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Editorial

The ‘view from nowhere’? Spatial politics and cultural significance of high-resolution satellite imagery

1. Introduction: why satellite imagery matters

“We only see what we look at. To look is an act of choice . . . We never look at just one thing; we are always looking at the relation between things and ourselves.” John Berger, *Ways of Seeing*, 1972, 8–9.

This themed issue focuses on the cultural meanings and spatial politics of high-resolution satellite imagery, critically examining how the burgeoning use of these data is radically reshaping the ways different groups comprehend space and place.¹ Orbiting high overhead are a scatter of small, but very costly, satellites designed to produce streams of visual spatial representations of the ground below. For several decades this remotely captured imagery has been widely recognised as a powerful tool in many aspects of military activity (Day et al., 1998), governmentality (Thomas et al., 1995) and environmental management (Barratt and Curtis, 1999). However, the social and spatial disposition of high-resolution satellite imagery of the earth is diffusing much more widely and freely. Data that were formerly in the military domain, under the exclusive control of elite groups and with uses carefully restricted on grounds of security, are being rapidly commercialised. Meanwhile, technological change is revolutionising the ways in which civil society are able to deploy these richly detailed and apparently mirror-like images. Internet mapping portals, in particular, have proved to be key sites of change, as they have begun to offer ubiquitous and ‘free’² access to high-resolution satellite imagery in unprecedented detail to a global audience through simple interfaces. The capabilities and technical beauty of Google Earth, in particular, has garnered widespread praise and a rapidly growing online fan-base since it launched in 2005 (Butler, 2006).³ The way

satellite imagery now can be browsed almost effortlessly, and without the upfront cost of data purchase and specialised software, is leading to radically different viewing practices. Some have argued that this is just the beginning of a pervasive visual ‘revolution’ based on the real promise of a totalising and universal capture of every observable space on a continual basis⁴ (Poster, 1996). Of course others see this pervasive ‘super-panoptic’ future as simply an extension of what Gelernter (1991) called a ‘mirror world’, and posit that it merely prefigures a different kind of visual imaginary, that is no closer to capturing essence of place than earlier technological fixes (cf. Pickles, 2004).

In the past, satellite imagery was mainly deployed as part of rational scientific discourse, to target enemy facilities, manage environments, monitor land-use change, or as evidential support for planning enforcement (see Morain, 1998). Increasingly, however, different social groups are deploying high-resolution satellite imagery in new ways. Actors in the process now range from mass-media, to artistic practitioners, pressure groups, policy makers, educators, and everyday leisure users. New spatial practices are emerging from this nexus of visual technologies, social actors and institutional structures. For some groups satellite imagery represents an opportunity to challenge power, by drawing attention to formerly secret sites and the previously hidden apparatus of state and military control (see Aday and Livingston, 2009; Perkins and Dodge, 2009). Satellite data are now a common visual prop deployed by news media, with the swooping zoom-from-space through multiple scales of imagery being used to place breaking stories (cf. Parks, 2009). It is also well suited to the needs of documentary makers, with imagery offering expansive and colourful views that look believably ‘real’, combined with a mobile viewpoint and the subtle aura of techno-scientific authority; this agency is well seen in the recent BBC television series ‘Britain from Above’ (cf. Harrison, 2008). The avowedly naturalistic look of the virtual globe shrouded in satellite imagery is beginning to replace the world map of nation-states as the default meta-geography of the media.

¹ The genesis of this themed issue was a double session, organised by the editors, at the 2007 Association of American Geographers conference. We would also like to thank Katie Willis as editor of *Geoforum* who organised the refereeing of the articles and the anonymous reviewers whose useful comments and suggestions contributed to the quality of the papers.

² It is far from free, of course. The huge capital costs of granting no-cost public access to high-resolution satellite imagery are being met, in part, by revenues from geographically-targeted advertising, but it is also being heavily subsidised at the moment by large corporations, like Google and Microsoft as they seek to entice users to their sites and to dominate the marketplace for online mapping. There is no guarantee that no-cost user access will continue to be provided by such corporations in the future.

