

New spatial media, new knowledge politics

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New spatial media – the informational artefacts and mediating technologies of the geoweb – represent new opportunities for activist, civic, grassroots, indigenous and other groups to leverage web-based geographic information technologies in their efforts to effect social change. Drawing upon evidence from an inductive analysis of five online initiatives that engage new spatial media in activism and civic engagement, we explore new dimensions of the knowledge politics advanced through new spatial media and the mechanisms through which they emerge. ‘Knowledge politics’ refers to the use of particular information content, forms of representation or ways of analysing and manipulating information to try to establish the authority or legitimacy of knowledge claims. The five new spatial media initiatives we analyse here introduce new dimensions to the modes of collecting, validating and representing information, when considered against practices of many activist/civic encounters with other kinds of geographic information technologies, such as GIS. The significance of these practices is not in their (arguable) newness, but rather their role in advancing different epistemological strategies for establishing the legitimacy and authority of knowledge claims. Specifically, these new knowledge politics entail a deployment of geovisual artefacts to structure a visual experience; a prioritisation of individualised interactive/exploratory ways of knowing; hyper-granular, highly immediate, experiential cartographic representations de-coupled from conventional practices of cartographic abstraction; and approaches to asserting credibility through witnessing, peer verification and transparency.

Key words epistemology; expertise; geoweb; geovisualisation; knowledge politics; new spatial media

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Introduction

The topics of social media and activism have received much joint press lately, with formal media outlets, bloggers and commentators debating the use of digital communication technologies such as Facebook, Twitter and Tumblr in the Iranian Green Revolution; students protesting cuts to British secondary education; the successful ousting of Tunisia’s president; the mobilisation of support for Occupy Movement protests; and mass demonstrations against the Mubarak regime in Egypt (Alexander 2011; Beardsley 2011; Goldacre 2010). Whereas some commentators herald these networks and digital applications as a new basis for mobilisation, others argue that these technologies do not in and of themselves beget activism, mobilise activity on the ground or spur charitable giving and voluntarism (Carter 2010; Fine 2009; Gladwell 2010; Spillman 2010; Strom 2010). Nevertheless, digital media are an ever-increasing presence in social movements, political participation and civic engagement. Significant to these debates, digital media and services are becoming increasingly location-based, with more applications providing geographical interfaces and supporting locational data (Letham 2009; Satri 2010; Turner 2009). As publicly available geographic information technologies (GITs) and data are increasingly taken up by social

movements, nonprofits, NGOs, citizen groups, indigenous peoples and grassroots organisations, it is critical to understand the forms of activism and civic engagement that are engendered through these uses of new spatial media (Crampton 2009).

By *new spatial media*, we mean the mediums, or channels, that enable, extend or enhance our ability to interact with and create geographic information online. Examples include Twitter’s GeoAPI (which enables the geo-tagging of microblog posts), Google Earth and other virtual globes, location-based social networking applications (apps) such as Foursquare and Gowalla, map mash-ups, application programming interfaces (APIs) that allow users to incorporate geographical content from other web services *and* the devices used to connect to these applications (smartphones, tablets and computers). These examples can be considered media in the same sense that geographic information systems (GIS) can be conceived as a medium for spatial representation. *New spatial media* are the technological devices and informational artefacts that constitute the geospatial web or geoweb (but are not equivalent to the geoweb). The term geoweb was originally conceived as spatially-referenced Web content and the use of this geographical information as a basis for organising the Web (Scharl and Tochterman 2007), but is now used more expansively to

reference new forms of spatial data such as ‘volunteered geographic information’ (Goodchild 2007); new practices for curating and interacting with locational content over the web; and the hardware/software objects, devices and technical standards that facilitate them (Elwood and Leszczynski 2011). That is, the geoweb is constituted by new content forms, new data practices and new spatial media.

Focusing on new spatial media rather than the geoweb’s content forms and data curation practices allows us to examine more closely how informational artefacts and technological devices are being deployed in practices of negotiating, legitimating and securing political claims. There is a growing body of research on the geoweb’s new content forms, techniques for validating or analysing them and the significance of new data practices such as crowdsourcing (Sui *et al.* 2012). But there is little work on how new spatial media are being leveraged within political initiatives by organisations and social groups to negotiate their claims. NGOs, social movement groups and community-based organisations increasingly use new spatial media in their efforts to affect social and political change, yet there is little existing theorisation of the nature or significance of the knowledge politics that are being produced through such efforts. We refer to these diverse practices as *activism* and *civic engagement* to try to elide some of the problematics that circulate around terms like *grassroots* or *community*, and also to encompass initiatives that seek change by working from within existing political and social structures and those adopting a more resistant stance.

Knowledge politics refers to

the ways in which individuals and institutions leverage digital spatial data and spatial technologies in negotiating social, political, and economic processes, often doing so in ways that rely upon the differential influence and authority that is granted to particular forms of knowledge or representations. (Elwood 2010, 352)

For example, a great deal of earlier work on GIS use by activists and community organisations has shown these knowledge politics to be shaped by deep institutionalised tendencies in planning and policymaking to grant greater weight to knowledge expressed as quantitative data or represented in cartographic forms (Elwood 2006b; McLafferty 2002). Most (but not all) prior research on the role and significance of geographic information technologies in civic engagement, social movements and political participation has focused on traditional forms of GIS. Yet given that new spatial media bring together different hardware/software configurations and different possibilities for manipulating, sharing and visualising information, it is reasonable to expect their knowledge politics to depart in some key ways from those

advanced through related engagements with GIS. Drawing on evidence from inductive analysis of multiple initiatives, this paper develops an account of these new dimensions of knowledge politics advanced via nascent digital spatial technologies.

Specifically, we show how these politics engage geovisual representations (and their presumed validity or credibility) in ways that both draw upon *and* depart from those advanced through many activist/NGO engagements of conventional GIS. We demonstrate that uses of new spatial media also show several differences around questions of knowledge, epistemology and the mobilisation of geographical information, particularly with respect to expertise and the uses of geovisual representation. Specifically, these new knowledge politics entail deployment of geovisual artefacts to structure experiential, exploratory ways of knowing and tend to assert the credibility of those representations through a grounding in practices of witnessing, transparency and peer verification. These knowledge politics are new or different insofar as representation – understood here as both geovisual artefacts and epistemological praxis – is decoupled from a project of cartographic legitimation where the legitimacy or credibility of representation is sought through appeals to, and practices of, cartographic abstraction and scientific expertise. These arguments about the new nature of spatial knowledge politics emerge from our analysis of the content and capabilities of a range of initiatives that involve citizens, activists and NGOs using new spatial media, well as blog posts, press coverage and commentaries about these initiatives.

We contribute to efforts to theorise the societal significance of the geoweb – specifically the deployment of new spatial media in activism and civic engagement – *and* efforts to theorise the ways in which new spatial media may draw upon, alter and depart from more fully GIS-based knowledge politics. Our purpose is not to make a case for map mash-ups or geosocial applications as new simply for the sake of doing so, nor to suggest that these applications or activist encounters with them are a complete break or next step progression from antecedent GIS practices. As well, we are not assessing the effectiveness, strengths or weaknesses of these activist or civic practices leveraged through online geovisual interfaces. Rather, our purpose is to examine whether there are any new dimensions to the in-practice epistemological politics advanced through new spatial media, and explicate the mechanisms through which they emerge.

