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Traces, tiles and fleeting moments: art and the temporalities of geomeia

Introduction: geomediation in the inhabitable map

In this chapter I discuss ways in which artists have exploited and exposed the temporalities of geomeia; I am following writers working at the intersection of media studies and geography in using this term to refer to a contemporary complex of technologies, content and practices that involve mapping, remote survey visualisations and the binding of digital information to location via GPS (Lapenta 2011, Thielmann 2010). My aim is to challenge the idea that geomeia's only temporal effects are ones of timelessness; crucial to this challenge is a separation out of two different versions of timelessness ascribed to cartography and new media, and sometimes conflated. However, rather than an artwork, I will begin with an image of artists *at work*. Depicting a moorland landscape split by a narrow, unmarked road, and with two figures in the midground to the right, this panoramic digital photograph is one image amongst the millions of others that, since 2007, have been captured and stitched into the dynamic archive of photographic mapping that is Google Street View.¹ Over the course of their lives, most of these automated images – instances of what Joanna Zylińska calls “non-human photography” – will escape serious human scrutiny (Zylińska 2013). Until April 2014, these lives would have been cut short by updates from the restless fleet of Street View cars. Since the introduction of a time slider to Street View's interface, however, such images remain accessible, though with all the millions of miles of road covered, and given the evident remoteness of the location depicted, it is unlikely that I would have found this particular image if I had not been told precisely where to look. This image

¹ <https://goo.gl/maps/HEfpY>

crystallises something important about several matters at stake here: geomeia's ubiquity, the way it has become part of our "technological unconscious", to use Nigel Thrift's term for the performative infrastructures which pattern our everyday lives (Thrift 2004); the remarkably short timescale these developments have unfolded over; the place of art in addressing and exploring these changes; and lastly the relationship of the photograph to the map. As I set out in this paper, issues of temporality are key to that relationship, both practically – in the photographic mapping services that Google provides – and analogically.

The figures captured in this photograph are those of the Dutch media artist Esther Polak and her partner Ivar van Bekkum; it was taken in September 2009 during their residency at the Highland Institute for Contemporary Art, an artist-run space in a converted farm building to the south of Loch Ness. When the Street View car passed them, Polak and van Bekkum were releasing GPS-equipped balloons with the intention of visualising their journeys in Google Earth (personal conversation, January 11, 2011). Polak is one of the best-known artists to use GPS and to work with the motif of the mapped trace of movement. Her 2002 work *Amsterdam RealTime* re-imagined GPS as a tool for a bottom-up, participatory cartography: over two months, beginning with an initially black projection screen, a map of that city was built up through the movements of sixty of its inhabitants (figure 1).² *Amsterdam RealTime* is a key early work in the locative media genre: this label was first used in the early-mid 2000s by a community of practice working with GPS in art and open data activism (Hemment 2006, O'Rourke 2013, Pinder 2013, Tuters and Varnelis 2006, Zeffiro 2012), and it is still used in both this sense and in academic literatures as a synonym for, variously, augmented reality, geomeia, and neogeography (Crampton 2009, Lapenta 2011, Thielmann 2010). Though GPS had been sporadically used by artists during the 1990s, the US Government's

² <http://realtime.waag.org/>

suspension of the purposeful degradation of the consumer signal in May 2000 (a function known as Selective Availability) meant accurate GPS receivers became cheaply available.³ This was a crucial move in establishing GPS as a ubiquitous consumer technology, and it opened a space for creative activity as it did so.

<FIGURE 1 ABOUT HERE>

For Polak and the other figures associated with locative media as it emerged in the early 2000s, technologies had to be hacked together: *Amsterdam RealTime*'s participants carried a satchel with a PDA phone attached to a GPS signal receiver that required an externally worn signal-boosting aerial, and visualising software had to be purposefully written for the project. As I write more than a decade later, most of its functionality could be achieved with off-the-shelf smartphones, apps and web mapping services. The fact that by 2009 Polak was using Google Earth in her projects to visualise traces of movement speaks of the thorough mainstreaming of GPS. Polak and van Bekkum liken their encounter with the GPS-equipped Street View car to the 'Droste effect': named after a famous poster advertising a brand of cocoa, this is a Dutch term for *mise-en-abyme*, the infinite recursion of an image that contains a reproduction of itself (personal conversation, January 11, 2011).