³ By February 2008 Google Earth software had reportedly been downloaded 350 million times (Ohazama, 2008).

⁴ Besides satellite imagery this revolution in visuality encompasses a vast rhizomatic assemblage of digital imaging technologies and visualising practices: included are the spy planes and automated drones of military intelligence, police surveillance helicopters and traffic cars patrolling the streets with automatic number plate recognition cameras, the ever growing array of watching CCTV systems, and not least the billions of roving camera phones, capturing, keeping and sharing images of mundane places and everyday social life.

For others, satellite imagery is about play: deriving pleasure from searching for ‘black helicopters’⁵; engaging in virtual tourism, place-based voyeurism and spying on the neighbours’ property; deriving affective pleasure from browsing image space; creatively making their own subversive mash-ups; or as part of a wider aesthetic performance (cf. Kingsbury and Jones, 2009). This play reconnects people visually to real places, in quite mundane but powerful ways. It is also used in all manner of quotidian activities, including searching for new homes, checking out holiday destinations prior to booking, or simply planning a new dog walk for a Sunday afternoon.

The extent to which imagery is increasingly all around us and doing important work in the world, as well as being deployed in many routine tasks, is already readily apparent. In the academy, for example, many geographers routinely use satellite imagery as a primary data source in their research (e.g. Boyd and Danson, 2005; Gillespie et al., 2009), as a visual aid in the dissemination of findings and journal publishing and as a pedagogic device (e.g. Rakshit and Ogneva-Himmelberger, 2008). The easy availability of high-resolution satellite imagery changes all of these uses.

As a product satellite imagery shares much in common with other visual media forms, including ‘still’ photography and landscape painting that can capture extensive geographic spaces in a single frame. This framing “shapes and defines what can be seen and what is out of view” (Mirzoeff, 1999, p. 37). On some internet mapping portals the distinction between satellite imagery and aerial photography is blurred; as one moves through scales of time and space the display can switch between different sources. As a visual form the satellite image also connotes an evidential and mimetic quality akin to other photographic technologies. It also shares some characteristics with cartography as a mode of representation, most particularly the predominance of the vertical, planar view onto the world and its ability to provide a spatially consistent referent between visual signs and ground features.

However, satellite imagery also enjoys some unusual qualities as a visual representation of space. It conveys a heightened sense of pictorial realism, a heterogeneity of colourful patterns, and a sense of apparent naturalism. Of course, this impression belies the complex cultural processes underpinning the production of all satellite images (see Wood and Fels, 2008, Chapter 10). Myriad ‘technical’ processes ‘correct’ for distortions and make them ‘look right’. Perhaps the biggest ‘lie’ of this seamless imagery is that it is constructed out of tiles from different times, which are mosaiced together to create a wholly artificial view devoid of cloud cover. Also, as much imagery is captured in periods when skies are clear, and when vegetation growth is maximised and visually prominent, the result often obscures the built environment, and thus diminishes the presence of people in the landscape. So images *appear* to be transparent and offer unmediated viewing; the position of the camera *seems* to be invisible. This apparent transparency distinguishes satellite imagery from the severe abstraction and uniformity of aesthetics associated with topographic reference maps. Satellite images appear to see more of the world, or at least the viewers perceive they are seeing much more. Images, superficially, offer greater informational depth, a *fuller* view of space; so that you think you can see things you would recognise with the naked eye, despite the initial strangeness of the overhead viewpoint with its distortions of shape and shadow effects.

High-resolution satellite imagery therefore has important capacities, we would argue, to convey a kind of *truth* about a territory. Satellite images are immediate and immanent representa-

tions, and especially when they relate to places one knows they have an indexical quality permitting personal interpretation, that is typically lacking with more impersonal thematic and topographic maps (cf. Turnbull, 1989). We believe satellite imagery is therefore a uniquely powerful spatial imaginary.

