maps*. New York: Guilford Press.

Woods, Clyde. 1998. Development arrested: The blues and plantation power in the Mississippi Delta. London: Verso Books.

Wright, Willie Jamaal. 2019. "The public is intellectual." *The Professional Geographer* 71 (1): 172–178. https://doi.org/10.1080/00330124.2018.1453186.

Yessler, Reagan, and Derek Hilton Alderman. 2021. "Art as 'talking back': Louise Jefferson's life and legacy of counter-mapping." *Cartographica* 56 (2): 137–150. https://doi.org/10.3138/cart-2020-0011.

Zhao, Bo. 2022. "Humanistic GIS: Toward a research agenda." *Annals of the American Association of Geographers* 112 (6): 1576–1592. https://doi.org/10.1080/24694452.2021.2004875.

DOI: 10.14714/CP109.2039

PEER-REVIEWED ARTICLE

Designing Maps in News Stories: A Longitudinal Visual Content Analysis of Cartographic Design in US Data Journalism

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Here, we report on a longitudinal visual content analysis on mapping praxis in popular US news media outlets over the past decade. Maps are integral to data journalism, yet professional practice in storytelling with maps continues to outpace research and education. To fill this gap, we analyzed 119 online news stories containing maps published over two periods in 2014 and 2021 from the New York Times *and* Washington Post. *We coded the sampled news maps according to three considerations: (1) conventional cartographic design (e.g., scale, projection, basemap, time, color depth, thematic map type, layout, map elements); (2) new digital technology (e.g., animation, interaction, real-time updates); and (3) visual storytelling techniques (e.g., story theme, genres, and tropes). The longitudinal visual content analysis provided a benchmark study for digital news mapping and yielded a number of insights into design trends, including: a decrease in the number and complexity of maps used in news stories; a shift away from mapping international stories towards domestic stories; a decrease in interactivity and an increase in animation due to a move towards mobile-first design and scrollytelling; an increase in mapping topics related to health, environment, and science; a decrease in the mapping of conflict, cultural affairs, and society; and a decrease in the focusing attention trope, but an increase in metaphor and designer voice. Based on these findings, we argue for continued critical analysis of news maps within data journalism, and visual storytelling more broadly, because of their pervasiveness in new digital media and associated outsized influence on map audiences.*

KEYWORDS: cartographic design; data journalism; news maps; visual storytelling; content analysis

1. INTRODUCTION: DESIGNING MAPS IN NEWS STORIES

In this article, we report on a longitudinal (i.e., repeated over multiple time periods for comparison) visual content analysis tracking the evolution of cartographic design and visual storytelling praxis in popular US news media outlets over the past decade. Maps are integral to data journalism—the creation of news stories generated from and supported by data analysis and visualization (see Gray et al. 2012, Riche et al. 2018 for overviews)—with professional cartographers increasingly serving as "visual storytellers" through the intentional design and curation of text, images, and data-driven graphics into intuitive and compelling narrative structures (Roth 2021, Kelly 2022). Similarly, storytelling is now an established research focus at the intersection of cartography, geography, and GIScience (e.g., Monmonier 1989, Elwood 2006, Pearce 2009, Phillips 2012, Caquard 2013, Fish 2020b, Harris 2020, Bogucka 2022, Olmedo and Caquard 2022, Song et al. 2022, Prestby 2024, Caquard and Shaw 2025) as well as related, visual-centric fields of information visualization, user experience (UX) design, and visual analytics (e.g., Gershon and Page 2001, Eccles et al. 2008, Segel and Heer 2010, Ma et al. 2012, Kosara and Mackinlay 2013, Hullman et al. 2013, Park et al. 2022). Despite this parallel interest, the professional practice of visual

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storytelling continues to outpace research and education (Wallace 2016, Cairo Touriño 2017).

We work towards filling this gap by examining how established cartographic design principles and emerging visual storytelling techniques are applied in the context of data journalism. Specifically, we ask:

- (RQ1) How are data journalists maintaining or disrupting conventional cartographic design tenets, and how have these practices changed over time?
- (RQ2) How are data journalists leveraging design affordances and constraints of new interactive, online, and mobile technology, and how has this digital practice changed over time?
- (RQ3) How are data journalists employing novel visual storytelling techniques, and how has this practice changed over time?

To answer these questions, we analyzed 119 online news stories containing maps published over two periods in 2014 and 2021 from the *New York Times* (*NYTimes*) and *Washington Post* (*WaPo*), two prominent US-based media outlets and two of the top three most subscribed newspapers in the country at the time of this writing (along with *The Wall Street Journal*). We conducted a visual content analysis (Rose 2022), coding each map within our sample according to three design considerations, each related to one of our research questions: (1) elements of cartographic design (e.g., scale, projection, basemap, time, color depth, thematic map type, layout, map elements); (2) new digital technology (e.g., animation, interaction, real-time updates); and (3) visual storytelling techniques (e.g., story theme, genres, and tropes). We compared our results across the two sampled time periods (2014 and 2021) to identify longitudinal changes and trends in news maps over these three design dimensions.

In the next section, we review useful conceptual frameworks from cartographic design, new digital media, and visual storytelling by way of defining and justifying the coding scheme applied in the longitudinal visual content analysis. We summarize the sampling strategy, coding procedure, and analysis approach in the third methods section. We review salient results from the longitudinal visual content analysis in the fourth section and conclude with a discussion and outlook of cartographic design and visual storytelling in data journalism. To this end, the longitudinal visual content analysis serves as a benchmark study for cartographic design and visual storytelling in data journalism, charting where news map design has been over the past decade while illuminating persistent gaps between theory and practice that inform future cartographic research, design, and education.

2. BACKGROUND: DESIGN CONSIDERATIONS FOR NEWS MAPS

The term *visual storytelling* originates in cinema and commonly is evoked today to describe stories communicated through illustrations, graphics, imagery, and video instead of or in addition to oral, written, and audio forms (Segel and Heer 2010). Research on "narrative cartography" draws from an eclectic set of influences in geography (e.g., Cameron 2012, Caquard 2014, Ryan et al. 2016), with a storytelling approach informing the digital humanities broadly (e.g., Knowles et al. 2015, Scott 2021, Alderman and Inwood 2024), as well as cinematic (e.g., Caquard and Taylor 2009, Muehlenhaus 2014), imaginative (e.g., Joliveau 2009, Caquard 2011), Indigenous (e.g., Chapin et al. 2005, Pearce and Louis 2008), literary (e.g., Moretti 2005, Bushell 2012), multimedia (e.g., Monmonier 1992, Cartwright 1999), and participatory (e.g., Elwood 2006, Miller 2006) mappings, specifically (see Roth 2021 for an extended review of influences). In the following, we use *story* to describe an account of specific events, places, and people, and *narrative* to describe the structure and presentation of story content (Pearce and Louis 2008). Given the focus of our research questions on the structure and presentation of maps within visual stories, we therefore primarily coded for aspects of the narrative that can be manipulated (i.e., designed) by the cartographer regardless of the story content.

Our first set of codes captured elements of cartographic design that impact the communication of geospatial information and therefore the presentation of the narrative (RQ1). These codes included design decisions made early in map preparation, such as cartographic scale (Raposo 2017) and map projection (e.g., class, orientation, perspective; Battersby 2017). We also captured information about how the included geospatial data layers were mapped, such

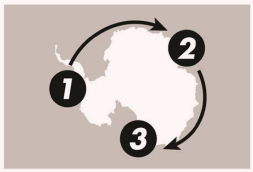
as the type of basemap (i.e., geospatial context, the visual style of which can play a persuasive role in interpretation of the map; Tyner 1982), the kind of temporal information if included (Fish 2018, Steiner 2019), and the number of mapped attributes and their resulting thematic symbolization (Golebiowska et al. 2021), including the color depth used for the symbolization (Christophe 2019). Coding deconstruction of map layers into location, time, and attributes followed Peuquet's (1994) information "TRIAD." Finally, we also coded layout composition (e.g., the map's aspect ratio, size, and placement within the overall story; Tait 2018) and map elements. These codes serve as a baseline for understanding how data journalists are conforming to, but also innovating beyond, established cartographic design principles (e.g., Robinson et al. 1995, Dent et al. 2008, Tyner 2014, Brewer 2015, Kraak et al. 2020, Slocum et al. 2022).

Our second set of codes examined affordances and constraints offered by new "geoweb" or "web mapping" digital media that are inherently interactive, online, and mobile (RQ2; Sieber et al. 2016). These codes documented dynamic animation as an alternative to static spatiotemporal representation (Fish 2018), implementation of interaction operators that enable the audience to change the map display beyond simple scrolling (Roth 2017), and real-time updates, particularly during unfolding events. Shifting visual storytelling towards interactive, online, and mobile media has a cost in both time and expertise, and therefore we expected digital maps supporting visual stories to be more intentional and creative in their designs as compared to more well-established static locator maps designed to work in print, potentially making them more indicative of patterns and trends in data journalism practice. Common strategies—such as inclusion of a "slippy" map that supports the pan, zoom, overlay, and detail retrieval interaction operators (Roth et al. 2014)—also may indicate how popular news agencies are drawing from and contributing to conventions in the use of the geospatial web. As with cartographic design decisions for static maps, changes in the number of animations or interaction operators also may suggest a shift to more or less information (regarding animation) and interface (regarding interaction operators) complexity for the purposes of visual storytelling (Vincent et al. 2019), and thus reveal the data journalists' intention to support an active and exploratory versus a passive and linear experience with the visual story (adapted from MacEachren 1994). We initially attempted to code for other salient characteristics of new digital media, such as responsive layouts between mobile and non-mobile devices or map sharing through social media, but nearly all sampled visual stories from *The New York Times* and *The Washington Post* supported these features. Instead, some patterns and trends in conventional cartographic design (RQ1) suggest new strategies for mobile-first and responsive cartographic design (Roth et al. 2024, Houtman 2025).

Finally, our third set of codes collected novel visual storytelling techniques described in the diverse literature on storytelling across cartography, geography, GIScience, information visualization, UX design, and visual analytics (RQ3). Visual storytelling codes included Vujaković's (2014) eighteen-part taxonomy of geographic news map topics organized into seven higher levels (politics: internal, politics: international, disasters/accidents, environment and science, society, cultural affairs, and economics), a categorization of story content (versus narrative structure) that we were able to code for reliably. We also coded for emerging visual storytelling genres and tropes as synthesized in Roth (2021). A visual storytelling genre is defined by the visual or interactive technique used to structure the continuity (sometimes, but not always, linear continuity) of the narrative content, and includes static visual stories (with continuity enforced through layout and annotation) and a number of narrative forms such as the longform infographic (i.e., "scrollytelling," with continuity from vertical page scroll), dynamic slideshows (continuity from slide advancement), narrated animations (continuity from playback time), multimedia visual experiences (continuity from anchor tags and hyperlinks), personalized story maps (continuity from the temporal order of user generated contributions), and compilations (continuity from the temporal order of real-time updates; Figure 1). A visual storytelling trope is a design technique used to advance the narrative rather than encode information (as in the cartographic design codes above), and for our analysis includes techniques used for setting the mood (primarily through visual style), focusing attention (e.g., highlighting, annotation, dynamism), imbuing metaphors (e.g., associative point symbols, juxtaposition, cartooning and illustration, hyperrealism, collage and montage), and embedding voice (through provision of authorship, bylines, data sources, and explainer text).

A summary of all codes used in the longitudinal visual content analysis is provided in the Supplemental Materials.

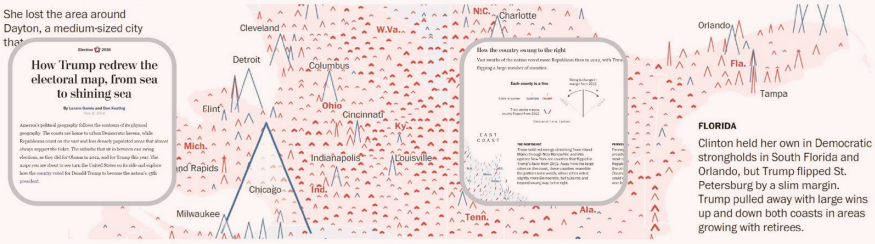
A
Static Visual Stories





B
Longform Infographics





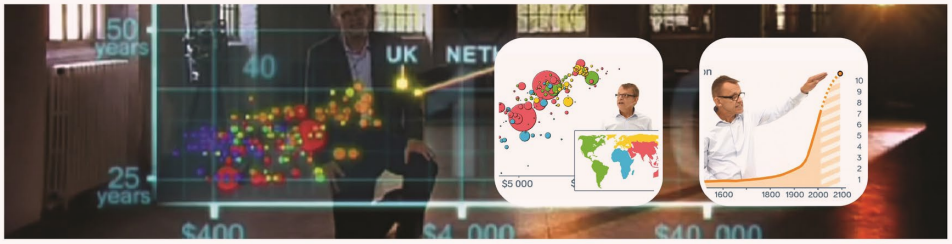
C
Dynamic Slideshows



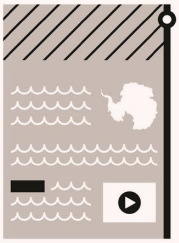


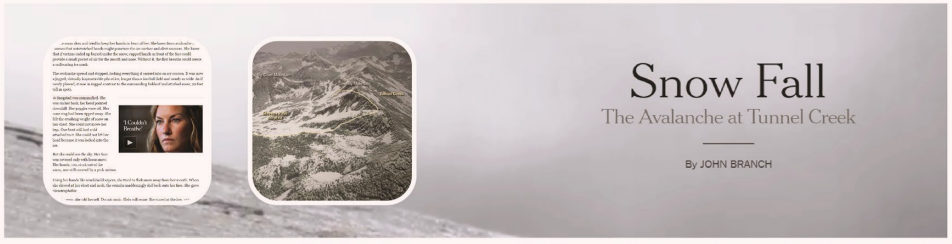
D
Narrated Animations





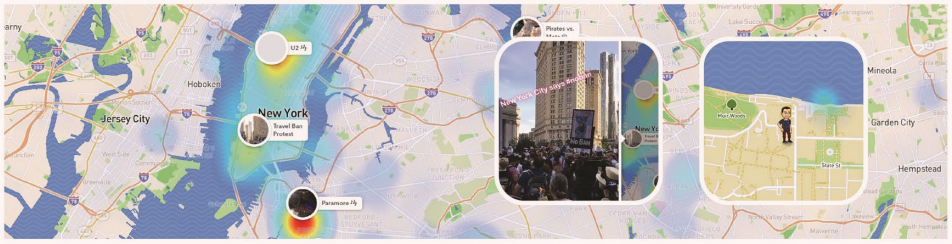
E
Multimedia Visual Experiences



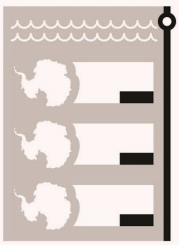


F
Personalized Story Maps





G
Compilations



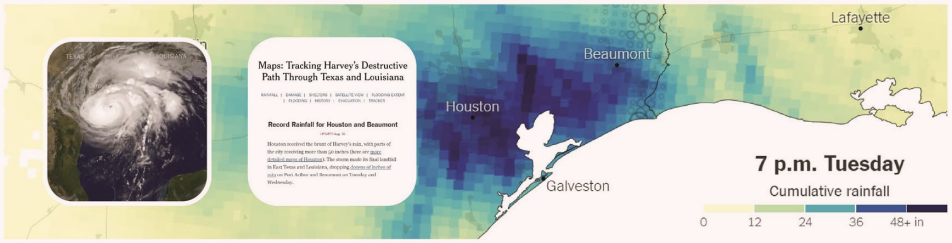


Figure 1. Visual storytelling genres. Visual storytelling genres differ by the visual or interactive technique used to enforce linearity in the narrative sequence. The following overview of visual storytelling genres is expanded from Roth (2021).

(caption continues on next page)

Figure 1. *(continued from prior page).*

A. Static visual stories. "The Melting of Antarctica," published in *National Geographic* (Tierney and Treat 2017), explains the increased susceptibility of Antarctic ice to climate change. The static visual story uses layout, negative space, and annotation to enforce linearity. A comparison of the static magazine version to a narrated animation of the same content is described in Tierney (2018).

B. Longform infographics. "How Trump Redrew the Electoral Map, from Sea to Shining Sea," published online by *The Washington Post* (Gamio and Keating 2016) uses two maps with novel symbolization to illustrate the shift in party voting in the US presidential election from 2012 to 2016. The maps are oriented east-up and read like strip maps, with linearity enforced through browser scrolling. Notably, the scrolling mimics the closing of polls from the Eastern to the Pacific time zones, adding a temporal dimension to the linear storytelling.

C. Dynamic slideshows. "Amazonia Under Threat," published online by *National Geographic* (Baptista et al. 2015) describes risks to biodiversity and the environment from human activities in the Amazon basin. The dynamic slideshow uses a persistent interface docked on the right to enforce linearity. The slide content is dynamic, enabling a break from linear storytelling through vertical scrolling, map panning and zooming, and animations.

D. Narrated animations. Example stills from "The Joy of Stats" videos published on **gapminder.org** (videos collected 2010–2018; accessed July 1, 2018), which use statistics and visualization to describe worldwide sociodemographic changes over the past two centuries. Linearity is enforced through display time in the narrated animation. Beyond just voice narration, Hans Rosling inserts himself into the animated graphics, further humanizing the visual story.

E. Multimedia visual experiences. "Snow Fall: The Avalanche at Tunnel Creek," published online by *The New York Times* (Branch 2012) details the experiences of skiers and snowboarders trapped in an avalanche in the US state of Washington. The multimedia visual experience uses a compelling array of text, images, maps, and videos, activating dynamic content through anchor tags and hyperlinks while scrolling.

F. Personalized story maps. "Snap Map," maintained by Snapchat (accessed July 1, 2018) is a platform for sharing photos and videos as georeferenced visual "stories" that last for 24 hours. The service aggregates clusters of stories to represent current events for viewing online, with linearity within each event enforced by the order of user contributions. In the mobile application, users can embed themselves into the map using an avatar, sharing their location with friends at a high spatial precision as they contribute visual media.

G. Compilations. "Maps: Tracking Harvey's Destructive Path Through Texas and Louisiana," maintained by *The New York Times* (Aisch et al. 2017) tracks the development and impact of Hurricane Harvey in the Gulf region of the US. As the event unfolds, map updates are placed at the top of the compilation, enforcing linearity from newest to oldest updates. Many of the maps in the compilation link to other content from *The New York Times*, enabling non-linear storytelling.

3. METHODS: LONGITUDINAL VISUAL CONTENT ANALYSIS

We followed principles of visual content analysis to identify patterns and trends in the design of maps in news stories. *Content analysis* (beyond the visual) is an established interdisciplinary research method that can examine both quantitative and qualitative relationships in secondary sources (e.g., archives, correspondence, documentation, and other popular or scholarly collections), using these materials as informative externalizations of the authors' meanings, decisions, and values to triangulate with primary sources or replace unavailable primary sources (see Krippendorff 2019 for a methodological overview). Accordingly, our study reported here complements the small suite of contemporary interview studies on news map design with data journalists (e.g., Roth 2015, Fish 2020b, Steinberg 2023). *Visual content analysis* describes the systematic coding process that analyzes the primarily graphic elements and composition of a corpus of visual representations (see Rose 2022 for a methodological overview), and has become one of the most common empirical methods in cartography and related disciplines given the ability to benchmark patterns and trends in design (Fish et al. 2025).

Our analysis aligns with and expands previous visual genealogies that examine cartographic design trends (RQ1) over time in atlases (Muehlenhaus 2011), journals (Kessler and Slocum 2011, White et al. 2017), and textbooks (Nestel 2024). Visual content analysis also has been used to assess changes in cartographic technologies (RQ2) like the influence of interactive (Roth et al. 2015, Fish

and Calvert 2016, Hart et al. 2022) and mobile capacities (Abraham 2019). While visual content analysis has been used to analyze storytelling techniques in data journalism (e.g., Knight 2015), existing studies on news map design primarily focus on a single thematic topic (e.g., Kelly 2016, Fish 2020a, Underwood 2022, Prestby 2024; see Gomes et al. 2025 for a recent, broader treatment of news maps). As such, our analysis serves to exemplify the breadth and utility of a visual content analysis of news maps across cartographic design, technologies, and visual storytelling (RQ3). Our study also extends previously mentioned genealogies of atlases, journals, and textbooks to provide a systematic longitudinal analysis of contemporary news map design, leading to several unique methodological considerations and constraints potentially transferable to other visual content analyses.

3.1 MATERIALS

The objective of our sampling strategy was to establish reproducible criteria that would yield two directly comparable sets of news maps for longitudinal analysis during our time period of interest (described below) and not to attempt to comprehensively sample across media outlet, time, or thematic topic. We originally considered a wide set of candidates with a diverse target audience and geographic circulation, while still publishing in English (the primary fluent language of the co-authors), including the ArcGIS StoryMaps gallery, the British Broadcasting Corporation, *National Geographic*, the *South China Morning Post*, *USA Today*, and the *Wall Street Journal*. However, we narrowed our focus to *NYTimes* and *WaPo* because they each had a sufficient volume of news stories with digital maps over the time period of interest, enough to enable consistent longitudinal analysis, although at the cost of constraining findings to US data journalism (as we discuss later on in the limitations section).

We selected 2014 as a baseline year because it followed several watershed changes in cartographic design practices (RQ1; e.g., the shift towards multiscale digital map design, such as the 2005 launch of Google Maps and 2012 launch of Apple Maps), digital technologies (RQ2; e.g., the ~2010 move away from rich internet applications like Adobe Flash for web maps and towards mobile-first design), and visual storytelling techniques (RQ3; e.g., following the 2012 Pulitzer Prize–winning "**Snow Fall**" scrollytelling experience published in *NYTimes*; Branch 2012). Thus, we anticipated a new era of map-based data journalism to have coalesced by 2014 that was unlike prior forms of news map design. We then selected 2021 as the comparative year due to similarities in events between 2014 and 2021 that we believed would afford consistency between the samples, including: a major disease outbreak (Ebola in 2014, COVID-19 in 2021), the #BlackLivesMatter movement (incidents and protests related to Ferguson, MO, and Minneapolis, MN, respectively), non-Presidential elections (2014 midterms and 2021 New Jersey gubernatorial and New York City mayoral races), and Israel's occupation of Palestine and blockade of Gaza (activities that have continued to escalate to war crimes, crimes against humanity, and genocide at the time of this writing; Weizman et al. 2024, Albanese 2024, United Nations 2024). However, a perfect parity in events is not possible for a longitudinal study on news map design.

We limited our sample to a pair of two-month time periods: October 10–December 20, 2014 and May 3–July 2, 2021. The 2014 window was longer than that of 2021 due to a gap in published map-based news stories during the US holiday week of Thanksgiving. We selected a time period in 2021 after the COVID-19 vaccine was globally available to capture COVID-19 news stories, but avoided the most potentially disrupted newsroom period of the pandemic in 2020 and early 2021.

We included only news stories with *digital* maps (i.e., designed for screens) in our corpus, given our focus on new digital technologies (RQ2) and visual storytelling techniques (RQ3). We excluded all news stories that did not include a digital map, although we employed a broad and inclusive definition of "map" as any spatialized (two- or three-dimensional) representation supporting a place-based news story. For example, our selection process included maps of outer space as well as air or satellite photos. We did not, however, include maps that were used in advertisements or logos, maps appearing in the background of photos or videos, or historic maps repurposed for the news story. Further, we only included news stories with maps posted on the social media accounts of each outlet's graphics team (specifically, @nytgraphics and @PostGraphics on Twitter, the platform now known as X), rather than all possible digital news maps. This narrowed the analysis to only the most relevant or novel designs, as determined by the people who created them. We utilized Twitter's API for academic research (a reasonable decision at the time, but limited in reproducibility today due to shifts in ownership and participation) to collect all

news stories linked in tweets posted during the two time periods. Finally, we did not include "year in review" articles or other articles primarily based on maps found previously in the corpus.

We captured the corpus of 119 stories in the spring of 2023 and largely completed the analysis and write-up in the 2023–2024 academic year, ultimately resulting in a 2025 submission.

3.2 PROCEDURE

We coded each news story within our sample across the three thematic arenas described above: elements of cartographic design, technology, and visual storytelling techniques.

We reduced an initial coding scheme of 298 codes to the final set of 161 codes (given in the Supplemental Materials) after two project members coded approximately 20% of the news stories in the corpus. We primarily removed ordinal level codes (e.g., degrees of low to high, sparse to dense, etc.) that were challenging to reliably code across coders, converting all codes to binary presence/absence. For news stories that contained multiple digital maps, a code was marked as "present" if any of the maps exhibited the feature represented by the code. The pair of coders then recoded the first 20% of the news stories and the remaining 80% of the corpus, marking any disagreements for group discussion and reconciliation.

We previewed all maps on both mobile and desktop devices, but coded all maps based on their desktop experience using a 1080p screen.

3.3 ANALYSIS

We did not run inferential statistics on the coding results, since the sampled corpus and code frequencies do not meet assumptions of normality, and instead interpreted patterns and trends from descriptive statistics (Muehlenhaus 2011, Rose 2022). We normalized all codes by calculating the percentage of news stories within each time period and outlet that exhibited that code. This allowed us to calculate change between 2014 and 2021 without focusing on the specific house style of either news outlet or differences in the number of sampled news stories in each time period. We then compared our results for each outlet across the two time periods (2014 and 2021) using the difference in percentages within each year (describing the change as a number of "points" gained or lost, much like election news reporting). Thus, for example, a change of "+8%" from 2014 to 2021 could represent a substantially large shift in cartographic design practice depending on the original percentage in 2014 (e.g., a shift from 8% of total to 16% of total at +8% is a doubling in the frequency of the given code). Therefore, in our reporting the use of "+" or "-" indicates the change in percentage points, whereas percentages reported without "+" or "-" indicate the overall percentage for one or both years. The codes are not mutually exclusive and, again, there may be multiple maps in a single news story, and therefore sub-codes within a given design category have a range of 0–100% but do not necessarily add to 100% across sub-codes in the category.

We provide permalinks to and our coding of all news stories in our sample in the Supplemental Materials.

4. RESULTS

4.1 CORPUS OVERVIEW

In total, we sampled and analyzed 119 online news stories containing at least one digital map, across our two time periods (2014 and 2021) from the *NYTimes* and *WaPo* (Table 1). Although 78 news stories met our sampling criteria in 2014, only 41 did in 2021, a potential indicator of decelerating innovation in cartographic design for data journalism, a change in social media strategy, or a shift away from map-focused data journalism altogether. Further, we sampled 47 news stories from the *NYTimes* (31 in 2014, 16 in 2021) and 72 from *WaPo* (47 in 2014, 25 in 2021), resulting in a modest imbalance between news outlets, though each exhibited a similar decline from 2014 to 2021.

The sampled news stories included, on average, 4.1 maps per story, although this declined from 4.2 to 3.8 maps per story between 2014 and 2021. In contrast, both the number of non-map charts (from 0.9 to 2.7) and photos

	NYTIMES	WAPO	ALL 2014		NYTIMES	WAPO	ALL 2021		OVERALL		
	frequency	frequency	frequency	average	frequency	frequency	frequency	average	frequency	average	change
Number of Stories	31	47	78		16	25	41	na	119		-37
Number of Maps	156	174	330	4.2	47	107	154	3.8	484	4.1	-0.5
Number of Charts	22	50	72	0.9	30	82	112	2.7	184	1.5	1.8
Number of Photos	148	13	161	2.1	147	48	195	4.8	356	3.0	2.7
	frequency	frequency	frequency	percentage	frequency	frequency	frequency	percentage	frequency	percentage	change
Text	31	44	75	96%	16	25	41	100%	116	97%	4%
Audio	1	1	2	3%	0	3	3	7%	5	4%	5%
Video	6	2	8	10%	3	5	8	20%	16	13%	9%
Animation	2	0	2	3%	0	1	1	2%	3	3%	0%

Table 1. Overview of the sampled news story corpus for the longitudinal visual content analysis.

(from 2.1 to 4.8) increased in the sample between 2014 and 2021, although on average they remained less frequent than maps across years (1.5 charts and 3.0 photos per story, respectively). Because a news story only was included in the corpus if it contained a map, the relative frequency of maps to other visual media is not meaningful, but the general downward trend of maps versus an upward trend of charts and photos potentially is meaningful and again signals a potential move away from mapping as a driver of visual stories over the time period of interest. While the visual content analysis method cannot confirm the underlying drivers, the overall downward trend of news maps aligns with recent discussions of the transforming political economy of the newsroom placing greater demands on labor (e.g., Usher 2020) as well as the "cartographic silencing" of news maps in increasingly conservative media (e.g., Fish and Kreitzberg 2023, 2492).

Nearly all (97%) of the sampled news stories were accompanied by separated HTML text (i.e., text other than that placed directly on the map), but only 13% of news stories included video, 4% included audio, and 3% included animation. Primarily pairing maps with HTML text indicates the general convention of scrollytelling for news stories and a relative dearth of multimedia cartography across the sample despite purposeful sampling of the more innovative news maps using social media.

One of the most poignant and concerning trends across the sampled years from the perspective of a global sense

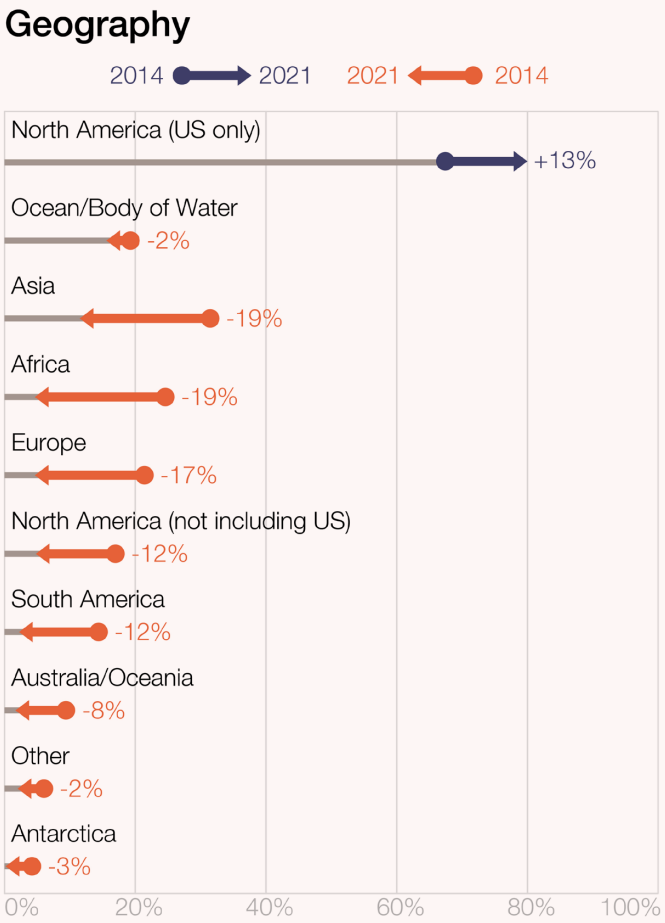


Figure 2. Percentage point differences in news story geography. Note: For Figures 2–20, a blue arrow pointing to the right indicates an increase from 2014 to 2021 in the given code percentage while an orange arrow pointing to the left indicates a decrease from 2014 to 2021 in a given code percentage.

of place (Massey 2008) was a geographic shift away from news stories with an international focus and towards domestic US issues (Figure 2). News stories focused solely on the US increased +13% from 2014 to 2021, accounting for nearly three-quarters (72%) of the sample across years, and 81% of the 2021 sample. In contrast, news stories about all other continents decreased from 2014 to 2021: Africa down -19%, Asia -19%, Europe -17%, North America (including Central America but not including the US) down -12%, South America -12%, Australia/Oceania -8%, Antarctica -3%, and oceans or other (non-planetary) regions down -2% and -3%, respectively. These trends point to an increase in a national (US) focus and framing in these two prominent newspapers, surprising given the range of global issues such as the COVID-19 pandemic occurring during the sampled 2021 time period.

4.2 CARTOGRAPHIC DESIGN (RQ1)

Starting with cartographic design (RQ1), news stories with country-scale maps were the most common across our sample (40% of all maps in the sampled news stories) and increased +14% from 2014 to 2021 (from 35% to 49%; Figure 3). News stories with regional scale maps were second-most common in our sample (32% of total) and increased +7% from 2014 to 2021 (30% to 37%). News stories with neighborhood scale maps (larger than municipal), often as detail or inset maps providing a localized account of events, also were relatively common (21% of total), but increased only slightly between time periods (+1%). In contrast, we observed decreases in news stories with world (-9%), municipal (-9%), and continental (-8%) maps. Overall, news stories with continental and world maps accounted for just 13% of our sample (8% and 6%, respectively), and we did not find a single world map in the 2021 corpus. Taken together, findings by scale again suggest a persistent and growing emphasis of *NYTimes* and *WaPo* on primarily US domestic issues, somewhat expected given their operation in two major US cities but again also perhaps cause for concern given the contemporary rise of nationalist rhetoric (and specifically the nationalization of the US media market; Jaidka et al. 2023) and the outsized impact these two media outlets have on domestic and international geopolitical discourse.

