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Mapping Risk: Geospatial Technology as Disaster Media

DISSERTATION

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by

Laura Beltz Imaoka

Dissertation Committee:
Professor Peter O. Krapp, Chair
Associate Professor Victoria E. Johnson
Professor Patricia Seed

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CURRICULUM VITAE

Laura Beltz Imaoka

2003	B.A. in Anthropology and Art History, University of California, Santa Barbara
2006	Teaching Assistant, Anthropology, California State University, Northridge
2007	Undergraduate Student Advisor, Anthropology, California State University, Northridge
2007	M.A. in Anthropology, California State University, Northridge
2008-2009	Student Services Coordinator, Temple University, Japan Campus
2011-16	Teaching Assistant, University of California, Irvine
2016	Ph.D. in Visual Studies, University of California, Irvine

FIELD OF STUDY

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PUBLICATIONS

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ABSTRACT OF THE DISSERTATION

Mapping Risk: Geospatial Technology as Disaster Media

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Laura Beltz Imaoka

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Professor Peter O. Krapp, Chair

Mapping Risk situates geospatial technologies in a long line of media composing an evolving (nuclear) imagination of disaster while unpacking the assumptions of a field of knowledge that position them as risk managing technologies *par excellence.* It considers how spatial technology acts in the "risk society" as a visual cultural media practice. That is, as a technology of risk production and risk management within the context of ordinary everydayness and catastrophic extraordinariness. Threads of inquiry include unpacking the social and economic evaluation and subsequent branding practices of geospatial technology by practitioners and commercial suppliers to show how these tools are positioned as systematic means to see and manage the world. It then follows these assumptions into spheres of media practice. First, it examines the applications of geospatial technologies by news media outlets and social media networks during past large-scale disasters and ongoing cases of risk. The local and globally produced and circulated geodata, visuals, and social and mass media narratives of radiation risk emanating from the 2011 Fukushima Nuclear Power Station disaster provide the main case study. Lastly, it

considers the viability of the geographic web for disaster capitalistic ventures by examining spatial media in the sphere of digital humanitarian and for-profit practice. It looks at Japan's tourism industry's collaborations with Google Corporation following the triple disaster, reading the location-based "content" deployed with the purpose to return international travelers to the nation and instill national pride in Japanese citizens dealing with the disaster's effects.

INTRODUCTION

From Google Maps on Facebook profile pages, Bing mapped traffic reports on the local morning news, to smart phone applications using location data to meet marketplace needs, location data, digital maps, and the geographic information systems (GIS) that construct them are inundating society's electronic screens and devices. Convergence with open source collaborative tools, geotagging possibilities on social media, and location-aware mobile technologies are changing how and when we consume, communicate, and interact with information about the Earth's surface and our everyday environment. More than mere tools, today's maps represent a set of "cultural technologies" that evolved over centuries of practices that produced space, place, geography, territory and the political identities of its inhabitants (Pickles 1991; 1995). The term cultural technology importantly situates newer mapping technologies within the strategies of neoliberal governance. That is, geospatial technologies work by "working outside 'public powers,' governmentalizes by presenting individuals and populations as objects of assessment and intervention, and by soliciting their participation in the cultivation of particular habits, ethics, behaviors, and skills" (Ouellette and Hay 2008, 13). The latter are newer applications of maps in which technological change expanded applications, turning mapmaking and spatial data collecting from the exclusive hands of governments and experts to become part of everyday practice.

The functional purpose of geospatial technology is providing data and tools to users to locate, evaluate, present or use for various means. Map utility harks back to the history of the computer map, which came into functional existence in the 1950s for mapping census data and land use. In 1964 came the first geographic information system (GIS), broadly defined as a computerized system of a wide range of information that becomes

geographic by its association with a set of locations. A decade later, increased data storage and the use of video terminals offered cartographers a chance to interact and experiment with temporary arrangements (Wikle 1991, 37). Then thirty years later, the first online mapping service came into existence. Mapquest was introduced in 1996, just two years after the release of the easy-to-use Netscape Browser. MapQuest initiated what was later celebrated as the "democratization" of maps by allowing non-cartographers to access, compare, and interact with maps and perform personal mapping activities, many of which were never in practice before.

In a relative short span of time, mapping practices and a map's basic utility for the average person changed. Other technologies such as GPS made it possible to determine one's position accurately. Internet geocoding services such as Google Maps and OpenStreetMap gave citizens the ability to make maps from their data and apply different cartographic design skills, which were practices only ever performed by professional cartographers. And possibilities expanded with Google Maps, which launched in February of 2005, and overtook Mapquest in April 2009 to become the world's most used mapping website (Strom 2011). Similar to other online mapping sites such as Yahoo Maps, Google Maps added innovations such as the use of the Telcontar platform system that provided interactive features such as "drag-to-scroll," shadowed push pins, cleaner images, and hybrid views that combined both satellite and aerial imagery.

Virtual globes such as the Google Earth platform also transformed the types of online mapping and data tools available free to end-users, resulting in new forms of cultural productions. Google Earth is a "free" downloadable service with Keyhole Markup

Language (KML), which allows users to manipulate and add data to the viewer.[1] It is free in the sense that it is free to browse, with no upfront cost of data or specialized software, but it is paid for by advertisements streamed to the user's interface by private-sector actors. It builds on earlier geospatial projects such as GIS, Terraserver, and Digital Earth, which all presented the globe as a patchwork set of satellite and aerial images acquired from different sources and different times. The end-user is encouraged to "fly" around and explore the planet as a "collaboratively produced" digital domain (Parks 2009, 536). The exploring function facilitates "play," and users might derive pleasure from engaging in virtual tourism, place-based voyeurism, browsing image space, or creatively making their own "mashup" of location information.[2]

User interactions go further than a click and search utility with these sites. Google's widely disseminated, open source application programming interface (API) gives users the ability to transfer information into their own map mashups and to embed those maps into third-party websites. Marking-up maps, Internet geocoding applications, combined with social media uses of the web gave individuals a means to use maps to tell alternate narratives and world-views. Social networking, such as with the Bulletin Board System (BBS) integrated into early versions of Google Earth, allowed users as members of the Google Earth Community to post placemarks with information about specific locations for

[1] In 2004, Google Corporation acquired and repurposed Keyhole Incorporated's mapping interface in 2004. Keyhole Inc. was small software company that developed GIS and other technologies for graphic visualizations of geospatial data. The company gained publicity during the U.S. led invasion of Iraq by providing news networks 3D reproductions of the "shock and awe" campaign in Baghdad (Strom 2011). Before being acquired by Google, the company launched a venture capital project with the CIA called In-Q-Tel. It is assumed that these homeland security and defense contracts were acquired by Google in the handover. Keyhole was an easy-to-use software program that combined a multi-terabyte database of geodata and images collected from satellites and airplanes. The "Keyhole Earth Viewer" ran as a subscription-only service and when acquired by Google become known as the popular geographic exploration tool, Google Earth.

[2] The *Encyclopedia of GIS* defines a mashup as "an online application or website that seamlessly combines content from several sources. GIS mashups typically combine spatial data and maps from several web sources to produce composite thematic maps" (Shekar 2008, 408).

any user to see. Members could create "overlays" that replace or augment existing maps, or leave comments on other people's creations. User engagements resulted in a broad range of cultural productions, including engaged responses to global crises and disasters.

These diverse user interactions hold varying degrees of economic, political, and cultural potential. In a wider scope of consideration of Google Earth, geographers Stephen R. J. Sheppard and Petr Cizek (2009) questioned whether the ability to “see” other places will lead to a cultural paradigm shift similar to the one attributed to “Earthrise,” the first photograph taken of the earth from space by the Apollo 8 astronauts on December 24, 1968. Sheppard and Cizek argued Google Earth will either shrink the world, or conversely, the novelty of virtual globes will dissipate after a few uses, leaving primary its mundane and utilitarian role. As historical precedent, Earthrise alludes to the status of the contemporary moment's "geographic imagination," which Denis Cosgrove (2008) called a "totalizing socio-environmental discourse of One-world and Whole earth" (271). Earthrise, depicting the earth rising over the lunar landscape, became the iconic image for that era’s social and political movements, and in particular the environmental movement. Along with 22/27 taken in 1972, which depicts the whole earth from space, it fed into the postwar impulse to imagine the world as cohesive global space as well as a discrete unit. Ideologically, it exemplifies a “tightly-interwoven relationship between the material and the symbolic” (Boczkowski and Lievrouw 2007, 967).

Similar to Earthrise, Google Earth places user's at about 16,000 miles above the earth’s surface but does so by compiling satellite imagery and aerial photography into a 3D virtual globe. The satellite image is positioned as the “entry point or gateway to closer views,” as users are encouraged to zoom through and bypass satellite imagery as opposed

to scrutinizing it (Parks 2009, 538). The effect, both in the famous photograph and Google Earth, is to downplay continental particularities. The world appears cohesive and borderless, as "an earth liberated from cultural consciousness and apparently at liberty to clothe itself anew in the natural hues of water, earth, and the softest veils of atmosphere" (Cosgrove 1994, 278). It heightens the concept of a “global presence” that stems from a longer history of visually representing the world as a unitary, regular body or spherical form (Cosgrove 2001, ix) and a longer prehistory of rendering nature as comprehensive totality (Williams 1980).

However, unlike photographs from space, maps are not without borders. The Western imperial history of visualizing a complete and conquerable globality constructed by the drawing lines and bounding of objects on its surface started with Renaissance cartography, early aerial photography in the 19th century, and the image of the globe as an emblem of empire in the early 20th century (Louis Pratt 1992; Cosgrove 1994).[3] The fundamentally geographic and spatial act of mapping is where the logos of Western thought was founded (Pickles 2004, 3). Seeing as well as acting and understanding the world has been an ongoing project of the universal science of mapping and cartography, where the historical and contextual claims of science privileged the map as a source of objective reason. Today’s maps carry this legacy of Western historical practice and a Cartesian-scientific worldview, casting them as trusted communicators of spatial information. That is, maps retain a neutral and objective status, capturing and portraying relevant information that the map reader can interpret and analyze (Kitchin and Dodge

[3] Google Maps uses a version of the famous Mercator projection, which, as all maps that attempt to flatten the three-dimensional earth onto a two-dimensional surface, distorted visual actualities for the benefit of sixteenth century navigation (Monmonier 1996). Despite radically altering the earth near the poles, expanding the represented size of the Global North as compared to the Tropical Global South, this projection became instrumental in Western empire building and remains the dominant image of the world (Strom 2011; Farman 2010, 878).

2007). Maps became constitutive of a rationality of security, authenticity-as-identity, and a confessionalized truth of the landscape that serves political ends and maintains existing power structures (Monmonier, 1991; Crampton 2003b, 174; Zook and Graham 2007, 472). Arguably, increasing technological functions and visual imagery further render invisible the infrastructures behind a map's creation.

Computer-assisted information storage and retrieval, graphic displays, and digital means of communication, move maps beyond the traditional communicative constraints of printed paper, but maintain and reinforce the fixed objectivity of the map itself. The integration of cartography and satellite and aerial imagery induces a heightened sense of pictorial realism and naturalism of the defined territory where the predominantly vertical, planar view of the world becomes more spatially consistent between visual signs and ground features (Curry 1998, 18; Goodchild 2000, 349). Satellite imagery appears to see more of the world with greater informational depth and a fuller view of space. At the same time, satellites provide the same evidential and mimetic qualities as photographic technologies such as still photography and landscape painting, capturing extensive geographic vistas in a single frame while shaping and defining what can be seen and what is out of view (Mirzoeff 1999, 37).

Adding Internet media makes these assumptions increasingly individualized and customized. In 2014, Google unveiled the idea of infinitely customizable maps that are dependent on your location, your tastes, which includes politics and purchasing patterns, your friends and their tastes, and your Web and click history, calling it "A map for every person and place" (Badger 2014). This makes internet portals such as Google Maps and Google Earth that encourage informational play uniquely powerful. As Jason Farman

(2010) noted, “by accepting the map as reality, the viewer enters into a partnership with the map’s author over the hegemonic assumptions such a visual representation makes” (878). For instance, a Google map of Crimea, a territory simultaneously claimed by Russia and Ukraine, is different depending on the user’s location. A user in Russia sees a map defining Crimea as part of their nation. In the U.S. and Ukraine, a dotted line shows a disputed border (Badger 2014). Maps both reflect and negate a geography in conflict.

Maps act as image-interfaces and image-instruments, and as Internet portals extend the utility and potential of the user's visual imagination. The increased access to easy-to-use mapping technologies, increasing applications in government, news, entertainment, and public discourse, and an inclined reliance on mapping by the average person threatens to produce shakier ontologies and a more individualized and volatile sense of an already falsified picture of reality. Lev Manovich (2001) situated the map into the prehistory of the society of the screen, arguing that it problematically rendered invisible the processing of information that produces these instrumental illusions. When Manovich called the computer the "new digital illusion generators" (2001, 178), he detailed what Bruno Latour (1986) mused prior about the map: "One cannot smell or hear or touch Sakhalin Island, but you can look at a map and determine at which bearing you will see the land when you send the next fleet” (8). In the same vein, GIS has been called "geographic illusion systems" (Couclelis 1996), the electronic version of Plato’s cave (Sui and Goodchild 2003, 22), or what Thomas de Zengotita (2005) an "environment of representations," destabilizing the view of fiction and reality. Concern is that information communication technologies with real-time capabilities blur the concrete with the virtual, while the increasing speed of life "causes the ties that bind us to the old, to the traditional and to the known, to easily slip

their moorings" (Hassan 2009, 13). Image-instruments such as maps arguably trap us into particular modes of knowing, and distance us from the world and its problems (Sui and Goodchild 2003, 13; Curry 1998).

This notion, however, negates the increasing role of open-source mapping platforms in the political project of finding one's place in the world, and its role as a site for political struggle. A photograph such as Earthrise became the iconic image of the 1960s, helping instigate an environmental movement that unlike other political movements at the time was supported by a wide cross-section of Americans, even leading a right-leaning political system and President Nixon to found the Environmental Protection Agency (EPA). Similarly, today virtual globes and digital mapping platforms act as conduits for smaller scale and increasingly diverse geopolitical agendas. Maps and their affordances as media construct "contested terrains," or key instruments of political power and a means through which individuals appropriate a map's truth power to scrutinize official categories and the power relations involved in their social construction and maintenance (Kellner 2009, 102).

Critical geographers only recently acknowledged that geographic information systems are media and attempted to historicize it within the technological present (Sui and Godchild 2011). Research on GIS, remote sensing, and spatial analysis software shifted to that of social networking and user-generated web content with studies that gauged the credibility of volunteered data contributions (Crampton 2008; Flanagin and Metzger 2008; Goodchild 2009; Haklay 2010), forged distinctions between publically available mapping platforms such as OpenStreetMap and Google Earth (Crampton 2008, 2009; Haklay et al. 2008; Miller 2006; Sui 2008), and examined the subjectivities that participation in these frameworks enabled or constrained (Budhathoki et al. 2008; Crampton 2008; Sui 2008).

This project does not reproduce research in that field but strives towards a more comprehensive political economy of geospatial technologies and the complex system of shifted relations between the state, the economy, social institutions, practices, culture, and organizations it reflects. It explores how the hype and subsequent practice of visually representing a natural phenomenon such as a disaster, materializes the political debates, cultural (mis)conceptions, technological potential, and social and economic networks of a growing geospatial industry in which monopolies over commercial and business spatial applications displays an oligopolistic system of control similar to the media industry (Bagdikian 2004; McChesney 2004).

Chapter one starts to unpack the organizations running the geospatial industry, exmaining the struggles and strategies to monetize the diversification of information flows in the digital economy. It takes as a case study the brand and branding practices of Esri, the world's largest geospatial innovation company. Brands articulate a corporation's desirable attributes, encompassing often problematic technological fantasies and grand claims, while branding practices are mediated processes of communication and autonomous acts of interaction among employees, clients, and consumers that enhance the productivity and potential of proliferating those rhetorical visions beyond company doors (see Jameson 1991; Harvey 1990; Lury 2004; Sturken and Cartwright 2006). Branding offers insight into the technological fantasies and grand claims selling geospatial technologies and assuaging mass acceptance of its use, which in the end, melds the symbolic with the material.

Analysis of Esri's brand is grounded within the context of the material, symbolic, and representational practices of the company and geospatial practitioners at Esri's 2014 and 2015 User Conferences. A cultural-industrial method of analysis is applied to the trade

artifacts, staff presentations, keynote speakers, and activities found while in attendance. A cultural-industrial method of analysis is a cultural studies approach informed by the interpretive anthropology of Clifford Geertz. It considers cultural forms such as texts not in terms of “social mechanics,” or having a direct social function, but in terms of “social semantics,” or "imaginative works built out of social materials” (Caldwell 2008, 5). Esri, the imagined community of geospatial practitioners, and by extension the geospatial technology industry, help package the empowering promises of marketplace democracy and the hyped notions of interactivity. When unpacked, it offers insight into the neoliberal power structures at play in selling geospatial products, services, and agendas.

At the same time, this project is critical of user acceptance and the ways ideology helps perpetuate the applications of mapping in society. Martin Heidegger (1977) argued that the essence of technology is not technological, but a relationship that blinds humanity to alternative ways of understanding. Ideas and beliefs are shaped by technological practices, and the institutions which mediate them. Technologies enhance human capabilities, and in the case of visual technologies, become central to our ability to see and experience the world. And as Heidegger warned, "The will to mastery becomes all the more urgent the more technology threatens to slip from human control” (1977, 289). Maps are mediums or channels of both communication and spatial representation, the potential of which is elaborately hyped by the branding of the geospatial industry. This project investigates both the hype and the transfer of information and the chain of practices and processes involved in the gathering of geospatial data, the ordering of geographic facts, and the creation of imaginative geographies.

Chapter two examines the 2011 Fukushima Nuclear Power Station (NPS) disaster to show not only a precarious technology such as nuclear power on the verge of slipping from our control, but how maps cannot protect or inform the public of risk as the industry promises. The case study follows the mass media and social media vectors that visualized, dramatized, and normalized official and unofficial information on radiation risk within media discourses in two national affective spheres, Japan and the United States. Spatial media made environmental risks of nuclear radiation visible, producing a forum for necessary public conversations. However, Fukushima's accompanying information disaster placed unjustified expectations on individuals to confidently assess source credibility, thus limiting the potential for sustained political critique and social change.

Using a cultural industry studies method of analysis, this project takes into account technological convergence, growth, and global scales of exchange alongside an analysis of shifting media texts, histories, audiences, and culture. Cultural industry studies is a combination of cultural studies and the political economy, interested in how cultural power is produced and reproduced, as well as mediated and consumed throughout the process of making and interpreting texts (Holt and Perren 2009, 8). Through the centuries, maps as texts held an intimate relationship to oral stories. Blank spots on cartographer's base maps were often filled in with stories from travelers and explorers. Individuals adorned maps with personal anecdotes and symbols to make meanings of the boundaries within which they lived (Caquard 2013, 136). Infographics, which include maps, charts, and graphs, are another precedent existing before the Gutenberg printing press. The first infographic in newspapers appeared one hundred years after the first newspaper, when *The Daily Courant* published the first woodblock map depicting the invasion of the Bay of Cádiz in

Spain in 1702. Infographics continue to complement the text but at times stand alone to produce a story. As media, maps mix with other forms of media content to produce new meanings and understandings. This project reads maps in their media context; that is, on television news broadcasts, online social media sights, and through smart phone applications. Reading disaster maps as media produces a broader view of a disaster's narrative and the narrative of the technology itself.

Technological fantasies and grand claims of technologies do not stand on promotional material of the industry alone, but are influenced by representations and potentials expressed in other forms of media, including film. Early practitioners of cinema imagined the possibilities of revealing visibility, or turning the invisible visible. For instance, kinetograph experiments magnified insects, turning an invisible part of daily life into "a nightmarish display of monstrosity" (Lippit 2005, 63). X-ray images that see the flesh transgressed also became morbid Victorian fascinations. Arguably, geospatial technologies follow a long line of "vision machines, apparatuses, techniques, and technologies already dismantling the visible world" (Lippit 2005, 156). At the same time, nightmares of machine vision were swept into narratives that when unpacked, reflect ideologies of man vis-à-vis the machine. Disaster cinema discussed in this project including such popular cinema as *Twister* (Jan de Bont, 1996), *The China Syndrome* (James Bridges, 1979) and the *Godzilla* franchise offer interpretive lenses into an evolving "imagination of disaster" (Sontag 1965), and in particular, the possibility for media and technologies to reflect world-wide anxieties while also serving to minimize them. Michael Ryan and Douglas Kellner note,

> The metaphor of catastrophe in such films permits anxieties to be avoided in their real form, but metaphor is itself a kind of aesthetic/psychological defense against threats to

> social ideals, a therapeutic turning away. It is through a deciphering of the metaphors by asking what they turn away from, therefore, that those symptomatically absent sources of anxiety can be deduced (1988, 51).

In these films, anxiety is often assuaged intertextually through narrative tropes such as the hero protagonist who takes control and commands technology to aid his or her survival. These ideologies are strikingly similar to the hype found in geospatial technology industry's branding, which hails the everyday individual as an essential component of a heterogeneous, interconnected network of technology and data, and a community of organizations presumed to be working for their benefit. This strong rhetoric of user empowerment validates products and services of corporations such as Esri, and encourages software to be chosen not for efficiency, but for the immaterial value and influential alliances constructed around it. The false sense of user empowerment given to technology during moments of crisis is backed by a larger ideological schema in media representations and industry branding.

Chapter three takes a closer look at spatial media content that is specific to the devices and information that creates or constitutes the "geoweb." The geoweb initially referred to spatially-referenced web content and the use of organizing the Internet with geographical information (Scharl and Tochterman 2007). Now it is used to reference newer forms of spatial data, practices, and hardware and/or software that facilitate creating and interacting with location-based content on the web (Elwood and Leszyzynski 2011). This includes crowdsourced geographic data, or volunteered geographic information (Goodchild 2007).[4] Researchers often distinguish spatial media from the geoweb in order to examine

[4] Volunteered geographic information or VGI is similar to crowdsourcing and holds the same popular conception that groups can solve problems more efficiently than experts and that information obtained from a crowd of several observers is closer to the truth than information obtained from a single observer (Howe 2008). Wikipedia is often cited as an example. In terms of

how these devices and information are being deployed in practice to secure, legitimate, or negotiate political claims (Elwood and Leszyzynski 2012, 545). For instance, research examining specific community initiatives and outputs of NGOs, social groups, and community organizations which use open-source spatial media platforms to influence social or political change. Often these micro-studies reiterate problematic utopian narratives about the democratizing effects of geospatial technologies (Haklay 2013; Leszczynski 2014). In chapter three, I instead put representation, knowledge production, and politics to bear on these developments to show the geoweb's commercial efficiency within the digital humanitarian and disaster capitalism context. The case studies examined include Google's spatial media campaigns and collaborations with Japan's tourism industry following Japan's March 11th, 2011 triple disaster. It argues that capitalist commercial interests intervene and align with humanitarian causes, complicating the political potential of these tools while extending the imaginative possibilities of their representations.

Understanding maps as media, or channels of communication that make meaningful spatial representations, and as meaningful things in their own right, makes visible the pervasive set of technologies, activities, relations, and ideologies in an era in which industries are struggling and strategizing to monetize the diversification of information flows in the digital economy. Examining mapping practices in different spheres of practice such as practitioners in the geospatial industry, scientific researchers, news journalist and amateur cartographers and citizen scientists, opens up the disjuncture between world-saving ideology and everyday practice. That is, as media, maps embed, transform, and make

geodata, traditional mapping agencies follow procedures to guarantee uniform quality of data, while crowdsourced data lacks a similar guarantee of accuracy. The context of the use of crowdsourced data becomes increasingly relevant if a quick response to act is needed. Governmental agencies and NGOs use VGI to aid emergency response during an evacuation for instance, even though unverified information can be detrimental (Goodchild 2007).

accessible data and symbolic content, but also as media they produce knowledge in specific ways and with specific categories that have real world effects. This project's goal is to map how the map works *as* and *in* media to temper grand claims and render visible the cultural power structures behind the sale and use of mapping products and services. It strives to question and address the societal impacts maps have on knowledge-making practices within the context of ordinary everydayness and catastrophic extraordinariness, especially amid a period of rapid growth and policy changes that are defining our digital and spatial lives. Lastly, I hope to show how our engagement with maps is an interaction with an unstable, power-ridden spatial environment, and with an evolving spatial imagination (of disaster).

CHAPTER 1: BRANDING GEOSPATIAL TECHNOLOGY

Location-based tools and technologies developed and deployed by the geospatial services industry continue to proliferate into diverse sectors in society. Individuals use maps to find a local vegan restaurant on Yelp and the driving directions to it, to figure out the most crime-free neighborhood to buy a home or rent an apartment, or if their area has a high pollen count during allergy season. A geospatial services ecosystem of data providers, location-enabled device manufacturers, app creators, satellite and aerial imagery services, experts, and so on enable this transmission of utilitarian information, but not only quotidian uses monopolize these services. The federal government and industries such as telecommunications, utilities, transportation, and education also use mapping technologies in their own management and decision-making practice. The government uses spatial analysis software in homeland security activities. During disasters, digital maps are deployed with the aid of satellite and aerial imagery to direct supplies, guide recovery, and

communicate spatial awareness of risk. In business, a commercial industry might use mapping to analyze how a company program is situated within and interacts with the social, economic, educational, and political structures that are embedded in those communities. Before the global coffeehouse chain Starbucks opens another store, it uses a geographic information system to decide whether that location is indeed a profitable place to do so, even if it sits on a corner right next to another one.

These multiple applications make mapping technologies and location data a powerful commodity and global economic force. The United States Department of Labor lists "geospatial technology" as a "high-growth industry," a title that reflects both the increasing relevance of location-based services and geo-referenced decision-making in institutional and government sectors, and the growing ubiquity and use of geodata and everyday spatial mapping practices in the public via the commercial sector. While still relatively young, geospatial services' impact on the U.S. economy is projected in the billions (Henttu, Izaret, Potere 2012). With the millions of connected consumers in the U.S. and all of them accessing geospatial information on their computers, mobile phones, tablets and GPS devices, corporations swiftly acknowledged the profit-making potential of linking business, consumer information, and geographically correlated information. The geospatial industry's adoption of HTML 5 as a preferred technology for online mapping, along with open-source and cloud-based geographic information systems also expanded the possibilities and profitability of these connections.

Scholars working in critical geography started to consider the social political implications of the newer forms of geospatial data production by users, but left unconsidered the commercialization of geospatial services and the business models that

drive spatial practice. Of the confluence of factors that contribute to a technology's success or failure, this chapter takes as its focus the *visual* material and *discursive* strategies that the geospatial technology industry uses to market its software and services. In popular media discourse, growth predictions are sutured to utopian ideals, salutary hopes, and technological promises, which typically accompany the rise of newer technologies. Geospatial technologies are being pitted as the solutions to overlapping and ongoing global challenges such as large-scale disasters, climate change, the shortage of sweet water, low-carbon emissions, the sustainability of food and sources of energy, and to kick start the stagnant economy.

Marketed technological fantasies hold a great deal of variety. Some reflect a *utopian* outlook, a means to perfect society's ills, and/or *functional* positioning, purporting to fulfill a social need. They are *contradictory,* where rhetorical boundaries are flexible enough to befit promotion in diverse sectors of society, and *selective* where certain aspects of the technology's history are highlighted and technical details neglected to highlight desirable goals (Geels and Smit 2000). Industry uses fantastical promises to promote and entice enterprise customers to invest in its technology, and to ease the adoption of its use by the everyday user. Rhetorical fantasies also attract political and financial support, relieve tensions from contested public discourse over the technology's use and abuse as it arises, push aside considerations of alternative and competing solutions, and disavow corporate responsibility related to adverse societal effects which could happen during the technology's deployment.

To unpack the geospatial technology industry's discursive material strategies, I apply a cultural-industrial method of analysis utilized by John Caldwell (2008) to

understand the identity-making enterprise of the Los Angeles-based film and television industry, staking a claim that the geospatial industry is also an image-making enterprise. This chapter takes as its object the global frontrunner of traditional geospatial information systems and proprietary software and services, the Redlands, California-based company Environmental Systems and Research Institute (Esri). Esri started in 1969 with 1,100 USD and turned a profit for over 40 years to grow to its current annual revenue of over 1 billion USD. Its software and services are used in diverse sectors such as scientific research, environmental protection, community resilience following large-scale disasters, police use for crime prevention, K-12 education, and commercial business. The company's annual user conference provides a focused case study to open up on the broader functional, utopian, selective and contradictory technological fantasies driving geospatial data and the technology. I argue these ideological devices are firmly situated in the material, symbolic, and representational branding practices that constitute the "imagined geospatial community" of Esri employees, investors, practitioners, and user-consumers. In particular, Esri's promotion and validation of the human dimensions of its tools and services seeks to validate the prescribed role of the individual user-consumer, while hyping its life-saving potentials further entices investment by the enterprise customers that matter.

BRANDING GEOGRAPHY

Since 2006, the term "neogeography" (Turner 2006) emphasizing "newness," framed the growing interest and proliferation of Web-based geographical information technologies and the mass ubiquity and commercialization of mapping practices outside expert communities. Newness arguably is a top-down discursive strategy and driving force behind the mass adoption of geospatial technologies in the commercial sphere and in

relation, the legitimization and acceptance of associated "big data" and open data practices throughout different sectors of society. According to geographer Agnieszka Leszczynski (2014), newness as a discourse has long been "operationalized as a means of engaging and (re)presenting emergent spatial information technologies, content forms, and praxes in ways that promote and preserve specific interests (capital, technoscience) with vested stakes in the propagation of these technologies" (2014, 62). Discursively, newness offered media industries such as Apple and Google an easy way to justify why the operation of their consumer technologies resulted in social data practices that, for example, infringed on the privacy of users. Suspect practices could be subsumed under inevitable outcomes of technological progress, where a "technologically defeatist" logic "overcodes our abilities to affect or control it, its progress, or its societal effects" (Leszczynski 2014, 70). The resulting dehistoricization and depoliticization, Leszczynski argued, helps sustain profitability for stakeholders and further disavows the social actors involved in the technology's design and dissemination.

Discursive newness, however, is not specific to geospatial technologies or novel to media technologies, and instead speaks to a continued hold of technological determinist claims on the public imagination (Heidegger 1977; Smith 1994; Gitelman and Pingree 2003; Gitelman 2006). Discourse, or "the discursive practices which represent the particular modes that 'discourses' become embedded within organization structures and practices" (Atkinson 1999, 59), also does not fully encapsulate the visually rich meaning-making practices designed to encourage the mass adoption and acceptance of a tool or service. Rather discourse, both in the visual material and practice sense, composes a company's brand. Branding emerged as the chief means of marketing identity in the age of

digital convergence. Studying the brand of the world's largest geospatial software and development company, Esri, I argue, will provide a more historically specific and institutionally precise view of how technological fantasies help drive the strategies of corporations to maintain the profitability and proliferation of its products and services.

Once only a minor device of managerial control, brands grew to become the most valuable component of corporations. Brands are considered an "intangible asset" or "crystallized knowledge" in the sense that they are powerful ideological devices that can be used to establish networked relations among important stakeholders. That is, brands "act" in the world and produce material effects (Arvidsson 2006). Even charitable gestures such as Esri offering its proprietary software free to emergent grassroots organizations to aid emergency crews during rescue and recovery in the aftermath of a devastating disaster, is a branding practice. The gesture of giving humanitarian aid enacts associated functional and utopian technological fantasies, and creates a narrative that can be used in public relation campaigns to build the corporation's reputation among target communities. The average person who reads a news report that mentions an instrumental application of spatial technologies, and if it states specifically the software was donated by Esri or contains maps as visuals with Esri's branded logo stamped upon it, cues understandings of that technology's potential to do public good and links it back to a corporation.

More positive interactions lead to more positive associations which lead to increases in capital. A company’s brand management seeks to imbue the technology with an ethical value or surplus. This constructed valorized potential, or what I call geospatial technology's "ethical imperative" to improve humanity’s ability to see and save the world, helps position GIS as a disaster managing technology *par excellence*. It is the means to

ideologically invest geospatial data, technologies, and content with value, which are then exchanged in relations among enterprise customers and user-consumers of the technology. A brand includes the clusters of ideas and images, the "immaterial labor" of salaried members of an organization, and the "free labor" practices of networked users and consumers to extend those visions into both the physical and digital public sphere (Lazzarato 1997; Terranova 2004). The immaterial labor and knowledge work undertaken in these socio-spatial-technical relations both direct and construct the desirable qualities of the brand, where value is based both on the quality of relations rather than quantity (Lazzarato 1997; Lury 2004; Arvidsson 2006, 131). Branding practices also aid the industry in building a collective identity among a community, which I discuss below as the "imagined geospatial community." Brands are what turn technological fantasies into strategic practice, extending beyond discursively operationalized "newness" to depoliticize and domesticate the technology.

While newness played a part in the technology's mass adoption, it does less to explain how it continues to sustain profits. In 2006, Di-Ann Eisner of the now defunct Platial.com that coined the neologism "neogeography." Platial.com was a free resource atlas where users could build maps for their personal use on websites and blogs, and collaborate with others to make map mashups. Distinct from "geography," the term neogeography encapsulated both the novel practices of mapmakers who had no formal cartographic training, and a growing set of Web-based geographic information technologies. These technologies included virtual globes such as Google Earth, large-scale crowdsourcing of geographic information or spatial wiki mapping initiatives such as OpenStreetMap, and public mapping application interfaces (APIs) that allowed individuals to generate and

disseminate their own maps (Eisner and Wilson 2006). Andrew Turner, who years later became the Chief Technology Officer of Esri Research and Development, would more formally standardize the term neogeography in his *Introduction to Neogeography* (2006). Neogeography encompassed all "digital spatial media" practices that superseded or broke with conventional GIS tools and practices and those that served the single needs of professional users (Sui and Goodchild 2003, 7).

Since neogeography's coining, other monikers for this phenomenon also joined in as explanations of this mapping phenomenon. These included "volunteered geographic information" or VGI (Goodchild 2007), "ubiquitous cartography" (Gartner et al. 2007), the "geospatial web" or "geoweb" (Scharl and Tochtermann 2007), the "wikification" of GIS (Sui 2008), GeoWikis (Guptill 2007), and new "spatial media" (Crampton 2009). This project uses the term geospatial technology and spatial media to represent what in the last decade became the present diversification and expansion of digital, networked spatial information technologies and resulting materialities in everyday spheres of practice (Crampton 2009; Elwood and Leszczynski 2013; Leszczynski and Elwood 2014; Wilson 2014). Spatial media, according to geographer Jeremy Crampton (2009), refers to both the technological objects with a spatial orientation (the hardware and software) and to the geographic information content produced with those technologies. It encapsulates the convergence of geographic content with digital media already on the geoweb,[5] its emergence as a base for online social networking and information organization and

[5] The geoweb refers to the broader phenomenon of the merging of digital content and location, as well as the practices involved and sustained by this convergence. It is not synonymous with spatial media, which are the technological devices and informational artifacts that constitute it (Elwood and Leszczynski 2013, 544).

retrieval, and its adoption by individuals into their everyday lives (Crampton 2009; Leszczynski 2012; Wilson 2012; Wilson and Graham 2013).

As with media, spatial media are not only the digital entities that contain locational components, but include those sites of relations between individuals, organizations, people, technology, place and the content those practices produce (Crampton 2009; 2014). This can include interactive web-based mapping services and platforms that allow for crowdsourcing spatial content such as Google Maps, WikiMapia, and OpenStreetMap, the crowdsourced content contributed, location-enabled mobile devices, algorithms that underwrite location-based advertising practices, spatial application programming interfaces (APIs), services connected to social networking platforms such as Twitter's GeoAPI that automatically geotags tweeted content, location-based, push-pin style discovery practices such as those found on the social networking site Foursquare which offers recommendations to users' mobile devices, and social review sites such as Yelp that offer search and vetting options for various services and establishments based on location.

Understanding spatial media and GIS as either synonymous or distinct entities is under constant revision within the discipline of geography. Traditional instrumental views of GIS, for example geographer Michael Curry's (1998, xii) definition as "a technological means for the collection, storage, analysis, and representation of geo-coded data," do not capture the more fundamental essence of GIS technology or its social implications (Sui and Goodchild 2001, 387; Sui and Goodchild 2003, 6). As early as 2001, geographers Daniel Sui and Michael Goodchild deemed GIS as rapidly becoming a new form of media, stating that "GIS can be understood as a new technological species in an already crowded media jungle, a species specifically focused on the communication of geographic information" (2003, 7).

All four major components of GIS, hardware, software, data, and people, and its major functions, data acquisition, storage, analysis/modeling, and mapping/visualization, were, Sui and Goodchild argued, being done the wiki-way with data production being the most significant change. Furthermore, going from instrumental to communicative affordances notably opened up possibilities for individuals and corporations to manipulate results and legitimize or impose political, economic and social agendas.

The initial interest by critical geography scholars in monitoring the growing ubiquity of GIS was to gauge the challenges it might pose for the future of "ge*ographic information science" (GIScience). GIScience was* coined by Goodchild in a 1992 paper in the *International Journal of Geographic Information Systems* to name a multidisciplinary field of researchers considering the questions raised by the technology in order to develop the science needed to improve its future application. Sui and Goodchild deduced the turning of the tide where once passive users of the vast geospatial information available online were becoming active producers and started to ask what was at stake (Sui 2008, 3). Goodchild (2007) later termed this transition of data production, “volunteered geographic information” (VGI) and hailed it a paradigmatic shift in cartography from a model in which national governments were lead actors in producing spatial data sets to a more multivocal one.

Optimism over the democratic potential of having citizens, states, and private entities utilize the data processing and visualization tools led critical geographers to extend scholarship beyond the usual suspects of GIS, remote sensing, and spatial analysis software to the emergent spatial practices in the technological present. Newer spatial practices now afforded citizens the possibility to visually communicate for example, the spatial

consequences of proposed projects of land use and natural resources and to evaluate alternatives or create new, original solutions (Jankowski 2009, 1967). Geographers studied the ways in which the technology enabled groups of people, specifically non-experts, to participate in the local decisions shaping their communities. Questions geared towards how open source geospatial technologies could be functional and fulfill some perceived social need, or enable certain social groups to benefit.

These studies continued the hesitancy to deem traditional GIS and newer spatial media the same. Preference swayed to defining it as neogeography or another moniker, underlining a need to uphold the rhetorical visions or fantasies professional geographers used to maintain GIS as purposeful rather than simply "fun," as Turner deemed everyday mapping practice (2006, 3). Turner emphasized that the essence of neogeography was not the new technologies and their affordances, but the "people using and creating their own maps, on their own terms" (2006, 2). Once passive consumers of the vast geospatial information available online, these "people" were becoming active producers. Geographers, who are considered the traditional gatekeepers of the scientific craft and upholders of the protocols of professional practice, expressed a collective unease over a growing class of novice mapmakers, which their defining of this practice represents.