Of course the visual virility and earthly representational richness of these images *can* also make recognition and interpretation of space much harder. The viewer may actually understand less of the structure of the place without the classification and clarity offered up by the professional eye of the cartographer. Also satellite imagery, like conventional topographic mapping, is a still and lifeless medium – images are only static visions, freezing time and denying the existence of a world-in-process. Images possess no sounds, feelings or other sensations and it might be more appropriate to conceptualise these as distanced *seeing*, instead of remote *sensing*.

2. Interpreting the meanings and politics of satellite imagery

In 2009 satellite imagery is widely used and significant and is likely to become more important in the decade to come, assuming the promised new platforms delivering greater spatial and temporal resolution come to pass and that ‘free’ online access is maintained. Now is an apposite time, we believe, for a considered reflection of the cultural meanings and spatial politics resulting from this greater availability and ease of use of satellite imagery. This topic speaks directly to recent academic and wider social concerns over changing constructions and perceptions of scientific knowledge; tensions between confidentiality and freedom of information; the changing status of visual technologies; the relations between power, space and representation; everyday and elite practice; and forms of resistance. Different theoretical approaches may be deployed to interrogate the significance of these powerfully affective visual technologies, and indeed it can be argued that the democratisation of satellite image accessibility is itself part of a significant epistemological shift.

The papers in this collection question what can be seen in high-resolution satellite imagery and what this might mean. This work can perhaps be best introduced by considering the seductively objective view of the world that they claim to represent – what one might term, following Thomas Nagel (1986), the ‘view from nowhere’. The key question is how this view is manufactured and mediated. This mirror-like viewpoint over territory is, in fact, spatially and temporally discontinuous: resolution and specifications vary, and despite apparent democratisation of access, ‘shutter control’ remains firmly in the hands of powerful government institutions and unaccountable corporations. Image currency and resolution on ‘free’ internet portals reflects perceptions of market potential by large corporations like Google and Microsoft and an ongoing tension between commercial and strategic interests. Online browsing interfaces encourage a belief in the veracity and accuracy of the data,⁶ and tend to facilitate site-specific searching, but also make customised comparative overview difficult. The consequence is that a keyhole view of the world predominates (see Perkins and Dodge, 2009), despite the apparent promise to browse at will across the whole (virtual) globe.

The five papers in this theme issue offer up a range of conceptual ideas and practical strategies to understand the diversity of work satellite imagery does in the world. They draw on assorted contexts and empirical evidence to make their case, but amply demonstrate the validity of focusing analytical attention on the social and spatial significance of satellite imagery.

⁵ See for example TheRegister’s Black Helicopter competition, which invited readers to submit images of ‘secret’ military sites found when browsing with Google Earth, <http://www.theregister.co.uk/2005/10/14/google_earth_competition_results>.

⁶ Metadata relating to the source of satellite imagery, such as date of capture and sensor resolution, is typically hidden beneath the surface of these interfaces or not available to end users.

Kingsbury and Jones' (2009) insightful paper argues for an interpretation of Google Earth, and the easy access it provides to a world of satellite imagery, that highlights the possibilities of excess, emancipation and pleasure. They draw on concepts from Walter Benjamin's reading of media affect in particular, making a call to resist the temptation to see Google Earth and satellite imagery as solely Apollonian objects of calculation, control and visual surveillance of space. Instead they make a powerful argument that Google Earth has genuinely Dionysian capacities to intoxicate and seduce users, as they eloquently describe it as the "projection of an uncertain orb spangled with vertiginous paranoia, frenzied navigation, jubilatory dissolution, and intoxicating giddiness" (Kingsbury and Jones, 2009, p. 2). They also claim that the unscripted and playful exploration of satellite imagery through online portals can usefully be considered analogous to Benjamin's Flaneurs drifting through Parisian streets: "both flaneur and Googler Earthling stroll (or scroll) through space" observe Kingsbury and Jones (2009, p. 4).

