Vertical Mediation: Geospatial Imagery and the US Wars in Afghanistan and Iraq

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Immediately before and after the 9/11 attacks the United States' National Reconnaissance Office (NRO) launched three new satellites from California's Vandenberg Air Force base, planned long before 9/11, sending up a Lacrosse radar imaging satellite on August 17, 2001, a signal detection satellite on September 9, and a K-11 satellite known as USA-116 on October 5 (Yugoslavia . . . 2006). In addition, two new commercial remote sensing satellites—Ikonos owned by SpaceImaging, which later became GeoEye, and QuickBird owned by Digital Globe—were launched in 1999 and 2001 respectively. These state and commercial satellite projects, planned long before the 9/11 attacks, have been key elements of US global reconnaissance in the context of the war on terror. To support the US invasion of Iraq in March 2003, the NRO reportedly had six spy satellites flying over the country each hour (Yugoslavia . . . 2006). Between 2001 and 2013, the NRO launched an estimated 24 more satellites into orbit, with several more waiting in the wings, and US private remote sensing companies have launched at least 6 more earth imaging satellites.

While aerial reconnaissance long precedes the historical conjuncture of the war on terror and the age of the satellite, extending back centuries, as Caren Kaplan shows in her crucial work on the history of ballooning (2013), to include more recent events like the Cuban Missile Crisis of 1962, the use of vertical vantage points has arguably intensified over the past decade as geospatial images have been mobilized to fight a war imagined as global and perpetual—an "everywhere war," as Derek Gregory (2011) has called it, and a "forever war" as Dexter Filkins (2009) describes it. The contemporary use of geospatial images by US state and corporate entities is part of a broader aero-orbital assemblage that also includes the power to commandeer the airwaves, to regulate activity in and out of the air through airport security, and to use unmanned aerial vehicles or "drones" to monitor, target, and

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destroy sites and people on the earth's surface. Such aero-orbital maneuvers are interwoven with what Eyal Weizman (2002) calls "the politics of verticality," which involves, among other things, the assertion of control over the airspace above a territory as part of an effort to regulate and control what happens on the ground beneath it. Though Weizman's concept emerges from a detailed analysis of Israel's attempts to "control the air" over Palestine, similar strategies have informed US practices of targeted killing and broader struggles for aero-orbital domination since 9/11 (Hajjar 2013).

What further distinguishes the current historical conjuncture is the shifting institutional terrain of aerial and satellite imagery. During the past decade, the restructuring of government agencies, the emergence of new remote sensing companies, and the proliferation of digital technologies combined have increased consumer access to high-resolution aerial and satellite images. Now referred to as the *geospatial industry*, this sector includes a host of federal agencies and private firms that participate, often collaboratively, in the production, distribution and interpretation of aerial and satellite imagery. Historically, strategic US aerial and satellite reconnaissance and image intelligence activities occurred under the federal umbrella of the National Reconnaissance Office and the National Imagery and Mapping Agency (NIMA). In 2003 a federal bill authorized NIMA to change its name to the National Geospatial-Intelligence Agency (NGA). The NGA, whose motto is "Know the Earth . . . Show the Way . . . . Understand the World," employs 16,000 people and most of whom work in one of the largest federal buildings in Washington DC (Office of the NGA Historian 2011). In 2013 the NRO's annual budget was $10.3 billion while the NGA's was $4.9 billion (Andrews and Lindeman 2013). Combined, the two budgets exceed that of the Central Intelligence Agency's. Alongside these federal agencies, two privately owned remote sensing satellite operators, Digital Globe and GeoEye, which initially surfaced during the 1990s and merged in 2012, have become major players in the geospatial sector, selling high-resolution satellite imagery on the international market and enjoying a steady flow of major US government contracts. In 2012 Digital Globe's revenue was $421.4 million, up 24 % from 2011 (Digital Globe 2013). And in 2011 GeoEye's brought in $356.4 million, an 8 % increase from 2010 (GeoEye 12 Mar 2012). Most of their revenue comes from US government contracts. In 2010 both companies were awarded 10-year contracts from the NGA to develop the "Enhanced View" program, which amounts to a combined total of $7.35 billion if all options are exercised (Hubler 10 Aug 2010). Finally, information giant, Google, whose revenue hit a record $50 billion in 2012, began emerging as another key player in the geospatial sector when the company purchased the digital mapping company, Keyhole, Inc. in 2004 (Google 2013). Keyhole's 3-D interactive mapping interface became the basis for Google Earth, which by 2011 had more than one billion downloads (Shaer 6 Oct 2011). Keyhole had been backed by the CIA private venture firm Intel-Q and was named after the Keyhole reconnaissance satellite program.