Geomedia is a category that encompasses the cartographic visualisations of moving bodies produced by Polak in *Amsterdam RealTime*, the Street View photography that captured her at work in Inverness-shire seven years later, and the vast and complex techno-social assemblage that has made both those visualisations possible. A brief list of some of the most significant elements of geomedia would certainly include the following: GPS and mobile computing; the georeferencing of digital photography and

³ A survey of early artistic employments of GPS can be found in Stephen Wilson's *Information Arts: Intersections of Art, Science, and Technology* (2002). Missing from that survey is Laura Kurgan's installation *You Are Here: Information Drift* (1994), mentioned later in this chapter.

other traditional media formats; the ubiquity of maps as interfaces for data; and the widespread access we have to ceaselessly (if unevenly) renewing archives of survey photography – photography which assumes both the Gods’ eye view of satellites and the view at ground level. If the media art that was gathered around the locative media label in the early-mid 2000s explored and sought critical and alternative versions of a technological imaginary that was still coming into being,⁴ the Droste effect Street View capture of Polak and Van Bekkum in 2009 and their embrace of off-the-shelf technology for their practice speak of a world in which such technologies and visualisations have been fully woven into our everyday lives, commercialised, banalised even. Seven years from Polak’s initial foray into mapping as art, four years from the launch of Google Maps and Earth and two since the launch of Street View, in 2009 we were already living in a world where digital maps and technologies of tracing had receded from bleeding-edge novelty into the technological unconscious; Thrift’s name for this world is “the inhabitable map” (Thrift 2011, 9).

This purported inhabitability is a problem: as Valerie November and her co-authors argue in their unpacking of the new understandings of space produced by digital mapping technologies and practices, “*no one* and *no thing* ever resided in the virtual image of the map” (November, Camacho-Hübner, and Latour 2010, 594). The map as it has been imagined in the western scientific tradition is lifeless, static, denying processes and temporality, cleaving time from space to construct it, as Doreen Massey puts it, as “the sphere of a completed horizontality” (Massey 2005, 107). Denis Wood and John Fels take a similar position when they say that “most maps exist in the present, or if they can possibly get away with it, the aorist: no duration at all ... out of chronology ... free of time”: the aorist is the Greek simple past tense, referring to completed actions with no

⁴ The criticality of locative media (referring here to a genre of media art practice involving location-aware technologies and digital mapping) has been much debated (Albert 2004, Fusco 2004, Holmes 2004, Tuters 2012, Tuters and Varnelis 2006).

indication of their current status or their durative thickness (Wood and Fels 1992, 112). Wood and Massey are in agreement that the map represents an already completed present, is mute about the unfolding of events in the past, and that it forecloses the future. As Massey memorably puts it, “loose ends and ongoing stories are real challenges to cartography” (Massey 2005, 107).

Two kinds of timelessness

To complicate matters, where some writers on geomeia are concerned there is not one kind of atemporality at stake, but two; the closure of the map to past and future is paralleled by and conflated with a timelessness associated with networked information and communication technologies (Farman 2012, Graham, Zook, and Boulton 2013). This second concept of atemporality can be found in prototype in Henri Bergson’s and Martin Heidegger’s respective critiques of ‘spatialized’ or ‘inauthentic’ time (which is to say, clock time) (Mackenzie 2002, Mitchell and Hansen 2010), but if under modernity the technical mediation of time and its standardisation was already seen as alienating humanity from the authentic experience of time, writers on technology and society in the closing years of the twentieth century described a dramatic acceleration of this effect. For critics like Paul Virilio, the instantaneity of the real-time communication systems that grant us global awareness and action at a distance belies computational time’s destructive effect on subjective, experiential time (Mitchell and Hansen 2010, Virilio 1997). Speaking broadly about this attitude, Adrian Mackenzie describes how “technological speed can give the impression that the future is closed, and that any experience of time grounded in duration and memory has been lost” (2002, 1). For Manuel Castells, writing in the mid 1990s with then-current critiques of the postmodern in mind (particularly David Harvey’s *The Condition of Postmodernity*) (1989), “the culture of real virtuality associated with an electronically integrated multimedia system” produces timelessness both through the temporal immediacy of distant events and

information and through the “mixing of times in the media”, whereby producers and users have access to an undifferentiated history of cultural expressions and can combine these in temporal collages “where not only genres are mixed, but their timing becomes synchronous in a flat horizon, with no beginning, no end, no sequence” (1996, 461-2). “Timelessness”, Castells tells us, “is the recurrent theme of our age’s cultural expressions” (1996, 463).