Their end goal is then to complicate the reductionist binary of fear versus hope that can too easily obscure more sophisticated readings of the meanings of socio-technologies like satellite imagery. They demonstrate how Google Earth encompasses mingling characteristics of Apollo and Dionysus depending on how it is deployed in viewing practices, and that as critical scholars we should be ready to embrace the latter fully in our interpretations rather than default to the former reading.

The paper by Aday and Livingston (2009) is focused on the impacts that publicly available high-resolution satellite imagery can have on the conduct of governments, looking at the case of supposedly secret Iranian nuclear facilities revealed by non-proliferation advocacy organisations and the media in 2002. They outline a set of broad theoretical explanations from Communication Studies that suggest how to read the new kinds of work that satellite imagery does in the world. Using the notion of 'epistemic communities', and the theory that governments are still the dominant actor in state-media relations, they consider the extent of change rising from independent and timely access to high-resolution satellite imagery.

They show how satellite imagery has the power to advance our understanding of epistemic communities when it is accurately interpreted, and also that its interpretation changes our capacity to act in the world. It is an important analytical tool and evidential source in the "incremental accumulation of painstaking fact checking of data points and verification of independently derived conclusions..." (Aday and Livingston, 2009, p. 5). While their case study discussion of a single incident in the work of a nuclear non-proliferation advocacy network is specific, their analysis more broadly points up the genuine difficulties in *properly seeing* with satellite imagery, the need for specialised skills of interpreting features and reading off patterns to gain meaning of the situation on the ground. The key problem – you can see it clearly, but what is it that you are seeing? – is not easily solved. This was especially apposite with suspected secret nuclear facilities in Iran – the site could be seen but what were the buildings for? What was inside? Were they really in use? What processes connected these places together? Acquiring the view from above gets the advocacy nowhere, if users can not then place the features somewhere.

Their thesis is generally positive and they assert the crucial role of satellite imagery in the 2002 disclosure that "brought an end to a policy of wilful public silence about the nuclear enrichment programs in Iran by both the Bush administration and the government of Iran" (Aday and Livingston, 2009, p.1). Timely access to high-resolution satellite imagery helped the advocacy network to set the media agenda and overcome scale limitations (such as their small staff in Washington, DC) to reach out and see across the world. While much internet-based protest is focused on the rapid and

uncensored *distribution* of existing evidence, they argue, in the case of satellite imagery there are real opportunities for advocacy organisations to *generate* new evidence that is, crucially, authoritative and autonomous from the state. The result, Aday and Livingston (2009, p. 2) argue, is that "commercial remote sensing technology can provide an avenue for oppositional voices to not only be heard, but perhaps even force the state to adapt, bend, or reverse course entirely."

Crutcher and Zook's (2009) analysis of the role of satellite imagery is more pessimistic than that of Kingsbury and Jones and Aday and Livingston. Their paper seeks to demonstrate how satellite imagery can be seen to represent racialised landscapes, and at the same time contribute to the unfolding production of these discriminatory patterns of ownership and inequality. Space is differentially viewed from satellites and it is presented in unequal ways in online mapping portals (with their variable update cycles, uneven depth of coverage depending on demand, variable scale and ease of access), but crucially for Crutcher and Zook (2009) the ability to view imagery is itself unequal. Their paper provides a useful aid to scholars in puncturing the easy inflationary hype surrounding online tools like Google Earth that are premised on powerfully utopian narratives of universality and empowerment. Race remains, according to Crutcher and Zook's (2009) analysis, an important dimension of difference in the use of high-resolution satellite imagery. The *potential* to access is not the same as *actual* use of satellite imagery to effect events on the ground (see also Parks, 2009).

