The Map Reader

Theories of Mapping Practice and Cartographic Representation

Editors: Martin Dodge, Rob Kitchin and Chris Perkins

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Chapter 5.11

Mapping the Digital Empire: Google Earth and the Process of Postmodern Cartography

Jason Farman

Editors' overview

In this paper, Farman examines how the technologies underpinning Google Earth have enabled new Web 2.0 forms of mapping that can be characterised as being more distributed, participatory and social than convention cartography. Rather than maps that people simply view and use, Google Earth invites its users to contribute content and to actively complement and subvert existing annotations and to participate in interactive dialogue through bulletin boards. As such, Google Earth offers a new form of map experience, according to Farman, in which all users can become authors, but one in which the Google corporation nonetheless holds a powerful position as the ultimate arbiter and gatherer of content. Farman draws on the critical cartography and GIS literature to examine Google Earth, but also details its emancipatory and empowering qualities, arguing that it embodies a postmodern cartography.

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Introduction

[...] [W]hat type of colonialism could be present in the seemingly 'neutral' technology of Google Earth? By connecting this popular GIS to the colonial history of cartography, this article analyses the cultural implications of this software program and the potential dangers that are often attributed to GIS. I also seek to counter these critiques by showing how Google Earth uniquely engages its users, not as disembodied voyeurs, but as participants in global dialogue, represented spatially on the digital map. Ultimately, this study seeks to find a way in which recontextualisation and subversion from the 'master representations' of maps can be achieved within the authorial structure of the digital map rather than re-authoring the existing software.

Digital mapping and Google Earth

[...] While many school-aged children around the world are presented with the Mercator map in the classroom, the ability to access a wider variety of maps in an online realm offers the possibility to visualise the space of the earth in a different way. [...]

While the consequences of accessing and comparing an unprecedented number of maps is an important step forward for cartography, comparing several maps with one another is not a 'new' method. What is new are the advancements made by emerging GIS programs such as Google Earth that allow for spatial debate of maps within maps, new levels of interactivity and user agency with maps, and the ability for non-professionals to engage in these activities. These options have instigated a massive step forward for how users interact with maps. [...]

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[Google Earth] falls under the category of GIS and has made this once-specialised software available and usable for the mass market. It compiles satellite imagery and aerial photographs into a 3D virtual globe that can be interacted with in a wide variety of ways. Once started, the program situates viewers from roughly the same distance to Earth as some of the Apollo 8 whole-earth photographs – about 16 000 miles – and then zooms in on (or 'flys to' in Google Earth terminology) the user's region. The baseline resolution [...] can be as good as 0.15 metres and up to one metre in largely populated areas of Europe or North America. [...] An historical timeline was added to version 5.0 in early 2009, which allows users to scroll through archived imagery of an area. [...]

One of the most important contributions that Google Earth makes in the field of cartography is the social network that has developed around the program called the 'Google Earth Community'. This network, which is essentially a spatial Bulletin Board System (BBS), was integrated into the early versions of the program. Members of the community can post placemarks that relate information about a specific location for any user to see. Many in the Google Earth Community also create 'overlays' that offer a literal replacement or augmentation of the existing map, such as a detail of the path of Cyclone Nargis and the affected areas in Myanmar. These overlays can be downloaded and implemented by any user of the program. Thus, users can spatially debate the very tool they are using while simultaneously augmenting the borders in Google Earth to offer a different map altogether.

Critiques of geographic information systems

[...]

One reason that mapping technologies such as Google Earth often avoid critique is their use of satellite and aerial photography. Though the photograph has undergone intense scrutiny in the digital age in regards to its status as an index of reality, the photograph still holds a connection to material space that is unmatched by handcrafted maps. Peirce (1998a: 322), who famously wrote that 'representations have power to cause real facts', brought notions of indexicality in visual representations to the forefront of semiotics. His studies posit the index (under which the photograph can be categorised) as being 'in contrast to the icon's relatively straightforward resemblance and the symbol's conventionality or arbitrariness' (Doane 2007: 2). Instead, the index 'stands for its object by virtue of a real connection with it, or because it forces the mind to attend to that object' (Peirce 1998b: 14). Photography's indexical nature prompts an evaluation of it as, according to Barthes (1981: 77), an index of an 'absolute [...], irrefutabl[e] present'. Thus, as users of Google Earth engage with the historical timeline function, the satellite or aerial photograph serves as an index of a specific moment in time and a representation of that ontological materiality captured by the photographic technology. Since the science of cartography has historically overshadowed the art of mapmaking (Harley 2001: 35), hand-drawn maps close the ambiguous gap between product and authorship. Harley (2001: 38) notes that the move from 'the manuscript age to the age of printing' caused an accentuation of the division of labour in the production of maps and, as maps become more reproducible, the sense of a single creator with a singular purpose becomes less obvious. This accentuation is accelerated in the photographic age of mapping. While photographs are often associated with a photographer (the 'witness' snapping the shutter in a specific moment in time), satellite and aerial photographs used in programs like Google Earth are more commonly associated with the machinery that produces them than the person or organisation capturing or compiling them. This association between machine and product distances maps like Google Earth from a sense of subjectivity and instead emphasises the objective nature of photographic representations of earth. The result, as Sontag (1977: 154) argues, is that the 'photograph is not only an image (as a painting is an image), an interpretation of the real; it is also a trace, something directly stencilled off the real, like a footprint or a death mask'. While early maps, created through drawing, painting, etching or other methods, often attempted to distance the creator from the representation, they still functioned less as an index than as an icon (in Peirce's terms). [...]