Time, space and the mapped trace

These ideas about timelessness depend on an opposition between technology and society. In his study *Transductions*, Adrian Mackenzie shows how that opposition has been challenged by relational approaches to technology where to be human is to be necessarily bound up with technology, such as Jacques Derrida’s concept of ‘originary technicity’, developed further by his pupil Bernard Stiegler (2002). For Stiegler, the tools with which we mediate time and space specify the way in which we experience them. Mackenzie describes how related ideas – though more focussed on the ‘lives’ of technologies themselves – were developed earlier by the philosopher Gilbert Simondon; for Simondon, technologies themselves form something like the perimeter of human societies, the point at which properties from physical contexts (properties of matter which produce particular effects, things like hardness or conductivity) are enfolded into our collectives and made portable and repeatable. Simondon uses technicity to describe the degree to which the useful, repeatable effects of technical objects are concretized within networks of relations; these effects are extended both spatially (in reproduced objects) and temporally in changing, historically specific manifestations. Technicity therefore also “refers to the historical mode of existence of technical mediations”: objectivations of particular lineages of technicity change over time in terms of the make-up of the milieus whose effects they enfold (Mackenzie 2002, 108).

These ideas can be illustrated through Mackenzie's discussion of GPS, and his alignment of it with an earlier objectivation of the technicity of clocktime, the pendulum clock invented by the seventeenth century Dutch polymath Christiaan Huygens. For Mackenzie, both pendulum clock and GPS confirm "the inseparability of timing and spacing": to produce positional fixes and measure movement through space, the constellation of GPS satellites bathes the world in a broadcast of Coordinated Universal Time (2002, 108). Huygens proposed that the fixed length of his pendulum be used as the basis of a standard global unit of measurement, the 'hour-foot'. Apart from the matter of the intervening three centuries, Mackenzie argues that what separates these two technical objects is a difference in their respective definitions of a second, the minimal unit of time. Whereas Huygens' second was based on the period that a pendulum of a defined length took to complete a movement, the clock signals of GPS are based on the wavelength of the microwaves emitted by the caesium atoms in the satellite's onboard atomic clocks (9,192,631,700 Hz). Mackenzie notes that the move from one "oscillation" per second to more than nine billion could be interpreted, as per Virilio and Castells, as evidence of the inexorable acceleration of technology (seen as a monolithic abstract entity) beyond the limits of human sense-experience, "a symptom of how human time is being lost to an inhuman, globalizing, technological 'time'" (2002, 88). However, technicity in Simondon's sense provides a way of thinking about this acceleration without resorting to pessimistic narratives based on an abstract opposition of society and technology. The regular rate of repetition known as a second derives in both cases from what new media theorist Mark B. N. Hansen calls "a distinct absorption of material contingency" (2005, 1210), in the ensembles within which pendulum clocks and GPS, as historically specific concretizations of the technicity of time, are reproduced: the planet's gravity for the former and the electromagnetic fields emitted by caesium atoms for the latter.

Hansen argues that mobile GPS devices are producing a practical understanding of “the interrelation of time and space, one in which time and space lose their heterogeneity as they become more and more intensely imbricated with one another”, and similar positions can be found elsewhere in the literature on digital mapping and locative media (Hansen 2005, 1207, Speed 2011, November, Camacho-Hübner, and Latour 2010). From this, it seems like GPS has the potential to support Doreen Massey’s project to reimagine space and time as interpenetrating rather than counterposed, the sphere of a plurality of interweaving trajectories – a dynamic simultaneity rather than a completed horizontality (2005). If – as in Michel de Certeau’s account – the early modern map removed narratives of travel as it worked towards the status of a science, becoming “a totalizing stage on which elements of diverse origin are brought together to form the tableau of a “state” of geographical knowledge,” then the GPS trace can be seen as a return to the map of “the operations of which it is the result or the necessary condition” (1984, 121).