Patterns and trends in the choice of map projection (Figure 4) largely corroborated the increasing focus on a US national geography and scale. Conic projections were the most commonly identifiable class (34% of all maps), and

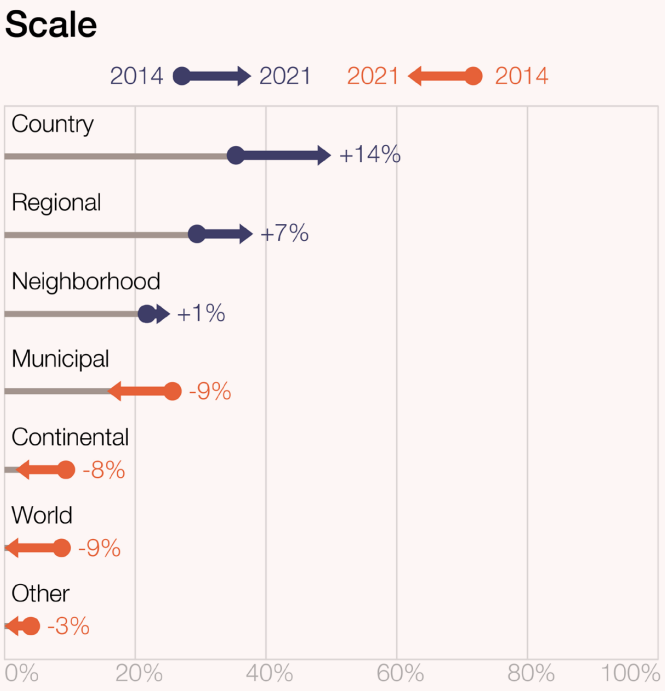


Figure 3. Percentage point differences in scale.

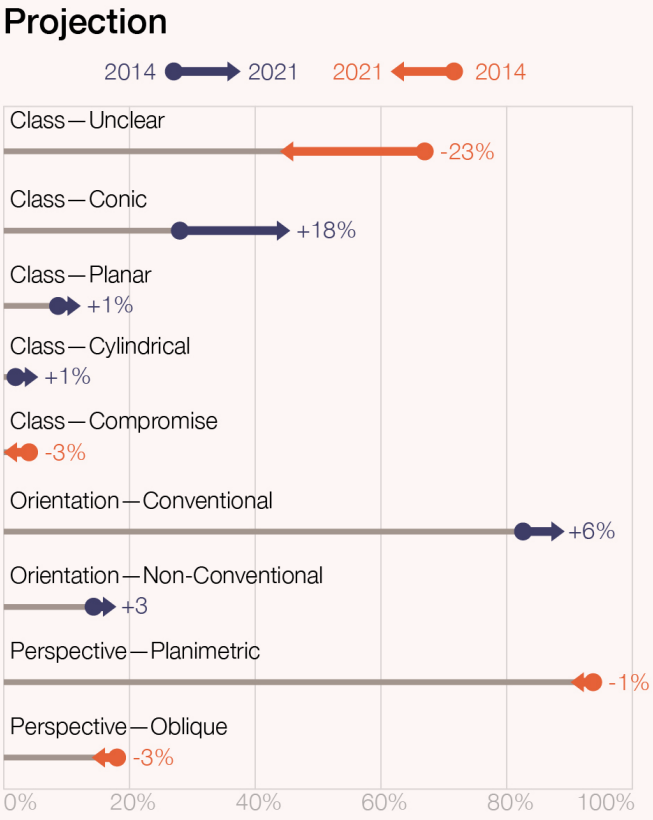


Figure 4. Percentage point differences in projection.

news stories with conic projections increased +18% from 2014 to 2021 (28% to 46% of total). Conic projections are

recommended for mid-latitude country and regional scale maps (Battersby 2017), suggesting an increased emphasis in visual storytelling on the Global North broadly and the US specifically. Notably, we were unable to confirm the projection class in 59% of the news stories (for discussion on visual identification of map projections, see Olson 2006 and Battersby and Kessler 2012), primarily for maps at a municipal or neighborhood scale that probably were in Web Mercator (a cylindrical projection) but do not offer enough visual cues for us to confirm. However, our ability to identify class improved from 2014 (67% unclear) to 2021 (44% unclear; -23% change), again correlating with a shift towards country and regional scale mapping. We found compromise (2%) and planar (2%) projections in just four news stories total, indicating a dearth of maps of global (often using compromise projections) and polar (often using planar projections) issues. There was minimal change in projection orientation and perspective between years, with most news stories following the convention of north as "up" (84%) using a planimetric "view from nowhere" or top-down view (93%). Accordingly, greater creative and intentional design of orientation and perspective for storytelling purposes is a future opportunity for news maps given their support of vantage point and voice (see below), providing a more embedded and humanized view from somewhere and someone to situate a news story in place (Pearce 2008, Pearce and Louis 2008).

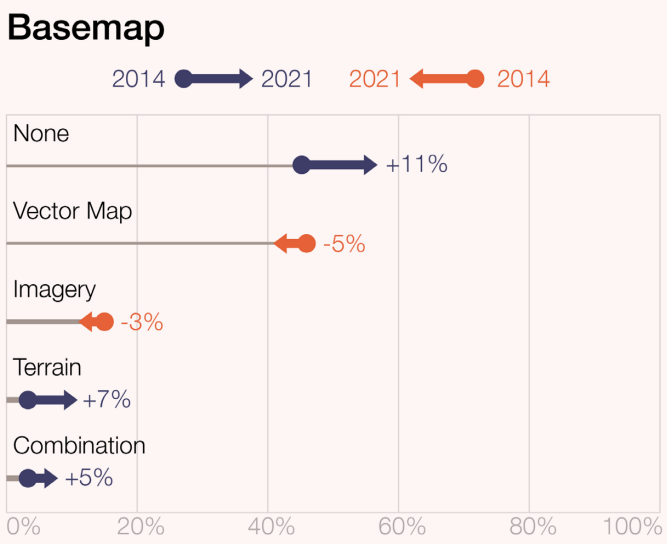


Figure 5. Percentage point differences in basemaps.

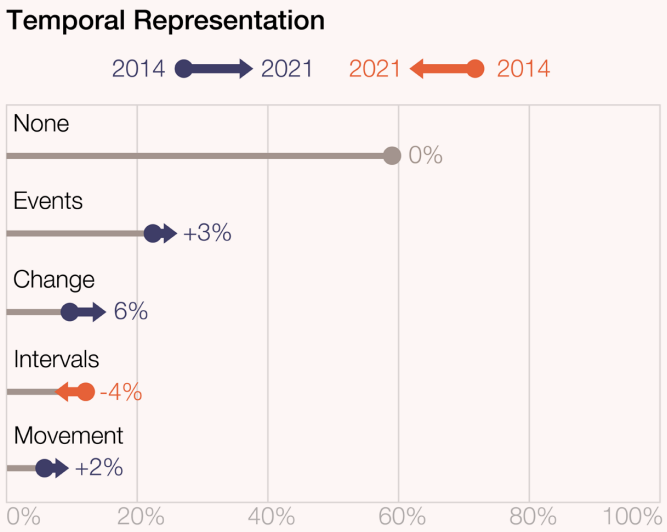


Figure 6. Percentage point differences in temporal representation.

Nearly half (49%) of the news stories contained maps with no basemap context (Figure 5), a trend that increased from 45% in 2014 to 56% in 2021 (+11%). This reduction in the inclusion of custom-designed basemaps suggests that newsrooms are moving towards more simplified maps, a trend we particularly noticed in thematic mapping, where visually complex basemap tilesets often are not necessary. We observed slight declines in news stories with vector (-5%) and imagery (-3%) basemaps, the latter of which was surprising given the proliferation of commercial satellite imagery services between 2014 and 2021. In contrast, we observed slight increases in news stories with terrain basemaps (+7%) and the ability to interactively underlay different basemaps on demand (+5%), although these basemaps overall remained relatively uncommon (in just 5% and 4% of news stories, respectively).

Temporal representations (Figure 6) were absent from 59% of the sampled news stories, perhaps not surprising given that many geospatial datasets are not configured to include time (Peuquet 1994). Yet, time often is fundamental to advancement of a narrative structure, as the best visual stories have rising action and character development across the plotline (i.e., timeline, Roth 2021), making greater focus on temporal representation an opportunity for news mapping. However, for news stories that did include temporal representations, we observed a shift away from intervals (-4%) and towards change (+6%). Intervals typically are represented as small multiple maps or in an animation, and thus have greater visual complexity than change representations that normalize two time intervals into a single difference map (Fish 2018). Thus, this trend in temporal representation provides a second indicator that

newsrooms are moving towards more simplified maps. Events were the most common type of temporal representation (23% overall), often represented as part of municipal and neighborhood scale maps, while movement was the least common (just 6%), an expected finding given the difficulty in construction of flow maps (Steiner 2019).

Interestingly, coding by thematic map type (Figure 7) revealed a potential shift away from common thematic maps and towards novelty in design. Arguably, iconic point symbol maps are the most common thematic map for qualitative information and choropleth maps are the most common thematic map for quantitative information (Golebiowska et al. 2021). While these thematic maps were the most common in the sampled news stories (14% and 39%, respectively), we observed a decline in both iconic point maps (-11%) and choropleth maps (-7%) from 2014 to 2021. In contrast, we observed an increase in news stories with cartograms (+11%), 3D representations (+8%; not always used for thematic purposes), proportional symbol maps (+4%), and isoline maps (+2%).

Despite this diversification of thematic mapping techniques, many thematic map types remained under-utilized across the corpus, including dot density (2% of total), flow (1%), and value-by-alpha (1%). Further, we observed a decrease in the total number of attributes mapped throughout the news story (Figure 8), with news stories that map one attribute (21% total) and no attributes (i.e., reference maps; 27% of total) both increasing between 2014 and 2021 (+9% and +4%, respectively) with multivariate news stories mostly declining during this period. Additionally, we observed a shift away from full color (-25%) and towards one color (i.e., monochrome) or limited color palettes (+23%; Figure 9). Expectedly, black/white (2%) and grayscale (1%) no longer are common in digital media. Taken together, this analysis by attribute representation provides three additional indicators that newsrooms are moving towards more simplified maps both in content and form, even as they are exploring alternative forms of thematic mapping. However, more complex designs remain,

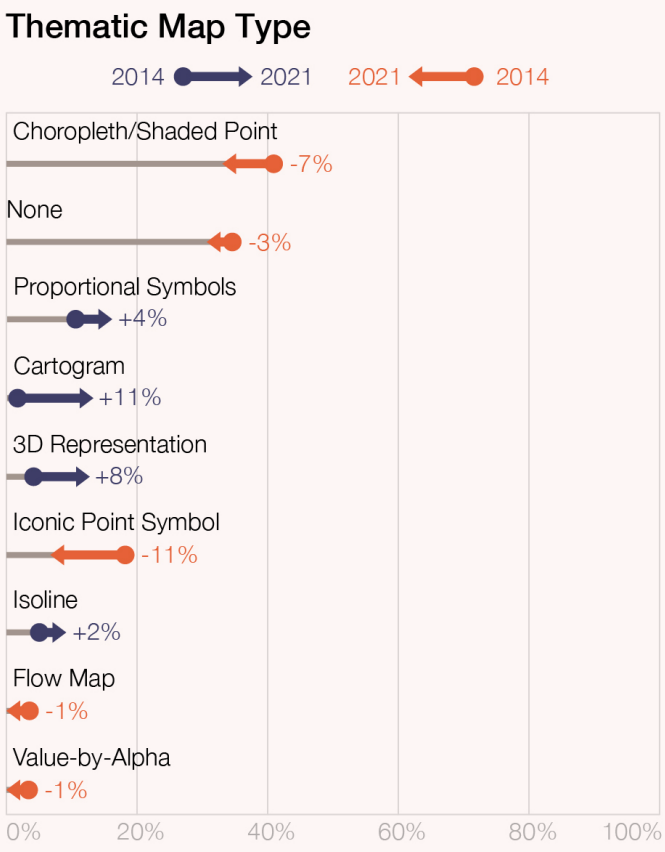


Figure 7. Percentage point differences in thematic map type.



Figure 8. Percentage point differences in the number of attributes mapped in the news story.

and we found 11 news stories with 10+ attributes, including two with over 100, suggesting that more involved data journalism and news mapping still can be useful for deeper treatments of complex news stories.

We observed an increased placement of maps (Figure 10) in the middle of the news story (+20%) compared to the beginning (-5%), or ending (-5%), as well as a decrease in news stories that primarily were composed of maps (-13%). We also observed an increase in the use of a landscape aspect ratio (+7%; explained in part by the increase in country scale, conic projections of the US) compared to portrait (-11%) or square (-2%) maps. Both trends run counter to original "martini glass" scrollytelling designs popularized in the early 2010s (Segel and Heer 2010) and suggest practice is moving away from the map being the central driver of the visual story, a finding also supported by the smaller 2021 sample size. Accordingly, we observed an increase in the number of news stories with intermediate-size maps (occupying the full width of the text column on a non-mobile 1080p display; +9%) and a decrease in those with a small size (less than width of the text column; -15%) or a large size (greater than the width of the text column but not the full viewport; -7%) maps, although there was a notable increase in full size maps taking up the entire viewport on non-mobile displays (+16%)—perhaps to support mobile-first cartographic design (Houtman 2025)—that are otherwise part of a larger scrollytelling experience.

Inclusion of map elements in news stories (Figure 11) overall decreased, including: titles (+10% with*out* titles, -17% with a main title heading), legends (+6% with*out* legends, -23% in nominal legends, -5% for comprehensive legends containing all map symbols), and indications of scale (+18% with*out* scale, -18% scale bars). Accordingly, map elements for news stories now most commonly include a title subheading only (46% overall), a nominal (59%, although again on the decline) or numerical (43%) legend (with legends increasingly omitted), no indication of scale (69%), no indication of north (92%), and no context map (83%). Overall, reduction in map elements again corroborates other indicators that newsrooms are moving towards simplified cartographic design of digital news maps, in this case with less context for interpreting the map.

4.3 NEW DIGITAL MEDIA (RQ2)

Regarding new digital media (RQ2), we observed an overall increase of some form of animation in news

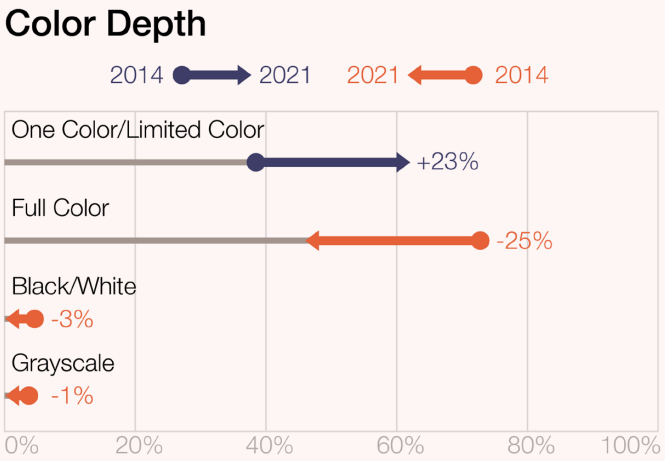


Figure 9. Percentage point differences in color depth.

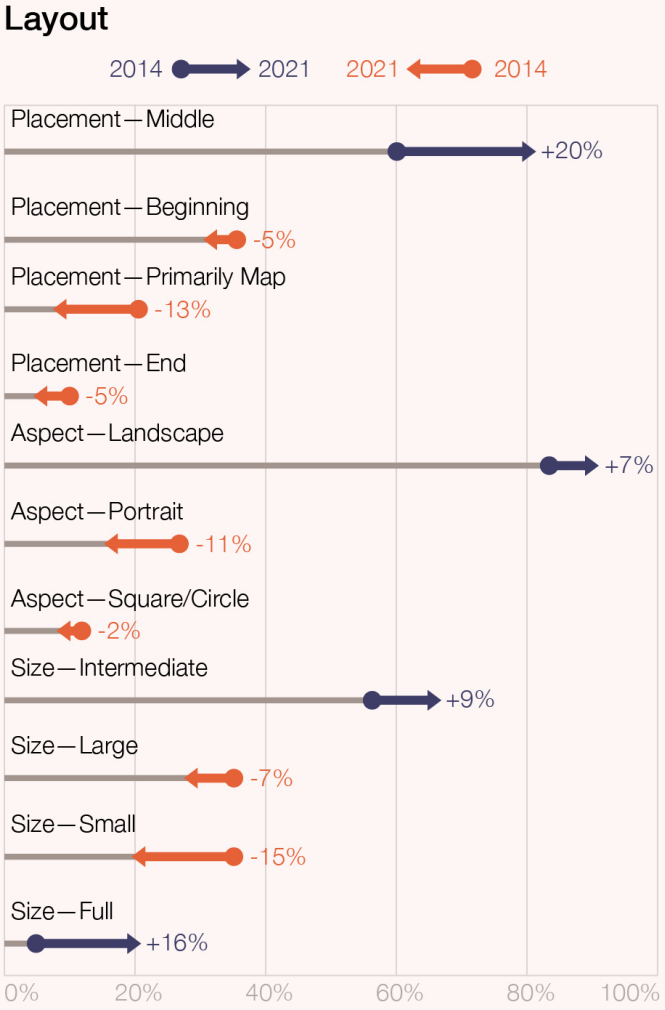


Figure 10. Percentage point differences in layout.

stories from 2014 (6% with, 94% without) to 2021 (20% with, 80% without; Figure 12). News stories with passive (no playback control) and active animation increased +5% and +12%, respectively. This finding was somewhat

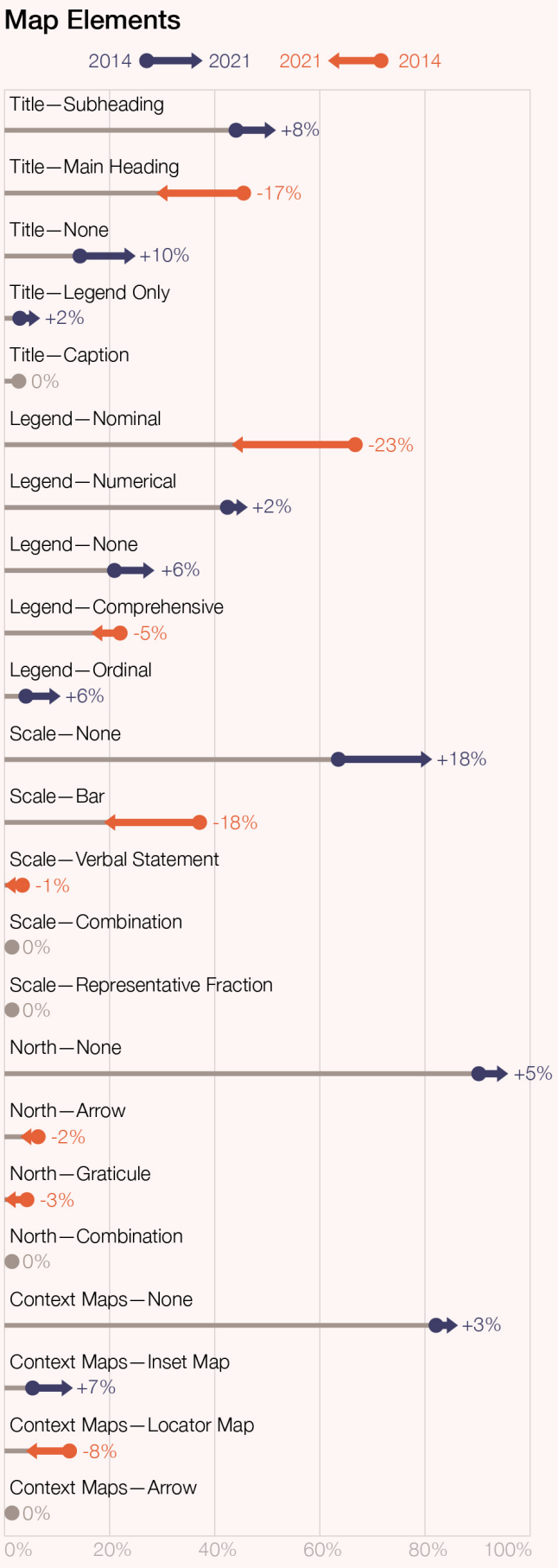


Figure 11. Percentage point differences in map elements.

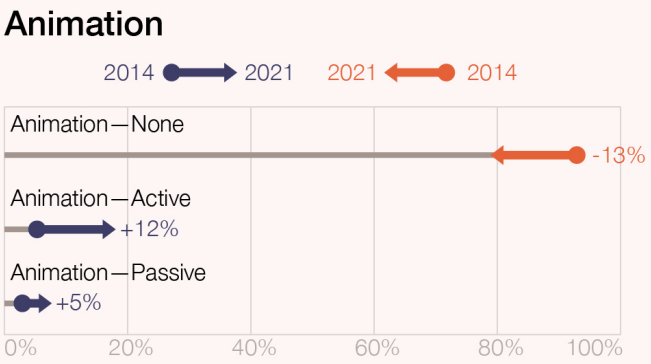


Figure 12. Percentage point differences in animation.

unexpected given the perceived shift away from animation in both cartographic research and education to other new digital media topics like interactivity, social media, user customization, and artificial intelligence. On one hand, an increase in passive animation parallels a move towards simplification in new digital media similar to our observed simplification in cartographic design (RQ1), as passive animation (e.g., animated GIFs) is a responsive design strategy for reducing visual and interactive complexity for mobile devices (Horak et al. 2022, Roth et al. 2024). However, the substantial increase in active animation provided through the sequence interaction operator from just 5% to 17% provides additional evidence that more involved data journalism and news mapping, here using multimedia, still can be useful for deeper treatments of complex news stories.

Overall, interactivity (31/119, or 26%) was more common in news stories than animation (just 13/119, or 11%). However, we observed a +6% increase in news stories with*out* interactivity from 2014 (72%) to 2021 (78%; Figure 13). Further, only one more news story had some form of interactivity (9/41, or 22%) compared to animation (8/41, or 20%) by 2021. This contrast of interaction versus animation does point to a simplification in the use of new digital media for news maps, confirming Tse's (2016) argument for and intention to replace interactives with scrollytelling at the *NYTimes*.

The frequency of most interaction operators decreased or exhibited no change. Pan exhibited the greatest decrease (-6%), noteworthy because panning often is a suboptimal interaction indicating that the user is disoriented or "lost" while zooming, but nonetheless often is implemented as a default function in slippy web maps (Roth and MacEachren 2016). Thus, this decrease indicates a

recommended shift towards interface constraints to keep user attention on the area of interest. However, we also observed decreases in overlay (-5%) and zoom (-4%), two additional operators commonly available by default in slippy web maps. Taken together, reductions in pan, zoom, and overlay suggest a move away from multiscale basemaps in news stories. Notably, retrieve—the fourth affiliated operator commonly implemented in slippy web maps—exhibited no change between years. Retrieve was the most commonly observed interaction operator, found in 22% of all news stories (the declining pan and zoom were next at 13% each) and in 26 of the 31 (84%) news stories with interactivity, suggesting that interactivity primarily is used in news maps to provide clarifying details about specific places to the audience and that this need is persisting despite the decline of slippy web maps.

Unexpectedly, search also declined -4% between years, with only one news story containing search in 2021, and overall was uncommon in the sample (found in just 5% of all news stories). We anticipated search to be more common in the news story sample given its support for basic identification of known locations, making it more appropriate for public-facing interactive maps (i.e., those found in news stories) versus other more sophisticated operators like reexpress, resymbolize, sequence, and, in particular, filter that support more complex tasks and thus more expert or specialist map use (MacEachren 1994, Roth and MacEachren 2016).

Reexpress (i.e., the ability to change thematic map type or its visual variables) was the only interaction operator that increased in frequency (+6%), an interesting finding suggesting that data journalists are more willing to let the audience view data-driven visual stories in multiple ways and thus to come away with potentially different understandings of the story. Accordingly, a move towards more simplified representation and interaction map design does not necessarily indicate an intention to have more control over the story interpretation itself.

Finally, we observed an increase in news stories including automated real-time updates to the map (+7%) and a corresponding decrease in manual updates (-12%; Figure 14). This finding potentially signals a trend towards automation in the newsroom, aligning with recent interest in GeoAI for cartography, although this practice remains uncommon, with 82% of the sampled news stories exhibiting no updates.

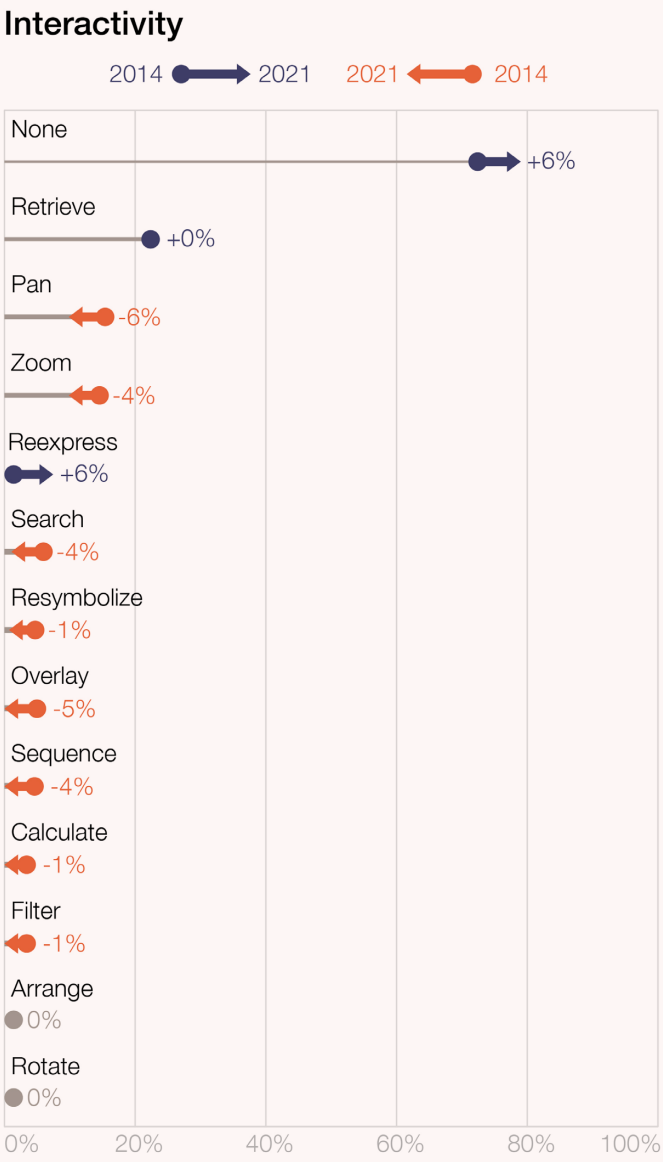


Figure 13. Percentage point differences in interactivity.

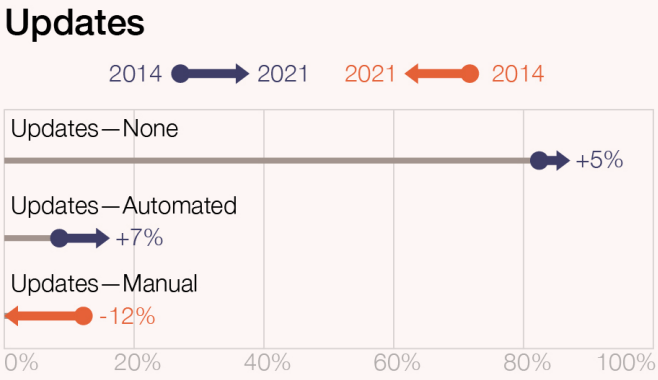


Figure 14. Percentage point differences in updates.

4.4 VISUAL STORYTELLING (RQ3)

Concluding with visual storytelling techniques (RQ3), we adapted Vujaković's (2014) seven higher-level news map themes based on the topics observed in the corpus. Health was the most commonly mapped topic in 2021 (so much so that we delineated health from science in adapting the Vujaković 2014 taxonomy), increasing +14% to nearly one quarter of the 2021 sample (24%) due to the impact of COVID-19 in 2021 relative to Ebola in 2014. We also observed a +8% increase in news stories about the environment and science, a noteworthy and potentially exciting trend given the contemporary politicization of many topics at the intersections of geography and science in the US, such as climate change, clean energy, conservation, and green transportation. Further, we observed a +5% increase of mapping disasters, which often were related to environment and science but focused around specific and potentially more memorable events.

In contrast, we observed a decrease in coverage on conflict (delineated from politics under the Vujaković 2014 taxonomy; -11%), cultural affairs (-8%), and society (-3%), a potentially problematic finding given the importance of covering sensitive events and social movements. On its face, a decrease in conflict mapping should be a desirable indicator of peace; however, in our sample this was related to unexpectedly low coverage of the #BlackLivesMatter movement as well as the shift away from international news stories, including Israel's occupation of Palestine and blockade of Gaza. We did not observe any news stories that explicitly mapped Vujaković's (2014) economics theme, but did add a separate code for elections—separating it from politics, given the presence of the pair of domestic elections in the sample—which accordingly was stable between years (-1%).

We observed only a small increase in the longform infographics genre (just +4%) with static visual stories comprising nearly half of the corpus (48% overall, although declining -10% from 2014 to 2021; Figure 16). We had expected to find continued and growing popularity of scrollytelling in the 2010s (Stolper et al. 2016) as well as increased ease in making scrolly maps through platforms like Esri StoryMaps, Mapbox Storytelling, and Story Maps JS. However, this result has more to do with the definition of longform infographics in contrast to multimedia visual experiences, with the former enforcing continuity through browser scrolling and the latter enforcing continuity through anchor tags and hyperlinks, which can be activated through scrolling. Accordingly, we observed a substantial increase in multimedia visual experiences



Figure 15. Percentage point differences in story topic.

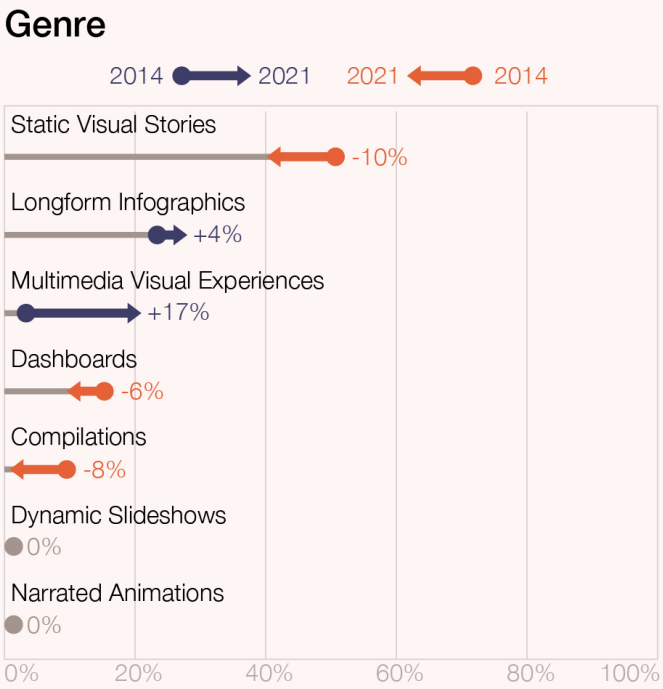


Figure 16. Percentage point differences in story genre.

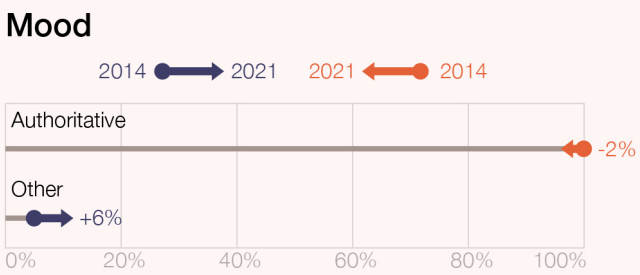


Figure 17. Percentage point differences in mood.

(+17%) that also make use of user scrolling, but include a greater amount of dynamic visual elements activated through HTML tags while scrolling. This shift towards multimedia integration with scrolling largely explains the decrease in static visual stories as well as the increases in intermediate size maps and a landscape aspect ratio, as these are more easily integrated into large, dynamically activated text blocks. Altogether, our difficulty in cleanly delineating longform infographics and multimedia visual stories suggests that these structures are colliding into a single "scrollytelling" genre in the Roth (2021) taxonomy; longform infographics and multimedia visual experiences together accounted for nearly one third (39/119; 33%) of the corpus.

Other genres decreased or exhibited no change, with compilations (-8%) and dashboards (-6%) becoming notably less common in 2021. We did not observe a single instance of the dynamic slideshow or narrated animation genres across the corpus, indicating these forms of visual storytelling have been mostly phased out from newsrooms.

Turning to visual storytelling tropes, the overwhelming majority of news stories used an authoritative visual style (after Muehlenhaus 2012) for their maps to set the mood, reifying a sense of accuracy and trustworthiness in the mapped information (Figure 17). While overall uncommon, an increasing number of news stories included at least one map in an alternative style (+6%), falling somewhere between persuasive and propagandist (we had difficulty further delineating these two rhetorical styles, and therefore collapsed them into "other"), primarily using a darker color palette to set a more ominous, foreboding mood.