Though cartographic methods that precede the photographic era sought standardisation and to be 'factual statements written in the language of mathematics' (Harley 2001: 36–37), these media forms were more readily associated with subjectivity (the hand of the hand-drawn map) than is associated with satellite and aerial photography. [...] [S]atellite and aerial photographs' link to machinic production from orbital locations instead point toward disembodiment, the dislocation of the subject, and objectivity.

[...] As Google Earth zooms in to the earth from a distance, the 'disembodied master subject' as Donna Haraway theorised is 'seeing everything from nowhere' (1991: 189). These representations are believed to be objective; they are simply images of reality and outside the realm of cultural interpretation. The problem with positioning GIS as software that simply gathers empirical data and presents it as fact is that such 'scientific objectivity' is typically situated and privileges those in power. The reading of objective space is indeed a 'reading', an interpretation that is never outside of the culture that produced such a reading. [...]

The relationship between technological gazing and being 'owned' by the gaze is particularly apt to the cartographic technology of GIS as seen in the Google Earth software. Maps have been, as previously noted by Edney, a way for empires to intimately know the territory they have conquered and controlled. The tools associated with GIS technology have many ties to militaristic uses, such as the implementation of aerial photography and satellite imagery. [...] Satellites were immediately understood to have a significant military function. [...] Thus, the technological gaze of aerial and satellite imagery – the essence of the interactive maps presented in Google Earth – has a long history with war and imperialism and subsequently has a historical relationship in the ways maps delineate 'us' versus 'them' as well as defining 'our territory'.

The digital empire

Here I return to the question I presented at the beginning of this article: if Google Earth's ancestry is colonial cartography and the tools it utilises (aerial and satellite imagery) are rooted in militaristic uses, what, if anything, is the empire mapped by this GIS? I want to argue that Google Earth's charting of the globe onto an interactive, web-based GIS is inherently connected to the desire to map out a new territory: the digital empire. Here I draw from Hardt and Negri's (2000: xi) redefinition of the term empire, in which they argue that imperialism, as it was known, no longer exists but has been transformed. The role of the nation state in acts of oppression and domination has undergone a progressive decline and has been replaced by a 'new form of sovereignty'. They continue by noting, 'Empire is the political subject that effectively regulates these global exchanges [of economies and cultures], the sovereign power that governs the world' (xi). [...] [S]uch a redefinition of empire is useful in identifying how corporations that control the flows of information and the infrastructure behind those flows now wield powerful global control. Google, currently one of the key corporations dominating information flows, is thoroughly invested in its role in 'modulating networks of command' (Hardt and Negri 2000: xiii). As Givler (quoted in Stripling 2008), executive director of the Association of American University Presses, recently said, 'I'm worried that Google is fast becoming our sole access point for information seeking [...] and I think that's a dangerous and unhealthy situation'. One such 'network of command' that reiterates Google's dominance of information is the data visualisation technology of GIS.

Since cartography, the delineation of borders, and the naming of territories have such historical intimacy to the control that empires wield, Google's sustained interest in digital maps have made them a key node of command over the 'information empire' [...] While mapping Hardt and Negri's new empire is a task that has not been very successful in a traditional cartographic sense (since it would require mapping the flows of information rather than the geographical borders of nation states), connecting the flows of information to the geographic map actually is one means of visualising McLuhan's 'global village' (which has indeed been actualised in the digital age). Though the World Wide Web continues to be a mostly unmapped territory for most internet users, there is still a desire to locate oneself spatially within cyberspace. One possibility for beginning to chart this new global and distributed power is to replicate the visual connectivity that was initiated by the 'Whole-Earth' photographs of the Apollo space missions. By representing the new global village as a virtual globe that can be navigated and interacted with, Google has taken the steps to chart out visually the territory that it has sought to command: an interconnected global village.

