Article

From Mapping Place to Mapping Space in Library GIS Work

Lena Denis

ABSTRACT

At many academic libraries, library workers run the teaching, general reference consultations, technical troubleshooting, and software and licensing maintenance in Geographic Information Systems (GIS) for their institutions. This is very much the case in the Data Services unit of Johns Hopkins University's Sheridan Libraries, where staff receive requests for help with a wide variety of mapping projects every semester. Sometimes they are straightforward requests for technical assistance, but sometimes they underpin much deeper investigations into how to situate people and significant events through time and geographic settings. This article discusses these types of requests in the context of the philosophical distinction between place and space, draws examples from real-world applications for synthesizing follow-up approaches in everyday work scenarios, and encourages further critical thinking about mapmaking itself.

INTRODUCTION

Faculty and students in disciplines across Johns Hopkins University (JHU) divisions engage with my department, the Data Services unit of Sheridan Libraries, because they need to join their research data with geographic data, which allows them to create maps and other visualizations that they can analyze and disseminate. To do so creates representations of the world as many people familiarly conceptualize it, with visual cues that bridge gaps in understanding and allow inferences to be made that might be harder to find with numbers alone. The success of these Geographic Information Systems (GIS) projects typically lies in their precision of *place*: geographic coordinates applied to data allow the intended audience to see with their own eyes the exact spot where a shoreline has eroded over the past century, the exact street where a neighborhood's risk of carcinogenic exposure from the nearby waste deposit site tapers off, and exactly which zip codes students live in who perform well on standardized tests.

Research topics like these make academic careers and inform public policy at all levels of governance, not to mention capture the hearts and minds of the public who sees them. In the news, in a brochure, in a book, maps for public consumption become a gateway consulted in private. An individual looking at a map, seeing it in a unique way with unique assumptions compared to anyone else who sees it, is looking at what purports to be a key to the real world and its contained truths that may be invisible to the naked eye. A map built upon data, standard coordinates and projections, and statistical analysis becomes a paragon of truthful persuasion. However, there are increasingly evident limits to place-based mapping.

Increasingly in recent years, mapping projects have come across my proverbial desk that do not hold geographic place-based precision as their goal. Sometimes, this is simply because of missing data, but frequently it is because an overreliance on data is seen as a hindrance to the map's aesthetic and persuasive function. These patrons seek alternative modes to those recreating a place. Instead, what they aim to create is *space*. Space relies on the context of experiences and events, no less real and no less "accurate" than place, but relying on other forms of information, such as a time-based setting, movement shown between places by key actors, relationships between large groups of people, or other such abstract visualizations of data points. These maps may be GIS-created in an academic sense, but with none of the usual tactics that library workers are accustomed to teaching in our introductory workshops. However, we are still uniquely suited to help with these endeavors, and we should learn how to support them.

Not only do our students and faculty need our guidance as information professionals, but the public more broadly would benefit from the ripple effects of shifting how we think about maps as straightforward information sources. Crucially, much of the world already does make and value maps that are not geographically precise – or, not place-based – in the ways that we train to make them, but instead highlight relational modes of understanding space, between people but also between disparate points in time and other modes of connection that are not represented by

discrete points on a two-dimensional surface. To neglect these alternative space-based modes of creation and dissemination contributes to actual real-world disasters, far beyond anything in the academic sphere. If we can enrich our guidance to prize space as well as place, especially for use cases that require maps in the context of experiencing events and relationships that build spaces, it will not only help people for whom traditional place-based GIS is insufficient, but it will also help us advise those for whom traditional GIS is their bread and butter, by lending to their work a more critical eye.