The government restructuring of aerial and satellite reconnaissance, the growth of private remote sensing, and the increasing availability and use of geospatial images via Google Earth form the backdrop of issues to be explored in this chapter. The

close collaboration of federal agencies such as the NRO and NGA with private firms such as Digital Globe, GeoEye, and Google Earth interventions makes it increasingly challenging to differentiate state, military and civilian activities in relation to geospatial images and the actions that they are used to mobilize and rationalize. Private companies such as Digital Globe and Google wield a growing amount of political and economic clout as their products support the US Defense Department in various strategic initiatives and worlding maneuvers. Though these private firms are not typically thought of as media companies, they have become integral to what James Der Derian (2001) calls the military-industrial-media-entertainment network. Extending Der Derian's work, Caren Kaplan traces the military histories of satellite-based geolocation systems such as GPS and GIS, and argues that systems designed to support "surgical strikes" in the Persian Gulf War have become part of broader consumer culture that now transposes subjects with targets and "habituates citizen/consumers to a continual state of war understood as virtual engagement" (2006, 705).

Building on this work, this chapter explores how geospatial images have functioned as part of militarized media culture in the midst of the US wars in Afghanistan and Iraq and considers what is at stake when major state decisions such as whether, where, and how to fight war pivot around the capacity to detect and display light and heat patterns on the earth's surface. Geospatial images are not benign abstractions; they are used to catalyze geopolitical agendas, rationalize military interventions, and develop postwar futures. As the co-editors of *Observant States* suggest, in these images "the logic of geopolitical reason is . . . inseparable from its visual representation" (MacDonald et al. 2010, 7–8). At the same time, however, as Laura Kurgan (2013) and others have suggested, the unique vantage point of the overhead view might enable ways of thinking about earthly matters from oblique political angles. To explore these issues further, this chapter examines a series of geospatial images as vertical mediations of the US wars in Afghanistan and Iraq. By *mediation* I am referring not only to the technical process of transforming material phenomena into framed images, but also to a multitude of imprints, traces, or residues left in the air, on the ground, or in the water by acts of war. As Kember and Zylinska explain, mediation is more than representation; it "can be seen as another term for 'life'—for being-in and emerging-with the world" (2012, 23). Approaching the geospatial image as a *vertical mediation* involves exploring the stretch of space between the earth's surface and aero-orbital platforms as part of vital processes, life worlds, and ways of life. It involves explicating the kinds of capacities and forces the geospatial image is used to demonstrate, enact, or mobilize, while remaining attentive to its limits and constraints and the unpredictable reversals of power it may be implicated within as well. In short, it involves treating the geospatial image not as a static frame of image data, but as part of biopolitical processes, as part of processes of "... becoming, of bringing-forth and creation" (Kember and Zylinska 2012, 22).

In an effort to approach geospatial images in such a way, the chapter opens by describing what I refer to as the "microphysics of geospatial imagery"—the technical and power-laden processes by which electromagnetic radiation traveling

through the atmosphere becomes geospatial imagery. Then, placing these technical processes in a particular historical context, I explore how US commercial or declassified geospatial images have been used to expose "enemy hideouts," spotlight alleged weapons of mass destruction, pinpoint bombed infrastructure sites, prospect for natural resources, and monitor reconstruction projects. In the process, I argue that geospatial images have been used not only to *represent* or *reveal* conditions on earth, but also to stage, enact, and bring about material transformations on the earth's surface, and I close with a discussion of the vertical remediation of Afghanistan and Iraq—the process of transforming the territories of sovereign nation-states into geospatial data that becomes the intellectual property of the US government or corporations so that it can be stored, shared, acted upon, or traded in the global digital economy and used in postwar reconstruction initiatives.

The Microphysics of Geospatial Imagery

Though aerial and satellite images involve different technologies, organizations, and companies, when they circulate in media culture they are often used interchangeably and without source information, which impedes the production of public literacies around their use. US State or Defense Department officials who release these images as declassified intelligence usually offer little, if any, detail about the satellite, aircraft or sensing instruments that acquired the image-data. Captions or taglines in the press often reiterate officials' statements or press releases and provide little information about the provenance of the image and sometimes exclude the date of its acquisition. Furthermore, it is challenging for most viewers to distinguish a satellite image from an aerial image since both look down on the earth's surface from slightly oblique angles and rely on similar sensing instruments and imaging software. Compounding this confusion is the fact that government agencies, military units, the press, and private companies refer to aerial and satellite images in different ways. When the US State or Defense Department uses aerial or satellite images they are called *reconnaissance* images, and historically have also been referred to as PHOTOINT, IMAGEINT and, more recently, GEOINT. When geographers or earth scientists use these images they are *remote sensing* or *geospatial images*. Those who want to convey that a satellite or an aircraft acquired the image-data might refer to them as a *satellite image* or an *aerial image*, or, more vaguely, as *overhead images*. The integration of aerial and satellite imaging, interactive mapping software, graphic design, and computer networking within the NGA and Google Earth has resulted in a shift away from platform-specific terminology (satellite reconnaissance) and toward the more integrative concept of *geospatial imagery or intelligence* or GEOINT. The discussions in this chapter are largely focused on declassified or commercial satellite images released or used by US officials and agencies, but I have decided to refer to them generally as *geospatial images*. How are such images generated?