While the relationship between Google and the nation state is quite different than the imperial relationship between Britain and the East India Company, it is important to note that Google's corporate concerns (even the positioning of the company as persistently developing technologies that advance human knowledge and interaction) are fundamentally linked to political concerns. From disputes of the proper labelling of Taiwan to the disappearance of Tibet from the program, the creation or erasure of national borders has caused worldwide debates that demonstrate the indelible link between this technology and political concerns. National governments, such as Chile, have demanded that Google change the borders on its program to accurately reflect the borders that have been previously established. Google responded to Chile's demands, correcting the border near the town of Villa O'Higgins (named after a national hero who fought for independence) to reside in Chile instead of Argentina (Haines 2007). However, Google has remained silent to the requests of Taiwan to be labelled as its own country instead of a province of China.

Another historically problematic issue with Google Earth that inherently ties into political issues is the map projection used. Wood (1992: 57) points out that, while there are quite possibly an infinite number of map projections through which we can turn the spherical globe into a planar representation, each projection works toward certain purposes to the detriment of others. Rather than the traditional cartographic problem of transforming a globe into a planar representation, Google Earth instead faces the opposite problem. This GIS is made up of various flat photographs that need to be altered into a 3D sphere and, as with any map projection, distortion occurs. The effects

of this distortion and its political consequences are determined by the mathematical projection used. [...] Though the projection Google Earth uses (an equirectangular projection) is well suited for a spherical representation of Earth, any decision regarding which projection to use is far more politically loaded than simply choosing the projection that best represents 'reality'. [...]

But as we have already seen, the attention to 'propaganda' is an alibi. It does nothing but deflect attention from the fact that the selection of any map projection is always to choose among competing interests, is inescapably to take – that is to promote, to embody in the map – a point of view. (Woods 1992: 60, emphasis original). [...] These decisions (the delineation of borders and the choice of map projection) reiterate the authorial control Google has over the representation it presents to its users. Since maps are, by and large, accepted as representing some ontological reality that exists beyond the limited subjectivity of its viewers, a transference of the power of the gaze is placed upon the viewer rather than the cartographer. By accepting the map as reality, the viewer enters into partnership with the map's author over the hegemonic assumptions such a visual representation makes. Acceptance of the map without question to the authorial nature of its design shifts ownership of the gaze onto the map user. Approaching the world around them with the assumptions of objective empiricism, their gaze into the world becomes a scientific one, outside of the realm of critique. However, as Wood (1992: 19) argues, if the map were acknowledged as creating the boundaries rather than representing them, it would no longer function as the tool that embodied reality.

The social network intervenes

Google Earth functions to trouble this transference of the gaze by including a crucial element to the map's own deconstruction: the fundamental component of a participatory culture. One major draw to the Google Earth program is the interactive nature it offers with a social network, the 'Google Earth Community'. By integrating a social network with GIS technology, the authorial nature of the map can be brought into public debate and reconfigured by the user-generated content created by the community. [...] [T]he Google Earth Community is a BBS that is spatially related to particular locations on the map. Users post forum comments that relate to particular pinpoints users stick onto the map. For example, in July 2007, a Slovenian member of the Google Earth Community, in his first post to the BBS, noted that the border between Italy and Slovenia was incorrect at the city of Nova Gorica. The other members of the community responded, compared maps, and linked to the site through which users can report errors to Google.

The border was then changed by Google to include Nova Gorica in Slovenia. (However, the label still reads 'Nova Gorica, Italy' as of this writing.) In another example, one user placed a pinpoint (or a 'placemark') on Lhasa, Tibet, that said, 'No Human Rights Here'. As users clicked on the placemark, the community member's post opened up to discuss the human rights violations committed by the Chinese government in Tibet. Various users responded, asynchronously in forum style, to the post, debating the current situation in Tibet and sharing the latest news about the location's border disputes.

Utilising [...] online social networking, [...] Google Earth is able to connect people across borders in the discussion of those borders. [...] Google Earth is able to present these debates spatially, associating the community dialog with the visual representation of the space being discussed.