PLACE VERSUS SPACE

The understanding in this essay of *place* versus *space* comes principally from the twentieth-century French philosophers Michel de Certeau and Henri Lefebvre. In de Certeau's influential book *The Practice of Everyday Life*, he gave two definitions at the outset, one for *space* (*espace* in French) and one for *place* (*lieu* in French). As he defined it, a place refers to the order of distribution of elements that co-exist in their exact locations, such as a series of buildings that make up a neighborhood block with a name that unites them. On the other hand, a space is an effect of the relationships that occur between those elements and everything else that interacts with them. Space refers to a general area that contains "intersections of mobile elements," defined by how those elements interact and what else may be part of them that cannot be encapsulated by a single discrete geographic location. An example of a space could be a region with nebulous boundaries, but a strong perceived identity as a holy place sacred to a certain religion. Spaces are constantly generated and shifted according to those who define them, unlike a place-based location.[1]

Lefebvre also wrote extensively about what he called the production of space, and his work has been interpreted and built on prolifically by theorists in the field of human geography, among others, who examine the power dynamics in urban systems that they hear expressed in Lefebvre's writing. One of the most prominent to do so, Edward Soja, reads Lefebvre as asserting the centrality of cities and sophisticated urban spaces in developing societies, stating that "all social relations remain abstract and unrealized until they are concretely expressed and materially and symbolically inscribed in lived space."[2] Lefebvre and Soja see the unfolding of space as part of a network of control and constraint, especially in the context of urban design when political and business entities determine so much of how space is constructed – hence, Soja's emphasis on power as part of the production of space. However, I posit that while identifying power dynamics is one crucial element, mapping space also gives mapmakers the opportunity to subvert power dynamics, by redefining the space according to their own modes of understanding. This subversion is especially evident in initiatives like

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[1] Michel de Certeau, "The Practice of Everyday Life," in *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley: University of California Press, 1984), 117–18.
https://idoc.pub/documents/de-certeau-places-spaces-34m77prq0846.
[2] Edward Soja, "Writing the City Spatially," *City* 7, no. 3 (November 2003): 269–80.
https://doi.org/10.1080/1360481032000157478.

counter mapping, which will be discussed later in this essay, but being aware of its potential across mapping initiatives can provide a more creative response to the types of questions and problems that space mapping seeks to answer.

Hopefully, these case studies in turn can give us a better idea of how to adapt our future teaching. First, in geographic metadata, we would refer to "place" using terms like "positional location." One uses places to survey an area of land or to build a GIS. "Space" or "spaces," on the other hand, are defined by relationships and associations that characterize one or more areas of the Earth's surface, areas which may or may not be precisely defined themselves. The cases in this essay give examples of spaces that are mapped through the interplay of human actions, through knowledge held by specific groups of people, and through how these elements intersect in a wide variety of ways that can still be clearly understood by their intended audience.

MAPPING SPACES OF MIGRATION

Mapping migration is a particularly timely and crucial sphere in which there are clear advantages to forgoing place-based precision in favor of space-based mapping of migrant experiences and perspectives, centering a vulnerable and typically marginalized viewpoint in doing so. Western media's depiction of the so-called refugee crisis of 2015-2016, when thousands of Syrian and Iraqi refugees migrated to Europe, is a case study in manipulative maps. In a presentation to the 2018 Symposium of the International Society for the History of the Map, Megan Barford, Curator of Cartography at the Royal Museums Greenwich, carefully pointed out similarities in many major news sources between maps of migration routes by those seeking asylum and wartime maps of the routes of invading armies.[3] At the time of this writing, the plight of Ukrainian refugees has captured the world's attention and a much more sympathetic media narrative has emerged, for geopolitical reasons as well as racial biases, at least in part. However, the news maps of their movement and of the atrocities occurring in Ukraine are still often harmful and misleading. Cartography and policy experts have pointed out the dehumanizing and invasion-minded way that refugee maps tend to represent people's movements with arrows, and the fact that using wide swaths of red to show Russian presence in Ukraine ultimately fuels a narrative that they are in greater control on the ground than is true, which has the unintended consequence of feeding into Russian propagandists' hands.[4] Place-based mapping is not just insufficient for the nuances of migration – it causes active harm.

Barford sought to preserve maps about migration with a different perspective, not only in terms of authorship and lived experience, but also in terms of how

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[3] ISHMap, "Survey, State, Map – Program," Osher Map Library, June 21, 2018, https://oshermaps.org/ishmap2018/program.

