

Mapping II: News Media Mapping; New Mediated Geovisualities; Mapping and Verticality

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Abstract

This report considers the role for cartographic visualization in the news media in relation to issues around its effectiveness and ethics. I consider extended notions of the map as geovisualities, with a focus on work analysing the significance of location-based services, spatial media and playful mapping praxis. The notion of geovisualities also has utility in relation to the challenge to 'flat' cartography from the new focus on verticality in human geography. Various elevations grant differential viewpoints, lead to interesting kinds of mapping, driven forward largely by technical and commercial imperatives but are also ripe for critical scholarship.

Keywords: geovisualities; spatial media; verticality; drones; overhead imagery; street view audits

Maps and the News Media

The last year has witnessed extraordinary shocks in the mainstream political system, most evident in the rise of populism and the election of Donald Trump as US President. Many uncertainties come from the inability to predict outcomes or to understand the often contradictory attitudes of voters. Establishment expectations have been confounded, exemplified by the Brexit referendum in 2016 and the general election in Britain in summer

2017. A highly charged and uncertain political atmosphere has been amplified by swirling claims and counter-claims about the facts and fabricated news stories. With concerns that voters are being misled via social media; trust in traditional news short is diminished. In this context there are growing challenges for journalism that is accurate and clear. It is possible that well designed cartography can make a positive difference in communicating situation effectively and truthfully to audiences. Although, it is well known that maps can be made to distort and deliberately deceive – including for example in the Brexit campaign (Kent 2017).

Developments in the news industry - declining print newspaper circulation and viewership of half-hour television reports, the growing significance of news filtered through social media and the rise of 'data journalism', coupled with online readers typically spend very little time swiping through trending' stories in seconds has encouraged the use interactive statistical charts and spatial graphics. Interactive and dynamic maps have become core means of data display (de Haan, et al. 2017; Salovaara 2017). Appropriately designed map displays can be highly effective at both attracting attention and communicating meaning in an instant Gestalt way. Apparently this kind of power of cartography appeals to current occupier of the Oval Office whose briefing papers are reportedly kept to a 'single page, with lots of graphics and maps' (Drum 2017).

How far the interactive maps generated by data journalists are accurate and trustworthy is hard to judge, but they are an important component in the ongoing challenge to produce effective cartography for the new media domain and delivered onto smartphones. However, many news organisations lack staff with necessary design experience and awareness of conventions of good cartography and technical skills to deliver effective interactivity (Reilly 2017). This is compounded by the 24-hour news cycle and the need for continual updates. There is little time for considered design, let alone testing and refinement, before maps must be published. News maps can only ever be provisional but potentially powerful in influencing readers.

While there is useful design guidance specifically for journalists working with interactive graphics (Cairo 2016), more could be gained from the applied field of information design on better ways to communicate complicated data in various spatial forms (Black, et al. 2017). Scope remains, nonetheless, for more research on how people are using online mapping in

all its forms to improve design in terms of aesthetics, and the underlying cognition and usability (Roth, et al. 2017). Another relevant strand of research is focused on understanding aesthetic and communication read through affective and everyday practice. Here the “feeling of numbers”, matters according to Kennedy and Hill (2017, p.2) because a ‘wide range of emotions characterise engagements with diverse aspects of data and visualisations, which in turn demonstrates the importance of emotions in efforts to make sense of data’.

Mediated geovisualities

There continues to be much interesting work that blurs the edges of conventional cartography with innovation in terms of critical thinking and creative rethinking about the visual display of geographic data and design aesthetics. In particular the integration of maps with various other forms of digital spatial media and different modes of interactivity to respond to user queries, give rise to what I term ‘mediated geovisualities’, which are enrolled by people to solve everyday spatial tasks. In turn these mediated geovisualities are component in broader ‘visualization of culture’ (Beer and Burrows 2015), a process facilitated by the deeper digitalisation of space (Graham, et al. 2013), the enveloping ‘sensor society’ (Andrejevic and Burdon 2015) and the datafication of oneself through self-tracking (Lupton 2016). More extensive digital geographies will feed into map-making and changing mapping practices in next few years. It may bring benefits to people and broader society but will enrich and empower those large companies and state agencies able to best exploit it.

Some of the academic interpretations responding to these new kinds of geovisualities are often playing catching up with what is unfolding in a highly dynamic new media industry. More critical interpretation is needed on how the nature of the map is changing with new modes of delivery and user interactivity, particularly when people are moving and using their smartphones (Wilmott 2017).