Writing with W.J.T. Mitchell, Hansen illustrates the way that GPS brings about “a concrete suturing of time and space” through a discussion of *Landing Home in Geneva* (2005), a GPS-based artwork by Masaki Fujihata from that artist’s long-running *Field Works* series (Mitchell and Hansen 2010).⁵ This work involved interviews with emigrants to that city, conducted while walking from their homes to a place which felt like home to them: these walks were filmed using a panoramic lens and the subsequent footage was animated as a cylindrical form, tracking along a line denoting the trace of the walk, all modelled in a virtual, three dimensional space. Mitchell and Hansen claim that

Fujihata shows us how, in the midst of a rapidly accelerating surveillance society, we can use the new found technical precision of space-time

⁵ Fujihata’s GPS projects are documented at <http://www.field-works.net/>

mapping as a rich and poignant means of asserting our own existential uniqueness. His media-specific configuration of time, space and embodiment gives us the opportunity to map global space-time in relation to our own movement through it. (Mitchell and Hansen 2010, 110)

As well as issues of power and control, artworks that employ these technologies enable us to reflect on our own participation in acts of timing and spacing,⁶ our own roles as moving parts in a socio-technological ensemble of satellites tracking in their orbits, radio signals and packets of data, amongst other things.

Time and photographic mapping

In their analysis of the temporal codes of mapping, Denis Wood and John Fels make a parallel with the snapshot photograph, likening what they perceive as an atemporality in snapshots to the way in which we understand the map: “in time but not of it; something with the time evaporated out of it” (1992, 126). This analogy is inappropriate; snapshot photographs may record punctual events extracted out of meaningful sequence, a momentary registration of light on a sensitive surface, but this doesn’t amount to timelessness. Their use as supports for memory means that temporality is rarely absent from the ways in which we interpret and are affected by them. In any case, Wood and Fels go on to soften their stance, saying “we *may* be aware of emplacing time in the photograph ... but we refuse to extend these understandings to the map. Time remains a ... hidden dimension” (1992, 126).

Wood and Fels formulated their semiotic framework for understanding maps during the 1980s, and when it was subsequently incorporated in 1992 into *The Power of Maps*, Wood’s critical treatise on cartography, it was accompanied by a discussion of a

⁶I am strongly influenced here by Bruno Latour’s work on the “metrological chains” through which spacing and timing regimes are produced (Latour 1997).

particular image that, for Wood, seemed to aspire to the condition of cartography and the snapshot at the same time. Stressing the importance of temporal selections and combinations, Wood narrates the production of Tom Van Sant's composite satellite image of the world from space, an image used as the half title page illustration for the 1990 *National Geographic Atlas of the World* and subsequently in 1992 as a poster to promote the environmental efforts of a telecommunications company, under the title "A Clear Day". This is a world where it is always daylight, always cloudless, always high summer: these selections are key to Wood's argument that Sant's image is better thought of as a map than a photograph. Wood goes on to relate the rhetoric of this image to the environmentalist discourse that framed the reception of the photographs of the earth from space taken by the Project Apollo astronauts.⁷

Wood's analysis works for Van Sant's image, but returning to the present it needs to be updated. Martin Dodge and Chris Perkins – drawing on much the same temporal markers as Wood – identify an illusory effect of seamlessness and transparency in composite satellite imagery, however this effect is far from guaranteed (Dodge and Perkins 2009). While the images of the earth they provide might be coherent at some scales and framings, applications and services like Google Earth and Maps do not hide their temporality, as such – even cursory play reveals the asynchronicity of image tiles, while the interfaces of both Google Earth and Street View explicitly provide the date the imagery was taken and supply time sliders to explore its thickness. Discussing Google Earth, Mark Dorrian also notes the consistency of cloudlessness and eternal daylight, but argues that despite these unifying criteria it is still an evidently fragmented, constructed image; for Dorrian the transparency and unity implied by those criteria speak of Google Earth's coherence as an interface for data – "the 'wholeness of its searchability'" rather

⁷ Denis Cosgrove has identified the "whole earth" as one of two rival, if related, discourses of global unity that drew upon the same images, distinguishing it from an imperialist "one world" discourse (Cosgrove 2003).

than its wholeness as a “natural’ image” of an object (Dorrian 2013, 299). Unlike Wood, Dorrian sees a significant difference between the cloud-swirled blue marbles of the Apollo photographs and the cloudless, eternal day of mosaicked satellite imagery; he argues that these patchwork worlds are a new kind of political map where differing resolutions and image upload frequencies speak more of western political, security and economic interests, wherever they may lie, than they do of the bounded territories of nation states.