[4] James Cheshire, "More than Arrows," *Jcheshire.Com* (blog), accessed June 3, 2022, https://jcheshire.com/resources/more-than-arrows/; Mateusz Fafinski, "In Putin's War, the Map Is Not the Territory," *Foreign Policy* (blog), accessed June 3, 2022, https://foreignpolicy.com/2022/03/07/russia-war-ukraine-maps/.

geographic space was understood. She did this extremely effectively with the acquisition of *The Road to Germany*, a map exchanged by Arabic-speaking refugees in 2015 over messaging platforms such as WhatsApp.[5] It was made by the migrants in question, rather than merely about them. While the design fits the basic definition of a map – an abstraction of a three-dimensional area – it does not center geography as passive news readers have been trained to do in our frame of reference. There are no coordinates or borders indicative of places drawn on this map, but there is a sense of motion shown by stick figures in addition to icons indicating modes of transportation. This makes the point clear that the image depicts a journey across geographic space. The currency amounts and translated names of destinations act as an immersive map legend, decoding the distances on this journey in a way that is relevant to the people making the journey. While borders don't appear, they are very clearly known, as many European countries that migrants knew would be more hostile to them are left out.[6] Additionally, the itinerary shown on this map, known as the Balkan route, wholly depends on a particular geographic journey. Furthermore, the map is tied to the geography of a specific and fleeting time, as the Balkan route was closed by 2016, after Hungary erected border fences and cut off its viability.[7] By the standards of a news reader, or even a maps librarian, this map is not what we usually think of when we think of maps of refugee crises. It does not have the style of place-based geographic precision – interrupted by arrows – that we look for when contextualizing information about migration points. However, as shown by how widely this map was circulated on WhatsApp in 2015, it is this map that actually helped people find their way in the world, quite literally, by being extremely precise in its depiction of the spatial relationships necessary to make this journey. It centered migrants' own spatialized perspectives, rather than further marginalizing them, at moments of vulnerable on-the-ground experience.

The lesson here is not that geographic coordinates or GIS are useless for understanding migration. That conclusion would be laughable, as people making crossings to Europe with smartphones were using their devices' GPS constantly, including in reporting shipwrecks to speed up the possibility of rescue.[8] Traditional GIS also plays an undeniable role in ameliorating the plight of refugees, such as through resource tracking and various public health applications. Rather, the lesson that library workers and other GIS information professionals can draw from this map's story is that

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[5] Royal Museums Greenwich, "Online Tour: Migration Objects in the Collection," Royal Museums Greenwich, accessed June 3, 2022,
https://www.rmg.co.uk/schools-communities/online-tour-migration-objects-collection; Marie Gillespie, "Day 41, Year of #Mygration: Navigating Refugee Smartphones and Maps," Research at The Open University, February 26, 2018,
https://www.open.ac.uk/research/news/navigating-refugee-smartphones-and-maps.
[6] Gillespie, "Day 41."
[7] Royal Museums Greenwich, "Online Tour."
[8] Alessandra Ram, "The Smartphone Completely Changed the Refugee Crisis," *Wired*, December 5, 2015, https://www.wired.com/2015/12/smartphone-syrian-refugee-crisis/.

when trying to map an experience related to geography, place-based GIS is not the right mode. Obviously, there is no way to fully understand a refugee's experience from the outside looking in, let alone simply by looking at a map they had saved on their phone. However, understanding that place-based data is not the key to humanizing an experience, as banal as that may sound, is crucial to advising our patrons when they seek to map complex events and emotionally challenging topics.

FLAWS IN GEOGRAPHIC DATA VISUALIZATION

The Road to Germany is a serious example, but there are many more benign everyday cases in research and digital scholarship where practitioners hit snags trying to visualize their work using map coordinates. Place-based precision is still necessary for most projects involving a geographic component, but even so it can be easy to misuse, an issue which is the focus of countless books and articles on the topic of geographic persuasion and manipulation.[9]