Crutcher and Zook's (2009) case study focuses on the political implications of how Google Earth and satellite imagery was used in the New Orleans area in the aftermath of Hurricane Katrina in 2005. It maps out the 'cyberscape' that emerged in the days after the disaster, through an in-depth analysis of the role of imagery, public comments on internet forums and, in particular, the posting of 'placemark' comments in Google Maps mash-ups relating to the events. A distinctive geographic pattern of user-generated content on these websites emerged, which reflects the uneven spatial segregation of the city. A statistical analysis of placemarks on the Scipionus.com website suggests a significant negative correlation between the percentage of African-American population in a census block and the number of user comments posted. There is a clear relationship, they assert, between the racial makeup of an area and its post-Katrina cyberscape of Google Earth placemarks. Crutcher and Zook (2009, p. 1) conclude that new online and interactive mapping technologies, particularly the combination high-resolution satellite imagery and user-generated comments "can create highly differentiated connections between places and cyberspace".

Parks (2009) also focuses upon the mediated deployment of satellite imagery in humanitarian disasters, by focusing upon the Google Earth's 'Crisis in Darfur' initiative and its depictions of political violence in the Sudan. Her analysis stresses in particular the importance of considering the social practices and political processes through which any satellite imagery is deployed. Instead of a neutral consideration of history as a backdrop, Parks advocates an understanding of technologies like Google Earth, with its seductive offer of seamless, 'free' satellite imagery, as partly constitutive of forces that make worldviews and are part of the political process.

Her case study of the Google Earth's 'Crisis in Darfur' initiative highlights the ways in which the project was received and discussed in the media as strongly humanitarian, but with almost no consideration of either the politics of the conflict, or of the assemblage of the various visual technologies of imagery, attribute data layers and interface options provided by Google Earth. The result of this scripting, she argues, was to encourage a preoccupation with retrospective events and the technological capacity to visualise

distant places in unprecedented detail, instead of a focus on political power on the ground and of viable solutions to the ongoing violence. By emphasising the shifting role of the satellite image, the temporality of the interface, the branding of the conflict and the indeterminate meanings of ‘information intervention’, Parks (2009) invites a more critical reading of Google Earth, in which the project can be understood as strongly implicated with Klein’s (2007) notion of “disaster capitalism”, and which reflects not a ‘view from nowhere’, but instead a view from a company with enormous visual capital. Accordingly, Parks (2009, p. 11) concludes her paper with a passionate plea for an engaged politics of satellite imagery arguing that “[r]ather than operate (sic) in the past perfect subjunctive... we need a visuality that is linked to acknowledgement, accountability and intention as opposed to regret and lament.”

Perkins and Dodge (2009) consider a very different context in their paper on secret sites. Their focus is how new modes of access to high-resolution satellite imagery might be counter-hegemonic, and with how the image might be related to the maintenance or revelation of secrecy. Visual technologies have traditionally been seen as reinforcing the power of those in control, deployed especially by the military to spy on others, but carefully guarded as technologies conveying power on the watcher. High-resolution satellite images and new modes of ‘free’ web access greatly increase the potential for visual control, but also potentially destabilise some of the power relations involved in the ongoing spatialised maintenance of state secrets. The precise location and physical structure of sites can be revealed for the first time, which were formerly either hidden in seamless global image coverage or else deliberately obscured by official secrecy. However, Perkins and Dodge (2009) suggest counter-hegemonic uses of satellite imagery do much more than simply revealing what was hidden from view. Instead they argue that newly oppositional projects deploying imagery can provide “apposite examples of spectacular secrecy in the way their very existence depends upon the culture of secrecy, in the way they create new kinds of secret knowledge... and in the ambivalent and varying politics of resistance” (Perkins and Dodge, 2009, p. 5).