Regardless of the overall effect of temporal patchworking in satellite imagery, time is of course emplaced, in the conventional way, within the unique images that comprise it. Artists have exploited these archives of fleeting moments in ways that draw their affective potential from the tension between the historical specificity of the event or conditions depicted and the idea of continual, exhaustive surveillance and recording represented by geomeia. The artist Laura Kurgan has spent the last two decades critically exploring the cultural implications of different digital mapping and remote imaging technologies; in 1994 she was responsible for one of the first artworks to use GPS, the installation *You Are Here: Information Drift*.⁸ For *Monochrome Landscapes* (2004) Kurgan purchased commercial earth observation satellite imagery of four eight-by-eight kilometre locations dominated by one of the colours white, blue, green and yellow, and the results were exhibited as large Cibachrome prints with the pixellation of the satellite’s scanner array clearly visible.⁹ As Kurgan relates, she “was interested in the idea that the places on earth that appeared from above as more or less a single color were also places that were contested, fragile, and subjected to an increasingly thorough surveillance apparatus” (Kurgan 2013, 153). All the locations were environmentally or

⁸ *You Are Here: Installation Drift* was exhibited at the StoreFront for Art and Architecture, New York, in January 1994. It dealt with the workings and military provenance of GPS, and visualised the ‘drift’ of Selective Availability (Kurgan 1994). Kurgan has recently published a collection of essays about her projects (Kurgan 2013).

⁹ <http://www.l00k.org/monochromelandscapes/monochrome-landscapes>

politically sensitive, and for the colour yellow a chance encounter was captured that helps to locate the image in geopolitical time: crawling bug-like over the monochrome expanse of a section of the Iraqi desert, two weeks into Operation Iraqi Freedom, two military helicopters can be seen (figure 2).¹⁰

<FIGURE 2 ABOUT HERE>

The artist Mishka Henner has captured a more varied and visceral palette of colours in a recent series of images culled from Google Earth which deals with landscapes that have been shaped by the production of meat. In *Feedlots* (2013), Henner focuses on the US beef industry and the sites where young cattle are fattened before slaughter – an intensely managed and scientifically accelerated process that, alongside a programme of food and supplements, involves a tight spatial organisation of pens, run-off channels and lagoons where the animals' waste products are broken down by chemicals.¹¹ Order and ordure are counterposed through the proximity of repeated rectilinear forms and roiling abstraction. In a widely reproduced image of the Coronado Feeders lot near Dalhart, Texas, the waste lagoon looks like an orifice or wound, wet and red with gangrenous greens, yellows and blacks crusting around its puckered edges (figure 3). Time is emplaced in this image in a fundamental way, one that becomes apparent when exploring the Coronado site using Google Earth's time slider: the image was taken in September 2011, and the lagoon's colours and the contrast with the dun surface of the pens are due to the devastating drought that Texas suffered that year, the worst in over a century (Mishka Henner, personal conversation with the author, 8 April 2014.). With the water evaporated, the organic and chemical contents in the lagoons were concentrated to lurid effect.

¹⁰ The other colours were represented by the Arctic National Wildlife Reserve, the intersection of the Greenwich meridian with the equator in the Atlantic Ocean, and an old-growth tropical rain forest in Cameroon.

¹¹ <http://www.mishkahenner.com/Feedlots>

<FIGURE 3 ABOUT HERE>

Coming back down to earth again, it is extremely difficult to see the panoramas of Street View as timeless, strung out punctually as they are along the traces of actual journeys. Like *Amsterdam RealTime* and *Landing Home in Geneva*, they too write movement, and thus temporality, back into the map that has for so long denied them. Street View doesn't just register the more-or-less static form of our built and natural environments, it is an archive of ephemeral events, and several artists have drawn on it in curatorial selections and framings (Moakley 2012). Jon Rafman's ongoing *9-Eyes* project (2009-ongoing), for example, brings together curious, sinister or poignant scenes alongside the uncanny effects produced by glitches.¹² Mishka Henner has also worked with Street View, but with tighter criteria than Rafman. For his *No Man's Land* books, Henner took locations gleaned from discussion forums used by the clients of sex workers and used Street View to source images of them, mainly urban edgeland sites in southern Europe (2011, 2012). Many of these images show the moment when the sex workers – all women – look up to address the photographic apparatus, their faces pixelated by Google's pattern recognition algorithm. However, the most poignant of the *No Man's Land* images capture these scenes at those times when they are empty of human subjects: Henner bookends the first volume with images that show only chairs by the roadside.