Last summer, I employed two high-school students through a summer jobs program coordinated between my university and my city, and these students demonstrated a highly effective use of traditional GIS practices. I gave them the task of using historic maps alongside a GIS-based exploration of current public health issues that are important to them.[10] In short, they did a phenomenal job, learning quickly about maps, map history, and some basic GIS skills through temporary institutional ArcGIS Online accounts. One student built an ArcGIS StoryMap about asthma rates in Baltimore as seen through the lens of current racial and income level disparities, and the other student built an ArcGIS StoryMap that focused on healthy food access across low-income neighborhoods in Baltimore. Since they were developing GIS processes on the fly, they had to learn quickly and through trial and error about how to make data into compelling and accurate maps. The students learned to normalize data – for the sake of comparing rates to population density and not just overall population – but they also learned about more aesthetic choices. Point data was easier to find for their projects, such as in the case of the location of a single factory or convenience store, but to show how these single entities affected an entire neighborhood, they had to find statistical measures describing the makeup of a broader tract of land, thus blending points and polygons. Ultimately, their most successful maps combined layers of each type of data, reflecting how well they learned to understand the mutability of maps and how the information they contain can land emotionally or completely fail, depending on mathematical and aesthetic decisions of the cartographer. In such a case, place-based coordinates are the

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[9] Mark S. Monmonier, *How to Lie with Maps* (Chicago: University of Chicago Press, 1991).

[10] Lena Denis, "Maps from the Past, Health Data from the Present, and Aspirations for Baltimore's Future: The Johns Hopkins Summer Jobs Program at Data Services," *The Sheridan Libraries & University Museums Blog* (blog), accessed June 3, 2022, https://blogs.library.jhu.edu/2021/09/maps-from-the-past-health-data-from-the-present-and-aspirations-for-baltimores-future-the-johns-hopkins-summer-jobs-program-at-data-services/.

right mode to start in, and the maps will succeed after the remaining GIS steps are applied.

Image 1. *Janiya Brown, map overlays of "Industrial Land Allocations effects on Today's Asthma Rates" and "Industrialization and its Effect on Asthma". Source Map: Baltimore Regional Planning Council & Maryland State Planning Commission. "Industrial Land 1957-1980."*

There is another category of scenarios that I now see with increasing frequency, where a map seems to be the most sensible mode of visualization because of a geographic component to what is being displayed, but place-based GIS solutions create something that is wholly anathema to the experience that the practitioner is trying to map. One I consulted on over the past year was from a professor in sociology and the history of medicine who wanted to map the shipwreck sites of slave ships on which captives mutinied in order to take down the vessels and prevent their enslavement. The gravity of these nuanced stories was completely lost, however, when he tried to do this by plotting approximate locations off the African coast where shipwrecks were believed to have happened. A series of approximate and close-together dots, which never had exact coordinates in the first place, made for an extremely dry base map with none of the weight of what the people on these ships experienced or what they accomplished. The spaces, ranging from their homes to their places of capture to their places of death and the places to which they would have been taken, along with all of the stories of their lives and decisions in their final moments, were missing. A different mode was needed to tell this story, even though geography played an important role.

A model for an alternative mode useful in situations such as this can be found in a rich source of space-based mapping that is much older and that can teach us about the

inversion of power dynamics in spaces: Indigenous mapping and counter mapping.[11] Counter mapping was first defined in 1995 to describe "alternative maps [that]...increase the power of people living in a mapped area to control representations of themselves and their claims to resources," for the sake of "challenging the omissions of human settlements from forest maps, for contesting the homogenization of space on political, zoning, or property maps, for altering the categories of land and forest management, and for expressing social relationships in space rather than depicting abstract space in itself."[12] Counter mapping thus refers to the practice of making alternate maps that resist externally imposed power structures and re-create boundaries for the benefit of the community being mapped.

Settlers and settler descendants have long tried to reconcile Indigenous worldviews – which are many and should not be treated as a monolith – to two-dimensional maps on coordinates that hold European capitals as world centers. Historic cases in North America show that when they were coerced into doing so, Indigenous wayfinders successfully translated their geographic knowledge into European-style maps, both as pedagogical sources for the maps' data and as cartographers themselves.[13] Despite rhetoric to the contrary, there was never any doubt in Euro-American explorers' minds that they needed Indigenous knowledge to succeed on the land they stole. However, what they did not understand was just how much information they lost by forcing Indigenous worldviews into the templates of their own limited understanding. The place-based precision they sought to create left out material that was no less important for understanding the land, but would never fit in the parameters they used and could never become GIS. While it is crucial to restate that no single mapping mode can capture all of the diversity and richness of Indigenous knowledge, current generations of Indigenous scholars have brought attention to these issues and opportunities with digital responses, through Indigenous mapping and counter mapping, that show how another way is possible. Long before de Certeau or Lefebvre theorized the distinction, these modes of mapping depicted what we would now refer to as space, transcending the places they were limited to in Euro-American imaginations.