In their empirical discussion Perkins and Dodge (2009) focus on three contrasting and novel web-based projects by activists offering new ‘pin hole’ views of formerly hidden sites. Like Parks (2009) they argue for a contextual interpretation of the significance of this case study material, and conclude that the aesthetics and politics of the sites are significant, along with evidence about how the imagery is deployed. Perkins and Dodge (2009) argue that it may be more useful to understand these counter-hegemonic web projects as reflections of a Deborian sense of generalised secrecy, rather than a Foucauldian reversal of the panopticon. They argue that these sites “show how vision is itself positioned, that the balance between secrecy and publicity is ambivalent and intensely political” (Perkins and Dodge, 2009, p. 14). The ‘pin holes’ are themselves part of a continuing performative culture of secrecy.

3. Towards a critical social agenda for satellite imagery

The majority of scholarly research around satellite imagery still deploys scientific and acritical ways of understanding the technology and medium. We believe, however, that social, political and cultural geographers can and should contribute more to the studies of satellite imagery, to build upon the five papers presented in this collection. There is real scope for original research that questions the ontological surety of satellite imagery and epistemological implications of online portals like Google Earth. For example, we need to explore further the tensions between transparency and secrecy that percolate debates about counter-hegemonic possibilities of populist access to high-resolution satellite imagery. More reflection

is also needed on the potential for the progressive use of satellite imagery by non-state actors in challenging established power relations and to effect real change on the ground. Research might address how new modes of public access to satellite imagery can make a social difference with regard to environmental monitoring, nuclear non-proliferation, natural hazards, human rights, political violence, land rights, counter-panoptic state surveillance, international treaty verification, or other critical sites of resistance. Much could be learnt from creative and critical analysis of mass-media use of high-resolution satellite imagery. For example by exploring how news media interpret images and integrate pictorial power, with labels and voiceovers, to support different discourses.

Another key way in which satellite imagery can be critically investigated is to engage with it as ‘infrastructure’ that both enables and disables. Norman (1998, p. 55) notes, “[i]nfrastructure defines the basis of society; it is the underlying foundation of the facilities, services and standards upon which everything else builds.” Critical interrogation of the infrastructures of everyday living has been widely overlooked by the social sciences because of the ways they tend to slip beneath the surface. From a political perspective, critical studies of infrastructures are problematic because of the ways in which institutions make it difficult to observe or question their design and operational logic. The invisibility of the infrastructure can often provide an effective cloak under which socially iniquitous practices can be safely carried out without undue negative public attention. The lack of critical studies of satellite imagery infrastructures tends to reify biases in the ongoing production of common data and specific dissemination practices.

Researching satellite imagery as an infrastructure would need to foreground the materiality of production, render transparent licensing agreements and exclusive supply contracts, and denaturalise the everyday appearance of imagery by highlighting corporate structures that underlie capture, processing and dissemination. Research could consider infrastructures that make contemporary access to high-resolution satellite imagery possible. The pivotal role of military facilities and funding in satellite imagery has been appreciated in historical studies (e.g. Cloud, 2002), but current paths of technical development of outwardly civilian satellites still depend, in large part, on the military (cf. Kaplan, 2006). A recent example reported in the press amply illustrates this; in September 2008 a new high-resolution commercial imaging satellite, called Geoeye, was launched. It is part supported by Google (who gain exclusive commercial access), but over half of the \$502 million cost was financed by the US military. Furthermore, the Geoeye system operates under license from the US government that ensures their continued primary access to imagery and denies highest potential resolution to anyone without explicit government authorisation (cf. Chen, 2008).

Research is also needed into the ways in which satellite imagery contributes to infrastructures themselves. The mundane disciplining role of GIS and satellite imagery in infrastructures of computerised governmentality continues to grow, for example in consumer marketing and crime mapping (Crampton, 2003). Rather than contributing to a more democratic society, one could argue that the powerful gaze of satellite imagery at the heart of surveillance infrastructure is likely to deepen the social power of corporations and the state. A critical approach is needed here – one research possibility is to follow the money directly from military, intelligence and state security sources towards the mapping research that they support. Tracing out patterns of capital investment, government subsidies, licensing fees and profits could reveal the wider political economy in which everyday viewing practice is situated, many of which are several steps removed from moments of use. Decisions on where capital is being invested to produce updated and new imagery affect how the world is going to be envisioned in the future, but are opaque to scrutiny. Key

research questions here concern who controls the images that are displayed when you enter a mundane geographical search query on the web (cf. Zook and Graham, 2007).