Unexpectedly, techniques for focusing audience attention were less common in 2021 (Figure 18). Specifically, we observed a decrease in the use of highlighting (-19%), leader lines (-18%), callouts (-14%), and geometric frames (-3%). A decrease in attention as a visual storytelling trope might be explained by the overall move towards simplicity in

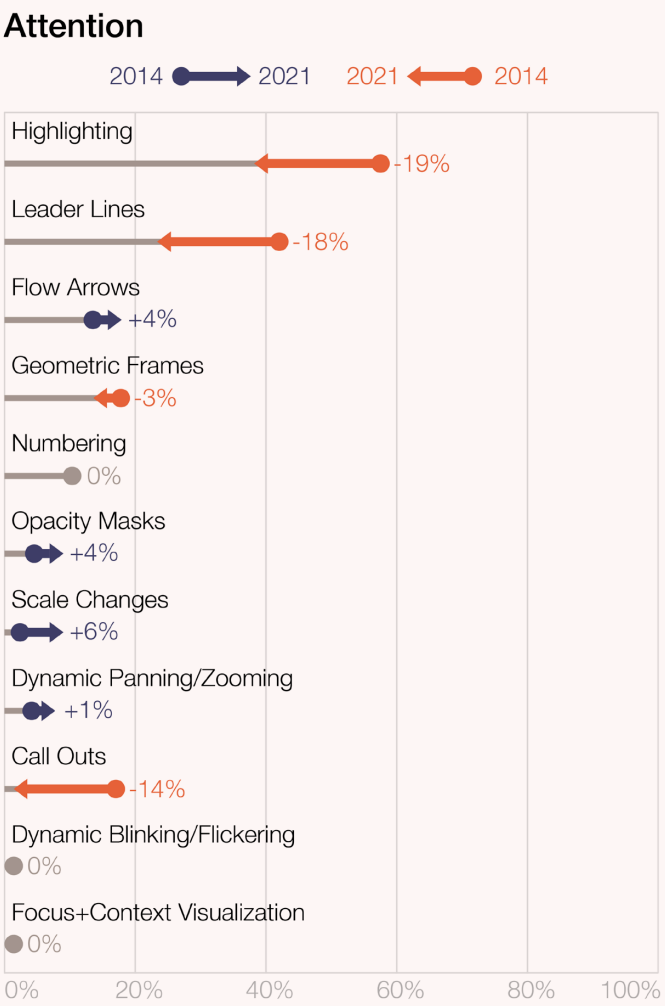


Figure 18. Percentage point differences in attention.

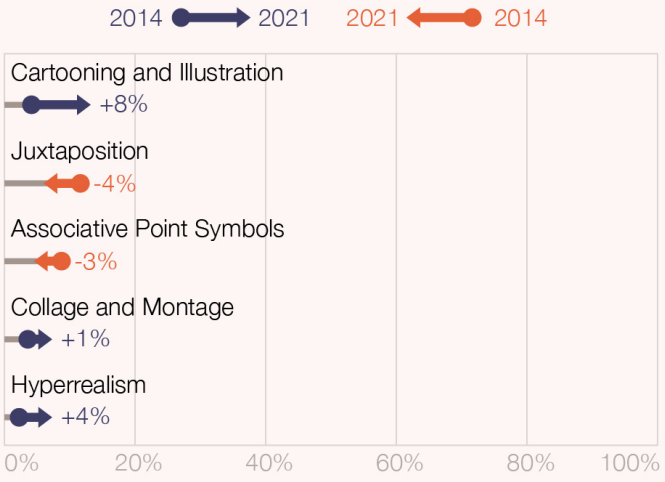


Figure 19. Percentage point differences in metaphor.

cartographic design (RQ1), as less visually complex maps and charts may require less annotation to highlight key places and patterns. Comparatively, we observed relatively

modest increases in the use of map scale (+6%), flow arrows (+4%) and opacity masks (+3%) in place of other focusing attention techniques.

In contrast to attention, metaphor techniques were more common in 2021 (Figure 19). We observed increases in cartooning and illustration (+8%) and hyperrealism (+4%). This finding indicates a noteworthy shift towards more artistic and creative methods of expressing visual stories, a counterpoint to other signals of a move towards automation in news mapping.

Designer voice also was more common in 2021 (Figure 20). Using definitions of designer voice from Steinberg (2023), we observed a notable decrease in news stories with*out* designer voice (-10%) and increases in stories that featured a cartographer byline (+18%), author byline (+23%), method explainers (+24%), and, especially, expanded data sources (+29%). Each of these signals a shift towards greater transparency and accountability in data journalism.

5. DISCUSSION AND OUTLOOK

In this article, we report on a longitudinal visual content analysis tracking the evolution of cartographic design and visual storytelling praxis in two popular US news media outlets over the past decade. Following Fish et al. (2025), this study makes five scholarly contributions:

- *conceptual* in synthesizing, validating, and modifying design frameworks in cartographic design, new digital media, and visual storytelling;
- *empirical* in producing a benchmark study based on secondary sources for cartographic design and visual storytelling in data journalism unspecific to a single thematic topic;
- *methodological* in developing a longitudinal approach to content analysis for cartography;
- *technical* by suggesting design opportunities and gaps for narrative cartography and data journalism; and
- *applied* in a case study specific to US data journalism in the *NYTimes* and *WaPo*.

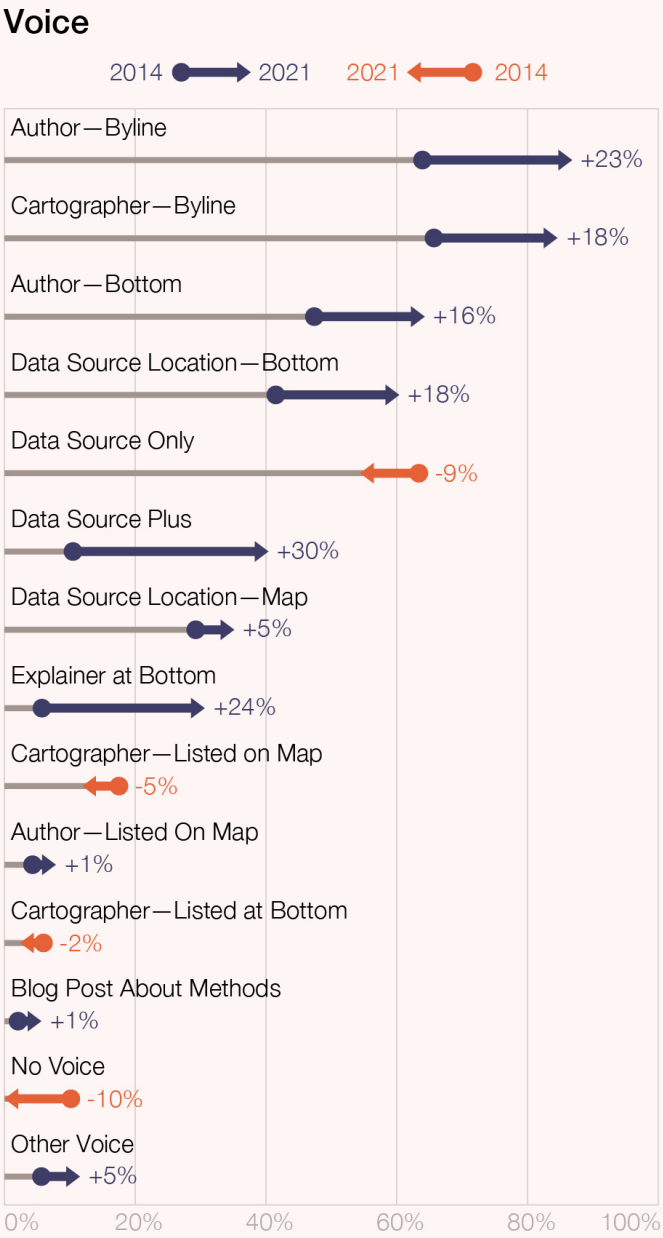


Figure 20. Percentage point differences in voice.

Specifically, we asked:

1. *How are data journalists maintaining or disrupting conventional cartographic design tenets, and how have these practices changed over time?*

Overall, we found a decrease in the use of maps in news stories and a simplification of these maps from 2014 to 2021, a trend that aligns with recent discussions of the transforming political economy of the newsroom placing greater demands on labor (e.g., Usher 2020) as well as the "cartographic silencing" of news maps in increasingly

conservative media (e.g., Fish and Kreitzberg 2023, 2492). This trend towards simplicity is reshaping the look of news maps in several ways:

- less frequent basemap context with fewer custom styles;
- a shift towards mapping change over specific time intervals;
- a decrease in the number of mapped attributes;
- a move from full color to monochrome or limited color palettes;
- overall smaller sized maps;
- more frequent map placement in the middle of the story versus the beginning or end; and
- elimination of map elements or reversion to their simplest form.

Further, we also observed a shift away from mapping international stories towards domestic stories, leading to an increase in conic projections and landscape layouts, design features that are recommended for maps of the US. Taken together, these trends present some cause for concern about the state of cartographic design in contemporary data journalism.

However, there were some interesting examples suggesting creativity still is encouraged in the newsroom, including:

- a shift away from common iconic point symbol maps and choropleth maps to alternative thematic map types such as cartograms, 3D representations, proportional symbol maps, and isoline maps;
- examples of maps that show over 10, or even over 100, attributes;
- an increase in full size maps taking up the entire viewport; and
- an increase in non-authoritative visual styles (RQ3).

Thus, cartographic practice in newsrooms has embraced simplicity while still enabling opportunities for creative design in some contexts.

2. *How are data journalists leveraging design affordances and constraints of new interactive, online, and mobile technology, and how has this digital practice changed over time?*

Unexpectedly, we found an increase in both passive and active animation but a decrease in interactivity, with static maps remaining the most common form of digital maps. We observed a decrease in interaction operators associated with slippy maps, including pan, zoom, and overlay, with retrieve remaining the most common operator across years. Accordingly, we suspect some of the move towards simplicity in representation (RQ1) and interaction design (RQ2), alongside an increased use of animation, is explained by newsrooms embracing mobile-first design and scrollytelling (RQ3). We also unexpectedly observed a decline in search, an operator commonly associated with public use cases aligning with the intended audience of news maps, but an increase in reexpress, an operator commonly associated with specialist use cases. Accordingly, a move towards more simplified design does not necessarily indicate an intention to have more control over the story interpretation itself. Further, we found an increase in real-time updates, one signal of automation in the newsroom.

3. *How are data journalists employing novel visual storytelling techniques, and how has this practice changed over time?*

Finally, we observed an increase in news maps about health as well as environment and science, a potentially exciting finding given the contemporary politicization of many topics at the intersections of geography and science. In contrast, we observed a decrease in coverage on conflict, cultural affairs, and society, a potentially problematic finding given the importance of covering sensitive events and social movements. From the analysis, we advocate for combining the longform infographic and multimedia visual experience genre into a single scrollytelling genre, and observe a substantial increase in scrollytelling accounting for a decrease in static visual stories. Dynamic slideshows and narrated animations appear to be mostly absent from newsrooms, or at least deemed not interesting enough to be circulated on social media. Notably, we saw a decrease in the focusing attention trope—again pointing to simplicity in cartographic design (RQ1)—but an increase in the use of metaphor and designer voice. An increase in metaphor again points to embracing creative design in some contexts while an increase in designer voice points towards greater

transparency and accountability in data journalism, both encouraging developments.

Our longitudinal visual content analysis study has several limitations suggesting rich avenues of future research. First, many results may not generalize beyond a US context. We selected *NYTimes* and *WaPo* because of their outsized impact (due to their high total subscriptions) on domestic and international geopolitical discourse, as well as their overall influence on visual culture in the US. The maps and graphics from these news outlets have some of the widest reach of any US cartography and therefore have a disproportional impact on what the general public conceives of and expects as "cartography." However, the outlets are biased towards US interests and events, increasingly so, as we found through the content analysis. Further, the US broadly, and these news outlets specifically, have a unique political economy around news media that is constrained by capitalist interests and labor tensions (Usher 2020). Accordingly, more research is needed on how such market forces influence cartographic design choices. Independent, nonprofit news organizations, such as *High Country News* and *ProPublica*, also produce maps, and their cartographic design strategies could serve as a point of comparison to larger news companies.

Second, our content analysis does not capture the contemporary moment of data journalism, which may have shifted significantly while writing this article. All benchmark studies effectively are locked in time, and arguably are useful not because they reflect current conditions but instead because they illuminate future opportunities for cartographic research, design, and education. However, since we conducted the study in 2023, the political economy of US newsrooms and online social media has transformed fundamentally, as several noteworthy US news media institutions have narrowed their topical coverage and accordingly reduced their staffing, ostensibly at the behest of politically active ownership (Parker 2026). Data journalism has not escaped these cuts, a troubling development for news mapping after cartographic expertise already was in the process of being replaced by related—but inequivalent—data science skillsets in the newsroom and elsewhere (Thatcher et al. 2024). It is possible that political economics explained some of the shift towards simplicity in news maps from 2014 to 2021, although visual content analysis as a method is relatively limited in its ability to reveal the underlying political economic conditions at work upon cartographic design decisions when compared to other social science methods like interviews and observation. However, it is possible that we are in the midst of a third wave of digital news mapping requiring a follow-up longitudinal content analysis from our results presented here—perhaps combined with additional non-visual archives such as correspondence and budgetary expenditures—as well as deeper investigation into the political economics causing these changes.

Finally, our analysis does not account for the intentions of the data journalists producing the news maps or the requests from editors and peers shaping the broader news stories. While a cluster of content analysis and interview studies now exist on news map design, these studies do not touch on what designs did not make it past the editor's desk, nor do they ask why. Based on these findings, we argue for continued critical analysis of maps within data journalism vis-à-vis alternative forms of visual storytelling because of their pervasiveness online and their impact on map viewers. Further, this cluster of studies does not explore how cartographers can and should be contributing back to data journalism. Particularly, we advocate for continued expansion of "investigative cartography" where the professional cartographer/geographer collaborates with the field journalist for news stories requiring onsite mapping and place-based research aligning with cartographic and geographic research (Usher 2019). There are many examples of such site-specific, map-driven journalism in the *NYTimes* and *WaPo* (e.g., Fox et al. 2019, Wallace and Watkins 2017, Abraham et al. 2024), with future efforts towards building nonprofit news organizations (e.g., *High Country News* and *ProPublica*, referenced above) and university partnerships (e.g., Fontes 2019, Marion and Cohan 2021, Underwood 2022) offering additional alternative strategies for attaining and enriching truly cartographic-first journalism.

ACKNOWLEDGEMENTS

This research was funded by National Science Foundation CAREER Grant #1555267, the Wisconsin Alumni Research Foundation, and the Office of the Dean of the Faculty of Arts and Sciences, Dartmouth College.

DISCLOSURE

The authors report there are no competing interests to declare. Artificial intelligence was not used at any stage in the project.

REFERENCES

Abraham, Leanne. 2019. "Where Do We Go from Here?: Understanding Mobile Map Design." Master's thesis, University of Wisconsin–Madison. https://minds.wisconsin.edu/handle/1793/79642.

Abraham, Leanne, Helmuth Rosales, Elena Shao, Anjali Singhvi, and Charlie Smart. 2024. "How the Trump Rally Gunman had an Edge Over the Countersnipers." *The New York Times*, July 23. https://www.nytimes.com/interactive/2024/07/23/us/trump-shooting-gunman-snipers.html.

Aisch, Gregor, Sarah Almukhtar, Jeremy Ashkenas, et al. 2017. "Maps: Tracking Harvey's destructive path through Texas and Louisiana." *The New York Times*, August 31. https://www.nytimes.com/interactive/2017/08/24/us/hurricane-harvey-texas.html.

Albanese, Francesca. 2024. *Anatomy of a genocide: Report of the Special Rapporteur on the situation of human rights in the Palestinian territories occupied since 1967*. United Nations Human Rights Council. https://www.un.org/unispal/wp-content/uploads/2024/03/g2404611.pdf.

Alderman, Derek H., and Joshua Inwood. 2024. "On The Living Black Atlas: Learning Geospatial Ethics from the African American Freedom Struggle." *The Cartographic Journal* 61 (4): 306–14. https://doi.org/10.1080/00087041.2023.2256131.

Baptista, Fernando G., Debbie Gibbons, Virginia W. Mason, and Ryan Morris. 2015. "Amazonia Under Threat." *National Geographic*. https://www.nationalgeographic.com/climate-change/explore-amazonia.

Battersby, Sarah. 2017. "Map Projections." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. https://doi.org/10.22224/gistbok/2017.2.7.

Battersby, Sarah E., and Fritz C. Kessler. 2012. "Cues for Interpreting Distortion in Map Projections." *Journal of Geography* 111 (3): 93–101. https://doi.org/10.1080/00221341.2011.609895.

Bogucka, Edyta Paulina. 2022. "Data-driven design and analysis of map-based storytelling." Dr.-Ing. diss., Technische Universität München. https://d-nb.info/127558800X/34.

Branch, John. 2012. "Snow Fall: The Avalanche at Tunnel Creek." *New York Times Magazine*. https://www.nytimes.com/projects/2012/snow-fall/index.html.

Brewer, Cynthia A. 2015. *Designing Better Maps: A Guide for GIS Users*. Redlands, CA: Esri Press.

Bushell, Sally. 2012. "The slipperiness of literary maps: Critical cartography and literary cartography." *Cartographica: The International Journal for Geographic Information and Geovisualization* 47 (3): 149–160. https://doi.org/10.3138/carto.47.3.1202.

Cairo Touriño, Alberto. 2017. "Nerd journalism: How data and digital technology transformed news graphics." Ph.D. dissertation, Universitat Oberta de Catalunya. https://openaccess.uoc.edu/items/34227fb3-e6dd-4984-8bb0-34106447bb9b.

Cameron, Emilie. 2012. "New geographies of story and storytelling." *Progress in Human Geography* 36 (5): 573–92. https://doi.org/10.1177/0309132511435000.

Caquard, Sébastien. 2011. "Cartographies of Fictional Worlds: Conclusive Remarks." *The Cartographic Journal* 48 (4): 224–25. https://doi.org/10.1179/000870411x13203362557264.

———. 2013. "Cartography I: Mapping narrative cartography." *Progress in Human Geography* 37 (1): 135–44. https://doi.org/10.1177/0309132511423796.

———. 2014. "Cartography II: Collective cartographies in the social media era." *Progress in Human Geography* 38 (1): 141–50. https://doi.org/10.1177/0309132513514005.

Caquard, Sébastien, and Emory Shaw. 2025. "Story Mapping Praxis to Principles: Learning from the Atlascine Project." *Annals of the American Association of Geographers* 115 (5): 988–1004. https://doi.org/10.1080/24694452.2025.2470748.

Caquard, Sébastien, and D. R. Fraser Taylor. 2009. "What is Cinematic Cartography?" *The Cartographic Journal* 46 (1): 5–8. https://doi.org/10.1179/000870409x430951.

Cartwright, William. 1999. "Extending the map metaphor using web delivered multimedia." *International Journal of Geographical Information Science* 13 (4): 335–353. https://doi.org/10.1002/9780470979587.ch25.

Chapin, Mac, Zachary Lamb, and Bill Threlkeld. 2005. "Mapping Indigenous Lands." *Annual Review of Anthropology* 34: 619–638. https://doi.org/10.1146/annurev.anthro.34.081804.120429.

Christophe, Sidonie. 2019. "Color Theory." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. https://gistbok-topics.ucgis.org/CV-03-009.

Dent, Borden D., Jeffrey S. Torguson, and Thomas W. Hodler. 2008. *Cartography: Thematic Map Design*. Sixth edition. New York: McGraw-Hill Education.

Eccles, Ryan, Thomas Kapler, Robert Harper, and William Wright. 2008. "Stories in geotime." *Information Visualization* 7 (1): 3–17. https://doi.org/10.1057/palgrave.ivs.9500173.

Elwood, Sarah. 2006. "Beyond Cooptation or Resistance: Urban Spatial Politics, Community Organizations, and GIS-Based Spatial Narratives." *Annals of the Association of American Geographers* 96 (2): 323–341. https://doi.org/10.1111/j.1467-8306.2006.00480.x.

Fish, Carolyn. 2018. "Spatiotemporal Representation." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. https://gistbok-topics.ucgis.org/CV-04-017.

———. 2020a. "Cartographic content analysis of compelling climate change communication." *Cartography and Geographic Information Science* 47 (6): 492–507. https://doi.org/10.1080/15230406.2020.1774421.

———. 2020b. "Storytelling for making cartographic design decisions for climate change communication in the United States." *Cartographica* 55 (2): 69–84. https://doi.org/10.3138/cart-2019-0019.

Fish, Carolyn S., and Kirby Calvert. 2016. "An Analysis of Interactive Solar Energy Web Maps for Urban Energy Sustainability." *Cartographic Perspectives* 85: 5–22. https://doi.org/10.14714/cp85.1372.

Fish, Carolyn S., and Katie Quines Kreitzberg. 2023. "Mapping in an Echo Chamber: How Cartographic Silence Frames Conservative Media's Climate Change Denial." *Annals of the American Association of Geographers* 113 (10): 2480–96. https://doi.org/10.1080/24694452.2023.2227672.

Fish, Carolyn S., Robert E. Roth, Paulo Raposo, Elaine M. Guidero, and Zhaoxu Sui. 2025. "Why conduct cartographic research: a comparison of cartographic research contributions in four International Cartographic Association (ICA) affiliated journals." *International Journal of Cartography* 11 (2): 190–215. https://doi.org/10.1080/23729333.2025.2475411.

Fontes, Anthony W. 2019. "Migrants' Stories: Why they flee." *Utica University Center of Public Affairs and Election Research*, April 9. https://www.ucpublicaffairs.com/home/2019/4/9/migrants-stories-why-they-flee-by-anthony-w-fontes.

Fox, Joe, Lauren Tierney, Seth Blanchard, Gabriel Florit, and Jake Crump. 2019. "What remains of Bears Ears: Utah's politically contentious southeast corner is a living landscape of culture and civilization." *The Washington Post*, April 2. https://www.washingtonpost.com/graphics/2019/national/bears-ears.

Gamio, Lazaro, and Dan Keating. 2016. "How Trump redrew the electoral map, from sea to shining sea." *The Washington Post*, November 9. https://www.washingtonpost.com/graphics/politics/2016-election/election-results-from-coast-to-coast.

Gershon, Nahum, and Ward Page. 2001. "What storytelling can do for information visualization." *Communications of the ACM* 44 (8): 31–7. https://doi.org/10.1145/381641.381653.

Golebiowska, Izabela, Jolanta Korycka-Skorupa, and Katarzyna Słomska-Przech. 2021. "Common Thematic Map Types." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. https://gistbok-topics.ucgis.org/CV-04-011.

Gomes, Arlindo, Emilly Brito, Luiz A. Morais, and Nivan Ferreira. 2025. "How do Data Journalists Design Maps to Tell Stories?" *IEEE Transactions on Visualization and Computer Graphics* 31 (1): 167–77. https://doi.org/10.1109/tvcg.2025.3633911.

Gray, Jonathan, Liliana Bounegru, and Lucy Chambers, eds. 2012. *The Data Journalism Handbook: How Journalists Can Use Data to Improve the News*. Sebastopol, CA: O'Reilly Media, Inc. https://datajournalismhandbook.org/uploads/first_book/DataJournalismHandbook-2012.pdf.

Harris, Dylan M. 2020. "Telling Stories about Climate Change." *The Professional Geographer* 72 (3): 309–16. https://doi.org/10.1080/00330124.2019.1686996.

Hart, David A., Timothy Prestby, and Robert E. Roth. 2022. "Design and Evaluation of Coastal Web Atlases: Best Practices and Future Opportunities for Map Representation, Interaction, and Usability." *Coastal Management* 50 (6): 514–48. https://doi.org/10.1080/08920753.2022.2126271.

Horak, Tom, Wolfgang Aigner, Matthew Brehmer, Alark Joshi, and Christian Tominski. 2022. "Responsive visualization design for mobile devices." In *Mobile Data Visualization*, edited by Bongshin Lee, Raimund Dachselt, Petra Isenberg, and Eun Kyoung Choe, 33–65. Boca Raton, FL: CRC Press. https://doi.org/10.1201/9781003090823-2.

Houtman, Lily. 2025. "Techniques, challenges, and opportunities in mobile thematic map design for data journalism." *Cartography and Geographic Information Science* 53 (1): 18–37. https://doi.org/10.1080/15230406.2025.2484210.

Hullman, Jessica, Steven Drucker, Nathalie Henry Riche, Bongshin Lee, Danyel Fisher, and Eytan Adar. 2013. "A Deeper Understanding of Sequence in Narrative Visualization." *IEEE Transactions on Visualization and Computer Graphics* 19 (12): 2406–15. https://doi.org/10.1109/tvcg.2013.119.

Jaidka, Kokil, Sean Fischer, Yphtach Lelkes, and Yifei Wang. 2023. "News nationalization in a digital age: An examination of how local protests are covered and curated online." *The Annals of the American Academy of Political and Social Science* 707 (1): 189–207. https://doi.org/10.1177/00027162231217873.

Joliveau, Thierry. 2009. "Connecting Real and Imaginary Places through Geospatial Technologies: Examples from Set-jetting and Art-oriented Tourism." *The Cartographic Journal* 46 (1): 36–45. https://doi.org/10.31219/osf.io/jshwz.

Kelly, Meghan. 2016. "Mapping Syrian refugee border crossings: A critical, feminist perspective." Master's thesis, University of Kansas.

———. 2022. "Narrative and Storytelling." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. https://gistbok-topics.ucgis.org/CV-04-033.

Kessler, Fritz C., and Terry A. Slocum. 2011. "Analysis of Thematic Maps Published in Two Geographical Journals in the Twentieth Century." *Annals of the Association of American Geographers* 101 (2): 292–317. https://doi.org/10.1080/00045608.2010.544947.

Knight, Megan. 2015. "Data journalism in the UK: a preliminary analysis of form and content." *Journal of Media Practice* 16 (1): 55–72. https://doi.org/10.1080/14682753.2015.1015801.

Knowles, Anne Kelly, Levi Westerveld, and Laura Strom. 2015. "Inductive Visualization: A Humanistic Alternative to GIS." *GeoHumanities* 1 (2): 233–65. https://doi.org/10.1080/2373566x.2015.1108831.

Kosara, Robert, and Jock Mackinlay. 2013. "Storytelling: The Next Step for Visualization." *Computer* 46 (5): 44–50. https://doi.org/10.1109/mc.2013.36.

Kraak, Menno-Jan, Robert E. Roth, Britta Ricker, Ayako Kagawa, and Guillaume Le Sourd. 2020. *Mapping for a Sustainable World*. New York: United Nations. https://digitallibrary.un.org/record/3898826.

Krippendorff, Klaus. 2019. *Content Analysis: An Introduction to its Methodology*. Los Angeles: SAGE Publications. https://doi.org/10.4135/9781071878781.

Ma, Kwan-Liu, Isaac Liao, Jennifer Frazier, Helwig Hauser, and Helen-Nicole Kostis. 2012. "Scientific Storytelling Using Visualization." *IEEE Computer Graphics and Applications* 32 (1): 12–19. https://doi.org/10.1109/mcg.2012.24.

MacEachren, Alan M. 1994. "Visualization in Modern Cartography: Setting the Agenda." In *Visualization in Modern Cartography*, edited by Alan M. MacEachren and D. R. Fraser Taylor, 1–12. Oxford, UK: Pergamon. https://doi.org/10.1016/b978-0-08-042415-6.50008-9.

Marion, Stacey, and Dustin Cohan. 2021. "From Veracruz to Wisconsin: Circular Migration in the Era of Border Militarization." *ArcGIS StoryMaps*. https://storymaps.arcgis.com/stories/67e04bf9d4da49a3ac3555d3ddd63ec7.

Massey, Doreen. 2008. "A Global Sense of Place." In *The Cultural Geography Reader*, edited by Timothy Oakes and Patricia L. Price, 269–75. London: Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203931950-45/global-sense-place-doreen-massey.

Miller, Christopher C. 2006. "A Beast in the Field: The Google Maps Mashup as GIS/2." *Cartographica* 41 (3): 187–99. https://doi.org/10.3138/j0l0-5301-2262-n779.

Monmonier, Mark. 1989. *Maps with the News: The Development of American Journalistic Cartography*. Chicago: University of Chicago Press.

———. 1992. "Authoring Graphic Scripts: Experiences and Principles." *Cartography and Geographic Information Systems* 19 (4): 247–60. https://doi.org/10.1559/152304092783721240.

Moretti, Franco. 2005. *Graphs, Maps, Trees: Abstract Models for a Literary History*. London: Verso.

Muehlenhaus, Ian. 2011. "Another Goode Method: How to Use Quantitative Content Analysis to Study Variation in Thematic Map Design." *Cartographic Perspectives* 69: 7–30. https://doi.org/10.14714/cp69.28.

———. 2012. "If Looks Could Kill: The Impact of Different Rhetorical Styles on Persuasive Geocommunication." *The Cartographic Journal* 49 (4): 361–75. https://doi.org/10.1179/1743277412y.0000000032.

———. 2014. "Looking at the Big Picture: Adapting Film Theory to Examine Map Form, Meaning, and Aesthetic." *Cartographic Perspectives* 77: 46–66. https://doi.org/10.14714/cp77.1239.

Nestel, Chelsea. 2024. "Aesthetic Epistemology in Cartography: A Genealogy of 'Really Good Maps'." Ph.D. diss., University of Wisconsin–Madison.

Olmedo, Élise, and Sébastien Caquard. 2022. "Mapping the skin and the guts of stories–a dialogue between geolocated and dislocated cartographies." *Cartographica* 57 (2): 127–46. https://doi.org/10.3138/cart-2021-0006.

Olson, Judy M. 2006. "Map Projections and the Visual Detective: How to Tell if a Map is Equal-Area, Conformal, or Neither." *Journal of Geography* 105 (1): 13–32. https://doi.org/10.1080/00221340608978655.

Park, Deokgun, Mohamed Suhail, Minsheng Zheng, Cody Dunne, Eric Ragan, and Niklas Elmqvist. 2022. "StoryFacets: A design study on storytelling with visualizations for collaborative data analysis." *Information Visualization* 21 (1): 3–16. https://doi.org/10.1177/14738716211032653.

Parker, Ashley. 2026. "The Murder of The Washington Post." *The Atlantic*, February 4. https://www.theatlantic.com/politics/2026/02/washington-post-layoffs-bezos/685872/.

Pearce, Margaret Wickens. 2008. "Framing the Days: Place and Narrative in Cartography." *Cartography and Geographic Information Science* 35 (1): 17–32. https://doi.org/10.1559/152304008783475661.

———. 2009. "Place codes: Narrative and Dialogical Strategies for Cartography." Paper read at the *24th International Cartographic Conference*, November 15–21, Santiago, Chile.

Pearce, Margaret Wickens, and Renee Pualani Louis. 2008. "Mapping Indigenous Depth of Place." *American Indian Culture and Research Journal* 32 (3): 107–26. https://escholarship.org/uc/item/3jw5k84m.

Peuquet, Donna J. 1994. "It's About Time: A Conceptual Framework for the Representation of Temporal Dynamics in Geographic Information Systems." *Annals of the Association of American Geographers* 84 (3): 441–61. https://doi.org/10.1111/j.1467-8306.1994.tb01869.x.

Phillips, Jonathan. 2012. "Storytelling in Earth sciences: The eight basic plots." *Earth-Science Reviews* 115 (3): 153–62. https://doi.org/10.1016/j.earscirev.2012.09.005.

Prestby, Timothy. 2024. "Design Techniques for COVID-19 Story Maps: A Quantitative Content Analysis." *Cartography and Geographic Information Science* 51 (2): 222–41. https://doi.org/10.1080/15230406.2022.2102077.

Raposo, Paulo. 2017. "Scale and Generalization." *The Geographic Information Science & Technology Body of Knowledge,* edited by John P. Wilson. https://doi.org/10.22224/gistbok/2017.4.3.

Riche, Nathalie Henry, Christophe Hurter, Nicholas Diakopoulos, and Sheelagh Carpendale, eds. 2018. *Data-Driven Storytelling*. New York: CRC Press. https://doi.org/10.1201/9781315281575.

Robinson, Arthur H., Joel L. Morrison, Philip C. Muehrcke, A. Jon Kimerling, and Stephen C. Guptill. 1995. *Elements of Cartography*. Sixth edition. New York: John Wiley & Sons.

Rose, Gillian. 2022. *Visual Methodologies: An Introduction to Researching with Visual Materials*. London: SAGE Publications.

Roth, Robert E. 2015. "Interactivity and Cartography: A Contemporary Perspective on User Interface and User Experience Design from Geospatial Professionals." *Cartographica* 50 (2): 94–115. https://doi.org/10.3138/cart.50.2.2427.

———. 2017. "User Interface and User Experience (UI/UX) Design." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. https://gistbok-topics.ucgis.org/CV-05-013.