The fear geographers held was that this blurring of experts and "others" would lead to a misapprehension of what professional geographers do, and furthermore lead to geography without geographers (Goodchild 2009; Sui 2008). Neogeography implied a usurping and (re)branding of the discipline that trivialized spatial practice as an entirely instrumentalist enterprise of easy-to-use tools that allowed anyone to curate and interact with location data. As with political power struggles for scarce resources, geographers

actively sought to protect their disciplinary boundaries (Moscow 2004, 35; Leszczynski 2009, 66). Web-based spatial media was distanced and an "otherness" attributed to its users. Envisioning the neogeographer's practice as an unruly and new endeavor also gave geographers the rhetorical muscle to set Web-based GIS apart from their own established activities in GIScience, which are performed within a set of disciplinary standards, pedagogical responsibilities, and systematic tools of analysis (Kelly 2013, 186). It is a stance similar to when geographers attempted to shield from critique automated geography when it was adopted in the 1980s (see Pickles 1995). Critical GIS studies emerged in the 1980s and 1990s precisely to scrutinize this approach, seeking to understand the technology as political by virtue of its social-technical constructivism and contestation (Schuurman 2000).

This project does not seek to erase the technical or pragmatic distinctions that set apart GIScience from spatial media or geospatial technology. Each maintain distinct genealogical developments and conform to different systems metaphors depending on application and purpose. But pointing out these separate avenues of interest brings attention to the areas critical GIS research lacks. Most studies that fall under the header of "GIS and Society" have shown a preference for studying "hard" sciences and technologies deemed more serious and historically relevant due to being involved in industry, engineering, military, and knowledge production, while neglecting media technologies (Gillespie, Boczkowski, and Foot 2014). "GIS and Society" research generally questions how GIS both reflects and shapes the social context within which it is developed and employed by either looking at the impact of GIS on society or the social influence of society on GIS (Sheppard 2005).

The impact of social influences on GIS is the less researched of the two. Studies employ insight from science and technology studies, namely the co-construction of technology and society (Latour and Woolgar 1979; Callon, Rip, and Law 1986; Pickering 1995). It is used to understand how social and institutional contexts shape GIS-related practices within organizations of purchased software. Focus has been on discerning the local use practices and learning-by-doing that takes place as the technology is adapted to meet that particular organization's needs (Pinto and Onsrud 1995; Harvey and Chrisman 1998; Tulloch 1999; Harvey 2000; Martin 2000; Sieber 2000). For instance, studies concerning the impact of GIS on society generally examine GIS use in the interventions of community activists, political initiatives, NGOs, and grassroots organizations to affect social and political change (Elwood 2006; McLafferty 2003). Left under researched by both branches are the specific economic and political systems within which the production, distribution, and reception of the technologies, data and content take place.

Understanding geospatial technology as both a consumer object and as media, require both micro and macro-political analyses to ascertain its use value in different sectors of society. Along with the larger institutional arrangements that structure exchange, branding practices offer an understanding of how meaning is created and shared among producers and designers of geospatial technologies and beyond the industry itself, as those meanings circulate among enterprise customers and user-consumers. If anything, the discipline's bifurcation of the geospatial phenomenon between "serious" and everyday mapping practice does illuminate some of the functional fantasies attributed to geospatial technology's mass adoption, which unsurprisingly, are similar to the ones strategically employed by the geospatial industry. In particular, utopian narratives that fetishize the

democratic life-bettering and educational potential of location-aware devices and spatial content (Farman 2012; Wilson 2014; Leszczynski and Elwood 2015; Leszczynski 2014).

Commodifying Geospatial Technology

Technologies and data impact relations between individuals and groups that possess, use, as well as influence their development, but equally important are the structures within which that production, distribution and consumption takes place. Capitalist societies, in which spatial technologies are being implemented, are organized and institutions and practices are structured according to dominant modes of production, namely the logic of commodification and capital accumulation. The business of geospatial technologies, and the technology's ability to entice consumers, are formed by branding practices that market the technology's rhetorical fantasies for profit-making purposes.

In terms of user-technology relations, cultural and media studies have articulated the role of technological objects in creating and shaping social identities and culture. For geospatial technologies, their affordances and implications further depend on the context of where they were developed (Rundstrom 1995; Zook 2005), who developed them (Kwan 2002; McLafferty 2005), and the institutional needs they are designed for (Aitken and Michel 1995; Leszczynski 2012; Pickles 1995, 2004), all of which satisfy, serve, reiterate and reify larger power relations and epistemologies. However, before becoming active agents in the world, the technology needs to be culturally appropriated (Oudshoorn and Pinch 2003, 14). In *Consuming Technologies* (1994), Roger Silverstone and Eric Hirsch argued that technologies are "domesticated" into the daily lives of individuals by being transformed from the unfamiliar and possibly threatening objects into familiar ones. Silverstone's emphasis on the processes of diffusion and use of technology within the

cultural dynamics of appropriation moves beyond the design context and places the user as part of a broader set of user-machine relations. This perspective articulates technological development within a culturally contested zone of a multitude of diverse users, spokespersons for users, patent advocacy groups, consumer organizations, designers, producers, sales people, policy makers, and so on who negotiate and give conflicting meanings and uses to technologies (Oudshoorn and Pinch 2003, 24). It also allows for technological artifacts to transition into tools for making status claims and expressing lifestyles. Both of which branding practices of companies and the fantasies they attach to the technology play a significant role.

The rhetorical visions and fantastical potential attributed to geospatial technologies are related to group fantasies of the geospatial technology industry, and digital technology industries more broadly. Incorporated are more dominant understandings or "myths" of the linear progression of technologies. Writing about the myth of "the digital" as "the end" of politics, Vincent Moscow (2004) argued that the power of myth lies not in dissemination but in the ability for digital objects to become naturalized. In order for naturalization to take place, individuals need incentives for adoption. As Leszczynski also explained, it is "when they believe them to be politically innocuous and friction free (neutral), the outcomes of scientific and technological progress (inevitable), and where their adoption is seen to promote some social or individual good such as democracy or further progress (necessary)" (2014, 67).

The power of discourse is not only in constructing but naturalizing perspectives. Critical discourse analysis parses through the relationships that cause and determine discursive practices, events, texts, and the wider social and cultural structures and

ideological relations of power they derive from (see Fairclough 1992, 1995; Eagleton 1991; Atkinson 1999). It is useful to identify and theorize systems of meaning articulated and produced within specific contexts because discourse is a fundamentally social relation, and what is "put into discourse" and how it is discursively framed always reflects the interests of those in power (Dittmer 2010; Doel 2010; Foucault [1976], 1990, 1). As articulated above, the framing of spatial media as "new" set the parameters for disciplinary demarcations and early user adoption, but the myths of spatial media as neutral, inevitable, and necessary are not distinguishable from the myths of other media technologies. Once geospatial technologies passed the conversion process of domestication, and became pervasive and taken for granted, newness no longer formed the basis of acceptance or a driver of industry profit. Rather a company such as Esri must construct and continually reinforce desirable attributes of its geospatial technology and to distinguish their product from market competitors such as Google's free, open-source mapping API.

As early as the innovation stage, manufactured fantasies and expectations of a technology maintain support and profitability among enterprise communities. Science and technology studies scholars examined context specific ways in which fantasies and expectations woo financial donors during a technology's innovation process (see Brown, Rappert, and Webster 2000; Borup et al. 2006). For instance, "future imaginaries" were mobilized to gain financial support for genomic scientists (Fujimura 2003), and nationally-influenced "socio-technical imaginaries" helped stimulate and steer nuclear research in South Korean and the United States (Jasanoff and Kim 2009). Symbolic convergence theory (SCT) was utilized by Sovacool and Ramana (2015) when examining the technological expectations and rhetorical visions of scientists and technologists associated with the

nuclear industry in building small modular reactors. SCT is a general theory used to explain how collective technological fantasies and rhetorical visions affect human actions. It argues that fantasies have a "communicative force" that, like gravity, affects the consciousness of individuals, groups, and larger publics (Bormann 1972, 1982; Bormann, Cragan, and Shields1994, 2001; Cragan and Shields 1995). Humans are storytellers and the common act of narrating an event enables groups to come to a "symbolic convergence" that marks common experiences (Vasquez 1993). Similarly, fantasies are ways for communities to share in the same social reality, and expand it in aid of domesticating the technology.

According to SCT, the three critical elements of fantasy are *dramatis personae*, symbolic cues, and rhetorical visions. Dramatis personae are a set of characters, both human and nonhuman such as public understandings of climate change, which populate the narratives that help form part of its shared fantasies. For the geospatial industry, the human characters that populate GIS origin stories and myths and who I will discuss, are the 19th century doctor and father of epidemiology, John Snow, noted as having been the first to use a map as a research tool, Roger Tomlinson, the proclaimed father of GIS, and Esri's CEO Jack Dangermond. Symbolic cues can be phrases, slogans, nonverbal signs, gestures, or code words that trigger shared fantasies (Cragan and Shields 1992). Cues can refer to geographic or imaginary spaces or a name of a person, and can evoke ranges of emotion from anger to laughter. Under examination here is Esri's slogan, "I am GIS," which evokes the company's emphasis on the importance of the individual user within a shared networked community, and the significance of individual efforts to sustain the whole. Lastly, and that which the dramatis personae and symbolic cues support, are the rhetorical

visions. These are larger narratives or discourses that make up the distinct world view of the group while defining their social reality (Gunn 2003).

For the geospatial industry, the technology's "ethical imperative" or potential to do public good is the most compelling and encompassing vision, but it is one also bestowed upon the shoulders of users serving to exalt the human behind the machine. SCT only provides a model to discern the processes that internally compose a group, or in this case, a company's collective fantasy. In order for a company to increase trade and profits, it needs to expand its fantasies beyond company doors and convince investors, enterprise customers, and user-consumers of the unthreatening economic and social benefit of geospatial technologies, data, and content. Esri's brand encapsulates and promotes the rhetorical and utopian visions of geospatial technology beyond software developers and company employees to an expanding base of user-consumers who appropriate and rearticulate the signs and symbols provided. Brands make rhetorical fantasies material through consumer practice.

Relevant to the critical approach applied in this project is positioning consumption rather than production as the most important basis for human relations and identity. This emphasizes the adaptive interplay that takes place between corporations and consumers in the political economy of late capitalism, where branding is a key institution (Ardvisson 2006). In the late 1980s, Baudrillard (1988) put forth a model of mutual dependence of production and consumption that emphasized the consumer as an active agent in shaping consumption, social relations, and identities. Similar to a ritual process, consumer culture circulates material goods as a system of symbolic exchange where the power of sign value rather than the utility of things act as markers or sources and shapers of identity and social

relations. The active agent of the consumer was one that in the 1960s, capitalist corporations learned to embrace and co-opt into a marketing regime that valorized change, individuality, novel experiences, and creativity (Frank 1997). Corporations incorporate the cultural categories and frameworks of society, package them in with their agenda setting and structure of their products, while giving consumers the leeway to make meanings from the signs and symbols on offer. Consumption became a cultural and material activity, as well as an economic and cultural practice (Douglas and Isherwood 1996; Morley and Robbins 1995). Corporate brands and branding practices inside and outside corporations in particular, served to valorize and impart value on products.

Using Adam Ardvidsson's (2006) conception of brands as paradigmatic embodiments of the logic of information capitalism, this project situates increasing corporate branding practices as a response to the hypermediatization of the social and as a capitalist institution rather than just a cultural phenomenon. Once a minor device of managerial control, branding turned into a valuable asset of corporations and reflects newer forms of capitalist domination. That is, domination in the sense that brand management enacts capitalist or imperialist forms of governance, and newer because capitalist command is weakened by separating production from valorization (Hardt and Negri 2000). Immaterial production by a multitude of user-consumers helps construct and direct the desirable qualities of a company's brand.

In terms of value, brands compose up to 20 percent of a company's worth and for a company such as Apple, the brand is worth half its market value. Value is inclusive of capitalist value, normative or social values, and practical tools of measurement or evaluation. The inability to directly measure brand value means that brand valuation is

similar to the valuation of intellectual capital where criteria is arbitrarily chosen and transformed into quantifiable variables. Subjective attachments such as the attention or affect of the product are values primarily established through relational networks.

By virtue of their application, geospatial technology structures socio-spatial-technical interaction through both individual uses and as part of assemblages. Value, in this sense, is shared between the company, the technology, and others involved. For example, value is constructed and shared between Google and the American Red Cross when a Google Map is used by the NGO to display local centers of disaster support. However, defining brand value is a political task. As a form of "immaterial labor" or knowledge work, branding operates both inside and outside corporations to "program" or manage consumer decision-making (Lazzarato 1997). That is, brands have the power to occupy a position of value or "virtual real estate" within the minds of consumers so they will act with consideration of the brand (Schiller 1999). As Mark Poster (2006) noted, "consumer objects under capitalism appear in the market as brands which function to fix in our minds to the fact that commodities come from companies" (248). This managed or directed action gets transformed into surplus value and profit for the producers. The labor of branding can be performed by salaried members of an organization, or as "free labor" by networked users, consumers, or online gamers (Terranova 2004). What is produced and reproduced by these social interactions is an emotional, aesthetic, or social quality where shared meanings or a sense of belonging attach what Maurizio Lazzarato called an "ethical surplus" to the goods in question. The "ethical surplus," or what I define more specifically as an "ethical imperative" of geospatial technology, is reproduced and reframed both by the

brand marketing of Esri and its community of users, such as non-monetized digital humanitarians using their software.

Branding as it is recognized today emerged at the intersection of the diverse histories of computing, information technology, media, economics, product design, and marketing (Lury 2004, 6). However, brands already evolved several stages beforehand. During the first phase that started in the 1880s and lasted until the 1950s, brands provided a distinct identification to the consumer product. Baudrillard noted that in the late nineteenth century the distinction between objects and images eroded with the emergence of a commodity culture, where the "image" became the object of consumption. Advertising agencies were intermediaries with producers, and their task was convincing people to be rational consumers; that is, they needed to instill in society a consumer mentality that would overturn pre-capitalist habits of purchasing goods for purely utilitarian purposes. In order for a product to be turned into a brand, advertisements attached particular attributes or indicated a kind of lifestyle associated with the object's use (Sturken and Cartwright 2006). It was not until the 1960s that goods' purely practical dimensions were overrun by significations of one's experience with the product. With a growing middle class, suburban migration, lost attachments to an ethnically defined urban community, and new televisual platforms for advertising, brands became the new language of consumer goods. At this time, market research also became heavily computerized. Similar to today's massive data mining, questionnaires polled information and put consumers in "value clusters." Categories such as politics, religion, and child rearing reflected how brands served as markers of "lifestyles" and an individual's identity. This new vision of consumer culture

was not static, but dynamic and brand management entailed monitoring techniques to anticipate and follow societal trends (Arvidsson 2006, 127).

Branding today is a response to the hypermediatization of the social in informational capitalism. Hypermediatization reflects how in a networked culture, consumption is a social rather than individualized practice. This is a transition from a centralized postwar-era "Fordist" economy to a mobile, segmented economy of "flexible accumulation" where the production of identity of the producer and consumer take precedence over the production of the consumer object itself. A changing media landscape and liberalization of the market in the 1980s and 1990s also ushered in the "affective economy" (Jameson 1991; Harvey 1990; Lash and Urry 1994). The "affective economy" is a new configuration of marketing theory which seeks and assumes emotions are the driving force behind consumer decision-making. Economically, the task for marketers is to quantify desire, measure the connections made, and commodify those commitments (Jenkins 2006, 62). Brand marketers seek to construct "brand communities" in which the consumers form an intense social and emotional bond with the product and thus the producing corporation (Jenkins 2006, 79).

Charitable gestures are the best reflection of a corporation's efforts to extend its brand community into more traditional milieus. Not unlike Google Corporation, Esri offers free access to its proprietary software to emergent grassroots organizations and non-governmental organizations to support for example, disaster recovery and environmental conservation efforts. In 2014, Esri pledged its advanced mapping software to 100,000 K-12 schools across the United States as part of the ConnectEd initiative. The monetary cost of the ConnectEd pledge, if one considers the 10,000 USD price tag for each online account, is

1 billion USD (Chen 2014). The immaterial value and long term benefit to the corporation, however, is exponential. First, Esri's pledge initially gains the company national recognition and media space to distinguish the company's offerings from Google's mapping API. Furthermore, it taps into children who are deemed as viable consumer-citizens by virtue of their multi-dimensional relationship with media culture (Banet-Weiser 2009). Children are hailed as profitable consumer-citizens and an important marketing strategy to tap into a future market. The children who use ArcGIS in the classroom will grow to associate Esri as the go-to for geographic literacy and education. Once in practice, the pledge will continue to build connections, and expand the tendrils of the imagined geospatial community.

Studying the post-network television environment and the shift from program to brand loyalty, Sarah Banet-Weiser (2006) argued that it is not an increase in advertising that characterizes contemporary culture, but a normalization of brand culture that associates a product with an idea or concept and trademarked name. By linking brands to lifestyles, politics, and even social activism, brand culture "shapes not only consumer habits, but also all forms of political, social, and civic participation" (Banet-Weiser 2006, 85). Esri's ConnectEd pledge helps extends the product into an important "brand space," education. According to Liz Moor (2007), brand spaces are a form of brand culture in which traditional venues for advertising and promotion of goods are traversed by going into alternative spaces and in particular media spheres. Similar to Google, Esri make pledges and embarks on public relations campaigns to invest in both established and potential relational networks.

Celia Lury (2004) argued that brands can be considered "new media objects" as Lev Manovich (2001) defined them because they are similarly dynamic, open to variability and

change, and act as an interface between producers and consumers in order to promote interactivity. Furthermore, it is an open-ended interaction with the consumer that exemplifies the "status of the object" in the information age (Lury 2004, 151). This is not to say that consumers before were passive. For example, despite the hyped newness of interactivity, the media industry's understanding of interactivity is not only a cybernetic product but a way to seal relationships with viewers. In a historical overview of the pre-Internet television industry, James Caldwell (1995) demonstrated how even seemingly disconnected objects such as the 1980s infotainment television program *America's Most Wanted,* activated a connected consumer who become "neither proverbial housewife nor distracted consumer of academic theory but a vigilante - a televisual bounty hunter energized by patriotic to American morality, law, and order" (260). The difference currently, however, is that commercial messages that sell brands twin as human-to-human forms of communication.

Marketers declare the cultural artifact or "product" open to continual transformation through information communication channels and through forms of user exhibition and expression. Consumers are encouraged to participate in the production process and to create content along with consuming it. Earlier systems of cybernetic feedback that anticipated and catered to a consumer's desires remain but further engagements are facilitated and developed through social networks where users personalize and create social connections. Internet geolocation services and the integration of mapping applications with social media platforms induce a "user subjectivity" similar to other interactive practices underway in the media-communications environment. While broadcast media's one-to-many distribution produced an "audience-subjectivity"

collectively organized and sold around a coherent commodity, more recent media production techniques hail individuals to see themselves as producing their own cultural activity and as active participants in a brand community (Marshall 2009). According to P. David Marshall (2009), user-subjectivity has created a new media industrial model, where participation, interactivity, and cocreation have taken center stage. Users are encouraged to make optimal use of mapping technologies, to find geographic information, to get directions and suggestions for travel, to enrich their online profiles with geo-information, to check into locations on their mobile devices, to partake in social mapping activities such as geocaching, to create their own story maps or mash ups, to volunteer information during disasters, and to manage their own risk by accessing open data. In the case of Esri's professional tools and services, the company's recent transition to cloud computing which changed its “enterprise technology” into a “platform technology,” allowed developers to create and deploy custom applications by using its middleware or platform as a service (Paas) as support.

Expanding Lury's argument on the status of the object in the information age, Arvidsson posited that brands are the paradigmatic manifestation of the logic of information capitalism. That is, it is distinct from the 1970s and 80s concept of one "logic of capital" which modeled the specific dynamics, rationalization, and standardization of industrial capitalism. Similar to the factory for the Fordist period, brands embody the abstract logic of accumulation that in turn drives capital in the information age. Capital is a tool employed in the production of an object, while established relations such as between a hammer and its wielder, a computer and its user, or a factory and its worker, is a relation of power. These tools contain a series of affordances which constrain the production

processes in a particular way. However, as an embodiment of value, different assets such as the factory, the machines, and goodwill are resources to be capitalized on either as support for the price of stock or collateral for loans. The dynamics of capital encompass a transition of value from a fluid state such as in the form of money, to a fixed state through investments in the means of production such as machines, factories, or media presence. The brand and its immaterial capital are both a means of production and a form of governance that manages the labor processes involved. Surplus value is again translated into more a fluid monetized form of value, making it a "reification of the production process" where value is in-progress and only temporarily fixed (Bellofiore 1998; Arvidsson 2006, 125).

Similar to money as currency, brand currency is a generalized medium of communication. The relational nature of brands means that this currency is not measured by quantity but quality of its compatibility and capability on a global scale (Lury 2004; Arvidsson 2006, 131). Brands are not physically rooted in one place, which again reflects the de-territorialization of the informational production process. Esri's headquarters or "campus" as it is called, may be based in Redlands, California, and Google's headquarters is in Mountain View, California, but it is through meditization that they extend their relational nexus and invest their products with social, albeit immaterial value around the globe. Likewise, the use-value or knowledge-capital of Internet platforms or computer programs resides not in concrete embodiments like pixels or databases, but in the social relations they mobilize. And while branded objects such as Google's mapping API, partially manifests the "personality" of the brand, it is "the relational network that makes up the core of its productive utility as an everyday tool" (Arvidsson 2006, 126).

Communicability is the substance of the monetary value of brands. User-consumers still pay to have access. Substantial premiums are paid for more robust versions of Esri's ArcGIS software. However, the use-value is more in the communicative potential of inserting the brand into the user-consumer's own assemblage of compatible qualities (Arvidsson 2006, 131). Furthermore, brands embody Manovich's quality of new media as modular entities. Similar to software units, brands can contain different forms of content or branded qualities from children's education to violence, and can be assembled without affecting the brand itself. Brands are useful for consumers if they can work in an assemblage with other brands and can be extended, networked, compiled and shared through communication (Negri 1996, 151; Lash 2002).

For Esri, value-creating connections are further induced by its latest product, the ArcGIS platform. In the early 2010s, Esri began to simplify its ArcGIS software, turning it from an "enterprise technology" into a "platform technology." At this time, the term "platform" emerged as a central theme in tech news and buzz circulating around software developers. In technical terms, a platform is an infrastructure of hardware and/or software upon which other technologies and applications can be developed or run. For instance, a computer operating system is a platform technology. Google, which started in 1998 as a straightforward search engine, became a platform when it added Gmail, Maps, Docs, YouTube and so on. Facebook likewise is both a platform and an application. Esri's ArcGIS software became a geospatial platform with the launching of ArcGIS 10.0 and ArcGIS Online in the summer of 2012.

Likened to the "Facebook of Maps," the ArcGIS platform is a cloud-based, dynamic web map that users, organizations, or developers can easily access through any application

on any device, keeping them connected to their data and to others. According to Esri, central to their move towards a geospatial platform is to provide greater value to the user. A platform promises to be easier to use for both new and advanced users because it is open and extendable, meaning others can leverage and integrate it with other geospatial technology, web services, and enterprise IT which then aids in the facilitation, organizing, sharing, and using of geospatial content, maps, and data. The platform opens communication between groups, across division of organizations, and between organizations and the public.

In terms of business, a platform is considered a consumer-driven business model reflective of the hypermediatization of the social in informational capitalism because it encourages the co-creation of users and application developers. Brand value increases because users consume and are expected to create value. That is, users become producers and create value on the platform for other users and consumers to consume. For instance, external developers extend Esri's ArcGIS platform's functionality and value by utilizing its API. Platforms are a key business model for the 21st century, while the main business model in the 20th century were alternatively termed "pipes" in which a company has one or more closely related products or services. Firms created products and sold them down the pipeline to customers. Value was produced upstream, and consumed downstream. All manufacturing, television and radio, education, and so on are considered a pipe form of consumption.

While Esri's company started in 1969 by carrying out service work projects, it transitioned in the 1980s and 90s to providing customers with software tools and products. These tools enabled users to do their own applications and build their own GIS

systems. From there, the company developed a partner network. From the 1990s onward, they focused on supporting their partners through enterprise-scale systems. This included expanding the capabilities of its products, adding licensing and support services, and new solution architectures. Current brand management focused on further building investments through new relational networks, which the platform's sharing capabilities benefit.

Importantly, Esri's marketing for its platform builds on its prior branding practices, engaging those subjective qualities such as attention, loyalty and emotional investments already established among enterprise customers of its software and services. In a press release, an Esri spokesperson underscores already established aspirational attachment that that ArcGIS platform enhances: "a platform we can use to turn simple geography and location into something more powerful and meaningful - geographic understanding. We use this platform to discover the how and why from the where, and to share and communicate that knowledge with others" (Szukalski 2013). A platform complements aspirational marketing of the democratic potentials of ICTs, or the "idea of democracy" that has long been pumped into selling technologies to enterprise customers and the broader public alike (Iversen, Vedel, and Wele 2004). While Esri markets its tools and services for governments and business professionals against Google's commercial or open source alternatives, both companies pull from the same technological fantasies that appear as natural and neutral attributes of the technology.

Rather than discursive newness, branding and the building of niche markets sustains the technology's use value and valorizes its ethical potential. This ethical surplus is not a given property of the technology, but is contingent upon the immaterial labor and

knowledge work undertaken by the social, spatial, technical, and relational networks that Esri's corporate brand management packages and promotes. Unpacking how the geospatial technology industry builds financial and political support entails understanding the broader political economy of production, distribution and consumption. This includes the branding practices or management of the brand as well as the data and text, visual content, and techno-social relations forged between producers and user-consumers. Focusing on the corporate branding of geospatial technologies extends analysis beyond discursive rhetoric to encompass the rich visual-cultural relations forged by networks of designers, producers, and user-consumers of geospatial technology and spatial media. To do this, I turn to methods in media industry studies.

Media industry studies is a subfield of film and media studies. It approaches media and technologies with political economic concerns by situating media technologies and visual texts within their system of production, distribution, and reception. Media as a practice is emphasized while maintaining a critical humanities interest in how cultural power is produced and negotiated through a process of making texts ("encoding") and interpreting texts ("decoding") (see Caldwell 2008; Holt and Perren et al. 2009; Mayer et al. 2009). In film and media studies, political economy approaches have been undertaken to highlight the neglected importance of analyzing media industries' texts within their system of production and distribution. This purview is critiqued as potentially reducing meanings of texts to those circumscribed, while reducing its effects to ideological functions. That is, media culture merely reflects the ideology of the ruling economic elite to become a vehicle for dominant ideology. However, similar critiques were overcome in the study of discourse.

While discourse gives elites the power to produce knowledge through defining, changing, managing and policing representation and behavior around specific subjects and objects, it is a social relation rather than an instrument of oppressive domination. There is no single, monolithic discourse, but a series of historically contingent discursive formations that take place within a specific context and reflects those relations of power (Fairclough 1992, 1995; Eagleton 1991; Atkinson 1999). Unpacking discursive practice within corporations, Rob Atkinson (1999) situated discourse into two manners of operation. First, the narrower, more traditional sense that refers to grammar and syntax, and second, the broader, more expansive sense put forth by Foucault, where the context of knowledge production and reproduction acts to structure what is "thinkable." Here dominant discourses try to delimit or steer employee thought into a particular direction congruent with that discourse. Both senses interrelate, with the latter creating the context in which the former operates (Atkinson 1999, 61).

Atkinson, who looks at the discourses of "partnership" and Leszczynski, who uses Atkinson's approach to focus on geospatial "newness," both employ a narrower sense of discourse that is less engaged with the hypermeditization of the social in informational capitalism. Both underscore the medium and meaning of language to show how discourse is articulated, steered, and conflicts entered into. But discourse can be materialized through "clusters of ideas, images and practices" that act or work to cause certain societal effects (Hall 1997, 6). Brands are discourses made material. They are the text, images, and practices enacted both inside and outside corporations to cue employees and user-consumers to "think" with the company's brand in mind, and to associate certain qualities or characteristics to the product. Unpacking Esri's brand articulates the modes within

which geospatial technological fantasies are packaged, articulated, put to work and expanded through the changing media ecology of user-consumer and producer relations. However, to meet the change, film and media industries developed a new conceptualization of its user-consumer market, and strategized how to court consumers and generate value from them (Green and Jenkins 2009, 215).

Media studies scholar John Caldwell (2008) applied a "cultural-industrial method of analysis" to the film and television industry to make creative industry research more historically specific and institutionally precise. Caldwell's top-down analysis complements studies such as those by John Hartley that link user interactions of a global creative industries to issues of cultural identity and identity politics. It takes into account "industrial identity theory," since corporations build brands and market media products around notions of cultivated "difference" (Caldwell 2008, 235). The cultural studies concept of difference is one in which identity has shifted from hardened self-evident categories, as those associated with identity politics, to cultural performance which is unfixed. This is not new. Companies have been co-opting countercultural movements to advance profit since the 1960s (Frank 1997). In the new creative economy, however, media conglomerates have hijacked culturally resistant forms of identity-based critique and activism, making corporate identities similarly volatile and theatricalized. Corporations "prosper by internalizing and mastering a regime of difference" which extends their products to as many niches, or taste cultures and social identities as possible (Caldwell 2009, 235).

Companies target specific niche economies with emotional, therapeutic, and "relationship" branding strategies (Caldwell 2009, 245). Even corporate involvement in humanitarian disaster campaigns that altruistically aid victims of catastrophe are branding

opportunities that involve a form of cultural performance and emotional relationship building on the part of the corporate identities involved (Klein 2006). For Esri, imparting geospatial technology's "ethical imperative" and ability to save the world is intensively promoted in all aspects of its marketing. For instance, potential enterprise customers who hear about and see Esri's software used in a digital humanitarian crisis mapping project by a NGO such as the American Red Cross, cues understandings of that company's objectives. Multinational industries such as Esri pick and choose the projects they highlight for its brands. Rather than expose specifics of military contracts or suspect commercial data practices, humanitarian projects, education, environmental conversation, and so on are brought to the forefront and celebrated. It valorizes the technology's potential to do public good, and by extension specifies the imagined culture of the geospatial community involved in this practice.

The culture that composes the geospatial industry is broadly inclusive. Caldwell in his study of the film and television industry includes the camera crew and marketing directors, as well as those involved in the production of films, television programs, and associated "para-text" (Gray 2010). Para-text includes the "making-ofs," behind-the-scenes features, documentaries, show-biz reports, and transmedia franchises that appear as branches of core texts themselves. Esri's community is composed of a primary workforce of around 3,000 employees at ten regional offices in the United States, a network of 80 international distributors, and extends to over a million users in 200 countries. In Caldwell's usage of the term and how I will use it here, “culture” is an "interpretive system" embedded and constructed through symbolic and collective processes of power and politics. Insider knowledge is managed and consensus is formed through "social semantics"

or hermeneutics rather than "social mechanics." Informed by Clifford Geertz's model of "interpretive" anthropology, Caldwell's "look over the shoulder" of film and television workers is a look into employee's "interpretation" of their practices.

Agency is involved at the local level. Caldwell employed Bruno Latour's notion of "actor-networks" to describe how cognition is distributed across the group to form industrial habits and sense-making. As with branding practices in the post-industrial digital age, it is local creative practices that give rise to the discursive processes that establish power at the broader social level (Caldwell 2008, 34). Situating his study during Hollywood's transition to an era of global convergence, Caldwell sought to understand "how these industrial 'critical' and 'theorizing' artifacts, rituals, and mediated forms of reflexivity express an emerging but unstable economic and social order" (2008, 5). With Esri, this study reflects on the rapid multi-sector growth of geospatial technology industry in general, the transition towards the Facebook-era of platform technology, and the need to maintain a distinct identity amid free open-source software and everyday mapping practice. As with Caldwell and the film and television industry, I situate Esri's branding within the changing technological landscape and existent political economic structures to ask to what degree meaning and the experience of geospatial technology as media, which makes it a site to experience meaning, is determined or circumscribed by the geospatial industry itself.

The 2014 Esri User Conference acts as a focused event to discuss the branding practices that inform the industrial reflexivity of the geospatial industry. Trade shows are "contact zones," or spaces the industry sets up to create a sense of willed affinity among disparate affiliates and to steer a common corporate symbolic identity. These activities

"solicit" and "cultivate" the industry's self-reflexivity, or what John Caldwell (2008) calls a form of local cultural negotiation and expression for lived production communities. Along with company trade talks, employee rituals, and representations, conventions are spaces where "Genesis myths," such as on the origins of GIS, and trade stories of working in the geospatial business, are retold in order to reinvigorate a sense of meaning and purpose to the activities of a diverse and geographically disconnected host of practitioners. At conventions, trade imagery in the form of t-shirts, buttons, posters, and pamphlets also circulated, establishing a common visual and rhetorical vocabulary among affiliates. Esteemed plenary speakers and the "auteur" personalities of company leaders such as Esri's CEO Jack Dangermond, proffer to an imagined geospatial community of Esri employees, affiliate organizations, and a widening base of user-consumers, a directed leadership, a shared vision, and a sense of belonging. These cultural performances are tightly vetted and packaged to create the company's desired image to best markets its products, both software and services, and to drive an uncritical adoption of geospatial technology in different sectors of society.

The UC is one of many industrial practices, technologies, discourses, and interactions that formulate and reinforce an identity and culture of an imagined geospatial industry. It seeks to instill a sense of willed affinity among disparate affiliates and to construct an imagined geospatial community. This community can be conceived of in similar terms as Benedict Anderson's "imagined communities," where media, namely print publications in the form of newspapers and books, enabled the cultural formation of a geographically dispersed nation. As Anderson suggested, "communities are to be distinguished, not by their falsity/genuineness, but by the style in which they are imagined"

(1991, 6). The style of the UC is primarily defined by its craft specialization, but it is not only the branded object of use, the ArcGIS platform, that motivates shared activities.

In the summer of 2014, I became one of 60 student assistants chosen to help run Esri's week-long convention. My experience as a temporary employee for Esri allotted me a "look over the shoulder" of community practice while allowing me time to be a participant observer at an event that is intended to be a grand cultural performance of Esri's brand. The following sections unpack the company's circulated trade imagery and mottos, retelling of "Genesis myths," and performance of "auteur" geospatial personalities, to understand how the technological fantasies and expectations of geospatial technology are packaged and promoted.

THE ESRI UC

Esri's 33rd annual User Conference took place one week before the 44th annual San Diego Comic-Con International, the largest mixed media popular culture event in the country. The geospatial conference is always hosted in the same month and in the same massive convention center that overfills to its 130,000 capacity with popular culture fans. The 615,700 square foot exhibit space has been the home of the Esri UC since 1997. From 1987 to 1996, the event was held in Palm Springs, California, while the first in 1981 and five following UC's took place at Esri's headquarters in Redlands, California. What 33 years ago had only 15 attendees now accrues over 16,000 GIS practitioners, commercial suppliers, and investors from every sector in society and from locations all over the globe. The San Diego Convention Center was deemed the only event hall on the west coast able to accommodate its exponential growth. But similarities between the two conventions extend

to the event itself as both the film and media industry and the geospatial industry use the space to ostentatiously perform their brand.

As with Comic-Con, the Esri UC is more than just a business conference. It is an event for Esri's software users and their family. The UC is composed of over 600 GIS user presentation sessions, half as many technical workshops, over 300 exhibitors, over 100 special interest, regional, and user group meetings, and 600 map posters and special displays representing the work of individuals and organizations from over 100 countries. The conference's tracks reflect the diversity of the industry with categories and topics such as business, education, environment, natural resources, government, health and human services, defense, public safety, transportation, and utilities. Beyond the main UC, conferences held in conjunction include the Esri Business GIS Summit, Esri Education User Conference, Esri Homeland Security GIS Summit, and Esri Survey and Engineering GIS Summit. There are preconference seminars, an opening Plenary Session of world renowned speakers, a Map Gallery, Virtual Map Gallery, lightning talk session, scavenger hunts and contests, an exhibit hall filled with booths of Esri's business partners and alliances, hardware and software vendors, and solution and data providers, award ceremonies and displays honoring that years' special achievements in GIS, and showcases of affiliated organizations such as the National Geographic Society, the National Academy of Science, and the Smithsonian. Activities also extend beyond the convention center to the streets and venues of San Diego for a 5K marathon, Golf Tournament and Tennis Tournament, and a themed Thursday night party of cultural food and live music. In 2014, this took place at San Diego's Balboa Park, where the venue's art and natural history museums were exclusively opened to attendees for an additional conference fee.

The UC always starts its festivities with a plenary session. The list of previous keynote speakers have included such esteemed guests as the former independent and Green Party candidate for president of the United States, Ralph Nader in 1991, Harvard University Evolutionary Biologist Edward O. Wilson in 1994, adventurer and famed Mt. Everest climber, Peter Hillary in 2003, and anthropologist and chimpanzee researcher, Jane Goodall in 2005. Keynote speakers embody the company's global directives such as environmental conservation and global economics. Early in the company's history, a slew of keynote speeches made by geography professors represented the company's initiatives in education. Over the last four years, the environment and the economy were the focus. In 2011 to 2013, Esri hosted Jacqueline McGlade, the Executive Director of the European Environmental Agency, Julia Marton-Lefèvre, the Director General of the International Union for Conservation of Nature, and Sam Pitroda, Business Executive and Indian Technology Policy Advisor. In 2014, the U.S. Secretary of Commerce, Penny Pritzker spoke to an exhibit hall of 12,000 filled seats.

Pritzker delivered a plenary speech on the "power and potential of open government data." This speech arguably encapsulated the optimism fueling the "big data revolution" and economic incentives promised by "open data." During the address, the Secretary also announced the plans of the U.S. Department of Commerce to hire its first-ever Chief Data Officer. The U.S. Department of Commerce houses two key data agencies, the Census Bureau and the Patent and Trademark Office. It is currently expanding its role as "America's Data Agency." According to Pritzker, data resources have achieved a "strategic priority: to unleash more of our data to strengthen our economic growth; to make our data easier to access, understand and use; to maximize return on investment for

businesses, entrepreneurs, government, taxpayers, and communities." Pritzker consistently referred to this as the government's desire to "unlock" data, where "open data," or an idea that information should be free to everyone to use, is touted for its economic potential and stands central to the administration's plans.

The speech embeds open data within an ethical framework that uses past disasters and technology-driven preparedness measures to emphasize that open data, whether being accumulated, produced, amassed, or disseminated, is a means to do public good. Pritzker takes a recent success story of geospatial disaster communication to rhetorically drive the "human side of data" against a cold detachment of technology.