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[11] The term "counter mapping" is alternately written in English as "countermapping" or "counter-mapping."

[12] Nancy Lee Peluso, "Whose woods are these? Counter-mapping forest territories in Kalimantan, Indonesia," *Antipode* 27, no. 4 (October 1995): 383–406, https://doi.org/10.1111/j.1467-8330.1995.tb00286.x.

[13] Michael Klein, "Native American Spaces: Cartographic Resources at the Library of Congress - Indian Maps, Mapping, and Geographic Knowledge," Research guide, Library of Congress Research Guides, accessed June 3, 2022, https://guides.loc.gov/native-american-spaces/cartographic-resources/indian-maps-mapping; David Rumsey Map Center and Barry Lawrence Ruderman Antique Maps, "Barry Lawrence Ruderman Conference on Cartography: Indigenous Mapping," Barry Lawrence Ruderman Conference on Cartography, accessed June 3, 2022, https://exhibits.stanford.edu/blrcc3.

For anyone completely unfamiliar with Indigenous mapping or counter mapping, a good starting point is to understand that both historical and contemporary approaches to the topic exist, and they are typically mutually dependent rather than mutually exclusive. One Indigenous scholar who uses both in his work is Deondre Smiles, a geographer currently based at the University of British Columbia. In his classes he draws on the Indigenous history of mapmaking both in and out of the context of settlers' cartographic norms.[14] Smiles uses this context to ground his own lab-based geographic work, as an Indigenous geographer working with other Indigenous scholars to support and widely integrate the knowledge that comes from these communities.[15] One Indigenous scholar who features in his class syllabi is Mishuana Goeman, a professor at the University of California, Los Angeles.[16] Goeman has written about Native women and mapping in the context of decolonizing what she calls "gendered spatial violence," arguing that Native modes of mapping that focus on relationships rather than territory are not only strongly grounded in tradition, but also necessary.[17] This idea of Indigenous mapping as a spatialization of relationships continues into what is perhaps her best-known project, Mapping Indigenous LA.[18] In one of the project StoryMaps, the co-authors, including Goeman, state:

> Maps are not always about exact locations. Craig Torres, Cindi Alvitre, and others have helped create this map based on years of research on Tongva placemaking, landscapes, and cultural history and what that knowledge has meant for them. Maps are about relationships. For the Tongva, mapping occurs in many forms depicting relationships between villages in the LA basin. These relationships include environmental factors, such as wetlands, ceremonial relationships, and kinship systems that reflect intermarriage. Many of the mainstream maps that have been used previously to depict indigenous peoples spatially… leaves out so much of the story.[19]

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[14] Deondre Smiles, "Class Info," *Deondre Smiles, Ph.D.* (blog), August 13, 2021, https://deondresmiles.com/class-info/; Annita Hetoevėhotohke'e Lucchesi, "'Indians Don't Make Maps': Indigenous Cartographic Traditions and Innovations," *American Indian Culture and Research Journal* 42, no. 3 (July 1, 2018): 11–26, https://doi.org/10.17953/aicrj.42.3.lucchesi.

[15] Deondre Smiles, "GIF Lab," *Deondre Smiles, Ph.D.* (blog), June 4, 2021, https://deondresmiles.com/gif-lab/.

[16] Smiles, "Class Info."

[17] Mishuana Goeman, "Publications," Mishuana Goeman, PhD, accessed June 3, 2022, https://www.mishuana.com/publications.

[18] Mapping Indigenous LA, "Mapping Indigenous LA," accessed June 3, 2022, https://mila.ss.ucla.edu/.

[19] Craig Torres, Cindi Alvitre, Allison Fischer-Olson, Mishuana Goeman, and Wendy Teeter, "Perspectives on A Selection of Gabrieleño/Tongva Places," Story Map Journal, accessed June 3, 2022, https://www.arcgis.com/apps/MapJournal/index.html?appid=4942348fa8bd427fae02f7e020e98764.