Users can take dialog about the map one step further: they can actually replace or alter the map through the use of 'overlays'. Overlays function as a way for users to augment the map by offering a different visual representation of a specific area and can range from the simple – such as a user replacing the low resolution imagery of Bora Bora in French Polynesia with a higher resolution aerial photograph – to the complex – such as an animated overlay that shows the shrinking Artic icecaps. The overlays highlight the fact that the maps are not simply static visual facts to be received, but instead flexible signs that can be engaged in free play. In the history of mapping, the notion of the overlay is not new. [...] However, incorporating the overlay into the social network – in which the overlay can operate as a piece of the larger bricolage – is what is truly revolutionary about the Google Earth Community's overlays. Upon entering Google Earth and engaging the Google Earth Community, it becomes quickly obvious that there is not a 'central' map of authority that will dominate user interactions; instead, the map users are initially presented with is acted upon, changed and replaced. This is a very different experience of maps than in other eras of cartography. The user-generated content of the Google Earth community brings this symbol, which has enjoyed the status of being a grounded sign, into a relationship with the users that allows them to engage in free play. Such levels of interactivity with maps have historically been reserved for those in positions of cartographic skill or authoritarian power. Since maps are 'inherently rhetorical images' (Harley, 2001: 37), rhetorical devices can be utilised to convey significant meaning across the information visualisation tool of Google Earth overlays. [...] [T]he sheer volume of user-generated content in conjunction with the spatial dialogs that develop around these overlays give this online community potential for a radical reinvention of the way we read maps.

The problems of interactivity and agency

Does the inclusion of a social network that is able to interact and alter the maps within Google Earth solve the fundamental problems posited by cultural cartographers and theorists? Some may argue that there is nothing neither new nor revolutionary about the Google Earth Community's overlays, since they rely on a level of skill to produce them and simply utilise the tools made available by Google. However, what one person has termed to me as the 'empire of technological skill' in the creation of overlays is very far from reserved for the specialist. In Google Earth, the creation of overlays is done in a way that is familiar to anyone who has uploaded a picture to a social networking site like MySpace or Facebook [...] Though the skill level to contribute an overlay to the Google Earth map is not necessarily a barrier to many computer users, there are still many barriers that people take issue with. There are, after all, the cartographic, design and coding decisions made by Google that necessarily structure and limit the ways users interact with the maps and with each other. After all, Google is the one that made the option of overlays available to users in the first place. [...] Also, as with almost all BBSs, there is a forum moderator, who ultimately decides what content is appropriate for the bulletin board and what content or users will not be allowed past the gates.

An even graver issue is the problem of access, as Google Earth is a broadband-intense program. While many cannot contribute to the spatial debates played out in Google Earth because they do not have access to a computer, even those who have access to a computer may not be able to participate due to the intense graphic and bit rate requirements of the program. [...] Programs like Google Earth are designed with a very specific user in mind, one who has broadband access and a computer that can handle the graphics requirements of the software. Thus, the question needs to be raised that, while dialog and debate over maps can take place within the map itself of Google Earth, do the users who are able to engage these debates represent a diverse range of perspectives?

Aren't we forced to read Google Earth as simply reiterating Western dominance over information distribution and adhering to centralised power over user interactions as laid out by the Google corporation? My response is, no, we do not have to read Google Earth as remaining within the static authorial control of its authors/programmers and system requirements. Drawing from the rich debates that have surrounded the term 'interactivity' in such fields as electronic literature or game studies (Ryan 1991), I argue that resistance to master narratives can come through a recontextualisation from within the existing structures. [...] Interactivity ... tends to function as a normative term – either fetishised as the ultimate pleasure or demonised as a deceptive fiction' (Kinder 2002: 4). For my analysis of Google Earth, I find it vital to locate the user in a relationship to the software that neither overemphasises dominance over the program (through fetishising interactivity) nor situates the user as always constrained by the limits of the program (thus demonising interactivity). Instead, by engaging issues of interactivity and agency within the very structure that potentially limits interactivity and agency, the social network as a community is positioned to enact agency. This potential for agency comes through the implementation of the very tools that limit them through a repurposing, reimagining, and reconfiguring of master representations in conjunction with user-generated content. [...]

While influential and inspiring feminist authors, such as Lorde (1983: 94–101), argue that 'the master's tools will never dismantle the master's house', I believe that any level of interactivity that leads to social reform comes from a recontextualisation of the existing master narratives – a refiguring that ultimately works to deconstruct the grounded signification demanded by any master narrative. Arguments which claim that interactivity and agency are impossible within Google Earth, because Google provides the tools of interactivity, go against our experience of navigating through everyday life and the authorial structures that bound us on every side. Despite the fact that boundaries exist according to authorial structures, we have the ability to 'freely' navigate the space and ultimately recontextualise the spaces that we inhabit. [...]