> We saw the life-saving power of data last November 17th, in Washington, Illinois, as an F4 tornado was bearing down on the area. It was a Sunday, and hundreds of residents were sitting in church. Their cell phones started receiving alerts and text messages about the approaching storm from the National Weather Service – a division of the National Oceanic and Atmospheric Administration, which is a part of the Commerce Department. Church staff led everyone to storm shelters; they waited as they heard the tornado roll by. Once the worst was over, all of the people in those churches had survived; many of their homes and businesses were damaged or destroyed, but they were safe. Tragically, only one person died, which of course is one too many.
>
> But in the wake of the tornado, it became clear that the National Weather Service's warning, built on our data and rapidly deployed, saved lives by giving the residents of Washington 15 precious minutes to find shelter.
>
> Just 25 years ago, Washington families may have had only 5 minutes to search for safety. But now, average tornado warning times have nearly tripled and tornado warning accuracy has roughly doubled. Put simply: today, there are more people alive in Washington and elsewhere, because we analyze data quickly and we get it out to the people who need it.

Pritzker would return to data's human dimensions and the tornado warnings in Illinois at the closing of her speech to remind the audience that open data saves lives. Alongside pushing government initiatives, this rhetorical framing supports the geospatial industry's profit-making incentives. It is an ethical discourse that situates the average citizen as the main beneficiary of the tools and data offerings. The promises of free access to data and open lines of communication positions the individual as an essential component of a

heterogeneous, interconnected network of technology, geographic information, and a community of organizations presumed to be working for their benefit.

Pritzker sells is a false sense of empowerment. Emphasis on user-directed accomplishments disavows any kind of determination by a system or structure and reassures individuals of their sovereignty in their own risk decision-making capabilities. Also unspoken are subversive government directives in location-aware technologies and citizen surveillance. This rhetoric manifests in more than the speaker's words. It is solicited and visualized through Esri's plastering of mottos on the convention walls, iconography on t-shirts and coffee mugs for purchase in the gift store, and through public relations and social media interactions that interpellate the geospatial community to carry out their part in world saving. The Amazing Mapman and Mapgirl, icons found on posters and buttons at the UC, act as examples.

The theme of Esri's 2014 event was superheroes, representing a tongue-in-cheek nod to the convention center's upcoming comic convention as well as the current mass popularity of DC (Detective Comics) and the Marvel Cinematic Universe. The Superman logo with the "S" replaced with "GIS," was found plastered on the registration wall, and on t-shirts, buttons, and posters sold at the convention center's store. Mottos written on the walls proclaiming "I am GIS," harking back to "I am Spartacus," further posit geospatial practice as individualized and superhuman. Common tropes, metaphors, and sayings found in Hollywood cinema and in particular disaster movies where technology is put to ethical use by a hero-protagonist, cultivate a shared understanding among the imagined geospatial community. According to Caldwell, trade iconography serves to persuade investors to buy and use products. However, the sharpened focus to empower the practitioner, to place

them in a heroic fight for public good, I argue, serves two purposes. First, it omits dystopian uses of geospatial technology in favor of fantastical visions of a practitioner-led utopian future, and second, it selectively utilizes the democratic concept of ICTs and "interactivity."

Elevating the human side of data is vital to keeping the technology's utopian promises from being overrun by those that could lead to our doom. In the case of geospatial technology, this is the technology's capability to increase citizen monitoring and surveillance. Celebratory discourse is a "mythological sleight of hand" already common in representations of science and technology in Hollywood cinema, and in particular the disaster movie genre where preventative monitoring technologies feature prominently (King 1999). Unlike postapocalyptic cinema where the disaster event is firmly set in the past, disaster movies devote a majority of screen time to the pre-impact period where the catastrophic event rarely emerges unexpectedly. Often characters are given signs that something is amiss and audiences are treated to anticipatory representations of the threat before it builds up to actualization.

Technological warning systems, at times shown via an excess of digital screens in control rooms, on computers, and portable devices feature alongside the ambiguous environmental cues of characters that experience them at the site of occurrence. Technological agents compiling this data include the satellites and telescopes that discovered the approaching intergalactic harbingers of an extinction level event in *Armageddon* (Michael Bay, 1998) and *Deep Impact* (Mimi Leder, 1998), or the ocean buoy sensors that alerted climatologists to rapidly decreasing temperatures in *The Day After Tomorrow* (Roland Emmerich, 2004). Computer screens running mapping simulations captivate and confound characters as well as offer the audience a glimpse into the worst-

case scenarios of what might come to their protagonist's location. They offer similar narrative conveyance as the mediation of broadcast voices while acting as a rhetorical strategy to claim authenticity for what is appearing on screen (King 2000, 163).

Control room screens along with television broadcasts emphasize the spectacular nature of the film itself, but in terms of diegetic utility, monitoring technologies only produce shortcomings for the fate of the world (King 2000, 155). In *Armageddon*, the President of the United States badgers NASA's lack of preparation for the asteroid, asking why "we didn't see this thing coming?" The given answer is specifics about NASA's "object collision budget," with 1 million USD allowing monitoring of only three percent of the sky. Similarly in the film *Dante's Peak* (Roger Donaldson, 1997), systems monitoring a soon-to-be deadly volcano consistently negate any imminent threat. If not for the intuition of volcanologist Harry Dalton (Pierce Brosnan), no one in the town would have survived. Technology is presented as insufficient, but its inadequacy is one through which can be asserted frontier-style heroics at the individual-level, and only if wielded by the right human agents, can it produce favorable results (King 2000, 155).

Continuing Sontag's "imagination of disaster," contemporary disaster films play on audience anxieties while offering reassurances. The recent history of the disaster film genre helps situate the tales we tell about ourselves and technology, and coincidently, how the technology industry brands their products and services. From the 1990s cycle onward, disaster movies hyped "high concept" scenarios with blockbuster worthy special effects scenes of mass devastation. 1990s disaster movies took on the geographic scope of 1950s science-fiction B-movies with the microcosmic focus 1970s disaster movies with narratives of group survival. *Independence Day* (Roland Emmerich, 1996) for instance, set the

standard for the 1990s cycle with movies involving city-wide or potential global destruction. In 1950s science fiction films, the world appeared at threat but the audience witnessed destruction focused on certain cities. A metropolitan alliance between military might and science brought solutions and assured an America-led victory. In *Independence Day*, despite reports of alien sightings and victory scenes broadcast from around the world, America still led the way.

Generic cycles of films are sparked by ideas resonant in the social, cultural, and political development of the time. According to Amy Taubin (1996), "*Independence Day* is a feel-good picture about the end of the world, or rather about how the end of the world is averted by good men who put aside their racial and ethnic differences to come together in a common cause" (6-7). Taubin's commentary reflects on the zeitgeist of the 1990s, as the film converses with the recent Rodney King trials and the L.A. Riots. Solutions that extend to the larger culture are formed by a representative group of characters who strive towards survival (Keane 2001, 5). The chosen "good men" in *Independence Day* also reflected the industry's push towards a more representative, though still masculine multiculturalism: African-American Captain Steven Miller (Will Smith), Jewish-American, David Levinson (Jeff Goldblum), and white President of the United States, Thomas J. Whitmore (Bill Pullman). Working together, this diverse group reassures the audience of America's scientific and military prowess after the military failed a counter-attack on July 3rd, only to save the day on July 4th with a scientific plan of victory.

Reflecting on the instrumentation use, both the winning actions and the interpretation of pre-impact warnings signs remain in the hands of a select few. "Only the lone hero," Mitchell et al. (2000) explained, and one who has a "tragic flaw or past loss that

can be remedied only by confronting the threat head-on, recognizes that the worst is about to come" (397). The hero protagonist is often a scientist or expert in a related field. He, and less often she, has their own technological gadgets at their disposal, but technology is often secondary to unmediated human instincts. To save the day, Smith and Goldblum's characters must man the alien spacecraft and detonate the nuclear device by hand since it cannot be done automatically. Despite the celebratory role of science and the importance of technology in many disaster movies, both pose a threat to the dominant individualist ideologies found in contemporary western culture. Films neutralize or domesticate science and technology through tropes of characterization and narrative.

The disaster movie *Twister* (Jan de Bont, 1996), one of the top grossing domestic films of that year, provides a relevant example in reference to Penny Pritzker's tornado-framed speech at the 2014 Esri UC. The central plot of *Twister* revolves around a ragtag group of university-financed tornado chasers trying to collect better data to design a new tornado warning system. Diegetically, both through spoken dialogue and a dramatic opening flashback of the death of the female protagonist's father, the film explains that three minutes of lead time before a tornado hits leaves minimal opportunities for people to hide and protect themselves. The solution is the promising data collecting technology nicknamed "Dorothy." The device is a large waste-can like cylinder with a "DIY" appearance reflecting both the team's lackluster funding while imparting a non-threatening homeliness.

The film swiftly positions the junk machine as the best way to discover what makes a tornado "tick." Once opened, the device will release scores of golf-ball sized round sensors to take measurements across the tornado’s funnel simultaneously. Of course, in

order for the gadget to be effective it needs to be opened directly inside a tornado, placed there by human individuals. It is the attempt of the chasers to correctly deploy the device that drives plot A, which is the adrenaline-filled spectacular narrative. This goal is made only more dramatic by an antagonist and rival crew who relies on a vanload of expensive, high-grade technology paid for by corporate funding. In Hollywood disaster movies, science and technology can be a source of solution but only if wielded by the right kind of individuals. Film narratives work to humanize the scientist and establish a "good" and "bad" version of their trade. "Dorothy" is entrusted to the individualistic, albeit eccentric group of idealistic tornado chasers who are quickly established as analyzing tornados for the benefit of saving humanity. This assures the audience of the purity of their scientific pursuits. In contrast, the villains, represented by an anonymous fleet of slick black vans, represent an unchecked version of science run by a giant state or corporate power. Their research of natural phenomena is entirely a pursuit of profit.

The good pursuit of science is further qualified by the hero protagonist, Bill Harding (Bill Paxton). The film introduces Bill, a celebrated weather researcher turned television weatherman, when visiting the crew he used to work with. He is there only to have his wife, Jo Harding (Helen Hunt) sign divorce papers. While the motley crew's computerized tracking equipment is celebrated, more so is Bill's unmediated instinct to read the skies and sense a tornado's formation. His "gift" is routinely mentioned by supporting characters in an attempt to persuade him to rejoin their efforts. Once lured into the team's current chase, Bill's unmediated instincts are instrumental in deploying Dorothy. Narrative closure is offered by the reunification of heteronormative romance between Bill and his estranged wife Jo, and an assumption that the data collected by Dorothy's successful though

harrowing deployment will contribute to a life-saving warning device system in the future. As with Pritzker's speech, the framing of science and technology through a humanized hero protagonist who wields the tools and trade for good, presents to the audience a comforting and celebratory version of science, technology, and rationality that is disconnected from the role of social, political, and economic factors in the determination of our fates (King 1999, 376). The sleek, black vans of corporate interests are swept under the rug.

Pritzker's allusion to the Illinois's F4 tornado produced a similar mythological sleight of hand to negate the profit-making and invasive data collecting pursuits of the government and other corporate entities. It helps asserts the importance of pushing the "data revolution" into the daily lives of citizens and to reassure them that the government's foray into open data will save lives and technologically prepare and equip the powerless in the face of indiscriminate harm. For Esri's brand, connecting their company to such initiatives reasserts the human within the map, validating to its clients that by endorsing their software, they are playing an important role in society. The kitschy caped superheroes, Amazing Mapman and Mapgirl, t-shirts emblazoned with GIS in the form of a Superman "S" logo, and mottos declaring "I am GIS" reinsert the user-consumer into a hero protagonist position who is set to use technology "right" by finding solutions to the world's disastrous problems.

While tongue-in-cheek, such branding speaks to a larger reassurance by geospatial industry leaders that its practitioners matter as much as the technology and its business. Usurping tropes from popular culture also reflects a counterculture cooptation and "cool" validation of the labor of geospatial technology users, but one that validates their deeds beyond the "fun" that in 2006 Turner posited that mass user-producers of geospatial data

and content were having. Instead, as with escapist narratives of big summer blockbuster disaster moves, the imagined geospatial community is cued to believe that their practice is contributing to the betterment of society. Esri reassures its users that they are Bill Harding, the hero protagonist who operates a non-threatening machine, or in this case, a geographic information system, and doing so only with a noble purpose in mind.

CONTRADICTION, SELECTION, AND *AUTEURISM*

Unlike the discipline of geography, Esri embraced the mediated ubiquity of geospatial technology and strategically utilized the democratic promises of "interactivity" in the digital public sphere to promote their brand. Esri has an active social media presence. The media relations team manages an exponential number of Twitter handles, Facebook pages, a Tumblr account, an Instagram, and Flickr galleries. At the user conference, there was a "media room" set up to handle public relations for the event and to keep each social media platform active to showcase conference activity. This included retweeting or reblogging selfies of conference goers wearing their GeoGeek Bling. Signs declaring "Wear GeoGeek Bling, Win Esri Gear," explained that plastic buckets placed throughout the conference center floor would be sporadically filled with small round pins colorfully emblazoned with the year's conference graphics, the Amazing Mapman and Mapgirl included. Conference goers are implored to find and collect all eight pins and wear them around the conference center proudly, attaching them for example to their conference badge lanyard. To win Esri Gear and prizes such a t-shirts and iPads, they have to take a picture of themselves wearing the pins and tweet the photo before 5:00 pm each day, making sure to affix the appropriate tags to the 140 character count. Winners of various prizes were announced each day after 6:00 pm during the length of the conference.

The GeoGeek Bling collecting activity represents a form of “gamification,” in which businesses apply game mechanics to employee activities to drive user behaviors in directions that are beneficial to the brand (see Hamari, Koivisto, and Sarsa, 2014). That is, it applies the concept of game mechanics to engage and motivate people to achieve company's goals. The oldest example of gamification are the Frequent Flyer Programs attached to an airline's customer loyalty programs, but it has now spread into all sectors of commercial business. The term "gamification" was coined by Nick Pelling in 2003, and gained popularity in 2010 when Badgeville, a company offered their PaaS for web and mobile sites to measure and influence user behavior. Businesses now use gamification to drive user behaviors in directions that are beneficial to the brand. Often this involves leveraging people's natural desires for achievement, altruism, competition, and collaboration. Marketers gamify communities to increase customer's engagement to both a brand's content and its users. As an activity taking place at the Esri UC, the GeoGeek Bling badge first seeks to entertain conference goers, while leveraging visible group identification. However, by making tweeting a selfie of one's GeoGeek Bling a part of the game, it extends the experience of the convention center into social media platforms where more community bonding, and in particular, brand visibility can take place.

Interactivity already holds an exalted position in the commercial sphere, and corporations have long been utilizing it to extend their brands into niche communities. It is reflective of the neoliberal economy, which is built on the principles of free trade, flexibility, short-term labor, outsourcing, constant corporate reinvention, and a shift from production to product branding. However, beyond corporate branding, interactivity has filtered into new forms of citizen subjectivity vis-à-vis the state. While the state takes on an

active role in securing the conditions and producing the subjects for markets, it does not actively intervene in its activities. Instead, subjects, having embraced free trade and consumer choice as the democratic ideal for everyone to achieve their goals, are called upon to rationally assess the cost and benefits of certain acts as opposed to others in accordance with economic incentive (Dean 2009, 52). Where the Keynesian welfare state interpellated subjects into specific symbolic identities, neoliberal ideology offers subjects different ways to imagine the self within a variety of possible lifestyle choices. The goal of governance thus becomes to teach individuals to take responsibility in rationally thinking through a range of risks from bankruptcy to natural disasters. Communicative technologies such as television series, participatory systems of audience feedback, automated face perception technologies, multi-player online games, and Internet forums and communities have become stages to discipline subjects into the role of productive consumer-citizens. Interactivity can be understood as a mean to shape a neoliberal user-consumer. It also engages with a widespread accepted notion that the free market is a site for democratic aspirations.

As a central concept and marketing keyword for new ICTs, interactivity relays the double meaning of customization and a democratic promise to talk back. Media scholar Marc Andrejevic (2007) located the slippery nature of the term "interactive" back to late 19th century Taylorism, early 20th century marketing strategies of consumer feedback, and military control. What developed as an "equation of feedback with power sharing" extended into the digital age as an "ideology of marketplace democracy;" that is, a promise of individuation and customization as empowering user identity (Andrejevic 2007, 21). Interactive digital recording devices such as TiVo for example, reflected a shift away from

generalizations and probability sampling to more detailed monitoring of individual viewing habits that now characterize the customized, interactive network era. On the level of the user-consumer, the promise of individuation arguably reflects a "grand moral inversion" where corporations become a contributor to individuality, promising to overcome alienation and regain a lost sense of community.

For risk managing geospatial technologies, interactivity foremost gives the individual user a sense of empowered security, and for a user-consumer of Esri's tools and services, the security afforded by the technology is further backed by a sense of exalted belonging to an imagined geospatial community. There is nothing new about using the promise of democracy to sell products, build an ethical surplus, or engage a niche community. Rather it is a resort to customization as an alibi for increasing comprehensive forms of consumer monitoring and infringements on consumer privacy that offers concern. Interactivity is both interconnectivity and distributed monitoring, but it is cast in a democratic light. As with everyday mapping practices, collecting GeoGeek Bling appears a harmless and "fun" activity, but it is part of a larger nexus of enlisting individuals voluntarily or unknowingly into free labor practices.

According to Esri, central to its move to a geospatial platform and a "Network Orchestrator" (Circero) is to provide greater user value. The claim that platforms are a "consumer-driven business model" is that it makes development, testing, and deployment of applications quick, easier, and cost-effective by building what is often popularly termed as an "ecosystem" around the technology to facilitate a smooth "value-creating interaction" between two or more groups. Esri's Web GIS connectivity opens and extends the platform's use to GIS experts and those working outside GIS departments so developers, partners,

users, and collaborators can organize and share spatial information among groups or across divisions of organizations, and between organizations and the public. It is "open, configurable, fast, and efficient," so "anyone," from private individuals to multinational corporations can share spatial information in Esri's platform, and use the infrastructure for one or more applications that serve their needs. It represents an iteration of the "sharing economy," where digital platforms provide the base for peer-to-peer access to goods and services."

This utility for the user is hailed in a platform's aspirational brand, but the value of a platform for the business is muted. The third-party, or Esri, still manages the online subscriptions, servers, storage, networking, and the software itself, but to the user, the open and accessible infrastructure "erases" the middleman so the exchanges within appear "simpler and fairer" (Olma 2014). But for the business, an open and extendable platform promises to accrue more value-creating exchanges and because of this, it allows companies to reach a monopoly position; "this enables the respective platform to set and control the (considerably lower) standards upon which someone (preferably anyone) could become a supplier in the respective market" (Olma 2014).

Second, platforms promise to increase company innovation by exploiting the labor conducted within it. Platforms allow software developers to build and customize applications. The fine print of Esri's Terms of Use specifies that ArcGIS Online Plan account customers can build applications for internal use and can make their app available to anyone. They can leverage and integrate ArcGIS APIs and SDKs with other technology, web services, and applications, and importantly create applications of their own, but they cannot monetize their app by charging a fee or embedding advertising in it. Nor can clients

remove any logos or trademarks when using Esri's services. While the platform is of immense user utility, internal innovation is owned, Esri's brand is extended, and a monopoly position is created.

The celebration of geospatial technology's interactivity is primarily used as a marketing strategy of Esri's brand, but it is a technological fantasy that is *contradictory.* This is a strategic contradictoriness, where flexibility allows for a broader enrollment of actors while vagueness helps offset criticism. Different sectors such as the government or military may highlight certain aspects of the rhetoric and subdue or omit technical details because they reveal the contested nature of the activity when pitted against utopian promises (Sovacool and Ramana 2014, 99). In practice, geospatial technology does not substantiate the hype surrounding interactivity nor result in reinforcing the importance of the human using the machine. A glorified example is the trend of tapping into live data for disaster response and recovery, which also reflects larger movements in big data collection, manipulation, and analysis in public and private sectors for decision-making and public policy.

In 2013, Esri integrated Geofeedia, a location-based social media foraging tool into their ArcGIS platform for public safety professionals to more accurately integrate, analyze and visualize data during emergency events as they unfold. With location analytics, information such as geo-located tweets, photos, and videos from social media platforms such as Twitter, Instagram, Flickr, YouTube, and Picasa can be mashed together with layers containing data on demographics, satellite and aerial imagery, and on critical infrastructures such as life, property, and natural resources. Real-time data integration, searching, and streaming of other free live data feeds can create a "live watch map" with

the potential to change the way agencies respond to disasters. A live watch map utilizing Esri's ArcGIS open-source software has been in the testing stage for two years in the Federal Select Agent Program (FSAP), which is jointly comprised of the Centers for Disease Control and Prevention/Division of Select Agents and Toxins and the Animal and Plant Health Inspection Services/Agricultural Select Agent Program of the U.S. government. The department overseas "entities" that are in possession of hazardous agents. Entities include any federal, state, or local government agency, academic institution, corporation, company, partnership, society, association, firm, or sole proprietorship. While agents, biological or toxins, are those that pose the risk of mass casualties, detriment public health and safety, concern the economy, critical infrastructures, or public confidence if deliberately misused or accidentally unleashed.

John Holcomb, a security specialist in the Office of Public Health Preparedness and Response, spoke at the Esri UC about the department's experiences with the live map technology. The innovative software is being used during pre-impact periods to keep a cautious eye on earthquakes, storm surges, hurricane evacuation zones, wild fires, and so on that could cause harm to entities and result in a release of agents. Free data feeds from the National Weather Service, National Hurricane Center, U.S. Forest Service, and U.S. Geological Survey, along with local news feeds, webcams, power grid information, and social media are constantly monitored on an Esri-powered live watch map. During a wild fire, for example, a satellite view can be collected to see the direction the smoke is blowing and allow for assessment points to be set up for further inquiry. For earthquakes, before the department would not respond unless it was over a 6.0 magnitude on the Richter scale. Now they look to U.S. Geological Survey's crowdsourced data on its "Shake Map" to see

where the earthquake was felt by residents and then make assessments based on that information. Holcomb declared they can go "from crisis to contact in minutes," noting that the department responded within five minutes to Hurricane Arthur that occurred in July 2014.

Interactivity as a form of human, data, and machine interconnectivity are undoubtedly celebrated upfront as a benefit to the live map technology. What before entailed assessing responses with incomplete or news media-based data is now more focused and reliant on authoritative data to handle only those at-risk facilities. Before there was no common picture, but now data can be shared and accessed through a network. Furthermore, with the ability to tailor data, the department was able to respond to more hazards quicker. Holcomb boasted they are 24 to 48 hours ahead of The Weather Channel, who they no longer need to rely on. However, the benefit of ArcGIS and what Holcomb noted cannot done with Google's KML file, are its fast and precise way to determine what is at risk through icon personalization. Icons can be designed specifically by the department to support their need of having a "click and get" information option. Rather than live interactivity, it is this customization element, the icon queries that can offer quick access to dangers on facilities in the potential impact zone that the department finds valuable. Interactivity in the social media sense is instead a challenge that government agencies face when incorporating GIS and big data into disaster management. Holcomb cynically stated that this positive can be a negative in two ways. First, the live and automatically updated map erases the picture that came before, leaving little room for reflection. Second, the crowdsourced or volunteered geographic information had known limitations. They would not act unless the data was verified. This is consistent with other emergency response

agencies that will not accept data from non-experts with questionable and ultimately unverifiable accuracy (Johnson and Sieber 2013).

The interactivity component of geospatial technology may be celebrated as a means to perfect the deployment of disaster aid and personnel, to understand the events on the ground for informed on the fly decision-making, and for post-event monitoring and social trend analysis, but it replaces labor instead of the importance of authoritative data for government agencies. Interactivity instead ideologically inserts the average citizen within the knowledge producing network. It falls in line with Penny Pritzker's rhetoric that hails open data as empowering citizens and saving lives. The human dimension of data's potential is also a contradictory promise. The top benefits and priority of implementing the technology as listed by Holcomb, was cutting department costs. He boasted that live mapping has saved the department money because of driving down labor cost. What took six people, eight hours to complete, now takes two people, less than two hours. Proclaiming "I am GIS" and wearing GeoGeek Bling encourages Esri's conference goers to take part in consolidating an imagined geospatial community, while utopian fantasies valorize their practice, hailing them as essential to the apparatus, and as peace-keepers, environmental activists, and life-savers. Free labor helps proliferate the technology's use in certain sectors of society, aiding in the industry's profit-making. However, in reality the human is less operable than the data and the software itself.

As with being contradictory, technological fantasies are *selective*, highlighting certain aspects of history and omitting others. This rhetorical selectivity extends beyond simply uncritically positioning advancements in technology to overlooking comparisons of previous technological transitions. For instance, often ignored is the paradox of relying on

technology to solve problems brought about by earlier forms of technology such as nuclear weapons and nuclear energy (Sovacool and Ramana 2014, 99). In terms of Esri's corporate branding, these selective fantasies are manifested in the "Genesis myths" and trade stories told among its employees, its user-consumers, public relations campaigns, press releases, and news articles that introduce Esri's C.E.O. Jack Dangermond, or eulogize the life of the father of the first functional GIS, Roger Tomlinson.

In relation to the film and television industry, Caldwell deemed trade anecdotes and allegories "narratives of authority." These narratives strive to cultivate character between practitioners and within the work worlds of production, to mark turf and exclude, to strengthen professional affinities, and offer the navigational tactics professional communities need to face economic uncertainty and technological change. In particular, Caldwell links both personal and professional "against all odds" allegories that liken to military struggle as cultural performances that cultivate character by celebrating the industry's hard work, suffering, and survival, while providing therapeutic griping about subpar working conditions (Caldwell 2008, 39). Genesis myths or origin stories less celebrate labor than remind the community of the originating moments and artistic pedigree of their creative work. They help self-actualize the psychological dispositions and internal relations of member's careers during moments of transition (Caldwell 2008, 52). Similar "narratives of authority" and "Genesis myths" valorize the work of the imagined geospatial community during a moment of exponential economic expansion and diversification of the workforce. They are self-reflexive glimpses into how the industry imagines the work geospatial technology does for the supposed benefit of society.

A few attendees at the 2014 UC remembered Roger Tomlinson serving as the keynote speaker for UC's plenary event in 1987. The man known as the "Father of GIS" was a relevant topic of conversation especially when nestled in a quiet corner of the convention floor was an exhibit memorializing his life. Tomlinson passed away on February 9, 2014, but his achievements are remembered by GIS practitioners and the discipline of geography. Similarly, a special panel was held in his honor at the 2014 annual Association of American Geographers conference in Tampa, Florida. Tomlinson is a key character in the GIS origin stories along with a more mythic precedent, the London-based, mid-19th century doctor and acclaimed father of epidemiology, John Snow and his Broad Street cholera map. These Genesis myths are particularly telling not just for what they tell, but for what they leave out.

In remembrance of Tomlinson's contribution, the *Smithsonian* published an article in June of 2014 on "The Unlikely History of the Origins of Modern Maps," which narrated the 1962 chance meeting of Roger Tomlinson and newly appointed head of the Canada Land Inventory, Lee Pratt. The article framed the meeting as a serendipitous event with exponential proportions. The Smithsonian is partnered with Esri, using its mapping software as "an innovative way to tell stories on the site," which they note as a "disclaimer" in the article after praising Esri's ConnectEd initiative with the U.S. government to provide free software to every K-12 school in the nation. The narrative written by Esri's partner is useful in highlighting some common arcs of trade-popularized Genesis stories of GIS. In particular is Tomlinson's special place within it, and how human elements are emphasized over the technology. Furthermore, the story highlights the ethical dimensions of the technology's use, particular within health sectors, while selectively omitting military

involvement in GIS development. For instance, government defense and intelligence agencies during the Cold War heightened innovations in computation geographic methods. Early military GISs, GPS, geodetic models, reconnaissance satellites, and intercontinental ballistic missile targeting systems still have military and civilian applications today (Dalton 2013).

As spun by the *Smithsonian*, Pratt, who was charged with cataloging Canada's productive resources, happened to sit next to Tomlinson on airplane flight from Ottawa to Toronto. During this short, one-hour trip, Pratt discussed his plan to collect and synthesize thousands of maps to document the country's landscape. Tomlinson recalled in subsequent interviews with the *Smithsonian* that the younger and less experienced Pratt did not fully consider the exorbitant costs of his endeavor. The conversation is described as opportune for geographer Tomlinson, who encountered a similar predicament a year prior. Tomlinson confronted the issue of too much data when the Canadian government contracted his aerial survey company, Spartan Air Services, to discern where in Kenya was best to cultivate tree plantations for use in papermaking. Having gathered all the variables on possible plantation locations such as topographic information, soil quality, atmospheric conditions, and so on, Tomlinson hit a wall. This, along with the rising costs of the project, resulted in a funding pull-out.

The trouble encountered was in overlaying variable-based Mylar sheets on top of each other, which led to a mess of lines that made it difficult to isolate variables or for mapped composites to make any geographic sense. Current strides in computer processing led Tomlinson to consider the possibility of converting map areas called polygons into data points and to geometrically relate them to other data points where each place or point on

the map could contain an infinite dimension of information. As the article explains, "The mapmakers' perennial dilemma of two-dimensional space would dissolve into boundlessness" (Aguirre 2014). Tomlinson's innovative idea of using computing technologies solved the problem of isolating variables by turning Mylar sheets into a "digital sandwich." Three months into his own massive cataloging project, Pratt realized that Tomlinson was right. With cutting cost on his mind, Pratt called the geographer for assistance and together they started the first recognized GIS project, the Canada Geographic Information System.

The *Smithsonian* embeds Tomlinson's tale of chance into two broader, though just as common narrative arcs that compose the GIS origin story. The first defines geospatial technology as a break from the printed topographic map. This offers the technology its own distinct transitive history, while promoting the popular idiom that GIS offers "a new way of seeing" the human landscape. That is, a digital map can do what the printed map cannot. As the article explains, "human experience of space is too complicated to be reduced to the peaks and valleys of a landscape" (Aguirre 2014). Space, in this sense, is more than mere topography. It is composed of variables that can be described and defined, and its "story," or its multitude of variables, cannot be captured by a regular map alone. Geospatial technology's supported strength is in understanding and problem solving for the human variables of space. Tracking disease outbreaks, demographic changes, political voting tendencies, food shortage predictions, immigrant remittances, obesity, climate change-induced crises, tracking Foursquare check-ins, disaster response and recovery, and so on are provided as the article's relevant, and mostly public good examples.

To further delineate the evolution of the ordinary map to a smart map, an earlier origins story and equally mythic precedent to Tomlinson is presented: the London-based, mid-19th century doctor and acclaimed father of epidemiology, John Snow, and his Broad Street cholera map. Variations of Snow's story exist in the fields that claim him as their own. These include public health, the history of medicine, and epidemiology. However, it is Snow's use of the map as a spatial-analysis device that features prominently for geographers. In 1854, London was suffering from a cholera epidemic; a disease which at the time was commonly assumed to be the result of miasmata, or bad air. With a local reverend in tow, Snow documented cholera deaths by neighborhood location, scratching an ink spot onto a paper map. The dot-compiled map revealed that spots clustered around a central water pump on Broad Street, tracing the outbreak's source. Snow overturned the popular conception of cholera's cause, where instead of bad air, it was water contamination. However, re-examinations of the stylistic and substantive differences in reproductions of the famed map suggest uncertainty of its primary role in the investigation (McLeod 2000). Instead, there is a tactical reason for medical geographers to make the map central to Snow's story. It allows their discipline to claim a contributing place in the study of disease. For the geospatial technology industry, Snow's mapping offers a similar strategy: a map layering variables allowed Snow to see what could not be seen by a list of numbers and names. It turned a map into an invaluable solution to a human problem.

Spatial theory and quantitative explanations are extended into the second common GIS narrative arc that the *Smithsonian* spins: the perfection of data management through computing power. Snow was dealing with only a few variables, namely cholera deaths by neighborhood location. As data collection proliferated, computer processing was essential

to make it functional. Tomlinson's serendipitous moment is thus rerouted from an established cartographic history to the "technological frontier" that transitioned computers from being calculators to data storage and processing devices. The only other precedent invention the article mentions is the 1890 tabulating machine and its use by the U.S. Census to numerically code statistics and process large quantities of data gathered on human populations. Attributed to IBM founder, Herman Hollerith, the tabulating machine would give way to the modern database. By resolving the quandary of counting, the tabulating machine, as the article declares, made GIS possible. Tomlinson and Pratt contracted IBM to help them build programming software to collate the data and solve their inventory quagmire.

Parallel GIS development stories are only briefly mentioned, including the Harvard-based Howard Fisher, who was developing a program to synthesize mapped data and later found the "Lab" or Laboratory for Computer Graphics at the Harvard Graduate School of Design, and the U.S. Census Bureau in New Haven, Connecticut, which was experimenting with a system plotting geographic data by neighborhood block. It is Tomlinson's fated moment and John Snow's mythic cholera map that centers the human individual rather than the technology in the story, while instilling an ethics into contemporary geospatial technology's use. It also situates GIS within the data age, to show the technology's improvement over the topographic printed map, and to distinguish its history from cartographic history and alternative unethical practices. Notably absent are government and military uses of maps and mappings that remain instrumental to GIS development and use today.

The military have a notable though subdued presence in terms of promotion at the Esri UC. The Esri National Security Summit was held not in the main convention center, but in the nearby Hilton Bayfront hotel. Still visible are the military commanders donning camouflage fatigues roaming the convention space. Homeland security, national security and defense were also given a respectably-sized space in the back corner of the exhibit floor. Formerly called the Esri Homeland Security Summit, the Esri National Security Summit is the world's largest GIS event of its kind. It invites commanders, first responders, intelligence personnel, law enforcement officers, executives and analyst to explore how Esri's software, service, and partner agencies can improve their mission. Esri's motto on the official webpage for the event is "Be Ready" and the event's focus is preparedness. The need of "knowing what you need and how to find it" in terms of saving lives, resources, and critical infrastructure, is declared solved by geospatial technology because it "enables true situational awareness and comprehensive understanding in even the most dire circumstances."

Esri's 2014 white paper entitled "GIS Platform for National Security," distills the company's attempt at wooing government agencies and stakeholders to reconfigure their organizational structure and streamline the operations they use to analyze and access raw data for the prevention, mitigation, response and recovery of threats to the nation. The white paper outlines the technology's unique capabilities that integrate geography with business intelligence. Through interagency collaboration and the ability of a network to share information for a common set of objectives, Esri's products, services, and geospatial technology in general, is deemed an essential component in the "business to securing a nation," as per a new paradigm of national security (Esri 2014, 1).

While highly contingent on each nation, security is broadly defined as a government's vested interest in protecting and managing government-owned critical infrastructures, national resources and assets, and preserving the life and cultural identity of its citizens, guest workers, and immigrant populace from threats within, at, and beyond its borders. One way governments mitigate threats ranging from the foreign to the domestic, from civil unrest and economic instability, to natural, manmade, and technological disasters is by investing in scientific and technological research and innovation. The stated goal of these investments is to develop the capabilities that identify and assess future risks, with risk referring to the probability of property damage, illness, injury, or death associated with a hazard. Governments seek to predict and prevent for example, the next terrorist attack, economic downfall, adverse effect of climate change, or territorial conflict. Research and innovation seeks to operationalize risks in terms of probability theory; to turn anticipation into rational calculation. "Decision-making" thus becomes possible under controlled conditions of uncertainty (Beck 1999, Krimsky 1992; Van Loon 2002). Esri's motto "Be Ready" asserts the company's prescribed role to control uncertainty.

The white paper twice emphasized that what makes ArcGIS software optimal for the new paradigm of national security is the technology's transformation from a specialized, scientific analytical system into an "easy-to-use" platform that can "support the mission, anywhere, at any time, on any network" (Esri 2014, 2). The "Be Ready" is in how the platform connects and grounds the network. The map is where "tabular data comes to life," offering a space for reflection and contemplation not found in other information technologies (Esri 2014, 2). Along with tailoring relevant content and appropriate

applications to each agency's role and needs, similar to the icon specifications that Holcomb celebrated, Esri's security configurable cloud environment further optimizes real-time sharing and access to information across organizations on any device or network. As Esri claims, GIS operationalizes risk by turning raw data into analyzed and therefore "actionable" information, but in a manner where interoperability between data, machines, organizations, and a broad community of individuals including citizens as sensors, is essential. The public, now technologically poised through social media networks to share and receive critical information before, during and after a disaster event, are operationalized by the technology's functions. The average citizen is positioned not just as a victim in need of saving, but as an integrated and key component in government crisis and risk management systems. However, while the software's business operations that support mission workflow are highlighted, interactivity and the human dimension remain peripheral. Instead, that remains more relevant in brand promotion.

Esri's geospatial platform also arguably fits into larger trends in government crisis and risk communication systems, where interactivity is a strategy for governments to mitigate negative outcomes of a crisis, to protect citizens and themselves from damage (Suzuki and Kaneko 2013, 51-2). The overriding goal for government is to reduce harm to stakeholders, which during natural disasters include the protection of health and safety of citizens, and the environment. Following a natural disaster or public health emergency, governments manage information sharing among organizational actors involved in mitigation efforts, while disclosing as a citizen's right, relevant information to allow for informed decision taking. These may include warnings, evacuation notifications, messages that entail the direction, predicted paths, or assumed happenings of the crisis, bad case

scenarios, health concerns, measures and cautions to be taken, or calls to obtain medical treatment (Suzuki and Kaneko 2013, 50). Government agencies argue that the media obstructs information, and that media practices have a negative influence on the public perception of risk. Social media also provides the public more opportunities to scrutinize how government organizations respond to crises and communicate over the course of them (Malone and Coombs 2009, 121). With increased transparency, one of governments' main concerns is managing accountability. The adoption of an interactive approach creates a larger crisis communication network, and therefore a larger net of accountability. Arguably, Esri's trade imagery of the Amazing Mapman, its retelling trade stories of geospatial technology doing public good, and military-free origins stories cues user-consumers into performing similar roles. Selectively deemphasizing subversive military or commercial endeavors helps Esri maintain the celebratory democratic promise of interactivity, as well as the technology's human dimension. It is selective by pandering to what are attractive aspects in one sector, while appearing contradictory in others.

Also on the exhibit floor and arguably, one of the most sought out activities at the Esri UC are practical demonstrations featuring different aspects and applications of Esri's ArcGIS software. These demos, along with on-demand demos at "Ask an Expert" booths, are run by Esri's staff, visible by wearing a red badge and lanyard while conference attendees wear black. Consistently referenced during demonstrations are the efficiency, speed, and user-friendliness of ArcGIS technology. At the same time, the competence of Esri's service staff and the care they make available to customers is on display. Alongside the trade artifacts that circulate at networking events, the social performance of employees further cultivate user-consumers into a consensus of the brand's meaning.