Like no information tool before, smartphones demonstrate that being able to pinpoint geographic location is an enabler of action – location is the “killer app” in new media. The capability to determine geographic position has explained the utility of cartography since

time immemorial, the smartphone in the palm of the hand does it all for people with seemingly no effort at all - it just knows where you are. This does not happen magically, of course, and depends on decades of research and extensive but unseen material infrastructures and software systems, and there remain significant 'digital divides' in access and content (Blank, et al 2017). There are also risks of dependency on smartphone because without network connectivity it is shiny little brick.

The effortlessness of 'knowing where you are' and how it changes activities, attitudes and affordances is central to the inquiry being developed by Leighton Evans (2016; also Evans and Saker 2017). He interrogates locative potential in terms of how sharing where you are with others leads to new kinds of promiscuous reproduction of the sense of place. Such shared locative capability has infiltrated into social networking platforms and in popular apps like Snapchat and Periscope that are used by millions of people to connect to friends and family. Evans and Saker (2017) detail how the mechanisms of 'check-ins' and sharing spatial awareness that can provide real-time recommendations and tailored up-to-date spatial geosearch from user-generated databases of place markers, comments and photographs are becoming essential and integrated into the media landscape and monetised.

They document the importance of locative social media in changing people's sense of spatiality, altering perceptions of time, durations and memories and impacting on how (post)modern identity becomes a performance of self across hybrid spaces sustained in part by smartphones swipes and status updates. Specifically what this might mean for future of cartography is articulated by Evans and Saker (2017, p. 8) in relation to the power dynamics of production of information about places: 'Users can add to the map, and change the character of the gazetteers that have already been left on that map. In doing this, the user is actively involved in a transformation of physical space into social space, through the activity of mapping and navigating – the map is ontogenetic.'

A wider ranging attempt to synthesize and make sense of the innovations in mediated geovisualities and their many implications for mapping spatial information is tackled by Kitchin, et al. (2017). Their interpretation uses the idea of spatial media which 'both encapsulates the technological components, spatial content (geoweb) and the emergent

socio-spatial practices (neogeography), and stresses the work that these do in mediating and conditioning everyday life and producing new spatialities and mobilities' (Kitchin, et al. 2017, p.5). Their notion clearly builds upon previous theorisation of GIS as media by Sui and Goodchild (2001) and more recent thinking by Elwood and Leszczynski (2013). In the more than twenty different contributions to the Kitchin, et al. (2017) volume there is a gamut of complimentary readings of geovisualities, ranging from the more conventional statement of the GI basis of spatial media through to the significance of geo-semantic webs, and the intensification of spatial surveillance and social profiling. Concern for the models of data production in spatial media around volunteered geographic information (VGI) and citizen science is one particularly important area. While the enrolment of the "crowd", via online platforms, to create map data has proven to be feasible and continues to excite possibilities for more democratic cartographies, the growth and sustainability of VGI brings with it many social and economic complexities that still needed to be explored (Haklay 2017). It is not clear that user-generated content and VGI will always be able to redress imbalances, and far from being "democratic" they can reinforce social hierarchies and spatial inequities in content. There is on-going work by researchers in the geodata field in regards to who is willing and able to participate and the authoritativeness of 'bottom-up' processes of geospatial data authorship (Senaratne, et al. 2017), including evaluations of *OpenStreetMap* from both procedural and political perspectives (Quinn and MacEachren 2017; Bittner 2017).

While the Kitchin, et al. (2017) volume has much utility, the framing of their interpretation would benefit from more explicit linkages to concepts and modes of media analysis being done in fields such as cultural studies, film studies as well as work within the sub-discipline of media geographies itself. There are some obvious overlaps but also several mismatches with coverage in the Main, et al. (2016) volume, for example. Ideas from media geographers like Paul Adams and Chris Lukinbeal while not explicitly focused on cartographic visualization have much value to say on changing terrain of geovisual culture.

Besides exploring geovisualities as spatial media or just an aspect of the media landscape, it might also be profitable to think about what makes mediated cartographies compelling, socially significant and personally affecting. This one of the objectives of *Playful Mapping* (2017), written by a 'collective' of Anglo-Dutch cartographic and media researchers, and

they explore what digital geographies and mobile mapping can become when infused with notions from gamification and ludic theory. While it is readily apparent that many classic games, like chess, have obvious cartographic-like elements and spatialised strategy, the deeper connections between game play and the production and use of maps is little researched. Perhaps it is because the act of play itself has been dismissed by academics as frivolous and intellectually unimportant. However, newer reorientations in scholarship demonstrate that play can be very serious, not least because it underpins multi-billion dollar leisure-media businesses and it has also been realised that making things ‘fun’ is an essential element in creativity and innovative thinking.