In a recent analysis of “the power relations involved in the practices that enact augmented realities”, Mark Graham and his co-authors Matthew Zook and Andrew Boulton have discussed Street View photographic mapping and the sharing of georeferenced photographs on Google Maps, among other data overlays (Graham, Zook,

¹² <http://9-eyes.com/>

and Boulton 2013, 465).¹³ Developing a heuristic typology of those relations, the authors identify temporal power as one of two dimensions which usually pass unnoticed in augmented realities; they place it alongside the power of code, particularly the search algorithms which regulate conduct by regulating the visibility of content. Graham, Zook and Boulton describe “timeless power” as a “flattening of time” (Graham, Zook, and Boulton 2013, 470), but rather than rehearsing the cartographic version of timelessness they instead refer to Castell’s cultural and technological concept of timeless time, likening the excessive, multiple temporalities of photographic mapping to the disordering of chronology that Castells sees as characteristic of contemporary culture. Like Dodge and Perkins, Graham and his co-authors also invoke the idea of seamlessness, this time in relation to representations of place; this wholeness is only made possible by the way in which augmented reality interfaces ignore temporal data while stitching together their overlays. Despite this, one of their case studies is a distinctly seam-like glitch in Street View: a street in Lexington, Kentucky, where travelling down Main Street in opposite directions reveals the before and after of a contested example of urban regeneration, a development known as CentrePointe. What is more, on Google Maps the CentrePointe site is peppered by user-contributed photographs that commemorate a demolished music hall. These before-and-after juxtapositions and the pinning, by users, of memories to the map are read by Graham, Zook and Boulton as a collapse of temporality.

The idea that a surfeit of temporal markers necessarily leads to such a collapse is challenged by a recent artwork that deliberately exploits the temporal seams of Google Street View to reflect on the clearance and gentrification of cities in much the same way as the Lexington Main Street seam. Justin Blinder’s *Vacated* (2014) exploits a quirk of

¹³ I’m not going to dwell on the distinction between augmented reality and geomeia – in terms of the examples discussed by Graham, Zook and Boulton, the terms can be treated as interchangeable.

Street View's update frequency to capture change in New York's built environment, namely the fact that major roads are updated more regularly than minor ones.¹⁴ The artist used the NYC Department of City Planning's PLUTO dataset to find corner lots where new buildings had been added in the previous four years, and then used the panoramas taken at those intersections to make a series of still and moving image works, including a series of animated GIFs which travel years in time as they shuffle a few metres in space.

Francesco Lapenta offers a less dramatic account of the effect of combining of temporal markers in geomeia that bring together photographic "elements of diverse origin" (de Certeau 1984, 121) in static tableaux:

This synthesised image, as the single photographs that compose it, is still a visible token of the past; but as a combination of contiguous photographs, it is also a combination of past, present and future, as the photographs that it merges together represent the present, past or future to one another. This new digital photographic map transforms a time-space unicum (the photograph taken at a specific time, in a specific place) into a fractured time within a space continuum (a composed photographic image that merges different times and connects contiguous spaces). (Lapenta 2011, 17)

From the point of view of photography alone, this isn't particularly novel: yes, the imagery these services provide involves abandoning the traditional understanding of the relationship of photography to a unique spatiotemporal referent, but then so does any photocollage technique. What is most at stake here concerns the relationship, practical and analogical, between the photograph and the map, and in particular the challenge that the excessive, visibly fractured temporality of photographic mapping poses to the lingering notion of the map as having a snapshot (a)temporality, in Wood's

¹⁴ <http://projects.justinblinder.com/Vacated>

terms, or of being “a slice through time”, in Massey’s (2005, 107). The stress on atemporality effects in studies of the aesthetics and cultural impact of geomeia, and the conflation of the cartographic and technological/cultural versions of timelessness in particular, moves too quickly to read a surfeit of temporal markers as a collapse of temporality as such. In much the same way that the mapped trace of moving bodies works to reveal our own parts in the technological mediation of time and space, the proliferating contingencies in photographic mapping and the artworks that have reframed them for affective ends – fleeting, mundane, poignant, politically charged, sinister, uncanny, or just glitchy – surely work to expose, as never before, the map’s silencing of its temporal codes.

List of figures

Figure 1: *Amsterdam Realtime* (2002) Esther Polak, Jeroen Kee and Waag Society. Participatory mapping project and installation; this image depicts a composite of GPS traces produced by participants. Image courtesy of Esther Polak.

Figure 2: Detail from *Monochrome Landscapes* (2004) Laura Kurgan. Yellow: southern desert, southeastern Iraq, between Al Busayyah and An Nasiriyah. Image courtesy of Laura Kurgan. Includes material © 2003 DigitalGlobe, all rights reserved.

Figure 3: *Coronado Feeders, Dalhart, Texas*, from *Feedlots* (2013) Mishka Henner. Map data: Google.

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