Contemporary remote sensing satellites are equipped with instruments that can "sense" visible light and other frequencies of electromagnetic radiation reflected off

of or emanating from objects or surfaces on Earth. As Jody Berland (2009) suggests, remote sensing augments human perception by making phenomena visible that would not otherwise be perceived. A geospatial image in the visible light register reveals surfaces and objects on the ground as well as the sunlight or artificial light reflecting off of them, which is what makes them visible. A geospatial image in the infrared register shows surfaces and objects on the ground as well as the infrared or thermal radiation they emanate. Infrared radiation has longer wavelengths than visible light and is imperceptible to the naked eye. Infrared geospatial images can show the relative temperature of objects and surfaces on or below the ground and are also used to increase in-the-dark visibility because they reveal the contours of surfaces and objects based on their thermal radiation rather than their reflection of visible light. As a result, infrared images are often used to track and target heat-bearing objects such as energy plants, communication transmitters, moving vehicles, weapons, or bodies.

As remote sensing and spy satellites move through low earth orbits, they pass over and scan particular areas of the earth's surface, turning those areas into swaths or scene footprints. Commercial satellites such as Ikonos, QuickBird, and KH-11 and KH-12 spy satellites, all used in the wars in Afghanistan and Iraq, carry multi-spectral sensors that detect radiation across various parts of the electromagnetic spectrum, from visible light to infrared to radio waves. Multi-spectral sensing is geared toward the production of efficient and information-rich geospatial imagery since data across multiple frequencies of the spectrum can be simultaneously collected during one satellite pass. For instance, multi-spectral sensors on QuickBird collect data in the blue, green, red, and near infrared bands, which can be used to generate images with resolutions ranging from 60 cm to 2.4 m (Wikipedia, Quickbird 2014b). Quickbird has a storage capacity of 128 Gb, which is equivalent to approximately 57 single area images. A single image represents an area of 18 by 18 km and Quickbird can revisit a site every 1–3.5 days. Quickbird's replacement satellites, WorldView-1 and 2, were financed in part by the National Geospatial Intelligence Agency and launched in 2007 and 2009 respectively. Worldview-1 can gather 750,000 km^2 of 0.5 m resolution imagery per day (Wikipedia, Worldview-1 2013). Another commercial satellite, GeoEye-1, funded by the NGA and Google, was launched in 2008 and can acquire images with 16 in. ground resolution (Wikipedia, GeoEye-1 2014a). The NRO increasingly relies on commercial geospatial images because they are not subject to the same classification rules as NRO-operated satellites and thus can be shared more readily with allies (Wesigerber 23 oct 2013).

Once a satellite gathers data, it is temporarily stored, encrypted and transmitted back to earth where it is archived in databases. To generate a satellite image, a user must extract data from the database and calibrate it using radiance and geolocation software so that it can be rendered as a grid or raster made up of pixels. For each pixel in the image there are multiple channels of information that can be activated, depending on how many frequencies of the spectrum data was collected in. These channels or registers can be turned on or off during image processing to support what the user seeks to convey or highlight in the image. These images can appear in black

and white or color and can be used comparatively or in a layered manner so that satellite or aerial images of the same site can be contrasted, analyzed or composited. When declassified geospatial images are publicly released and discussed by US officials they often appear in black and white and are inscribed with various graphics that are designed to guide interpretation.

The geospatial image is one of the most technologized kinds of images since its production is based on so many layers of machine automation—remote sensing, data encryption, signal transmission, data storage, and image processing. As a rendering of detected electromagnetic radiation, the geospatial image is a computational image: its view has been scanned by electronic sensors rather than seen through a looking glass. While it is somewhat in vogue in media studies to celebrate the machinic aspects of computational images (Kittler 1999, Kittler and Enns 2009; Ernst and Purikka 2012), there is a tendency to overlook the myriad forms of human labor that support their production. To think of the geospatial image as purely machinic or computational, I would argue, ignores its complex materialisms—the scattering of materials, labor, energy, affect, and discourse that undergirds its production, circulation and signification. Despite the computational status of the geospatial image, humans participate in the design and manufacture of satellites and sensing instruments and extract natural resources to make them. They monitor interfaces in earth stations to track these objects from afar and determine which parts of the earth they scan. They navigate software menus and make decisions in the process of rendering and interpreting image data. They use geospatial images to advance scientific arguments, make business speculations, and carry out military assaults. And humans and non-humans across the planet are profoundly impacted by such uses. Since the geospatial image is as reliant upon humans as it is upon machines it makes more sense to approach it as part of a techno-social formation, actor network, or human-machine assemblage than it does to posit it as an autonomous technical form. The geospatial image is made not only by remotely controlled aerial and orbital machines; it is arguably the product of janitors who ensured the clean room was "clean," communications specialists who track satellites, and mechanics who fueled rockets before take-off.