The various co-authored chapters in *Playful Mapping* emerged from several years of intellectual interaction; practice-orientated doctoral research and intensive participatory map-making during fieldwork teaching. It provides the first serious attempt to consider how cartography is changed and challenged through playful thinking; as the authors note, play is essentially ‘a cultural praxis that can be very much related to power’ (PMC 2016, p.16). Their analysis examines how mapping informs and engages players in locative games, the nature of hybrid cartographic production within online games, the gamification of navigation systems, and the enrolment of playful map tools on smartphones in civil protests to try to subvert authoritarian power. Looking outwards, their agenda has an important methodological aspect: ‘playful mapping refers to mapping practice in which participants experience a combination of pleasure and ludic involvement during the process of mapping: from map-making, through to the deployment of mapping in particular navigational, sport and strategic tasks’ (PMC 2017, p. 17). It seems likely that development of more augmented reality and hybrid spaces in locative games – illustrated by the phenomenal success of *Pokémon GO* in 2016 – and that more emergent and participatory mapping in the coming years will require more serious thinking about play in cartographic scholarship.

Verticality and cartographic vision

To most people’s mind a map should provide a flat view of the world, where space is presented as surface. Cartographic conventions are deeply wedded to the planar representational form and most maps depict what lies on the ground surface and is visible

from an overhead perspective. This approach to mapping has been demonstrably powerful in summarising space, but it is inherently partial in what aspects can be shown. There has long been a dialectic in cartographic design between the desire to show more dimensionality to space, whilst sticking to planar representations. Map-makers have struggled, sometimes ingeniously, to effectively convey unevenness in topography and mountainous elevations and multi-storeyed nature of the built environment in cities.

Looking beyond challenges in representation, some of the conceptual, perceptual and political issues in regards to documenting spaces beyond the ground surface are becoming more actively researched by human geographers interested in 'verticality' (cf. Elden 2013; Harris 2015). The necessity to increase the dimensionality in academic enquiry, to truly think about space in 3D, as well as being much more cognizant to volumetric shapes of territory, is evident especially in geopolitics and urban geography. Researchers have examined the uneven development of cities (Rosen and Charney 2016), the aesthetics and affective experiences of subterranean spaces (Garrett 2016), the geological subsurfaces (Bridge 2013), oceanic volumes (Steinberg and Peters 2015) and the control of air spaces (Williams 2013). A key premise of this work is to challenge the unacknowledged "horizontalism" that has traditionally pervaded geographical praxis, typified of course by the historical dominance of topographic maps and land-use plans. As Graham (2016, p.13) asserts '[t]he continued, though diminishing, preoccupation with the surface as seen from some God's or bird's-eye view has radically undermined critical treatments of the spaces and domains both above and below it'; his book documents numerous significant spatial domains of verticality from outer space and its orbiting satellites down to geological strata.

Furthermore, Graham (2016, p.13) asks provocatively 'is it possible for us to shift our perspectives sufficiently to see boundaries and relations between layers and levels within volumes of geographic space to be as important as those that horizontally demarcate traditional 'flat' notions of boundaries territory?'. Yet this kind of shift in perspective is very rarely represented in human geography literature, nor visually mapped by cartographers. Indeed, Graham's book serves as a demonstration of this – most of the illustrations are allusion to nature of verticality, such as evocative photographs or schematic diagrams, but not effective maps of the complexity of three-dimensional space. In part this is because the

necessary maps do not exist (for exceptions see Shelton, et al. 2011 and Solomon, et al. 2012).

Expanding the conceptualization of territory from a singular flat surface to multiple elevations, and from areas and planes to cubes, bubbles and spheres of human activity will require rethinking of the aesthetic registers of mapping and diagrammatic practice. For this some inspiration maybe gained from history because in the pre-scientific era of cartography, cities were commonly mapped in pseudo-3d landscape perspective, for example in Braun and Hogenberg's (1612) *Civitates Orbis Terrarum* or Hollar's celebrated panoramic engravings; in later centuries urban mapping became dominated by the planar form that was better suited to governmentality.

Conventional cartography has been extended in the digital era through experimentation with 3D GIS, with extruded block landscapes and CAD-generated city models, sometimes delivered through VR interfaces and AR apps, but these attempts whilst interesting in their initial 'gee-whiz' moment fail in terms of effectiveness in real mapping tasks. Navigating in 3D on screen interfaces is often awkward tactilely and cognitively time-consuming; this is why 'flat' Google Maps wins out over 3D Google Earth for most routine cartographic tasks.