Digital activism, the geoweb and GIS-based knowledge politics

Efforts to theorise the deployment and significance of new spatial media for activism and engagement are

informed by interdisciplinary research on emergent and increasingly mobile digital communications technologies. A great deal of interest in recent years has centred upon blogs and social networking in electoral and protest politics. The newsworthy events noted in the introduction attest to the increasing presence of digital technologies in citizens' efforts to engage with each other, organise and mobilise. Media coverage and scholarly commentary alike recognise social networking and other Web 2.0 (O'Reilly 2005) practices as offering new ways for people to communicate with one another and the world at large, framing these activist and alternative engagements with nascent technologies as *digital activism*.

Here, we follow Lievrouw's (2011) framing of digital activism, which conceives of 'alternative and activist new media' as constituted by the use of

communication artifacts, practices, and social arrangements of new information and communication technologies to challenge or alter dominant, expected or accepted ways of doing society, culture, and politics. (2011, 19)

This definition emphasises the interlocking role of information technologies *and* the informational artefacts they are used to produce (data, visual representations) in shaping how political claims are negotiated, legitimated and secured. This proposition is central to our examination of the knowledge politics of new spatial media.

Key concerns of the digital activism literature include explaining how and why digital technologies may alter politics and collective action, the mobilisation of individuals for these efforts, and resulting social relations. In much of the political science and communications research on digital media in the electoral process, the value of digitality for politics has been conceived in terms of speed, extensibility, reliability and the lower cost of communications (Carty 2011; Hindman 2009; Joyce 2010). In this vein, scholars examining the role and effectiveness of blogs, networking and email/text message campaigns in mobilising voters tend to ask how democracy as a 'good' is promoted or constrained by emergent digital media (Carty 2011; Hindman 2009; Howard 2010; Joyce 2010; Meier 2011). For Howard (2010), technological diffusion, specifically of what Meier (2011) calls 'liberation technologies' (social and mobile Internet media), advances democracy by fostering a healthy 'online civil society' (2011, 194). This utopian imaginary is echoed in Jansen's (2010) claim that by bringing freedom of information, social media also bring civic freedoms more broadly.

These contemporary forms of digital activism have their antecedents in cyberactivist uses of email and early Web technologies and prior research on the role of information and communications technologies

(ICTs) in realising political change (McCaughy and Ayers 2003; O'Leary 1997; Pickerill 2003; Rafael 2003). For Lievrouw (2011), however, social media and more recent digital ICTs are distinct in that they enable new forms of interactivity. She argues that new media provide users with an 'unprecedented degree of selectivity and reach in their choices of information and cultural resources, and their personal interactions and expressions' (2011, 13). Interaction undergirds a 'qualitatively different experience' (2011, 13) – users need to actually *do* something with the technologies to make them 'work', as opposed to simply receiving content. This, she suggests, may propel users 'toward more involved social and cultural participation online and off', because it is 'a much shorter step from ... interaction to participation than from ... reception to participation' (2011, 14). Meier's (2011) evidence supports this claim. He found that increased access to the Internet via computers (and a parallel increase in Internet users) was positively correlated with an increase in anti-government protests in 38 countries. Meier attributes this effect to the generative nature of the Internet as a platform for creating multimedia content, and to the nature of relationships fostered through such activity. Specifically, he suggests that Internet interactions allow people to 'cluster in groups, and in turn allows groups to connect with other groups in a highly scalable manner' (2011, 194).

Yet other scholars challenge claims that technology in and of itself exerts influence on political processes or fosters democracy, insisting on the need to look beyond the instrumental communications role of digital media to the social and political relationships forged through digital media practices. Gladwell (2010) argues that while social media such as Facebook and Twitter facilitate new ways of connecting individuals to social and political causes, the nature of these ties is different from those forged in conventional direct action, organising and protest. Digital connections, he argues, foster weak ties that may facilitate online expressions of solidarity, but not the repeated, longitudinal commitments needed to effect material change. Similarly, Turkle argues that part of the appeal of nascent social media lies in the 'weak ties' that they enable, connections that are 'friction free', absent the complexity of in-person human interaction (2011, 13). A culture of 'weak ties', she argues, erodes our ability to foster meaningful human relationships – the kind Gladwell argues are necessary to social movements and real-world political change. In contrast, others argue that the sense of connectivity that social media may foster among people, causes and organisations is a powerful 'emotive driver' that sustains a 'very real sense of community' (Ma'anit 2011, np), with the potential to alter political practices (Hands 2011).

Rather than positioning new digital media as a simple communicative pathway for moving information and ideas, these scholars emphasise their significance in the formation of social and political meanings, claims and relationships. These framings suggest that nascent ICTs are politically constitutive because of how they mediate the construction and representation of meaning, because the digital encoding of participation and politics plays a role in structuring and defining the field of possibilities for organising, engaging and mobilising with ICTs. But this literature offers relatively little discussion of new *spatial* media, nor specific focus on digital encodings of spatial representations and relationships. Mol (2008) is an exception, drawing upon his analysis of environmental movements to argue that emergent digital media matter not just as a coordinating portal for activist practices, but because environmental groups use them for practices of 'relational place-making' (Pierce *et al.* 2010, 54), to reproduce and fortify their relationships both *to* and *across* space(s).

Far greater attention to the spatial dimensions of new digital ICTs is evidenced in recent work on the cultural politics of the geoweb. Among other things, this research emphasises shifts in the nature of seeing or concealing that are possible via new spatial media. Parks (2009) has noted that the form or framing of visual artefacts in the geoweb is often used to shape meanings or interpretations of represented phenomena. Drawing examples from Google Earth's Crisis in Darfur layer, she argues that icons displayed atop this high resolution image base function as 'portals' through which users pass as they zoom to photos of human suffering. This framing enables users to bypass the geovisual interface and distracts from the geopolitical and historical dimensions of the conflict that might emerge from closer engagement with the satellite imagery, enabling a voyeuristic viewer to see but take no action. 'Geovisual interfaces' refers to map-based interfaces, but also visualisations such as digital 3D spatial models. For example, Google Earth is a digital globe as compared to a map interface that uses the metaphor of the Earth to represent geographic entities and processes. Similarly, remotely sensed imagery beneath a Google Maps mash-up is part of a geovisual interface, but is not necessarily 'a map'. Thus, *geovisualisation* involves the explicitly visual representation of phenomena, contexts and problems with geographic/spatial referents, and their subsequent delivery may occur via a variety of media (Slocum *et al.* 2005).