Part of a techno-social formation, the geospatial image is, like other images, imbricated within what Michel Foucault calls the "microphysics of power" (1995, 26)—the strategies, tactics, techniques and concrete functionings of power. The transformation of electromagnetic radiation into data, image, and discourse brings it within the realm of power and enables it to affect and become part of—to mediate, in a most vital way—human and non-human relations, territories, and actions on and beyond the earth. As Foucault insists, power can move "through progressively finer channels, gaining access to individuals themselves, to their bodies, their gestures and all their daily actions" (1980, 152). Like multi-spectral scanning, power is mobilized across multiple "bandwidths" and generates higher "resolutions." It sets out to make everything and everybody visible. Though the geospatial image can be understood as participating in the quest for what Foucault calls "power through transparency" (1980, 153) or "subjection by illumination," (1980, 154) its unique qualities–namely, its capacity to detect the presence of human *and non-human*

phenomena such as radiation, landscapes, vegetation, animals, and objects compels a recognition of its potential to activate imaginings of difference, estrangement, and Otherness.

The aesthetic qualities of geospatial imagery at once make us to strain to see the human in its abstraction and demand object-oriented modes of engagement as it always renders phenomena that are non-human. To embolden the analysis of power and geospatial imagery, we might turn to recent formulations by Jane Bennett and Graham Harman, who develop critical theories and philosophies to account for the presence and dynamism of non-human entities, objects, and matter. Bennett sets out "to highlight what is typically cast in the shadow: the material agency or effectivity of nonhuman or not-quite-human things" (2010, ix). In the process of elaborating a theory of "vibrant matter," she argues, "the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption. It does so by preventing us from detecting (seeing, hearing, smelling, tasting, feeling) a fuller range of nonhuman powers circulating around and within human bodies. These material powers, which can aid or destroy, enrich or disable, ennoble or degrade us, in any case call for our attentiveness or even 'respect' . . . ." (2010, ix). Significantly, she asks, "How would political responses to public problems change were we to take seriously the vitality of (nonhuman) bodies? By 'vitality' I mean the capacity of things—edibles, commodities, storms, metals—not only to impede or block the will and designs of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own" (2010, viii).

Relatedly, Graham Harman insists we must account for objects "that are neither physical nor even real," explaining, "Along with diamonds, rope, and neutrons, objects may include armies, monsters, square circles, and leagues of real and fictitious nations. All such objects must be accounted for by ontology, not merely denounced or reduced to despicable nullities" (2011, 5). For Harman "Objects are units that both display and conceal a multitude of traits" (2011, 7). Emphasizing the idea that the ontology of objects exceeds the visible he sets out to describe "how objects relate to their own visible and invisible qualities, to each other, and to our own minds—all in a single metaphysics" (2011, 7). Beyond this, Harman embraces the complexity of objects and suggests they have realities that are distinct from human subjects or consciousness. He writes, "Objects need not be natural, simple, or indestructible. Instead, objects will be defined only by their autonomous reality. They must be autonomous in two separate directions: emerging as something over and above their pieces, while also partly withholding themselves from relations with other entities" (2011, 18). Ultimately, Harman offers a philosophy that refuses reductionism, and insists "... the world in itself is made of realities withdrawing from all conscious access" (2011, 38).

Taking the ideas of Bennett and Graham into consideration would entail not only treating satellites and their images as vibrant matter or complex objects, but also recognizing that objects have visible and invisible qualities, the capacity to become something beyond themselves, and to have relations to other objects. Satellite images, for instance, always mediate a multitude of objects, non-human

bodies, vital things—trees, buildings, vehicles, lands, plants, rock, snow, insects, minerals, roads, etc. Such objects are often latent or dormant in the visual field, perceptible but unintelligible, present but not seen, locatable but without a position in a story or discourse. We might call this the *surplus matter of geospatial imagery*—the earthly stuff that is detected by sensors and turned into imagery yet appears as background or peripheral and hence is not immediately registered as significant or of interest. The geospatial image becomes part of the microphysics of power not only by mediating sites and objects of interest but also by *overlooking* myriad other material forms—both in the sense of passing over and in the sense of abstracting and minimizing their presence and/or significance. The geospatial image's broad inventory of surplus objects and phenomena beckons the viewer to recognize the complex materialisms that constitute this view. Building on the ideas of Harman and Bennett, I want to explore how the surplus matter of the geospatial image might complicate, destabilize, or obstruct its strategic/militaristic deployment. Put another way, lurking within every geospatial image's registry of spectral radiation is a story to be plumbed about vibrant matter.