———. 2021. "Cartographic Design as Visual Storytelling: Synthesis and Review of Map-Based Narratives, Genres, and Tropes." *The Cartographic Journal* 58 (1): 83–114. https://doi.org/10.1080/00087041.2019.1633103.

Roth, Robert E., Arzu Çöltekin, Luciene Delazari, Bradley Denney, André Mendonça, Britta A. Ricker, et al. 2024. "Making maps & visualizations for mobile devices: A research agenda for mobile-first and responsive cartographic design." *Journal of Location Based Services* 18 (4): 408–78. https://doi.org/10.1080/17489725.2023.2251423.

Roth, Robert E., Richard G. Donohue, Carl M. Sack, Timothy R. Wallace, and Tanya M. A. Buckingham. 2014. "A Process for Keeping Pace with Evolving Web Mapping Technologies." *Cartographic Perspectives* 78: 25–52. https://doi.org/10.14714/cp78.1273.

Roth, Robert E., and Alan M. MacEachren. 2016. "Geovisual analytics and the science of interaction: an empirical interaction study." *Cartography and Geographic Information Science* 43 (1): 30–54. https://doi.org/10.1080/15230406.2015.1021714.

Roth, Robert E., Chloë Quinn, and David Hart. 2015. "The Competitive Analysis Method for Evaluating Water Level Visualization Tools." In *Modern Trends in Cartography: Selected Papers of CARTOCON 2014*, edited by Jan Brus, Alena Vondrakova, and Vit Vozenilek, 241–56. Cham, CH: Springer. **https://doi.org/10.1007/978-3-319-07926-4_19**.

Ryan, Marie-Laure, Kenneth Foote, and Maoz Azaryahu. 2016. *Narrating Space / Spatializing Narrative: Where Narrative Theory and Geography Meet*. Columbus, OH: The Ohio State University Press.

Scott, Darius. 2021. "Normalized Alterity: Visualizing Black Spatial Humanities." *GeoHumanities* 7 (2): 475–93. **https://doi.org/10.1080/2373566x.2021.1904788**.

Segel, Edward, and Jeffrey Heer. 2010. "Narrative Visualization: Telling Stories with Data." *IEEE Transactions on Visualization and Computer Graphics* 16 (6): 1139–48. **https://doi.org/10.1109/tvcg.2010.179**.

Sieber, Renee E., Pamela J. Robinson, Peter A. Johnson, and Jon M. Corbett. 2016. "Doing Public Participation on the Geospatial Web." *Annals of the American Association of Geographers* 106 (5): 1030–46. **https://doi.org/10.1080/24694452.2016.1191325**.

Slocum, Terry A., Robert B. McMaster, Fritz C. Kessler, and Hugh H. Howard. 2022. *Thematic Cartography and Geovisualization*. Fourth edition. Boca Raton, FL: CRC Press. **https://doi.org/10.1201/9781003150527**.

Song, Zihan, Robert E. Roth, Lily Houtman, Timothy Prestby, Alicia Iverson, and Song Gao. 2022. "Visual Storytelling with Maps: An Empirical Study on Story Map Themes and Narrative Elements, Visual Storytelling Genres and Tropes, and Individual Audience Differences." *Cartographic Perspectives* 100: 10–44. **https://doi.org/10.14714/cp100.1759**.

Steinberg, Jake. 2023. "Towards a Code of Ethics for Journalistic Cartography: Graphics Professionals' Perspectives on Visual Storytelling." Master's thesis, University of Wisconsin–Madison. **http://digital.library.wisc.edu/1793/84801**.

Steiner, Erik. 2019. "Flow Maps." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. **https://gistbok-topics.ucgis.org/CV-04-031**.

Stolper, Charles D., Bongshin Lee, Nathalie Henry Riche, and John Stasko. 2016. "Emerging and Recurring Data-Driven Storytelling Techniques: Analysis of a Curated Collection of Recent Stories." *Microsoft Research*, Washington, USA. **https://www.microsoft.com/en-us/research/wp-content/uploads/2016/04/MSR-TR-2016-14-Storytelling-Techniques.pdf**.

Tait, Alex. 2018. "Visual Hierarchy and Layout." *The Geographic Information Science & Technology Body of Knowledge*, edited by John P. Wilson. **https://gistbok-topics.ucgis.org/CV-03-007**.

Thatcher, Jim, David Retchless, and Carolyn Fish. 2024. "Dueling cartographies: science, positivism, art, and critical praxis." *International Journal of Cartography* 10 (3): 377–94. **https://doi.org/10.1080/23729333.2024.2338496**.

Tierney, Lauren. 2018. "How we Made 'The Melting of Antarctica'." *Cartographic Perspectives* 89: 44–52. **https://doi.org/10.14714/cp89.1469**.

Tierney, Lauren C., and Jason Treat. 2017. "The Melting of Antarctica." *National Geographic*, July.

Tse, Archie. 2016. "Why we are doing fewer interactives." Presentation at Malofiej, Pamplona, Spain, March 6–11.

Tyner, Judith A. 1982. "Persuasive cartography." *Journal of Geography* 81 (4): 140–4. **https://doi.org/10.1080/00221348208980868**.

———. 2014. *Principles of Map Design*. New York: The Guilford Press.

Underwood, Nick. 2022. "Mapping Guatemala-US Migration: A Case Study in Critical Visual Storytelling." Master's thesis, University of Wisconsin–Madison. **http://digital.library.wisc.edu/1793/83759**.

United Nations. 2024. "UN Special Committee finds Israel's warfare methods in Gaza consistent with genocide, including use of starvation as weapon of war." November 14, 2024. **https://www.ohchr.org/en/press-releases/2024/11/un-special-committee-finds-israels-warfare-methods-gaza-consistent-genocide**.

Usher, N. 2019. "Putting 'Place' in the Center of Journalism Research: A Way Forward to Understand Challenges to Trust and Knowledge in News." *Journalism & Communication Monographs* 21 (2): 84–146. **https://doi.org/10.1177/1522637919848362**.

———. 2020. "News cartography and epistemic authority in the era of big data: Journalists as map-makers, map-users, and map-subjects." *New Media & Society* 22 (2): 247–63. **https://doi.org/10.1177/1461444819856909**.

Vincent, Kristen, Robert E. Roth, Sarah A. Moore, Qunying Huang, Nick Lally, Carl M. Sack, et al. 2019. "Improving spatial decision making using interactive maps: An empirical study on interface complexity and decision complexity in the North American hazardous waste trade." *Environment and Planning B: Urban Analytics and City Science* 46 (9): 1706–23. **https://doi.org/10.1177/2399808318764122**.

Vujaković, Peter. 2014. "The State as a 'Power Container': The Role of News Media Cartography in Contemporary Geopolitical Discourse." *The Cartographic Journal* 51 (1): 11–24. **https://doi.org/10.1179/1743277413y.0000000043**.

Wallace, Tim, and Derek Watkins. 2017. "Town After Town Under Water in the 100 Miles From Houston to Beaumont." *The New York Times*, September 2. **https://www.nytimes.com/interactive/2017/09/02/us/harvey-beaumont-flooding.html**.

Wallace, Timothy R. 2016. "Cartographic Journalism: Situating Modern News Mapping in a History of Map-User Interaction." Ph.D. diss., University of Wisconsin–Madison. **https://digital.library.wisc.edu/1711.dl/ZWERTBUL7VICK8Z**.

Weizman, Eyal, Nour Abuzaid, Omar Ferwati, Davide Piscitelli, Samaneh Moafi, Joshua Richards, et al. 2024. "A Cartography of Genocide: Israel's conduct in Gaza Since October 2023." *Forensic Architecture*. Accessed June 1, 2024. **https://forensic-architecture.org/investigation/a-cartography-of-genocide**.

White, Travis M., Terry A. Slocum, and Dave McDermott. 2017. "Trends and Issues in the Use of Quantitative Color Schemes in Refereed Journals." *Annals of the American Association of Geographers* 107 (4): 829–48. **https://doi.org/10.1080/24694452.2017.1293503**.

DOI: 10.14714/CP109.2035

PEER-REVIEWED ARTICLE

Counter-mapping as Action Research: Lessons Learned from the Microgeography of Universal Public Restrooms

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Single-occupancy restrooms benefit families and caregivers as well as trans and non-binary people. Recent US state laws restricting the use of gendered restrooms based on a person's sex assigned at birth highlight the importance of improving access to these places. Part of our university's response to a state law restricting restroom access was to share a map (layer) that identified the location of all-gender restrooms on campus. After identifying mistakes and learning these locations were not ground-truthed, we re-mapped these locations by visiting every public building on campus. Our work illustrates the nuances of restroom access on college campuses, identifies opportunities for advocacy, and provides a product that helps students and staff who do not conform to a binary definition of gender.

The design and evolution of public spaces provides insights into a society's core values and beliefs. Mapping these spaces is one way to better understand how they operate and affect the everyday lives of users. This is true for parks, benches, sidewalks, libraries, museums, and, indeed, for public restrooms. Restrooms have long been contested sites where ideas about privacy, gender, race, and disability play out. They can be places of oppression, but also of access and social inclusion. We find that the act of mapping these spaces represents both an opportunity to better understand how access works at the scale of the building as well as to direct and amplify efforts to improve access.

In November 2024, our state, Ohio, passed a bill restricting the use of gendered restrooms in K–12 schools and universities to the sex users were assigned at birth. Single-occupancy restrooms provide a non-gendered option, making the ability to find these facilities important for those who do not fit into definitions imposed by the law. These restrooms are valuable to trans and non-binary people under the new state law, but also remain important for families with small children, people with disabilities, caretakers of the elderly, and many other situations that require a single-user or mixed-gender room.

We are part of a small community geography lab on a public university campus, where we create free maps on request from, and in collaboration with, the community.[1] We are both cis women, but with friends, family, and colleagues affected by the new state law. In December 2024, we reached out to the staff/faculty LGBTQ+ organization on campus, attended their monthly meeting to hear about specific concerns and needs, and offered to make a map of universal restrooms on campus. We suggested that we could make a simple Google My Map and post signs with QR codes linking to the map outside gendered restrooms around campus. We also met with the campus LGBTQ+ center, asking what data they would like shared on the map and what type of advertising of this map they would be most comfortable with.

The LGBTQ+ advocates obtained a list of universal restrooms[2] created by our campus facilities management

1. While our university's identity is clear from our affiliation, we chose to keep our discussion of our location non-specific, recognizing that the challenges revealed through the mapping project could apply to any college campus. We also describe campus buildings by their use rather than their proper names, which are less meaningful to most readers.

2. There are several terms used to refer to individual-stall restrooms. In our research we followed the university's use of the term "universal" in reference to restrooms not labeled by gender, per Ohio Administrative Code Rule 3342-5-12.18. While most universal restrooms were also in compliance with the Americans with Disabilities Act (ADA), a few were lacking push buttons and two were only accessible by stairs.

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department. However, they expressed concern about how the university identified which restrooms were "universal," and requested we double-check locking and signage. But when we asked for the list of these restrooms as a starting point, the facilities office seemed uncertain about sharing this data, and wanted assurances that we would keep the map up to date. After we made these assurances, we were then told by a representative from our campus human resources/diversity office that they did not want us to make a map that would compete with the official campus map, which includes a layer for universal restrooms. This was understandable, so we offered to instead ground-truth the existing map layer and they agreed.

We originally approached this as a community mapping project, not as research. But the fieldwork required for mapping restrooms provided a far deeper understanding of the challenges of accessing and sharing the locations of these facilities. We argue in this paper that the process of mapping helped us learn more about the microgeography of restroom locations in buildings, providing greater insight into how to better accommodate those who use single-occupancy restrooms. This fine-scale analysis illustrated the difference between universal restroom *existence* in a campus building versus universal restroom *accessibility* in these places. The mapping process also identified opportunities for advocacy around access issues, highlighting the value of cartography in ongoing social justice work.

COMMUNITY GEOGRAPHY, COUNTER-MAPPING, AND CRITICAL GIS

Creating maps to support social justice has a strong tradition in geography. While in hindsight many early Western maps were most often produced by and for those in power, in recent decades maps have been increasingly promoted as a tool for social justice (Harley 1991, Monmonier 2018, O'Sullivan 2006, Parker 2006, Alderman et al. 2021, Velázquez Soto 2024, Buckley and Case 2025). The work of the Detroit Geographical Expedition and Institute, for example, represented a "radical break" in which cartographers created maps to advocate for change and visualize municipal neglect (López Garrido 2021, Warren et al. 2019). In more recent years, maps have been used to identify cases of environmental racism, discriminatory eviction practices, queer spaces, and health disparities, among many other examples in which the maps served as tools of empowerment (e.g., Cinderby et al. 2008, Maharawal and McElroy 2018, Swab and Gieseking 2022, Binte Mohiuddin 2025).

The growth of GIS as a tool for mapmaking led to multiple concerns about this new field, in particular the emergent recognition that only those with skills and an expensive software license could make maps. Early responses called for Public Participatory GIS (PPGIS): computer-assisted mapping that involves, from start to finish, members of the community that is being mapped (Parker 2006, Corbett et al. 2016). More recent focuses on community-engaged geography have broadened calls for public involvement beyond mapmaking to include co-producing knowledge from research questions to data collection to analysis to sharing results (including through maps; Koopman 2024).

The evolution of these practical interventions into the mapping process mirrors a broader theoretical understanding of the role of geographers in their local community. Long a field of "explorers" who visit places briefly, extract knowledge, then leave, more recent understandings of geography argue that it can, and should, be a research process that co-produces knowledge with local community members; one in which those affected help determine research questions and methods as well as work together with researchers to produce, analyze, and disseminate results. Shannon et al. (2021) define community geography as praxis, bridging theories of inclusion and empowerment with the actual approach to conducting research in the field. This perspective suggests an active engagement by geographers and cartographers in counter-mapping. Counter-mapping is defined by Harris and Hazen (2006) as "any effort that fundamentally questions the assumptions or biases of cartographic conventions, that challenges predominant power effects of mapping." In the case of restroom locations, the production and sharing of a universal restroom map is an act of resistance to the conventional assumption of restroom ubiquity and homogeneity. At a time when ideas about gender and sex are increasingly legislated, restroom mapping is both an act of recognition of human heterogeneity and a response to basic human needs and comfort in navigating everyday life.

A SHORT HISTORY OF GENDERED PUBLIC RESTROOMS

Sex-segregated restrooms in the United States were first introduced when women entered the professional workforce in the late 1800s (Kogan 2007). Though women had access to, and frequented, public spaces, there were no policies dedicated to women's use of public facilities until Massachusetts enacted a sex-separation law in 1887. This law, and those that followed, reinforced the idea that restrooms needed to be segregated by sex based on morality, privacy, and women's modesty. The creation of sex-segregated public spaces, including restrooms, reinforced the idea that women were physically and intellectually different than (i.e., inferior to) men (Kogan 2007).

Segregation of public restrooms by sex coevolved with racial segregation of public facilities that were part of Jim Crow laws. Along with the passing of the Civil Rights Act of 1964, outlawing the segregation of public facilities and accommodations, activists pushed for inclusive restroom construction provisions (Gershenson 2010). Though public facilities became more accessible and less racially segregated in the 1970s, restrooms remained sex-segregated.

The first alternative to this traditional architecture arrived in 1991, when the first family restroom debuted at a suburban shopping mall (Davis 2020). While justified through cis/heteronormative families, they also created a space that could be used by people regardless of gender identity. By the early 2000s, some states required that at least one family restroom be included in new buildings. While family restrooms grew in popularity, college students advocated for gender-neutral and mixed-gender restrooms on campus, including in dormitories. By 2005, private businesses and public parks began to add unisex restrooms to increase the amount of ADA-compliant restrooms at a lower price point (Anthony 2006).

This brief period of focus on increased flexibility and access was short-lived. In 2016, North Carolina's House Bill 2 (HB2) restricted the use of multiple occupancy public restrooms by sex assigned at birth. This law resulted in national outrage and boycotts, and the bathroom portion of the bill was rolled back a year later (Prichep 2024). But political climates can shift quickly, and similar laws were easily passed in other states in 2023 and thereafter. In 2024, thirteen states had laws that restricted the use of public restrooms in schools and/or government buildings based on sex at birth (Human Rights Campaign 2024). In Ohio, these restrictions include schools and college campuses, where the law took effect at the end of February 2025.

MAPPING ACCESS TO PUBLIC SPACES

Basic campus maps rarely show restroom locations, as they are assumed to exist within all buildings. And while this is true, a restroom's type and microgeography impact its accessibility. There is an element of transactional access that lies within the confines of when the building is open, if individuals feel comfortable using the space, and if state law allows for their use of the space. While they are often not shown on campus maps, (gendered) restrooms are frequently included on interior maps of public buildings, to aid in access. The idea that universal restrooms would need to be distinguished on these maps from gendered restrooms is relatively new, but a critical perspective on public spaces recognizes the value of this information to people with a variety of different identities and situations.

Gendered restrooms are just one part of a broader discussion about public spaces. A larger question, tackled across academic disciplines, is one of access: Who moves easily through public space and who is restricted? And why? The practice of mapping these spaces, and learning through the mapping process, is important for a better understanding of how these spaces both affect and are affected by cultural and political realities. A longer history of mapping access focuses on disability, particularly how and if those with limited mobility can access public facilities. Kitchin (2002) describes a landscape of curbs, steps, narrow doorways, and unpaved walkways encountered daily by those in wheelchairs and advocates for a mapping process that identifies challenges and empowers users. While we did not use participatory mapping in our project, we certainly recognized the power of using on-the-ground experiences of everyday landscapes to better understand access.

Hamraie (2018) sees critical accessibility mapping as an "open-ended process, a negotiation, and an intersectional

and multimodal issue" rather than a task with an end point (456). Hamraie continues: "Beyond aiding navigation, accessibility mapping became a device for asking questions: what counts as access, for whom, and under what conditions?" (460). More broadly, maps can disrupt power by guiding users to safe, friendly, or accessible places, or away from dangerous and/or discriminatory spaces. Past examples include Green Books showing Black-friendly businesses (1936–1967) and Bob Damron address books (1960s–2021), also known as the Gay Guides (Bottone 2020, Regan and Gonzaba 2019). Today, counter-mapping includes mapping queer-friendly spaces, sanctuary cities or immigrant-friendly businesses, sites of Indigenous presence, and safe/dangerous spaces for women (e.g., Fileborn 2021, Anti-Eviction Mapping Project 2021).

CARTOGRAPHIES OF CAMPUS RESTROOMS

Even before restrictive legislation, university students and staff made efforts to map and identify restrooms that are single user, non-gendered, and accessible. In 2003, UC Santa Barbara affiliates created a coalition dubbed PISSAR (People in Search of Safe and Accessible Restrooms), which worked to increase awareness of and map safe, accessible, and gender-neutral restrooms (Chess et al. 2016). In 2022, an MIT student produced a map depicting single and multi-stall all-gender restrooms on campus. The map includes a dyslexia-friendly font family and colorblind-inclusive color scheme (Seaman 2022).

Maps of restrooms on college campuses are not rare: at least 456 college websites list these facilities (Beemyn 2024). Virginia Commonwealth University, for example, hosts a gender-inclusive restroom map on their website identifying single-stall, gender-neutral restrooms on campus. This interactive map was created using Google My Maps and includes detailed information about the restrooms, including handicap accessibility, public access, and exact location. There is an additional submission box for students, staff, or members of the community to submit new restroom locations and provide additional details. Other colleges and universities, including New York University, Oberlin College, University of Minnesota, and University of Illinois Chicago, use interactive mapping platforms to visualize non-sex segregated restrooms. Some colleges and universities do not host maps on their websites, but have lists of gender-neutral, single-user, or universal restrooms and their locations. In most cases, the maps and lists provided are separate from other campus maps and focus exclusively on showing non-gendered restrooms.

AN OFFICIAL UNIVERSAL RESTROOM MAP

Our regional Midwestern public university consistently ranks 5/5 stars in the Campus Pride Index. Our campus has approximately 30,000 students and 5,000 faculty and staff, with 6 percent (about 2,100) who identify as trans, non-binary, or gender fluid (Rankin Climate 2025). The university opened one of the first campus LGBTQ+ centers in the state (which closed in June 2025 due to a different state bill) and hosts the longest-running student LGBTQ+ organization in the country. While administrators have been cautious in a politically hazardous climate, they have made their desire to protect all students clear. So, while this article points out some of the problems with the existing campus map, this is certainly not a critique of the university's response to the new state bathroom law. It is important to reiterate: We have met no opposition to mapping and providing accurate information about the location of universal restrooms on our college campus, even if the bureaucratic wheels have sometimes been slow to turn. In fact, our experience is that most faculty, staff, and administrators see the value of this process and support creating safe, accessible spaces for students and staff. So rather than placing blame for access difficulties, this article focuses instead on the architectural and administrative challenges and opportunities of mapping universal restrooms.

Since at least 2014, there has been a universal restroom layer on the official campus online map. This map, created by Concept3D, includes 21 layers, ranging from academic buildings and ATMs to bike racks and lactation rooms (Figure 1). An email from three senior vice presidents in February 2025 shared this map (with the academic

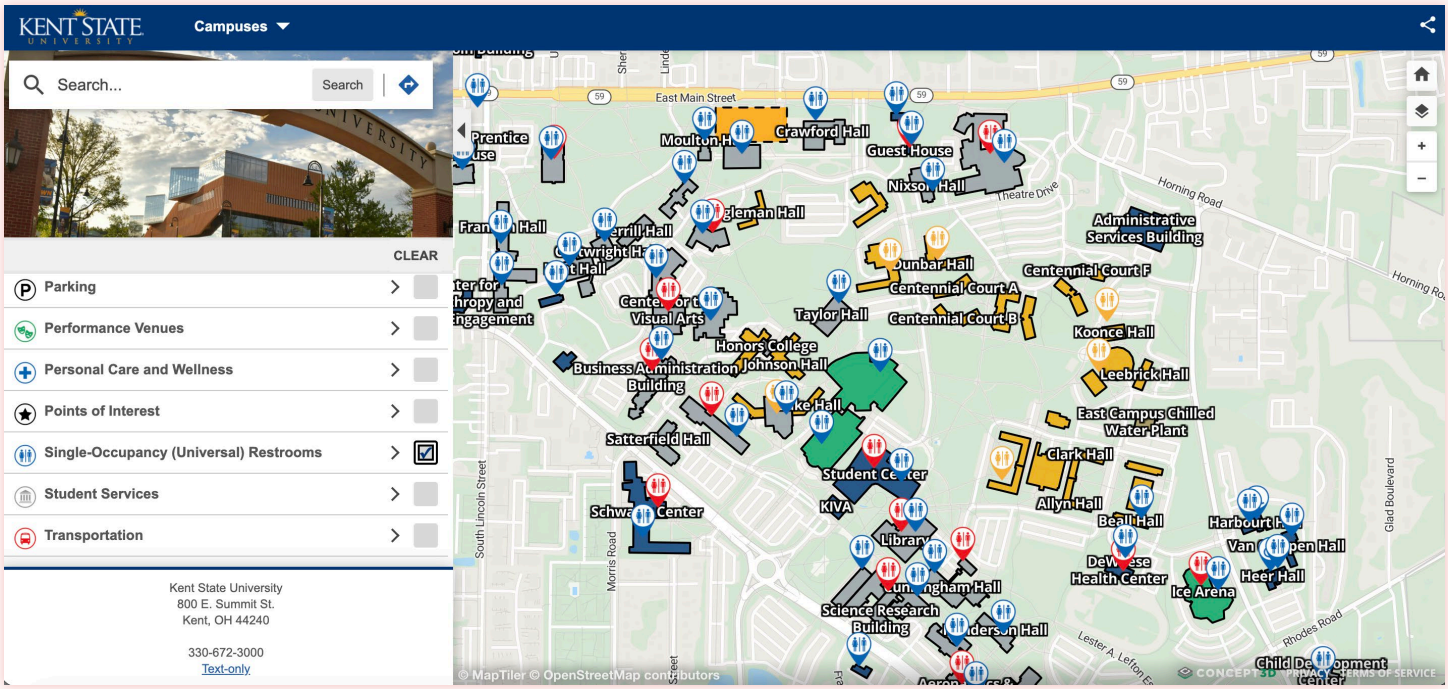


Figure 1. Screenshot of the campus map, with universal restroom layer turned on.

building layer checked, but the universal restroom layer unchecked) with students, faculty, and staff 15 days before the bathroom law went into effect. The email encouraged users to scroll down the list of map layers and click on the universal restroom layer. QR codes linking to the map were posted around campus, including monitors in the student center. At the time of this email, the map showed 168 universal restrooms in 52 public and semi-public buildings on campus.

GROUND-TRUTHING THE OFFICIAL UNIVERSAL RESTROOM MAP

The data on the official campus map came from the campus architect's office, but was not ground-truthed before the map was shared in February 2025. In fact, we learned of the need to correct errors on the spreadsheet we received in early 2025 by noticing that the information for our own building (earth sciences) was incorrect, as it stated that there were two universal restrooms, but there was only one. The methods we used focused originally on correcting errors, but expanded during the project to qualitatively assess access issues for these restrooms.

To re-map campus universal restrooms, we visited all floors of all non-dormitory buildings on campus. Visiting these buildings allowed us to see if the building was truly accessible to the public, and to look for both listed and unlisted restrooms. Field research lasted for three weeks in March and April 2025, with follow-up visits to answer additional questions in June 2025. In addition to identifying the existence or absence of universal restrooms, we also looked for any barriers to access. We only looked for restrooms in buildings where we were allowed to walk around the building without explaining our presence to an office worker. This restriction was self-imposed as we felt potential restroom users would not want to ask permission to access interior spaces where visitors are required to check in or explain themselves to access the building's semi-public spaces.

We found a key aspect of our assessment of restrooms to be centered on whether they were accessible to all: Were they *public* restrooms? There are two parts to this question (Figure 2). First, is the building itself publicly accessible? Access to dormitories is clearly the most restricted on a college campus, so we began by assuming these to be private. Only students with swipe cards or their guests can access the interior of these buildings. The police station, health center, and preschool also have strong access restrictions. At the opposite end of this spectrum are buildings

that are clearly public: our campus library and student center, for example, are open long hours (including weekends) and do not require swipe cards. Academic buildings

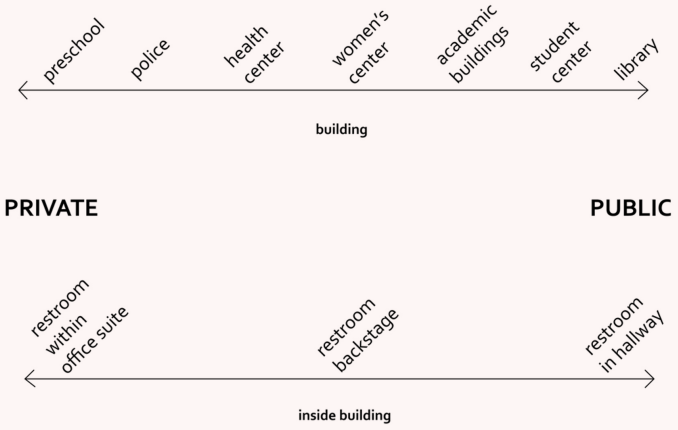


Figure 2. A spectral understanding of public and private buildings on a college campus, as developed during our research on the location of universal restrooms.

(which often pair faculty/staff offices and classrooms based on discipline) are typically open to all during regular business hours. Other buildings are in the middle, with unlocked doors but people at a front desk whom you need to check in with to proceed into the rest of the building. The next part of the question is: within the building, is the restroom in a public space? Restrooms in hallways in public buildings are the most public. Restrooms in closed (and sometimes locked) office suites are the least public. Other spaces are somewhat in between, and these can make the user feel uncomfortable due to their unclear status.

We categorized 75 campus buildings as public, semi-public, or private (Figure 3). Public buildings could be entered by anyone during business hours (or beyond). Semi-public buildings required a check-in with office staff (a specific appointment with someone who works there or a planned event), and private buildings were restricted to those with special permission (the preschool or police station). These

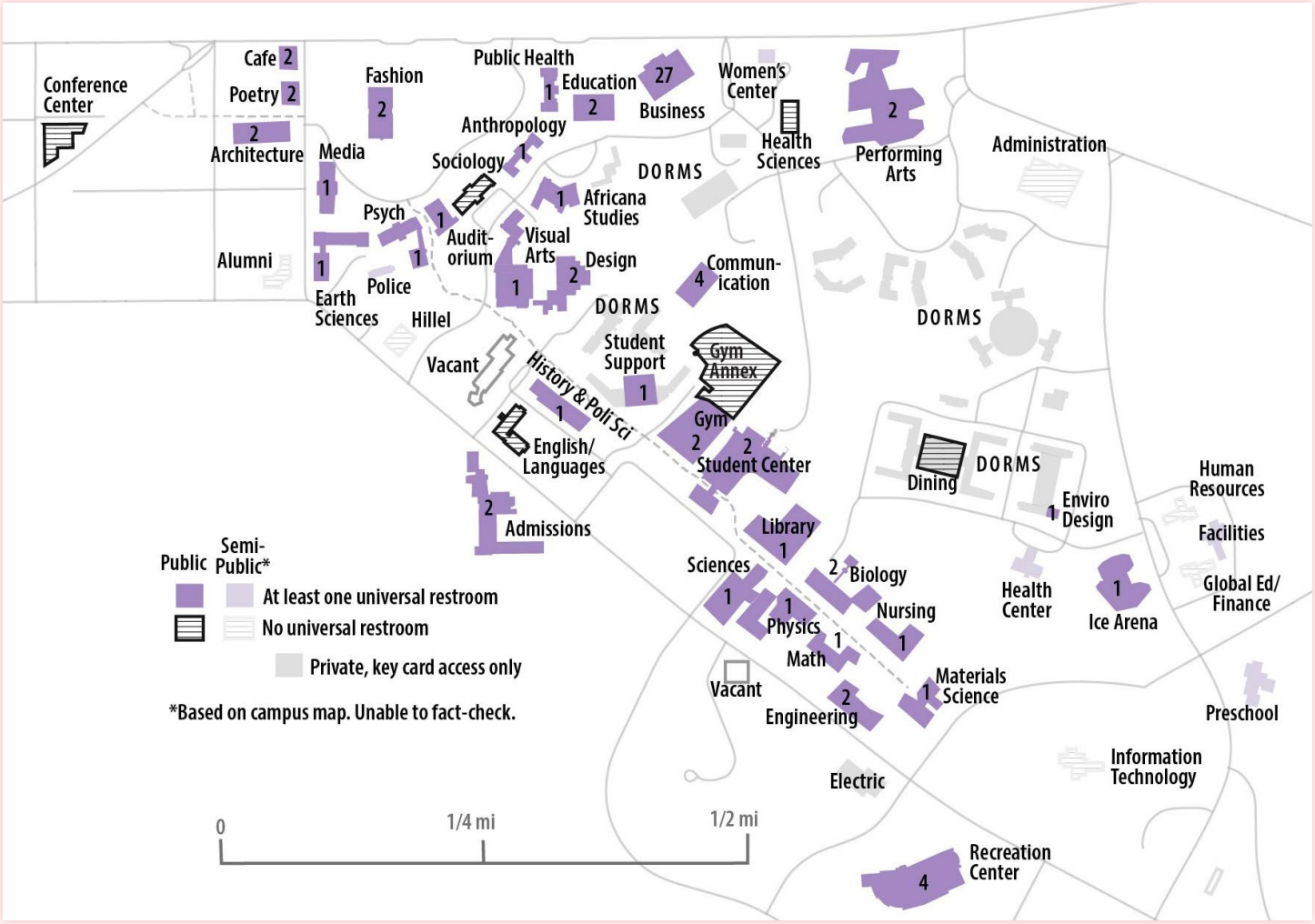


Figure 3. Map showing public, semi-public, and private buildings with and without universal restrooms, with quantity noted for public buildings.

Public Buildings					
Building purpose	Universal restrooms	False +	False -	Other	No Error
Admissions	2				•
Africana Studies	1	•			
Anthropology	1			•	
Architecture	2				•
Auditorium	1			•	
Biology	2				•
Business	27				•
Cafe	2	•			
Communication	4				•
Conference Center	0				•
Design	2				•
Dining	0				•
Earth Sciences	1	•		•	
Education	2			•	•
Engineering	2	•			
Enviro Design	1				•
Fashion	2	•		•	
Gym	2	•	•		
Gym Annex	0	•		•	
Health Sciences	0	•		•	
History/Poli Sci	1				•
Ice Arena	1	•	•		
Library	1	•			
Materials Science	1			•	
Math	1	•			
Media	1				•

Public Buildings (Continued)					
Building purpose	Universal restrooms	False +	False -	Other	No Error
Nursing	1	•	•		
Performing Arts	2	•			
Physics	1				•
Poetry	2		•		
Psychology	1	•	•		
Public Health	1				•
Recreation Center	4		•		
Sciences	1				•
Sociology	0				•
Student Center	2	•		•	
Student Support	1				•
Visual Arts	1				•

Buildings with Restricted Access (Semi-public)		
Building purpose	Universal restroom	Known error
Administration		
Alumni		
Facilities		•
Global Ed/Finance	•	
Health Center	•	•
Hillel		
Human Resources		•
Info Tech		
Police	•	•
Preschool	•	•
Women's Center	•	•

Table 1. Ground-truthing results for campus buildings.

categories were determined by both authors together given our experiences as faculty (Mapes) and student (Spence) and additional research (if needed). We did not extend our research to sports stadiums and similar outbuildings. On the main campus there are 25 private buildings: 24 dorms and the campus power plant. There are 39 public buildings on campus and of these, 32 had at least one universal restroom. Of the remaining buildings, 11 are semi-public, and while we were limited in our ability to ground-truth these, the campus map stated that five of these had universal restrooms. Overall, we found universal restrooms in 74 percent of public and semi-public buildings, confirming in-person 80 of these spaces in public buildings across campus. But these basic statistics do not adequately represent everything about the experience of finding and using universal restrooms on campus.