Related research on the geoweb also describes transformations of social and political relationships around surveillance, privacy and watching, attributing them in part to shifts in control over the production and dissemination of digital information. Perkins and

Dodge (2009) remark that while new geographic information technologies enable surveillance of civil society, they also engender citizen counter-hegemonies through 'surveilling back' at the state. Citizens' use of Google Earth imagery to identify covert military bases and other 'hidden' geopolitical installations, they argue, disrupts conventional power relations between citizen and state with respect to who watches whom. Our earlier study of the changing nature of (spatial) privacy (Elwood and Leszczynski 2011) emphasises other changes in the nature of the knowledge and knowing that accrue from some geoweb-specific services. Geo-located photorealistic panoramas such as those available through Google's Street View enable perception of individuals' supposed presence, activities or characteristics in highly immediate and un-abstracted forms. These forms of representation facilitate much different invasions of privacy than those ensuing from more abstracted or aggregated forms of conventional maps and spatial databases. Other scholars emphasise the enrolment of these technologies in everyday life. Kingsbury and Jones (2009) for example argue that seemingly mundane activities, such as tracking the location of unmarked black (covert ops) helicopters in Google Earth as a game or form of recreation, is simultaneously an exercise in 'anti-geopolitics' that disrupts the geopolitical gaze and works against the state-as-apparatus-of-surveillance discourses that have dominated previous critiques of geographic information technologies.

Within these discussions, some scholars attribute shifts in surveillance, watching and perceiving to the widespread availability of digital imagery previously unavailable to the public, and to its comparatively easy dissemination via the Internet (Aday and Livingston 2009; Dodge and Perkins 2009; Madden and Ross 2009; Perkins and Dodge 2009). Other scholars attribute these transformations to the forms of visualisation and the nature of seeing/knowing that are possible via new spatial media. Kingsbury and Jones (2009), for example, emphasise that these interactive platforms for exploring high resolution satellite imagery enable more than only rationalising, panoptic, controlling or Cartesian visual epistemologies. They argue that these (geo)visualisations can also advance confusion, paranoia, titillation and amusement, ironically purporting to advance a fully visible and knowable Earth that can in fact never be fully known to the viewer, thus providing a platform where 'new ways of political *and* ethical thinking emerge and where new epistemes are concocted and erupt' (2009, 509).

This early research on the societal significance of the geoweb offers rich accounts of its new forms of visualisation, their socio-political implications and the possible mechanisms through which these implications emerge. This literature suggests the need to be

attentive to how digital visual artefacts frame audiences' interactions with the presented content, to the visual practices enabled by these emergent artefacts (e.g. watching, playing, surveilling, controlling, gaining awareness), and to the visual epistemologies that emerge within these practices. What has yet to be undertaken are grounded studies of the substantive practices emerging from activist and civic engagement applications of new spatial media, to consider the nature and genesis of the epistemological politics advanced through these initiatives, and the extent to which they re-inscribe or depart from engagements with other kinds of geographic information technologies.

The substantial body of research on the knowledge politics of activist and civic engagements with GIS offers several important propositions. Much of this work examined the implications of GIS adoption in the late 1990s, as nongovernmental organisations, community organisations and activists around the world adopted GIS in growing numbers, in urban community organising and development (Elwood 2002; Ghose and Huxhold 2002); participatory planning initiatives (Elwood and Leitner 1998; Shiffer 2002); environmental activism (Sieber 2000; Tulloch 2002); anti-gentrification activism (Parker and Pascual 2002); community-based resource and land management (Macnab 2002); and participatory development schemes (Bronsveld 1994; Dunn *et al.* 1997). A substantial emphasis of this literature has been the sorts of information, representational practices and meanings that citizens and citizen groups rely on as they use GIS to forward their claims. While a great deal of this research has been framed as public participation GIS or participatory GIS (PPGIS/PGIS), we are not setting up new spatial media as a comparative 'other'. PPGIS/PGIS encompasses diverse methodologies for involving members of the public and their contributions of information into planning and problem-solving practices that use GIS (often in concert with other digital technologies), and not all PPGIS/PGIS involves activism or NGOs (Dunn 2007).

Within NGO/activist engagements with GIS, one well-documented approach has been to invoke epistemological hierarchies broadly associated with science and its validated hallmarks of expertise and truth: prioritising quantitative or cartographic modes of analysis and representation over qualitative or narrative accounts; patterns over anecdotes; visual forms of evidence over non-visual forms; and objective or neutral accounts of people, place and conditions over experiential, testimonial or emotional accounts (Elwood and Leitner 2003; Macnab 2002; McLafferty 2002). For some, the choice to use GIS was an explicit attempt to position themselves as knowledgeable and their claims as valid or true, simply by virtue of having been forwarded via this assemblage of hardware,

software and data (Elwood 2006a). Closely related, using maps generated with a GIS has been a way to draw simultaneously on the truth/expert power afforded to digital technologies *and* to cartographic representations (Elwood 2006b; Ghose 2007).

In these efforts, GIS has often been deployed to transpose narrative descriptions of events or conditions into (mostly quantitative) forms stored in a spatial database or represented cartographically. Such translational approaches to GIS seek to legitimise narrative or experiential accounts against efforts to reject them as anecdotal, or produce representations that claim legitimacy on the basis of showing a larger spatial or temporal context. For example, neighbourhood organisers in some US cities have used GIS to monitor a variety of indicators over time, using the database capabilities of GIS to compile these data and its cartographic functions to map and analyse them, with the goal of bolstering their claims about neighbourhood needs and conditions (Elwood and Leitner 2003; Ghose 2003). Other such appeals to broader context frame claims about one place in relation to other areas, using GIS-based representations to argue, for example, that a community is underserved or overburdened compared with others, or that a local problem is part of a broader regional pattern (Elwood 2006a; Macnab 2002; McLafferty 2005; Sawicki and Burke 2002).

While their specific practices vary considerably, these engagements with GIS revolve around a strategy of cartographic, scientific and technological legitimisation, seeking to legitimate claims and characterisations through digital spatial encodings that trade on assumptions about the validity and relevance of cartographic representations, aggregated and quantitative data, and technology-mediated modes of analysis and representation. These spatial encodings have largely relied upon a moment of translation associated with the epistemologies of representation: transforming experiential, testimonial and qualitative forms of knowledge into quantitative, aggregated or abstracted forms.

Yet it is important to note that not all activist/NGO engagements with GIS have pursued the epistemological strategies described above, and that a wider range of possibilities has long been imagined by geographers and other scholars (see Crampton and Krygier 2006). In the late 1990s and early 2000s, critical cartography and GIS scholars envisioned the possibility of spatial technologies that would support and enable a more diverse knowledge politics than those we describe above. This 'GIS/2' was to be a historically self-conscious GIS more inclusive of participants and multiple representations, capable of interoperating between those representations and multiple data types, and able to communicate *about* the representations produced through its applications (Schroeder

1996; Sieber 2004). Miller (2006) later argued that online geographic interfaces such as Google Maps began to realise these goals. More broadly, the past decade or more of conceptual and methodological advances from critical, feminist and qualitative GIS have vastly expanded the epistemological diversity of GIS practice (Cope and Elwood 2009; Kwan 2002; Sheppard 2005). Yet while debates about GIS/2 certainly prefigured the possibility of a new knowledge politics around geographic information technologies, new spatial media are more than simply web-based forms of GIS. Some dimensions of new spatial media resemble and relate to functionalities and technical affordances of GIS (Haklay 2008; Haklay *et al.* 2008), yet they are a different genre of geographic information technologies, emerging from a different political-economic context and employing different digital structures, techniques and applications (Gerlach 2010; Leszczynski 2012).