To summarize, then, on the one hand, I am critiquing the Berlin school of media's investment in the non-human and non-discursive aspect of machines, leading to an erasure or suppression of human labor, energy, and affect and a fixation on internal function, design, and specification—or diagrammatic operations—and, on the other hand, I am embracing elements of object-oriented ontologies in an attempt to develop a critical analysis of wartime uses of geospatial imagery that recognizes the presence, traits, qualities and potentials of a broader repertoire of human and non-human actors, organic and inorganic materials, visible and invisible things. To explicate this mode of analysis we might consider how strategic US uses of geospatial images can be complicated by the traits of objects included in or inferred by the views. For instance, in the weeks after 9/11, US news media circulated several Digital Globe satellite images allegedly revealing "enemy hideouts" in the Darunta Lake region of Afghanistan (Globalsecurity.org 2011b). These images use squares and arrows to identify particular sites as potential targets, while flattening the stature of the mountains nearby. As geological objects with massive scale, solidity and vertical depth, these mountains are challenging to navigate on the ground or from the air, and there have been countless stories about US troops' inability to physically maneuver through such treacherous terrain in Afghanistan, which became a rationale for drone warfare. Excavating and raising questions about the surplus matter in such images–in this case, the mountains–can complicate the ways in which graphics are used to overdetermine geospatial images as targets, and bring Other matter, whether visible or inferred, to the surface. Approaching the geospatial image in such a way not only acknowledges the potential of the mountains to obstruct a strategy of precision targeting, but also brings other objects and matter into the discussion of war and vertical mediation.

To delineate another example of this mode of analysis, we can turn to geospatial images of bombed communication infrastructure sites in Afghanistan and Iraq. Declassified images released by the US Defense Department not only show before

and after scenes of targeted sites, but also infer the presence of invisible frequencies of the electromagnetic spectrum, which carry military and civilian communication through vertical domains (Richelson 2003; Globalsecurity.org 2011a). Like mountains, such frequencies can be used to thwart US military assaults, hence the forceful annihilation of transmission facilities as evidenced in these views. The US attacks on communication facilities may have disrupted access to and use of the airwaves by Iraqi and Taliban military units from these sites, but they did not destroy the spectrum itself. In an era in which the US military audaciously claims to have the power to see, know, and destroy everything, it is worth adopting a diffractive position in relation to such geospatial images, and using them (perhaps paradoxically) to acknowledge that some things cannot simply be seen and destroyed.

In making this point, I do not mean at all to diminish the horrific and systematic military violence that US troops have perpetrated on people and things in Afghanistan and Iraq during the past decade. Rather, I am seeking to formulate a posthumanist critique of geospatial images that acknowledges the humans and non-humans that are constitutive of and connected to these views and their uses and to highlight the wide array of organic and inorganic objects, materialities, or phenomena that are part of any war theater and thus are potentially impacted by geospatial imaging and aerial assaults. Even though the US has been able to visualize and attack sites throughout Afghanistan and Iraq from above, insurgents in both countries have used ground tactics to challenge US vertical hegemony, reinforcing the reality that it technologized power is not total. Developing critical dispositions and literacies in relation to geospatial images seems all the more urgent given their ongoing use in military campaigns, their integration within everyday media culture, and the billions of US taxpayer dollars spent on generating them. And while I want to explore different ways of critically engaging with geospatial images, I also want to consider how the commercialization of geospatial imaging and its integration within media culture is articulated with broader hegemonic efforts to reorder and remediate life in Afghanistan and Iraq.

Remediating Afghanistan and Iraq

Google Earth emerged in 2005 as a digital platform offering unfettered access to geospatial views of the planet to anyone with Internet access and a computer. In a matter of years, Afghanistan and Iraq went from being strictly regulated visual domains to ones open for anyone in the world to see as Google Earth circulated geospatial images of these war torn countries as part of a new form of commercial media culture. As geospatial images have become more widely available through the Internet, strategic practices historically associated with intelligence agencies such as the NRO and NGA have been normalized as part of everyday civilian life, creating a culture of open-source GEOINT on demand. In this sense, Google Earth not only serves as another media site for circulating geospatial imagery; it

is also a material enactment and manifestation of a set of technological, economic, and political relations between federal intelligence agencies and the commercial geospatial sector. Though its composited interface is made of geospatial image data gathered and licensed by satellite and aircraft operators around the world, its digital architecture—that is, the capacity to arrange and display the world in this way—is the intellectual property of Google and the result of a history of coordinated federal and corporate financial, technological, and political transactions.