There is also a need for insightful evaluation of alternative resistive visual culture made possible by high-resolution satellite imagery. This might critically examine artistic experiments with satellite imagery; considering how artists employ the 'view from nowhere' to problematise relations between subject and object; or remix media (see for example Thompson, 2009). It might explore different registers and affects enabled by satellite imagery, such as ludic qualities alluded to by Kingsbury and Jones (2009), or interrogate the emotive power of the visual interface (e.g. Yusoff, 2005).

Research could also be undertaken to situate the potential of progressive pedagogy employing high-resolution satellite imagery. How far does the ability to see the world differently open up new ways of thinking about the world? Can the active comparison of imagery with topographic mapping, for example, reveal the selective processes of producing cartographic knowledge? How might teaching and research, by human geographers in particular, employ these data in more creative and intellectually challenging ways?

Given the significance of internet portals as sites of interaction with satellite imagery, work critiquing the naturalising power of the Google Earth interface is vital and the papers in this collection by Crutcher and Zook (2009), Parks (2009) and Kingsbury and Jones (2009) provide some useful indicators of what can be achieved. Further work in this field might consider the politics of playing with the Google Earth interface, whilst foregrounding the violent and military origins of these systems. Work should also interrogate notions of satellite ethics by considering the degree to which frequently updated high-resolution imagery at multiple scales, threatens individual privacy and community rights. The interplay between satellite imagery, other place-specific data (such as street views, or address-based databases) and flexible search interfaces is fundamental here. Other potentially rich ethical issues around the social significance of satellite imagery include the tensions between freedom of information legislation, commercial or state secrecy, and the market mechanism.

4. Epilogue

"[T]he most objective view we can achieve will have to rest on an unexamined subjective base." Thomas Nagel, *The View from Nowhere*, 1986, 68.

This collection draws together practice and theory, juxtaposing different ways of understanding the social significance and spatial politics of satellite imagery. We hope it offers a robust and provocative challenge to the simplistic notion that high-resolution satellite imagery is 'a view from nowhere', demonstrating instead the many complex ways in which these detailed images of space, taken from space, operate and the many different meanings and practices that emerge from this process. Research challenges arising from these emerging visual technologies and socially-embedded viewing practices will be addressed in the future: the five papers here are an early intervention and begin to explore the subjectivity alluded to by Nagel (1986), by showing how positioned the view from nowhere really is!