Combining our categorization of public and private spaces on campus, along with a survey of every floor of every building, we found that more than half the entries on the official campus map were inaccurate or misleading, for a variety of reasons (Table 1). The data used by the official map was missing some single-occupancy restrooms (false negatives) and included some that were gendered or not

publicly accessible (false positives). Even in semi-public buildings that we could not check, some errors were clear: classrooms in the campus preschool were identified as having universal restrooms, even though the school is not accessible to the public, and the restrooms are not intended for adult use. Restrooms inside exam rooms at the health center were also identified on the map layer, despite being only accessible by the patient occupying the room.

Errors listed under "other" in Table 1 refer to issues with accessibility such as locked doors, incorrect room numbers, and unsigned locations. Though the official map includes a note for some of the restrooms saying that they are in office suites or lounges, the map user must click on the restroom and review the pop-up window to find this out (Figure 4). These restrooms are technically single-user, but they are not easily accessible and their hidden, semi-private, or unfinished location may discourage potential users (Figure 5).

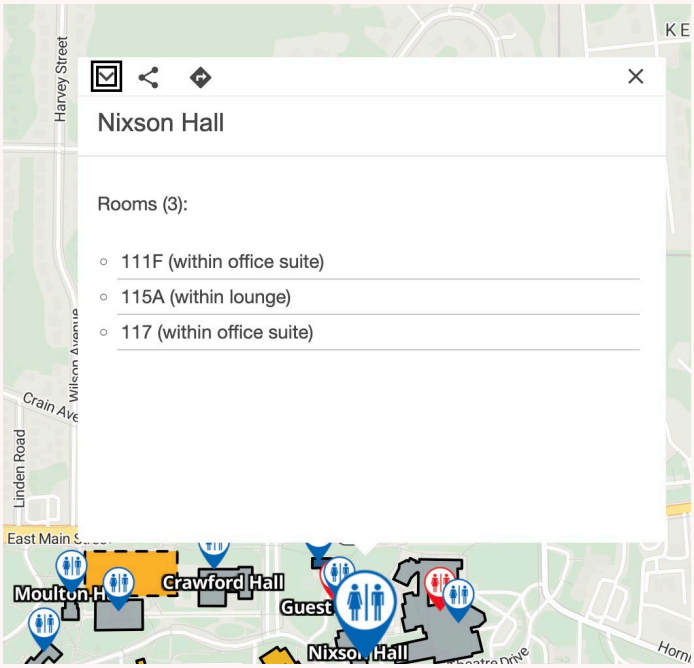


Figure 4. Notes on the campus map add caveats to the "universal restroom" designation, but in some cases this means the restrooms are not actually public.

WINDING ROUTES AND LOCKED DOORS

Within buildings, we found that the microgeography of restrooms determined how accessible they are to potential users. Some universal restrooms were in hallways, like most gendered restrooms. However, there were many others with more complicated geographies, making them more difficult to access.

BACKSTAGE

Several of the restrooms designated as universal were located backstage in auditoriums or small stages around campus. These posed a unique challenge because they were not built originally for public use, but for performers during performances. While it is always useful to have more single-user bathrooms, describing them with a broad brush as "universal" is problematic.

The campus auditorium building provides a good example of how a backstage location can make a restroom less-than-public. The building is a hub for faculty, staff, and students, and includes office suites, student lounges, and the auditorium. While the campus map identifies a universal restroom on the third floor, the difficulties in finding this restroom are indicative of broader problems with the identification of all single-user restrooms as both



Figure 5. The basement of the math building was listed on the campus map as including a universal restroom, but its location was unclear and the basement felt like it was not a public space.

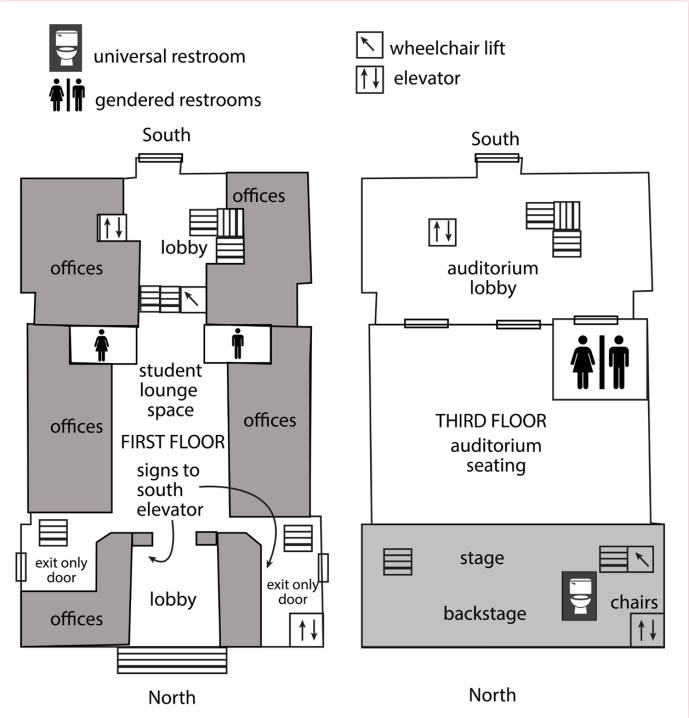


Figure 6. Administration/auditorium building floor plan: The north elevator is the only way to access the universal restroom, which is in back of the auditorium stage. There is no signage indicating the restroom's existence or how to get there from other parts of the building.

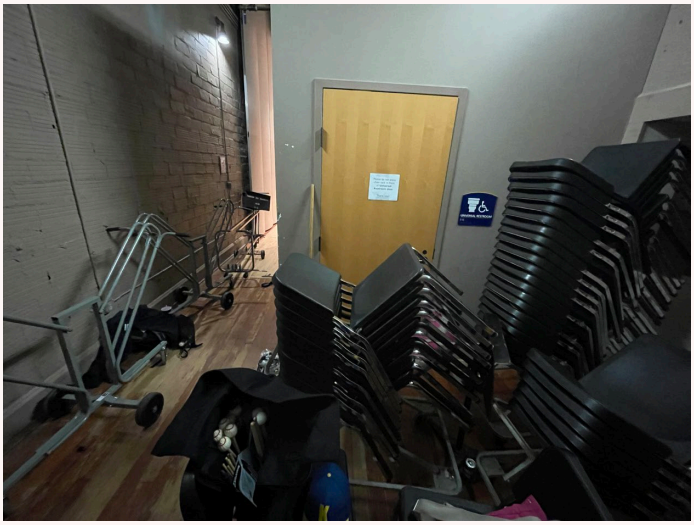


Figure 7. There is little space backstage in the administration/auditorium building, so during several of our visits to this location, chairs were blocking the restroom. The sign on the door suggests this is a known problem for access: "Please do not place chair rack in front of universal restroom door. Thank you!". Additional signs (not shown) illustrate the correct storage setup for equipment so it does not block the restroom. The doorway to the right, also blocked by chairs, leads to stairs and an elevator lift with access to the auditorium seats.

universal and accessible. At the front (south side) of the building, stairs and an elevator lead to the back of the auditorium on the third floor (Figure 6). There are gendered restrooms at the back of the auditorium, but no signs explaining how to get to the universal restroom or noting its existence. This restroom is at the back of the stage, and so was likely built for performers to discreetly use during a show. There are two options to get there. One involves cutting through the auditorium and stage to access backstage, but there are frequent events and musicians practicing there. The other requires the user to find a hidden elevator (on the building's north side) that is not mentioned on any sign and take this elevator directly backstage. We inspected this restroom multiple times and found stacked chairs blocking the door (and a sign saying users should not block the door with chairs) several times (Figure 7).

OFFICE SUITES, LOCKER ROOMS, AND LOUNGES

Three of the most public buildings on campus are the library, student center, and gymnasium. All three of these buildings had universal restrooms listed that were either not public or not found. We considered these to be false positives—restrooms listed on the map that did not exist or were not accessible by typical students or staff. In the library, the map listed four universal restrooms, but only one was a true universal restroom. One was within a gendered lounge (Figure 8) in the basement. Two others were located within office suites off-limits to all but staff of the president and provost (the library's second floor includes these top administrative offices). A similar situation was found in the history/political science building, which also hosts the dean's office—this office suite includes a single-user restroom adjacent to the dean's conference room. While there is no sign forbidding outsider use of this restroom, it is unlikely to be considered an option by anyone besides the dean and their staff. In the student center, one of the universal restrooms was in a sometimes-locked room where the Board of Trustees meets.

Our overall assessment of the campus map was that it is mostly accurate at the scale of the building. For example, eight universal restrooms are listed for the performing arts building on the campus map. And it is true that the building has universal restrooms. However, when we examined the microgeography of building layouts and function, we found that the picture is incomplete. Two of these eight restrooms were indeed universal, but one was multi-user (so, legally not permitted to be universal), two were

backstage, one was locked, and the other two were located in gendered locker rooms reserved for the dance studio.

As another example of how the picture becomes complex once we focused on the level of the building, the recreation center on campus includes two gendered locker rooms with strict single-sex policies for everyone over age four. But it also has two lockable gender-neutral rooms next to the pool, with lockers, showers, and a toilet. These are listed on the campus map. There is an additional restroom listed on the campus map that is "in a wellness suite" that we could not find. However, there were two single-stall restrooms on the first floor that seemed to have been recently switched from gendered to universal (one still has a urinal inside), but these were not listed on the map.

COMPLEXITIES OF BUILDING INTERIORS

Our research shows that simply inputting data from the architect's office does not work for mapping universal restrooms. Some of these facilities are within gendered or private spaces. In other cases, the construction of the building changed after the plans were submitted, making some areas more public and others less public. Other inaccuracies are mysterious: it is unclear how some non-universal restrooms were listed as universal on the campus map, or why others were left off.

If there is one problem we knew before this mapping project began, it is that campus buildings are weird. Architects get creative, and renovations over decades or even centuries can make them even weirder. Additionally, the locations of restrooms within buildings are often the result of overlapping layers of historic building use. This may include buildings not originally built to include women, and so restroom locations do not follow an expected pattern of two gendered multi-stall restrooms per floor (Hammonds 2020). The library on our campus, for example, is 12 stories of restroom confusion with a combination of male, female, universal, and mixed restrooms—but not all are available on each floor (Figure 9). The earth sciences building includes a single large multi-stall gendered restroom and



Figure 8. Library room 016 was listed on the campus map as a universal restroom, but it is a multi-stall restroom inside a gendered lounge. A sign directs those looking for a universal restroom to a different floor.

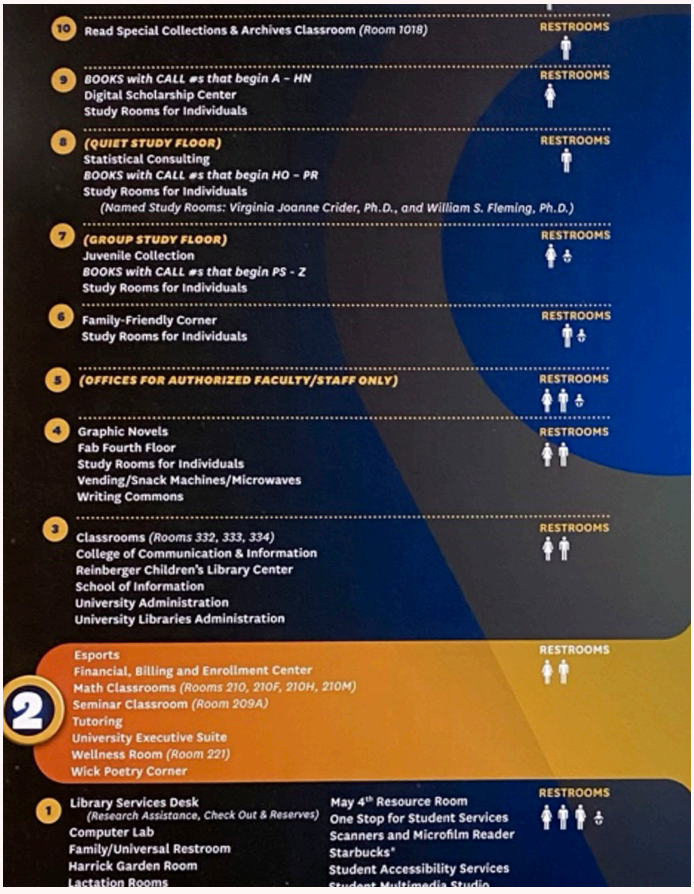


Figure 9. This sign, on the second floor of the library, shows restroom availability by floor in the column on the right, illustrating how the building was constructed with only one gendered bathroom per floor above the 5th floor.

two smaller gendered restrooms on the second, third, and fourth floors—these restrooms have likely undergone many iterations of what gender they are assigned to. Levine (2023) calls these incongruities "scars of organizational assumptions" in her autoethnographic survey of restrooms on Purdue University's campus (22).

While the age of campus buildings sometimes plays a role in their "campus weirdness," it does not necessarily determine whether they have a universal restroom. Many of these buildings were renovated recently and universal restrooms were added. The earth sciences building, for example, did not have a universal restroom until 2024, when the first floor was renovated and a single-user restroom was added (the first floor previously did not have any restrooms). Some of the most accessible setups and helpful signage are in buildings renovated or constructed in the past few years, including the new business building (2024) which includes 27 universal restrooms (one-third of all on campus) and only a single set of gendered multi-stall restrooms. On the other hand, the new 70,000 sq ft sciences building, which opened in 2017, only has one publicly accessible universal restroom and it is in the basement and behind an unmarked, closed outer door.

OPPORTUNITIES FOR ADVOCACY

While there are many takeaways from this mapping project about how easy it is to misrepresent access through uncritical mapping, we are optimistic that our more detailed process of ground-truthing and mapping has created many opportunities to improve access. While most of the on-the-ground mapping was done by one of the authors (Spence), we reached out to many colleagues across campus who know their buildings best. In doing this, and through the in-person visits to buildings, we were able to identify ways to make inaccessible spaces into accessible spaces and encourage our colleagues to advocate for these changes.

CHANGING LOCKS

One issue we found with universal bathrooms was locks. This problem can go in two directions. The state law requires that universal restrooms be lockable from the inside and include only one stall. On our campus, there are some restrooms that do not have a lock on the main door but include only a single stall that can be locked. Adding a lock on the inside of the main restroom door would transform this space into an "official" universal restroom. Conversely, other restrooms are locked on the outside and can only be opened with a faculty key. So, while they are single-user, they are not reliably public. This is another situation where an easy mechanical change can create a new universal restroom.

In the psychology building, there is a short hallway with a universal restroom at the end. It was originally built to be a semi-private office suite but has been converted into several separate offices and is now public. A sign on the hallway door says, "do not close, this door will lock." One colleague asked the department chair to change this locking door into an unlocked door to make clear that this is a public space, and therefore the restroom is public. Unfortunately, this was not successful, and the space is now identified as faculty lab space although it remains publicly accessible. In the English building, another antiquated setup includes signs designating single stall, gendered, unlocked restrooms as faculty only. Faculty voted to open these up to students, and they requested that locks and signs be added to make them universal restrooms under state law. During our mapping, we were included in an email request to permanently unlock the exterior door to the only universal restroom in the gym annex. This faculty request found its way to a student accessibility specialist who put in a request to campus facilities management, and they fixed the lock.

SIGNAGE

Appropriate signage can make a big difference in the accessibility of a universal restroom. These should be listed in the building directory, and signs should be added to guide users from gendered restrooms to universal ones. In many cases, the nature of complex academic buildings and complex numbering systems made universal restrooms difficult to find during our research. Grassroots advocacy work in the Africana studies building was clear from multiple, unofficial paper signs pointing users to the universal restroom (Figure 10). In the visual arts and design buildings, gendered restrooms included official (plastic) signs pointing the user to the nearest universal restroom (Figure 11). However, beyond these two examples, there

were very few attempts to provide helpful signs to universal restrooms.

In addition to the challenge of a lack of internal building signage, the appearance of universal restroom signs is also a topic of debate. Best practices call for a single-user accessible restroom sign to include a toilet symbol next to the International Symbol of Access (ISA) symbol (a person sitting in a wheelchair) and be labeled with the words "Universal Restroom" or "All-Gender Restroom" (Peebles et al. 2024). However, there is some debate regarding the ISA symbol, as it is not representative of all people who need accessibility aids—in other words, not everyone who needs an accessible restroom uses a wheelchair (Vice et al. 2020). Universal, or non-gender-specific, restrooms do not need to mention gender, only whether the restroom is accessible, and/or is single or multi-user (Colburn 2020).

RAISING AWARENESS WITH A ZINE

We were asked not to create a second online map, so we chose a different route for sharing accurate locations of universal restrooms on campus: we published a zine. Zines, derived from the concept of magazines, are small do-it-yourself (DIY) publications that are an alternative way to analyze or bring awareness to a concept or topic, in contrast to more traditional flyers or pamphlets. The use of zines both inside and outside of academia reaps a variety of benefits including informal information distribution and raising awareness of social and environmental issues both through the creation and reading of the publication (Sharp et al. 2026). The small size of most zines improves accessibility, pushing the creator to simplify and focus their words and graphics. The DIY nature of the zines is designed in part to draw attention in places where conventional publications may be overlooked. They are also quick and easy to make. A zine became a way for us to share our findings unofficially and quickly, as the passing of the state law created a pressing need. This need was not addressed by the university's official map, as it contained errors and would not be updated quickly.

The creation of this zine was inspired by the Geography Zine Organizing Network (GEOZONe), a collective dedicated to the collection and production of zines regarding geographic phenomena and pedagogy. GEOZONe hosted a zine fair at the 2025 American Association of Geographers (AAG) conference in Detroit, MI, that included more than a dozen examples of geographer-created



Figure 10. Unofficial signs were added throughout the Africana studies building, pointing to the universal restroom.



Figure 11. At a gendered restroom in the arts building, an official sign indicates the location of the closest universal restroom.

zines from around the world (Sharp et al. 2026). We attended this conference and were inspired by the zines shared there to create one related to our ongoing research and activism related to identifying the location of campus universal restrooms.

Our audience includes faculty, staff, and students, and our zine aims to inform readers about the issue, including the university's official policy and restroom label disparities, while also drawing attention to a map of universal restrooms. This map was placed on the inside of the zine, a location that serves as an extra layer of protection for information about spaces that may be frequented by trans, non-binary, and gender non-conforming folks. The reader is required to read through the entire zine to locate the map revealing these spaces. This application of "secrecy" in the unfolding of the zine to view the map provides an element of comfort for the restroom user, as restroom use and access is generally private (Piepmeier 2008).

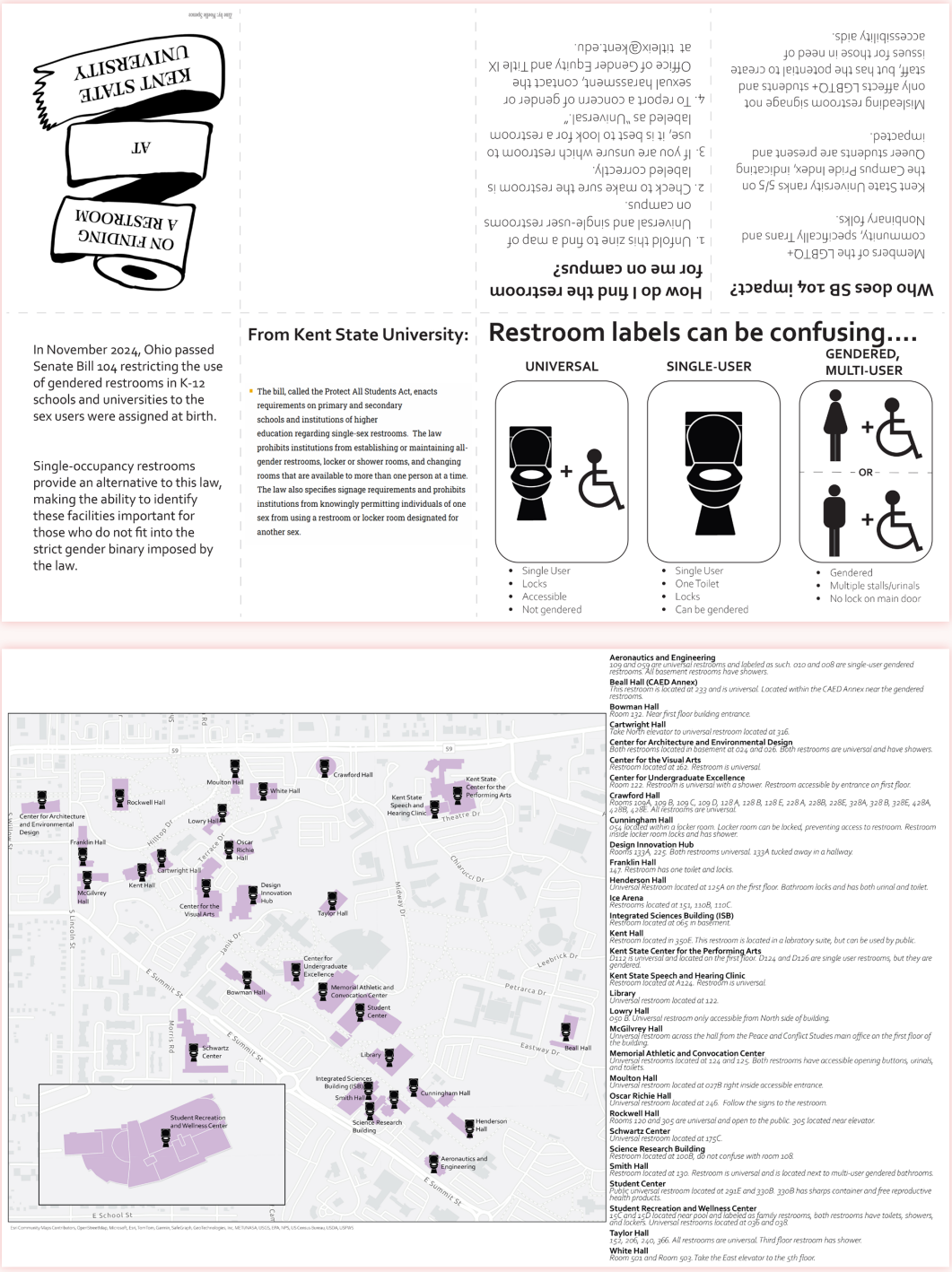


Figure 12. Our zine explains the impacts of the passing of the state law and provides a map showing universal restrooms on campus.

A MICROGEOGRAPHY OF CAMPUS RESTROOMS

While there are hundreds of colleges that list or map universal restrooms on campus, our research showed that access to these restrooms is often more complex than can be communicated with a simple point on a map indicating a building that includes a universal restroom. Returning to thinking about the microgeography of everyday landscapes, we found that, except in one new building, universal restrooms are not easily found and accessed on our campus. Instead, they can be unsigned, on different floors, in the basement, behind chairs, or

otherwise hard to access. Even just identifying buildings that are semi-public (monitored by office workers) reduces the total number by half of universal restrooms promised by the campus map.

At the conclusion of our research, we provided our human resources contact with a long list of suggested corrections to the official map of universal restrooms (including non-public restrooms, non-existent restrooms, gendered restrooms inaccurately listed as non-gendered, and universal restrooms that were missing from the map). As of April 2026, these changes have not yet been made. Given our experiences trying to find restrooms using the campus map, we realized that providing a QR code linking to the official campus map was not as helpful as we first imagined. We suggest instead, to campus colleagues who would like to help, that they post signage at gendered restrooms (easy to find) with specific directions to the closest universal restroom (harder to find). Directions beyond just room numbers could help provide place-based context that accounts for winding routes, elevator restrictions, and clarity about what spaces are public. Simple changes in door locks and signs could also improve access.

The microgeography of restrooms, along with associated signage, reflects our culture. As gendered public restrooms were established in the late 1800s and early 1900s, they reflected sexism and racism in our society. Today, design, location, and access to universal restrooms on campus and within buildings can reflect a disinterest in, or valuing of, inclusive facilities for trans and non-binary people. Our research revealed many different treatments of universal restrooms: from not offering them at all, to integrating these facilities throughout a building. In most cases, there was only one universal restroom per building, and it was hard to find or access. Additionally, the official campus map included numerous incorrect room numbers and other inaccuracies. Overall, while we appreciated that most public buildings on our campus included a universal restroom, the mapping process was an essential part of better understanding how to expand and improve access for a wide variety of restroom users.

DISCLOSURE

The authors have no financial interests to disclose.

REFERENCES

Alderman, Derek H., Joshua F. J. Inwood, and Ethan Bottone. 2021. "The Mapping Behind the Movement: On Recovering the Critical Cartographies of the African American Freedom Struggle." *Geoforum* 120: 67–78. **https://doi.org/10.1016/j.geoforum.2021.01.022**.

Anthony, Kathryn H. 2006. "An Update on Public Restrooms in the USA." Paper presented at World Toilet Forum 2006, Bangkok, Thailand, November 17, 2006. **https://www.ideals.illinois.edu/items/127163/bitstreams/415095/data.pdf**.

Anti-Eviction Mapping Project. 2021. *Counterpoints: A San Francisco Bay Area Atlas of Displacement & Resistance*. Oakland, CA: PM Press. **https://archive.org/details/counterpointssan0000unse/page/n1/mode/2up**.

Beemyn, Genny. 2024. "Trans-Supportive Campus Policies: Colleges and Universities That List Campus Gender-Inclusive Restrooms on Their Websites." Genny Beemyn - LGBTQ+ Educator, Author, Speaker, and Consultant. Last updated September 12, 2024. **https://www.gennyb.com/research/trans-supportive-campus-policies/gender-inclusive-restrooms/**.

Binte Mohiuddin, Maliha. 2025. "Everywhere She Maps Through the Lens of Feminist Standpoint Epistemologies." *Discover Global Society* 3: 46. **https://doi.org/10.1007/s44282-025-00188-3**.

Bottone, Ethan. 2020. "'Please Mention the Green Book:' The Negro Motorist Green Book as Critical GIS." In *Historical Geography, GIScience and Textual Analysis: Landscapes of Time and Place*, edited by Charles Travis, Francis Ludlow, and Ferenc Gyuris, 51–64. **https://doi.org/10.1007/978-3-030-37569-0_4**.

Buckley, Aileen R., and Nat Case. 2025. "Introduction to Ethics in Cartography." *Cartographic Perspectives* 105: 5–12. https://doi.org/10.14714/CP105.1997.

Chess, Simone, Alison Kafer, Jessi Quizar, and Mattie Udora Richardson. 2016. "Calling All Restroom Revolutionaries!" In *Everyday Women's and Gender Studies: Introductory Concepts*, edited by Ann Braithwaite and Catherine Orr, 385–92. New York: Routledge. https://doi.org/10.4324/9781315643205.

Cinderby, Steve, Carolyn Snell, and John Forrester. 2008. "Participatory GIS and its application in governance: the example of air quality and the implications for noise pollution." *Local Environment 13* (4): 309–20. https://doi.org/10.1080/13549830701803265.

Colburn, Selene. 2020. "Beyond the Bathroom Wars: Increasing Gender-Free Restroom Access in Libraries." *College & Research Libraries News* 81 (8): 387–90. https://doi.org/10.5860/crln.81.8.387.

Corbett, Jon, Logan Cochrane, and Mark Gill. 2016. "Powering Up: Revisiting Participatory GIS and Empowerment." *The Cartographic Journal* 53 (4): 335–40. https://doi.org/10.1080/00087041.2016.1209624.

Davis, Alexander K. 2020. *Bathroom Battlegrounds: How Public Restrooms Shape the Gender Order*. Berkeley: University of California Press. https://doi.org/10.1525/9780520971660.

Fileborn, Bianca. 2021. "Online Activism and Street Harassment: Critical Cartographies, Counter-Mapping and Spatial Justice." *Oñati Socio-Legal Series* 11 (5): 1198–1221. https://doi.org/10.35295/osls.iisl/0000-0000-0000-1144.

Gershenson, Olga. 2010. "The Restroom Revolution: Unisex Toilets and Campus Politics." In *Toilet: Public Restrooms and the Politics of Sharing*, edited by Harvey Molotch and Laura Norén, 191–207. New York: NYU Press. https://doi.org/10.18574/nyu/9780814759646.003.0020.

Hammonds, Evelynn. 2020. "Challenges and Change for Women of Color in Science – A Conversation with Evelynn Hammonds, Chair and Professor of the History of Science." Interview by Jennifer Berglund. *HMSC Connects! Podcast*. August 20, 2020. https://hmsc.harvard.edu/2020/08/20/challenges-and-change-for-women-of-color-in-science-a-conversation-with-evelyn-hammonds-chair-and-professor-of-the-history-of-science/.

Hamraie, Aimi. 2018. "Mapping Access: Digital Humanities, Disability Justice, and Sociospatial Practice." *American Quarterly* 70 (3): 455–82. https://doi.org/10.1353/aq.2018.0031.

Harley, J. B. 1991. "Can there be a Cartographic Ethics?" *Cartographic Perspectives* 10: 9–16. https://doi.org/10.14714/CP10.1053.

Harris, Leila M., and Helen D. Hazen. 2006. "Power of Maps: (Counter) Mapping for Conservation." *ACME: An International E-Journal for Critical Geographies* 4 (1): 99–130. https://doi.org/10.14288/1.0357973.

Human Rights Campaign. 2024. "Anti-Transgender Bathroom Bans." Last updated November 14, 2024. https://www.hrc.org/resources/state-maps/anti-transgender-bathroom-bans.

Kitchin, Rob. 2002. "Participatory Mapping of Disabled Access." *Cartographic Perspectives* 41: 44–54. https://doi.org/10.14714/CP41.563.

Kogan, Terry S. 2007. "Sex-Separation in Public Restrooms: Law, Architecture, and Gender." *Michigan Journal of Gender and Law* 14 (1): 1–57. https://www.proquest.com/scholarly-journals/sex-separation-public-restrooms-law-architecture/docview/236690077/se-2.

Koopman, Sara. 2024. "Will the Real People's Geography Please Stand Up? Community, Public, and Participatory Geographies in Conversation." *Geography Compass* 18 (4): e12745. https://doi.org/10.1111/gec3.12745.

Levine, Naomi Tova-Tmira. 2023. "If These Stalls Could Talk: Organizational Invitations to Identification Evoking a User's Sense of Belonging as Communicated through Infrastructure." Ph.D. Dissertation, Purdue University. https://doi.org/10.25394/PGS.23787420.

López Garrido, Gonzalo José. 2021. "Radical Geography and Advocacy Mapping: The Case of the Detroit Geographical Expedition and Institute (1968–1972)." *Journal of Planning History* 20 (4): 291–307. https://doi.org/10.1177/1538513220988673.

Maharawal, Manissa M., and Erin McElroy. 2018. "The Anti-Eviction Mapping Project: Counter Mapping and Oral History toward Bay Area Housing Justice." *Annals of the American Association of Geographers* 108 (2): 380–89. https://doi.org/10.1080/24694452.2017.1365583.

Monmonier, Mark S. 2018. *How to Lie with Maps*, 3rd ed. Chicago: The University of Chicago Press.

O'Sullivan, David. 2006. "Geographical Information Science: Critical GIS." *Progress in Human Geography* 30 (6): 783–91. https://doi.org/10.1177/0309132506071528.

Parker, Brenda. 2006. "Constructing Community Through Maps? Power and Praxis in Community Mapping." *The Professional Geographer* 58 (4): 470–84. https://doi.org/10.1111/j.1467-9272.2006.00583.x.

Peebles, Evan, Alyssa Ross, and Lora Ericson. 2024. "All-Gender Restrooms: Necessary and Possible." *Library Leadership & Management* 38 (2). https://doi.org/10.5860/llm.v38i2.7593.

Piepmeier, Alison. 2008. "Why Zines Matter: Materiality and the Creation of Embodied Community." *American Periodicals: A Journal of History, Criticism, and Bibliography* 18 (2): 213–38. https://doi.org/10.1353/amp.0.0004.

Prichep, Deena. 2024. "Transgender Bathroom Bills Are Back, Gaining Traction after Past Boycotts." NPR. May 6, 2024. https://www.npr.org/2024/05/06/1249406353/transgender-bathroom-bill-republican-states.