The images of maps that appear in Mapping Indigenous LA are striking not only for how different they are from a typical GIS place-based map, but also for their aesthetics. Maps in Indigenous modes are closer to what Euro-American cultures would consider visual art – they contain human and animal figures as central place markers, showing the passage of time in seasonal and environmental contexts, and informed by oral history. The sense of a place exists in these maps despite coordinates being totally unnecessary, even when they're known, because the value transcends places and builds spaces instead. The beauty of these maps elicit an emotional response, which is another realm of meaning and meaningfulness that precision-based geospatial data cannot express and can actually sometimes obscure. Space-based mapping of experience in this context centers the perspectives of those who are often marginalized, similarly to the afore-mentioned case of refugee migration, and while these maps seem more focused on eliciting emotion in the viewer than the previous examples, they similarly gain their power from the emotion-filled experience and on-the-ground knowledge of the creators.

While Mapping Indigenous LA features a variety of Indigenous and Hispanic groups of people in one place that coexist with distinct traditions, Indigenous ways of mapping and knowing can still be represented faithfully but non-exploitatively when focused on a single group of people. As an example, another current project in this discipline is the Zuni mapping project undertaken by Zuni farmer Jim Enote, to preserve Zuni geography that depends on storytelling.[20] The maps are aesthetically striking depictions of space, recognizable even to Euro-American eyes but at vastly different scales and with Zuni pictorial conventions that denote sacred meanings. They prioritize history and relationships between people and the environment, giving visual depictions to prayers and highlighting the natural world. In a conversation published in *Emergence Magazine*, Enote explains:

> To assume that people would look at the earth only from a vantage point that is above and looking straight down doesn't consider the humanity of living on the landscape. Saying that there's a pond, there are cattails, there are turtles in that water—that is a different view that expands the human experience of a place.[21]

This counter mapping project, like Mapping Indigenous LA, relies on partnership with Indigenous artists as well as those who know histories that GIS was not built to explain. The navigation that these maps enable, as one of the artists explains, is different but no

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[20] Adam Loften and Emmanuel Vaughan-Lee, "Native Cartography: A Bold Mapmaking Project That Challenges Western Notions of Place," Aeon Videos, October 4, 2018, https://aeon.co/videos/native-cartography-a-bold-mapmaking-project-that-challenges-western-notions-of-place.

[21] Chelsea Steinauer-Scudder, "Counter Mapping," *Emergence Magazine*, February 8, 2018, https://emergencemagazine.org/feature/counter-mapping/.

less significant than the kind of navigation that GIS allows: "A conventional map takes you to places—it will tell you how many miles and the fastest route. But the Zuni maps show these significant places that only a Zuni would know."[22] Being part of the Zuni community and needing to find places that connect the Zuni people to their traditions and their ancestors – especially in a region where these traditions and connections were almost completely destroyed by settlers – makes these space-based maps of experiences and time the most important aspects of mapping a place.

My intention in pointing out these examples is not to culturally appropriate them. Hopefully it goes without saying that this would be egregiously unethical. Rather, I suggest them as a gateway to looking more broadly at how people map, and have mapped, lived experiences at specific or broad scales of time, in contrast to how those same experiences would be mapped from an academic or journalistic mode that relies on place. While events are limited in time by their definition, they do not have to be depicted with the constraints of linear time. While geographically defined, they also do not have to be limited to a rigid scale and perspective. While aesthetic choices are important in all maps, mapping lived experience can rely more on artistic influence and storytelling through figural and action-oriented representations. Finally, the geographic space depicted is one of several interlinking matrices for displaying relationships between human beings as well as between these relationships and everything else they interact with.

MAPPING TIME AND EVENTS IN SPACE
While these characteristics of maps produced in a digital age stand in contrast to the primary digital mode of GIS, they are not new even to Euro-American culture. There are strong historical precedents for maps that rely on methods that are not considered precise – not relying on coordinates or other navigable features – while still accomplishing their goals of geographically situating a lived experience. Many exist, but battle maps provide a particularly illuminating set from Western culture.