Drawing from these constituent literatures on the societal significance of digital activism and spatial technologies, we would argue that understanding the significance of new spatial media requires conceptualising the nature of these technological mediations on three levels: (i) the visual and other strategies that claimants use to forward their claims via the geoweb, and in this context, the roles that geovisual representations play in these politics; (ii) the forms of knowledge used to advance and negotiate claims; and (iii) any new bases of legitimation within the spatial knowledge politics of activism and civic engagement. In the remainder of this paper, we consider the nature of emerging knowledge politics advanced by activist and civic engagements with new spatial media.

Practising activism and civic engagement with new spatial media

Our arguments emerge from an 18-month study of online civic or activist initiatives using new spatial media. The first step in this work involved identifying a theoretically relevant (and practically research-able) sample of cases for more in-depth study. Over several months, we reviewed blog posts, media coverage and other popular commentary sources that comment on or identify instances of digital activism and/or civic engagement. We indexed postings and articles about geoweb implementations by activist groups, community organisations and NGOs, as well as geoweb services developed by and for such groups. From this pool of initiatives, we identified five cases for further study, based in large part on their suitability to illuminate core conceptual dimensions of this project. Examining how informational artefacts and technological devices are being used to negotiate and secure political claims meant that we did not select imple-

mentations aimed at, for instance, coordinating the logistics of street protest.¹ Further, because we conceive of these digital politics as shaped by the forms of information and representation employed, prospective cases needed to have a sufficient/sustained online presence to allow us to examine these dimensions. Finally, given the tremendous diversity of existing new spatial media applications, we designed our subset of cases to include both large well-known applications and smaller less prominent projects; applications oriented toward a range of issues (environmental activism, urban infrastructure and service delivery, social services, anti-violence and harassment activism, and election monitoring); and a range of different approaches to activism and engagement.

The selected cases – Donor2Deed, Ushahidi, KaBoom, FracTracker and CitySourced – are not offered as representative examples of all existing or potential engagements with new spatial media by activists or civic groups, nor were they selected on the basis that their geospatial interfaces are new, unique or superior to others currently in use. Rather, these cases were selected as illustrative examples suitable for exploring the forms of information, information collection, visualisation and dissemination being fostered by such actors or institutions. In this way, the cases presented here constitute a theoretical sample, a common approach in inductive case study research in which cases are selected for their capacity to illuminate key conceptual dimensions of a given research project (Yin 2008). It is also important to recognise that these five cases consist of specific activist and civic engagement *initiatives* that use new spatial media, as well as Web-based spatial information *platforms* that are used in (or toward) civic engagement and activism. The latter group – the platforms – are designed to be used by many groups and are not particular to any one cause or organisation. The development and assertion of knowledge claims via new spatial media occurs at the intersection of technological capabilities, information content and representational practices (as has already been demonstrated in the case of conventional GIS). Thus, it is imperative to consider both initiatives *and* platforms.

The second phase of our project involved in-depth study of multiple forms of evidence for each account of goals and practices made directly available by each initiative (or in the case of new spatial media platforms such as Ushahidi, by specific implementations of their tools). We reviewed organisation or site developer's own textual accounts of their goals and practices, especially their engagements with new spatial media. As well, we examined conventional media and blog discussions of these organisations and initiatives by others, in order to look beyond organisations' self-stated goals and strategies, as well as blog and

media commentaries by others. Our inductive analysis of these forms of evidence examined the forms of representation or geovisualisation deployed by each; the types of data produced or used; the intended and actual purposes or benefits of the services as presented by site creators, contributors and users; and the strategies used in each to advance, negotiate and legitimate political knowledge claims. Our purpose was not to discern the ultimate success, failure or effectiveness of particular initiatives, but rather to discern the content, strategies and goals of their engagements with new spatial media. Again, we are not assessing the strength or weakness of these platforms at achieving their stated goals but, rather, are examining the visual, representational and discursive strategies employed in these interfaces to advance particular political and knowledge claims.

In the remainder of this section, we characterise our five cases – Donor2Deed, Ushahidi, KaBoom, FracTracker and CitySourced – and the different ways in which each initiative supports the engagement, curation and use of spatial information, and new spatial media towards advancing, legitimating and securing political claims. Donor2Deed² develops interactive map-based interfaces for NGOs, typically with the objective of providing current and potential donors with information about the NGO's projects and appeals for aid. While Donor2Deed also develops social media services for NGOs, it primarily constructs map mash-ups that are embedded as services, or plug-ins, in client organisations' websites and mobile applications. These interactive map mash-ups enable donors to trace the impact of donations by exploring what their money has purchased (or could) in terms of material goods and aid and where. An implementation built for relief agencies following the 2010 Pakistan floods allows donors to see, for example, that their donations have paid for Oxfam to give first aid training to fishermen in Jamshoro, or that the United Nations High Commission for Refugees distributed tents and family kits in Upper Dir. Another Donor2Deed interface, built for Dublin Simon Community, includes an interactive map showing its transitional housing facilities and treatment centres, and allows users to access information about fundraising goals, specific uses of donated funds, and information from and about staff, volunteers and individuals receiving services.³

Ushahidi, much like Donor2Deed, provides new spatial media services to other groups.⁴ Ushahidi provides a suite of open-source tools for the compilation and geovisualisation of information observed and reported by individuals. Originally created by a group of volunteers to provide an online map of violence reported during the 2008 Kenyan elections, Ushahidi is now a full-fledged NGO that provides its open-

source tools to a variety of other organisations and initiatives. Voluntary organisations, media and humanitarian groups are using Ushahidi to collect real-time reports of intimidation around elections or post-election violence (e.g. Sudan Vote Monitor; Cuidemos El Voto); locations and patterns of violence in areas of conflict (e.g. the East Congo Conflict in the DRC; War on Gaza); incidences of gender-based or racial harassment (e.g. Egypt's Harrassmap; Arizonans Unite); and information about relief needs or services in areas affected by natural disasters (e.g. Haiti and Chile Crisis Maps). The Ushahidi tools enable individuals to contribute information via SMS (text message), Twitter, email or web widget. Contributions are integrated into a database and visually rendered as an interactive map in which textual descriptions of each report (and occasionally photographs) are associated with a map object that a user may open to view in full.

KaBoom is a US-based organisation working to create and maintain parks and playgrounds for children.⁵ Its activities include constructing play spaces; providing community organising, planning and fundraising tools to citizen groups to build playgrounds on their own; and conducting and disseminating research on play space availability (and 'play deserts'). KaBoom's online resources include an interactive map built with the Google Maps API that allows users to add their own information to an ongoing inventory of playgrounds in 188 cities worldwide. Users can add information directly via the map interface, creating a point location and, if desired, adding a photograph and description. This accreting data set helps KaBoom identify areas that are in need of play spaces, informs their advocacy work and enables site users to find playgrounds to visit.