Understood as a Darwinian imperative to survive in a given market of competitors, one way industries seek to gain advantage over competitors is by convincing clients that their company is the most cost-effective and cutting-edge (Caldwell 2008, 91). However, for Esri, it is the employees who are showcased. Caldwell's study updates Everett Cherrington Hughes's proposal for an "economics of self-conception," Goffman's "the presentation of everyday life," which refers to the interactive rituals and "self-performance" of workers, and Arlie Hochschild's study of the "commercialization of human feeling," which examines how emotions are managed as part of executive posturing. Caldwell notably extends social presentation, self-conception, and identity performance beyond workers' day-to-day activities to marketing and business strategies. He asks what organizational identity goals drive these activities, as well as what kinds of cultural metaphors and tropes are deployed to achieve these ends.

In Esri's case, the cultural metaphor and tropes highlighted are cultivation and care to reflect on the services the company endeavors to provide its clients. Not only are the staff deployed as branded entities at the UC, but the face of Esri, its founder and CEO Jack Dangermond also embodies and reiterates the brand in the public sphere. In an interview with the *New York Times* (2011), Dangermond recalled his first job working in his family's plant nursery business and being put in charge of managing a crew at the young age of 16. Being asked of directing older workers, Dangermond emphasized how teamwork and equality were part of his management style then and continues to be today. It "is not being elitist," Dangermond explains, "but rather being involved with the people doing the actual work" (as quoted by Bryant 2011). Other lessons from this experience were an aptitude to

nurture employees as one would plants in a nursery business. In a nursery, neglecting ones plants is a liability to lose profits.

"Jack," as he is casually called by Esri's staff and members of the broader Esri community, can be spotted roaming the UC's convention space. He is constantly hindered by but graciously accepting of attendees desiring photo opportunities. Notably, a smile is present in every picture snapped. His speaking style is informal, his dress business casual, and his demeanor kept kind and approachable. Redlands, where Esri's main campus remains, was where Dangermond was born to an immigrant family, and a father who only received a sixth-grade education. He graduated with a landscape design degree at Cal Poly Pomona, studied urban design at the University of Minnesota, and received a master's degree at Harvard. In the mid-1960s he helped pioneer the field of computational geography at the Harvard laboratory for computer graphics and spatial analysis. Esri was founded in 1969, and in the 1980s, began selling its software and doing consulting work with governments on regional projects. That the man and his business remain firmly planted in and a contributing member of the Redlands community is a defining part of his "auteur" as well as the public image of the company itself.

"Auteurism" is a theory of film authorship that elevated certain directors of films to canonical status and deemed them the center of creativity and control in the production process. Auteur designation was challenged in the 1970s with the final breakdown of the studio system and three-network era, which changed workplace environments and gave producers more dominate roles (Bordwell and Thompson 2010). Similarly, "authorship" of television production in the age of the Internet altered practices. Transmedia franchises emphasized collective practices of authorship which extended beyond production to peer

or consumer participation. However, despite obvious collectivity, studio and network publicity departments continue to hype auteur showrunners and directors in marketing campaigns for films and "quality" television programs (Mann 2009). Brands harness the potency and creative power of "authors" or auteurs to voice and publically perform the desired meaning-making of the product itself. Auteurs of ICT companies such as Apple with the late Steve Jobs, Microsoft's Bill Gates, and Esri's Jack Dangermond, serve a similar purpose.

Beyond the rags to riches life-story and approachable persona, when interviewed, Dangermond is careful that his words project and maintain the longstanding technological fantasies associated with geospatial technology. His vision is “to build an ecosystem of geographic knowledge for the planet, a kind of nervous system for the planet, so as (people) move around, they're guided by this higher level of consciousness about the environment” (as quoted by Nisperos 2014). Geospatial technologies continue to be hailed as bringing about the “Second Age of Geographic Discovery” and the rational decision-making apparatus for the future (Goodchild 1998). Dangermond importantly puts forth these global goals but roots them in the employees and the community his business supports. In the *New York Times* interview he lists his four priorities of running Esri: to focus on what customers need and want, to make the company a great place to work, to assure that the business supports the first two priorities by taking care of stockholders, and fourth, by working seriously with business partners for which they have over 2,000 around the world (Bryant 2011). Personally nurturing each sector as one would plants, Dangermond attempts to maintain Esri's small business façade amid its global expansion. The pursuit of profit is negated in favor of one dedicated to making a better world to live

and work in, especially if you work for Esri. Rather than representing the sleek black vans partaking in science for the pursuit of profit as in *Twister*, Dangermond wants his company and community to appear as Bill Harding and the individualistic, motley crew who seek to make a better world with their tools and services.

To say Dangermond consciously performs this image is beside the point. Instead, Esri's CEO is a powerful branding element. He is the human face that connects the themes of the company's brand and technologically-based enterprise. Google arguably is a faceless enterprise, while Dangermond is at the center of Esri's operations and its imagined geospatial community. Dangermond consciously makes visible and hails his employees as relevant, knowing his business is built not only on software but service, another branded aspect that sets Esri apart from competitors. Jack is the humble controller of the corporate machine, or the Amazing Mapman others aspire to. That he continuously relays not only rhetorical visions of the technology but a conception that Esri remains grounded in humble roots, further reflects how the operation of both corporate macrostrategies and human microstrategies compose a company's collective sense-making and performance.

CONCLUDING THOUGHTS

The geospatial technology industry provides data and services to enterprise customers, clients, and everyday user-consumers who need to locate, evaluate, present, or deploy geodata and maps for various ends. Corporate branding by the geospatial industry legitimates those prescribed uses and propagates new ones to extend its use into viable sectors of the economy. Beneath the “on-screen” representations of geospatial technology, there is an equally busy “off-screen” production where brands represent a marriage between art and commerce. As Arvidsson argued, brands entail a "fusion of the aesthetic

and economic, of media and reality, of the attention economy and the industrial economy" (2006, 136). Understanding the political economy of geospatial technology necessitates unpacking this production, which includes the creative construction and maintenance of an imagined geospatial community.

Disperse members appropriate and operationalize the industry's desired meaning-making, which are encapsulated in the technological fantasies or expectations of those tools and services. In turn, this preserves and promotes user acceptance and proliferates the industry's profit-making enterprises. Esri's mottos such as “Responsible Products and Solutions for Improving the Quality of Life Everywhere,” are only part of larger strategic efforts to enroll geospatial technology into a certain epistemology. Beyond discourse, the interactive and visual ventures such as annual user conventions, sponsored humanitarian campaigns, and corporate pledges seek to build a community identity and extend desired meanings to a larger market. Branding is what drives social value, while promoting and preserving the industry's main interest, profit-making.

CHAPTER 2: GEOSPATIAL TECHNOLOGIES AS DISASTER MEDIA

Geospatial data and technology played a central role in the global and local media coverage of the Fukushima Nuclear Power Station (NPS) disaster. By visualizing and spatially analyzing collected data of the atmospheric spread of radioactive particles into maps and simulations, geospatial technologies produced understandings of associated environmental and health risks. This chapter's emphasis travels not only on the radioactively charged trade winds that exuded hazardous chemicals from the damaged nuclear reactors, but on the mass media and social media vectors that carried, visualized, dramatized, and normalized information about precarity and risk within media discourses

of two national affective spheres, the United States and Japan. The different agendas of each nation's media system, that is, the production logics, broadcast policies, source and journalist relations, and audience reception played a vital role in how geospatial technology was used as a disaster communication tool. Unpacking media practices allows reflection on how during periods of crisis, geospatial technology seems to ephemerally fulfill, but in reality fail corporate branding hype that deems it a solution for everyone to manage and "see" the world.

On the one hand, geospatial technologies play a central role in affirming visually and rhetorically the consequences of the breakdown of perceived barriers separating social, environmental, and technological systems. The maps in their creation and reception offer a forum for necessary public conversations on the dangers of nuclear energy. Open source geospatial technology and open data initiatives help diversify the routes to collect and disseminate information that in the case of the Fukushima NPS disaster, the Japanese governments delayed or withheld from the public during the crisis. On the other hand, while networks of people mobilize geospatial software and disseminate relevant information in new and often productive ways, the task for individuals to manage and understand personal risk, one responsibility of many comprising neoliberal citizenship, is not streamlined by more access to information. Citizen's use of geospatial technologies did not undermine the reliance on dominant mediums and official sources during the extended period of crisis. Fukushima's messy data and media discourse instead facilitated what film and media scholars Julia Leyda and Diane Negra (2015) call an "elision of questions about the origin of systemic failures" that "displaces responsibility onto the individual rather than the social institutions charged with disaster preparedness and response" (16).

A cultural circulation or "cultural circuit" model distinguishes "moments" of meaning-making in the production and consumption of the cultural texts related to the mediation of health risks of the Fukushima NPS disaster. The circuit of culture model is an extension of the three dimension of cultural analysis outlined by Douglas Kellner (1997): "(1) the production and political economy of culture; (2) textual analysis and critique of its artefacts; (3) study of audience receptions and the use of media and cultural products" (34). It follows distinctive instances either when meaning is encoded into its form and content from moments during consumption, reception, or use and when meanings are decoded to affect everyday life. This model connects the cultural texts or artifacts, which in this case are the geospatial data, maps, and the television news reports and online news and social media disseminating them, to a larger social and technological world. The circuit of culture model adds identity and regulation to each of these areas (du Gay et al. 1997). In this project's case study, I will look at the media and production networks, financial capital, audience mobilization networks, cultural discourses, and the hopes and expectations shaped by prior "successes" of the medium to unpack the more dominant readings.

The local and global populations experienced the meanings of the environmental and health risks of the Fukushima NPS disaster largely through the media. By virtue of the disaster's scale, it is a grand example of how multi-actor involvement, politicized debates, and the esoteric technical nature of the data situated information-seekers into a more than usual dependence on mediated exposition. Official and unofficial data analysis and interactive simulations and maps which "forecast" nuclear radiation's effects, were the symbols and resources used to legitimize media stories. Second, this calls attention to how the geodata and content became "contested terrains" (Kellner 2009). Focusing on meaning-

making further affirms the notion that as media, geospatial technology remains a key instrument of political power and means through which individuals can scrutinize official categories and the power relations involved in their social construction and maintenance (Kellner 2009, 102). Following the nuclear disaster, social media picked apart official data and cautiously packaged statements released by various government agencies, scientific research organizations, and industry officials that attempted to manage public perceptions, assuage expected fears, and protect vested interests (Malone and Coombs 2009, 121-2). It produced an affective feedback loop between netizens and the international news media that pinpointed the delays, non-specific language, discrepancies, and withholding of information. The multi-sector use of geospatial technology and its communicative "truth" power became entangled in the minutia of political controversies and conspiracies, lending to the uncertainty of personal risk. This enervated the sustainment of public conversations on the future or nuclear energy. By marking a disjuncture between world-saving branding discourses and technological practice, this chapter calls attention to the unjustified expectations that individuals can assess source credibility by way of new information visualizing technology. It serves to temper grand claims of the hyped democratic potential of geospatial technology to effect social change and to offer the necessary means to manage personal risk.

AN INFORMATION DISASTER

On the International Nuclear Events Scale (INES), the March 11, 2011 Fukushima Daiichi NPS "accident" elevated from a provisional Level Three on day one to a Level Five one week later. In one month it reached the highest level possible, Seven, which is considered a "major accident" and equivalent to the Chernobyl nuclear disaster in 1986. A

communication tool of the International Atomic Energy Agency (IAEA), INES standardizes nuclear events into levels of significance to facilitate prompt communication among technical communities, the media, and the public. IAEA defines a Level Seven as having "widespread health and environmental effects" resulting from the "external release of a significant fraction of reactor core inventory" (International Atomic Energy Agency 2013, 152). The scale's gradual escalation also mirrored civilian anxiety as Japan's residents began to question the accuracy of formulaic press announcements from government officials and the national regulatory oversight body, the Nuclear and Industrial Safety Agency (NISA). NISA repeatedly emphasized the limited influence of the released radioactive contaminants on human health. Public concern and a push by parliamentary opposition party members prompted the government to disclose to mass media the official daily radioactivity levels for each major city. As a result of this decision, national public station NHK began to provide Japan's residents with the day's recorded radiation measurements after its televised weather report. These numbers were scaled to microsieverts per hour and featured on an ordinary weather map as information comparable to temperature and precipitation data. The commentary that accompanied the forecasts reconfirmed official assertions about the negligible risk of atmospheric radiation on the health of residents and, consistent with other reporting on the nuclear accident, stayed away from commenting about the possible courses the nuclear crisis could take.

In contrast, as soon as reports of the Fukushima NPS explosion reached international news desks, United States media began avidly speculating on the "worst case" scenarios of the nuclear situation. News of the preceding earthquake and tsunami's devastation was interspersed with nuclear "meltdown" speculations and explanations of

fallout scenarios by nuclear experts from scientific research organizations worldwide. One scenario of growing concern was the global circulation of radiation on jet streams in the stratosphere, a layer of atmosphere that extends about 30 miles above the earth's surface. Radiation particles traveling with Pacific Ocean wind currents could be dragged down with dust or heavier particles by spring storms and settle into foreign soil and drinking water. Immediate following the first explosions, sophisticated nuclear radiation monitoring systems, air filter detection systems, and Geiger counters began to record measurements. Data was collected by a multitude of agencies and technological systems. These included the Environmental Protection Agency (EPA) and their nationwide system RadNet, Japan's SPEEDI (System for Prediction for Environment Emergency Dose Information), the International Monitoring System (IMS) run by the Comprehensive Nuclear Test-Ban Organization (CTBTO), university-based scientific research organizations, emergent grassroots organizations in Japan such as SafeCast, and anti-nuclear watchdog groups in the United States. Spatial data analysis by these actors produced official and unofficial maps and speculative simulations that circulated on mass and social media in the weeks and months that followed. Unofficial maps created on open-source software programs such as the Google Maps application programming interface (API) also took official data and mashed it with alternative sources such as handheld Geiger counter measurements taken by civic activists within various locations in Japan and notably, on the west coast of the U.S. Narratives pertaining to radiation risk circulated through multiple channels, but the data it was constructed from often lacked provenance. Despite the official reassurances of the extremely low risk posed by radioactive contaminated wind and rainfall, U.S. media's initial

focus on the health implications for Japan's local communities transitioned into a homegrown nuclear panic that arguably lingers five years later.

In calling Fukushima an "information disaster," I purposefully draw attention to what corporate hype in the efficiency of geospatial technology as a risk managing and communication technology neglects; that is, the growing media-communications environment. The term "information disaster" refers to a similar dependence on news media during the weeks and months following Chernobyl in 1986, when West Germans remained unsure about health consequences and had to judge source credibility. Assumptions were based on an inconsistent picture of radiation risk being presented by the news, official governmental sources, and anti-nuclear activists. Because of this, media critics began decrying Chernobyl as an "information disaster" (Peters 1992, 325), and I argue that Fukushima should be attributed the same title. Several decades later, risks continue to be defined and interpreted by the media, corporations, government, the public, and interest groups (Gamson and Modigliani 1989; Fitzgerald and Rubin 2010). Data and information visualizing technologies are increasingly being used to validate those opinions. Situating geospatial technologies within the sphere of "the media" necessitates a nuanced analysis of established and shifting government and media crisis communication practices, information media technologies, the increasing role of social media in the circulation of information, and the position of the individual vis-à-vis the technology and data.

As media, geospatial technologies produce a rapidly constructed and disseminated (as well as dismantled) form of knowledge politics. Geospatial knowledge politics are generally understood as how individuals and institutions leverage digital spatial data and technologies to negotiate social, political, and economic processes (Elwood 2010, 352; Sui

et al. 2012; Elwood and Leszczynski 2013, 545). The differential influence and authority granted to cartographic representations as one holding forms of truth power, are employed by various actors to represent narrative descriptions of events or conditions in quantitative, aggregated forms (Elwood 2006; Ghose 2007). By showing larger spatial or temporal contexts or by framing specific relations, it offers legitimacy to narratives, anecdotal, and experiential accounts. This has initiated a feedback loop of the tool's use and perceived importance; that is, the tendency for planners and policymakers to privilege knowledge that is expressed as quantified or cartographic has led to an increasing need to apply geospatial technologies and data in other fields.

I argued in chapter one that similar authority and user-empowerment is being granted to the technology's use-value through corporate branding discourse and practices organized and structured according to predominant cultural logics of late capitalism such as the logic of commodification, of capital accumulation, convergence culture, and the attention economy. These logics reflect the shifting relationships of the state and the market in accordance with neoliberal rationalities and forms of governance. The public's access to free open-source software (FOSS) to create their own geospatial information visualizations, aided by the globalization of information flows and the growing popularity of "citizen journalism," place individuals into a more active role in collecting, reporting, analyzing and disseminating news and information (Anderson 2006; Gillmore 2005; Lasica 2003; Mythen 2010). This hypermediation contributes to knowledge production, and the circulation and contestation of cultural texts. The plurality of voices constructing risk, especially those offering alternate agendas from mainstream news and traditional sources of information, led to a beneficial questioning of the political and cultural logics that form

the basis of risk incidents. At the same time, it is complicating the average citizen's ability to decipher personal risk and by shifting the burden on the individual, neglects attention on the state's responsibility in the production of risk.

The impact of citizen journalism on the process of risk communication remains an under-explored topic (Mythen 2010), but the relationship between culture, the media, and risk, as well as the assumption that public attitudes towards risks are shaped and influenced by the media have long been assumed (Eldridge 1999; Hansen 2000; Reilly 1999; Wales and Mythen 2002). Since the 1980s, risk-related affairs have increasingly saturated traditional media outlets, while technological change has diversified routes to collect and disseminate risk information. In sociology, Ulrich Beck's diagnosis in 1992 was that we live in a "risk society," and his theoretical writings on risk continue to have relevance in the 21st century. According to Beck, the risk society "can be grasped theoretically, empirically, and politically only if one starts from the premise that it is always also a knowledge, media and information society at the same time" (2000, xiv). These notions remain on a general level of theorizing: understandings of media processes of representation, whether it is transforming scientific information into news or in technologies altering how information is received and read by autonomous individuals, tend to denote "the media" as a homogenous entity with homogenizing effects. In practice, the media works in complex ways and Beck's theories overlook the economic structure of media industries and the nuances of cultural contexts in which information is disseminated and consumed.

Practice-based studies by researchers working within the sociology of communications media argued that risk researchers present a naive portrayal of the power

dynamics of mass media (Anderson 1997; Cottle 1998; Hughes, Kitzinger, and Murdock 2006; Kitzinger 1999; Murdock, Petts, and Horlick-Jones 2003; Otway and Wynne 1989; Wilkinson 1999). According to Iain Wilkonson (2010), "risk researchers are identified as failing to pay sufficient heed to the complexities of communication flows and as lacking insight into the multiple forms of interaction that take place between mass media and their audiences" (20). Rather mass media is identified as simply having a negative influence on public perceptions of risk. The Social Amplification of Risk Framework (SARF), long discredited in mainstream media studies, has been influential in shaping a view of audiences as passive receivers of information rather than active participants in the social production of risk (Murdock, Petts, and Horlick-Jones 2003). This view falls in line with government agencies who also perceive of the media as obstructing expert information. Following a natural disaster or public health emergency, governments manage information sharing among organizational actors involved in mitigation efforts, while disclosing relevant information to allow citizens their right to more informed decision taking. Information may include warnings, evacuation notifications, messages that entail the direction, predicted paths, or assumed happenings of the crisis, scenarios, health concerns, measures or cautions to be taken, or calls to obtain medical treatment (Suzuki and Kaneko 2013, 50). Risk experts often point to how "framing biases" of news media act as obstacles in adequately conveying these messages, while also pointing out how news content tends towards sensationalizing violence, conflict, and disaster (Wilkinson 2010, 22). Framing and citizen journalism aside, news outlets still regard government released information as an appropriate source of information to obtain during a crisis (Dunwoody and Peters 1992, 203).

Framing biases are also not limited to the news media. For example, the news's preference to report on "events" rather ill-defined issues is akin to government and scientific community tactics. Officials and experts draw limited geographic and temporal boundaries around disasters and perform industrial biases that are similar to how the media frames and uses conventions to mold information into familiar narratives. Descriptions seek to assuage public fears and manage public perceptions of a crisis and their role within it. INES, the scale that charts nuclear "events" by levels of magnitude is according to the International Atomic Energy Association (IAEA), "a means for promptly communicating to the public in consistent terms the safety significance of events at nuclear institutions" in order to "ease common understanding among the nuclear community, the media and the public." Popular terminologies that the press might use such as "meltdown," are also not recognized by the scientific community as a scientifically meaningful description and they consciously avoid critical phraseology that can be misconstrued (Cleveland 2014). During Fukushima, when Japan's opposition party members in a parliamentary panel asked the government regulatory body, NISA, to provide a layperson understandable explanation of the scale of radioactive emissions they responded that such comparisons would lead to irrelevant results (Suzuki and Kaneko, 2013, 66).

Similarly problematic is how government regulators and industry officials continue to define disasters as "natural" and refer to situations like Fukushima as "accidents" caused by technological glitches or human error which can be fixed and amended (Perrow 1999; Smith 2006; Hindmarsh 2013; Pritchard 2013). As with air pollution, acid rain, and climate change, Fukushima showcased the inevitable and hazardous interplay of natural and technological systems, or the breaking down of the reified boundaries humans imagine

separating themselves from these systems. The boundary is imagined and reified in the sense of it being continuously defined and constructed as such. This examination takes a corrective "social constructionist" approach to crisis communication, emphasizing that crises are only as serious as significant actors make them (Hearit and Courtright 2003, 208). It embeds risk and safety within social structure, making it defined and interpreted, rather than objectively comprehended (Stallings 1990, 80; Fitzgerald and Rubin 2010, 368). Both governments and news organizations are considered significant actors in constructing risk and defining crises. "Crisis" is defined as "the perception of an unpredictable event that threatens important expectancies of stakeholders and can seriously impact an organization's performance and generate negative outcomes" (Coombs 2007, 2-3). A crisis is "unpredictable but not unexpected" (Coombs 2007, 3). In an effort to reduce potential harm to stakeholders, organizations prepare for or seek to prevent crises by assessing risk (Heath and Miller 2004; Coombs 2007). "Risk" can be defined in terms of the "probability of an issue gaining momentum" (Coombs 2007, 3). In the case of Fukushima, the scale of the crisis increased because of the number of voices or stakeholders involved in its defining.

Communication plays a vital role in managing the perception of both crises and risks, where even the potential for an issue to become a crisis becomes something agreed upon by various actors. For example, crisis managers are charged with deciding minor risks from crisis-producing risks. News organization likewise select events to report, quote experts who interpret them, and assemble and disseminate reports according to frames and narrative conventions that act as a set of "interpretive packages" of an issue for the public to interpret (Gamson and Modigliani 1989, 3; Millar and Heath 2004, 15). Geospatial

content, whether it is the visualized data or interactive maps that appear with news stories, are produced and shaped according to these frames and conventions. Due to radiation's invisibility, geospatial technologies and content were allotted a central role by news media as entities of visual knowledge for the Fukushima crisis and conventions of weather reporting. As I will demonstrate, mappings were strategically co-opted by the mainstream press in the U.S. and Japan in different ways to package information on atmospheric radiation into desirable visual narratives dependent on economic and political needs and expectations.

With the growth of alternative media sources, government organizations and news media adapted their approach and adopted Web 2.0 strategies to communicate crisis information to the public. A part of media convergence, these changes express not technics and pragmatics, but a change of cultural logics involving a complex interplay between multiple channels of distribution and networked actors. Media companies adopted Web 2.0 strategies and sought user-generated content from social networks in hopes of "harnessing collective intelligence" (O'Reilly 2005). Companies talked of "putting the We in the Web" (Levy & Stone 2006) and embraced granting consumers greater influence over decisions that impacted production and distribution of media culture. But despite the strong rhetorical hype of democracy circulating around the new Web 2.0 paradigm (Burns and Burrows 2007), by 2007 contradictions and conflicts appeared. On the one side, media conglomerates sought to exploit "synergies" between different divisions. By matching consumer demands of when, where, and what form, the market fragmented and larger institutional actors broke into narrower interests and control. On the other side,

consumers embraced more loosely affiliated networks to construct and shape the web to fit their daily needs, while seeking personal benefits from those offerings.

The tension experienced by producers grew out of not knowing how to allow consumers to generate value around cultural products while not enacting prohibitionist approaches, and how to embrace collective intelligence rather than allow it to exist as an independent source of consumer power and critique. In order to do so, producers formed what media scholar Henry Jenkins called an "implicit social contract between media producers and consumers, balancing the commodity and cultural status of creative goods" (2009, 222). Jenkins (1992) defined a "moral economy" in fan studies when examining fan fiction writers legitimating their appropriation of media content. He uses E.P. Thompson's (1971) "moral economy" concept in which Thompson saw an implicit social contract at work in the 18th century England following a series of food riots. The peasants challenge to landowners resulted in actions becoming discursively shaped by "legitimizing notions," such as a belief that the landowners were defending traditional rights and customs. Connecting this to contemporary media producers and consumers, Jenkins saw similar notions of moral and social value being injected into these interactions. As a strategy of "affective economics," however, the value of consumer engagement and loyalty for media producers remains within the traditional paradigm of consumer roles, which is to bring eyeballs to advertised products (Jenkins 2009, 217).

Web 2.0 applications such as blogs, wikis, folksonomies, and mashups enable new functionalities in geodata collection and production, and provide a new class of everyday cartographers with data-authoring capabilities. As within fan studies, there has been an emphasis by Critical GIS scholars on the practices of user-consumers, referred to as

practitioners, producers of geospatial data and content, and digital humanitarians who are producing, analyzing, and circulating geodata and related content. Often studies in participatory GIS overemphasize new modalities of knowledge production, continuing Pierre Levy's (1997) notion that networked communities represent an alternative source of knowledge and power. These networks, as Levy argued, intersect but remain autonomous from the transnational reach of consumer capitalism and the sovereignty of nation-states over their citizens. This, however, is not the case. Beyond the adoption of Web 2.0 technics and pragmatics, this new regime of data production and associated trends in big and open data coincide with historical and political economic shifts associated with changing practices between the state and the market, and neoliberal regimes of "governance" (Singh 2002; Leszczynski 2012).

Governance assumes social elites govern through securing hegemonic relations with the governed. It is a "structural" thesis of power where power takes on certain political (governments), economic (markets), or social forms. From these forms certain regulations or exercises of authority materialize, including those over people and territories and over data (Rose 1999; Singh 2002). One form of political governance is the state, which itself is understood as being governmentalized because it also secures itself by non-state-based hierarchies (Foucault 1980). The state continues to exist within contemporary power relations because of its own govermentalization, which allows it to extend beyond itself to govern in available apparatuses or categories, while also serving as a connective force for a complex assemblage of authorities and forces (Rose 1999, 18). This form of governance serves to fix or stabilize political economic order through regulatory or other mechanisms (Harvey 1990, 109). In late capitalism, a new articulation of markets, technology, and

science make up the assemblages, while power relations between these private sectors and the state operate under the regime of neoliberalism.

In the United States, the onset of this transition to "technoscientific capitalism" began after the oil and energy crisis in the 1970s with radical transformations in modes of social and economic regulation and a restructuring of labor as production transitioned away from the manufacturing of mass goods to an "innovation-based economy" that capitalizes on the creative potential of the human mind (Rajan 2006; Terranova 2004). In terms of geospatial technology, the potential is in harvesting crowdsourced geographic content and labor often for the benefit of government surveillance and commercial business. The benefit to the user also falls in line with neoliberal ideology. Neoliberalism is understood as a changed mode of policy, ideology, and governmentality. In regards to policy, it is foremost a restructuring of the welfare state and a transference of public services including disaster response and recovery, to the private sector and deregulated markets. Ideologically, the understanding is that human well-being is best maximized through privatization, neoliberalism, and deregulation. Governmentality likewise, transfers the responsibility of social welfare onto the individual, expecting them to become self-actualizing, self-entrepreneurial subjects (Rose 2007). The state does not disappear, but reconstitutes power vis-à-vis the market so governance melds state and corporate forms and rationalities (Leszczynski 2012, 77).

The market strategies of neoliberal governance or "governing at a distance" are further enacted within spaces of interaction on the geoweb. Within these spaces, user-consumers frame their tastes as original and given, but their free labor and monitored information benefit those in power. According to media theorist Marc Andrejevic (2007),

the dangers of a model of interactivity which acts as cybernetic feedback is that it teaches a form of participation that amounts to what *Slavoj Žižek* calls staging the scene of our own submission. That is, monitored forms of interaction tend to stop short of shaping the goals and desired ends of those in control and instead help both political and commercial entities increase their leverage over its citizen-consumers (Andrejevic 2007, 49). The promise of individual control reflects a "grand moral inversion" where corporations become a contributor to individuality, while promising to overcome a citizen's feeling of alienation and lost sense of community, as is the case with Esri's construction of an imagined geospatial community. At the same time, however, consumer organizations take the helm of providing security solutions to contemporary problems of surviving in a risk-trodden, disaster-ridden world while their methods open citizens up to potentially invasive monitoring technologies.

In terms of disasters, citizen sensors who voluntarily or involuntarily communicate information are deemed an asset to large corporations who use that data with publicized intentions of humanitarian aid. "The Great East Japan Earthquake Big Data Workshop," or "Project 3.11," was organized in the fall of 2012 by Google and Twitter in order to assess how information from mass media and social networking sites circulated during and after the March 11th triple disaster. A select cohort of experts were given data sets from several key organizations with the aim of re-analyzing big data and brainstorming services that would be useful in order to prepare for future disasters.[6] One of the participants, Hidenori Watanabe, an associate professor at Tokyo Metropolitan University, soon after launched a data visualization project entitled the "East Japan Earthquake Coverage Map." Using the

[6] Project 3.11 participant organizations included The Asahi Shimbun Company, Google Japan Inc., Honda Motor Co., Inc., Japan Broadcasting Corporation, JCC Corp., Rescuenow. Inc., Twitter Japan K.K. and ZENRIN DataCom Co., Ltd.

Google Earth platform, the project combines different layers from workshop provided data sets, linking for example, NHK media coverage with crowd-generated content such as geolocated tweets and WeatherNews Inc.'s citizen reports. Together the map visualizes what types of information at which locations were and were not covered in the news during the first week. For example, a Tweet from an individual stranded in the tsunami-struck village Kesennuma in Miyagi Prefecture on March 12, 2011 at 1:23 am, expressed the interference of news reporters: "People are calling for help but because of the [news] helicopter we cannot hear their voices. Please make them stop flying over here." The hope of combining the use of crowdsourced social media with the locative and contextualizing power of geospatial technologies was to push news organizations to improve disaster coverage and reduce interferences with search and rescue organizations.

Despite humanitarian hopes however, online interactivity is a space of governance. In the current neoliberal regime, the state no longer directly intervenes in securing the conditions and producing the subjects for its markets. Rather the goal of governance is to teach individuals to take responsibility in rationally thinking through a range of consumer choices as well as risks from bankruptcy to natural disasters. Consumer citizens, having embraced free trade and consumer choice as the democratic ideal for everyone to achieve their goals, are called upon to rationally assess the cost and benefits of certain acts as opposed to others in accordance with economic incentive (Dean 2009, 52). Media scholars have examined the spaces of multi-player online games, Internet forums and communities, television series, participatory systems of audience feedback, automated face perception technologies, arguing that interactivity is another means of shaping the subjectivity of a neoliberal consumer-citizen vis-à-vis a state (Andrejevic 2007; Oulette and Hay 2008;

Gates 2011). While the convergence of geospatial technologies brings eyeballs to products through advertisements, these networked spaces of interactive consumption on the geoweb also act as a stage to discipline subjects into the role of productive and savvy consumer-citizens. This moves geospatial technology beyond a new source of data consumption and production and aligns it with a shifted set of practices, epistemologies, and emergent social relations that are reconceptualizing how emergency practices are carried out (Burns 2014).

A mobile application such as Waze for instance, hides its practices of governance behind a black box of life-bettering, user-driven potential. Waze, which was first named "Freemap," is a GPS-based geographical navigation application for smartphones and tablets that displays user-volunteered information to drivers about various traffic delays. Other traditional GPS navigation software including Google Maps takes driving times from users to provide routing and real-time traffic updates, but Waze gathers map and road data such as accidents, traffic jams, police stop points, cheaper fuel stations, local events and protests, and updated addresses directly from its users who input this information using the application's online map editor. The startup company "Waze Mobile," was founded in 2006 in Israel as a community project by Ehud Shabtai, who wanted to create a free, non-commercial digital database of the map of Israel. It expanded its operations over the following years becoming a global application, but with a true critical mass in only 13 countries. In June 2013, after a flurry of interest by companies such as Facebook, Waze was bought by Google for 1.1 billion USD.

The Waze community member or "Wazer" enters into a trust relationship with the data provided by their fellow drivers, whose information remains anonymous and

unverifiable. At the same time, their data whether volunteered through the online map editor or not is no longer their own but given freely to fellow users, governments for community planning, and to news stations who use the interface to broadcast traffic reports. The system itself is also open to vulnerability to those who want to disrupt or game the system. Waze's servers communicate with user's phones by a SSL encrypted connection which ensures the company's computers are talking to an app on someone's smartphone. Researchers at the University of California, Santa Barbara (Wang et al. 2016) discovered the possibility of intercepting that communication by using their computer as a go-between with their phone. This opens up the possibility of reverse-engineering Waze protocol. The researchers created thousands of "ghost cars" that could be used to create fake traffic jams and also collect information on drivers around them.

The user can avoid being tracked by going invisible every time they open the application on their smartphone, but as a user-driven application, invisibility is not what Waze desires. Rather the interactive user is prioritized and sought after. The app encourages a more active Wazer by gamifying activity. The Waze point system tracks the client's driving, application, and use of the map editor where certain actions are given points, for instance reporting congestion or driving over special icons. Point totals are compared to others in the community to determine a user's rank. Other possibilities of interaction include the app's monetization by local resellers and advertisers, which Wazers can opt into having small icons show up on their screen. In each of these cases, the user has some control over whether to participate or not though the drive is for participation.

Contention over the legal appropriateness of driver-submitted information brings into question user's right to share information in the public square and the responsibility of

Google to intervene. In December 2014, the Los Angeles Police Department (LAPD) complained to Google Inc. about Waze's police locator feature, which allows Wazers to place a police icon on the map and report if the officer is hidden or visible. The LAPD claimed potential criminal misuse by drivers who could endanger police officers and the community. They pressured the company to remove the feature. Google however, holds to the First Amendment right of free speech and assures that such knowledge of officer's whereabouts only encourages better driving (Sullivan 2015). Digital empires continue to hold steadfast against encroaching demands by law makers and enforcers to govern their platforms, but such cases speak to a larger societal questions of the responsibilities of systems in which a vast amount of users interact with disperse data (see Gillespie 2017).

Questions of governance are similarly overlooked by industry marketers and crisis management researchers who hype the potential of geospatial technologies and in particular the analysis of big data, open data, and crowdsourced data to improve the ability to prepare for, prevent, and better inform the public by assessing risk. However, rather than a direct overhaul of disaster management practice as often promoted, these technologies are appropriated into both standing practice and changes already underway. To start, mass mediation in the digital age provides the public more opportunities to scrutinize how organizations respond to crises and communicate over the course of them (Malone and Coombs 2009, 121). With increased transparency, government agencies in particular seek to manage accountability by strengthening their public relations capacity. One strategy has been by adopting a more interactive approach that situates their organization's role within a larger crisis communication network. In this sense,

government organizations mitigate negative outcomes of a crisis and protect themselves from damage by sharing the obligations of interpretation (Suzuki and Kaneko 51-2, 2013).

Similarly, one can ask to what extent citizen's production of the news or even traffic alerts, challenge the government and the news media's dominant role as the major source and interpreter of conflicts (Bahador and Tng 2010, 179). The globalized complexity and complex nature of contemporary media further undercuts the traditional Social Amplification of Risk Framework model mentioned prior, which assumes television news, radio and newspapers as the main public diet of information concerning risk. Newer media technologies and in particular mobile devices alter the moment in which the public engages with information, changes the quantity and quality of information transferred, and produces an alternate forum within which citizens can debate and discuss the causes and consequences of risk. The lack of certainty in the answers is another incentive to study the impact of the internet and new communication technologies on the construction and circulation of vital information (Anderson 2006; Bardoel and Deuze 2001). The Fukushima NPS disaster's complex mediation offers a cogent case study to assess geographic information's role in the construction of risk and production of uncertainty.

THE NUCLEAR IMAGINATION OF DISASTER

Risk remains a leading topic of concern, and the media, a pertinent source of information and sense-making in contemporary culture. Media constructs and constitutes cultural meanings associated with risk, linking it to social differences, ways of seeing, and social realities. Media is also a technology of information transfer, an act of communication, and a chain of practices and processes that employ geospatial technologies. These technologies gather geodata, order and visualize geographical information, and construct

and disseminate imaginative and risky geographies. Risk, however, is inherently contingent and constructed uncertainty, and an outcome of media and public discourse (Stallings 1990, 82). This project is not only about determining the ways in which risk information circulates through geospatial technology, but to follow the cultures and affective registers that circulate with it. Nuclear radiation in particular, has a complex culture related to nuclear war technology and as one of many human-produced hazards that result from the processes of modernization and the damaging effects of scientific and economic development in capitalist societies. In the case of Fukushima, geospatial technologies visualized risk that is invisible to the human eye, radiation.

Arguably, the Fukushima NPS disaster clearly represented a catastrophic actualization of Ulrich Beck's (1992, 1998) post-industrial "risk society." It is a disaster that could only take place in the current era; that is, in an era of aging nuclear power stations and controversial and unsustainable strategies for nuclear waste removal and containment. The magnitude 9.0 reverse fault megathrust earthquake that occurred 100 kilometers off the Pacific coast of Japan's Tōhoku region triggered a huge tsunami wave that breached the protective walls and knocked out the main electricity supply and the backup generators for cooling systems that ran six nuclear reactors at the Fukushima Daiichi NPS. This led to the collapse and subsequent explosions of reactors one, two, and three, severe damage to reactor four and the plant's containment systems, and to ocean water not only invading the nuclear facility, but radioactive materials escaping beyond it (Matanle 2011). Understanding the media representations of nuclear risk thus necessitate unpacking past, present, and evolving public understandings of nuclear power and nuclear disasters.

Nuclear power and nuclear disasters each carry distinct and interlocking cultures that evolved since the post-World War II era and on through Three Mile Island and Chernobyl disaster. At the core of nuclear energy, for instance, is a dualism of representation that exists both in news coverage and fantastical representation (Gamson and Modigliani 1989, 12). On the one side is maintained a dystopian understanding. General awareness of nuclear power is automatically linked to the atomic bomb and the destruction of Hiroshima and Nagasaki in World War II, where the afterimage of the bomb's mushroom cloud explosion is instantly recalled. At the same time, nuclear power is linked to the utopian theme of technological and societal progress where public discourse following WWII framed it as a choice between "atoms for war and atoms for peace," constructing an "either/or structure of nuclear dualism" that went relatively unchallenged for the next quarter century (Gamson and Modigliani 1989, 13). A nuclear disaster caused by nuclear energy, however, falls to the side of this paradigm.