The Google Earth interface turns this model of GEOINT on demand into a privatized consumer media experience that is accessible as a download on computers and smart phones. The interface is made of composited, publicly and privately sourced aerial and satellite imagery that is periodically updated. Datasets turned into graphic displays known as "layers" can be formatted as kmz or kml files and dropped into Google Earth so they can be superimposed on the geospatial interface. Not only is geospatial imagery in Google Earth highly processed and composited, it is covered up with icons, shading, and text as layers are activated. This results in a version of geospatial imagery that is so heavily inscribed with graphics that the initial image data recedes and becomes little more than a background for the inscription of iconography, reducing the potential for geospatial literacy.

For instance, when the Digital Globe layer is activated, color-coded square lines and DG brand icons appear in the visual field. The color-coded square lines, called "scene footprints," function as traces of a satellite's pass over a specific part of the earth. When composited, they form a historical record of satellite image data acquisitions during a certain time period, as well as reveal a slice of Digital Globe's inventory. The Google Earth interfaces of Afghanistan and Iraq provide Digital Globe satellite coverage from 2002 to 2010. Clicking on a DG icon opens a frame with data about the image including the acquisition date, cloud cover, and an environmental quality rating. If the user clicks on "preview," she enters a meta-browser featuring the single satellite image captioned with information about how to purchase it or others from Digital Globe.

The US exercised "shutter control" to restrict access to satellite imagery of Afghanistan for 3 months in 2001, but after 2005 allowed Google, Digital Globe and GeoEye (previously, Space Imaging) to conduct an international business that turned the territories of Afghanistan and Iraq (as well as those of other countries) into digital real estate—intellectual property produced, owned and distributed by US corporations. Just as the leveling of communication infrastructure provided opportunities for US contractors to restructure and rebuild Afghan and Iraqi broadcast and telecom systems, Google Earth's vertical mediation of Afghanistan and Iraq is designed to boost the business potentials and profits of US companies as the geospatial image has been used both to stage the eradication of Taliban and Hussein systems and as a platform upon which to imagine, design and map new ones. In this way, the geospatial image is implicated in the material restructuring and remediation of nation-states. As described in the examples below, aero-orbital platforms are not only technologies of observation, but of inscription.

Mediascaping

Google Earth has been used, for instance, to map Iraq's newly privatized media sector. A layer called "Iraq Media Mapping" released by the Open Source Center visualizes a plethora of new commercial television and radio networks that sprouted up in Iraq after the fall of Saddam Hussein's regime and during the US occupation. The layer specifies the names of TV and radio stations, the locations of their headquarters and transmitters, and potential audience size, and uses color-coded shading to indicate the stations' coverage zones. While the layer provides a useful overview of the media industry within Iraq, many of the key stakeholders of Iraq's media system exist beyond the country's borders. Several of the new Iraqi TV networks, for instance, were developed through US Defense Department contracts or are owned by wealthy Iraqis in exile. Al Iraqiya, for instance, an Iraqi news and entertainment TV network, was founded as Iraqi Media Network in 2003 and developed by US defense contractor Science Applications International Corporation for an initial no-bid contract of $82.3 million, which was supplemented by hundreds of millions of dollars (Goldstein 2008; Auster 2004). Another TV network, Al Sharqiya, was launched in 2004 and is owned by Iraqi media tycoon Saad Al-Bazzaz who lives between London and Dubai (Arango 28 April 2013). And TV channel, Al Baghdadiya, which emerged in 2005, is owned by Cairo-based Iraqi businessman, Awn Al Khashlouk. This "free" Google Earth interface articulates the re-mediation of Iraq through multiple layers of media privatization, using privately owned satellite imagery accessible through a privately owned web-platform to map largely privatized use of Iraqi airwaves. In this digital world, Iraqis who live in Iraq have minimal ownership or control over their airwaves, geospatial views of their territory, or their lands (Fig. 10.1).

Resource Speculation

In addition to mapping the restructuring of Iraq's broadcast sector, US geospatial imagery has also been to identify and develop other forms of material value and exchange in and around sites that have been bombed or destroyed. The US Geological Survey has used Digital Globe satellite images and geographic information systems more powerful than Google Earth such as ArcGIS to scout natural resources in Afghanistan and Iraq and share this information with interested parties and investors (USGS undated-b; USGS undated-c). Geospatial images have been used to pinpoint Afghanistan's coal, oil and natural gas, mineral, and hydrologic assets (Chirico 2006), and function as treasure maps or invitations for foreign corporate development and extraction. As the USGS explains, geospatial data sets are "vital to short-term and long-range planning regarding management of these resources, as well as for identifying potential new resources that may attract foreign investment and create employment opportunities for Afghans" (USGS undated-c). The organization even offers geospatial "information packages" as