In 1571, the Battle of Lepanto was fought in the Peloponnesian region of Greece, and while a history lesson on the battle is beyond the scope of this discussion, it is worth noting for the sake of argument that while it is not a particularly famous event now, at the time this battle was so significant that it was painted as a wall mural in the Vatican Gallery of Maps. As was common in those days, when very few people would have had a chance to see it in the Vatican, the battle was best known through large single-sheet prints that could be circulated as mass media. While the geography of where the battle took place was important – a point situated between European states and their stated enemy, the Ottoman Empire – what was more significant was the battle action. Thus, the circulated prints generally conform to the format of a map, just as the Vatican paintings do, but the events of the battle are not bound by the scale or perspective of the landscape, as seen in this example. Nor are they bound by time. Instead, ships that appear at disproportionate sizes to each other and the coastline – as well as appearing

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[22] Steinauer-Scudder, "Counter Mapping."

from the side rather than aerially like the land – fill the print, with text saying who commands the ships and how each column of ships performs. Even if someone illiterate looked at these maps, they could still pick up on some of the movements through pictorial details, such as the Ottoman ships that are labeled with crescent moons.
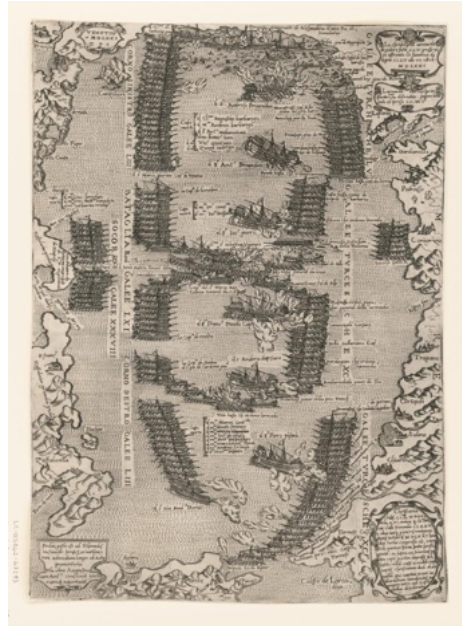

Image 2. *Robot8A, Lepanto (Galleria delle carte geografiche). CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons.*

Image 3. *La christiana armada di galere futil C.C.V grosse VI si affronto co l'innimico de legion CCLV alla VII ottob. M D LXXI. Library of Congress, Public domain, via Wikimedia Commons.*

The purpose of maps like these, and the expectation for those using them, would never have been to look at a set of coordinates to determine the exact location a cannon was fired on one of these ships, nor the exact location even of Lepanto itself. Even if GIS existed in the sixteenth century, this approach would probably not have crossed the minds of the printers and cartographers. (Navigating to the battle is a separate story, but not the reason for selling prints after the fact.) Instead, the maps show and describe a human experience – war between nation-states – that would have been all too familiar to people at this time. The cartographic elements exist to situate this particular battle and these particular soldiers and sailors, but geographic precision about them would not be effective in getting the news of the battle across. Just as in the transfer of Indigenous knowledge or the transfer of migrants' knowledge, this kind of knowledge transfer relies on human relationships in action and subsequent emotional

connection. News outlets today that struggle with how or when to use arrows could probably learn something from this approach.

In sum, thinking about all kinds of examples of maps, new and old and from many cultures and perspectives, may help our patrons and industries outside our usual sphere of influence have a better understanding of the limits of place-based mapping and what their space-based alternatives may be. With the example of battle maps' visual language applied to a project on shipwrecks, we can see that, counterintuitively, a map that creates space instead of place can actually impart more precise and specific knowledge to the person encountering it than a series of points might have. Additionally, mapping space could be used to provide more critical examination of the assumptions that go into place-based maps, and challenge those assumptions through the organization of space. Lefebvre may have seen space as the domain of state power, but Indigenous mapping, mapping events on an extended timeline, and counter mapping show how traditions based in relationships with the Earth and all the living things in it can subvert the power structures that we take for granted.

THE ROLE OF LIBRARY WORKERS IN MAPPING SPACE

Libraries and library workers are often the first stop on a patron's way to learning how to use maps and make maps of their own. We hold the physical map collections they will learn from, georeference, and recreate, and we typically hold the GIS software licenses and expertise that they need as well. The decisions that we make about how we describe our maps, through initiatives such as critical cataloging and reparative description in our collections, as well as in how we store them and understand them as objects, ripple far beyond us to our students, faculty, and beyond.