Historian Hayden White (1996) created a list of "modernist events" that are "anomalous" in their "resistance to inherited categories and conventions for assigning them meanings" (20). On this list are the "pollution of the ecosphere by nuclear explosions and the indiscriminate disposal of contaminants" (White 1996, 21). According to White, the media represents these events in ways that render them impervious to explanation and resistant to attempts to represent them in story form. He explains:

> Not only are modern post-industrial "accidents" more incomprehensible than anything earlier generations could possibly have imagined (think of Chernobyl), the photo and video documentation of such accidents is so full that it is difficult to work up the documentation of any one of them as elements of a single "objective" story. Moreover, in many instances, the documentation of such events is so manipulative as to discourage the effort to derive explanations of the occurrences of which the documentation is supposed to be a recorded image (1996, 23).

When used to capture and explain nuclear risk, geospatial technologies that are hyped to manage and objectively "see" the world are attempting to represent that which is considered unrepresentable.

White's assertions relate to a larger thread of his discussion stating that "it's no accident" that representation of these modernist events tend toward an "aesthetics of the sublime-and-the-disgusting" (1996, 23). He is referring to Hollywood's approach to representing nuclear issues such as nuclear testing or atomic radiation in the form of dystopian images of biologically mutated invaders or in future dystopian scenarios. These media tropes are elucidating when one considers understandings of nuclear risk in relation to media representations of actual nuclear disasters. Media do not exist in isolation, and the consumption of disasters in particular are a complex part of a cultural-visual matrix operating in what can be considered a mixed affective register blending nostalgia, spectacle, and nihilism (Leyda and Negra 2015, 3). This register can be applied to how users read a nuclear disaster from interactive maps as well as from news reports.

In terms of film, one can start with the science-fiction B-movies of the 1950s such as *Them!* (Gordon Douglas, 1954) and *It Came from Beneath the Sea* (Robert Gordon, 1955), where Los Angeles is terrorized by giants ants produced by atomic tests in the desert and a giant mutated octopus respectively. In contrast were dramas and suspense features depicting future nuclear dystopias such as *On the Beach* (Stanley Kramer, 1959), and in the 1960s, *Seven Days in May* (John Frankenheimer, 1964) and *Fail Safe* (Sidney Lumet, 1964). These narratives of nuclear instability, Frankenstein creatures, and mad scientists' hubristic attempts to master nature serve as elements of allegory to suggest human's

transgressions can be punished. Cinematic stories stood in stark contrast to official narratives of the American nuclear industry, which since the 1940s promoted nuclear energy as a "machine in the garden" that could produce clean, white power (see Marx 2000).

As an offshoot of Cold War anxiety, a renewal of Hollywood's interest in nuclear anxieties resurfaced in the early 1980s in the form of the nuclear war movie. Rarer were films such as *Testament* (Lynne Littman, 1983), a low-budget production of a nuclear attack on a small community in California which explored the psychological experiences of such an event. More common were narratives such as *Thunder Run* in 1985 and continuing into the 1990s post-Cold War era, *True Lies* (James Cameron, 1994) and *Crimson Tide* (Tony Scott, 1995). The plots of these action-adventure films and the apocalyptic thrills of danger, survival, and male heroism resulted from a common plot device, nuclear materials, mostly weapons, falling into enemy hands. Any anti-nuclear discourses presented were framed by the recurrent binary oppositions of authority/victim, logic/feelings, and nature/culture. One side is typically occupied by the scientist and his dangerous devices, the cruel parent, the domineering male, or can simply take the form of the government, industry, or military official, or a more general threat of science and technology. In opposition stands the victimized guinea pig or worker, rejected child, dominated woman, or individual (Weart 1988, 350).

News media representations of nuclear energy similarly waver between a specialist discourse and a challenger discourse. Nuclear specialists from public agencies such as the Nuclear Regulatory Commission and U.S. Department of Energy, the Atomic Energy Commission and its successors, use journals and print media to frame nuclear energy in

what Gamson and Modigliani (1989) termed a "progress package;" that is, a neoconservative agenda that resonates with larger themes of technological progress. The prevalence and support of this package resulted in serious nuclear accidents such as at Fermi in Detroit in 1966, Brown's Ferry in Alabama in 1975, and Rancho Seco in Northern California in 1986 going relatively unreported by the national news media (Gamson and Modigliani 1989; Mazur 1990). Media discourse typically frames issues into interpretive packages where frames are central organizing ideas that make sense of relevant events. These frames do allow for degrees of controversy within them. Specialists from various agencies whose job brings them into contact with journalist must compete with challengers who also bear packages intended to mobilize audiences into some form of collective action (Gamson and Modigliani 1989, 1-2). Despite a general lean towards favoring technological change, news coverage is never wholly positive. Furthermore, a crisis occurring is considered an "interruption of narrative" (Heath and Millar 2004, 11). Society's ignoring of risks of everyday life make it such that when crises happen they interrupt the benign, under control, and taken-for-granted outcomes of society's routine activities. Or as Susan Sontag (1965) argued, “we live under continual threat of two equally fearful, but seemingly opposed, destinies: unremitting banality and inconceivable terror.” Television structures both parts of the contemporary imagination, assimilating and producing crisis as part of an ongoing commercialized spectacle (Doane 2006, 261). For reporters, a crisis “story” is typically built with speculation, using the organizations involved as characters and what was done or needs to done as plot points (Heath and Miller 2004, 15). As I will demonstrate, reporters normalized the visual conundrum of Fukushima invisible radiation through similarly characterization and the framing the weather report.

In the 1960s, environmental movements and the energy and oil crisis increased the media attention given to environmental problems. In the 1970s, both pronuclear packages and movements against nuclear power plants increased public awareness over the prospect of a hazardous release of radiation (Mazur 1990, 360). An ironically relevant filmic case study to examine changing public understandings of nuclear disasters is the nuclear thriller *The China Syndrome* (James Bridges, 1978). The film represents government negligence in reporting and withholding of information to the public, as well as the power of ordinary citizens to become informed opponents against the corporate system. The plot is similar to the media narratives constructing the Fukushima NPS disaster. The film arguably reflects the contemporary moment and makes a similar claim that "empowering" truth telling technologies, when in the hands of honest citizens-turned-radical protagonists, enables them to bring correct knowledge to the public.

The China Syndrome was a cinematic product of anti-nuclear advocacy, and in particular among Hollywood personnel. It was part of a response to the domestic nuclear industry's decline, as spiraling costs and safety questions of aging facilities delayed needed changes in regulation. The film's stars, Jack Lemmon and Jane Fonda, were anti-nuclear campaigners. Prior to this film, Fonda tried but failed to buy the movie rights to the Karen Silkwood story. Silkwood was an American chemical technician and labor union activist who raised concerns for health and safety practices in a nuclear facility. Her mysterious death and an associated lawsuit against the chemical company later gained more notoriety and became the subject of the film *Silkwood* (Mike Nichols, 1983) starring Meryl Streep. Lemmon likewise narrated the voice-over of an anti-nuclear public television documentary, *Plutonium: Element of Risk* (PBS, 1977), which presented a one-hour long investigation into

the dangers of plutonium as a by-product of nuclear energy. *The China Syndrome* would reinforce popularized perceptions of nuclear energy and technology as being controlled by corporate businesses which place profit above human lives. Its main narrative conflict revolves around a safety issue at the fictional Ventana nuclear power plant. Focus is on the "cover ups" which involved a rushed negligent report by the Nuclear Regulatory Commission (NRC), done to vindicate existing safety procedures and expedite the construction of a new station.

The audience is allotted a position of privileged knowledge by being given insight into the conspiracy while the main characters struggle with their positional dilemmas to unravel it. According to Michael Ryan and Douglas Kellner (1990), "the slow transformation of ordinary people into informed opponents of the corporate system probably appealed more to audiences than if the characters had begun as radicals" (104). The main narrative suspense is held by the transformation of protagonist Jack Godell (Jack Lemmon), a loyal control room supervisor at the Ventana nuclear power plant. The film establishes that it is his self-sacrificial attempts that prevent the "China Syndrome" from occurring. The film's title refers to a hypothetical nuclear reactor operations accident in which a meltdown of a reactor's core could burn through the containment vessel, its housing facility, and so on, continuing though the crust of the Earth until reaching the other side, or "China" as it is jokingly referred to in the United States. Godell is self-sacrificial in the sense that his efforts to rectify the situation for the nuclear industry end up getting him killed by the police anti-terrorist squad in the process. It was he who discovered that faulty welding was the cause of the radiation leak. The NRC's "cover up" was by official reports, which falsely blamed "minor faults" in a generator circuit and stuck valve, and a

construction company that falsified tests when constructing the plant in order to save money. Godell's confrontation and subsequent failure to convince the financially-strapped company manager to run a safety check ends as a build-up of water pressure which evokes his valiant attempt to prevent a radiation leak from occurring. On the similar evolution from naively accepting the industrial capitalist system to seeking to reform it from the inside is television news journalist Kimberly Wells (Jane Fonda). Her goal, which is accomplished at the end, is to bring this story of corporate corruption and safety negligence to the public.

The political position of both characters is one of vindicated opposition to corporations and the general threat of nuclear energy, but it is further established by humanizing science and technology. That is, science and technology in the hands of the right people is what rectifies corporate corruption in the end. It is this same false, self-serving empowerment of the user that is used to sell geospatial technologies. Notably, escaping the "China Syndrome" does not resolve the anxieties of future risks of technological failure at the Ventena facility, but audio-visual media technologies, investigative news journalism, and scientific expertise are vindicated as competent vehicles for communication and instruments for objective truth. This at first seems in opposition to the film's narrative framing. It opens and closes with a cacophony of newscaster voices and multiple screens in a television studio. According to environmental film scholar David Ingram (2000), this framing can "suggest a confusing babble of competing voices and image," but when discussed in relation to the film's narrative dynamics, access to reliable truth, and trustworthy mediation is shown possible by vindicating "the competency of the mass media as an effective guarantor of American democratic pluralism" (170). Similar to

the tornado investigating device "Dorothy" in the honest hands of a ragtag group of independent researchers in *Twister* (Jan de Bont, 1996), *The China Syndrome* offers audiences reassurances that the "audio-visual media technologies, when in the hands of men and women of honesty and goodwill, can give unproblematic access to truth" (Ingram 2000, 170). The narrative however, must correct or disavow the confusing babble, the falsified radiographs, and the complacent public relations lectures on safety and efficiency of nuclear power at the beginning of the film.

Investigative news journalism is likewise justified when represented through Wells, an ordinary person but competent news journalist who possesses the qualities of authority and integrity. She is presented as being committed to both the truth and the need to inform the public about the vested interest of corporations involved. Solutions to the problem remain within the dominant paradigm of technocratic rationality, but truth is signified instead not by scientific jargon of industrial specialist but by the inarticulate nervous interview of Godell's television broadcast that showcases his ordinariness (Ingram 2000, 170). Wells's parting words in the film similarly suggest a tentative possibility for reform: "I'm sorry I'm not very objective. Let's hope it doesn't end here," thus reaffirming her humility against corporate corruption (Ingram 2000, 171). As U.S. Secretary of Commerce Penny Pritzker's allusion to the ordinary individual role during Illinois's F4 tornado, *The China Syndrome* produced a similar mythological sleight of hand of citizen responsibility and the potentials for engagement. Fukushima allotted similar possibilities for citizens to become involved.

As with the ideological meanings of the film's text, the cultural economy or "cultural circulation" of the film also speaks to contemporary understandings of nuclear disasters,

demonstrating how cultural texts converse with real world events. *The China Syndrome's* release coincidentally was twelve days before the nuclear accident at Three Mile Island. The incident was a partial meltdown of reactor number 2 at the Three Mile Island Nuclear Generating Station in Dauphin County, Pennsylvania. As Fukushima, Three Mile Island rated a "Level Seven" on the International Nuclear Events Scale, or an accident with wider consequences. Due to its topical relevance, the film became a key site alongside news reports for "educating" average Americans in the jargon of nuclear technology. Taken up by public discourse was the film's title, understandings of core meltdowns, weld inspections, and various engineering terms. A phrase from the film, "an area the size of Pennsylvania," also gained widespread notoriety, while related press questioned the ethics of cinematic representation (Clarfield and Wiecek 1984, 388-9).

Among commentators were nuclear experts either praising the film's relevancy or decrying its scaremongering. Supporting organizations and consultants who worked on the film included the Union of Concerned Scientists, who also became involved during Fukushima by releasing public statements concerning the mass consumption and buyout of potassium iodide pills in the U.S. A member of the Union was also cast in a cameo role in the film. Alternatively, the nuclear industry pointed to the inaccuracies and distortions in the film's representation. For example, nuclear specialists commented on the actual lack of a central emergency core cooling systems at nuclear plants, how the interval of time for a plant approaching a meltdown was shortened for narrative economy, and that it would not be difficult to shut down a reactor from outside a control room in the event of it being taken over by terrorists or in the film's case, the control room supervisor, Godell. Further

discomfort was in the representation of nuclear scientists and the utility foreman as being insensitive to their responsibilities.

The China Syndrome was released 12 days before the Three Mile Island disaster meaning the film acted even more as a site of education, contradiction, and contestation than pure entertainment during its cultural circulation. While there was no nuclear thriller offering a timely precursor to the Fukushima NPS disaster, cultural understandings instilled by past media representations of fantastical and real nuclear disasters continue to influence public discourse. But more than in the 1980s, Fukushima invigorated and drew urgency to contemporary debates pushing nuclear power as a technology to combat anthropogenic climate change. Since the 1990s, concern over the impact of global climate change claimed nuclear power as a promising alternative to fossil fuels such as coal. Since then, nuclear power has been reframed as a "sustainable energy" source and for many countries, an essential component to future energy policy and climate change mitigation (Bickerstaff et al. 2008, 146). The 2005 Kyoto protocol that was signed by 141 countries and aimed to reduce global greenhouse emissions, further encouraged nuclear reactors as a "zero carbon dioxide emission" technology (Sovacool and Brown 2007, 107). Public opinion remains mixed on the resurgence of nuclear power mostly because climate change remains an unknown danger, while the history of nuclear technology and associated cultural repertoire of images of dread and fear of radioactive waste more so influences the public concern over the nuclear industry (Bickerstaff 2008, 146). Still policy building climate change mitigation is seen as encouraging a reluctant acceptance of nuclear power (Bickerstaff 2008, 159).

As nuclear disasters prior, the Fukushima NPS disaster piqued concerns over nuclear power plant safety, and in line with contemporary concerns, shook future governmental commitments to nuclear power. Breaking news reports following the ongoing investigations of the Japanese government nuclear regulators and the power plant operators, Tokyo Electric Power Company (TEPCO), highlighted the vulnerability of aging nuclear facilities worldwide and inefficient preparedness measures already in place (Suzuki and Kaneko 2013, 50). Several countries also went on to reconsider their recent push for nuclear power with the disaster influencing decisions to phase out nuclear power in Germany (for 2022), Switzerland (2025), and Belgium (2034). Italy also rejected a plan to revive its nuclear program (Hindmarsh 2014). Nuclear incidents in distant locations have been shown to renew unease about nuclear facilities in general elsewhere, as well as reduce trust in nuclear energy technology (Parkhill et al. 2010; Flynn 2003). For example, similar changes in public opinion regarding sustainable nuclear energy practices have been linked to the media coverage of Three Mile Island (Mazur 1981; Mitchell 1982).

Whether in film or in news coverage, the mediation of environmental disasters initially denaturalizes Beck's "risk society" by raising public awareness of the human actions or inactions that have harmed and are harming the planet's ecologies and setting humanity at risk. It follows what Richard Grusin (2010) calls an "affective life of media," or the way in which individuals engage in complex affective interactions with media technologies and practices (4). This model engages with both media studies and the more recent affective turn in cultural studies and social theory that seeks to provide an alternative method to post-structuralist psychoanalytic approaches to the human subject and its motivations. While understanding "meaning" focuses on how information works to

produce signification, "affect" bypasses knowledge production to consider consensus building. In this sense, affect modulates a response first and signification second, while seeking to explain embodied individual and collective social and medialogical responses (Lukinbeal and Crain 2009, 180). Affect and non-representational theory in particular, attempts to grasp mediation as an ontology of multiplicity in order to overcome the dualisms implied by representation such as non-human and human, mind and world, culture and nature, and so on (Latour 2003; Thrift 2007). According to Grusin, it is a look at "the things that mediation does rather than what media mean or represent" (2010, 7).

Endurance of public discourses that effect policy changes after the initial shocks to the system, however, are more tenuous. Social theorist Brian Massumi (2011) argued that the news media's handling of Fukushima's preceding the earthquake and tsunami fell to what he calls a “media-driven affective conversion circuit” that characterizes contemporary culture. As with large-scale disasters that hypermediate away from local affected populations to accrue global spectatorship and concern, the media neutralizes the initial shock and harrowing details of destruction with "heart-warming" narratives of human struggle and heroism only to soon be seceded by another media event. For overseas audiences, the social upheavals in Libya provided the new spectacle of interest, while Japanese audiences continued to be swept along in national-support campaigns. Both left little time to reflect on the inner workings of the larger economic, technological, and social systems that contributed to the prior disaster's devastation. This "half-life of disaster," as Massumi deems it, also produced a distancing effect in geographic and temporal terms. Electronic screens provided instant access to the local crises, but audiences outside the

disaster zone were safely distanced from the trauma as it transformed into an event on a continuing mediated timeline.

The Fukushima NPS disaster, however, is one whose aftermath cannot be ideally conceptualized into human-interest narratives, geographic constraints, or within a defined timeframe. White argued that nuclear disasters resist inherited categories and conventions that assign them meanings (1996, 20). In the following case study, I seek to show how meanings of the regional and global reach of Japan's local nuclear disaster were conceptualized through the visualizing and "truth" telling power of geospatial technologies and the standard narrative conventions of ordinary and extreme weather media. Fukushima's airborne radiation became akin to a weather event, bringing similar results to the consumption of environmental disasters such as extreme weather events and climate change. The mediation filled in for the public conversations not being held on the viability of nuclear energy technology.

However, the possibility for sustained critique and reflection on environmental risks fell victim to commercial and political agendas, the inundation of esoteric and questionable data, the competing opinions of experts and laypersons, contentious political debates, complex international policies, and far-flung conspiracy theories. The ongoing media event embodied the cacophony of talking heads displayed on the numerous television screens framing the close of *The China Syndrome*. The resulting narrative in retrospect, however, did not uphold the mass media or the radical protagonist as a competent guarantor of democratic pluralism despite the noble appropriations of expert mapping technologies by the latter. This is not to discount the legitimate anti-nuclear activist movements within Japan and abroad, or the agency of those like Godell and Wells who confronted and

protested government negligence, lax regulatory standards, and an unsustainable reliance on nuclear energy. Rather it is to consider media affect in the long term as well as the short term, and to temper grand utopian promises of newer technological applications.

RADIATION FORECASTS

Of ironic relevance is the fact that maps are second only to weather information in the number of Internet searches (Peterson 2005). This ubiquity, however, can be considered in relation to what media scholar Ethan Zuckerman (2012) argued that "the most powerful tools for political change are those that achieve wide adoption and are integrated in everyday practice." Widely available open-source web-mapping software that allows individuals and media outlets to create their own maps turns them into "platforms" for the production of politics. "Platform" is used discursively by media companies to express promotional notions of connectivity and interoperability as I mentioned in the branding of Esri's ArcGIS mapping platform in chapter one. The interactive spaces are far from neutral, and the technical, legal, and commercial features of platforms end up shaping online participation. Online mapping platforms arguably afford users particular modes of participation that differ from other participatory media platforms such as Twitter or personal blogs. Those studying geospatial technologies, and in particular those interested in putting these tools to use for social justice, are considering platform politics to discern what allow or restrain certain forms of participation (Clark et al. 2014, 1447).

In regards to the Fukushima NPS disaster, STS scholars have deemed the emergence of civic engagement in Japan and in particular the use of mapping platforms such as the Google Maps API, as an “appropriate” technology. This follows Kim Fortun's (2004) notion of an appropriate technology as one attuned to the material, political, and technological

realities within which it is put to use by people during a given time period. A map, or what Atsuro Mortia, Anders Blok, and Shuhei Kimura (2013) refer to as a "civic infrastructure," became an important tool or appropriate technology for Japanese citizens to evaluate the official government statements and the circulating rumors of radiation risk. Similarly, media scholar Jean-Christophe Plantin (2015) claimed that it was no surprise that open-source mapping applications became the preferred platform. Radiation maps, Plantin argued, represented a politicized attempt by amateurs to more equally redistribute information on radiation, going beyond what was officially released by TEPCO and the Japanese government with their own produced data. Plantin followed Jason Coburn's (2005) analysis of the ways in which local knowledge was being used to effect environmental health policy reform. According to Corburn, the aggregation property of maps is an important incentive to the public to use during territorial conflicts. Plantin examined how web-based maps combined with radiation measurements to provide a tool for social actors to verify and communicate governmental and crowdsourced radiation measurements. As Plantin noted, "opposed to textual PDF reports from the federal government, maps provided easier and more readable access to pertinent information" (2015, 12).

In terms of the politics of platforms, the affordances of online maps shaped how amateur mapmakers used them. In Plantin's assessment, he separated participatory actions into those that occurred before the map and through the map. Before the map is "participation as data extraction," where concerned actors collect data on-the-ground with Geiger counter monitoring, or extract and republish data from official sources. While with "participation as data aggregation," actors aggregate and verify different sources of official,

alternative, and crowdsourced datasets, and disseminate the maps to different venues. In taking into consideration the map before and after construction, Plantin's study contributes to research on the study of power relations of participation in social media platforms, while also touching upon their temporality. Many of these radiation maps are now offline, applications are no longer updated, and mapping projects vanished or were renamed. While Plantin's study is preliminary, it calls attention to the importance of taking into account the temporality of online participation. However, it makes no claims concerning the long-term effects of these social movements.

As with the social movements themselves, maps do not exist in media isolation. The following case study seeks to broaden understandings of geospatial technologies not only as appropriate technologies, but as "contested sites," reading them in relation to other media used in conjunction to construct public understandings of the health risk of the nuclear disaster in Japan and the United States. In particular, I draw attention to how atmospheric radiation was read as weather media. The weather map has been claimed by geographer Mark Monmonier (1996) to be one of the greatest inventions of modern geography and one responsible for shaping our lives. The taken for granted aspect of the weather map perhaps best alludes to why it is often mistaken as neutral. The weather map takes on a specific relevance as both a visual representation of environmental phenomenon, as a platform for politics, and as a "contested terrain" that can be appropriated by different social actors to verify or refute official information. The following sections examine the framing of Fukushima radiation as weather within local and global media contexts respectively. It compares the narratives and geospatial visualizations of NHK's daily radiation forecasts to sensationalized reports of radioactive rainfall in the

United States. Culturally symbolized as weather and defined within the rhetorical conventions of weather news coverage helped maneuver radiation risk into narratives that fit different national media agendas.

AMPLIFYING AND REDUCING THE RISK OF NUCLEAR RADIATION

On July 12, 2011, K5 News, a local television news station in Seattle, Washington, reported an allegation by the Seattle nuclear watchdog group, Heart of America Northwest that the U.S. government was negligent about keeping the public informed of health risks from elevated levels of radiation in rainfall during the weeks and months following Fukushima. At the end of March, the U.S. federal Environmental Protection Agency (EPA) flagged Washington as one of fifteen states with the earliest U.S. detected trace amounts of radioactive airborne particles, while the greater Northwest Coast region also accrued the highest levels of radioactive rainwater. The televised news segment interviewed the nuclear watchdog group's representative as he was seated in front of a desktop computer, visualizing the actual site of his investigation. Provided access to the EPA's open-source data on their public website, individuals in the group discerned that Iodine-131, a product of nuclear fission, was found in Washington rainwater at the end of March at levels 41 times above drinking water standards. The news segment voiced the group's concern over the general public's ignorance about levels exceeding health standards. It pitted them against "the federal government," in this case the EPA, which is described by the newscaster in the clip's opener to have "come out swinging on this one." Far from provocative, however, the EPA's quoted response reiterated the agency's official stance that Iodine-131's short eight-day half-life resulted in only a brief period of exposure and negligible heath risk.

The news segment also included an interview with a Seattle resident on location in her backyard vegetable garden. Several wide shots of hard rain hitting the black concrete of urban streets are interspersed with low angle shots of the gardener's recycled rainwater container and green plants budding up from the moist soil. The resident relayed her uncertainty as to whether her homegrown vegetables were safe to consume after being exposed to contaminated rainwater. She admitted that if she had known that any risk existed, she would not have planted a garden at all. Ironically, the end of the report confirmed a clear point of agreement between the watchdog group and the EPA: that watering plants with water exposed only briefly to these elevated radiation levels was unlikely to pose health risks upon their consumption. It is a revelation that came only after the news anchors cued audiences to expect a wider conflict between official and alternative sources regarding health risks.

While K5's is one report among many concerning Fukushima's weather-borne radiation and its health risk for U.S. residents, it exemplified the narrative arc and visual elements that contextualized the disaster for U.S. media consumption. In terms of narrative, reports affirmed those actors who became the press' significant local sources: representatives from both government and independent scientific research agencies, in this case, the EPA, anti-nuclear activists groups like the Heart of America Northwest, and the concerned civilian, represented by the backyard gardener. Each actor's stance on health risks was clearly demarcated: the agency and nuclear watchdog group stand on opposing poles, while the resident occupies a middle space, questioning what they should do or should have done during these periods of exposure. Visually, breaking news reports used

mapped simulations of the radioactive weather system to depict its migration from Japan across the Pacific Ocean, to which K5's news segment devoted a short clip for back-story.

Radiation was also represented as fused with the local environment. In this news segment, it is a conspicuous threat hidden in the raindrops, the street puddles, the recycled rainwater, the garden's soil, the vegetables, and the individual, whose body was exposed to risk through rainfall and potentially contaminated vegetables. In related reports, dairy cows and other livestock also stood in as visuals for radiation's presence in the U.S. environment. On April 1st, in an article by *The Bay Citizen*, a non-profit news organization in the San Francisco Bay Area, a stock image of two dairy cows harmlessly grazing in a meadow visualized the report's disclosure of radiation's detection in milk samples. Similar to K5 News' televised report months later, *The Bay Citizen* emphasized how "the U.S. government has still not published any official data on nuclear fallout here from the Fukushima disaster" (Upton 2014). These representations reflect how residents occupied the same space as radiation, but any stable understandings of the health risks posed by that environment remained buried in competing opinions. By visualizing and contextualizing risk, the U.S. media's "weatherization" of radiation reflected the "twin tendency" associated with other extreme weather media forms to present disasters as spectacle and as occasions for neoliberal exhortations to personal responsibility (Leyda and Negra 2015). Reports consistently stimulated fear of the surrounding environment and established risk uncertainty, placing the burden on the individual to judge for themselves the credibility of sources and which actions to take in response, if any actions could still be taken outside of blaming the government.

At the start of the nuclear crisis, the conventions of weather reporting were instrumental to the mainstream press in turning Fukushima's invisible radiation into a tangible U.S. news story of public anticipation and interest. The earliest reports of the traveling radioactive plume approaching North America were similar to those of a developing storm, with only speculations as to its severity and the regions likely to be exposed. News anchors and journalists implored audiences to remain calm, while promising to keep them posted on further developments. Updates were steadily released by government agencies and independent researchers who began tracking the radioactive plume's migration and simulating its future path and dispersal over the Pacific Ocean. First came predictions. The United Nations forecast that the plume would reach the Aleutian Islands on March 17th, and hit Southern California on March 18th (Broad 2011). Predictions were then substantiated by testing with sensitive radioactive isotope-measuring equipment, air filter detections, and Geiger counters. On March 18th, air filters at the University of Washington in Seattle indeed detected the presence of radioactive isotopes that likely originated in Fukushima (J. Diaz Leon et al. 2011).

The EPA, which routinely samples the nation's air, precipitation, drinking water and milk for radiation with its nationwide monitoring system, RadNet, accelerated its routine sampling schedule starting from the first day of the crisis until June 30th. The agency disseminated statements to media outlets throughout the three-month period as well as devoting a substantial part of its official website to providing the public with radiation risk information. At the end of the accelerated sampling period, the EPA released a public statement reaffirming its prior assurances that the radiation levels detected by RadNet were well below any level of public health concern, and they steadily decreased during the

month of April, and since May, any detections of radioactive isotopes associated with the Japanese nuclear incident were deemed negligible.

Similar to typical weather forecasting, reports incorporated the official data about atmospheric and nuclear science and attempted to make it intelligible and palatable for nontechnical audiences. Despite individuals having access to alternative platforms of information, when severe storms bear down on the nation, The Weather Channel continues to acquire audiences who are both interested in and dependent on its forecast interpretations. TV news channels primarily act as outlets to disseminate government warnings and guidelines. Their weathercasters take weather information, which is "the end product of an international system of data collection, evaluation, analysis, modeling forecasting, and dissemination," refine or enhance it, design a segment with striking graphics, and attempt to integrate an onscreen personality into the presentation (Carter 1998, 26). Instead of simply telling audiences that a severe storm is imminent, weathercasters hype the storm's development as it occurs and provide dramatic visual elements to maintain viewership as it approaches. Similarly, official maps and simulations were incorporated into early Fukushima radiation forecasts, making the radioactive cloud visible, mobile, and temporal. As with 24-hour news channels exploiting a developing storm, radiation's slow but steady dispersal and movement across the Pacific region thus could be turned into an anticipated weather event, and provide a logic to news outlets' following up with subsequent breaking reports.

Simulations that visualized the radioactive plume's geographical movement cultivated a low level of fear, further inducing U.S. audience's need to know about future developments. This reflects what Richard Grusin (2010) described as the news' shift of

focus following 9/11 from detailing the past to premediating the future. An early example of a press-released simulation was the Comprehensive Nuclear-Test-Ban Treaty Organization's (CTBTO) push-play map that projected one week of airborne radiation dispersal over the Pacific Ocean. A version published in the *New York Times* on March 16th under the headline, "Forecast for Plume's Path Is a Function of Wind and Weather," closely resembled a traveling storm with its intensity colored in gradients of purples, blues, and yellows. The key explained these colors as "arbitrary units" of "relative levels of radiation," rather than being based on definitive data. The accompanying short report on the simulation's significance further emphasized in bold text that "the forecast does not show actual levels of radiation," but was instead an estimate of when monitoring stations might detect them (New York Times 2011). As Grusin argued, premediation is not about correctly predicting the future, but "proliferating multiple remediations of the future" to prevent the reoccurrence of a similar shock to the one experienced on 9/11 (Grusin 2010, 4).

As actual radiation readings were collected by stations, reports included more detailed data and speculations on health risks. These reports, however, lacked consistency in the units used, fluctuating between becquerels, microsieverts per hour, millisieverts per hour, and millisieverts per year. By the second week real radiation doses were slowly abandoned and by April rarely used in favor of reporting more comprehensible "times above normal" without any indication of what "normal" represented in relation to already variable background radiation levels (Hoetzlein 2012, 116). A radiation reading two times above normal can excite alarm in civilians unaware that worldwide background levels can routinely fluctuate by up to ten times. Mistakes and retractions of level readings, along with blanket comparisons to various city averages, x-rays, and bananas confused audiences

rather than informed them. Conceived of as "friendlier than sieverts and grays and rads and rems," the banana equivalent dose, or BED, expresses the amount of radiation exposure received from eating one banana (Blastland 2011). For example, 400 bananas are considered the equivalent of taking a flight from London to New York. While the BED calls attention to the low levels of natural radioactivity within food, it does not explicate the enormous variations of risk that stem from differences in the physical characteristics of radioactivity, such as varying half-lives and the type of radiation rays emitted, or how radioactive isotopes travel through and are taken up by the body. While simplified for the layperson, the BED more often confuses than clarifies the situation.

Health risks were treated in similar nonspecific fashion as scientific research organizations conscious of the contested nature of their public disclosures, did not rule out any effect. The *New York Times* article's statement that "health and nuclear experts emphasize that any plume will be diluted as it travels and, at worst, would have ***extremely minor*** **health consequences** in the United States," reflected similar disclaimers found throughout media reports during the initial exposure period. The lack of definitive language and use of trite and/or misleading comparisons helped to make uncertainty a recurring trope of reports, which along with Fukushima's unresolved containment, ultimately sustained public interest in the story's development.

In Japan, vocal public criticism about the lack of official risk information led to the media's disclosure of radiation measurements in daily weather reports. In the U.S., on the other hand, The Weather Channel and other media outlets are not direct conduits for government information. Reporting decisions are instead primarily based on capturing market shares, maintaining an audience, and providing returns on investment. Coverage of

the disaster began reflecting not the "objective hazard" itself but indicators of the social and political activity surrounding it (Mazur 1990; Peters 1992). This activity took on international dimensions as reports sorted through different countries conflicting nuclear policies. The U.S. Nuclear Regulatory Commission announced on March 17th, a recommendation for U.S. citizens residing within 80 kilometers of the Fukushima nuclear power plant to evacuate or take shelter indoors. This deviated significantly from Japan's initial 20 kilometers. Germany and Canada followed with their own citizen advisories shortly thereafter. These differences fueled both international and domestic speculation about the crisis' actual severity and cast suspicion upon the information provided by the Japanese government and TEPCO.

Urged by anxious family members abroad and cautious advisories by embassies and employers, foreign residents in Japan left the country in droves. According to a Tokyo Metropolitan Survey reported in the *Mainichi* newspaper in May 2012, in Tokyo alone, 25 percent temporarily returned to their home countries while another 5 percent fled to the Kansai region on the other side of Japan. What became pejoratively dubbed the "flyjin" phenomenon, which replaces the word "fly" for "gai" in *gaijin* (foreign person), reflected an outcome of the anxiety spurred by overseas speculations on the worse-cast scenarios of the nuclear situation. Confusing data-filled radiation forecasts only extended perceptions of radiation's global reach, while subsequent high-pitched political controversies stimulated rather than resolved U.S. residents' concerns over the particles entering U.S. airspace.

Unlike Japanese media, the U.S. media do not conceive of their role as part of a community emergency response effort, but as "somehow outside the social system, observing, chronicling, and evaluating its performance" (Quarantelli and Wenger 1991,

206). It more readily performs the role of helpful mediator, aggregating diverse sources and encouraging individuals to analyze and interpret radiation risk on their own. For news media outlets, geospatial technologies offer a systematic means to collect and sort big data and create visuals for news segment. Broadcast news regularly uses Google Earth or Bing Maps to report weather and traffic conditions, or to display location-based information. Though similarly, their data is not seamless. Fox News, for example, broadcasted a map three days after the crisis which labeled Japan's nuclear power plants, but it incorrectly placed two plants near Tokyo. One, “Shibuyaeggman," was actually a Tokyo night club in the prefecture of Shibuya named Eggman. The gaffe was quickly picked up by social media spheres, such as the media watchdog website *Media Matters*. Social media became an integral space for concerned individuals to work through official and mainstream discourse. However, social media also cultivated an affective feedback loop with the mainstream media, fueling fear about, interest in, and uncertainty in regard to radiation safety.

In particular, fraudulent "nuclear fallout maps" circulated across social media networks alongside official measurements, maps, and models. A prime example was a map that falsely bore the logo of the Australian Radiation Services (ARS), a privately owned nuclear safety business. It projected the path of fallout across the western United States in the event that a meltdown occurred. Similar to pressure systems on a weather map, colored gradients of red, orange, and yellow displayed the temporal movement and "rad" distributions, or absorbed radiation doses, as the plume moved eastward across the Pacific Ocean. At three days, the forged illustrations suggested the plume would reach the Aleutian Island chain carrying 3,000 rads. Within ten days, it would cover western North America

from Alaska to the tip of Baja California at levels of 750 rads. These measurements, however, were wildly inaccurate and portrayed an "end of days" scenario more appropriate to a massive nuclear attack since even measurements of 550 rads would result in no survivors. ARS quickly declared that it had no connection with the map, stating on its website a desire to be distanced from any such misinformation. Agencies such the California Emergency Management Agency and the CTBTO responded to increasing public queries by releasing additional statements concerning the radioactive contamination's dispersal and dilution by wind and weather during its thousands of miles of travel from Japan, which were not accounted for with the block colors on the faked ARS map.

U.S. fears also materialized in the mass consumption and subsequent shortages of the global supplies of potassium-iodide pills, which are used to protect against thyroid cancer after inhaling radioactive iodine. The Union of Concerned Scientists would release a statement on March 17th, urging the American public to let Japanese citizens be first in line for the pills, especially because it appeared "there will not be adequate supplies in Japan in the event of a larger radiological release" (Lyman 2011). Major news sources such as PRI, Reuters, and the *Los Angeles Times* relayed these statements but as the alarming weather-map-style visuals continued to pass through social media channels and the severity of the nuclear disaster remained uncertain, U.S. anxiety and potassium-iodide pill purchasing continued.

Arguably, U.S. media's graphic emphasis on the wind-borne radioactive plume's distribution through global geographic space made visible Beck's formulation of localized disasters taking on unforeseen global consequences. Though the specifics of these consequences were up to interpretation, and expert communities who seek to control such

meanings, witnessed unexpected appropriations of their maps. A map by the National Oceanic and Atmospheric Administration (NOAA) Center for Tsunami Research modeled the path of the tsunami's wave and maximum wave heights as it dispersed throughout the Pacific Ocean. Despite being labeled appropriately, the map would became the poster child for radiation hysteria and continues to find itself attached to social media and blogs critiquing environmental and health consequences of the disaster where the map is represented as proof of radiation dispersal into the ocean. NOAA needed to add a disclaimer on its webpage under the map which stated, "It does NOT represent levels of radiation from the damaged Fukushima nuclear power plant."

In regard to the radioactive plume, the later unspectacular landfall of ordinary deposits of rain and snow dissipated radiation's visual and dramatic appeal. When news media could no longer cue anticipation of the incoming plume, they marked uncertainty of past exposure by reporting such as K5 News's alarming though after the fact realizations gathered from vast archives of open-source data. For example, the press reported with certainty that Iodine-131 was discovered at the end of March in rainwater as far as Pennsylvania and Massachusetts in excess of the recommendations for drinking water (Griffith 2011). These reports similar to K5 News also highlighted nuclear watchdog groups' accusations against the U.S. government for negligence in informing the public about heightened levels when it mattered. At this point, however, the radioactive plume had already passed, contaminated rain had fallen, water and milk been consumed, vegetables watered and ingested, and U.S. residents exposed to what were in fact minimal levels of radioactive particles that quickly passed or degraded into harmless forms.

The World Health Organization conducted a comprehensive assessment on health risks associated with the Fukushima NPS disaster and released a report in February 2013 concluding that the predicted risks are low for general populations inside and outside of Japan, and it anticipated that there would be no observable increases in cancer rates above baseline rates. However, as the Seattle gardener's statements attested, during the initial stages of the crisis, individuals remained firmly stuck in place, inundated by data, simplified comparisons, and contradictory opinions about their predicament. Despite being technologically equipped with the geospatial tools to more easily assess risks and as governments continue to provide open access to collected data, the layperson ultimately remains in a position of uncertainty that extreme weather forecasting cultivates for the purpose of revenue.