FracTracker is another service that supports collection, integration and sharing of geographic information, in this instance related to the deleterious environmental and other effects of 'fracking' (rock fracturing) for natural gas extraction.⁶ Involving academic and research institutions, industry, environmental organisations, philanthropic foundations and NGOs, communities and private citizens, FracTracker serves as a clearinghouse for spatial data pertaining to fracking such as environmental violations, permitting data, locations of drill sites or incidences of illness potentially associated with environmental contamination. FracTracker includes both official data from sources such as state-level EPAs or pollution control agencies, as well as citizen-generated data sets from activists working against fracking. The site incorporates a variety of new spatial media tools for (geo)-data compilation, visualisation and dissemination. For example, the data are available in proprietary GIS data formats, but also as KML files, which allow users

to visualise and manipulate the data using spatial media platforms such as Google Earth. FracTracker also provides tools to support citizen collaboration. Users may provide comments or feedback on datasets, rate the quality or usefulness of the data, exchange ideas about how the datasets may be used, or upload their own data and geovisualisations created with FracTracker resources.

Finally, CitySourced is an initiative that provides new spatial media tools for civic engagement.⁷ Aimed at local governments seeking citizen involvement in municipal problem-solving, CitySourced tools include an ESRI⁸ mobile application that enables citizens to submit geotagged photographs and textual descriptions of problems in the built environment including garbage, code violations, potholes or graffiti. The submitted reports are rendered as an interactive online map in which map objects may be opened to view the original report, photographs, exact address and latitude/longitude coordinates, time and date of report, as well as the person reporting (though this field frequently reads 'anonymous'). Users may download these data in formats that support further manipulation in web-based applications, Google Maps or conventional GIS software. The CitySourced interface further includes a 'reports feed' section that tracks local government responses to a report, such as notations that a report has been received, forwarded to a department for action, verified or resolved.⁹

These five initiatives/platforms demonstrate the diversity of institutional arrangements from which activist and civic engagements with new spatial media emerge, and diverse modes of activism or civic engagement being supported. Donor2Deed and CitySourced are both for-profit companies, with Donor2Deed targeting NGOs as its primary clientele, and CitySourced targeting municipal governments. The primary mode of engagement sought via Donor2Deed interfaces is monetary contributions, though implementations that highlight the activities of volunteers (as in the Dublin Simon Community map interface) can also be read as tacitly encouraging contributions of voluntary labour. In the case of CitySourced, the form of engagement sought is citizens' observation and documentation of local infrastructural conditions. Ushahidi, KaBoom and FracTracker all provide data and spatial information services intended to facilitate the research, consciousness-raising, policy advocacy, protest or the service delivery work of other nonprofit and citizen groups. Ushahidi and KaBoom are best characterised as NGOs, whereas FracTracker includes a mix of university-based research centres, NGOs and philanthropic partners. There are of course any number of interesting questions to be asked about the changing political economies and institutional infrastructures of spatial data creation and geographic

information services represented in these examples, as well as their implications for societal understandings of activism, participation and engagement.

However, here we are interested in the modes of collecting, representing and validating information that are part of these new spatial media implementations, as an essential step in interrogating whether and how they may advance new forms of knowledge politics with spatial technologies. Prior research on the social and political impacts of geographic information technologies has demonstrated these practices (collection, representation, validation/legitimation) as central arenas in which knowledge claims, power and authority are negotiated (Elwood 2006b; Wilson 2011).

With respect to practices for collecting information, KaBoom, CitySourced, FracTracker and most Ushahidi implementations support the user-generation or 'crowdsourcing' of spatial content, assembling data sets from the contributions of individual data items (or in the case of FracTracker, assembling a data clearinghouse from the contributions of site users).¹⁰ Much has been made of crowdsourcing of geographic information in the burgeoning literature on volunteered geographic information (Sui *et al.* 2012). The practice of creating data sets from the contributions and observations of lay persons has long been part of NGO/activist engagements with spatial technologies, especially efforts to incorporate 'local knowledge' into GIS and spatial data infrastructures (Elwood 2008). This said, all of the implementations studied here are gathering contributions of information at a greater scope and scale than was typically part of these encounters with GIS. Moreover, 'crowdsourcing' typically means that anyone with a vested interest in an issue can contribute spatial content to 'open' initiatives such as OpenStreetMap or Google Map Maker, and/or build their own mash-ups by hooking into publicly released mapping APIs. While the contributions themselves may be edited, the question of *who* can contribute typically is not controlled by researchers or other facilitators.

What is more definitely novel about the information handling practices emerging from the new spatial media implementations profiled here is their approaches for ensuring data reliability and provenance, which depart from longstanding practices used in conventional spatial data clearinghouses or web-based data portals. The accuracy of crowdsourced geographic data, especially in comparison with conventionally sourced data sets, has been a central concern in volunteered geographic information (VGI) research (cf. Haklay 2010). Here we are not focused on data accuracy, but instead on the *approaches used* to foster or assert the validity of contributed information. Traditionally, the origin, accuracy, derivation and

other details of spatial data sets has been verified by conventionally authoritative data institutions (such as spatial data infrastructures) and documented via metadata that adheres to standards defined by these institutions. In FracTracker, Ushahidi applications and KaBoom, such details are recorded in user comments and ratings assigned to individual reports or data items, essentially constituting a user-generated metadata far more open in structure and content than conventional forms. Ushahidi's crowdsourced approach to data verification also includes its SwiftRiver system, which extracts contextual information such as locational features or descriptive words from incoming Twitter posts, emails and SMSs. Using a combination of volunteer labour and built-in algorithms, SwiftRiver filters for duplicates, assigns more weight to contributions from persons with more prominent web presences and classifies reports as more reliable if they mirror other reports from the same vicinity (Swiftly.org 2011). These practices break from conventional science models in which the legitimacy of the information is in part meant to be assumed because of its delivery or production by an 'expert'. We understand these approaches to validating information as innovative not simply because they employ new forms of digital technology, but because they depart from conventionally-recognised practices for verifying spatial data sets and conventional content, structures and sources of metadata.

With respect to their practices for representing information, all of the initiatives profiled here either include or support multimedia representations that incorporate text, digital images and maps, and several support the geo-locating of text and images on a map interface. Yet these representational capacities in and of themselves are not new. Qualitative and participatory GIS have developed a host of closely related techniques (Harris *et al.* 1995; Jung and Elwood 2010; Knigge and Cope 2006; Kwan 2002; Kwan and Ding 2008). What *is* novel about the representational practices advanced in these implementations is their use of new spatial media for a practice we term geovisual framing. Here we refer to the design and use of a geovisual representation to structure communications or interactions between organisations/initiatives and their audiences or site users.¹¹ In Donor2Deed interfaces, for example, the interactive online map structures a visual experience for donors, who can use the interactive interface to access information about the NGO's accomplishments, its monetary needs and the purposes to which donations are being put. The CitySourced map is intended to structure citizens' interactions with local government, with the notion that by placing objects in the map and tracking information linked to them, citizens will be able to both communicate their concerns directly to government

and discern local officials' efficacy in responding. Our use of geovisual framing departs from Parks' (2009) use of framing. Whereas she emphasises the use of visual forms to construct meaning and user interpretations, we emphasise the use of a geovisual interface to structure user experience of and interaction with information from and about an organisation and its activities. All of the five initiatives we have profiled use interactive maps as a primary mode of structuring encounters between their organisation/initiative and its audience for a variety of ends – encouraging donation (Donor2Deed); facilitating communication (CitySourced); and raising awareness, witnessing and monitoring (Ushahidi, KaBoom, FracTracker).