Such a reading of interacting with the existing structures to formulate a path of resistance resonates strongly with the work of Debord, particularly in the ways that his ideas of derive and détournement correspond to notions of bricolage. Theories built around the derive, defined as a wandering through the urban landscape that allows the drifter to reconfigure the sign and map systems of the city, and détournement, understood as an alteration of existing semiotic structures via a 'reuse of pre-existing artistic elements in a new ensemble' (Debord 1959), work well with the ability to reconfigure existing structures to ultimately subvert master representations. By navigating/wandering the 'psychogeography' of Google Earth (to use Debord's term), the user is embodied as he or she engages the sign systems and begins to reconfigure them through a bricolage of user-generated content. As Debord and Wolman (1956) write in their 'A User's Guide to Détournement', 'Détournement not only leads to the discovery of new aspects of talent; in addition, clashing head-on with all social and legal conventions, it cannot fail to be a powerful weapon in the service of a real class struggle. The cheapness of its products is the heavy artillery'. [...]

Combining Derrida's notions of bricolage with Debord's theory of détournement, we have a method for recontextualisation of master representations that corresponds with the potentials present in and through the Google Earth Community's utilisation of user generated content. Though some argue that utilising tools that are outside of master representations in order to subvert these dominating structures would be ideal and even necessary, such an approach is a produced myth. While it can be argued that 'all discourse is bricoleur', it must also be noted that there is no 'subject who supposedly would be the absolute origin of his own discourse and supposedly would construct it "out of nothing", "out of whole cloth"', since this subject 'would be the creator of the verb, the verb itself' (Derrida 1978: 285). Such notions of discourse outside existing structures tend to return to metaphysical and theological ideas, for which, Lévi-Strauss noted, also do not exist outside bricolage. Again I return to the notion that we are indeed bound at every side, yet we are importantly bound by bricolage with which we may become interactors. By engaging the bricolage – the 'heavy' and 'cheap' artillery Debord spoke of and Derrida defined as the instruments at our disposal – users of Google Earth engage in the process of rhetorical and flexible nature of maps rather than simply relying on their static authorship. [. . .] [U]sers should begin to engage software such as Google Earth as a tool that can radically recontextualise master representations and discursive structures through the bricolage of user-generated content. This user-generated content disseminated in Google Earth by the social network is a tool that ultimately reimagines the status of the map presented by Google and the viewer's relationship to that map. Through spatial discussions and map overlays, users become interactors involved in the representation of the social space of the global village. Though it is often argued that the age of the internet is a borderless space, borders are constantly reiterating their presence. From the disputes over borders within the Google Earth program to the borders established by the software and its system operators to limit the types of interactions users can have with this GIS, many feel so bounded by these borders to argue that such authorities need to be replaced by a complete re-authoring of the software.

Such perspectives unfortunately do not take advantage of the potential that bricolage has for major social change of re-evaluating the static nature of maps and cartography. As Google Earth and digital mapping programs continue to be growing objects of study in the field of new media, theorists and designers will need to analyse the ways that the software's interface fosters or discourages user debate and dialog about the very interface users employ. Programs like Google Earth alter the ways users inhabit mixed reality spaces that encourage seamless collaboration between material landscape and digital interface. As such, studies must interrogate the ways that these interfaces (digital and material) rhetorically situate their own methodology in order to promote or discourage critical dialog. Further studies need to also analyse the audience of this critical dialog, especially since many of the emerging devices and interfaces are available and usable by a very specific demographic. Can programs designed for a broadband-only audience actually be used to confront issues of the digital divide rather than reiterate the distance between those who have access to the necessary tools and those who do not? Studies should continue to analyse the consequence of broadband-intense programs and consequences on shifting definitions of the digital divide.

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See also

- Chapter 1.13: Beyond the 'Binaries': A Methodological Intervention for Interrogating Maps as Representational Practices
- Chapter 1.14: Rethinking Maps
- Chapter 2.4: Maps and Mapping Technologies of the Persian Gulf War
- Chapter 2.5: Automation and Cartography
- Chapter 2.6: Cartographic Futures on a Digital Earth
- Chapter 2.12: Imaging the Word: The State of Online Mapping
- Chapter 4.10: Citizens as Sensors: The World of Volunteered Geography
- Chapter 5.8: Cartographic Rationality and the Politics of Geosurveillance and Security