We also provide the first line of training, through individual consultations and group work, for our patrons. My department, for example, teaches well-attended webinars on ArcGIS Pro and several ArcGIS Online products every semester. I teach the ArcGIS StoryMaps webinars, which attract a wide variety of academic interests, and which as a format naturally lend themselves to this discussion since their entire purpose is to situate GIS-created maps with images, other media, and interactive visualizations, in order to tell a larger narrative that one precise map alone could never do. My high school student workers' final presentations took the form of StoryMaps, as do most of the presentations I give. (It is also worth noting that there are plenty of alternative tools to the ArcGIS version, with names that are some variation of "story map," including open-source options.) Many of the students we work with at JHU also use StoryMaps for their class projects. One project in particular is tied to an ongoing museum exhibition, *Hostile Terrain 94*, that as of this writing was most recently on display in Baltimore, Maryland, at the Peale Center for Baltimore History and Architecture.[23] The show is a participatory art project, consisting of toe tags pinned to a wall map of southern Arizona

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[23] The Peale Center for Baltimore History and Architecture, "Hostile Terrain Exhibition – The Peale," accessed June 6, 2022, https://www.thepealecenter.org/events/hostile-terrain-exhibition/.

and northern Mexico that mark places where a migrant has died trying to cross the border. Each tag contains details about the deceased. The result is overwhelming: the map is so covered in tags that, while the locations are precise in their depiction of places, any location is impossible to parse. Instead, the human scale can only be understood from the content of the tags themselves.

Image 4. *Will Kirk, "A Topography of Death."*

Natalia Stefanska, a Johns Hopkins University student who worked on the installation of the exhibition when it was being displayed at JHU's Milton S. Eisenhower Library, made a StoryMap about the experience of working on this exhibition called "A Topography of Death."[24] When my colleagues and I decided to host a Love Data Week panel about StoryMaps and how they transform data, one of her professors recommended Natalia, who presented her StoryMap along with a moving discussion of why the tags were so important to make the map meaningful. Referring to the number of tags, Stefanska said, "3,205 stories – before they died, these people lived… Some things need a narrative to be understood. Some things require not our reason but our humanity." She closed with a visceral example of a premature baby given the distinction "nonviable fetus," but whose tag had a name on it. Besides transcribing the tags, participants including Natalia would write messages on the back of the tags, and some even went on to write poetry inspired by the tags they filled out. On the back of the baby's tag, she wrote, "Pedro, you were given a name but not a life." As she ended her presentation, Natalia asked the audience what would make them feel something when

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[24] Natalia Stefanska, "'A Topography of Death,'" ArcGIS StoryMaps, February 11, 2022, https://storymaps.arcgis.com/stories/a6e34fdf0bf54b248d32c9ba08456aa5.

looking at this exhibition: the perfectly georeferenced grid of tags, or the words on a tag for a baby who never lived? As in the other examples, it is the human element of the relationships known and imagined within the space presented here – such as that of a grieving parent on a terrible journey, naming a baby who they would never meet alive – that gives them their devastating emotional power.

This heavy, important exhibition and Natalia's response to it show the power of applying an academic framework for some of what I have discussed: the centering of marginalized and vulnerable would-be mapmakers and their experiences in terms of events and emotions; the representation of action and movement as well as non-linear spatial relationships and forms of knowledge; and the valuing of traditions that pre-date GIS and can inform ways of doing so without co-opting a tradition that is not one's own. When given a variety of tools and a variety of examples to draw from, our patrons can be much more creative and allow their empathy to shine through in a way that ultimately makes more effective maps, in the instances when place is not enough. As library workers, we can draw from historic precedents, in Western culture and across many others, that we find in our collections and beyond. We can refer them to current sources, the people doing the very best work in these fields who do not get the same amount of press as a war map in the news, but who are making the maps with lasting power, the maps that answer the call to understand all human dignity within the places we live and work. Library workers are perfectly situated to balance and synthesize this information, and we know enough to educate our patrons and encourage the incredible work they do to reach new possibilities.

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