In this discussion of new spatial media practices for information collection, validation and representation, our point is not that the practices described here replace or constitute a radical break from previous approaches. Indeed, many of these NGO and activist uses of GIS and conventional digital spatial data emerging from PPGIS blend multiple technologies, sources and practices (Ghose 2007; Sieber 2000; Rattray 2006), and software-level innovations in qualitative GIS have offered ways for incorporating multimedia evidence, narratives and so on (cf. Kwan and Ding 2008; Jung and Elwood 2010; Shiffer 2002). The simple fact of being able to blend multiple forms of information or representation in an online geovisual interface is not our primary concern – our focus is rather on how civic actors use geovisual interfaces to produce or assert particular kinds of knowledge claims within citizen politics or civic engagement. In the preceding discussion, we have identified two new modes of validating and representing information: (i) efforts to vet or validate data through blendings of conventional research/data practices with Web 2.0 practices such as peer ratings or crowdsourced evaluation of data and (ii) geovisual framing to structure interactions between organisations/initiatives and their audiences/site users. The significance of these practices lies not in their novelty (which some readers may dispute anyway), but rather their role in advancing different epistemological strategies for establishing the legitimacy or authority of knowledge claims. That is, these validation and representation practices advance a new knowledge politics, to which we now turn our attention.

The contemporary nature of (new) spatial knowledge politics

The significance of new spatial media in activist and civic engagement initiatives rests not only on their particular modes of collecting, validating and representing information, but on the epistemological strategies enacted and enabled through these practices.

That is, new spatial media are implicated in a new knowledge politics by way of the approaches to making and establishing the legitimacy of knowledge claims that they are used to advance. Within the five cases considered here, we identify two notable new dimensions to the knowledge politics of activist/NGO encounters with new spatial media, as compared to engagements with conventional modes of GIS: a resituating of *geovisual epistemologies* and a reworking of *expertise*. This resituating of geovisual epistemologies involves the use of interactive geovisual interfaces to frame an exploratory engagement with content, rather than primarily for the purpose of cartographic abstraction or cartographic representation. Strategies for asserting the legitimacy or credibility of the information or knowledge claims made via these interfaces are cultivated not foremost through demonstrations of conventional norms of science or disciplinary cartography, but through practices of transparency, peer verification and witnessing. There is considerable discussion of questions of expertise in the burgeoning literatures on VGI and neogeography, mostly debating the demise or continued need for disciplinary expertise in cartography, GIScience, surveying, geodesy and other fields traditionally contributing to the production and maintenance of geospatial data and maps (see for example Goodchild 2007 2009; Turner 2006). However, our concern here is the *significance* of this rise of the amateur cartographer and the attendant resituating of expertise for *knowledge politics*.

The resituating of geovisual epistemologies and expertise originates from the way that geovisual artefacts are generated and used in these deployments of new spatial media. Specifically, geovisual artefacts generated and accessed via new spatial media are being used for different purposes, are oriented toward different ways of knowing and assert the credibility of knowledge in different ways. A key dimension of these transformations lies in the role played by the map or geovisual interface. Many activist/NGO encounters with GIS have been oriented toward producing cartographic narratives. In these approaches, they carefully tailor the visual and textual content of maps, with accompanying oral or textual material, to establish interpretive frames that bind particular meanings to the spaces, objects or processes represented (Elwood 2006b). This narrative is meant to establish and defend a particular account of what is true. In contrast, within practices of geovisual framing, the geovisual interface plays a very different role. In geovisual framing such as that deployed in the Dublin Simon Community's Donor2Deed interface, the map does not so much narrate a particular cartographic representation or set of meanings as structure a visual and interactive experience for the user. Discrete objects in the geovisualisation facilitate inter-

active exploration by the user, who may open a particular map point to access detailed related information (often text, photographs, embedded video or user comments). In aggregate these individual map objects are more oriented toward directing users' interaction with the content than toward narrating set, predetermined meanings or messages. What is of importance here is *not* the practice of associating multimedia or user-generated content with map objects, which is a practice longstanding in multimedia GIS (Shiffer 2002), qualitative GIS (Kwan and Ding 2008; Matthews *et al.* 2005) and online mapping platforms more generally (Miller 2006). Our emphasis here is upon the design and use of specific map interfaces to *frame a particular kind of user interaction* with the geovisual content.

In several of our cases, the interactive geovisual experience is intended to mobilise a user to do something – contribute money, contribute information to the map or another data set or join an initiative. For KaBoom, the online map interface is a basis for mobilising citizens to contribute information about play spaces, or to become involved in playground initiatives. Donor2Deed emphasises the relationship between geovisual exploration and mobilisation even more directly, noting in its website that this exploration will mobilise individuals to become donors by 'linking them directly to projects, giving them more choice and informing them of the impact of their donation' (Donor2Deed 2010). The mobilising potential of interactive geovisual experiences is often attributed to transparency – the ability to 'see' particular activities or outcomes through the geovisual interface. Ushahidi, for example, frames its mission as, in part, increasing transparency. A representative of Mexican NGO Cuidemos el Voto using Ushahidi tools in election monitoring argues, '[t]he fact that people see their report it is the biggest motivation to engage them' (Salazar 2011, np). Donor2Deed's mission statement similarly emphasises transparency, arguing that individuals are more likely to donate if they can view exactly how a charity will use a donation or target their donation to a specific chosen place or item.

Certainly, mobilising donors through creating a personal connection is not new (NGOs have long done this), but the knowledge politics centred around transparency as a way of establishing such a connection *is* novel. We are *not* making any claims around the actual validity of this assumed relationship between transparency and action, or whether the site's/organisation's own actions are or are not transparent. Rather our interest is in the visual politics of *supposed* transparency being produced through these geovisual interfaces. Here, geovisual artefacts function as a sort of window through which an individual perceives other information or passes for further

(individually-tailored) exploration. The visual experience advanced through these new modes of representation is one in which the user is meant to develop knowledge by interacting with and exploring objects in the geovisualisation. This emphasis on *knowing through exploring* stands in contrast to the cartographic narrative approach that relies more upon a 'receive and believe' paradigm evident in a great deal of the GIS-based knowledge politics in which the map user is understood to receive meanings scripted in and through a particular geovisualisation.