Rankin Climate. 2025. "Kent State University: Key Findings Report." https://www.kent.edu/node/1010522.

Regan, Amanda, and Eric Gonzaba. 2019. "Mapping the Gay Guides: Visualizing Queer Space and American Life." Mapping the Gay Guides. Last updated October 7, 2022. https://www.mappingthegayguides.org.

Seaman, Elliott S. L. 2022. "Lavender@MIT: The Case for an All-Gender Restroom Paradigm on the MIT Campus." Undergraduate Thesis, Massachusetts Institute of Technology. https://hdl.handle.net/1721.1/144751.

Shannon, Jerry, Katherine B. Hankins, Taylor Shelton, et al. 2021. "Community Geography: Toward a Disciplinary Framework." *Progress in Human Geography* 45 (5): 1147–68. https://doi.org/10.1177/0309132520961468.

Sharp, Wiley, Eden Kinkaid, Willow Ross, Nick Koenig, Priya Kunjan, and Rae Baker. 2026. "Mischief, Care, and Heterotopia: Reflections on the Potentials of Zines in Geography's spaces." *cultural geographies*. https://doi.org/10.1177/14744740251410945.

Swab, Jack, and Jack Jen Gieseking. 2022. "Toward Queering the Map 2.0: A Conversation with Michael Brown, Larry Knopp, and Bo Zhao." *ACME* 21 (4): 416–35. https://doi.org/10.14288/acme.v21i4.2217.

Velázquez Soto, Armando Octavio. 2024. "Alternative Cartographies of Mexico: Violence, Hope, and Future." In *Un-Mapping the Global South*, edited by Gero Bauer, Nicole Hirschfelder, and Fernando Resende, 21–36. London: Routledge India. https://doi.org/10.4324/9781003422853.

Vice, Jason, Beth A. Barstow, Sean Bowman, Tapan Mehta, and Sangeetha Padalabalanarayanan. 2020. "Effectiveness of the International Symbol of Access and Inclusivity of Other Disability Groups." *Disability and Health Journal* 13 (1): 100836. https://doi.org/10.1016/j.dhjo.2019.100836.

Warren, Gwendolyn C., Cindi Katz, and Nik Heynen. 2019. "Myths, Cults, Memories, and Revisions in Radical Geographic History: Revisiting the Detroit Geographical Expedition and Institute." In *Spatial Histories of Radical Geography: North America and Beyond*, edited by Trevor J. Barnes and Eric Sheppard, 59–85. Hoboken, NJ: John Wiley & Sons. https://doi.org/10.1002/9781119404781.ch2.

DOI: 10.14714/CP109.2123

Knowing About Place: The Importance of "Where" in Ethical Geospatial Education

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INTRODUCTION

The core of this article can be captured in three words: geographic context matters. Often in designing the curriculum for, and then teaching, geospatial subjects like GIS[1] or cartography, we implicitly and explicitly draw on the fundamentals of the discipline, often overlooking the role of local context in how these "truths" are delivered or received. Textbooks cover fundamental concepts like points, lines, and polygons; raster data; Bertin's visual variables; and different map projections (e.g., Bolstad and Manson 2022, Chang 2019, Longley et al. 2015, Shellito 2023). But rarely do these textbooks explore how local context is a factor in both teaching and learning, or in the application of GIS more broadly.

Picture a motorway. Where you live or have lived might substantially shape your mental picture of that motorway. In New Zealand, State Highway 1 runs out of Wellington city and hugs the coastline towards Lower Hutt City. Along this stretch, it has four to six lanes, and its speed is capped at 100 km/h. In contrast, in Houston, Texas, motorways can be far more formidable structures. Spanning up to twenty-six lanes (including main and managed lanes as well as frontage roads), the Katy Freeway offers a starkly different mental image and impact on the landscape. Both are still motorways, with controlled access through on-ramps and off-ramps, but are vastly different in their spatial presence. Your localised experiences of motorways (Figure 1) could lead you to interpret a seemingly objective polyline on a map or in a geographic dataset as corresponding to a particular physical reality, drawing on your knowledge and expectations of what such a feature typically entails for you.

My conceptual understanding of geographic features, their importance, and their utility is shaped by my background and experience. This extends beyond how "positionality" (Bourke 2014) is usually understood and draws on Jadallah (2025, 227), who asks us to broaden "our notions of positionality to consider relationality with respect to



Figure 1. State Highway 1 coming out of Wellington city and the Katy Freeway in Houston, Texas (source: Google Street View and Google Maps).

1. Here, GIS refers to either *geographic information science* or *geographic information systems*, which take different philosophical approaches to education (de Róiste et al. 2025). For the purposes of this article, the differentiation is of limited impact as both are implicitly influenced by context.

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place and land." Going further, Germinaro (2025, 1) calls this "where we know from," based on work by Zuroski (2020) and others. My teaching of geospatial concepts is, therefore, shaped by my positionality based on my identity and perceived identity, as well as by my understanding and experience, and, critically, the places in which these were formed. For example, in a previous article (de Róiste 2025), I describe how my early work experience in Ireland influences the way I teach geospatial ethics. However, the concepts through which I envisage the world are deeply shaped by place-based experiences, moving beyond narrower understandings of positionality grounded primarily in identity categories alone to include the influence of particular places, environments, landscape, and spatial contexts.

On the other side of the education process, students bring their own perspectives, expectations, and prior knowledge, all of which influence how they interpret and apply what they learn. Learning GIS requires an understanding of the software and data as well as how the real world is represented or potentially distorted by these constructs. The potential conceptual misalignment between learners and their teachers about not only the terminology in geospatial domains, but also the very real world features we are capturing, can impact the effectiveness of both teaching and learning. Here, I highlight three moments that explore three conceptual misalignments: mismatched cultural interpretations, a lack of shared spatial knowledge, and unacknowledged personal meanings associated with data.

As part of the cartography component in our introductory GIS course (GEOG 215), I cover visual variables and discussion of colour qualities (hue, value, and chroma). In class, I ask students to collaboratively edit a Google document detailing the colours associated with different features and concepts: danger, safety, water, mountain, etc. The key intended learning is that making use of people's colour associations in designing maps can make the maps easier to interpret. However, colour associations in Aotearoa New Zealand differ from those I'd internalised growing up in Ireland. In Māori culture, where this is an Indigenous context in Aotearoa New Zealand, red is associated with vitality and life force. I've been told about an online map where red was used to identify marae (Māori meeting places), but local real estate agents complained that the features looked dangerous to potential house buyers. It's easy to envisage how poor management of the class discussion for a seemingly innocuous geospatial topic could alienate or disengage students.

In the first lab in the same introductory course, I introduce students to ArcGIS Pro. The lab aims to get students to familiarise themselves with the software interface, interact with and recognise the different types of geospatial data (raster, vector points, lines, and polygons), and solve a simple geographic problem. As the course runs during the second half of the year, most students have been in Wellington for at least five months, so I use local Wellington data to ease the cognitive exploration of the data in the lab. However, overseas students, as well as some students from outside the region, struggle with identifying local landmarks, such as Te Papa (the national museum) and key city streets. They don't share the same points of reference, which makes completing the lab harder. My assumption of a shared understanding of location has led to real frustrations for some students and made engaging with the software and course content more difficult.[2]

The datasets used in labs can also evoke personal emotional responses and may not be experienced by students as value neutral. Working with a student who was looking at different datasets for their GIS project, I started talking about the deprivation index. The New Zealand Index of Deprivation uses nine census variables (including means-tested benefits, unemployment, and lack of qualifications) to categorise the level of deprivation in each small area across the country. Each area is categorised as a decile (10%) from most to least deprived. What had begun as a technical explanation of an area-based indicator quickly shifted when the student looked up their home area and realised that it was categorised in the most deprived decile. The dataset, which I had presented as an analytical tool, suddenly became a description of a place central to their lived experience and was perceived as an inherent judgement about worth. While such datasets are essential for spatial analysis and policy, they also carry social meanings that can surface in the classroom.

I'm sure there are other examples where I missed student reactions to conceptual misalignment, particularly in my larger classes of over 100 students. But, it can be hard to

2. In response to these frustrations, I have included an encouragement in the instructions to locate these features using Google and compare them with the maps used in the lab.

identify which elements aren't being understood in the way I expect, and students who find the content more difficult due to a conceptual misalignment are unlikely to raise this issue as a reason for their disengagement or frustration—"GIS is too hard" or "I don't get it" is more likely to feature in their thinking. As I move towards my third decade of teaching GIS (including a few years simultaneously teaching cartography), I've reflected on how my teaching approach has evolved in response to real and potential misalignments. In this article, I will outline some of the geographical context that forced me to more deeply consider "where I know from" and what I had to learn to teach more effectively in the local context. As I contextualise this journey, I encourage you to explore your own learning and the influence of your "where" and positionality in how you think about and communicate geographic concepts.

MY BACKGROUND

I arrived in Aotearoa New Zealand from Ireland in January 2007. My Head of School collected me from the airport and kindly showed me around the city before bringing me to the Maranui Surf Club Cafe in Lyall Bay for something to eat. As I sat in the funky café looking out over the sea, I remember feeling disconnected, tired, and grubby, but also grateful and excited to be here. This was the first time I'd been in the country and had only passed my Ph.D. oral defence less than a month earlier on the other side of the globe.

I had under a week to prepare for a third-year GIS course. The course consisted of three hours of lectures in the morning and three hours of labs in the afternoon each day for two weeks. I relied heavily on textbooks and scrounged data to create the lectures and associated labs. Thankfully, and in direct contrast to Ireland at the time, geospatial data was easily available. I also adapted material I had delivered as a part-time lecturer at the Dublin Institute of Technology (a fact I had forgotten until I revisited my original lecture slides for this article). The labs I designed used local Aotearoa New Zealand–based data to help students connect more deeply with the material by drawing on their existing knowledge of familiar places—partially due to my strong belief in using local data, but also a lack of access to other materials. My assumption was (and still is) that when students know the area, they can more easily connect to and understand the features represented, identify patterns, or spot errors in data. This assumption has been somewhat supported by recent research. Powley et al. (2025) note how geospatial professionals exploring a familiar area in VR identified errors in the spatial data. Students participating in an online field trip to two cities (one familiar and one unfamiliar) as detailed by Martínez-Hernández et al. (2024) reported higher motivation for working in familiar spaces and displayed more accuracy of the mapped locations and choice of scale. However, descriptions provided by participants of the same features were better for unfamiliar cities. Alongside this benefit of familiarity assumption, developing familiarity with New Zealand–specific data has clear value for their employability and work after graduation.

Developing and delivering the course within such a short timeframe was an intense experience. In subsequent years, I remember hearing the following rule of thumb about teaching—in the first year you develop the course, the second year you fix it, and the third year you perfect it. But such seemingly useful advice leaves out the importance of gaining local context in making those subsequent improvements. I had much to learn (and still do) about the implications of teaching GIS in *this* specific geographic context.

The journey to provide relevant examples has led me towards a recognition that ethical teaching should include developing a deeper understanding of the local context. At a basic level, that means providing meaningful examples to students of problems or data that relate to their geographic environment and link to their existing understanding. At a more effective level, ethical teaching should include a reflection on the nature of data, concepts, tools, and my experience, examining how these impact my teaching lens and my ability to connect to the world views of my students and their experience. Conceptual misalignments can undermine both teaching and learning. I can believe I'm teaching a particular concept supported by relevant examples, but through a lack of local or lived knowledge of these concepts, I can impede learning.

Aotearoa New Zealand and Ireland have a lot in common. Both are island nations known for their natural

landscapes, and have similar populations, similar government systems, and strong agricultural sectors. Both were colonised by the British Empire, and while they have native languages and cultures, English is the primary language spoken. However, the more my connection developed with Aotearoa New Zealand, the more the differences with Ireland became apparent. In contrast to Ireland, Aotearoa New Zealand is characterised by a highly dynamic landscape. Glaciation is an ongoing process and Milford Sound, for example, provides easily accessible (almost textbook) examples of glacial features, such as U-shaped and hanging valleys. Frequent (mostly small) earthquakes, volcanic activity, and landslides all influence the landscape and its features, and their interconnections with government services. These hazards impact physical features, human infrastructure, and people's lives. After ground movement caused by earthquakes, changes are required in the geodetic system and associated land data records.[3] Disaster response is heavily influenced by the community nature of marae[4] whose communities are often the first to provide accommodation and food for displaced people guided by manaakitanga (showing compassion, respect, and generosity for others). Each of these different elements contrasts with my previous understanding of the requirements of geospatial professionals across a range of applied areas from infrastructure to statistics. The different hazards have a clear expression on the physical landscape but their impacts on the human landscape and geospatial education are more subtle.

A COLONISED LAND

The legacy of the geospatial disciplines is also different here. Similar to Ireland, Aotearoa New Zealand is a colonised country with a land-based system primarily influenced by the principles of land ownership and survey imported by the United Kingdom. However, in Aotearoa New Zealand, the change in land ownership was rapid. An agreement between the Māori and the British Crown (te Tiriti o Waitangi / the Treaty of Waitangi) was first signed in 1840. By 1860, Māori held about 80% of the North Island of Aotearoa New Zealand; in only thirty years (1890), this had halved. In 2000, the estimate of this ownership was as low as 4%.[5] This loss and land alienation included exclusive Crown rights to land purchase, land confiscations, and forcible acquisition of land for public works. Cartography and geospatial history were not neutral in this colonisation process.

The tools I use and teach have been employed both naively and maliciously to claim, divide, and control land, and are intrinsically linked to the colonisation of the country. By mapping territory, colonial authorities tried to legitimise their presence and establish administrative control. Surveys were often tied to legal mechanisms that formalised land ownership according to colonial law, disregarding Indigenous systems of land tenure and reshaping Indigenous relationships with land. Surveying introduced Western ideas of property, geometry, and grid systems that contradicted Māori understandings of whenua (land) as interconnected, relational, spiritually significant, and linked to key geographic features, such as river bends.

As an immigrant from another country previously colonised by Britain, the formal cartographic processes and understanding of the underlying data are comparatively similar to my pre-existing expectation of how such systems work. However, these similarities can mask fundamental differences, and my expectations can lead to misunderstanding. Data on heritage features, such as ruined or intact castles, were one of the few freely available datasets in Ireland in 2007. Implicit in this approach is the expectation that awareness brings protection to these features. Knowledge of their locations means that they are harder to demolish without repercussions. Adding these features to a map means local or roading authorities are aware of their presence in planning decisions.

In Aotearoa New Zealand, similar historical or cultural data is less readily available. Some historical features are freely available but those associated with Māori cultural locations, such as wāhi tapu (sacred sites), may be better

3. https://www.linz.govt.nz/guidance/survey/earthquakes/kaikoura-earthquakes/post-earthquake-co-ordinates.

4. Marae as meeting places consist of ātea (courtyard) and buildings including a wharenui (meeting house), wharekai (dining area/kitchen) and other facilities. They operate as community, learning, and spiritual hubs. Marae are also critical emergency response sites post-disasters (Bailey-Winiata et al. 2022, Yates 2023).

5. See **https://www.thepress.co.nz/nz-news/360885055/historic-ngai-tahu-land-deeds-be-displayed-together-first-time** for context on Ngāi Tahu, an iwi (tribe) on the South Island, Aotearoa New Zealand.

protected by their absence from maps. Awareness of the locations may encourage the sites to be disturbed or visited when culturally inappropriate. This approach is in direct contrast to one of the most open data environments internationally.[6]

Clearly, directly transferring my knowledge of another country to Aotearoa New Zealand can potentially lead to misunderstanding, or even the destruction of significant features if I were to incautiously share protected information. It could also cause a loss of the trust of my students and their willingness to engage with the course. This impact is potentially magnified by the fact that I can influence well over a hundred students each year.

TE TIRITI O WAITANGI / THE TREATY OF WAITANGI

Since I've been in Aotearoa New Zealand, there has been a greater recognition within the country of the importance of engaging with and considering Māori world views in both research and teaching. Government research funding requires that investigators consider and engage with te ao Māori (Māori worldview). However, a recent change in the focus of research funding **towards more economic impact**, changing **school curricula**, and the **removal in late 2025** of a Treaty obligation from school requirements may erode this position.

The shifting status of Māori world views within mainstream education and research is not solely a matter of policy preference or political mood, and is linked to the country's constitutional setting. Aotearoa New Zealand does not have a single constitutional document, and its foundation instead comprises various documents, such as the Constitution Act 1986 and the New Zealand Bill of Rights Act 1990. Te Tiriti o Waitangi ("te Tiriti") or the Treaty of Waitangi (1840) is a key document for the country, but its place within this "unwritten constitution" is disputed—as well as what was agreed to in the treaty (Palmer 2012). The te reo Māori (Māori language) version was signed in 1840 by the consul for the British Crown and rangatira (Māori chiefs) present in Waitangi, and subsequently taken around the country to other iwi (tribes). Approximately 530 rangatira signed the te reo version of the agreement with the Crown and a further thirty-nine signed the English version. Some of the English wording did not directly translate into Māori and consequently, the meanings of its references to sovereignty, governorship, and ownership of land and physical resources are debated. These differences mean that the two versions of the document have been treated by some as different documents (Manatū Taonga 2017). As the te reo version of the document was signed by most rangatira, this version is most often viewed as the authoritative version. In 1975, the **Treaty of Waitangi Act** introduced the principles of the Treaty of Waitangi and these were codified in 1987. These principles are often referred to as "the three Ps": *partnership* between Māori and the Crown, *protection* that prioritises Māori rights and interests, and *participation*, which refers to Māori involvement in decision-making processes at all levels. Other principles include redress and equality (de Silva 2024). At Te Herenga Waka—Victoria University of Wellington where I teach, the principles have been enacted to inform university policy through the **Te Tiriti o Waitangi Statute** approved in 2019. Te Tiriti principles are intended to inform the different activities conducted by the university and its staff, including teaching. The principles span areas such as kāwanatanga (governance) and kaitiakitanga (protection of Māori rights and interests). These are interpreted in the context of the university to reflect partnering with Māori for decision making and protecting Māori student, staff, and stakeholder rights and interests in relation to university activities.

EMBEDDING LOCAL CONTEXT INTO MY TEACHING PRACTICE

Translating these principles into actionable, integrated teaching that reflects the local context and drawing on geospatial principles and global developments is daunting. At a fundamental level, digital geographic information represented in a GIS is either captured as raster or vector data, often with precise boundaries and limited

6. Aotearoa New Zealand was ranked 29th out of 198 countries in the **Open Data Inventory for 2024**.

attributes. Thinking through local examples that fit with my increasing knowledge of the geography and society in Aotearoa New Zealand, so I can better connect with where my students learn from, can be enjoyable. Engaging with te ao Māori feels uncertain in comparison. The restrictions on geographic data capture and storage in commercial GIS software feel counter to a more expansive view of land and environment inherent in te ao Māori.

Ra Smith, in conversation with me during a co-designed and collaborative research project on **telling the story of wetlands**, has spoken about approaching GIS through a whakapapa (genealogy or lineage) lens. He highlights the importance of telling stories of places, rather than simply capturing attributes. I'm both ashamed and somewhat reassured to say I still don't fully understand what this means and how it can translate into effectively teaching for students in Aotearoa New Zealand. Yet, I think that uncertainty and questioning of my own teaching approach is important.

I find satisfaction in understanding the geospatial processes and linking these to real world applications. For example, at the start of an introductory GIS course, I use contemporary newspaper and online maps from the 2010 and 2011 Christchurch earthquakes, produced by a former student, to illustrate several cartographic concepts. These concepts include how target audience shapes information needs and map design, with different requirements for scientists, emergency services, and the public. Implied in the targeting of these audiences is the importance of changing map design over time as information needs evolve. Early earthquake response differs from more long-term needs related to recovery or public communication. I also highlight design decisions inherent in the map, such as colour choice and the use of animation versus static maps. In particular, I introduce the concept of accessibility through discussion of later map edits by the organisation's marketing department, which changed my former student's symbol colours to a red/green combination that was not colour-blind friendly. By starting the introductory GIS course with this and other local examples, I pre-emptively introduce themes later returned to in the course.

I think about how the concepts make sense here in Aotearoa New Zealand and also how they can connect to the experiences of students from overseas. These connections can be *tangible*, for example through the use of physical maps or internationally relevant datasets; *verbal*, through examples of how concepts are applied elsewhere; or *personal*, by creating space for students to relate concepts to their own experiences and contexts and to share these differences where appropriate. For a lecture on visual variables in a postgraduate cartography course, I provide tangible examples through physical topographic maps from Aotearoa New Zealand and multiple other countries. I ask the students to identify commonalities and differences in the representation of similar features and relate these to Bertin's visual variables. When introducing data types, I provide verbal examples of features common in Aotearoa New Zealand as well as those only found overseas. How best can "elephants" be represented? As a point where they are observed, as a line where they are tracked, or as a polygon showing their habitat range? While covering colour in my introductory GIS course, the collaboratively edited online document I mentioned earlier also facilitates a discussion of the cultural perspectives on different colours and allows students to link to their personal experiences.

These reflections have gradually shifted my attention from simply helping students understand geospatial processes to considering the different ways people understand and relate to place itself. I've learnt from Māori, geospatial professionals, and other academics based in Aotearoa New Zealand, both in the geospatial disciplines and outside. I've read about what it means to be Tāngata Tiriti (people of the treaty[7]; Bell 2024) and expanded my knowledge of the history of Aotearoa New Zealand. Some of this learning has been outside my comfort zone, and accompanied by a deep (almost tangible) fear of doing or saying the wrong thing. Hotere-Barnes (2015) speaks of "non-stupid optimism" where Pākehā (broadly meaning non-Māori New Zealanders) education researchers need to develop a critical awareness that well-intentioned efforts do not necessarily lead to success.

Sitting in this discomfort can be useful as a growth catalyst. Time to work through this discomfort battles against other priorities such as delivering lectures, writing labs, grading student work, staying up to date with technology changes, learning about new programming packages, serving on committees, engaging with the wider community,

7. *Tāngata Tiriti* includes both Pākehā (non-Māori New Zealanders) and tauiwi (other non-Māori) and implies a more active and relational form of citizenship. The term acknowledges that the presence and belonging of non-Māori in Aotearoa New Zealand is enabled through Te Tiriti o Waitangi.

and conducting research—all of which are expected in a geospatial academic role. These demands on academics are well documented elsewhere (e.g., Houston et al. 2006). I feel there is more I can be doing and should be doing but also know that my time is limited and acknowledge such efforts are not directly rewarded.

A seemingly "easy" solution is to ask Māori academics employed in the university to help me upskill and become more culturally competent. This approach replicates how I've reached out to my physical geography and geology colleagues to ensure my teaching material works for this place and this time. However, Māori colleagues experience larger workload burdens, the labour of translating between cultures for their own navigation of the academic system, and barriers to promotion and advancement (McAllister et al. 2019) as well as all the responsibilities of their academic roles.[8] Implicit in this burden is an expectation that Māori colleagues will draw on and maintain connections to te ao Māori. As Overton (2021) notes, these relationships can be shaped by individuals' varied and sometimes complex connections to place and iwi.

LEARNING THROUGH PLACE

During the almost two decades I've been in Aotearoa New Zealand, key elements of my teaching philosophy have remained consistent. I focus on teaching concepts rather than just software training. I prioritise using local data and examples whenever possible to help students build on their existing knowledge and scaffold their knowing of space to better support their learning of new geospatial concepts, techniques, and tools. I also aim to be responsive to student feedback while keeping learning goals in mind, recognising that meaningful learning sometimes requires students to move outside their comfort zones—especially when working with computers and data, which can be a source of anxiety for some (Hayat et al. 2024).

I've grown more familiar with national expectations and characteristics. I've observed my preconceptions and tried to notice how they differ from those who were born in this culture. I now know what a State Highway here entails compared with the Irish motorways.[9] I've developed a good working knowledge of local geospatial datasets and providers, as well as an awareness of the care required when discussing geospatial data, particularly socioeconomic, cultural, or hazard data. I've adapted many of my teaching examples to the local context by using topical and authentic geospatial problems (e.g., "why might the number of liquor licenses have been **incorrectly identified** within the distance of a proposed venue?", "which buildings might be impacted by **a proposed tunnel**?", or "how many buildings are too high for current firefighting equipment?"[10]).

However, bridging to te ao Māori is harder. I've listened, taken opportunities to learn—from university training courses to those hosted by other organisations—and held space for different viewpoints. I've tried to learn from criticism, and step back when my voice isn't needed or dilutes other viewpoints. But I'm not perfect, and I make mistakes. Sometimes, I step forward when I should create more space for others, and sometimes, I hesitate when I should engage more confidently. At times, the pressures of academic life also mean this work slips lower in my priorities than it should. I've had to walk away from "great" research project ideas because I wasn't the right person to do them, and my lack of knowledge could have led to a technically accurate but culturally inappropriate and potentially damaging outcome. It can be tempting to remain within familiar areas of expertise rather than reflect on how my own background and knowledge may not align with students' learning needs. Bell (2022) likens engaging with this discomfort to building stamina.

It seems fitting that ako, the te reo Māori word for teaching, is also used for learning. Increasingly, I believe that a good educator is in a constant state of becoming rather than achieving. Thinking about who the students are and where they know from, as well as the factors that may

8. Although researching Māori secondary teachers rather than university academics, Mitchell and Mitchell (1993) offer useful insight into the pressures faced by Māori educators and the factors contributing to their departure from the classroom.

9. Neither of which prepared me particularly well for navigating motorways in Texas last year.

10. A special thanks to Fire and Emergency New Zealand (FENZ) for sharing the work they did to address this problem. Their approach and methodology underpins one of my lab assignments.

impact their learning, should influence how we teach. We also need to explore who we are and where we know from to better meet the needs of our students—reducing the conceptual misalignment that can come from erroneous assumptions of shared spatial knowledge or a lack of understanding of the personal and cultural dimensions of data and its representation.

Knowing a place and learning its context involves navigating layers of meaning and the potential for misunderstandings, no matter how well intentioned my approach. The different geospatial curriculum areas rarely make explicit the inherently place-based nature of geospatial education, even though the examples, assumptions, and concepts embedded within textbooks and teaching materials are grounded in particular places and contexts. We already know that different countries place different emphasis on skills and content areas (de Róiste et al. 2025). I argue here that positionality, as commonly applied in research practice (see for example Bourke 2014), should also inform geospatial teaching. In doing so, we must explicitly consider a wider concept that takes in the "where" of both teachers and learners when ethically teaching geospatial concepts.

Ko ia kāhore nei i rapu, tē kitea
S/He who does not seek will not find

ACKNOWLEDGEMENTS

Over the past nineteen years in Aotearoa New Zealand, I have been grateful for informal conversations and/or research discussions with Ra Smith, Anne Hiha, the Paenga whānau, the Mitchell family, Haami Te Whaiti, Duane Wilkins, Gordon Morris, Ocean Mercier, Amanda Thomas, Billy Van Uitregt, and Sara Kindon, as well as the opportunity to engage with their scholarship, all of which has influenced my thinking. I would also like to thank my students. Their interest in, enthusiasm for, and questioning of geospatial learning, even when they found it challenging, afforded me opportunities to reflect on, question, and continually refine my own approaches to teaching and learning. Any errors or misinterpretations are, of course, my own.

REFERENCES

Bailey-Winiata, Akuhata, Shari Gallop, Daniel Hikuroa, and Iain White. 2022. "The role of coastal marae in natural hazard response and climate change adaptation." In *Coast Adaptation: Adapting to coastal change and hazard risk in Aotearoa New Zealand*, edited by Charles Hendtlass, Tom FitzGerald, Ana Serrano, and Don Neale, 41–44. **https://www.coastalsociety.org.nz/assets/Publications/Special-Issues/SP5-reading-WITH-REVISIONS.pdf**.

Bell, Avril. 2022. "Building stamina, fighting fragility: The account of a white settler 'recovering racist'." *Ethnicities* 22 (5): 685–704. **https://doi.org/10.1177/14687968211062671**.

———. 2024. *Becoming Tangata Tiriti: Working with Māori, Honouring the Treaty*. Auckland University Press.

Bolstad, Paul, and Steven Manson. 2022. *GIS Fundamentals: A First Text on Geographic Information Systems*. Seventh edition. Eider Press.

Bourke, Brian. 2014. "Positionality: Reflecting on the Research Process." *The Qualitative Report* 19 (33): 1–9. **https://doi.org/10.46743/2160-3715/2014.1026**.

Chang, Kang-tsung. 2019. *Introduction to Geographic Information Systems*. Ninth edition. McGraw-Hill.

de Róiste, Mairéad. 2025. "Ethical Dilemmas in Early Career: Reflections on a GIS Internship Experience and its Echo in Geospatial Teaching." *Cartographic Perspectives* 105: 18–21. **https://doi.org/10.14714/CP105.1941**.

de Róiste, Mairéad, Scott C. Pool, and John H. Lowry. 2025. "Evaluating geospatial education provision: a case study of Aotearoa New Zealand." *Journal of Geography in Higher Education* 49 (2): 185–202. **https://doi.org/10.1080/03098265.2024.2403075**.

de Silva, Tommy. 2024. "The principles of the Treaty of Waitangi, explained." *The Spinoff*, February 3. **https://thespinoff.co.nz/atea/03-02-2024/the-principles-of-the-treaty-of-waitangi-explained**.

Germinaro, Kaleb. 2025. "Our Spatial Orientation: Positionality, Relationality, and Learning Through the Body." *Qualitative Inquiry* 32 (5): 401–11. **https://doi.org/10.1177/10778004251319462**.

Hayat, Ali A., Nahid Barzegar, Hatam Faraji Dehsorkhi, et al. 2024. "A cross-sectional study on the role of computer anxiety in students' online learning." *Journal of Advances in Medical Education and Professionalism* 12 (1): 51–56. **https://doi.org/10.30476/JAMP.2023.99057.1824**.

Hotere-Barnes, Alex. 2015. "Generating 'Non-stupid Optimism': Addressing Pākehā Paralysis in Māori Educational Research." *New Zealand Journal of Educational Studies* 50 (1): 39–53. **https://doi.org/10.1007/s40841-015-0007-y**.

Houston, Don, Luanna H. Meyer, and Shelley Paewai. 2006. "Academic Staff Workloads and Job Satisfaction: Expectations and values in academe." *Journal of Higher Education Policy and Management* 28 (1): 17–30. **https://doi.org/10.1080/13600800500283734**.

Jadallah, Christopher C. 2025. "Positionality, relationality, place, and land: Considerations for ethical research with communities." *Qualitative Research* 25 (1): 227–42. **https://doi.org/10.1177/14687941241246174**.

Longley, Paul A., Michael F. Goodchild, David J. Maguire, and David W. Rhind. 2015. *Geographic Information Science and Systems*. John Wiley & Sons.

Manatū Taonga — Ministry for Culture and Heritage. 2017. "The Treaty in brief." *NZHistory*. Last updated May 17, 2017. **https://nzhistory.govt.nz/politics/treaty/the-treaty-in-brief**.

Martínez-Hernández, Carlos, Arie Stoffelen, and Radosław Piskorski. 2024. "Obtaining geographical competences through online cartography of familiar and unfamiliar urban heritage: lessons from student workshops." *Journal of Geography in Higher Education* 48 (1): 74–93. **https://doi.org/10.1080/03098265.2022.2155935**.

McAllister, Tara G., Joanna Kidman, Olivia Rowley, and Reremoana F. Theodore. 2019. "Why Isn't My Professor Māori? A snapshot of the academic workforce in New Zealand universities." *MAI Journal* 8 (2): 235–49. **https://doi.org/10.20507/MAIJournal.2019.8.2.10**.

Mitchell, Hilary Anne, and Maui John Mitchell. 1993. *Māori Teachers Who Leave the Classroom*. New Zealand Council for Educational Research. **https://files.eric.ed.gov/fulltext/ED365480.pdf**.

Overton, John. 2021. "Is This Professor Māori? Personal reflections on identity in academia in Aotearoa New Zealand." *MAI Journal* 10 (1): 50–6. **https://doi.org/10.20507/MAIJournal.2021.10.1.7**.

Palmer, Matthew. 2012. "Constitution – What is a constitution?" *Te Ara – the Encyclopedia of New Zealand*. Published May 7, 2012. **https://teara.govt.nz/en/constitution/page-1**.

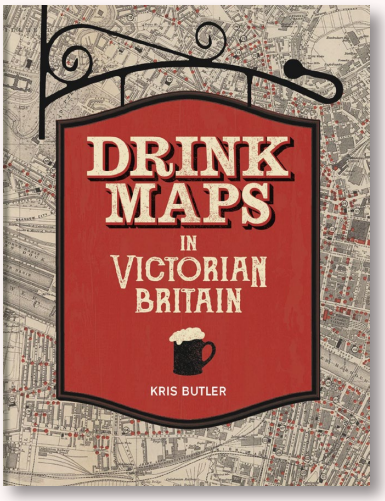
Powley, Benjamin, Craig Anslow, Mairéad de Róiste, and Stuart Marshall. 2025. "Immersive Analytics for Understanding Ecosystem Services Data." In *2025 IEEE Conference Virtual Reality and 3D User Interfaces (VR)*, 559–68. IEEE. **https://doi.org/10.1109/VR59515.2025.00079**.