Looking downwards – the importance of satellite imaging and new era of camera drones

Calling attention to the verticality of human activity and power relations encoded in the stratification of space helps to flag up the long standing and continuing importance of high level vantage points in map production. The inquisitorially gaze from above has been elemental to population governance and martial supremacy (Adey, et al. 2013).

The capacity of the military, certain agencies of the State and latterly a few large corporations to control overhead perspectives and the peer down with hindrance has been highly significant in last half century in the construction of evermore accurate cartographies, and this continues today as mainstream cartographic production is driven by high-resolution satellite imagery and sensor data. The promise of social detachment and the allure of scientific objectivity obtainable through the use of such overhead imagery remain important in techno-centric discourse. But critical work by human geographers and other social science scholars demonstrates we need to remain alert to the political economic underpinnings of

the supposed 'view from nowhere' (Valentine 2016; Kurgan 2017; Weizman 2017). The inherent duality in the surveillant capacity of overhead imagery to be an agent in caring for people as well as controlling them has been well illustrated in mapping in disaster management and health monitoring in the 2013-16 Ebola outbreak in West Africa (Peckham and Ria Sinha 2017).

The overhead perspective for image capture and cartographic production has evolved significantly in the last decade with the emergence of affordable camera-carrying drones. While the deployment of drones started under the egis of military needs for tactical surveillance their use has spread into multiple different spheres: television media production, land-use management, civilian policing and emergency response, scientific research. Drones are a form as serious recreation, as well as being played with 'just-for-fun'. In this regard the dualistic and ambiguous status of drones for mapping parallels many earlier geospatial technologies that were funded and refined by the military and then subsequently found wider applications in civilian spheres (Boucher 2015). Understandably the critical work on drones in human geography concerns their supposed optical detachment and used targeted killings by the US military (Crampton 2016; Parks and Kaplan 2017; Shaw 2017) rather than in terms of implications for place-specific aerial mapping. Yet commercial, academic, activist and recreational use of camera drones is a serious challenge to the long established military and state intelligence domination of air space and the elevated viewpoint. In response there are attempts at spatial control over drones and regulation of ownership, although these seem doomed to fail. Air power is becoming more unstable and overhead mapping more available.

Drones are not just about "getting above" they are also fundamentality about visual capture that is 'going mobile' and offering spatial flexibility in recording and mapping of multiple targets on the ground; of course the targets might be dynamic and in motion themselves. Previously such mobile aerial mapping capacity was expensive, largely limited to the military and police, or those with resources required to hire a helicopter or commissioning specific aerial filming. In a similar fashion to the blanket CCTV surveillance in cities in the 1990s and the ubiquity of mobile phone cameras capture everyday events since the millennium, the widening availability of cheap drones is contributing significantly to changing the regimes of geographic visibility – what can be seen, in what ways and by whom. As Klauser and Pedrozo

(2015) detail there are many important areas of critical research for human geographers on drone usage in regards to space and visibility when multiple actors might be flying drones invisibly above cityscapes. Some regard the use of drone technology as being a logical and even desirable step in mapping, yet the allure of ever more panoptic urban gaze is a false one. In real-world situations what can be seen will always be partial and limited, the machines are unreliable in different weather conditions for example and are inherently vulnerable (e.g. detection and signal jamming). The camera drone, then, is another example of 'technical fix' for cartography where new technology promises to over-come the 'blind spot' once and for all but comes with its own conditions and constraints.

Despite this conditionality, drone mapping proliferates and is feeding into cartographic production and may well facilitate novel forms of geovisuality in the future, particularly in regards to mobile and autonomous capture of space. The enrolment of drones for human geography research and for creative mapping may well have been initially hampered by concerns that the technology is ethically compromised by its militaristic ancestry, yet in aspects of geography teaching drones are engaging pedagogic tools (Williams, et al. 2017) and students interaction with them can also facilitate critical consideration of effectiveness and their ethics for social science research (Birtchell and Gibson 2015).

Street views as place mapping

Moving downward from the satellite viewpoint and mobile drone perspective, there are interesting developments in ground level geovisualities and mapping of place. Here the action of tilting the camera through ninety degrees and the reduction of verticality can be read as a move from the disembodied "view from nowhere" to more human scale and embodied sense of place: 'street-level imagery is always explicitly grounded in a *somewhere*' notes Shapiro (2017, p.2, original emphasis), 'its emphasis on the particularities of place rather than cartographic abstractions of space makes it seem progressive, absolved from the visual-semiotics of scientific rationality or objectivity'.