The exploratory/interactive ways of knowing advanced through these new spatial media interfaces also stand in contrast to conventional GIS-based cartographies in their privileging of detail, directness and immediacy in visual representation, over abstraction and generalisation. In the interfaces offered by Ushahidi and Donor2Deed applications, as well as those built by KaBoom and CitySourced, individual acts, donations, projects or contributions of information are all discernible as discrete map objects – rather than being represented, for example, as summary counts of contributions in particular regions. In these hypergranular approaches to cartographic representation, the kinds of information linked to discrete map objects also emphasise directness and immediacy. Ushahidi implementations are specifically intended to gather and geovisualise eyewitness observations, as are the KaBoom and CitySourced applications. CitySourced implementations and the Dublin Simon Community's Donor2Deed interface emphasise immediacy and direct observation through the linking of photographs and video to map objects. Rather than, for example, examining a map showing the total number of severe potholes in various neighbourhoods, a CitySourced user may click on objects in the map interface to view photographs and other information associated with each individual pothole.

This design of geovisual interfaces around individual objects to which a near-infinite volume of additional textual and visual content may be associated designates an expanded role for cartography. While new spatial media are being used to create geovisual interfaces that are definitively cartographic, many do not deploy cartographic techniques in typical ways. Rather than relying upon cartographic abstraction to reduce the granularity of data or enable users to discern spatial patterns, conventional cartographic techniques such as categorisation, when they *are* used, are largely directed towards structuring interactive exploration of the map. In the Sudan Vote Monitor Ushahidi implementation, for instance, categorisation is a structuring device for visual exploration, so that a user can display on the map interface all objects that fit into a particular category, such as irregularities in the voting process, voter registration or campaigning

activities. In this manner, a cartographic technique such as categorisation becomes redirected not toward illustrating spatial pattern, but toward facilitating a highly individualised geovisual experience in which a user can explore, choose and direct how map objects and associated content are engaged. As a Glendale, California, official said of his city's use of CitySourced, '[w]e're trying to move in the direction of personalized public data' (ESRI 2010, np).

The NGO/activist engagements with new spatial media we consider here further constitute a fundamental resituating of epistemologies of expertise by way of the strategies used to advance the credibility or reliability of their information and representations. As noted earlier, a common approach in previous NGO applications of GIS (some of which self-identify as PPGIS) was to assert the credibility of information by representational and analytical approaches underscoring its mediation through digital technology, (cartographic) expertise and (scientific) objectivity. In contrast, with these new spatial media implementations, the pervasive emphasis upon transparency, directness and immediacy of the geovisual representations asserts credibility on the basis of direct observation and experience.¹² 'Expertise' still matters, but in a very different way than in these previous GIS-based efforts to suggest or evoke it. The notion of 'witnessing' rests upon the assumption that the credibility of the interactive geovisualisation, such as CitySourced's interface, is established by it being visually consumed by users.

Within the implementations considered here, another dominant basis for asserting the credibility of information is evidence of its verification, often generated through peer-based or crowdsourced mechanisms. Ushahidi implementations such as Sudan Vote Monitor or Tracking the Eastern Congo Conflict employ an automated *and* peer-based verification engine (SwiftRiver) to assign each data item a tag denoting it as verified or unverified. FracTracker includes user ratings and comments for data sets or geovisualisations, enabling users to make their own ratings and view those made by others. The service developers link these crowdsourced verification tools and validity reports to the credibility of information made available, arguing that they 'allow you to evaluate the trustworthiness of everything on the site yourself' (Rhiza Labs 2010, np). Staking the credibility of information upon its verification could be seen as an invoking of normative practices of science. Yet we would note that the actual practices of verification deployed in these examples depart from conventional expectations of vetting by experts or authorities. In FracTracker and KaBoom, the rating and assessment of user-contributed information is done by other users. These examples extend the proposition that

credible information is that which has been verified, yet they do so through practices of verification to rely upon Web-based peer and crowdsourced user rating/commenting functionalities.

Together, the preceding examples constitute a resituating of digital spatial knowledge politics that is produced through several key elements: a deployment of geovisual artifacts to structure a visual experience (rather than to narrate a set of pre-given spatial meanings); a prioritisation of individualised interactive/exploratory ways of knowing; hyper-granular, highly immediate, experiential cartographic representations that are de-coupled from conventional practices of cartographic abstraction; and approaches to asserting credibility that are based on witnessing, peer verification and transparency. This resituating of both scientific expertise and the role of the geovisual as advanced through new spatial media fosters a knowledge politics that rewrites some of the associations or characterisations around which the knowledge politics of GIS have been practised by many activist/NGO initiatives: the positioning of local knowledge, invocations of science/objectivity or disciplinary expertise, and deployments of the 'truth power' of visual artefacts. These knowledge politics have of course been deeply problematised, starting from trenchant critique of cartographic epistemologies and their equation with objectivity (Harley 1988 1989; Pickles 1995). Yet previous research on the use of GIS has demonstrated the presence of such epistemological strategies in many NGO encounters with GIS, and their effectiveness in advancing these groups' claims to knowledge and authority.

For example, in many cases, these GIS-based knowledge politics have been structured to respond to characterisations of 'local knowledge' as biased, idiosyncratic and insufficiently objective. Their geovisual and other knowledge practices followed in suit, trying to pre-empt these associations by aggregating and transforming experiential reports into quantifiable (i.e. 'scientific') measures and creating cartographies of spatial pattern and 'broader context' (Elwood 2002; McLafferty 2005). In contrast, in the new spatial media knowledge politics profiled here, 'local knowledge' occupies a seemingly privileged position, with phenomena directly seen or witnessed assumed to be reliable, current and 'true'. This is not to suggest that the exclusion of citizen information on the basis of purported bias or idiosyncrasy no longer occurs, but rather to highlight that new spatial media are being used to forward a different set of associations with experiential knowledge.

Further, in the new spatial media initiatives profiled here, we see an altered relationship between spatial knowledge politics and expertise evidenced in the decoupling of the map from traditional carto-

graphic rationalities. In GIS-based knowledge politics, maps have often been deployed as 'true' in part on the basis of their demonstrated insider-ness to the expert domain of cartography. That is, on the basis of having deployed the rules and practices of disciplinary cartography, the map was synecdoche for truth. Or, as a community organiser quoted in Elwood argued, when questioned about the veracity of his description of a community area, '[y]es, it's there. It's on the map' (2006b, 336). In contrast, the interactive map interfaces of the new spatial media implementations presented here are positioned as true on the basis of their transparency to direct observation and exploration, with transparency, as in the case of FracTracker, being a direct function of data sets being vetted by citizens, peers and site user through supported practices of crowdsourcing. For Donor2Deed, the use of interactive maps to draw users in and transform them into donors is motivated by the notion that the map interface makes the donation process itself more transparent. The ability of users to decide where their money goes is supposed to mobilise site users as initial and/or repeat donors (Cosgrove 2010). The map is still asserted as 'true' because it supports and enables visual epistemologies, but these visual epistemologies are no longer necessarily tightly coupled to or equated with disciplinary cartography rationalities. These spatial knowledge politics no longer rest upon the legitimating work that cartographic expertise affords to cartographic representations, nor do they co-implicate GIS as a harbinger of science (Brody 1982). Rather, the objective of using a map interface to structure a visual experience for users, as in the case of Donor2Deed, is premised in part upon a politics of transparency.