Shellito, Bradly A. 2023. *Introduction to Geospatial Technologies*. Sixth edition. W. H. Freeman.

Yates, Siena. 2023. "Why our marae will always open in a crisis." *E-Tangata*, March 17, 2023. **https://e-tangata.co.nz/reflections/why-our-marae-always-open-in-a-crisis**.

Zuroski, Eugenia. 2020. "'Where Do You Know From?': An Exercise in Placing Ourselves Together in the Classroom." *MAI: Feminism & Visual Culture*. January 27, 2020. **https://www.maifeminism.com/where-do-you-know-from-an-exercise-in-placing-ourselves-together-in-the-classroom**.

DOI: 10.14714/CP109.2099



DRINK MAPS IN VICTORIAN BRITAIN

By Kris Butler

Bodleian Library Publishing, 2024

208 pages, 47 color plates

Hardcover: $40.00, ISBN 978-1-85124-578-9

Review by: Mia Nighgroh, University of Tennessee, Knoxville

Today—through mapping or map-driven tools like Google Maps and Yelp—the internet provides easy access to the names and locations of establishments selling alcohol, but this convenience is a relatively recent phenomenon. Historically, collections of this information have been available, but not for use by the public, and most emphatically not for the convenience of those seeking alcoholic libations. In Britain, between the mid-nineteenth and early twentieth centuries, directories—known as "drink maps"—were compiled and published by a variety of crusading temperance societies as key tools in their campaigns against the recreational use and sale of alcohol—especially amongst the working classes.

In *Drink Maps in Victorian Britain*, Kris Butler examines the historical rise and spread of temperance drink maps, detailing the varying forms they took and their evolution over time. "Made with an agenda that was adamantly hostile to drinking alcohol" (1), drink maps were employed as tools to educate the country's magistrates and to encourage them to reduce the availability of alcohol. Despite the overall, long-term failure of the temperance movement, these drink maps exemplify one way cartography has historically been used as a political tool.

The book is chronologically organized, guiding the reader step by step, stage by stage, through the evolving landscape of the Victorian temperance movement. It lays out how the movement came to create the drink map, and how the approach of these activist societies developed and progressed throughout the era, explaining the relationship between the maps and the social and legal contexts that influenced their design and led to their widespread publication across Victorian Britain. Butler enriches her argument by including narrative vignettes alongside official legal sources in order to capture the personal implications of the movement.

The Industrial Revolution of the eighteenth and nineteenth centuries brought increased urbanization to Britain, as well as growing concern about the social ills to be found in overcrowded cities. Drinking was no longer a private activity, but a public one (6), and the consumption and availability of alcohol became a growing public concern. A plethora of societies arose, all attempting to combat widespread alcohol consumption using a variety of methods and approaches. One of these methods was to create "drink maps"—each designed for a specific city or urban area in Britain. Drink maps showed areas with heavy concentrations of licensed public houses and beer shops, plus off-license vendors such as grocers and other small retailers where alcohol could be purchased and/or consumed. Butler details which cities and neighborhoods were mapped, and how often, over the many decades of drink maps' popularity and use.

Drink maps used the spatial distribution and concentration of drink vendors as a proxy for the availability of alcohol, and for the extent of its consumption. They framed alcohol consumption as a public health issue—primarily

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among the lower class (19, 92)—and Butler argues that this strategy and tactic were largely inspired by John Snow's 1854 map of a cholera outbreak in London's Soho. Snow's map visualized geographic concentrations of disease outbreaks, helping to reveal hotspots and demonstrate how cholera was being transmitted throughout the city. In adopting Snow's approach, the temperance crusaders aimed to depict alcohol consumption—and, by extension, drunkenness—as a disease. By using bold visualizations, they also hoped to broaden support for a movement that was often limited by its roots in moral arguments thundered from church pulpits (9).

The maps were targeted particularly at magistrates—lower court judges, often unpaid and usually appointed from the local gentry. Magistrates often had limited knowledge about law and procedure, and, as wealthier gentlemen, they were normally rather isolated from lower class social milieus. They did, however, exercise jurisdiction over the licensing of pubs and clubs—in what were known as Brewster Sessions—so temperance activists saw them as a key audience for their proselytizing. During these annual sessions, magistrates reviewed any violations of licenses; were presented with memorials, deputations, and signed petitions; and then approved, renewed, or objected to the license applications (59). Magistrates were not required to listen to or read the presentations, so it was vital to draw their attention and interest. Starkly rendered in red and black ink, drink maps served as striking visual tools deployed to persuade the presiding magistrates to restrict the renewal of alcohol licenses by fostering a sense of alarm about the effects of a drink-sodden populace on public order.

Besides limiting the sale of alcohol, advocates had a second goal—that of slowing or halting its consumption. This was to be achieved by promoting temperance, or even total abstinence from consumption of alcoholic beverages, primarily among the lower class (19). Results were lackluster, and drink maps proved to be more powerful as a political tool to influence government officials than the general public.

The late 1800s was a period of widespread social and economic changes, and public controversy about the spike in alcohol consumption led to a number of court cases that challenged the decisions about alcohol licenses. The legal contestation was often from proprietors whose applications to renew their longstanding licenses were denied. In 1883, a court in a small town in Lancashire (northwest England) greatly expanded the power of magistrates in these matters. In deciding the case of *Kay v. The Justices of Over Darwen*, the judges "held that 'The Beer Dealers' Retail Licences (Amendment) Act, 1882,' gives the licensing justices power to refuse the renewal of existing off licences without there being any grounds for such refusal." From this point, even without any violations having occurred, magistrates could deny applications to renew existing licenses. Butler posits that this decision led directly to an explosion in drink map production—and a major offensive by temperance activists—resulting in the publication of over eighty-five different drink maps in the following years (89). Many of these drink maps explicitly cite *Kay v. The Justices of Over Darwen* on their backs and include directions about how this decision could be used to fight drinking (72). The author eloquently argues that prior to this result there was no one singular purpose or strategy regarding the creation of drink maps, but that after the decision "the focus became razor-sharp" (104). The maps clearly seemed to be working, and temperance groups like the United Kingdom Alliance even provided local chapters with publication templates for maps, alongside their other templates for various anti-alcohol materials (92).

Yet Butler's extensive analysis demonstrates that this appearance was deceptive. Temperance advocates may have felt that drink maps were successful, but when Butler examines the political and social impact of these maps, and their efficacy in curbing the accessibility of alcohol, they are found wanting. Chapter five, "Drink Maps in Manchester & Norwich," follows one of these campaigns over an extended period of time. Three successive drink maps of the city of Norwich demonstrate the limited success the movement enjoyed in meeting its goals. The first publication was released in 1878 and was likely the first temperance map to explicitly use the words "Drink Map" in the title and on the map itself. While earlier maps may have been known colloquially as drink maps, the official titles instead used words like "licenses," "public houses," or "spirit dealers." The second Norwich map was published fourteen years later, in 1892, and eleven years after that, the final map was published in 1903. Interestingly, that third map was the last of its kind to utilize the label "Drink Map" on its face, signifying the end of the era (128–134). Each of the three maps records the number of licenses that had been granted and denied in the city, and allows us to see that any decrease in the number of public houses was, at best, marginal. It would seem that the

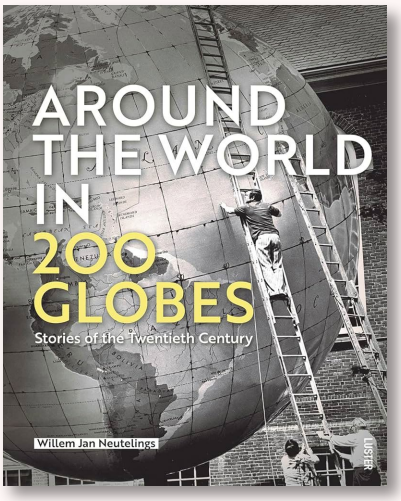
temperance movement, even with effective tactical help from the maps, was ultimately unable to significantly reduce alcohol consumption in Norwich. This analysis lends strong evidence in support of Butler's overall argument that drink maps were not particularly effective.

Butler's thorough analysis of Victorian drink maps—supported with detailed research on the legal and social context surrounding them—establishes a strong argument, grounded in the existing artifacts. The primary limitation of this work, Butler notes, lies in the relatively small number of drink maps that survive. Although many of these maps were published in editions of thousands, only about twenty-five are known to exist today (161)—a small number, but one that allows her to review and analyze all the available source material. She compensates, in part, for this limitation by utilizing other types of archival sources, like Royal Commission reports, legal declarations, newspapers, and letters to provide supporting information. Somewhat disappointingly, Butler does not provide an account of her investigative process for discovering and collecting either the drink maps or the supplemental materials, but the absence of this methodological information does not subtract from the scope and persuasiveness of the research conducted.

Although there is a substantial amount of literature and scholarship about historical alcohol abolition and temperance movements, there has been a major lacuna in academic discourse about drink maps specifically. Butler's analysis fills a gap in cartographic scholarship about the history, application, and impact of drink maps—weighing the significance and role of drink maps as a tool for social change within the context of the Victorian temperance movement. The research presented shows how Victorian drink maps served as a strategic method of persuasion for social and legal change.

Drink Maps in Victorian Britain is an interesting, important, and insightful read—laying out cartographic connections to, among other things, social and legal dynamics. The textual information, descriptions, and analysis are accompanied by images of drink maps, advertisements, and other illustrations from the era—drawing the reader's interest and building upon the literary experience with visual appeal and pertinent context. The work brings to the fore a little known but important historical example of cartography applied as persuasion and strategy. Finally, it makes insightful connections between societal issues, governance, and the role maps and mapmaking played in Victorian Britain. Butler's research is compelling, and the presentation draws in the reader. Concluding with a call for readers to be on the lookout for any unidentified drink maps, or as Butler affectionately phrases it, "hidden treasures" (161), an invitation is extended for continued scholarly development on this topic.

DOI: 10.14714/CP109.2103



AROUND THE WORLD IN 200 GLOBES: STORIES OF THE TWENTIETH CENTURY

By Willem Jan Neutelings

Luster Publications, 2024. Distributed in the US by Simon & Schuster.

264 pages

Hardcover: $55.00, ISBN 978-94-6058-367-4

Review by: Hans van der Maarel, Red Geographics

This book illustrates historical developments in the manufacture and use of globes throughout the twentieth century, using two hundred examples. The globes are divided into nine thematic chapters—such as "Technology," "Style," "Education," "Society," and "Pop Culture"—and each chapter is subdivided into brief sections dedicated to some aspect of globe production or use pertinent to the chapter's theme. The "Technology" chapter, for example, contains eleven sections categorizing the various materials that can be used to create globes, such as "Paper," "Cast-iron," "Bakelite," or "Plastic." The "Style" chapter covers various styles of globe, with sections devoted to "Art Deco," "Modernist," and so on.

Each section occupies one- or two-page spreads with photos and a brief text. There is usually a full-page image, alongside one or more smaller images of globes that fit that category. For example, the "War Globes" section of the "Society" chapter features a large photo (99) of a 1939 twelve-inch Weber Costello globe "with grim black landmasses contrasting with white oceans . . . [and] thick blood-red political borders that would soon be fiercely contested," paired with a 1940s Cram advertisement for their "self revising" globe on the prior page (98). The last section in each chapter is titled "More Globes," and is filled with additional, smaller, globe photos, each with a short description. Sometimes these globes have been mentioned elsewhere in the chapter, but often not.

The brief accompanying text places the globes in their broad historical or societal context. For example, the "Tectonic Globes" section (84–85)—from the "Education" chapter—begins by introducing Alfred Wegener's plate tectonics theory, and goes on to discuss how Marie Tharp helped prove that theory with her bathymetric map that clearly showed the until then unsuspected existence and extent of the Mid-Atlantic Ridge. Having set that stage, it goes on to mention various other tectonic globes, some of them shown in other parts of the book. A National Geographic globe, based on Tharp's map, is this section's main feature, but there is another example in the section on scientific globes. The continents on that one are attached by Velcro, thus allowing educators to demonstrate continental drift.

Of special interest is the spread on braille globes, which includes a globe that uses a combination of braille labels, wide rivers cut into raised landmasses, and textured embossing to give the visually impaired user a good overview of the shape of the Earth.

The section on outer space covers several pages, showing celestial globes, Moon globes (with, depending on the year of their design, the far side rendered empty), but also the globes used for spacecraft navigation. A notable example is the globe incorporated into the Orbitometer used by the cosmonauts aboard the Soviet Salyut space station to

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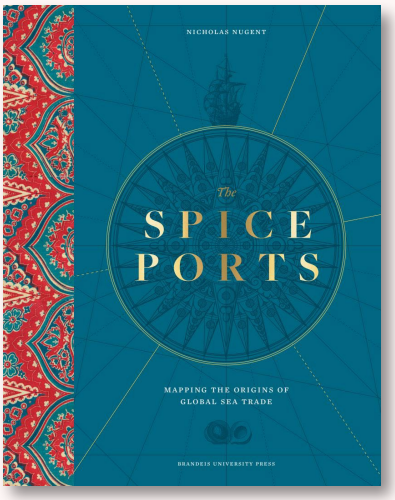
fix their position in space relative to the Earth, stars, and constellations.

The final chapter is entitled "Future," and is something of a catch-all for a variety of globes—such as magnetically levitating globes—that do not fit easily into the earlier categories.

The globes in *Around the World in 200 Globes* are, as mentioned in the subtitle, from the twentieth century. Unfortunately, this means that there is no coverage of the many interesting developments that have occurred in the first quarter of the twenty-first. For example, there is no mention of **Bellerby & Co. Globemakers**—founded in 2008—the North London makers of truly spectacular artisanal handcrafted globes. It is also worth mentioning that the clear focus on European and North American globes means that there are hardly any globes shown that were not produced in those regions. In fact, there are two chapters—"European" and "North American & UK"—that focus each of their subsections on a single commercial globe production company from the region, for a total of twenty.

The photos in this book, especially the full-page ones, are very nicely done and make this a perfect coffee-table book. As a broad overview of the variety of globes that were produced over the technologically, politically, and socially eventful twentieth century, there is a lot to be found in *Around the World in 200 Globes*. As a comprehensive or in-depth study of the same period—or a look forward to the present century—it may fall a bit short. It all depends on what you want.

DOI: 10.14714/CP109.2105



THE SPICE PORTS: MAPPING THE ORIGINS OF THE GLOBAL SEA TRADE

By Nicholas Nugent

Brandeis University Press, 2024

288 pages, approximately 184 maps and illustrations

Hardcover: $50.00, ISBN 978-1-68458-244-0

Review by: Mir Rodríguez Lombardo (he/him), Fundación Almanaque Azul

In the German children's book *Oh, wie schön ist Panama* [published in English as *The Trip to Panama*] (Janosch 1978), the character Little Bear finds a crate floating on a river with the word "Panama" written on the side. The smell of bananas coming from the crate convinces him that Panama is the land of his dreams, prompting him and his friend Little Tiger to attempt to travel there. They have no map, so they start off by asking everyone they meet for directions. Having traveled in a big circle, they eventually end up back at their own home, and, thinking they have finally reached the land of their dreams, they live happily ever after. The book, as well as its pseudonymous author and illustrator Janosch, is very popular in Germany, and when I tell Germans that I am from Panama, they often mention the story and ask me about bananas.

It's always strange when our discussion of a feel-good story about friendship and dreams morphs into one about the United Fruit Company, industrial-scale monoculture in Central America, worker exploitation, wetland destruction, pesticide poisoning, and genocide. Reading *The Spice Ports* feels a bit like this.

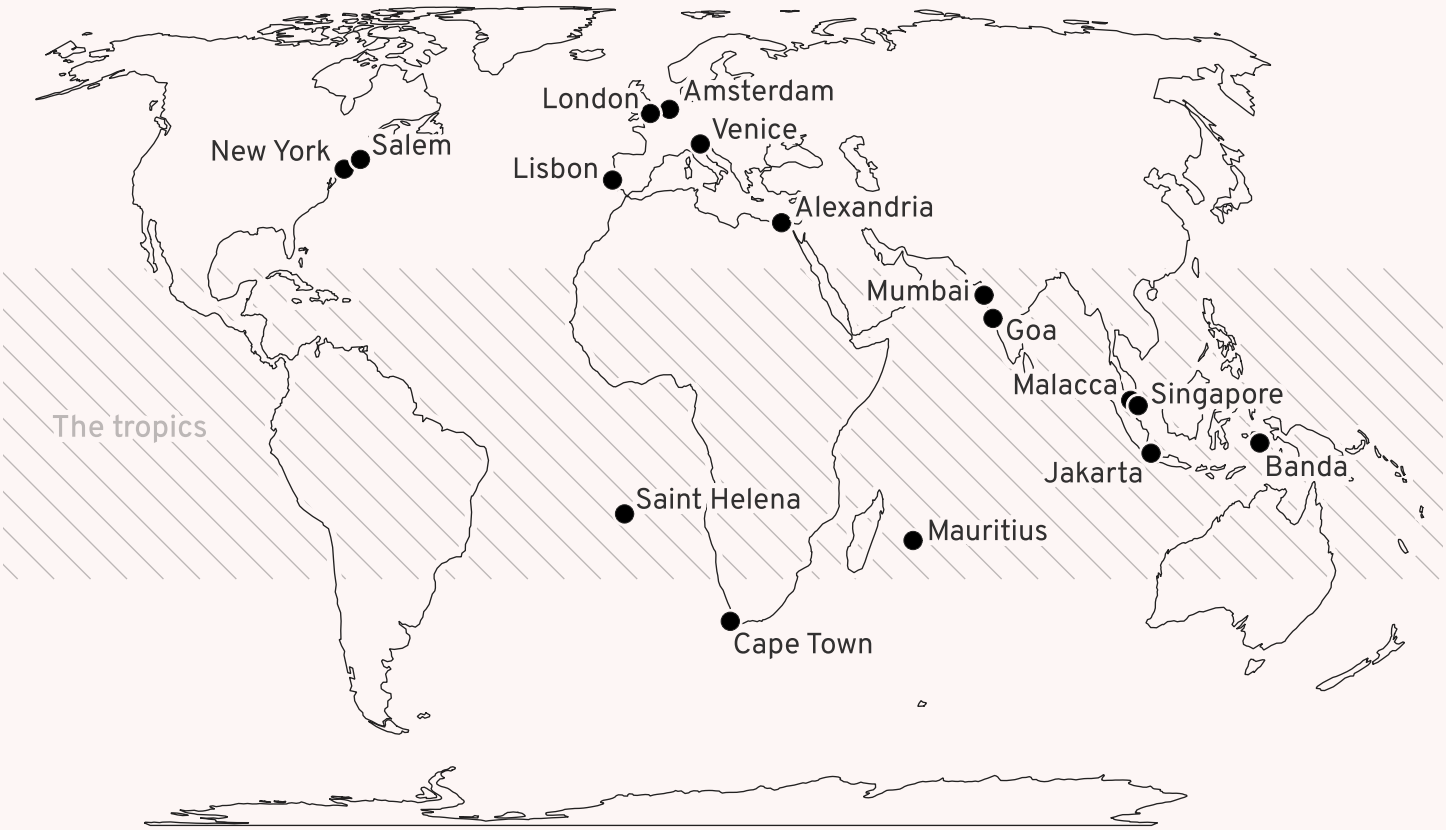
This book by British journalist Nicholas Nugent—published by Brandeis University Press in the US and the British Library in the UK—examines how the world changed through the extraction and transportation of valuable plants from the tropics to Europe. While this story has been explored before, Nugent frames it with an impressive assemblage of maps and illustrations, with nearly half coming from his own personal collection of antique maps, amassed over the decades since his first visit to Indonesia's Banda Islands in the 1970s.

It's difficult to overstate the impact of spices in world history. Why were they so sought after? *Out of the East: Spices and the Medieval Imagination* (2008), by Yale historian Paul Freedman, tells us that the huge European "craving" for spices came from how these flavorful and aromatic plants symbolized social prestige and carried sacred overtones—coming, as they did, from faraway, mysterious lands associated with the Christian concept of Paradise, imagined as a perfumed location somewhere in the East (Freedman 2008, 97). The way in which this trade stimulated the push for colonial expansion, enabled by technological advances in cartography, shipbuilding, book-making, and navigation, came not only from the enormous profit margins—cloves, on the dock in Venice, easily fetching one hundred times their original price—but also from the obsession with bypassing Muslim intermediaries to access these luxury status symbols that promised far more than their practical culinary uses. This was the driving force behind Columbus's and da Gama's expeditions to India, one reaching the Americas and the other the actual India.

The Spice Ports tells this story in twelve self-contained chapters dealing with an assemblage of places (see map) connected to Nugent's map collection. These places were either key ports in the trade of spices to Europe and the

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Places in *The Spice Ports*



US, or sites where spices grew and were extracted. The second chapter, for example, is devoted to Alexandria, the main port where Arab traders, with established commercial routes to the east, met those from Venice, who had a special papal exception to the rule against trading with the Islamic world. Towards the end of the book Nugent goes to the Americas, with a chapter on Manhattan, a place that was indirectly connected to spices when the Dutch traded control of that island to the English in exchange for the small (and, arguably, at the time more valuable) island of Run in the Banda archipelago.

The book is large and beautiful, and handsomely demonstrates the breadth of Western colonial mapmaking in the service of extraction, all the while providing a good reference to today's cartographers looking for color combinations, symbology, and inspiration from design details.

While the maps themselves are beautiful artifacts worthy of study, they cannot be separated from the violent colonial project they served. Nugent acknowledges this, referring to the violence that enabled the European spice trade, with mentions of the slave trade and the "dark side" of this history. But, in the end, his narrative comes from the perspective of the explorers: the conquerors and larger-than-life characters who are presented as driving the march of history. It avoids posing challenging questions, or problematizing in any serious way Western historical frameworks.

It is thus the decidedly colonial bias of this book which is its main shortcoming. By relying almost exclusively on documents and maps from Europe and the US—as well as Western fiction—as references, the rest of us get no say in the telling of these events. In the chapter about Manhattan the so-called "purchase" of the island from the Lenape people, for example, gets taken at face value, with minimal critical examination.

Most tellingly, the near-extermination of the Banda Islands population in 1621, a key event in the history of the spice trade, receives only passing mention. The resistance of the Bandanese people to Dutch colonialism, as well as their reluctance to grant the Netherlanders a monopoly in the trade of nutmeg, resulted in their mass murder by Jan Pieterszoon Coen—the "Butcher of Banda"—at

the orders of the Dutch East India Company. Only about 1,000 of the original 15,000 inhabitants of Banda survived—some enslaved in Jakarta, a few more fleeing to nearby islands. The Dutch replaced them with other enslaved peoples to establish nutmeg plantations that enriched the Netherlands. The unfolding of these events is described in detail and masterfully put in full historic perspective by Amitav Ghosh in *The Nutmeg's Curse*: *Parables for a Planet in Crisis* (2021), a much-recommended source for those looking for a more complex look.

The memories of the colonized, usually absent from historical documents and charts—and barely mentioned in *The Spice Ports*—challenge old mainstream narratives and are fundamental to understanding ongoing forms of oppression and power. To this day, descendants of the victims of Banda remember the event very clearly. They still gather in a seafront ceremony to commemorate the massacre, holding bamboo branches symbolizing the poles where the heads of the islands' elders were displayed by the Dutch before the massacre. Memory is also passed along in the form of a dance, the *cakalele*, which survived cultural repression by the Dutch and keeps alive the story of their culture.

The Banda Journal, a multimedia project by Indonesian journalists Muhammad Fadli and Fatris MF, captures some of these memories through photography, film, and text. It focuses on Bandanese communities both in the archipelago and on Kai Besar, where some survivors fled and whose descendants still speak the language. These communities, located on Indonesia's so-called outer islands, face internal colonialism from the Indonesian state, something the Sumatran authors are aware of, and reflect upon. Rather than attempting a comprehensive history, this decolonial project remains intentionally local. The organizers, according to Fadli, deliberately chose to hold its first exhibition in Banda "as a way of showing respect" (Nathaniel and Rahad 2021, 8:53).

As Swedish author Sven Lindqvist notes in his preface to "*Exterminate all the brutes*" (1996), "European world expansion, accompanied as it was by a shameless defense of extermination, created habits of thought and political precedents that made way for new outrages" (Lindqvist 1996, x). The Dutch, although hardly the first to do it, showed Europeans that genocide was not only a possibility, but an effective way of doing business and politics as well. These outrages and their "shameless defense" (Lindqvist 1996, x) continue to this day. The dehumanizing and pragmatic language about the need to depopulate Banda that Ghosh (2021) recounts from the Dutch chronicles shows chilling similarities to the words heard from the perpetrators of the Gazan genocide.

A few centuries after the peak of the spice trade, Little Bear imagined a place which "smells of bananas all over" (Janosch 1978, 14), and decided to seek that perfumed paradise by following the European tradition and launching an expedition with the aim of settling in Panama. Nugent, like Janosch, tells a good story, but one whose point of view sounds very different from our side. At a time when advocacy for the recolonization of the Global South has become mainstream (see **the remarks** by US Secretary of State Marco Rubio at the Munich Security Conference in February 2026), stories of Western ingenuity and fearless explorers, in which the voices of the colonized are silenced, have become very dangerous.

REFERENCES

Freedman, Paul. 2008. *Out of the East*: *Spices and the Medieval Imagination*. New Haven, CT: Yale University Press.

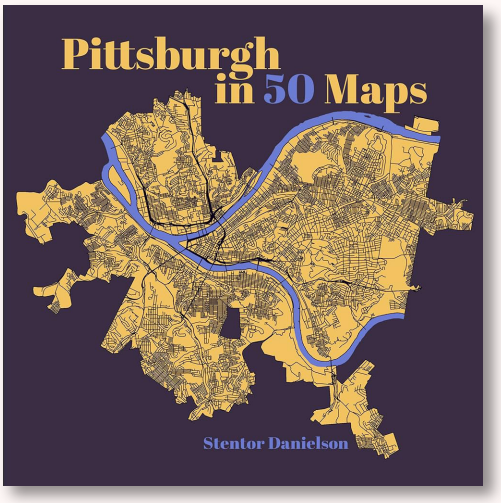
Ghosh, Amitav. 2021. *The Nutmeg's Curse*: *Parables for a Planet in Crisis*. London: John Murray.

Janosch [Horst Eckert]. 1978. *The Trip to Panama*. Translated by Anthea Bell. London: Macmillan Children's Books.

Lindqvist, Sven. 1996. "*Exterminate all the brutes*": *One man's odyssey into the heart of darkness and the origin of European genocide*. New York: The New Press.

Nathaniel, Danishwara, and Rizky Rahad. 2021. "Representational Redress in The Banda Journal." Uploaded by ImageApp, 18 September 2021. **https://youtu.be/qPVd59lmNZc**.

DOI: 10.14714/CP109.2115



PITTSBURGH IN 50 MAPS

By Stentor Danielson

Belt Publishing, 2025

136 pages

Hardcover: $30.00, ISBN 978-1-953368-85-0

Review by: Quinn E. Cowing

Right off the bat, *Pittsburgh in 50 Maps* frames its examination of the city with a quote from the cartoon *Calvin and Hobbes* (5):

> Calvin: "I wonder where we go when we die."
> Hobbes: "Pittsburgh?"
> Calvin: "You mean if we're good or if we're bad?"
>
> (Bill Watterson, 1985)

One of the newest installments in Belt Publishing's *50 Maps* series (including *Boston in 50 Maps* and *Detroit in 50 Maps*), this book seeks to show you what it is that makes Pittsburgh unique through a series of maps on a wide array of topics. In fifty-six maps, this book reveals that there is more to Pittsburgh than steel and stairs.

In full transparency, one of my best friends has just moved to Pittsburgh, so I read this book primarily to learn more about the city I'm destined to visit in the near future. While *Pittsburgh in 50 Maps* is well-suited to the needs of a soon-to-be Pittsburgh tourist, it is also a perfect starting place for anyone generally curious about the city.

The book is divided into four broadly thematic sections. "Situating the City" uses maps of Indigenous displacement, geology, and shifting urban and neighborhood boundaries to contextualize Pittsburgh. "Getting Around the City" shows how the city's locals—known as Yinzers—move about, with maps of Pittsburgh's highways, numerous bridges, and dense networks of stairways. One map (61) details a decades-long dispute over a single, inconveniently placed parking spot on one of the city's major thoroughfares. The third section, "Communities and Neighborhoods," takes a deep dive into demographics and social inequalities, with maps of neighborhoods, gentrification, tree cover, and food deserts. "Places and People in the City" is the final section, and it focuses, unsurprisingly, on the locations of a variety of places of interest, many associated with prominent residents and visitors to the city.

In the first section, we learn about the land upon which Pittsburgh was founded, and how the city developed. We also get a first glance into the culture that grew and evolved with the city. Today's city lies nestled in a fertile landscape at the confluence of three rivers—known nowadays as the Allegheny, Monongahela, and Ohio—an area that has long been inhabited by numerous Indigenous groups. In a story similar to that of other burgeoning cities in early American history, an influx of white settlers forced native peoples from their ancestral lands. The rivers that fed the surrounding habitat and Indigenous communities became highways for transporting iron ore and coal to fuel the rapidly growing steel industry, one which polluted those same rivers, but also brought Pittsburgh to its peak population. As the population grew, so did the boundaries of the city—reaching its current extent in 1951. While this growth trajectory is shared by numerous US cities, Pittsburgh stands alone with the unique spelling of its name. In the late nineteenth century, the federal

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government imposed a standardized spelling on the thirty-four US municipalities named Pittsburgh—forcing them to drop the silent h—relenting only in 1911, and only for Pittsburgh, Pennsylvania.

This section contains a diverse range of map types illustrating changing boundaries, landmarks, and even the aquifer underlying the city. The minimalist nature of the maps allows for easy interpretation and familiarizes you with Pittsburgh's complex outline. The map of the "City of Hills" (14–15) is a simple shaded slope map with points locating the city's highest and lowest points, as well as the steepest street in the city. The accompanying text draws a direct line from the prevalence of steep slopes in the city to the many disastrous landslides that occur there to this day. The best map in this section is a general reference map that focuses on the folk tale that Pittsburgh's famous Point State Park fountain—situated on the point of land where the Allegheny and Monongahela rivers join to become the Ohio—is fed by a secret fourth river (16–17). This map clearly outlines both the surface water drainage and the underlying aquifer that abuts the three rivers—showing that it constitutes a very real fourth water source feeding the fountain.

As a geologist, I also felt a connection to the "Coal City" map (26–27). The map's inset locates Pittsburgh's situation in the midst of a large coalfield, while the main map shows how much of the city has been mined. The accompanying text connects this broadly mined region to environmental impacts faced by the city at large: instability of the ground above abandoned mines, acid drainage from abandoned mines, and poor air quality stemming from extensive coal burning (the last of which has improved with the reduction of coal use). We also get the first look into Pittsburgh's rich culture with "Famous Firsts" on page 32. This map highlights fifteen landmarks connected to innovations made within the city, including the first motion picture theater in the world (the Nickelodeon, 1905), the first polio vaccine (Jonas Salk, 1955), and the first paramedic-staffed ambulances (Freedom House Ambulance Service—staffed entirely by African American paramedics, 1967).

Section two shows how Yinzers get around their city. While Pittsburgh used to be filled with trolleys and funiculars (called "inclines" by the Yinzers), today the city's infrastructure caters to cars. The "Ride the Trolley" map (54) compares the expanse of old trolley lines to the scant bus routes that run through the city today. One of my favorite maps from this section is the "City of Bridges" map (46–47). While at first the map seems straightforward—a map with a point for each recognized bridge—I couldn't help but think back to the topographic "City of Hills" map (14–15). Looking at the bridge map you can see that—in addition to bridges crossing the major rivers—the bridges are concentrated into corridors that follow the valleys shown on the topographic map. I also appreciated the "Pittsburgh Steps" map of all the public staircases in the city (53). These stairways, like the rail-mounted inclines, are a legacy of historic laborer commutes in the city. The factories were located along the banks of the rivers, while the workers' homes were atop the overlooking bluffs—requiring the workforce, daily, to descend slopes too steep for streets, and then climb them again at the end of their shift. The fact that so many are still in use today speaks to the resistance of the area's landscape to citification. Even as industrialization advanced urbanization in Pittsburgh, there are still places where roads physically can't—and even shouldn't—replace historic infrastructure.

Section three begins with a detailed map of the city neighborhoods (64–65), giving a brief overview before diving deeply into their people and culture. It is remarkable that ten of the city's ninety distinct neighborhoods have descriptors like "hill" or "slopes" in their name; another clear legacy of Pittsburgh's steep slopes. This is followed by a series of maps that detail gentrification and inequities that disproportionately affect both lower-income and Black, Indigenous, and People of Color (BIPOC) communities. This thematic thread opens with an anecdote about a certain property company's push to remove a beloved "there are Black people in the future" billboard that sat atop a prominent—but now closed—Black bar and music venue, and continues with maps on race and ethnicity, tree cover, food deserts (aptly called food apartheid by the author), and even "Old Houses and Lead Paint" (70). Immigration and religion also contribute significantly to the city's culture, and several maps are devoted to exploring their manifestation in the city. Evidence of early European immigrants survives in neighborhood names like "Polish Hill," and in the vast and deep-rooted Jewish community. However, the city's Chinese immigrant communities—many dating from the late 1800s—have faced systematic displacement by recent development projects. Lastly, while deep-rooted Catholic and Jewish influences are to be expected in a Rust Belt city housing European immigrants since the eighteenth century, the map "Muslim Pittsburgh" (91)

details the early and continued history of Muslims in the city—starting in 1932 with the first mosque in the US to be founded by native-born Americans.