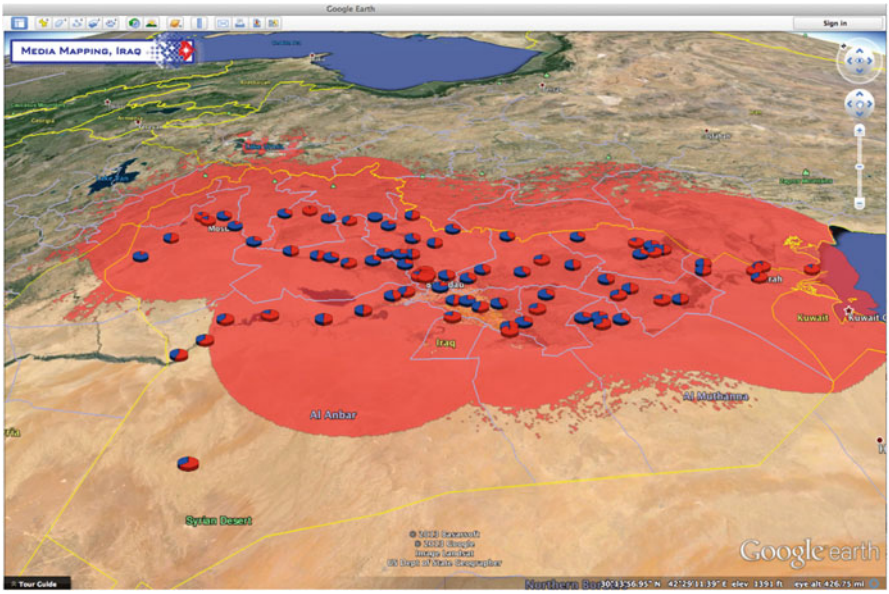

Fig. 10.1 The media mapping Iraq layer in Google Earth demonstrates the mediascaping of Iraq after the 2003 war (Source of layer: Open Source Data Center)

well as an interactive "Afghanistan Oil and Natural Gas Viewer" for potential energy developers, using geospatial images to encourage the tapping of Afghani resources underground (USGS undated-a). Here the geospatial image becomes part of extractive geo-economic strategies that resemble colonial-era practices. What differs, however is the way in which the widespread availability of such images through the web and Google Earth has the effect of normalizing these views as ethical.

Monitoring Reconstruction

At the same time that geospatial systems are being used for mediascaping and resource prospecting, organizations such as USAID have adopted Google Earth to track and verify the flow of reconstruction funding, which is sometimes parachuted into remote regions. Given the corrupt handling of US reconstruction funds in Afghanistan (billions is siphoned out of Afghanistan each year), Mercy Corps to send Afghanis to contentious or remote regions with GPS cameras to photograph people performing work leading to the fulfillment of US contracts. The photos are uploaded into a "Google Earth-style program" so that Mercy Corps "can track projects and their participants" (Hodge 2010). The system, reportedly, allows Mercy Corps to "extend its reach" and work in areas where "it's too insecure to work, or too remote" (Hodge 2010). Here, Google Earth and geospatial imagery are used

to remotely monitor financial flows and reconstruction processes—to ensure that projects on the ground conform to externally developed plans and visions.

Predictive Analytics

Finally, geospatial images have been used to monitor insurgents' movements in Afghanistan and Iraq and formulate predictive analytics designed to mitigate improvised explosive device (IED) attacks. In 2009 the Open Source Data Center released a detailed report (including a Google Earth layer) about insurgent incidents that occurred in Afghanistan and the FATA region of Pakistan between 2004 and 2008, offering a "hot spot" analysis designed to "provide valuable information for those responsible for operations in the region" (Open Source Data Center 2009). The Google Earth layer enables users to view the data in different ways, according to incident density, deaths, wounded, kidnappings, and perpetrators. Using data from the National Counterterrorism Center's Worldwide Incidents Tracking System, the report mapped a total of 4,129 incidents and projected their locations onto a Landsat image. During the 4-year period, 64 % of the incidents were allegedly committed by the Taliban, 42 % were caused by IEDs, and 36 % were armed attacks. Like weather forecasters using geospatial imagery to predict the intensity of a storm, Open Source Data Center analysts assess past data to predict the location of future terrorist attacks coding high probability areas in sienna and low probability areas in yellow. As Mark Andrejevic suggests, the tendency of such projects "is to portray predictive analytics as a crystal ball whose view of the future becomes clearer with every new piece of data about the present—as if at the very point when we can capture the entirety of the present in a database, the future will simultaneously be pinned down" (2013, 32).