The Google Street View (GSV) service, publicly launched in 2007, has enjoyed widespread appeal as a 'virtual reflection of the world to enable armchair exploration' (McClendon 2010). It is indeed one of the defining examples of novel geomedia of the last decade, providing a strangely pleasurable and surprisingly immersive spatial sensation, enabling

users to wander virtually through places far from home. Although, like many experiential engagement with novel geospatial digital media what at first seems amazing becomes a mundane tool on repeated usage. While the scale of geographic coverage and online delivery by GSV is undoubtedly impressive, the underlying method of representing space from ground level to facilitate horizontal movement and visual inspection of street frontages and building elevations is not new. There is a long established lineage of street level urban mapping, perhaps most successfully demonstrated in John Tallis's mid-Victorian views of streets in central London (O'Bryne and Stobart 2017).

Understanding how GSV is being enrolled by people solving everyday tasks is uncertain, yet the degree to which its particular street level view can influence individual and broader perceptions of place is an area of concern (for example in property search and real estate; Alvarez León 2016). Access to mass of georeferenced street imagery in GSV is facilitating novel analysis based algorithmic inspection and automated detection of environmental characteristics of place (e.g. Langton and Steenbeeck 2017; Li, et al 2017; Naik, et al 2017); this is analogous to use of overhead imagery and remote sensing but for urban streetscapes. Advocates of this automated auditing environmental 'quality' of neighbourhoods claim it can be more 'objective' because it is based on quantifiable elements of street life and observable building characteristics within millions of photographic images being processed. As such this promises to overcome human biases and be better able to predict tangible characteristics that are of utility in fields such as real estate, property development, city marketing, and criminology. The major problem lies in the encoding of normative judgements "orderliness" of space and the categorisation of "acceptable" use of public realm into the image detection algorithms which all too easily can engender stereotypical perspectives. The results also stigmatise all the people who live in the places being categorised - the problem of ecological fallacy. In part this is because the encoding is based on implicit use of environmentally deterministic and social reductionist models of place, including the "Broken Windows" notion that remains common criminology and policing but discredited by many critical scholars.

Critics of automated place auditing using GSV data have argued that the results reinforce divisions and risk further "digital redlining" (cf. Power, et al. 2012). As Shapiro (2017, p.11-12) points out 'aggregation and abstraction by "datafication" of street-level imagery have

the potential to inscribe new power geometries onto urban places through algorithmic linkages between visual environmental qualities, geographic information, and valuations of social worth and risk.'

These newly inscribed power geometries, based on automatically generated rankings, are problematic when feed unreflectively back into 'top-down' urban policy, commercial investment decisions and discriminatory policing strategies. Yet we could imagine creative and subversive ways of algorithmically processing millions of street view images that are not about redlining but redefining policy options in progressive? Could new maps be made highlighting unequal community resources, and work as counter-mapping of place that empowers residents by providing robust 'quantifiable' evidence to call for improvement rather than more imposition of more control?

Conclusion

In a time of increasing political uncertainty and concerns that news reporting of crucial issues, such as economic inequality and climate change, is ineffective, inaccurate and biased, we should also be concerned with the way that geospatial data and interactive maps are deployed by journalists and activists to tell their stories. Cartography could be an effective means to communicate complex issues but how maps in the news media are designed and deployed needs critical scrutiny.

The notion of mediated geovisualities is a useful way to think about contemporary applied cartography and geoweb services that are extending what a 'map' can be. Geovisualities situate mapping as a practice at the intersection social, cultural concerns with along with attention to visual aesthetics and the underlying spatial data, geocoded imagery and algorithms of GIScience. The nature of geovisualities is being by smartphones, the dominant media channel for the majority of everyday mapping tasks. More traditional cartographic forms may retreat view to be replaced by other spatial media and geosearch, and with gentle slides and swipes of the touch screen in their hands people will change how space around them comes into being. Better understanding of the power relations in these

geovisualities will requires explicit focus on ways position and place is created and communicated through social media, including the enrolment of playful mapping praxis.

Notwithstanding the powerful affordances of the smartphone in relation to place, one of the challenges in cartographic visualization is how more effectively delineate and communicate the three dimensionality of space – and also the four dimensions of time-space dynamics – on a small display screen. This matters in part because thinking vertically and effectively visualizing volumetric space is essential to understand interlinked human activities, the need to reshape future cities in more progressive ways and to cope with consequences of the Anthropocene.

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