Extreme weather reporting can heighten anxiety, spark fear, and serve as a marketing lure to maintain an audience interested both in and dependent on the information provided. In contrast, ordinary weather reports as with "ordinary television," are a repetitious part of television news programs and often pass unquestioned and remain subsequently understudied by academics (Bonner 2003). The qualitative division between the two is often tenuous in terms of broadcast flow, however. Each can exist alongside the other; that is, early projections of an incoming storm do not necessarily keep a local news station from broadcasting the greater region's daily projected temperatures. Alternatively, these locales might watch with distanced interest in a faraway storm's dramatized development without needing to take heed of warnings. Extreme or ordinary, the daily weather forecast can appear local while fostering in national and at times international levels of identification and community binding (Miller 2007, 148).

Fukushima's radiation forecasts accomplished this, but paradoxically. The mediation of Fukushima's migrating airborne contaminants turned Japan's local and national crisis into a global event, but one which the U.S. media re-nationalized in terms of American victimhood and U.S. government oversight. These narrative frames provided relevance and therefore further cultivated American audiences' interest in the ongoing debates and controversies regarding Japan's nuclear situation. In contrast, Japan's mass media outlets took an uncontroversial stance on the nuclear accident and its regional airborne health risks. This is not to say that Japanese citizens were unconcerned. As Katherine Harmon (2012) pointed out in *Scientific American*, "The prospect of invisible radioactive material contaminating the air and ground is terrifying--especially for a country that experienced two nuclear bomb attacks in 1945." However, early reports by the established Japanese news media appeared to suggest otherwise. NHK's representational decision to place radioactivity levels within ordinary weather maps and reports, purposefully sought to make radioactive material benign to aid the Japanese government and TEPCO's agenda, which was to limit national and international perceptions of the severity of the "accident" and to localize nuclear fears of radiation risk to Fukushima Prefecture.

In order to understand NHK's framing decision and its effect on the nation's radiation risk perception, it is first necessary to define how the roles of Japanese broadcasters are functionally distinct from news-gathering and news-dissemination in more freelance systems. These distinctions in reporting explain differences in how geospatial data and technologies are utilized. Studying the Japanese system of political communication, Toshio Takeshita and Masamichi Ida (2009) state that media relations are

characterized by the *kisha kurabu* (press club) system and an editorial policy of neutrality. Aptly deemed Japan's "information cartels," press clubs serve to control access to and presentation of the news (Takeshita and Ida 2009; Freeman 2000). Specialist reporters are granted exclusive access to particular politicians, government agencies, and business organizations with an unspoken understanding that these sources will not be undermined by unauthorized reports or special investigations. Broadcasters are already beholden by broadcast law (Article 3-2) to be politically impartial, to avoid disturbing public security, to present controversial matters from several viewpoints, and in the event of a disaster to produce programming that, in no uncertain terms, minimizes harmful effects.

NHK in particular, is unique among the six major national broadcasters in Japan and broadcasters worldwide with additional legal mandates that link the station directly to major data-collection sites across Japan. For example, Article 6-2 of Japan's Broadcast Law and the Disaster Countermeasures Basic Law of 1961 mandates that NHK must gather and broadcast relevant information to the public in times of disaster and report disaster-prevention information accurately. Accuracy is further defined by the Meteorological Service Law that mandates that if the Japan Meteorological Agency (JMA), which monitors the earth's environment and forecasts natural phenomena of the atmosphere, ocean, and earth, issues a warning of a tsunami or severe weather conditions, NHK must broadcast it promptly and in exactly the manner in which JMA issued it (Mendel 2000, 37).

Unlike U.S. media outlets, Japanese broadcasters are the official conduits for government information. Legal mandates and the press clubs' voluntary self-censorship thus produce a symbiotic relationship between official sources and journalists, and thereby discourage independent analysis and critique. Furthermore, due to NHK's and other

networks' direct access to official government information, the general public in Japan is more prone to trust the established mass media. News that lacks this direct attribution is perceived as less credible, which makes the eventual breakdown of public trust in Japan's mass media system all the more significant.

Japan's journalistic culture of conformity can be seen in the stark similarities in the nuclear situation's initial reporting. During the first weeks of the crisis, the *Kantei* (the Cabinet and Prime Minister's Office), NISA, and TEPCO held press conferences several times a day in which they disclosed information to the public. The press, radio and television broadcasting, and internet media treated these press conferences as breaking news. Networks followed the live broadcasts with media professionals explaining the meaning of the government announcements. Well-known academics were often invited on news programs to further explain any technical details, but information from these guests did not extend beyond explanations of what officials disclosed (Suzuki and Kaneko 2013, 58). Dependent on the same sources, NHK and the two leading commercial networks, Nippon Television and Fuji Television, increased and decreased their coverage of the nuclear disaster at similar times. The initial peak occurred with the first hydrogen explosion at Fukushima's reactor one on March 12th, the second when information was acquired about a possible hydrogen explosion at reactor three on March 13th, and the third when another actual explosion occurred on the morning of March 14th.

The intervening decreases in coverage coincided with official statements by government officials asserting the relative harmlessness of the dispersed radiation (Tanaka 2013, 96-98). After the hydrogen explosion on March 14th, for example, Chief Cabinet Secretary Yukio Edano stated that "the integrity of the containment vessel is maintained,

and the possibility is low that a large volume of radioactive materials has been scattered in the air" (Tanaka 2013, 98). The news media reported the provided information, specifying the negligible risk of radiation dispersed by the explosion, and decreased coverage afterwards. All this was in stark contrast to the concurrent clamor in international news media and social media spheres speculating on the worst-case scenarios of nuclear fallout.

Considering NHK's legal mandates, the daily televised weather report appears to be a logical choice for a news segment in which to widely disseminate government-disclosed, location-based radioactivity levels. As in the U.S. market, the weather report is a popular and integral part of morning and evening news programming, and is associated with NHK's peak viewing times. According to the results of the National Individual Audience Rating Survey conducted in June 2010 by the NHK Broadcasting Culture Research Institute of the Public Opinion Research Division, the peak viewing times for NHK GTV are from 6 a.m. to 9 a.m. in the morning and from 6 p.m. to 10 p.m. in the evenings, with news programming taking up most of these time slots. On weekday mornings from 4:30 a.m. to 8 a.m., "NHK News - Ohayo Nippon" airs with an average 9.0 percent ratings peak between 7 to 7:45 a.m., a time when Japanese citizens are preparing for the work or school day. The time slot 7 p.m. to 7:30 p.m. has the highest audience viewing rate for NHK GTV at 13% and is when NHK News 7 is broadcast. While serial dramas may garner higher ratings, NHK news yields consistent viewership.

Radiation measurements for major cities were plotted onto a standard weather map and included in the broadcast along with other maps predicting daily regional temperatures and precipitation. If included, health and safety recommendations accompanied the forecasts through short written blurbs that appeared onscreen or relayed

verbally by a weathercaster during or after the report. Weathercasters' recommendations mirrored those by NISA and were not unlike those disclosed to the U.S. media by the EPA with an emphasis on the negligibility of radiation risk. On March 23, 2011, NISA published answers to 22 of the most frequency asked questions concerning radiation risk on its official website in Japanese and English. The answers repeatedly stated the extremely low risk of radiation on human health and encouraged the public to trust in official information. Topics covered included bathing or showering, washing clothes, being rained on, having pets drink from rain puddles, eating vegetables from non-restricted areas, draining or flushing the toilet with rain water, and general safety for children and pregnant women who come into contact with radioactive rainwater (Nuclear and Industrial Safety Agency 2011). News reports further reassured people living outside the evacuation and in-house evacuation areas that health risks associated with radioactive wind and rain were deemed by the government as essentially low and unworthy of debate or further concern as long as some recommended precautions were taken.

The straightforward disclosure of official radiation measurements in daily weather forecasts and the no-nonsense confirmation of government statements on negligible risk remained consistent with NHK's legal mandates. It also advanced the broadcaster's hybrid promotional agenda to inform and reassure both the national and the international public. While primarily supported by a standardized license fee, NHK fills its budget gap with government funding. It is also the only broadcaster in Japan with its own press club. NHK's intense awareness of its role in the nation's image management is reflected not only in it internal guidance, which provides reporters a handbook requesting they avoid buzz words such as "catastrophe" or "massive" that could sensationalize crisis situations, but also in its

meek reporting on controversies concerning government policy and bureaucratically-funded corporations like TEPCO (Cunningham 2011). Arguably, NHK used the crisis to promote its global image as the nation's designated go-to broadcaster for earthquakes and other disasters, and internationally, as the perceived "Voice of Japan" that the world looks to for information.

According to NHK's executive managing director Tamaki Imai, the network seeks "to prevent further damages" at home (Harlen 2011), and according to the Special Controller of the General Broadcasting Administration at NHK, Toshiyuki Sato (2012) , to "prevent negative rumors inside and outside Japan." The average number of receivable commercial television channels in Japan, including cable channels and direct broadcasting satellite is 7.1. According to a National Individual Audience Rating Survey conducted in June 2010 by the NHK Broadcasting Culture Research Institute, 56 minutes of the 3 hour 35 minute average TV viewing time per head per day was spent watching NHK TV. On March 11, 2011, ratings for NHK in the Tokyo area rose from 3% prior to the earthquake, at a time when households typically have their television sets off, to as high as 22% following. Internationally, footage from "NHK World TV" was broadcast on more than 2,000 international TV stations as breaking news of the disaster. NHK began international television broadcasts in 1995 and "NHK World TV" started in February of 2009. "NHK World TV" reaches 150 million households in 130 countries by domestic and regional satellites and cable networks (Sato 2012). Sato remarked proudly that when the Japanese government was not releasing enough information, the U.S. Department of State supplemented reports on the disaster with translations of press conferences and additional commentary provided by NHK World TV, NHK's expansive 24-hour English news and

information channel. Subsequently, NHK was acclaimed overseas for its handling of the disaster, its perceived success tellingly proclaimed by the *Washington Post* on March 26th in an article entitled "The Calm behind the Headlines," that ironically invoked exactly the desired effect of the broadcaster's subdued radiation forecasts.

On an affective level, including radiation measurements within the daily weather report and map conforms to an attempt to manage public fears and re-position a nation rocked not only emotionally but financially into a sense of returned normalcy and productivity. According to Toby Miller (2007), weather forecasts incorporate and inform the economy of work and control through time disciplining. By providing individuals with the technologically-derived knowledge of risks from mild to serious climatic variations, weather forecasts support the expectations of neoliberal cultural citizenship. Japan's residents, most of whom are heavy users of public transport, especially depend on the morning weather report to decide whether or not to take an umbrella or a heavy coat. Grabbing an umbrella before leaving home prevents *salarymen*, Japan's primary workforce, from arriving at work unseemly drenched or late due to having to purchase one on the way. Forecasts help assure the uninterrupted functioning of social institutions and allow workers to gain an imaginary sense of control over their day-to-day routine (Miller 147-8). Unlike the dramatic radioactive cloud migrating over the Pacific Ocean, the imaginary geovisuals that heightened U.S. residents' anxiety and highlighted the uncontrollability of invading radioactive particles, in Japan, daily radiation forecasts made radiation risk seem manageable, and along with government reassurances, benign. It "routinized the unexpected," in a fashion which sociologist Gaye Tuchman (1973) has identified as a journalistic means of placing something extreme or unanticipated into a familiar narrative

frame or story type (Tuchman 1978). The government sanctioned suggestions for those living in the in-house evacuation areas, such as to wear masks and long sleeves when going outside or washing the body after returning home, were disclosed as no different from weathercasters' friendly suggestions to take an umbrella or wear a heavy coat upon venturing out in the rain or snow. The ordinary weather map and report downplayed the potential threat that radiation posed to everyday life so that life, and in particular Japan's disaster afflicted economic system, could return to normal.

Coming weeks after the crisis coverage that inundated the daily lives of Japan's residents with catastrophic imagery, harrowing details of survivors of the tsunami, and rising death tolls in the Tōhoku region, radiation forecasts fostered rather than upset a return to normality. From two minutes following the earthquake and for one week after, NHK suspended regular network programming and continued its 24-hour disaster reporting for its main terrestrial and satellite television channels and radio (Tanaka 2013, 91). Many commercial networks followed similar schedules, even suspending commercials for several days before returning to regular broadcasting. While U.S. news media began scrutinizing the nuclear developments, Japan's news media primarily focused on the dignity of the victims and survivors of the earthquake and tsunami and the bravery of the nuclear power plant workers, or "Fukushima 50," who continued to helm the crippled station. NHK supported the national spirit campaigns being mobilized by the state, which championed the slogans "Pray for Japan" and *Gambare Nippon* ("Stay strong Japan") that proliferated on social media as "badges" in profile images. These campaigns encouraged citizens to rally together in support of the nation rather than question government responses (Slater et al. 2012, 105). NHK's "keep calm and carry on" facade, an implicit

motto that radiation forecasts complied with, attempted to depoliticize the crisis amid increasing accusations in the foreign press and social media that the government and TEPCO were withholding information on the severity of the nuclear situation and its health risks.

NHK could not so easily temper negative rumors or sway public trust amid damning proof of failures of government oversight, however. The first cracks began with the SPEEDI scandal that linked location data of nuclear radiation, weather media, and politics. Similar to the U.S. EPA's RadNet, SPEEDI (System for Prediction of Environment Emergency Dose Information) is a Japan-based simulation system designed to forecast real-time radiation based on measurement data and predict how weather patterns will disperse radioactive fallout into the environment. Established after the Three Mile Island nuclear accident in 1980, SPEEDI continues to be administered by Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) to help predict the effects of a nuclear accident. On March 11th, the system simulated the direction and range of radioactive emissions, submitting the technical reports to relevant national agencies such as NISA. These predictions, however, were not officially disclosed to the general public until March 23rd, 2011. A comparable delay occurred in its dissemination to Japanese governmental offices where SPEEDI was relatively unknown outside a small circle of bureaucrats. Even the Vice Minister of MEXT at the time, Kan Suzuki, remarked that he was unaware of the system until being approached by a particle physicist from the University of Tokyo. Professor Ryugo Hayano had been steadily drawing public attention to SPEEDI by tweeting about its operative existence and subsequent lack of utilization on Twitter (Cleveland 2014). Again, this is in contrast to the numerous graphic representations appearing in international news

reports and across internet media simulating the global spread and dispersal of Fukushima's airborne contaminants. As days passed, these simulations could be verified or modified and remapped with location data collected by scientific research organizations or from various open data sources on the internet.

Social media quickly became a staging ground for Japanese citizens to heighten public awareness of the delayed circulation of SPEEDI's data and its potentially detrimental consequences for Fukushima's evacuating residents. If utilized properly, SPEEDI is assumed to provide towns with timely evacuation notices and prevented evacuees from unknowingly moving into areas where weather systems were predicted to deposit high levels of contamination (Suzuki and Kaneko 2013, 64; Cleveland 2014). According to sociologist Kyle Cleveland (2014), "the SPEEDI scandal was seen as being the result of incompetence at the highest levels of government, betraying a lack of concern for the people most at risk from the nuclear disaster." Grassroots initiatives started via social media led to the formation of local citizen groups who procured Geiger counters and took their own radiation readings to post on shared websites (Morita, Blok, and Kimura 2013).

These humanitarian "information interventions" took advantage of on-line database services and open-source geospatial software to collect and send information to the public. For example, the open-source software Ushahidi, pinned as a prime example of crowdsourcing for disaster response and recovery, was used to aid victims of the earthquake and tsunami. During the 2010 Haitian Earthquake, the interactive online map aggregated data into geographic displays of the crisis as a whole, becoming an online source for Haitian residents to map the earthquake's effects and human needs, from natural hazards, polluted water, damaged buildings and points for relief. Just hours after

the earthquake, members of the Japanese OpenStreetMap community launched an Ushahidi platform. Less than 24 hours later, Japanese students at the Fletcher School in Boston, where the Ushahidi-Haiti project was run the year before, mobilized to support the Tokyo-based mapping project. The group created the Sansai Info Crisis Map that offered similar aid as to Haitian citizens.

Providing informational aid to the public following the Fukushima NPS disaster differed, however, because physical access to the area surrounding the nuclear power plant was restricted both geographically and politically. The first move towards an emerging sociotechnical network was by a Tokyo-based career video director living in Nagano, who on March 13, used his Twitter account "MFkuruchan," to request collaboration from individuals to build a Google Map covering radiation monitoring posts all over the country. It quickly attracted attention and served as an infrastructural node of an ad hoc collaboration of concerned citizens with no formal science training to learn through collective processes (Morita et al. 2014, 85). Added to the map would be counts per minute values of Geiger counters that contributors had access to, along with data pulled from a number of public and private monitoring posts in the country such as those run by municipalities, companies, research institutes, and individuals. The civic map became a single radiation inscription, linking together heterogeneous data infrastructures and forging links between public and private social identities similar to other emergent concerned groups (Latour 1990; Callon and Rabeharisoa 2008). Heterogeneity helped expand data but also leant aid to the map's credibility since mistrust in the government's disclosure of information could be crosschecked against citizen monitored data (Morita et al. 2014, 87).

Established credibility may have contributed to Diet members from the Japan Communist Party (JCP) later confronting Prime Minister Kan with independent readings to show that uneven patterns of radiation reached well outside the 20 kilometer evacuation zone (Slater et al. 2012, 105). Aware of these estimates, several mayors from evacuated cities located close to Fukushima's nuclear plants became vocal social actors in government protests. Katsunobu Sakurai, Mayor of Minamisōma City and later named one of the 100 most influential people in the world by *Time* magazine, posted a viral video on YouTube on March 24th renouncing the Japanese government for providing insufficient relief to Fukushima's evacuated residents. In subsequent interviews given in the wake of having gained internet fame, Sakurai commented on the ineffectual evacuation strategies, declaring that "it's worse outside the 20km zone" (Slater et al. 2015, 105). While contributing to international news' drama, these mayors and the SPEEDI scandal also raised national suspicions about the nuclear situation's true severity. Along with Fukushima being elevated to a "Level Seven" on the International Nuclear Events Scale, these developments stood in stark contrast to the government and NHK's continued reassurances about the negligible health risks of radiation.

Public outcry prompted the government to release official daily radioactivity levels for mass media disclosure but rather than raising alarms nationwide, NHK's daily televised radiation forecast remained a subdued side note in its ongoing disaster coverage. The forecasts informed the public of the particles driven into their location by wind and deposited by rain and snow, but paradoxically attempted to persuade Japanese residents living outside of Fukushima Prefecture to remain unconcerned about the health effects of

radioactive weather. There were no dramatic visuals or conflicting opinions, only measurements added to an ordinary weather map.

It was not until May 24th, 2011, the day before the IAEA investigation, that TEPCO officials released data indicating that three of the reactor cores had indeed collapsed or "melted" within hours of the loss of power due to the tsunami. The realization that the international news media had reported these meltdowns in the first week of the disaster solidified public distrust in the government. It sparked contempt in the established media system for complying with the government's attempted depoliticization of a topic of growing international and national concern. By this time, however, Japan's residents, who could not simply leave the country as many non-citizens did, were still no better off than the Seattle gardener in understanding health risks and the effect of past actions or inactions on their future health. Japanese citizens could only blame the government for negligence as it was being uncovered. Such negligence included the failure to hand out potassium-iodide pills to evacuating residents until days after the explosion by which point they actually become ineffective (Hayashi 2011). Rather than raising public suspicion, NHK's radiation forecasts supported the disingenuous rhetoric of the government and TEPCO in covering up the disaster's severity and offered a subdued counterpoint to the hyperbolic weather media discourse taking place elsewhere, adding to the overall uncertainty about health risks.

CONCLUDING THOUGHTS

By embedding radioactivity levels within the ordinariness of the daily weather map and forecast, Japan's public broadcasting organization, NHK, played a role in the

government's now heavily criticized normalization and ineffectual communication of risk following the crisis. While turning radiation into a spatially and temporally expansive case of extreme weather, U.S. news media extended disaster coverage and shifted distanced spectatorship into a lived reality of anticipated risk, as reports embodied the initial hype and "watch protocol" of other severe weather events. Discrepancies in representation further showcased not only the constructedness of weather disasters, but the ways in which geospatial technologies can play an affective role in the public understanding and uncertainty of risk, often to the detriment of social change. As with the "half-life" of other extreme weather events that get swept into a "media-driven affective conversion circuit" (Massumi 2011), the global dispersion and dissipation of Fukushima's exploded nuclear contaminants eventually resettled back into the lived environment of contemporary culture and nuclear narratives.

As of April 2014, the Japanese government reversed a previous decision to phase out nuclear power and the idled reactors were set to be restarted. And as if in a final nod to returned status quo, many of Fukushima's evacuees returned to their homes in the exclusion zone. Radiation forecasts and the geospatial data and technologies that fueled them were a powerful and instigative component of public debates, but despite being placed into citizen's hands, the "information disaster" that accompanied Fukushima revealed the uncertain nature of the neoliberal citizen's ability to assess risk during heightened periods of crisis, with ineffective processes normalizing the "risk society" and keeping individuals firmly stuck in their gardens of uncertainty.

CHAPTER 3: THE SPATIAL IMAGINATION OF DISASTER

Images and video taken, mixed, and disseminated from YouTube, citizen photographers, and professional news teams captured and replayed the horrors of buildings shaken from their foundations and of villages being engulfed by the rising sea. From these media vectors sprang sites of spatial interpretation, crisis and risk management, and far reaching economic repercussions for the nation involved. Spatial media played an equally important role in covering the disaster, as maps were interwoven into the fabric of news and social media reports. As newspapers, tourist guidebooks, television programs, films and novels, maps similarly framed and structured spatial imaginaries and influenced spatial trajectories. The previous chapter exposed how geospatial technology and spatial media content on the geoweb contributed to citizen's spatial projections of a disaster by creating interactive and contested arenas to debate the extent of a crisis and its devastating reach. Alternative representations of risk-free place played a competitive role in decision making for individuals in or with plans to travel to the affected regions, and to stakeholders whose profit-making ventures are located in those areas.

For the tourism sector, the consequence was a dramatic downturn of foreign tourists entering the country, with a surprising number of tourists cancelling trips to areas located far from the disaster zone and airlines such as American suspending its flights to Tokyo for a year after the disaster. According to the Japan National Tourism Organization and reported in *The Japan Times*, the nation experienced a 73 percent fall in the March 12-31 period directly following the March 11 disaster, a 62.5 percent drop in April, the largest year-on-year drop on record, followed by a 50.4 percent drop in May. In response, Japan's

tourism industry sought to use media to neutralize the shock of disaster news, inspire confidence in the land's stability, and to stimulate the failing tourism sector.

Spatially enhanced media or interactions with location-based , cross-platform "content" on the web were instrumental in Japan's tourism campaigns to return foreign travelers to the nation and instill national pride in Japanese citizens dealing with the disaster's effects. Content is used by news companies to replace the term "journalism" in some news rooms (Klinenberg and Benzecry 2005, 8). In the previous chapter, I discussed how the content of maps, simulations, and comparative nuclear radiation measurements from Fukushima were used by media outlets to induce the fear of being invaded by nuclear particles from across the Pacific. The technique aided in prolonging the United States news coverage and audience interest in the weeks and months following the disaster. In this chapter, I argue that spatial media content was being repurposed by the tourism industry to not increase the fear of Fukushima abroad but to reverse the damage done to foreign points of view. Initial news reports sought spectatorship and continued consumption of the disaster's averse effect, but the tourism industry sought its negation. Repurposed spatial content from social media platforms met the visual demands of audiences and readers in both contexts.

Tourism campaigns consisted of interactive databases, contests to woo tourists with the promise of free tickets, and the calls for international journalists to advertise Japan's safe and tourist-friendly atmosphere. Each presented similarities to and divergence from traditional broadcasting techniques while also employing spatial media's affordances to help change the disrupted meanings of that place. The tourism industry's collaboration with Google Corporation in particular, provided the tools and the digital reach for what I

call an “information intervention” while at the same time, representing a more pervasive reach by transnational corporations to use disasters to their economic advantage. Japan’s tourism campaigns can be considered a collaborative form of disaster capitalism (Klein 2007); that is, a means to extend the corporation's commercial brand through humanitarian campaigns of good will.

Japan’s tourism industry rebounded and stabilized to a normal level a year after the earthquake. Whether it is a direct result of these campaigns is indiscernible. For Google, however, these collaborations show the viability of the geoweb for disaster capitalistic ventures. The previous chapter followed the information overflow following Fukushima, showing the ways in which a mythical public sphere can become besieged by a cacophony of voices, text, images, and publications, of which geospatial technology and spatial media do less to organize than contribute more noise. This illustrates how spatial media content is repurposed for profit: not to induce fear or political intrigue but reduce it for the benefit of another industry's interest, in this case tourism. Commercialized spatial media also allows us to situate Fukushima within an evolving spatial "imagination of disaster" (Sontag 1965) for which newer installments of the Godzilla franchise will be read as a symptomatic text of an evolving nuclear threat. It is this threat that campaigns emphasizing an ideal "tourist gaze" (Urry 1990) labored to overturn.

DISASTER CAPITALISM

The tourism industry's public relations campaigns and the discourses that circulate to diverse audiences through various media vectors illuminate evolving ideological dimension of digital humanitarianism and disaster capitalism. Humanitarianism may be seen as a dominant discourse and a powerful vector for Western ideas and modes of

behavior, including globalization and governance. In a globalized world, humanitarian actions link economic and social globalization processes, specifically in the communication sector (Reiff 2002; Ruffin 1986). Disaster assistance is also rooted in the ideological framework of humanitarianism. Humanitarianism's historically formed out of the Enlightenment, related traditions of charity, colonial administration, military logistics, and so on. Without strict partisan leanings, humanitarian practice is distributed geographically. Arguably, it is structurally, economically, and culturally "of the North," while of essence is part of the logic of Empire. That is, part of a new form of sovereignty or "network power" where it is not the extension of one state or an alliance of states that shapes the global order but a combination of nation-states, transnational corporations, global institutions, and NGOs functioning according to hierarchical divisions. Hardt and Negri (2001) deem humanitarian agencies the "mendicant orders of Empire," and the capillary vessels of globalization in that they function as the "powerful pacific weapons of the new world order" (36).

Digital humanitarianism came about with the advent of Big Data, crowdsourcing, and the geoweb. Geographer Ryan Burns (2014) conceptualized digital humanitarianism as "the enacting of social and institutional networks, technologies, and practices that enable large unrestricted numbers of remote and on-the-ground individuals to collaborate on humanitarian management through digital technologies." This includes organizations using both traditional GIS and spatial technologies such as Humanitarian OpenStreetMap Team and Ushahidi. Both are crowdsourced communities that take to synthesizing information from social media, aerial photography, traditional spatial databases, and Short Message System (SMS or "text messages"). Even without crowdsourced data, traditional GIS assists

humanitarian rescuers by integrating maps or aerial photographs, or a combination of both, with before-and-after views that make visible the damage to buildings, roads, bridges, and critical infrastructure including shelters and hospitals. For example, in the case of floods, GIS can enable emergency services to see flooded areas, gauge the depth of flooding, mark evacuation routes, and gather population specifics. Knowing age demographics for instance could allude to how many people have restricted mobility and need assistance in evacuating. It is also possible to check areas or structures needing vacating if they contain oil tanks or other hazardous materials.

In 2007, a report by the U.S. National Research Council (NRC) acknowledged the importance of maps and all forms of geographic data in the immediate aftermath of a disaster event including humanitarian support. The report documented the insufficient priority given to making geospatial tools and data essential parts of all aspects of emergency management. It argued that since disaster events unfold in real-time and satellites capture images to create damage assessments, digital maps can direct supplies and guide recovery operations. Geographic coordination by search and rescue teams and by those planning evacuations can use overhead mapped images to assess damaged locations, help coordinate food, shelter, and ultimately save lives. As discussed in chapter one, Esri's marketing of ArcGIS software reiterates NRC needs by hailing ArcGIS's interoperability, interconnectedness, interactivity, and real-time capabilities to serve local, impacted populations. However, necessary funding in resources and training, as the NRC noted, are not given priority by the general public or society's leaders. As a replacement during disasters, stretched-thin response agencies are experimenting with how to

effectively utilize the eyes and ears of the general public who are often eager to help emergency responders (Goodchild 2007, 204).

Increasingly government authorities in their bid towards open data are releasing more crisis information to the public who then become suppliers of more content. Typically content is pulled involuntarily from Facebook and Twitter posts, and YouTube and Flickr images. Voluntary participation is also elicited by NGOs. For example, in October of 2013, after a devastating Typhoon Nari struck the Philippines, the American Red Cross and United Nations targeted humanitarian relief by pooling citizen mapmakers worldwide to digitally trace roads, while asking locals to rate actual damage. However, it is the incorporation of Big Data or massive, unstructured datasets into their interventions that is credited with revolutionizing traditional humanitarian methods (Howe 2006; Lohr 2013).

Grassroots organizations also encourage global netizen involvement in humanitarian endeavors by crowdsourcing crisis information and mapping it for the benefit of the affected populations. Ushahidi, Inc. is one such non-profit software company that develops free and open-source software to collect, visualize, and map information in the aftermath of a crisis. Ushahidi, whose name in Swahili means "testimony" or "witness," was a website developed in the aftermath of the disputed 2007 Kenyan presidential elections. Its purpose was to collect eyewitness reports of violence through email and text messages that then were plotted onto a Google Map. The company represents the initial model for "activist mapping," which combines crowdsourcing for social activism, public accountability, citizen journalism, and geospatial information. Ushahidi uses OpenStreetMap's map in its interface, which requires the Google Maps API for geocoding.

Activist mapping such as Ushahidi enacts the promises of Big Data such as its efficiency, speed, actionable action, and inclusivity, hailing it as a means to extricate practices from the *modus operandi* (Meier 2012). However, grand claims and optimistic accounts as outlined in chapter one on Esri's marketing stand in stark contrast to critical scholarship that shows the ways in which technologies such as GIS embody social norms and values, and reinforce existing power dynamics and social inequalities rather than disrupt them (Shuurman 2000; Sheppard 2005; Burns 2014). According to Burns, "the growth of Big Data within digital humanitarianism should be seen not simply as a new source of data, but instead as a shifted set of practices, as an epistemology, and as an emergent social relation" (2014). While Burns follows this through two contexts, emergent humanitarian communities and within formal humanitarian organization, my research looks at transnational corporate involvement, namely Google. Google owns the digital tools deemed instrumental to open-source emergency rescue and response efforts in the 21st century.

The transnational digital corporation Google can be considered a trusted name in Internet-related products and services. Google's open-source mapping platform Google Maps is a user-friendly, go-to tool for digital humanitarian interventions because it facilitates “free” to end users information from databases uploaded by agencies, companies, and individuals around the world. The ability of Google to make a profit out of a "free" reconfiguration of data hides behind a secret business of algorithms and trust steadily accrued by Google aligning its company’s “Do No Evil” mantra into all subsequent actions including its information interventions (Halavais 2009, 42; Zook and Graham 2007; Parks 2009). These humanitarian efforts purport the company’s desire to go beyond global news

networks by representing world historical events and raising international awareness to a more disperse field of users around the world. Relations between digital corporations and local conflicts primarily reflect humanitarianism practices under the umbrella of neoliberal economics. However, Google's collaborations in this sector also represent unexamined examples of disaster capitalism.

From the top-down, Google's involvements in humanitarian campaigns follows what Naomi Klein (2007) termed the "shock doctrine," or a neoliberal manifestation where elites in government and business depend on or even engineer crises and catastrophes in order to shock the public into accepting exploitative privatization schemes. As an owner and disseminator of information, Google is an important stakeholder in disaster capitalist ventures where its mapping platforms are not only essential to humanitarian aid, but produce the spatial media content that can be repurposed into other commercial ventures such as mass media and the international tourism industry.

Disaster capitalism increases the role of private constituencies in public responses to disasters. It is defined as "national and transnational governmental institutions' instrumental use of catastrophe (both so-called natural and human-mediated disasters, including post-conflict situations) to promote and empower a range of private, neoliberal capitalist interests" (Schuller 2008, 20). The involvement of digital corporations as opposed to the state, international agencies, or NGOs in distributing information after a disaster further reflects this change. Infrastructure-wise, this transition occurred following the terrorist attacks on New York on September 11, 2001. Global security industries expanded and rapidly privatized. Transnational digital corporations that owned and operated satellite and computer technologies went on to assume prior nation-state

responsibilities of global imagining. They became the main providers of security solutions to contemporary problems including global conflicts and natural disasters (Klein 2007). Google, which handles projects once administered by the CIA, continuously functions as the means through which information becomes accessible and valuable in the global economy (Parks 2009, 542). Intellectual property previously classified as a public domain is compiled and made accessible to the public as a privatized database through the interfaces of Google Maps or Google Earth.

The corporate giant's collaborations with other commercial industries in the aftermath of disasters complicate understandings of Google's bid for global informational dominance and empire status. The end user's interaction with an application on Google's platform in all cases comes with a constant viewing of Google's logo, however, I do not claim as media scholar Lisa Parks (2009) that Google's brand on a virtual globe metaphorically "transforms the sovereign territories of all of the world's nation-states into visual, digital, navigable and privatized domains (largely) owned by one US corporation, Google" (541). Following Japan's triple disaster, Google heeded the call of global crisis management, helping loved ones find survivors with its people finding technologies and partnering with the Red Cross. At the same time, it aided insurance carriers to pinpoint the correct locations of policyholders to access damage. In addition, Google became a conduit through which the international tourism industry sought to test its own disaster capitalist ventures.

Klein identified tourism as a principle means to advance disaster capitalism during post-disaster economic recovery efforts. In 1998, Hurricane Mitch devastated Central America and Honduras. It is the year that Klein argued that disaster capitalism hit its full

stride. Anthropologist Susan Stonich (2008) examined the 1998 Honduras hurricane to explicate the relevance of disaster capitalism for characterizing recovery and reconstruction strategies in the international tourism sector. Tourism revenue was increased but was neither environmentally nor socially sustainable, and in the end contributed to social and ecological vulnerability (Stonich 2008, 67). As with Klein, Stonich's focus was on economic ventures, looking at foreign exchange remittances and trends in key exports. Both neglected the tourism industry's public relations campaigns and the discourses that circulated to diverse audiences with them; discourse which illuminates the ideological dimensions of the political economy of disaster capitalism and digital humanitarianism.

Most sociological research engages with the lived experiences of marginalized communities in the global South. The onset of disaster is often one of disempowerment where survivors are reduced to victims in need of aid. At the same time, external agents are elevated to the role of saviors. I want to consider the ways in which disaster capitalistic ventures and humanitarian frameworks transform the virtual tourist, more often situated in the Global North, as digital humanitarians and to outline the discourses circulated within and through that relationship. This is not activist mapping or digital activism of an "alternative and activist new media" where information and communication technologies are used "to challenge or alter dominant, expected or accepted ways of doing society, culture, and politics" (Lievrouw 2011, 19). Post-Fukushima community activists and DIY networks such as Safecast, which generated nuclear risk information using the Internet and social media when the government failed to do so, fall into this category. Rather focus here is on corporate and industry interventions and the user experiences of produced and

contracted spatial media content. Practices fit within the shifted state of humanitarianism and the market, conforming to the current state of crises and disaster communication management as discussed earlier.

Spatial media constructed to overturn negative viewpoints is engaged with in the same media sphere as disaster media content that is demonized or faulted for its impact on tourism (Cassedy 1991; Murphey and Bayley, 1989: Drabeck, 1992). Media reports can spread misinformation, inhibit verification, and foster sensationalism (Milo and Yoder, 1991), becoming what Young and Montgomery (1998) argued as "detrimental to the marketability of any tourist destination" (4). In econometric terms, because tourism is a pleasure-seeking activity defined in terms of services and products, its elasticity index per level of perceived risk is higher than other industries (Gonzalez-Herrero and Pratt 1998, 86). Travel for pleasure is a flexible item. For consumers the "quest for paradise (can) suddenly transform into a dangerous journey that most travelers would rather avoid" (Cassedy 1991, 4). Likewise, the tendency for negative images to linger in the media extends the time it takes for a destination and its services to return to normal. Market communication plans are often integrated into disaster management strategies at the expense of others (Young and Montgomery 1998).

Reviving tourism through various interventions can also be considered post-disaster assistance in that it is a strategic and symbolic means of bolstering national pride following a national crisis. It boosts development and becomes a source of foreign revenue, but usually at the displacement of local needs and concerns of disaffected low-income communities (Gunwardena 2008, 70). After Hurricane Katrina in 2005, President Bush visited the city and insisted that "out of New Orleans is going to come that great city again."

The great city in mind was not a redevelopment of secure and affordable social housing for the evacuated poor, African Americans and working class people to be welcomed back to New Orleans, but rather as a center of tourism with a more "Disneyfied" manufactured authenticity than the surviving French Quarter nearby.

Similarly within Japan, state campaigns embraced the slogan *Gambare Nippon* ("Stay strong Japan") and the media's focus on heroic stories of the "Fukushima 50," uplifting the spirits of Japanese citizens and rallying support in the nation's pride, came at the expense of focused questioning on the government response or neglect of survivors (Slater et al. 2012, 105). Japan's tourism industry aided national support with its own rigorous mass media and social media campaigns. Several of which included collaborations with Google, allowing for further dissemination of the Japanese spirited resilience to an international audience already glued to the media's coverage of the disaster.

Klein's account of disaster capitalism neglects the fact that rather than shocking the public into acquiescence, disasters also trigger spontaneous and directed nationalist sentiment through the same diverse forms of mass media and consumptive practices. This project defines post-disaster tourism campaigns as informational, textual, and visual ventures akin to screenplays, which John Caldwell (2009) argued are branding opportunities for the film and television industry. But instead of a film, they are marketing a nation's products and services and putting images and information to work in specific times and contexts as per specific political and/or affective means. It is a form of branding for the stakeholders involved. Japan and Google utilized the disaster in similar but different registers: Japan to upstart an ailing sector of their economy, while extending nationalistic "soft power" during a wave of international sympathy; Google, as functioning in the global

capitalist system, took the expanding scope of the disaster's mediation as an opportunity to extend its power into local economic arrangements. In whatever form, post-disaster assistance conforms to the demands of the market, as per the prescription of neoliberal economic doctrine and the changing landscape of crisis communication.

The market for international tourism industry is dependent on the public's perception of risk during and after a disaster hits a tourist destination. Popular definitions of risk play a significant role in the resultant media practices and knowledge politics produced. That is, the type, scale, and scope of a disaster matters to how industry and governments respond, and to how the public reacts. Disaster sociologists define the notable differences between types of catastrophic events, grouping them in terms of disaster, catastrophe, crisis, hazard, and risk (see Quarantelli 2006; Oliver-Smith and Hoffman 2002). A risk is commonly defined as an occurrence that can have a positive or negative consequence and is to varying degrees, predicted and controlled (Heath 2006). A crisis is considered a risk manifested. On a similar scale, a catastrophe designates an event that is believed to have a very low probability of materializing but if it does, resultant harm is so great and sudden to appear discontinuous with preceding events (Posner 2004, 6). The outlines of these definitions aid decision-making practices within organizations and industries, and between stakeholders, while crisis communicators use these definitions to shape or amend public perceptions of the organizations involved during each stage of a crisis (Heath and Pelenchar 2009).