Such vertical mediations of Afghanistan and Iraq reinforce the temporal and spatial logics of the "forever war," or "everywhere war" by commandeering aero-orbital platforms and digital technologies, historically subsidized by US taxpayers, to turn the world's territories into privately owned and strategically mobilized digital intellectual property that can be used both to stage military assaults and remodel Others' territories. This re-mediation of Afghanistan and Iraq appropriates geospatial imagery to demonstrate and enact the privatization and globalization of mediascapes, the prospecting and speculation of natural resources, and the monitoring and policing of local communities (Fig. 10.2).

Conclusion

Given these enactments and inscriptions of power, the geospatial image can be understood as a signature site for studying vertical mediation and the war on terror. I have approached the geospatial image, on the one hand, as a site for a critical and diffractive object-oriented analysis designed to complicate strategic looking, and, on the other hand, as a site that makes hegemonic use of the vertical field

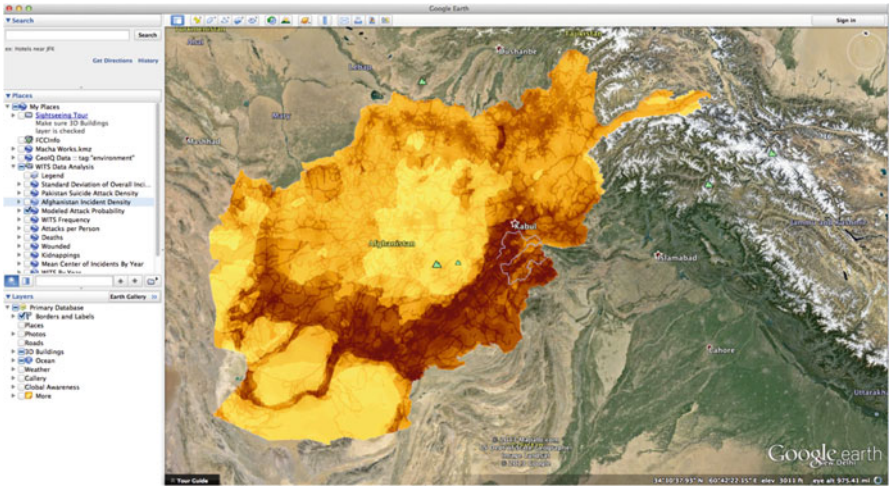

Fig. 10.2 This Google Earth layer predicts the likelihood of future terrorist attacks along the Afghanistan and Pakistan border coding high probability areas in sienna and low probability areas in *yellow* (Source of layer: Open Source Data Center)

intelligible and exposes efforts to remediate the landscapes and lifeworlds of untold and unnamed Others. Much more than remote views, theses vertical mediations are implicated in the material restructuring of life on earth. They are part of broader regimes of targeting, striking, and eradicating, which leave holes and eliminate people such that new governments, social orders, and built environments must be imagined, developed and put in place. At the same time, by detecting human and non-human, organic and inorganic, earthly and circumterrestrial objects and phenomena, geospatial images reveal that war always exceeds the frame, as Rey Chow (2006) and Judith Butler (2010) powerfully remind us, and is inscribed as traces, residues, layers, chemical compounds in the air, the earth's crust and water, as well as in the flesh and minds of bodies. Geospatial images help us to think about the ways war remediates life itself.

It is crucial that hegemonic uses of geospatial images and their institutional underbellies be excavated in the process of critically engaging with them. At the same time, the fact that state and military organizations use geospatial images strategically does not mean we have to inherit and idly adopt those ways of looking at and using them. In fact, one might argue that the increased circulation of geospatial images has created a crucial turning point in visual culture in which we have to struggle to maintain the right to interpret itself, especially given that so many geospatial images come into circulation as always already read—that is, with dense layerings of graphics, icons, and arrows inscribed in the view, which regulate acts of interpretation and sense-making. True GEOINT—geospatial intelligence—is not housed in the NRO or the NGA, but would involve fostering geospatial imaging literacies among citizens so they could engage with such images on different

terms and from multiple vantage points and begin to question and fracture the now normalized process of waging war and conducting foreign policy by sensing radiation emanating from the surface of the earth.

What I am ultimately suggesting is a need to further situate the geospatial image within critical dialogues on media and democracy and media conglomeration. The geospatial image is not only helping to shape perceptions and worldviews; it is also being used to re-model life on earth. Given the high stakes of geospatial imaging, it is vital that scholars from an array of disciplines interrogate the effects of its development and continuing use. For instance, to what extent are Iraqi or Afghani citizens able to access and use Google Earth's "free" platform to support their agendas and interests? What policies and regulations have been applied to Google Earth and Digital Globe as they turn the planet into a proprietary digital archive and platform? Why are there so few humanitarian geospatial projects (like Satellite Sentinel) and so many militaristic ones? While it might seem on the surface that the geospatial image lies beyond the purview of media and communication studies, I hope I have shown that it has a generative potential to extend research in new directions.

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