While most of the maps in this "Communities and Neighborhoods" section are choropleth maps detailing, for example, differences in income and median age, one map stood out against the rest. I quite enjoyed the "Catholic Pittsburgh" map (88). Instead of simply identifying the locations of the many Catholic churches in the city, the map makes a point about dwindling congregations by detailing whether each Catholic church is open, vacant, demolished, or if it has been sold to nonprofits, sold to private businesses, or converted to a church of another denomination. I will use this map when, on my Pittsburgh visit, I pass by a beautiful Catholic church and wonder if it is one of the many relics of the city's rich European immigrant history that has been converted to a bar or apartment.

The final section, "Places and People in the City," details Pittsburgh's lasting legacy through the lens of labor, arts, and sports. The "Carnegie's Legacy" map on page 107 maps out twenty-seven locations throughout the city that had a connection to industrialist and philanthropist Andrew Carnegie—mostly libraries and museums he founded—while the accompanying text takes a deep dive into his complex story. While Andrew Carnegie was a man who came from very little and ultimately gave away ninety percent of his amassed wealth, he also believed that "working-class people couldn't be trusted with higher wages because they would waste them on 'indulgence of appetite' in contrast to his own enlightened altruism" (106). Air quality, one of the major impacts of the steel industry, is creatively addressed with a map of asthma rates (115). The map breaks the data down by neighborhood, making it easier to see the disproportionate effects this disease—linked to polluted air—has on low-income, predominantly Black, neighborhoods. The section also includes a map of the life and works of, and memorials to, the city's lauded playwright, August Wilson. Lastly, the long history of sports in the city is depicted with a map of all the professional teams that have called the city home. As one of the more famous Pittsburgh teams, the Steelers have their own special map showing the greatest (and most controversial) play in the history of the team (and of the NFL)—the 1972 "**Immaculate Reception**" (124).

While this book did a great job at getting me interested in all facets of Pittsburgh, some of the maps left me wanting more. Mostly due to my own curiosity, I felt like there were a lot of interesting threads dropped, lacking follow through, or just missing an explanation. Maybe it's the environmentalist in me, but I was disappointed that the book mentions a major tributary flowing past a chemical spill site but never mentions the specific chemical or any of the potential impacts. In another instance, the text accompanying the "City of Four Rivers?" map (16) references old rivers, streams, and ponds that are visible on old maps, but makes no effort to trace the whereabouts of these historical features on the accompanying map. Even if it was a (questionable) design choice to reduce map clutter, I would think that some sort of source note or bibliographic reference would be in order. That same map attempts to provide an explanation of how the famous Point State Park fountain—referred to in the book only as "the Point"—is fed by an aquifer, but the map is missing any marker of where the Point is. Similarly, many of the maps are either missing vital labels altogether, or lacking explanations for the ones that were provided. Starting at the beginning of the book, the author constantly mentions neighborhood names long before we get a map that indicates the whereabouts of that neighborhood.

Design choices prevented some of the maps from meeting their full potential. When I described the "City of Bridges" map (46–47), I noted that the bridges are concentrated into corridors that follow the valleys shown on the topographic "City of Hills" map (14–15). While I noticed this pattern, I feel this would be best presented by adding the terrain to the bridges map. In another case, the map of "Eds and Meds" (110–111) seeks to display the spread of the new industries throughout the city, and draw attention to the growing number of them that are exempt from property taxes. While the map does effectively show the locations of relevant sites, it doesn't display any evidence to support the assertion that these tax-exempt properties make up a third of the city's parcels. A basemap with each parcel owned by a tax-exempt party shaded a different color would be a simple way to show the extent of land that doesn't pay municipal property tax.

Just as some maps left me wanting more, some felt as if they didn't contribute much to this portrait of Pittsburgh. The "Sister Cities" map details the loose relationships between Pittsburgh and its twenty-one sister cities—supposedly tying Pittsburgh to the world stage (28–29). It seems to me that the "Famous Firsts" (32–33), "Carnegie's Legacy" (106–107), and "August Wilson" (120–121) maps

already do a thorough job at highlighting how Pittsburgh and Yinzers have changed the world. Likewise, "To Outer Space" (96–97) feels like a mishmash of random facts loosely melded together by the phrase "outer space." While some points are well founded—like the location of an observatory in the city—others are a bit of a reach: a borough named Mars that's not even in the same county; a high school far north of the city that an astronaut attended; and a township named Moon. I did, however, like that it presented the opportunity for the author to weave in the Seneca creation story beginning with the Sky Woman.

From maps that lay bare social inequalities, to maps that show where every dinosaur statue is located, this book excels at balancing the serious and the silly sides of Pittsburgh. I have already mentioned how one series of maps outlines the complex ways in which low-income and BIPOC communities continue to face disproportionate effects from housing degradation, air pollution, and gentrification. The author also provides productive social commentary through their examination of how local organizations, community members, and officials are addressing these and other challenges. Outstanding examples include the work of Tree Pittsburgh—an environmental nonprofit—planting trees in low-income neighborhoods (77) and proposals to turn vacant lots into affordable housing or community spaces (69). Meanwhile, the book spreads levity by making light of demonstrations of Yinzer persistence with examples ranging from a tiny city held within the city limits to the aforementioned Penn Ave parking dispute.

Looking back to Calvin's second question in the opening dialog—"[do we go to Pittsburgh] if we're good or if we're bad?"—it seems clear that the correct answer is "only if you are good." The diversity of reference and thematic maps in *Pittsburgh in 50 Maps* only begins to show that Pittsburgh can be a heavenly place for any nebby (Pittsburghese for nosey) wannabe-Yinzer that picks up this book. But, most importantly, after reading you'll be prepared for the Pittsburgh Left—or at least know one when you see it.



SHELTER: AN ATLAS

Edited and produced by Alicia Cowart, Charles Drucker, Darin Jensen, Kristin Scheel, Maia Wachtel, Mattie Naythons, Michelangelo Bonfiglio, Nic Reale, Paul Rogé, Sapna Thottathil, Susan Powell, and Sydney Johnson

Guerrilla Cartography, 2023

182 pages

Paperback: $40.00, ISBN 978-0-9884272-5-9
Hardcover: $80.00, ISBN 978-0-9884272-5-9
eBook: **Free to download**

Review by: Lucy Haggard

Food, water, shelter: three non-negotiable needs of every living creature. The interdisciplinary group Guerrilla Cartography covered the first two topics in books published in 2013 and 2017, respectively (*Food: An Atlas* and *Water: An Atlas*). The group's third volume, *Shelter*: *An Atlas,* was published in 2023 (though dated to 2022) and largely follows the same format as the previous two, with a handful of loosely defined chapters categorizing the dozens of maps and graphical layouts included in this glossy, square-paged anthology.

Though the various entries share an overarching conceptual theme, their locations, specific topics, and aesthetics vary widely from page to page. To be sure, it's impossible to comprehensively map the concept of "shelter" around the world, but even so, the book's survey of the subject feels incomplete and imbalanced. A disproportionate number of maps focus on California's Bay Area, for example. While this is an area of perennial conflict between housing affordability, availability, and accessibility—making it rich in case studies and relevant data—the emphasis is likely also a product of Guerrilla Cartography's base in Oakland. The book's map of contributor and supporter locations reveals that most of the maps in the book come from contributors in North America or Europe, with a handful from East Asia, South America, and Australia. Unlike previous Guerrilla atlases, Africa is quietly blank.

Reading *Shelter* is akin to perusing an exhibit on the subject in a geographically inclined modern art museum. While you can help support their efforts by purchasing a bound copy, Guerrilla Cartography also publishes all their atlas content online, for free, for perusal by curious readers at their leisure. In some ways, the compilation might have been better if it could be experienced and explored in an interactive exhibit, with more content to help the reader to understand how each of the submissions relates to others in the context of the overall topic, and to experience the artistic approaches to some of the submissions in a more engaging way. Many of the contributions bring artistic or avant-garde approaches to cartography and spatial analysis. Perhaps the most unique is a cartographic piece of jewelry: *Oakland Redevelopment Map #1 – Downtown Oakland* (82; Figure 1). This creation maps the impact of racially and economically motivated "redevelopment" projects on Oakland, California.

> In the 1950's–1970's eminent domain was used to acquire and clear many mixed-use blocks in the downtown core. Considered a blighted neighborhood by the Oakland Redevelopment Agency (ORA), it contained largely working class and minority residents, as well as their businesses. The ORA would forcibly remove both to allow for large-scale new construction projects meant to recapture business and shopping revenue lost to suburban white flight. New double blocks were created, which would eventually contain the outdoor mall, hotel, convention center, high rise offices, government buildings, and BART station that

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we see in downtown Oakland today. (82)

Creator Kasey Smith represents the downtown street layout as a delicate grid of fine silver and gold jewelry chain. Streets and intersections (and with them, histories) that have been erased by the ORA are rendered in gold, while those they deemed worthy of preservation are represented in silver. The resulting necklace portrays a city layout of grace and contrast, made all the more alive by both the topological changes revealed by the ghostly restoration of the erased streets, and the street fabric reshaping that occurs when displayed on different bodies. In a similarly artistic vein is the cartographic art piece titled *Shelter of Man* (32–33) by Catherine Gates. This triplet of diptychs—subtitled *The Elements*, *More Than One*, and *Context In Defense*—portrays the interplay of shelter and settlement in natural, clustered individual, and social systemic habitats under the influence of "natural topography and manmade geometry" (33). While not explicitly depicting a particular location in the world, the multiple angles presented combine with the clean, earthen aesthetic to create a feeling of timelessness in how humans protect themselves from and within the world.

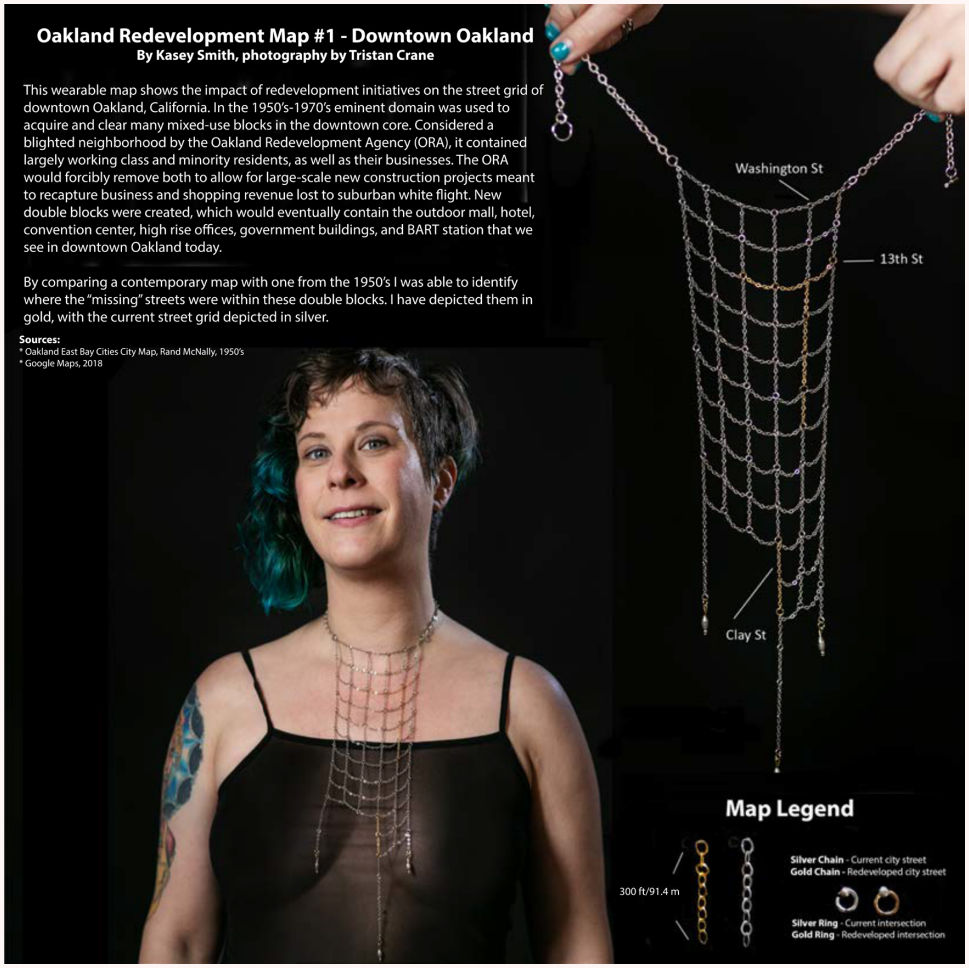


Figure 1. *Oakland Redevelopment Map #1 – Downtown Oakland.* Kasey Smith. Oakland, California, USA.

Besides artistic and individual explorations of the concept of shelter, the atlas also features community-driven projects. While not always the most visually pleasing, I found these to be the most compelling, likely because the priorities and voices of the community in focus illuminate the lived experiences, values, and needs of real people that are often absent from cold, hard data. A fantastic example of this is in the community-driven *Map of Wood Street Commons* (53) from Oakland, California and its accompanying essay, "Shelter—Proposal to the City of Oakland" by Clancy Wilmott (52–59). This mapping effort occurred in hopes of securing municipal support to make permanent an ad hoc cooperative community that had coalesced in an otherwise undesirable part of town. The map itself is simple, visually inspired by the sort of schematics issued by architectural/planning/development commissions, yet its intent contrasts starkly with those same bodies of power. Its backstory, laid out in an accompanying essay, frames the project around the desires of those who commissioned it, and their relationship with the entrenched formal structures of land ownership and jurisdiction. Among *Shelter*'s many community-led submissions are three of particular note. The first is a map highlighting transphobic violence across Lima, Perú—*TRANSitar Lima*: *Mapa de violencia transfóbica* (39; Figure 2)—using labels of what creator Ale Sotelx calls "testimonial drawings" of the experience in question. The second is an intercultural mapping project with young migrants in Buenos Aires Province, Argentina—*Interculturality as Shelter* (36)—where participant-chosen intercultural locations—the bus station, the school, grandma's house—are mapped alongside quotations from participants. The third is Nicole

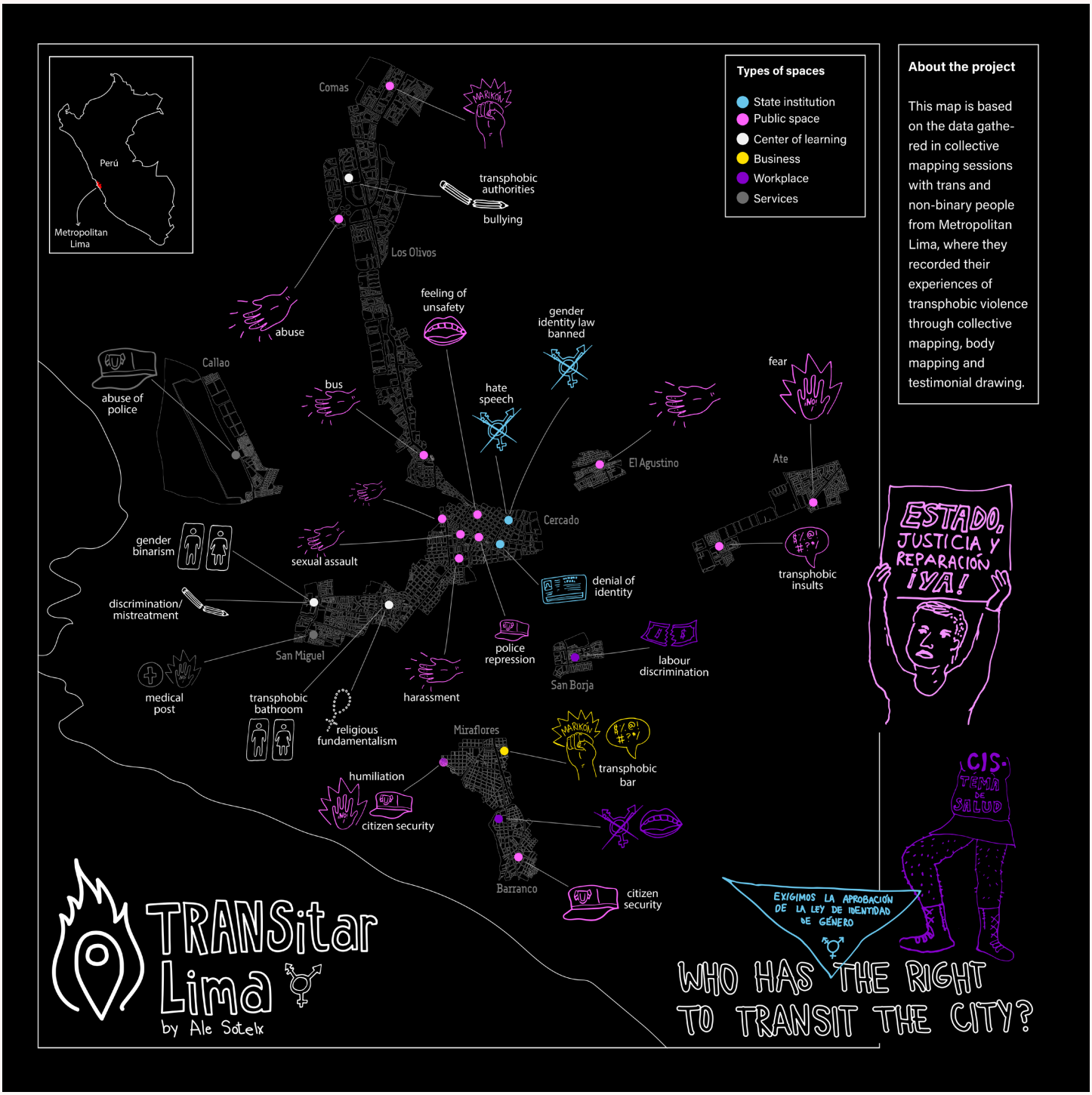


Figure 2. *TRANSitar Lima: Mapa de violencia transfóbica.* Ale Sotelx. Lima, Perú.

White's map—*Can You Stay?* (100)—of quantitative and qualitative survey responses from residents of communities in southwestern Nova Scotia to the question "Is it sustainable for you to keep living where you're living now?"

Of course, there are a few maps in *Shelter* that exemplify the best of traditional cartography, which is to say that they are both beautiful and clear in their message. Alison DeGraff Ollivierre's contribution *Bicknell's Thrush* (143), about the migratory patterns and varying threats to the species' summer and winter homes along the Atlantic seaboard, is both clear and clever in its use of color and layout. More simple in some ways and more complex in others, Molly Roy uses her submission *Mansions //// Shanties* (73) to draw in geographic and pictorial relief the contrast between the world's most expensive domiciles

and the world's most populated slums and informal settlements. On the more analytical side is a stellar layout by the Feminist Mapping Collective (92) that uses proportionally sized half-circles to juxtapose US Census counts of vacant housing units with point-in-time estimates of sheltered and unsheltered homeless populations in twenty-five major US cities. When the map's title explicitly asks *Can We House Those Experiencing Houselessness?* the map provides both a short answer—"Absolutely YES"—and a longer, more nuanced one supported by other data on the page.

However, few submissions are this direct in helping the reader understand the map's purpose and how to use it going forward. Some of these maps suffer from an overload of data—more are not necessarily better, especially when the relationships between data sets are not explained clearly—leaving the map's meaning ambiguous at best. Other maps lack a substantive conclusion at all, at least one discernible from visual inspection. In both cases, these problems can be traced to the way the data are displayed, to the way the included data sets interrelate, or to some combination of the two—and sometimes the data sets do indeed speak to each other in some relevant manner, but that conversation may not be inherently spatial in nature. This was the case both in a map about luxury student housing distorting affordable rental availability in Athens, Georgia (68) and a map (74) purporting to explore the relationship between residential home lot sizes and repeat burglaries in selected neighborhoods in Miami-Dade County, Florida, by perplexingly conflating geographic correlation with confirmed causation. Maps like these serve to remind us all that just because data exist with spatial components, it doesn't always mean that geography is a significant factor.

In many ways, *Shelter* is a lesson in cartographic intentionality. In theory, every cartographer gives careful consideration to both the explicit and implied message of each element of their map. In practice, even when mapping a topic or location where power and equity are at the forefront of the conversation, many of us choose elements out of convenience, familiarity, speed, or some unexamined assumption. Many mapmakers included in *Shelter* challenge us to question what constitutes a cartographic expression of justice through their choices of composition, organization, symbolism, data, and more—whether that's labeling "south" on a compass rose instead of "north," or choosing equal-area projections for global extents. Others, still, stretch established cartographic conventions even further; for example, the (clever? confusing? bizarre?) distortion of the geography of the eastern border of Vermont (essentially, the track of the Connecticut River) to graph the—mostly falling—fluctuation in the non-White population of the state. Very little about this map, *Vermont's Great Retreat* (89), is immediately obvious: that the filled line graph area is supposed to be recognized as the (rotated and distorted) shape of the state is only one.

Clearly, not all contributors to *Shelter* have had cartographic training—at least one explicitly tells us so while explaining the backstory of their map—and this creates an evident divide between the maps that begin with cartography in mind, and the ones for which cartography is an afterthought. Many of the maps have visually assaulting color combinations, low graphic resolution, or a number of other aesthetic choices that detract rather than contribute to the message the map is attempting to convey; and more than a few submissions border on the cartographically questionable. One map, *Living conditions in Lombardy during the COVID-19 lockdown* (116), depicting the size and local context of housing units in that region of northern Italy, chose a monotone gradient to demonstrate contextual land cover/land use classes. It creates an illusion of relative value between the classes that feels neither relevant to the map's story nor accurate as a method for displaying qualitative data in a non-comparative way.

Another map, *Rough Shelter* (99), about poverty and unhoused shelters in Athens, Georgia, feels simply too visually overwhelming. The layout collages a map of the urban area of Athens—one overloaded with several layers of poorly distinguished data (per capita income annual growth rate 2018–2023, streets with sidewalks, watershed boundaries, and whatever "UGA" might be) of no immediately obvious pertinence, alongside nearly identical green cross symbols for (likely pertinent) hospital emergency rooms and homeless shelters—with a floating inset map of poverty in the southeastern USA; one of those occurrence-sized word salads with no identified source; and some random photos of woodland rubbish. The base map is not rendered any clearer by the Athens neighborhood labels that fill the neighborhood areas and occlude several of the data layers. On top of it all, the entire composition is overlaid with a scribbled red line that seems to lack any geographic significance, but that does succeed in

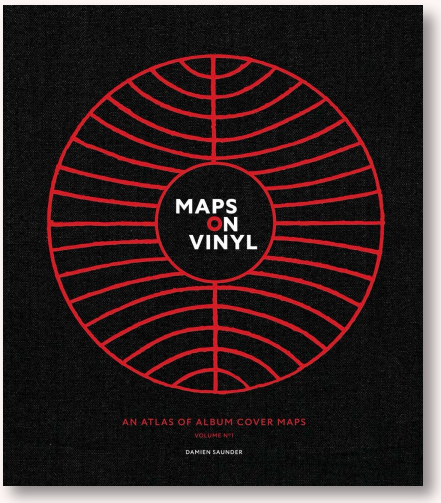
obscuring almost everything else on the page. The only clue seems to be the subscription: "The REASONS given to rough SHELTER are LOST data, disconnected from reality. . . [*sic*]."

The organization of the collection feels somewhat arbitrary: there's an entire chapter, titled "Pandemic! Shelter in Place," devoted to maps at the intersection of shelter and the COVID-19 pandemic, but there are also pandemic-related maps outside of that chapter. The same is true with maps about unhoused communities and the "(Un) sheltered" chapter. The dedication of six pages to an interesting narrative about the well-being of rescued macaques in Vietnam seems inexplicable—there is no visual component that even remotely resembles a map; the text is mostly about the psychology and sociology of these complex primates; and it is only tangentially about shelter. The essay's placement at the end of the "Pandemic! Shelter in Place" chapter—although its listing is segregated from that chapter's entries in the Table of Contents—and before the "Shelter of Nature—Nature of Shelter" chapter also raises the question: to which does it belong? This would have been a good place for the editors to have included an introductory/explanatory note.

Unquestionably, Guerrilla Cartography has pulled together an impressively varied range of maps in assembling *Shelter*: *An Atlas*. Paging through the volume, I find myself concurring with Nat Case's review of the previous Guerrilla Cartography project, *Food*: *An Atlas*. While the idea of a thematic map compilation conveying an overarching narrative about an essential aspect of living is admirable, *Shelter* just doesn't live up to the task. The wide variation in clarity, text size, image resolution, supporting map furniture—and sometimes even the coherence—of the submissions raises questions about the publisher's inclusion criteria and editorial policies. Few maps had any discussion of method or process—either alongside the maps themselves, or as part of the "Process" or "Map Notes" sections of the book. Not everyone, of course, can succinctly describe their process—their map is their expression—but might this have been something with which Guerrilla Cartography could have assisted? If—as I suggest—*Shelter*: *An Atlas*, like *Food*: *An Atlas*, fails to hold together an overarching narrative, it might be better seen as a snapshot anthology of activist activities—where Guerrilla Cartography is simply assembling a collection rather than curating an exhibition. While that represents a more modest and limited aspiration, it is arguably an equally valuable one.

As Case noted in his review of *Food*, it appears that most of the submission creators for *Shelter* are globally privileged, intellectually employed individuals or groups (for the record, I count myself among this cohort). The atlas comes across as partly attempting to be an academic publication (one map references lyrics to a famous Rolling Stones song with the citation of "M. Jagger, K. Richard [*sic*]/ 'Gimme Shelter'," which feels hilariously stuffy), but its artistic and grassroots inclusions pull it toward being a politically active text. While there is surely a Venn diagram between these two genres, the book ends up short of offering enough of a tangible "so what?" for either group to take with them. At its best, *Shelter* and other topical anthologies like it serve as a time capsule, reminding (some of) us how things were previously and what was most actively on (some of) our minds and in our conversations, and a documentation of the disparate efforts of the many whose activism would quite likely otherwise be lost to human memory.

DOI: 10.14714/CP109.2131



MAPS ON VINYL: AN ATLAS OF ALBUM COVER MAPS, VOLUME № 1

By Damien Saunder

Cart Publishing, 2025

332 pages

Hardcover: $50.00, ISBN 978-0-646-70871-3

Review by: Glenn O. Humphress, Southeast Community College

Have you ever come across an article or book that is so in your wheelhouse that you thought, "why didn't I think to write that?" As a lifelong enthusiast of both the cartographic and vinyl record media forms (the latter to the extent that my first job was working in a record store), *Maps on Vinyl* by Damien Saunder is just such a book for me. I have certainly noticed the use of maps on album covers before, but, alas, the idea of a book on that theme escaped me, so I am pleased that another cartographer who is also a record collector decided to fill that gap. Saunder is an Australian cartographer with a lengthy *curriculum vitae* of high-profile positions, including leading the cartography efforts at Apple and National Geographic, as well as extensive involvement with publishing, speaking, and outreach regarding a variety of cartographic topics, particularly map design. He has also "long been fascinated by the role that maps play in the art of the album cover" (331). *Maps on Vinyl* is clearly a melding of passions.

According to the "Introduction," *Maps on Vinyl* is a collection of over four hundred images of vinyl record jackets, gatefolds, sleeves, inserts, picture disks, and center labels that include some sort of cartographic representation as part of the artwork, including representations of over one hundred identifiable places. The earliest record included is from 1939 and the latest from 2024, with record sizes predominantly consisting of the common 7-inch and 12-inch formats, but also including the rarer 10-inch format. Pages 12 and 13 provide a timeline indicating the number of records per decade that appear in the book, as well as proportional symbols—cleverly designed to look like various sized records—representing the number of times particular geographic locations or geographic themes appear in the book. What stands out on these pages is not the (expected) large number of representations of the United States and Europe, but rather the unexpectedly large number for Africa (thirty-three), which is the only region to get its own chapter, as well as the exceedingly small number (six) for East and Southeast Asia combined, while South Asia does not appear at all. Antarctica, represented by five records, has almost as many as all of Asia. The "Introduction" also provides some interesting discussion about the historical and technological contexts for changes over time in how maps look on records, the roles the maps played by being on the records, and some consideration of the varying public interest in maps during different time periods; this is a welcome inclusion that is well thought out and researched.

Reflecting Saunder's working definition of a map as "an abstracted representation of a real or fictional geographic form in which spatial relationships are of primary relevance" (8), there is no specific common theme to the records that were included, beyond Saunder's statement that the book represents a collection of what he considers "the most unique examples to date" (11). I suppose I could make some protest about what has been left out—several of Jimmy Buffett's records come immediately to mind, as well as specific ones from Chicago, Saga, and the country band Alabama, to name a few—but let's be honest, an

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author must draw the line somewhere and the quantity Saunder chose to include is impressive. Then too, this collection is expressly labeled as volume one, so any records that might seem unfairly omitted may well make it into a subsequent volume. Suffice to say, what is included in this work covers a suitably wide variety of cartographic forms and visualizations.

Following the "Introduction," the substantive portion of *Maps on Vinyl* is divided into eight themed chapters. Every page in these chapters displays at least one cartographically themed example along with information about each. Saunder states that he attempted to track down background information for each by contacting designers, recording artists (the singers, musicians, or bands on the records), record companies, or family members if possible. This diligence results in some interesting stories about the inspirations for some of the designs.

The chapters begin with "C(art)ography," which engages with the contributions of maps to an overall artistic design for the visual material included with records. Examples include a picture of slightly crumpled maps that have been skewered by pitchforks and a painting of a cake that has portions of a world map designed into the icing (I will leave it to the readers to check out what albums are the sources of these). At eighty-four pages, this is the longest chapter (over twice the length of any of the other seven chapters, but one), and it displays the widest range of cartographic representations. As is the case with any visual element included on a record sleeve—packaging that is rarely designed by the singers or musicians themselves—the maps may simply have been designed for graphic purposes, or for some visual pun. The next chapter, "We Built This City," not surprisingly focuses on representations of cities, in whole or part, followed by an "On the Road" chapter that covers representations of travel, touring, and transportation infrastructure, including several examples that incorporate route maps.

The shortest chapter, but, to my mind, the most unique, is "African Beats." This chapter includes the largest number of recording artists from outside of North America and Europe, although not all are from Africa: several Jamaican reggae artists have utilized maps of Africa on their album covers, for example. The next chapter, "Astroworlds," highlights albums that include representations of all or part of Earth as a globe—although there is one example of a map of the night sky—while the following chapter, "Ocean Whispers," includes those that have an ocean-map theme. The "Maps with Attitude" chapter illustrates how maps can be used to help communicate themes such as war, oppression, rebellion, and violence that have been popular with some punk and metal artists. Last, but certainly not least, the chapter "Music from Here" focuses on the use of maps as companions to music that reflects strong national, regional, or local pride. In these cases, there is generally a strong relationship between what is represented on the map and something meaningful to the musical artist, or that is represented by songs on the record.

Maps on Vinyl is a fun excursion through a compilation of cartographic artifacts that have been largely overlooked by professional cartographers until now. I received this book to review at a time when I was teaching a cartography course, so I brought it to class for the students to examine. They were interested in this rather novel use of maps, but generally saw these maps as products of graphic arts rather than cartography. Such a distinction can affect perceptions of the legitimacy of these products as "maps," and this reaction may well point to one reason why cartographers have, in general, so consistently ignored this genre. However, graphic-arts produced maps can have an appeal—as demonstrated by some of my cartography students, who are enthusiastically interested in the maps that are integral to many of the games they play—and academic cartography could benefit from embracing and analyzing the role maps play in the entertainment industry, as Saunder has done here.

Mapmaking is often said to combine both art and science, and with *Maps on Vinyl* Saunder has produced a work that pulls together a selection of high-quality examples that strike a refreshing balance between the two. While admiration for the maps themselves is clearly his primary motivation, he manages, along the way, to place them into the context of the principles and history of cartography, and of the wider framework of the social impact of maps in general. I, myself, think that academic cartography tends to focus too much on the science and not enough on the art, so I welcome works such as this—and, besides wishing *I* had thought of making a book like this first, I am hoping further volumes are forthcoming.

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Robinson, Arthur H., Joel L. Morrison, Phillip C. Muehrcke, A. Jon Kimerling, and Stephen C. Guptill. 1995. *Elements of Cartography, 6th Edition*. John Wiley & Sons.

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Danzer, Gerald. 1990. "Bird's-Eye Views of Towns and Cities." In *From Sea Charts to Satellite Images: Interpreting North American History through Maps*, edited by David Buisseret, 143–163. University of Chicago Press.

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Cartographic Perspectives

The Journal of **nacis**

Number 109, 2026