Originally, the field of crisis communications was geared towards crafting public relations strategies to mitigate or deflect blame and responsibility in the post-crisis stage of communication. Today it is an ongoing process seeking to identify risk and coordinate

resources such as equipment, personnel, and information to avoid and reduce harm in post-crisis situations (Sellnow and Seeger 1997). Categorizing crises into typologies such as natural disasters, violence, workplace, rumors, challenge, technical error accidents, human effort accidents, and organizational misdeeds, seeks to segregate occurrences into appropriate crisis management programs. These enactment-based strategies which look towards organizational prevention, preparation, performance, and learning also seek to frame the meaning of the crisis. This includes telling stakeholders how to react after the event, providing information on how to psychologically cope with the situation, and giving information that people can use to formulate an image about the organization itself (Sturges 1994). Crisis managers tailor messages to meet what each crisis phase demands. For instance, getting information out to specific stakeholders or gearing messages needed to resolve or rebuild an organization's reputation.

Despite the impossibility of predicting future social and political unrest, agencies such as the United Nations World Tourism Organization (UNWTO) employ similar crisis communication strategies and disaster definitions. The state of the tourism industry is constantly assessed and preliminary estimates for future growth are produced amid growing concerns or risks. One concern currently assessed by the UNWTO for instance is the increasing intensity of climate change and related extreme weather events. Intense and periodic hurricanes and flooding often impact coastal areas which are categorized as rich in tourist destinations. Reports consistently show that particular regions and individual destinations suffer serious short-term setbacks following a crisis, but overall the global tourism industry remains resilient and affected areas eventually rebound. Still the industry's crisis communication programs seek methods to mitigate the effects of a

disaster. For instance, the UNWTO along with the World Tourism Organization and often in conjunction with the World Meteorological Organization disseminate guidelines to state tourism boards both on combating and lessening the impact of disasters on tourist regions. They also give suggestions on how to reconstruct and re-launch those destinations after.

The March 11, 2011 disaster presented a challenge for crisis managers to define and the tourism industry to mitigate. First, it was a triple disaster comprised of the East Japan earthquake, tsunami, and the Fukushima Daiichi nuclear power plant explosions and subsequent leak of nuclear material. Even disaster scholars looking specifically at the sociopolitical terrain of Fukushima, framed the nuclear explosions as a new type of disaster seated at the intersection of a "chronic technological disaster" and a "natural disaster" (Hindmarsh et al. 2013). The "natural" being the March 11th, magnitude 9.0 reverse fault megathrust earthquake that occurred 100 kilometers off the Pacific coast of Tōhoku, Japan. It triggered the huge tsunami wave that reached heights of up to 40 meters (130 feet). The wave swept away entire towns, fishing ports and industrial and commercial zones, flooded 217 square miles (561 square kilometers) of land, resulted in more than 15,000 deaths, and breached the protective walls and knocked out the main electricity supply and backup generators of cooling systems that ran six nuclear reactors at the Fukushima Daiichi NPS (Matanle 2011, 823). This breach contributed to the collapse and subsequent chemical hydrogen gas explosions of reactors one, two, and three, while severely damaging reactor four and the containment systems. Radioactive materials leaked beyond the vicinity of the station.

Though triggered by a natural occurrence of an earthquake, Fukushima is also considered a chronic technological disaster similar to Chernobyl (1986) and Three Mile

Island (1979) before it. A chronic technological disaster is defined as one which could have been prevented or was perpetuated by human decision making or policy, or lack thereof (Gramling and Krogman 1997). Reports from critical investigative groups consistently pointed to the lack of preparedness measures taken by government regulators and the power plant operators, Tokyo Electric Power Company (TEPCO). The claim was that this resulted in the tsunami's breach, subsequent energy malfunction, and continuing dilemmas (Suzuki and Kaneko 2013, 50). As discussed in the prior chapter, the political intrigue surrounding important stakeholders quickly filtered into global news reports fueling public interest, misunderstandings, and fear. Less visible and coincidentally less critiqued in both the news reports and subsequent framing were the decades of policies, practices and actions that make up the sociopolitical landscape in which such a disaster could occur, or more specifically, the man-made nuclear environment.

Emphasis on the natural trigger, alluding to an "act of God," serves as "ideological camouflage" to the specific interests of a powerful few. According to environmental geographer Neil Smith (2006), policy-related discourse continues to uphold disasters as natural occurrences whose adverse effects are preventable by improving decision-making and reforming policy. Smith emphasized that "natural" classifications negate vulnerabilities based on social class. In many locations, rich people tend to populate higher land and the poor and working class are situated in lower lying regions that are more vulnerable to flooding. Inequalities in stages of disaster preparation to reconstruction also reflect similar social oppression and exploitation.

Nuclear power stations are inevitably exposed to reoccurring natural events by existing within the environmental systems that both contain and disperse these human-

made hazards (Hughes 1993; Perrow 1999; Pritchard 2013). The emphasis on the natural as well as human error, aided Fukushima crisis communicators in minimizing public concern on the inherent risks modern technological systems while offering reassurances of the possibility of human and technological fixes. Denying the naturalness of disasters does not deny the natural processes of earthquakes, tsunamis, droughts, blizzards, and hurricanes, where normal occurrences are considered disasters depending on the location of occurrence. However, even current climatic events and the dramatic warming of the earth as a result of an increase in airborne emissions of carbon make it so that natural causes cannot be divorced from the social.

Media, which the crisis communicators strive to manage, makes manifest what sociologist Ulrich Beck (1992) called the new human-produced hazards, crises, threats, dangers, and uncertainties of the post-industrial "risk society." In the case of Fukushima, it brought new urgency to contemporary debates concerning the future of nuclear power and how to confront global sustainability in the face of climate change. However, any greater perceptual shift towards acknowledging the risk posed to humanity by all nuclear power facilities continues to be hindered by a pervasive confidence that environmental and technological systems are discrete entities, where the "natural" can be detached from the technological. At the same time, public and private-sector definitions of disasters played into a larger social, historical, and media trajectory of places and disasters. For tourist destinations, crises temporary or in some cases, permanently overturn media constructed idealisms while the disasters themselves carry the weight of other representations.

VIRTUAL TOURISM

It is not to say that the distant viewer of trauma is unaware of the human and non-human world being full of fraught and uncertainty. Even the casual viewer of environmental news is cognizant of disrupted ecosystems and the looming possibility of a world-wide ecological or technological collapse. Since the 1950s, the consequences of both were continuously re-imagined in post-apocalyptic cinema. Climatic events portrayed in such film as *Waterworld* (Kevin Costner and Kevin Reynolds, 1995) imagined how rising global temperatures could lead to the melting of the polar icecaps, causing the eventual flooding of the entire earth. Other films such as *Mad Max* (George Miller, 1979) portray a world after nuclear war, painting a bleak picture of a relentless arid climate and tenuous social structure where humans are struggling and often times fighting to survive. As Sontag argued, "This nightmare – the one reflected, in various registers, in the science fiction films, is too close to our reality" (1965: 225). Even the iconic cult film *Planet of the Apes* (Franklin J. Schaffner, 1968), which depicts an earthscape of devolved humans ruled over by an evolved species of primates, revealing at the end that the narrative took place long after a nuclear war, reflected the era's Cold War paranoia (Kakoudaki 2002, 120). A long line of nuclear warning films followed, actualizing potential disasters in order to make political statements about government actions and human responsibilities. This evolving nuclear imagination of disaster, discussed in length below, induces an equally strong influence over individual understandings of disasters such as Fukushima, regardless of crisis communicator definitions, constructed news reports, or maps detailing risks. Media imaginaries of disasters keep the pulse of the public entertained as well as disturbed, while

beating up against scientific definitions, political battlegrounds, and ideal portrayals of place.

At the same time, portrayals of place follow longer traditions of still imagery and the "enframing" of nature. This cinematic territorialization of the world and subseqent affective registers that hold onto people's imagination of place was considered as early as the 1930s (Ivakhis 2013, 70). Walter Benjamin (1936) in his influential work, "The Work of Art in the Age of Mechanical Reproduction," mused "our taverns and our metropolitan streets, our offices and furnished rooms, our railroad stations and our factories appear to have us locked up hopelessly. Then came the film and burst this prison world asunder by the dynamite of the tenth of a second, so that now, in the midst of its far-flung ruins and debris, we calmly and adventurously go traveling." Media layer and extend our "geomorphology;" that is, our grasp of everyday geography in which we determine inside and outside, public and private, and even ours and theirs. Media geomorphism take pieces of the world and fuses them into a synthesis that becomes a newly produced world. It imbues its referent with an aura which is ripe for capitalist ventures including filmic portrayals (Ivakhis 2013), and as I will show, tourism ventures.

The camera in this case serves as an instrument of distancing and dominating by enabling objectification, decontextualization, dehistoricization, and commodification of objects that make up the world. It is the consumption of the world through a filter and consumer society's growing appetite to consume. Sontag (1977) in *On Photography* discussed it in terms of an "ethics of seeing" where the world is reduced to a set of potential photographs and where events are valued for their photographic interest. Concern by Sontag and other media critics is that such consumption makes audiences spectators or

“tourists of reality” rather than participants while also spreading a dangerous sense of a false reality. The act of the photography is essentially an "act of non-intervention" which provides audiences knowledge through cheaply produced images. To Sontag, photography is an addictive pleasure and “irresistible form of mental pollution" that comes at a high cost (Sontag 1977, 24). Highlighted here is how visualizing technologies are both an antidote and a disease in the context of ecological crisis. As Andrew Ross (1994) argued in reference to Sontag, "images of ecology" are standard media atrocity fare alongside being central means through which we understand our social habitat (175).

As other media before it, newer spatial media imbues users with imagined possibilities of transporting their immobile self to another place without leaving the confines of their home. In 1950, Charles Siepman, an influential critic of the quality of radio and television broadcasting, enthused that “television provides a maximum extension of the perceived environment with a minimum of effort. Television is a form of ‘going places’ without even the expenditure of movement, to say nothing of money. It is bringing the world to people’s doorsteps” (340). Early console advertisements placed TV sets in exotic locales, while slogans like DuMont’s in 1948, mused about TV as “your new window on the world,” emphasizing this illusionary traveling outside one’s domestic setting (Spigel 1992, 105). Television shows would also intersperse realistic window views of outdoor vistas to break up the staid monotony of domestic based sets. For instance in 1955, *I Love Lucy* took its audience on a vicarious vacation to Los Angeles for an entire season, ushering in the travelogue as a conventionalized sitcom motif. Before long, special shows and entire network niche channels would be devoted to the subject, substantiating the notion that the stationary viewer’s mind can be virtually transported to anywhere. According to Margaret

Morse (1990), these couched bodies become virtual travelers, offering a "road in the midst of the idyll, reconstituting a virtual world of face-to-face relationships shared between viewer and television personalities displaced or teleported from elsewhere in the process, a fiction of the paramount reality of discourse" (205). Anne Friedberg (1993) also noted the paradox in these developments through history, where "as the 'mobility' of the gaze became more 'virtual' - […] - the observer became more immobile, passive, ready to receive the constructions of a virtual reality placed in front of his or her unmoving body" (28). For Morse, this discourse provides a protection from the world, which is always constituted as beyond and elsewhere. For Friedberg, the journey is nothing but confined.

The contemporary immobilization of the subject is linked to what tourism studies deemed the "post-tourist" condition, describing the post-modern individual who is less likely to find it necessary to leave home with the surrounding technologies that allow them to "gaze" on tourist sites in isolated comfort (Fiefer 1985). However, according to market research this has not been the case. The tourism industry, catering to both leisure and business, became one of the most notable economic and social phenomena of the past century. According to the World Tourism Organization (2007), the number of international arrivals evolved from a meager 25 million in 1950, to approximately 806 million in 2005, with an average annual growth rate of 6.5 percent. The tourism industry's continued intensification and development of travel-related media products such as travel literature, guidebooks, magazines, newspaper travel sections, online websites, and television programs allows the contemporary individual to delight in the increasing eclecticism of travel options, not only by the implosion of the experience economy making more places tourist-like, but with the actual increase in commercially available trips, packaged tours

and the potential to tailor excursions to suit an individual's preference and personality (Ritzer and Liska 1997). Media representations and images of places and tourist destinations play a considerable role in influencing people's holiday decision-making process (Iwashita 2006; Riley, Baker and Doren 1998). According to John Urry (2002), the virtual dreams, expectations and fantasies found in travel media create a hermeneutic circle of tourist motivation:

> What is sought for in a holiday is a set of photographic images, which have already been seen in tour company brochures or on TV programmes. While the tourist is away, this then moves on to a tracking down and capturing of those images for oneself. And it ends up with travelers demonstrating that they really have been there by showing their version of the images that they had seen before they set off (129).

This cycle establishes a closed self-perpetuating system of illusions, providing the tourist with the basis for selecting and evaluating potential places to visit, while also codifying their desire to travel. Disasters break this cycle.

Global news events as Fukushima make disparate sites of action appear as one moving drama with different vectors blurring the line between crisis and media sensation. Media theorist McKenzie Wark (2006) argued it can even have the effect of eclipsing "geographical barriers separating distinct cultural and political entities" (271). This along with repetition, a strategy of news outlets to cope with events that initially "violate" narrative control and management, saturate media with decontextualized images, videos, and speculations. However, it also unveils issues with geographic illiteracy on a more simplistic level.

On March 14, 2011, three days following the triple disaster that hit the North East region of Japan, the United Nations World Tourism Organization (UNWTO) released an

official letter of support to Japan's Minister of Land, Infrastructure, Transport and Tourism assuring them of their readiness to provide any political or technical assistance to aid recovery. Beyond the loss of lives and property, the Secretary General of the UNWTO stated his additional concern for the damage caused to "the beautiful tourism destinations in North eastern part of Tokyo and many of other places." Sendai, the epicenter of the 9.0 magnitude earthquake, is located approximately 189 miles from Tokyo prefecture, while Fukushima, the site of the damaged nuclear power plant, is approximately 149 miles. While the North eastern coast of Japan was ravaged by the earthquake and tsunami that crashed its shores and a thirteen mile radius of land was quarantined around the damaged Fukushima nuclear power plant, Tokyo did not experience a similar detrimental impact. As mentioned last chapter, was Fox News' Google map incorrectly labeling two non-existent nuclear power plants in Tokyo, with one of them named "Shibuyaeggman," which turned out to be a Tokyo night club. These geographic gaffes reflect a multitude of others following the disaster as global news outlets detailed the search for survivors and speculated on the potential effects of radiation leaks.

Even as a clearer picture of the devastation grew, the horrors of buildings being shaken from their foundations, whole villages being engulfed by the rising sea, and the ongoing drama of a damaged nuclear power plant had passed the eyes and ears of global audiences. News outlets likewise utilized social media to collect information and images from citizen sources. As communication scholars Babak Bahador and Serene Tng (2010) noted in their comparative study of the social media responses to the 2008 Mumbai attacks, citizens are "no longer just consuming the news but also producing it and potentially even challenging the government's dominant role as the major source and

interpreter of conflicts" (179). Despite the information rich environment of the Internet or news outlets desire to verify the credibility of their sources and check the contents of the maps before reporting, the media still effectively constructed in global minds that Japan, the nation as a whole, had become unsafe. Media attention resulted in a dramatic downturn of foreign tourists entering the country and a surprising number of tourists cancelling trips to areas located far from the disaster zone.

In response, Japan's government and various industries sought to utilize social media technologies to neutralize the negative effect of disaster news and inspire confidence in their country's tourist-friendly stability. The move reflects entertainment and educational programs increasingly migrating to the Internet as the shift to an "attention economy" makes offering modes of participation the standard in capturing audiences and, some may argue, the means to remain relevant in today's increasingly digital society. While "media has turned social" (Lovink 2007, ix), it has also turned marketable, with companies integrating participatory components into their business plans and mixed-media marketing campaigns generating buzz for their brands via ever enticing Internet-based interactions (Green and Jenkins 2009, 215).

Social media embodies a cultural logic of convergence, shaped by media conglomerate's desire to exploit "synergies" between different divisions, as well as consumer preference for media content in more on-demand forms. Convergence is not about bringing together all media functions within a single device, but instead enacts a complex interplay across multiple channels of distribution (Jenkins 2006). As with marketers rethinking marketing strategy, diversifying their advertising budgets, extending their brands across multiple distribution outlets to target smaller niche markets,

governments and their industries are applying similar techniques. For government, it offers an avenue to extend their “soft power” associations. Soft power as opposed to hard power or military operations is how nations take to “inspiring the dreams and desires of others through projecting images about one’s culture that are broadly appealing and transmitted through channels of global communication” (Allison 2006, 17). Public relations campaigns following Fukushima such as official websites, the encouraging of positive multi-voiced global communication from foreign residents in Japan, and contests that provided paid-for travel to the country with the stipulation that winners use social media to promote tourism, provide a rich space to analyze not only the tensions between governments and media, but also the anxieties created over media’s new participatory context and the dual objectives repurposed content cater to.

Unpacking Google's humanitarian campaigns shows how spatial media created a visual knowledge politics, while geospatial artifacts and geovisual interfaces and forms functioned as sites for meaning production, consumption, and the circulation of cultural power. This approach complements critical humanists who traditionally approach disasters through a broader, historical lens to consider a media affected culture of risk acceptance and commercialization. For instance, Kevin Rozario (2007) traced the historical development of disasters in the United States as opportunities for spiritual renewal and capitalist expansion. Looking at the disaster-prone city of Los Angeles and its representation in fantastical disaster cinema, Mike Davis (1999) pinpointed repeated themes of denial and inequality. Both E. Ann Kaplan (2005) and Marita Sturken (2007) produced larger order affect ideologies of disaster mediation. Kaplan coined the term "empty empathy" to describe a spectator's emotions when the news fails to contextualize

images of war and disaster. Sturken focused on how kitsch consumerism following national traumas such as the Oklahoma City bombing and the September 11, 2001 terrorist attacks on New York produced a "culture of comfort" in the U.S. And as discussed last chapter, Brian Massumi's (2011) understanding of the "half-life of disaster," explained how media is responsible for cycling spectators from initial shock into a vague foreboding of another imminent crisis.

Similarly, this approach complements scholars who study communities engaged in scientific knowledge production practices and investigate the role of public engagements following political events and environmental disasters (Callon et al. 2009; Latour 2004; Goodchild 2010). For instance, following Fukushima, anthropologists studied the radiation mapping community Safecast, which began monitoring the spread of nuclear radiation after widespread unrest and mistrust of the government-released and media-disclosed information concerning radiation risk (Abe 2014; Slater et al. 2012). Starting within a week of the disaster, Safecast mapped Geiger counts, generating over 3.5 million readings by December 2012, and a multitude of Google Maps that analyzed the data. In contrast, I hope to shed light on citizens producing broadly-conceived digital humanitarian spatial content without overt political intent and through commercial prompting and collaboration. One case study examined is the non-citizen journalists involved in the launching of a YouTube/Google Japan “partner” program called “Japan is *Genki*” (Japan is energetic, great). The campaign sought to bring together message videos from Japan-based video bloggers to report on the conditions of their location and to introduce and promote local sightseeing, business, and recreation to its foreign audiences.

While far from an extensive survey, the case studies presented represent three types of marketing strategies deployed by Japan's tourism agencies: databases, contests, and non-citizen journalists. For databases, Google expanded its Special Collection of Street View imagery of Japan's World Heritage sites, Buddhist temples and shrines, tourist resorts and attractions to 108, making it at the time, the country with the largest database on file. In the "Memories of the Future" project, for nine months following the disaster, Google digitally archived the areas of Northeastern Japan that were devastated by the earthquake and tsunami. In terms of contests, Japan Tourism Agency scrapped a plan to give 10,000 free round-trip tickets is compared to the Travel Volunteer Project, the brainchild of a small travel agency in Kanazawa City, Ishikawa Prefecture, which recruited two Britons out of 1,897 applicants who had never before visited Japan to travel the country's forty-seven prefectures in 100 days, all the while posting daily, geo-located blogs from the road.

DATABASES, CONTESTS, AND NON-CITIZEN JOURNALISTS

With the desire to express to foreign tourists that Japan is a safe place for travel, the Ministry of Foreign Affairs and the Japan Tourism Agency (JTA) enlisted the help of the well-coifed, all-male pop idol group, Arashi. On July 11, 2011, the five members held a news conference at the Foreign Ministry's Iikura House in Tokyo to introduce a short PR video entitled, "Message from Japan," which featured them respectively enjoying the touristic pleasures of Hokkaido, Aomori, Tokyo, Kyoto, Kagoshima, and Okinawa. In the coming weeks, the clip would air simultaneously across the globe in airports and Japanese embassies of more than 133 countries and regions, including on a giant electronic billboard in New York's Times Square. The boy band, appointed the previous year as the agency's ambassadors, directly addressed the audience at the beginning and the end of the film to

give gratitude for foreign support and to invite visitors back to Japan's shores. Through footage of landscape, local cuisine, traditional and popular culture, this advertisement directly inflected Japan's iteration of soft power. It was essentially a mosaic of positive imagery embodying the inverse of what was flooding news media channels and Internet portals immediately following the triple disaster. It also reflects a traditional means of broadcasting soft power associations, providing a comparative example to situate PR campaigns that incorporated social spatial media.

Notable in this PR clip is that discussion of the disaster is neglected by the pop stars, bypassed in favor of benign shots of rice fields and sandy beaches, kimono-clad women, summer festival dancing, and long tables filled with dishes of regional delicacies untouched by the shaken earth, risen ocean water, or invisible leaks of nuclear radiation. Such purposeful mediation expresses communications theorist James Carey's (1989) assertion that such media is not about sending or gaining information but instead is a form of both cultural production and communal ritual, working to maintain society through "the creation, representation, and celebration of shared even if illusory beliefs" (43). This ritual view of communication is a situation in which nothing new is learned but where a particular view of the world is "produced, maintained, repaired, and transformed" (Carey 1989, 23).

The world communicated by JTA is first one of a safe, idealized geography. In a study of the "anniversary journalism" coverage of Oklahoma City bombing of April 19, 1995, television scholar Victoria E. Johnson (2008) found that these programs drew heavily upon and reiterated conventions established in the Heartland myth, which is informed by the American fantasy of exceptionalism and other "preferred narratives" of regional mythology

(175). Johnson deduced that place is presumed sacred and innocent in the face of terror. Similarly as Japan's geography was highlighted, the JTA clip adopted a tone of naïve curiosity and wish fulfillment as the five members expressed childlike attributes of awe and wonder at tilled farm fields and pots of boiling tofu and vegetables, while encountering friendly, carefree citizens along the way. The benign landscape and jovial citizens not only produced a preferred narrative for the home country, but also "work" to invite foreign travelers to a land seemingly untouched and innocent of trauma.

Images of places and tourist destinations play a considerable role in influencing people's holiday decision-making process (Riley, Baker and Doren 1998; Iwashita 2006). As Urry (2002) argued of the virtual dreams, expectations, and fantasies found in travel media that create a hermeneutic circle of tourist motivation, only reaffirms the tourism industry's intensification and development of travel-related media products such as special guidebooks, travel literature, travel magazines, newspaper travel sections, television programs, and tourism websites. However, the economic and technical means to broadcast media one-to-many does not assume that its message will be read as intended amongst a dispersed global audience. For instance, the pop idol group Arashi is little known outside of Asia, making their impact on audiences in New York's Times Square, reactions of which were recorded and broadcasted on several of Japan's television news broadcasts, less compelling than the visuals themselves.

Another instance of cultural kitsch gone awry is that throughout the clip members carry a *maneko neko* cat doll. Several times they imitate its paw-waving stance of one arm bent upward followed by the cat meow sound of "nya," as fellow Japanese they encounter repeat their expression in unison. Subtitled into English, Korean, and Chinese, the group

explains near the beginning of the video that in Japan a maneki neko invites people and brings good fortune. Known in English-speaking countries as "lucky cats," these ceramic figurines often grace the cashier counters of Asian diners and are sold as cheap trinkets in Chinatowns, losing their cultural specificity to become part of global kitsch culture. The needed affirmation of their origin suggested acknowledgement on the part of the agency that the distance in distribution detriments the access and reliability of information being relayed. As cultural theorist Stuart Hall (1973) argued, encoding and decoding are determinate moments in the television communicative process. While at the denotative level, the televisual sign is fixed, at the connotative level, ideologies can alter and transform significance, performing a "struggle over meanings" (512).

Diverse readings are only quantified when globally distributed, such that the dissemination of images and information from producer to consumer is a complex, overlapping, disjunctive order in the global landscape (Appadurai 1996). Not only is global electronic communication abstracting cultural expressions, but traditional thinking about "areas," driven by conceptions of geography, civilization, and cultural coherence are becoming obsolete (Appadurai 1996; Castells 1996; Gupta and Ferguson 1997). This comes with recognition of the social actors' ability to construct global imaginations; that is, space is a socially constructed object of the imagination. The nation of "Japan" signifies a particular brand and blend of fantasy-ware that inspires an imaginary space (Allison 2006, 18). For the West, "Japan" is a historically and economically produced montage of traditional icons of temples, geisha and samurai, the demeaning imagery of the "yellow peril" from American World War II propaganda, the robotic business culture of the economic Bubble Years of the 1980s, and the bright, large-eyed characters of Japanese

animation (Schodt 1994, 44). While “Message from Japan” represents a desire of traditional social institutions and governments to channel only positive associations, it also reflects the already contested domain of cultural understanding in a global context. Spatial media, as I show below, is appropriated into this domain. Rather than improving "geoliteracy," our ability to better understand location, or overturning dominant narratives of place by its presumed neutrality, it contributes to and solidifies them.

In June 2012, a year after the disaster, Japan’s Ministry of Education, Culture, Sports, Science, and Technology’s center for resolving disputes against Fukushima nuclear plant operator TEPCO, expanded their compensation standards to eleven of the country’s 47 prefectures. Part of this compensation was for the financial damages caused to the tourism sector following the media’s frenzy over radiation fears. Some 30 damages claims were filed by the tourism industry, including by group tour operators which were hit by a sharp drop in school excursions and other children’s group travel to the region. Further talks of expanding the eligible list puts into perspective not only the scope but the desperate attempts taken to lure tourists back into a country that the world assumed was plagued by radiation and constant aftershocks. One such campaign that received hyped media coverage before actual budget approval was JTA’s “Fly to Japan!” which would offer 10,000 free roundtrip tickets to the country to winning participants. Would-be travelers would detail their travel plans in their application, and if chosen they would be required to pay for their own accommodation and meals, as well as publicize their trip on blogs and social media sites. The media attention prompted JTA and the Japan National Tourism Organization to take control of informing interested parties of the events and promotions in 2012 via Facebook fan pages categorized by country. The possibility of becoming a “fan”

of such agencies further situates the pervasiveness and interplay of converging media platforms.

The 1.18 billion yen or approximately fifteen million USD requested for the campaign, however, was not approved as part of the governmental draft budget. In a December 2011 announcement, Kyle Clark, head of PR and marketing at the London branch of the Japan National Tourism Organization, put their reasoning into context:

> We realize that this announcement is going to disappoint thousands of people around the world, but we hope people will understand how insensitive it would appear for the Japanese government to give people free flights to Japan when the cities, towns and villages devastated by the tsunami are still in desperate need of funding for reconstruction.

The sudden acknowledgement of disaster victims and material devastation seemed to be an afterthought to the initial prospect of 10,000 voices proclaiming Japan as safe and visitor-ready. It is a moment of reflexivity when the realities of the northeastern coastline and the cost of rebuilding in an economically recessed country conflicted with a commercial desire to turnaround the nation's global image.

The concept of selecting influential blogger-types to relay positive Internet messages did not go untapped by smaller tourism agencies, however. One such campaign was the Travel Volunteer Project, the brainchild of a small travel agency called Magellan Resorts in Kanazawa City, Ishikawa Prefecture, which recruited two Britons out of 1,897 applicants who had never before visited Japan. They would travel the country's forty-seven prefectures in one hundred days, a journey mapped in real-time on a Google map, all the while posting daily blogs from the road. The aim was similar to the preceding PR campaign discussed in regards to representing a safe, tourist-friendly Japan. According to the bilingual website's introduction:

> After seeing the coverage about Japan from international media, we felt a big part of information was missing: although the earthquake, tsunami and nuclear issue are terrible disasters, Japan as a country was NOT entirely destroyed or irradiated. All other places outside the evacuation zone are totally safe. But the media never mentioned it or that life goes on normally in many parts of Japan. This had severe consequences for many businesses in the travel & tourism industry, so we decided to create this project to promote Japan amongst the world's travellers and show that it still is a safe & wonderful country to visit [sic].

The trip gained momentum and support via word-of-mouth so that by the end of the journey a large press-conference at Kanazawa Station in Tokyo demonstrated the country's interest in the PR stunt. However, initial support during the scheme's launching fell flat. According to Aya Kihara, supervisor of inbound operations for Magellan Resorts, JTA had no interest to provide funding, perhaps due to their own interests in procuring finances for their 10,000 ticket giveaway. METI, Japan's trade and economy ministry, supported the project, but not financially. Instead, local tourism associations, hotels, commercial tourist agencies, breweries, *onsen* (hot springs), restaurant chains, and tour bus companies became the trip's sponsors.

The couple chosen to undertake this mission from September 15th to December 23rd, 2011, was British photographer Katy Morrison and writer Jamie Lafferty. Their respective professions added to their desirability for the work they would be required to produce in exchange for the trip; the remnants of which is an itinerary of photojournalistic blog and geolocated entries detailing their stays in each prefecture where sponsors welcomed them and introduced them to distinguishing aspects of the region in hopes of being featured kindly. While citizen journalism and pro-amateur creative activities dominated early conceptions of how digitization would change media production, today companies are more strategic in integrating participatory components into their business plans. While

companies desire a new relationship with their audiences, there is anxiety over providing too much freedom in the task of generating the raw material to enhance the brand's value for marketers (Green and Jenkins 2009, 214). "Free labor," as the Travel Volunteer Project partially represents, is problematized as a "moment where this knowledgeable consumption of culture is translated into excess productive activities that are pleasurably embraced and at the same time often shamelessly exploited" (Terranova 2004, 78). Older media such as television and print culture also drew on free labor, but it structured contributions more strictly in terms of economic organization and moralistic judgment. Immaterial labor draws on the momentum of capitalistic development to extract as much value as possible (Terranova 2004, 89). The value of Katy and Jamie's labor was the notion of unfiltered "objectivity" of virgin eyes, where they could support the recovery of tourism in Japan via what the website announces as "a volunteer traveler's objective impressions on a daily travel blog."

The notion of objectivity goes hand-in-hand with the utopian concept of the Internet as an unfiltered environment of open participation and free speech where users can produce their own media content. Examining the couple's final product, however, commercial constraints become apparent. The couple's actual mapped trek throughout Japan was planned and catered to by commercial vendors whose respective websites are linked and located in their posts. Like traveler guidebooks and television travel programs which produce and reproduce trivial and overly positive images of exotic, faraway locales, their blog details clichéd experiences of feeding biscuits to the deer of Nara Park, crossing the Shibuya scramble in Tokyo, and whisky sampling in the Suntory distillery. Photographs captured the familiar landscapes, cuisines, and culture of Japan, while their commentary,

translated into Japanese for a bilingual audience, presents a conservative politeness, taking seriously the charge of promoting Japan's tourism to both a foreign and Japanese audience. Critique was also limited to addressing Western media reports on Japan's disaster situation. Their October 3rd blog detailing their day spent in Fukushima prefecture highlights the positioning of Japan's safety vis-à-vis comparative critique:

> I spent this afternoon worrying about my brother who currently lives in America. He is not American, not quite, but he essentially leads an average American life: he goes to college, he eats food, he drinks a bit.
>
> He is an exceptional person, but his lifestyle is pretty average. And that's what gave me such cause for concern because as an average American, he's being exposed to around three millisierverts of radiation a year. Three! Here we are in Fukushima, sucking up a lowly 1.4 a year and my brother, running around the hills of North Carolina is being blasted by an unseen menace!
>
> Worse, we went to America for six weeks this year – we ate American food and American fruit and who knows what that could have done to us? We're 88km (54miles) from the doomed Fukushima plant and we're far safer than when we were sucking down hotdogs in front of the White House [sic].

Objectivity is presented with a photograph taken while there of a handheld radiation reader displaying 0.16 millisieverts. It provides the technical proof that seemed contradictory to radiation maps being put out by citizen scientists at the time. This blog post ends as others do with links to local companies; a restaurant and grocer in Fukushima who helped make their day trip there possible. While the Travel Volunteer blog garnered interest and commentary at home and abroad, the final product's content did not stray far from the messages produced through traditional broadcasting. Despite the desire of objectivity, the two travelers became commercial platforms similar to the well-groomed and well-paid pop idols who work for JTA. Katy and Jamie essentially produced the blogged foreigner rendition of the "Message from Japan" PR clip without the same level of local and

international exposure. Each utilized spatial media, but in ways similar to how broadcast media incorporates maps into news reports or as visual accompaniments to a story primarily focused around human emotions and experiences.

Google Maps was the go to mapping platform for Jamie and Katy's adventure, but before discussing Google Corporation's own endeavors to produce spatial media content in ways that showcased what makes its mapping platform special, its subsidiaries such as YouTube were also actively involved in disaster aid. Google arguably represents a new form of global hierarchy as a corporation controlling the flow of information instead of the traditional nation state. It is more of a complex interplay, however, as corporations work with nations to repurpose the same controlled content. Google's other tourism-focused initiative followed the Travel Volunteer Project's in terms of relinquishing media production to user-producers, but tensions between the medium's networking capabilities and the company's branding objectives made it less likely for Google to capitalize on its output. In May 2011, YouTube/Google Japan launched a "partner" program called "Japan is *Genki*" (energetic, great) to bring together message videos from Japan-based video bloggers to report on the conditions of their location and to introduce and promote local sightseeing, business, and recreation to their foreign viewers. While receiving less attention and promotion than the preceding PR campaigns, the initiative and output best displayed the reasoned anxiety over the participatory context of the Internet and the costs and benefits of relinquishing control of media production.

Officially launched in December of 2005, YouTube is now a thriving, global video-sharing website still touting the democratic potential of converting media consumers into producers. It can be considered a hybrid or convergent medium where music videos and

copyrighted film clips are perched alongside user-generated videos and mixed content. Power relations are infused in YouTube's structure and operation, aiding its democratizing goals towards economic potential (Wasko and Erickson 2009). Despite launching as an advertisement-free venture, its popularity quickly shifted it into a place for corporations and investors to explore ways to translate potential captive audiences into advertising revenue. YouTube thus became monetized through advertisements, coming in the form of banners, image-overlays, and commercials before, during, and after videos.

In early 2007, YouTube began revenue-sharing with its most-viewed users, instigating a partnership program. While paid, "partners" remain less desirable than professional media content from major companies (Wasko and Erickson 2009, 382). Despite this, partner financial success stories hype YouTube's "Broadcast Yourself" mantra and encapsulate TIME Magazine's declaration that 2006 was the year of "you." Less publically acknowledged is the video exchange service's facilitation of a more positive democratic effect of the Net. That is, a powerful medium for non-elites to communicate, support each other's struggles, and create equivalent insider groups at scales going from local to global (Sassen 2007). Defined as voluntary, temporary, and tactical, these new communities affiliate through diasporic conditions, common intellectual enterprises, and/or emotional investments that are reaffirmed through mutual production and reciprocal exchange. They can serve multiple purposes from being indispensible resources for identity confirmation and construction, as spaces to challenge authority, to engines for the circulation and exchange of commodities (Levy 1999; Jenkins 2006). Japan-based video bloggers, or "J-vloggers" as they term themselves, are an example of a networked community who are providing the commodity of information to a growing base of people

that are migrating to more informal and non-institutionalized digital resources for a wide range of needs.

Members of the J-vlogging community connect both through their status as foreigners in Japan and their desire to share personal experiences and information about Japan via social media. Demographically, this group is truly trans-multinational and intergenerational, being composed of long-term residents with families, to temporary English teachers, study abroad students, as well as Japanese nationals seeking to connect with an international audience. While the term "netizen" describes a new kind of political relation that shares allegiance to the nation with allegiance to the Net and a planetary political space (Poster 2006, 78), J-vloggers can faithfully fulfill the concept of "transnetizen," occupying an unfixed space between several political spheres. The community is continually constructed and reconstructed through brief generations, partially due to passing interests in vlogging as a hobby, but also to the transitory nature of foreigners living in Japan. Beyond a cyber community, J-vlogger's ties are actualized through planned meet-ups and video collaborations.

YouTube's ability to visually connect viewers to individuals and their place of residence may also be its source of power. Viewers often already have an inherent interest in Japan and use these videos as stepping stones to their dreams of geographic mobility. Videos range from personal storytelling, travel vignettes, Japanese language tutorials, to more in-depth conversational series on issues ranging from finding an English teaching job, renting an apartment, to colloquial mannerisms. Often the most mundane videos, such as apartment tours or Japanese snack food reviews, are among the most popular and accrue the highest view count. J-vloggers thus represent an online niche community with a well-

defined, engaged audience who could relay information to others in their online and offline social circles, making them well suited to assist in the various initiatives taken to stimulate Japan's tourism. The community was also already engaged in initiatives. For example a video collaboration called "*Ganbare* Japan" (you can do it Japan) project, was started in the beginning of July 2011 by a well-known J-vlogger member named "Gimmeaflaeman," who elicited anyone anywhere to send a video or picture to inspire recovery after the earthquake.

YouTube's self-described emphasis on user-generated community often discourages marketers and commercial content providers from placing their brand in the hands of its user producers. Concern includes control over the page in which the ad is displayed, which could distract or link to alternative sites with risqué content or criticism (Andrejevic 2009). Furthermore, while content favored by advertisers is carefully crafted to be compatible with the consumerist messages it supports, the unbounded diversity of content produced through online social networks cannot assure advertisers that their desired message will be transmitted. Supporting tourism to Japan is less commercially specific, but anxiety is expressed in YouTube Japan's invitation letter to participate in "Japan is Genki." Sent to Japan-based video blogger partners, the letter begins by reiterating a similar reasoning behind the Street View Special Collection, detailing Japan's drop in foreign tourists and the need to help in recovery. In return for participating, YouTube Japan Team states:

> We may introduce some of your videos at the press conference on May 11, at which Google Japan will announcement the project as one of our ongoing initiatives…There will be no reward or guarantees paid for your contribution, but you are free to monetize the video. We will promote the video and the central channel including your videos on our homepage, blogs, Twitter, and Facebook [sic].