References

- Aday, S., Livingston, S., 2009. NGOs as intelligence agencies: the empowerment of transnational advocacy networks and the media by commercial remote sensing in the case of the Iranian nuclear program. *Geoforum* 40 (4). doi:10.1016/j.geoforum.2008.12.006.
- Barratt, E.C., Curtis, L.F., 1999. *Introduction to Environmental Remote Sensing*, second ed. Chapman & Hall, London.
- Berger, J., 1972. *Ways of Seeing*. Penguin, London.
- Boyd, D.S., Danson, F.M., 2005. Satellite remote sensing of forest resources: three decades of research development. *Progress in Human Geography* 29 (1), 1–26.
- Butler, D., 2006. Virtual globes: the web-wide world. *Nature* 439, 776–778.
- Chen, B.X., 2008. Google's super satellite captures first image. *Wired News* 8 October. <<http://blog.wired.com/wiredscience/2008/10/geoeye-1-super.html>>.
- Cloud, J., 2002. American cartographic transformations during the Cold War. *Cartography and Geographic Information Science* 29 (3), 261–282.
- Crampton, J.W., 2003. *The Political Mapping of Cyberspace*. Edinburgh University Press, Edinburgh.
- Crutcher, M., Zook, M.A., 2009. Placemarks and waterlines: Racialized cyberscapes in post-Katrina Google Earth. *Geoforum* 40 (4). doi:10.1016/j.geoforum.2009.01.003.
- Day, D.A., Logsdon, J.M., Latell, B., 1998. *Eye in the Sky: The Story of the Corona Spy Satellites*. Smithsonian Institution Press, Washington.
- Gelernter, D., 1991. *Mirror Worlds: Or The Day Software Puts the Universe In a Shoebox ... How It Will Happen and What It Will Mean?* Oxford University Press, New York.
- Gillespie, T.W., et al., 2009. Finding Osama bin Laden: an application of biogeographic theories and satellite imagery. MIT International Review. <<http://web.mit.edu/mitir/2009/online/finding-bin-laden.pdf>>.
- Harrison, I., 2008. *Britain from Above*. Pavilion Books, London.
- Kaplan, C., 2006. Precision targets: GPS and the militarization of US consumer identity. *American Quarterly* 58 (3), 693–714.
- Kingsbury, P., Jones, J.P., 2009. Walter Benjamin's Dionysian adventures on Google Earth. *Geoforum* 40 (4). doi:10.1016/j.geoforum.2008.10.002.
- Klein, N., 2007. *The Shock Doctrine: The Rise of Disaster Capitalism*. Metropolitan Books, New York.
- Mirzoeff, N., 1999. *An Introduction to Visual Culture*. Routledge, London.
- Morain, S.A., 1998. A brief history of remote sensing applications, with emphasis on Landsat. In: Liverman, D.M., Moran, E.F., Rindfuss, R.R., Stern, P.C. (Eds.), *People and Pixels: Linking Remote Sensing and Social Science*. National Research Council, Washington, DC, pp. 28–50.
- Nagel, T., 1986. *The View from Nowhere*. Oxford University Press, Oxford.
- Norman, D., 1998. *The Invisible Computer*. MIT Press, Cambridge, MA.
- Ohazama, C., 2008. Truly global. Google Lat Long Blog 11 February. <<http://google-latlong.blogspot.com/2008/02/truly-global.html>>.
- Parks, L., 2009. Digging into Google Earth: an analysis of "crisis in Darfur". *Geoforum* 40 (4). doi:10.1016/j.geoforum.2009.04.004.
- Perkins, C., Dodge, M., 2009. Satellite imagery and the spectacle of secret spaces. *Geoforum* 40 (4). doi:10.1016/j.geoforum.2009.04.012.
- Pickles, J., 2004. *A History of Spaces: Cartographic Reason, Mapping, and the Geocoded World*. Routledge, London.
- Poster, M., 1996. Databases as discourse; or, electronic interpellations. In: Lyon, D., Zureik, E. (Eds.), *Computers, Surveillance, and Privacy*. University of Minnesota Press, Minneapolis, pp. 175–192.
- Rakshit, R., Ogneva-Himmelberger, Y., 2008. Application of virtual globes in education. *Geography Compass* 2 (6), 1995–2010.
- Thomas, G.B., Lester, J.P., Sadeh, W.Z., 1995. International cooperation in remote sensing for global change research: political and economic considerations. *Space Policy* 11 (2), 131–141.
- Thompson, N., 2009. *Experimental Geography: Radical Approaches to Landscape Cartography and Urbanism*. Melville House, New York.
- Turnbull, D., 1989. *Maps are Territories: Science is an Atlas*. Deakin University Press, Geelong, Victoria.
- Wood, D., Fels, J., 2008. *The Natures of Maps*. University of Chicago Press, Chicago.
- Yusoff, K., 2005. Visualizing Antarctica as a place in time: from the geological sublime to 'real time'. *Space and Culture* 8 (4), 381–398.
- Zook, M., Graham, M., 2007. The creative reconstruction of the Internet Google and the privatisation of cyberspace and digiplace. *Geoforum* 38 (6), 1322–1343.

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