Conclusion

In sum, we have seen here a series of shifts that beget a new or different spatial (knowledge) politics. FracTracker emphasises the sharing of spatial data whose utility is established not only by its scientific value, but also by the vetting of other users. Ushahidi, as a geovisualisation platform, emphasises data integration and a politics of witnessing more so than scientific or officially authorised modes of legitimation. Donor2Deed is concerned with a politics of transparency rather than a cartographic accuracy. CitySourced prioritises crowdsourcing information from citizens over the geographic accuracy of any eventual representation. KaBoom's map mash-up engages citizens not on the basis of, for instance, constituting a statistically complete accounting of all play spaces across the US, but via its interactive affordances, which allow users to explore issues within their local context. Within these practices we see an epistemological resituating

of geovisualisation toward structuring individualised explorations, rendering hyper-granular cartographies that support interactive experiential over interpretive ways of knowing, and witnessing approaches to framing the authority or veracity of claims.

With respect to some of the broader societal implications of these shifts, we might interpret these developments as a waning of expert-produced scientific geovisualisation and a rise of the amateur. Yet as Crampton (2008) argues, the rise of new spatial media breaks down the notion of the amateur, for indeed, if the amateur can do the same thing as the expert, then they are no longer amateurs and the distinction ceases to be meaningful. We would argue this transformation may be better understood as a shift from the expert to the 'everyday' (Geersten 2010): the ascendance of location as a primary way of engaging the web and the increasing ubiquity of digital media with a spatial component suggests a comparative accessibility and ease of use to these technologies by non-experts in a wider range of everyday practices.

For NGOs, activists, community organisations and others, we argue that these transformations are significant in part because they signal a possible transition away from an expert–amateur binary and vocabulary being used to describe the public, civilian nature of new spatial media and their political opportunity structures. Yet a great deal of further research is needed to more fully interrogate how and with what impacts the new spatial media practices and knowledge politics discussed here are integrated (or not) within the negotiations, process and decisions that activist and civic engagement groups seek to influence. More research is needed to explore how and with what implications the transparency supposedly enabled through geovisual mechanisms is experienced by the users of new spatial media. Here, we have considered how this geovisual transparency is produced, and services providers' arguments about its purpose, but we did not test claims about the capacity of this transparency to foster mobilisation, action or experiential ways of knowing.

Further, a number of important questions remain with respect to documenting longer-term transformations. FracTracker's 'trust tools' for data verification and provenance are so new that at the time of writing, nearly all commenting and rating is from staff members, leaving open the question of who will engage these tools and how. CitySourced claims to allow citizens to track local governments' responses to reported problems, yet at present, the content of municipal government responses predominantly document only the handling of submitted data, not actions taken toward resolution of reported problems. For witnessing and monitoring implementations such as Ushahidi, further work is needed to assess whether and how citizen

reports are acted upon, and with what implications for political process, persecution and the host of other situations that Ushahidi implementations seek to transform. The actual uptake and impacts of local knowledge reported via interfaces such as CitySourced is critical. It is entirely possible that the valorisation of local knowledge voiced by public officials in regards to such applications amounts to channelling of citizens' involvement toward tightly bounded and carefully controlled forums.

The new spatial media knowledge politics we characterise here, and their core epistemological shifts, must be understood as deeply intertwined in the political-economic and institutional contexts of the types of organisations profiled here. The hardware, software and other digital capabilities of new spatial media are of course part of the story, but also deeply implicated are the material and discursive contexts in which NGOs, community-based organisations and civic engagement groups operate. In a context of declining funds, increasing competition between groups for resources and an emphasis on organisational entrepreneurialism, these organisations are under increasing pressure to document material impacts, illustrate exactly how resources are used, monitor measureable benchmarks and indicators and generate their own revenues (Martin 2004; McCann 2008). In this context it is unsurprising that NGOs are using geovisual media toward 'transparency' in the public gaze upon their activities and outcomes. Given the persistent prioritisation of quantitative/cartographic forms of measurement and representation, it remains critically important to ask how new spatial media are also being deployed in support of science-expert rationalities.

Finally, we must ask whether and how the new spatial media practices characterised here may be part of a transformation in the forms of action that individuals and social groups understand as constituting activism or engagement. The practices profiled here, in addition to being highly individualised and strongly oriented toward a virtual-digital experience, are frequently presented to the actor whose mobilisation is sought as easy or fast, emphasising how undemanding it will be to participate. As NGOs and civic engagement groups continue to adopt and launch new spatial media implementations at a dizzying pace, it is imperative to examine whether these practices emerge alongside other more collective and presumably demanding modes of engagement and action, or whether they signal a decline in these modes of political and social practice.

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Notes

- 1 An example is that of Sukey, the anti-kettling social media application that presented UK activists protesting austerity measures in 2011 with a crowdsourced map-based interface displaying real-time locations of police action and presence (blockades, disbanding of protest action, etc.). Demonstrators both contribute to and see crowdsourced points and routes of passage through blocked-off areas of the city.
- 2 See <http://donor2deed.com> Accessed 15 March 2011
- 3 Dublin Simon Community is an Irish NGO that provides a range of programs and services for homeless individuals; <http://www.dubsimon.ie/d2d.aspx> Accessed 15 March 2011
- 4 See <http://www.usahidi.com/> Accessed 15 March 2011
- 5 See <http://kaboom.org/> Accessed 15 March 2011
- 6 See <http://www.fractracker.org/> Accessed 15 March 2011
- 7 See <http://www.citysourced.com/default.aspx> Accessed 15 March 2011
- 8 Environmental Systems Research Institute, the vendors of ArcGIS software.
- 9 The reports feed does not appear to be used by all municipalities that use CitySourced, and the degree of detail offered by those who do use it varies widely. For most of the cities we examined, the reports feed details of the handling of a submitted data item (i.e. 'report received', 'forwarded to relevant department'), with only a few cities providing information about material actions related to a reported problem.
- 10 Data clearinghouses by their very nature involve the compilation of data sets from multiple contributors. FracTracker differs from conventional clearinghouses in that it includes data from institutional sources and lay contributors, as well as derived data sets produced through further integration or analysis by any FracTracker participant.
- 11 The sort of interactivity we consider here is different from that implied in MacEachren's (1994) geovisualisation 'cube'. His original discussion emphasises user interactivity with data in the production of cartographic representations, and the interpretive insights a cartographer can derive from such interactions. Our focus is on the use of digital spatial media interfaces to structure interactions between organisations/initiatives and their audiences/site users.
- 12 This is not to suggest that the affinity between cartographic expertise, spatial technology and legitimation no longer persists; see, for example, Radcliffe (2009) on the continued reliance upon computerised cartographic techniques as a basis for legitimating contemporary practices of modern statecraft.

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