Reminiscent of Jamie and Katy's labor for local tourism agencies and companies, J-vlogger's work is being tacked onto one of the many initiatives that further brand Google's humanitarianism. It also provides stipulations. The following list discerns what should be included in the video:

> - Your name, where you are originally from, where you live in Japan now
> - Introduction of the city/town you live now (on-site reports are most welcomed, but shooting in your bedroom is okay too)
> - Promotions of local business, site seeing spots, events, festivals, restaurants, amusement areas, and etc
> - An encouragement for the audience to visit Japan

There are also tips for lingual effectiveness: "speak your native language and add English subtitles (even if you speak English in the videos, English captions will allow users to translate it to other languages)."

A video produced by "camswitzer," a blogger and twenty year Fukui prefecture resident who also posted the entire content of YouTube Japan's letter on his website, presents two minutes of himself in front of an exit of busy Shinjuku Station in Tokyo. While following the letter's advice and stipulations, the video does not present the similar glossy aesthetic presented in JTA's "Message from Japan" PR clip. Instead, for one minute of nervous hand gestures and unscripted, choppy dialogue, he tells the audience to visit Japan for the non-descript "shopping," "culture," and "food," while the last forty-five seconds are a shaky point-of-view shot of him walking through the crowded and slightly darkened subway terminal, which reflect the post-earthquake energy conservation mandated throughout Japan. Uploaded in May of 2011, by November of 2012 it garnered just over 600 views.

A YouTube search for "Japan is Genki" filtered by view count reveals other partner videos. In November 2012, the number one most viewed was just over 10,000 times and by "Rhyminggaijin" on Fuji-Q Highland, a theme park situated outside Japan's iconic Mount Fuji. "Rhyminggaijin," who calls himself "Rhyming" for short, is a Tokyo-based, African American freestyle rapper whose intermittent vlogs detail his daily life as an English teacher, while promoting through this channel and several others his hopeful music career. He dedicates his channel to those "trying to do the impossible." The impossible for him is to become an internationally recognized, commercially successful, Japan-based rapper. He has used YouTube as an outlet to publish himself in the Guinness Book of World Records for longest freestyle rapping. While other J-vlogger's ambitions may be less overt, there is usually a sense of self-promotion. Reasoning provided for participation in "Japan is Genki" is perhaps best expressed by "Camswitzer" on his blog: "I can't turn down an opportunity to 1) help people, and 2) pimp myself out to the world!" Marketers dealing with YouTube not only contend with the Internet's technical abilities to hyperlink away from targeted commercial interests, but additional interference from the dual objectives of the participants. Effective participation in the attention economy means that users can employ the same tools to also gain attention.

Furthermore, J-vloggers desire to provide information to a global audience about life in Japan does not mean all their videos paint a positive picture of their host country. As Geert Lovink states, "The essence of the blog is not the interactivity of the medium: it is the sharing of the thoughts and opinions of the blogger" (2007, 28). Among the vlogs inviting their audience to visit Japan, others by the same vlogger may detail inconveniences encountered as a foreigner. Vlogs detailing personal experiences of "racism in Japan,"

typically given this headline, often garner the most views and video responses for members of the community. J-vloggers represent a fraction of a unique and unexamined minority in Japan's social landscape. They reflect how "geographic mobility and new technologies are giving rise to new collective subjectivities and new public spheres in which struggles over meanings and power are staged and social action is mobilized" (Bernal 2006, 161). J-vloggers also connect over discrimination and disenfranchisement in their country of residence while offering insight into global and local experiences of belonging in a geographically mobile and digitally connected world.

What is lost in terms of control for marketers over content may be gained in terms of desired "objectivity" that has the potential to go beyond what Katy and Jamie could freely share in their Travel Volunteer blog. YouTube embraces a radical alternative to television's concept of seeing at a distance. "Liveness" is defined as one of the oldest elements of television's definition and despite being supplanted by video, it remains a touted capacity of televised sports, breaking news, and special events (Uricchio 2009, 31-32). YouTube's use of "liveness" as an excess signification still misses the capacity for televisual liveness. Instead, YouTube presents "a shift in agency (producer-controlled flow as distinct from user-generated flow), and a shift from flow as default to flow as a condition that requires active selection;" with "flow" referring to Raymond William's distinction of traditional broadcast programming (Uricchio 2009, 33). While YouTube may not necessary be live or without restrictions, it is user traveled and composed of user presentations, presenting a façade of unfiltered rawness. Furthermore, connecting through recommendations, annotations, and prompts means that "YouTube is making use of network affordances, unlike its industrial counterparts who are using the network as little

more than a data dump and alternate channel" (Uricchio 2009, 35-36). What Katy and Jamie's Travel Volunteer blog lacked due to contracted obligations, "Japan is Genki" gained in unbounded opinions, given stipulations rather than a contract, and outreach to an established community. It is a personal, extended travel brochure and a living, narrative-driven form of "street view" where "Japan" is both constructed and demystified via the accounts of its residents.

YouTube/Google Japan did not overly hype its "Japan is Genki" database of user content, the reasoning for which can only be speculated. However, its initiative and output reflects how the Internet is neither an emancipator nor oppressive technology. It is instead a "contested terrain" for media dissemination, obstruction, appropriation, creation, and exchange (Kahn and Kellner 2007, 621). In this environment, media frames the very language of societal communication. Considered in these terms, it is perhaps less ironic that J-vlogger's on the ground reporting contributed to the damaging images utilized by global news networks who usurped their YouTube videos as they coped with sparse information on the earthquake. Several J-vloggers witnessed their highest view counts coming from "Japan earthquake" headlined videos or geotagged Tweets, such that several ended up profiting from the disaster. Just as the initial occurrence of spontaneous and dramatic news events encouraged media outlets to go directly to citizen journalists, disaster recovery campaigns are finding citizens, or in this case non-citizens, useful allies in their hopes for commercial stimulation. Their commercial value, however, depends on the ability of the sponsors to control and the technology to filter that which strays from the marketable content they desire. Google's Street View technology may offer similar views for the virtual tourist but under the control of the company who produced them.

Beginning in 2014, TokyoStreetView is an ongoing project of not-for-profit videographers working toward compiling the first high definition 4K video library of Japan to showcase aspects of Japanese culture and locations around the country. The goal is to have one thousand videos of Japan's land- and urban-scapes with one to two hundred of those videos being specifically on Japanese culture, such as cuisine and martial arts. On their Youtube about page, producers call it "a bias-free experience of Japan and its many wonders. Unlike other videos you may find on Japan, TokyoStreetView videos are purely contemplative where our camera(s) are your eyes, our tripod your chair. Just sit with us, relax and let an amazing world unfold in front of you." Viewers experience the high-definition camera's wandering of the market-lined streets of Senso-ji temple in Asakusa, Tokyo, or the crowded famed anime Mecca of Akihabara. The eye line view floats audiences along at a leisurely pace as they see and hear everyday life at that locale. The producers encourage embedding their videos elsewhere using the YouTube embed code, but remind users of the prohibition to download and re-upload their videos elsewhere or modify them. Most of the folders of Japan content are listed by prefecture, but as of January 2016, none show the landscape of Fukushima.

The content presented on a YouTube channel called "TokyoSteetView - Japan the Beautiful" shows striking similarities to the content of Google's Street View technology. Among Google Japan's crisis response initiatives to help the victims of the triple disaster, there was moderately promoted “Special Collection” of Street View images. The project upped the count of catalogs showcasing Japan’s World Heritage sites, Buddhist temples and shrines, tourist resorts and attractions, with the stated interest of offering users a chance to learn more about the country and thus contribute to its revival and reconstruction. Street

View was introduced to the company's popular mapping platforms Google Maps and Google Earth in May of 2007, with a desire to "provide an interface that can display street-level images in a natural way that enables convenient navigation between images without losing the map context" (Vincent 2007, 118). The Flash application offers 360-degree "picture bubbles," or graphic experiences of detailed high-resolution panoramic images collected and processed by a fleet of custom vehicles deployed worldwide. Through Street View, users can explore via their computer screens and mobile devices various world landmarks and natural wonders, go inside museum galleries, restaurants, and small businesses, and navigate a trip before taking it. Similar to JTA's "Message from Japan" PR clip, the message is fixed before it is distributed and decoded: Japan's landscape is frozen in time, appearing untouched by trauma, and ready to be consumed as a safe digital spectacle.

The blog post officially announcing the Special Collection reiterates the goal of Street View: to enable everyone to "go to" places around the world through technology in spite of time, national borders, and distance; to provide a chance to know and learn about a place and gain a desire to visit the actual place. While invoking the tourism industry's hermeneutic circle of commercial desires, it also reinstates a long held notion of cyberspace as an absolute space that simultaneously "eliminates distance" and becomes an "electronic window" of instant and unmediated access to the world. Interaction via Google's Street View is ideologically imbued with the hope of overcoming borders and power relations, and equalizing and empowering users who appear to only benefit from its virtual intimacies and information giving properties (Robins 1999).

Google, whose branded logo remains on each frame, positively interpellates its users as global peacekeepers and charitable do-gooders. That is, as digital humanitarians and in

the case of this Special Collection catalog, as a potential tourist set to visit Japan. While this information intervention serviced Japan's soft power by broadcasting gaze-worthy images of Japan's landscape, it also became a means for the company to extend its brand and essentially profit from the disaster. According to media scholar Lisa Parks (2009), there is little sense that Google's platforms directly impact policy-making (Parks 2009, 541). Parks deconstructed the unique ways spatial media technologies advance geopolitical agendas by examining public access to information on the Crisis in Darfur through Google Earth software. Google Earth builds on and differs from earlier global media formats such as broadcast media by structuring geopolitics as a "domain effect." That is, it represents world historical events similar to global news networks but opens the field of representation to users around the world who have different vantage points, social backgrounds, and political interests and agendas. Likewise, it organizes events and structures information into discrete units of data or geo-referenced "layers." This is unlike news reports which cover events in sequential flows.

Using discourse analysis, Parks explored how Google Earth reproduced Western tropes of the African tragedy, while also missing the opportunity to generate literacy around the political provenance of satellite imagery. The interface itself draws on and combines visual conventions from cartography, National Geographic photo essays, war photography, and human rights monitoring to proffer "global awareness" about a situated conflict. According to Parks, "rather than being a site/sight of focus in the context of a print or broadcast news story, the satellite image is positioned as an entry point or gateway to closer views" (Parks 2009, 538). Users who are in search of closer and presumably more meaningful perspectives are encouraged to zoom through or bypass satellite imagery as

opposed to scrutinizing the power apparatus behind it. Closer views and representations of humans reveal consistencies with Western tropes of African tragedy and the representation of refugees. They rely on what Michael Shapiro called a “personal code” in that they focus on individual bodies rather the complex dynamics of political violence in the region. This along with the lack of layers calling attention to historical postcolonial geopolitics, perpetuates a Western imaginary of the ahistorical African continent locked in unchanged and unchanging perpetual strife (Parks 2009, 540). Google Earth draws attention to the crisis and interpellates its users as global peacekeepers as a form of nonbinding digital humanitarianism.

Chosen landscapes presented in the Japan Special Collection avert the nuclear crisis and instead displayed to foreigners an untouched landscape safe for traveling, virtual or otherwise. However, this information intervention was accompanied by a humanitarian promise announced by the corporation to digitally archive the areas of Northeastern Japan that were affected by the earthquake and tsunami, but doing so for the local population. Google's "Memories of the Future" project is a map filled with thousands of miles of Street View imagery of the affected areas taken before and after the disaster. A user can click "Before" and "After" and drag the yellow "Pegman" icon onto the map to see the impacted area. Survivors are also encouraged to share photographs and videos of places if they have them. The project was announced by Google in July 2011, and released in December 2011. According to Google, the project endeavors to allow the people of Japan to rediscover lost memories of their homes and towns and to keep those memories alive for future generations. It is also a digital archive meant to be useful for researchers and scientists

studying the effects of natural disasters and for anyone who wants to better understand the extent of the damage.

"Memories for the Future's" inclusion of imagery of the landscapes of evacuated towns in Fukushima prefectures comes two years after the explosions. Partially this is due to restricted free access to evacuation zones, but the negation of mention of these areas in earlier Street View imagery suggests an avoidance of politics on the behalf of Google's positive initiatives. On March 27, 2014, the project released Street View imagery of the Fukushima Exclusion Zone in Namie-machi, a small city on the coast of Fukushima prefecture that was effected by the triple disaster, and nuclear situation long after. In an invited blog post on Google's Official blog, the mayor of Namie-machi, Yu Baba, told of the local government's collaboration with Google in order for the residents to see the actual condition of their hometown, while adding the desire to share with the world the gravity of the situation.

With the aid of social media and geoweb capabilities, marked-up maps provide communities such as Namie-machi and individuals such as survivors of the crisis to locate and share personal and/or collective stories. As Tasker (1999) commented, these "maps become far more than expressions of cartography, they become holders of our memories; part of our personal journeys and to some extent, records of our passage through life itself" (1). These types of personal mappings serve the therapeutic and healing process (Coulis 2010). Also at a collective level, it makes the experiences of a group more visible and in the case of Namie-machi, politically charged. The mayor's collaboration with Google to bring attention to his town's plight emphasizing how spatial media serves as another “contested terrain” within a media space overtaken by popular blogs and YouTube vlogs that

communicate shared values. But personal and community maps do not benefit the represented alone. Rather they are part of a system of feedback loops between industries, governments, and the public. Such campaigns emphasize the geoweb's viability as a commercial platform to stabilize and reinforce hegemonic discourses, while providing insight into how governments promote their soft power, how industries such as Google promote their brand through humanitarian ventures, and how audiences repurpose location content to serve their own needs.

TOWARDS A NEW SPATIAL IMAGINATION OF NUCLEAR DISASTER

As with other spaces of human interaction, the geoweb is constituted by multiple layers of history, relationships, and geography. It is a platform to navigate audiences as audiences navigate themselves, and often through personal interest in narratives about human drama and destruction. The examined case study on Fukushima emphasizes the diverse political and economic dimensions of practice which all allude to the geographic dissonance of the geoweb. Geospatial communication tools are marketed by Google and Esri to resolve geographic confusion and enhance geoliteracy, but instead end up verifying what Mark Poster called the "transcultural confusion" of global communication (2006, 11); an issue manifested in Fukushima's information disaster. However, the trauma narratives represented and experienced by disperse users of these tools are already locked into a historical continuance of disaster representation, making it important to look at the effects of these past and post-productions (Ivakhis 2013) and discern their influence on mapping and capitalizing on place.

In particular is a pervasive "imagination of disaster," which can be traced back to the science fiction films of the 1950s and 1960s. However, a more general disaster

imagination can be grounded in actuality. In 1883, the island of Krakatoa erupted in a volcanic explosion heard around the world. The noise of the massive blast reached over 50 different geographical locations, making up an area covering a thirteenth of the globe, and as far as 3,000 miles away. It is considered the most distant sound heard in human history (Winchester 2004). The great wave of air pressure produced various content-specific understandings of what occurred. Fishermen boats close by believed the Day of Judgment had come, while those farther away, deemed it a roar of distant gunfire. Imagination of what the seemingly ominous force was soared before news traveled by telegraph of its volcanic origins. Still "end of the world" scenarios and moral pandering for repentance did not subside. Fukushima produced similar and more disperse imagined narratives through audio-visual channels of media communication, followed by ethical bids for or against the sustainability of nuclear energy. Cinema similarly puts on view the potential of forces of destruction, but raises those narratives to a new level of imaginative potential while providing the commercial movie-goer an element of escapism.

Susan Sontag's influential 1965 essay on the public fascination with science fiction disaster films remains applicable to society's relationship and understandings of catastrophe. Despite being ripe with grotesque monsters and alien invaders, science fiction flicks of the 1950s and 1960s reflected the current era's anxieties such as radiation, contamination, and destruction. Sontag argued, "Alongside the hopeful fantasy of moral simplification and international unity embodied in the science fiction films lurk the deepest anxieties about contemporary existence" (1965, 220). Sontag claimed that there is an "imagination of disaster" found in fantasy that accommodates and negates the more general and perennial human anxiety about death even as it assuaged those fears with the

banal. Fantastical narratives gave audiences a chance to escape into exotic and dangerous situations but still survive those traumatic experiences with last-minute happy endings. Overused plotlines full of heteronormative romances, trite dialogue, and overused clichés about identity, power, knowledge, social consensus, guilt, and responsibility neutralized the discomforting otherness of aliens and radioactive monsters.

Sontag's essay offered a generalized viewpoint on how media reflects and relieves painful human self-consciousness of the inevitability of death, the loss of love, meaninglessness and other pressing societal fears. It does not negate the importance of further examining this imagination's historical specificity in particular contexts. She claimed that, "from a psychological point of view, the imagination of disaster does not greatly differ from one period in history to another but, on the other hand from a political and moral point of view, it does" (Sontag 1965, 224). Certain aspects of the imagination of disaster are unchanging, but the types, frequency and magnitude of disasters and their representations overcome and increase in different forms of media after the 1950s and 1960s, which Sontag detailed. Fantasy operates in a way that displaces the human origins of disasters into outer space or onto alien creatures. Narratives forego producing a genuine social or political critique or rupture of the moral and political status quo since it would hamper its success in providing temporary but satisfying solutions to surviving disaster. This approach is strikingly similar to the narratives produced by spatial media just discussed. However, within both these commercial art forms exists more profound dilemmas of contemporary society.

The pop culture icon of the atomic age, *Godzilla,* is one such symptomatic multi-media text that evokes a historically and contextually specific imagination of disaster, and

one which evolved over its past 50 years of existence. Following Japan's triple disaster, the well-known icon was photoshopped into a screenshot from NHK World's Breaking News report on the "Water Spraying Operation" at the Fukushima nuclear power station. The building sized, lizard-like monster is scaled to size and standing to the left of the smoke-enshrouded plant, breathing from its jaws a reddish blue radioactive heat ray. This "atomic breath" is the classic movie monster's signature weapon; a death ray built from a nuclear blast within its body. This image mashup is one of several tongue-in-cheek appearances of the atomic beast found among the circulating memes, comics, costumed activists roaming nuclear protests around the globe, and named in topical headlines sensationalizing the precarious nuclear situation or harmful aftereffects. This included hoaxes sensationalizing Godzilla-sized, radioactive fruit grown from Fukushima soil. Cultural play reflected a linguistic and metaphoric switch of Fukushima to signify Godzilla, which references both the type of disaster and its country of occurrence. Three years later, however, Godzilla or more specifically the 2014 American reboot of the Japanese franchise came to signify Fukushima in the minds of audiences. This is despite director Gareth Edwards declaring that the film's connection to Fukushima was only a coincidence: "our film is not based on anything to do with Fukushima, it's in a fictional city outside of Tokyo and happened 15 years ago" (as quoted by Hoare 2016).

The Legendary Pictures produced and Warner Brother's distributed refashioning of Godzilla, which Legendary paid millions for the rights to, diegetically recalled the March 11th disaster in several ways. The film opens with a voice over by the main scientist protagonist, Joe Brody (Bryan Cranston) saying, "You are not fooling anybody when you say that what happened was a natural disaster. You're lying. It was not an earthquake. It

wasn't a typhoon because what's really happening is you're hiding something out there." As with the transformation of the protagonists Jack Godell and Kimberly Wells in *The China Syndrome*, Brody's activist journey follows his will to expose the government cover up of the disaster at the fictional Janjira nuclear power plant where he used to work. Besides killing his coworker and wife, Sandra, the mysterious explosion also caused the entire region surrounding the power plant to be declared a quarantined zone.

Television news stations, NHK's World News among them, recounted the Janjiru meltdown in similar ways as seen on global television screens following the March 11th disaster. It leads into the film's primary narrative which unfolds 15 years later when it is revealed that the incident was not caused by an earthquake but by a "MUTO," or a Massive Unidentified Terrestrial Organism. The MUTO's destructive actions are later mediated as a spectacle through similar headlined televisual reports. Broadcast voices grant the audience a familiar position of spectator to the event, emphasizing authenticity while also conveying narrative information (King 2000). The film also transitions from televised reports to those engaged on the streets, giving the audience a more direct or "authentic" point of view of the action. Since inhabitants of disaster movies do not have the time to stop and stare, this rhetorical strategy helps make a claim for the authenticity of events taking place on screen (King 2000, 163-4). Reports of the beasts also bear striking resemblance to the social media memes overlaying the image of Godzilla onto screenshots of Fukushima news reports. Audiences witnessed this before.

Narrative-wise, the film's conspiracy plot also recalls the multitude of "what ifs" coming from talking heads on network news stations and social media networks over whether a meltdown occurred and on whether and what information the Japanese

government and TEPCO were withholding. Audiences using Fukushima as a point of reference for the film or vice versa, that is, connecting popular culture to a past or present crisis is not new. U.S. citizens made sense of the terrorist attacks on the World Trade Center through familiar visual mixed-media forms. News reports in the days following 9/11 shared the same language as the promotions of disaster films with headlines such as "Apocalypse" and "The End of the World" (King 2005, 47-57). The common refrain quoted from viewers and eyewitnesses on the streets of New York was "it was just like a movie." Without any terrorist attacks on American soil beforehand, disaster movies provided Americans the most immediate point of reference (Mutean 2009, 52).

Studying the post-9/11 landscape, film scholar Stephen Keane (2006) placed the events on both a historical and referential timeline. The former refers to a series of events in the "war on terror," including the invasion of Afghanistan in 2001, the 2003 war in Iraq, the subsequent invasion, and other terrorist incidents such as the Madrid bombings on March 11, 2004 and the London bombings on July 7, 2005. The referential refers to a generalized imagination of disaster as considered by Sontag. Contextually, these are elements emanating from 9/11 to inherit that reference point. It includes the spectacle of urban destruction, ideologies of national security and international terrorism, and paranoia of the Cold War and Vietnam with threats coming from the outside migrate to ones emanating from within. War films for instance might reflect events from abroad but action is domesticated through these referential elements.

Fukushima, or more broadly a string of historical nuclear disasters and subsequent nuclear paranoia, falls on a similar historical and referential timeline. Godzilla, who appears in a swath of media including comic books, television shows, video games,

novels, around 30 films produced in Japan and two Hollywood appropriations, represent a horizontally broad "symptomatic text" of overlapping and imaginative stories and cultures of nuclear weapons, power, disasters, and politics. While Godzilla is the most recognizable symbol of Japanese popular culture and of the atomic age, it is also the most culturally misunderstood and mistranslated. Even at the linguistic level, "Godzilla" is arguably the English mispronunciation of "gojira," he portmanteau of the English word "gorilla" and the Japanese word for whale (*kujira*). It refers to the monster's size, power, and aquatic origin. According to press releases for the 2014 reboot, Japanese actor Ken Watanabe, who plays a lead scientist studying the MUTO, was adamant to keep the original pronunciation of the monster's name.

Gojira was born out of the early *kaiju eiga*, "monster films" or "strange creature films" of Japan, which were science fiction films featuring unnatural creatures of immense size. Japan had a burgeoning industry of *tokushu satsuei* or *tokusatsu* (special filming or special effects techniques), for which the kaiju eiga film genre showcased with its excess in radiation, grotesque mutations, and the destruction of cities by horrific monsters. It was the original film *Gojira* that intensified the genre's popularity and led to Toho Co., Ltd.'s rise to global acclaim. Toho, the Japanese film, theater production, and distribution company started in the 1930s, managing most of the kabuki theaters in Tokyo. It would later house several famous *auteurs* including Akira Kurosawa and Yasujiro Ozu. *Gojira's* creator, director Ishiro Honda, became best known for directing many more *Gojira* titles as well as science fiction television series and iconic superhero franchises such as *Ultraman.*

Before the death of Honda in 1993, the director and visionary lamented on the failure of his wish that the metaphor of Gojira would provoke a discussion about nuclear

proliferation. Instead, he witnessed what was intended as an anti-war symbol transformed into a spokes-monster for the nuclear status quo. The original *Gojira* came out nine years after the fire bombings of Tokyo, and the dropping of atomic bombs on Hiroshima and Nagasaki. The director envisioned the monster to be a political statement concerning the national trauma of the war and against continuing U.S. bomb tests on Bikini Atoll, both of which are given only minimal reference in Legendary's 2014 film. More politically specific, the original 1954 film directly referenced the Lucky Dragon 5 incident (*Daigo Fukuryū Maru*), during which a Japanese tuna fishing boat was exposed to the nuclear fallout of the U.S. Castle Bravo thermonuclear device test on Bikini Atoll on March 1, 1954. The fallout of Castle Bravo reached more than 7,000 square miles. The boat's chief radioman Aikichi Kuboyama, died seven months later from acute radiation syndrome and was considered the first victim of the hydrogen bomb. The Japanese press called it "the second atomic bombing of mankind." Hondo's film started with an attack on a fishing boat and specified that the monster's origins were a nuclear explosion. With these events fresh in the Japanese psyche, Gojira stood as an allegory for the effects and consequences that nuclear weapons might have on earth.

The 2014 reboot negated the uncomfortable facts about the monster's origins and specifically, America's culpability in nuclear creation. The vague origin scenario provided is that Godzilla is an ancient sea creature who appeared after the end of World War II to feed off of nuclear materials. Scenes with old stock footage of the Marshall Islands display the monster swimming ashore as a hydrogen bomb is detonated on the beach. It harkens to the years between 1947 and 1962, when the Pacific region was a "proving ground," the U.S. name given to land or sea reservations where military technology is experimented and

tested. In this oceanic region, 105 atmospheric nuclear explosions took place, yielding a total of 210 megatons (a weight equaling thousands of Hiroshimas). The film reinvents nuclear history, where the detonations in the region were not to test nuclear weapons at all but to kill the beast. Arguably, the reboot maintains a long running U.S. educational system and media-constructed narrative that the atomic bombs dropped on Nagasaki and Hiroshima in August 1945, which killed a quarter million Japanese civilians, were a necessary and justified action to hasten the end of World War II (Ryfle 2014).

The Americanization of the original 1954 film, which was imported and distributed throughout the U.S. in 1956, also presents this version of history through creative editing. The original film was first screened with subtitles in U.S. Japanese American community theaters before the international rights were purchased for $25,000 by producer Edmund Goldman. While the commercial potential of the original remained, it was unlikely as it is today for audiences to flock to a subtitled film. Goldman and director Terry Morse thus worked on transforming *Gojira* into *Godzilla: King of the Monsters* (Terry Morse, 1956), a highly water down, badly dubbed, and edited version of the original that was deemed more palatable for American audiences. Goldman sold the film to Jewell Enterprises Inc., a small production company, to adapt for American audiences. The company created a new main character, Steve Martin (Raymond Burr), an American reporter who was on the scene in Tokyo during the first Godzilla attack. Martin recounts or narrates the event in flashback while recovering from his wounds in a hospital. These additional scenes were filmed a few days in studio before being spliced into the original film. The final product fell more in line with other low-budget, U.S. science fiction B-movies of the 1950s which were intended for the teen boy market. Sontag called these films

"camp" because they exploited the serious, topical concerns about nuclear proliferation in an utterly simplistic and unabashedly commercial format. Like other films of that genre, the remake also downgrades the emotion of character relations. For instance a love affair between the fiancé of the doctor and a young naval officer is stripped away with U.S. editing. Likewise, the political resonance of Godzilla's atomic origins gets elided for focus on scenes of mass destruction. The rest of Toho's series would be brought over to the U.S. in similar fashion.

As of 2016, there have been only two reboots of the franchise, but *Godzilla 2* is slated for 2019. The first Hollywood refashioning of the nuclear monster was in 1998. With hyped taglines of “Size Does Matter” and “Something Big is Happening,” TriStar pictures released its version of the ongoing Japanese franchise. Unlike Legendary's, which turns Godzilla into a dubious savior figure, TriStar’s digitally re-mastered Godzilla was represented as an efficient killing machine, a product of pure evil, and only capable of generating sentiments of fear and repulsion. Again, the monsters origins are altered. There was no mention of Hiroshima and instead, the monster's origins are linked to controversial nuclear tests in Polynesia conducted by the French. This version was so alien to Japanese audiences that Toho created another movie in response to the film, *Gojira 2000 Mireniamu* (Godzilla 2000 Millennium) (Takao Okawara, 1999). *Godjira 2000* sought to describe the relationship Japanese have with the monster, which according to Anne Allison (2004) is “one where Gojira is once again the more ambiguous character audiences find sympathetic, yet fearsome. Japanese dream of repelling this monster, but also becoming him” (2004:44). For the Japanese, Gojira came to express only half of what Hondo wanted, being both the dreams and nightmares that exist within the Japanese psyche.

However, *Gojira* is only one part of a larger imagination of the nuclear that exists within Japanese popular culture, and in particular, the burgeoning post-war popular culture reflected the nation's struggle to rebuild. This imagination rose from the ashes of atomic devastation at the end of World War II, which included the fire bombings of Tokyo and the dropping of atomic bombs on Hiroshima and Nagasaki. Each engrained a permanent scar on Japanese history, while the experience of nuclear annihilation left a visual and sensory imprint on the Japanese mind. The post-war imagination was best captured in the tokusatsu film genre with films providing moviegoers an escape from real world anxieties in the 1950s and 1960s, while also showcasing imagery that was directly linked to the war. It was America's own fascination with nuclear monsters such as the oversized ants in *Them!* (1954) that helped pave the way for the appearance of kaiju-eiga to be imported from Japan (Desser 2003:183). However, while American audiences were caught in the grip of nuclear Cold War paranoia, reflected in 1950s science fiction films of alien invasions, for the Japanese, the enemy was not technology, but nature out of control (Tanner 1994:127).

Japan was relatively optimistic about the benefits of technology and this can be seen in science fiction *manga* (Japanese comics) and anime (cartoon animation), which had its start in 1963 with a young robot named *Tetsuwan Atomu*, literally meaning "Mighty Atom." The show's hero, a child of science, was considered both a defender of justice and the embodiment of the bright future. According to contemporary artist Takashi Murakami in relation to *Astro Boy*, "to consider that his name is identical to the force of the atomic bomb, and that the bomb dropped on Hiroshima is nicknamed "Little Boy," is to understand the tortuously twisted road that led from war to recovery" (Murakami 2005:112). *Astro Boy*

reflects Japan still pondering its defeat in the war as they also placed their faith in nuclear energy. Anime and manga series evolved to represent this strange dichotomy. Narratives portrayed never-ending loops of main characters that defied death as they were continuously reborn. Planetary bombs, space colonies falling to earth, and exploding white light followed by red were common story elements, while many narratives began in the catastrophic aftermath of an atomic explosion. Children's television shows such as Hondo's *Ultraman* series laid the groundwork for what became standard in the next twenty or thirty years with themes deemphasizing the fight of "good" versus "evil," and questioning the meaning of battle while exploring the meaning of life.

In contrast, the U.S. reboots elided Gojira's wartime origins, instead favoring an American audience's apathy towards its own influence on nuclear history. According to director Edwards, Legendary's *Godzilla* cites a more "genuine problem" of a "nuclear Pandora box," where society benefits from nuclear power but the possibilities of it going wrong are great. As he mentions, "the 'what if?' of this film is 'what if creatures existed that needed to feed on this stuff', so having it became a really bad thing rather than a good thing" (as quoted by Hoare 2016). Understood in this way, the theme of the film fits squarely in line with Hollywood disaster movies since the 1970s where the narrative and the protagonist's struggle is to expose man's arrogance to nature while struggling to survive its consequences. As director Edwards stated, "The question we tried to raise the most in the movie is: We try to control nature, we try to abuse it for our own benefit. Often it's impossible that we could fully control it and something always goes wrong and actually it's nature that controls us" (as quoted by Sneed 2014). Or from a choice piece of dialogue

from the Japanese scientist Dr. Ishiro Serizawa (Ken Watanabe), “the arrogance of man is thinking nature is in our control and not the other way around."

The 1970s cultural anxieties of a nuclear holocaust, Cold War tensions, loss of American dominance in the global economy, and the loss of faith in the U.S. government transitioned into fears of nuclear weapons falling into the "wrong" hands. A familiar trope repeated in Hollywood action cinema in the 1980s and after was the singular wayward nuclear device, complete with bleeping and blinking numerical countdown device, ticking its way to exhaustion. At the same time, these nuclear devices were potential tools to be used by the hero protagonist against threatening objects. Even in *Armageddon* (Michael Bay, 1998), the only way to save the earth from a mass level extinction is to detonate nukes within the belly of the incoming monster, or in this case, an asteroid the size of Texas. According to Mary Ann Doane (2005), "catastrophe signals the failure of the escalating technological desire to control nature" (257). Filmic representations present moments of challenge in the faith commonly held in science and technology from nuclear power to genetic engineering. It is not about blaming individuals or humanity for technological problems, but showing how technological limits and insufficiency always leaves room for fixes, guaranteed solutions, or more sufficient warning systems. These challenges, long represented in the imagination of disaster, are the same mythological sleight of hand taken up as comforting selling points in technological fantasies, including those marketing geospatial technologies as life-saving technologies.

Godzilla's negation of nation-specific politics transformed into the film's more convoluted plot involving an operation of transporting a single nuclear warhead from the overflowing U.S. arsenal to a specified location to detonate and destroy the MUTO. It is the

Japanese scientist (Ken Watanabe) who pleads against the nuclear option because it puts innumerable lives at risk, and saying it has been tried before. The climax then falters into the destruction of San Francisco, as three monsters, Godzilla and two MUTO, duke it out while the ticking timer on the nuclear bomb requires interceptive disabling. The hero, a the military soldier, family man, and the son of the scientist and conspiracy activist Brody, manages to detonate the bomb a few miles off of San Francisco Bay. Despite the warhead being described as "megaton" in size, the next morning, city residents are shown rummaging through the wreckage without any nuclear fallout in sight. The last minute, happy ending spoils a teachable moment on the dangers of nuclear power and downgrades its destructive power.

A similar effacing of nuclear consequences took place at the end of the Americanized version of the original *Gojira*. The final scene's setting takes place on a boat of survivors who bear witness to the beast's destruction by a weapon called an oxygen destroyer. Shown underwater in scuba gear is Dr. Daisuke Serizawa, who valiantly sacrifices himself with the weapon he created. On board the boat are his fiancé, Emiko, who during the narrative fell in love with a young naval officer (Hideto Ogata), also shown, and Dr. Yamane, Emiko's father. Dr. Yamane is given the last words in the original, while in the U.S. version, the newly invented character, the reporter Steve Martin (Raymond Burr), is shown aboard the ship and it is his narration which concludes the film. The dissimilarity between the two ending dialogues is staggering. Steve Martin declares victory in a subdued telecaster style, globalizing the celebration: "People of the world, Godzilla is dead. Give us strength to rebuild our beloved lands." Serisawa's sacrifice is acknowledged after, "The menace was gone, so was a great man, but the whole world could wake up and live again." The dialogue

provides the narrative closure or happy ending expected of escapist 1950s U.S. science fiction disaster films. In contrast, the original leaves the witnessed victory over the monster more ambiguous. Instead of cutting over to Burr, the camera sits on a medium close up of a grief stricken Dr. Yamane, who finds no cause for celebration: "I can't believe Godzilla was the only surviving member of its species. But, if we keep on conducting nuclear tests, it's possible that another Godzilla might appear somewhere in the world again." This warning instead is extended to the audience, producing the critique Director Hondo intended and undoubtedly, the marketable possibility for Gojira sequels.

Escapism, or the last minute happy endings in the Godzilla franchise reaffirm the possibility that technological fixes can solve the ongoing problems of contemporary society. The shortcomings of technologies such as nuclear power are presented as part of the problem, but it provides an opening for what Geoff King calls frontier-style heroics at an individual-level (2000, 155). In the original *Gojira*, Dr. Serizawa sacrificed himself with his own weapon of mass destruction. In the 2014 reboot, Brody's altruistic son risked his life to detonate the nuclear bomb "safely" away from shore. The films play on audience anxieties while offering a personal brand of DIY reassurance. As expressed in the previous chapter, the media's coverage of Fukushima increased global awareness of the effects of radiation on human health and the tenuous nature of the nuclear facilities that western societies depend on for energy. However, faith remains in policy reform, the ability to mend human causing errors, and in newer technologies to improve safety, give quicker warning signs, and raise risk awareness. The nuclear weapon detonated at the end of the 2014 *Godzilla* was personally handled by the likable and unassuming hero, and the next sun-filled morning, the thought of nuclear fallout is erased. Likewise, Fukushima's erosion of

the historically assumed boundaries between the natural, the social, and the technological was temporary.

Despite its shortcomings, the new *Godzilla* hints at an evolving imagination of nuclear disaster which infuses nuclear energy and nuclear weapons into complementary threats. In the summer of 2011, during a lecture to young diplomats at the Peace Memorial Museum in Hiroshima, Hiroshima atomic bomb survivor, Keijiro Matsushima, called Fukushima the "third atomic bombing" of Japan: "When I heard the news of the accident at the nuclear power plant in Fukushima, I was stunned. It seemed as though the Japanese people were experiencing the third atomic bombing, after Hiroshima and Nagasaki" (Tashiro 2011). In Japan, the linkage between the two events was unavoidable. It prompted several nuclear bomb survivors who were lifelong advocates calling for the elimination of nuclear weapons, to no longer remain silent on Japan's nuclear energy policies.

Similar advocacy is recycled by the commercial sphere with newer technologies promising the public safe, cleaner energy, as nuclear energy continues to be seen as the only viable option to combat climate change, and mobile applications offering ways to manage risk on the personal level. Geospatial technologies are marketed as being one such means to avert risk and promote safety, especially when in the empowered hands of citizens who live in a world of mobile technologies and crowdsourced, open data. Spatial media and spatial content is also imbued with the power to shape an individual and society's view of the world, and in this case, the disaster imaginary. The visually mapped and interactive narratives coalesce and inflect the myths, symbols, and resources through which a society's common culture is created and appropriated. Memes that mapped the crawling nuclear plume mashed together with an image of Godzilla reflect this mixed media

convergence of symbols and cultural misunderstandings. Likewise, the narratives produced by Japan's tourism campaigns and filtered through Google's mapping applications drew heavily on geographically based myths and cultural values presumed to define the place impacted in order to neutralize shock imagery and reaffirm the broader symbolic value of the nation to a global audience.

As Douglas Kellner (2009) argued, "the media are key instruments of political power, constituting a terrain upon which political battles are fought and providing instruments for political manipulation and domination" (94). These political battles foreground the individual agents within the larger media structure because such interactions constantly challenge notions of a monolithic industry that in turn has to adapt to suit user-consumer needs (Holt and Perren 2009, 8). Despite the hype of participatory culture to network, promote data production and geoliteracy, and hasten vital warning times, information and geospatial communication technologies remain a sphere to confirm dominant world views, continue media imaginaries, and disrupt or occlude space and its relations. Maps depict space, but also depict places already constructed through mediated myths and understandings forged over decades, and arguably centuries of media culture. Spatial media is one node among many that frame and structure spatial imaginaries and influence spatial trajectories while playing an integral role in disaster response and recovery, and in for profit ventures.

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