



Reuters photo RTXFVMO by Jorge Silva

A child navigates over Mexico City in a *Google Earth* search set up on many screens in Cancun, 5 December 2010.

BULLETS, BOMBS, AND ICE CREAM: THE UNINTENDED CONSEQUENCES OF *GOOGLE EARTH'S* NEW CARTOGRAPHIC WORLD – (OBSERVATIONS WITH RESPECT TO INSURGENT SURVEILLANCE TARGET ACQUISITION)

by **Nicholas Kaempffer**



DND photo AR2009-2043-13 by Master Corporal Jonathan Johansen

Kandahar airfield at night, 26 July 2009.

Introduction

My interest in *Google Earth* was first piqued after a friend of mine, Corporal Johann Reimer, had returned from a nine month tour at Kandahar Airfield, Afghanistan, in 2006. As the initial medic on the scene of a mass-casualty incident, he helped apply life-saving first aid to soldiers wounded by a rocket attack against one of the base's many mess halls. As all soldiers do, Johann found humour in the story of a wounded but happy comrade, saved by the ice cream he had bent to retrieve, which left his posterior to absorb several pieces of shrapnel otherwise aimed at his chest. The architect of the rocket strike, later killed by an American gunship, was begrudgingly admired for his skill in accurately targeting specific facilities on the base. Months later, I noticed several news outlets on the internet referring to

insurgent use of *Google Earth* to plot rocket firing solutions in Afghanistan and Iraq, and I couldn't help but think back to the tale of the life-saving ice cream. This short article will address the ever-unfolding and still-unfinished story of insurgent utilization of *Google Earth*, set within the history of cartography and empire, and the decentralization of geographic knowledge in the 21st Century. The first two chapters, *In the Interest of Empire*, and *Knowledge as Power*, will situate the reader within the history of mapping, security, and the state. From *Enter Google Earth* onwards to the final conclusion, a discussion on insurgent use of *Google Earth*, a powerful, satellite-based, global cartographic application, including case studies, will be undertaken. The intent here is to highlight how the technical innovation *Google Earth* is revolutionizing public access to geographic information, now that cartography is becoming a decentralized endeavour. This unprecedented access to specialized satellite material, once under the sole purview of the state, has generated unintended insurgent utilization by virtue of the transition from state to public ownership of geographic data. To properly contextualize this evolution, the initial link between the state security and cartographic knowledge must be discussed.

In the Interest of Empire

Maps and the military have a long and interwoven history, as conquest and empire have relied upon cartography for navigation, commerce, strategy, and tactics. The first 'Empire Maps' were produced by the Spanish and Portuguese in the 16th Century, and were known as the *Padreo Real*, and the *Padron Real*. These maps were highly coveted and jealously guarded by Boards of Trade, as cartographer and author David Turnbull noted: "Portugal and Spain were the first nations to attempt to construct spaces within which to regulate all geographical knowledge."¹ Akin to quelling a prison riot before it started, these states were attempting to 'lock down' cartographic knowledge, through *proactive*, not *reactive* action, leaving rival nations unaware and unable to compete for territory in the 'New World.'² By establishing trade boards that allowed for the maintenance of trade monopolies, the Spanish and the Portuguese were able to safeguard the physical security of their colonies, upon which hinged the economic security of the state. Thus, maps became highly coveted and jealously guarded by the state as they became both the 'blueprints' of colonialism, and instruments of warfare. However, the Portuguese and Spanish could not maintain their stranglehold on maps of the 'New World' forever, and, plagued by technical problems, the *Padreo Real* and the *Padron Real* fell into disuse and obscurity.³ Despite the inherent technical and financial difficulties of charting empire, the allure of cartographic knowledge meant that great efforts were made, specifically by the French via the Cassinis, to map the territory of the state.⁴ Thus, it is clear that since the advent of 'empire mapping,' the state has had a vested interest in limiting access to cartographic information in order to control knowledge vital for economic benefit and security. Chris Perkins, and

Martin Dodge, in their excellent essay entitled *Satellite Imagery and the Spectacle of Secret Places*, (rightfully, I maintain) contextualize Europe's history of state involvement in cartography, stating:

Large-scale national topographic surveys commissioned throughout Europe from the eighteenth and nineteenth centuries and extended to European colonies were established primarily to help military forces to maintain state control over territory. State mapping agencies almost all trace their origins to military needs and the cartographic specifications underlying most contemporary national 'framework' geospatial data-sets are derived from the needs of war fighting.⁵

The power of the map became of utmost importance, not only to the state that endeavoured to chart its empire, but to rival nations, who had a great amount to gain by acquiring the cartographic knowledge of their opponents. In this manner, wars for information started in earnest.



Peter Birch, *Google Earth* Product Manager, presents the future of *Google 3D Maps* at the company's offices in San Francisco, 6 June 2012.

Reuters photo RTR337HI by Handout

Knowledge as Power

From both a strategic and economic perspective, it is vital for states to map, not only their internal boundaries, but those of their neighbours. In an ever globalizing world, the scale of 'neighbour' has increased to encompass the planet, meaning that nations invest enormous efforts of capital and manpower to map the 'other.' Today's surveillance technology is a far cry from Lord Baden-Powell's mapping of enemy positions by hand⁶ – indeed, it is a world of satellites, spy planes, and clandestine operations. The Cold War and cartography were very much correlated in the rise of modern geographic survey technology, as states spared little expense to map enemy positions, routes, infrastructure, and activities. While this technology and cartographic knowledge was initially hidden from the public, brought out only occasionally for the needs of national security,⁷ the civilian world slowly gained access to cartographic knowledge once only held within the

purview of the state. As the commercial demand grew, the public began to utilize military cartographic technology for civil activities. The Global Positioning System, widely known by its acronym GPS, was initially developed by the government of the United States to fixate military movements on battlefield maps, and it is now available globally to the public.⁸ GPS is still owned by the US government, and it is considered a national resource, with every aspect of the service controlled by the state. In the event of a conflict, or situation where it deems necessary, the US government is able to either *reduce the accuracy of*, or *completely block out* civilian GPS receivers.⁹ This fact, in itself, has led to many nations and organizations, including China, Russia, and the European Union, to develop native systems to provide GPS capability. Moreover, it demonstrates the continued need for the state to strictly control *access to* and *use of* cartographic resources. This brings about the interesting question of what governments are to do when they can no longer control the creation and distribution of cartographic knowledge, specifically when said knowledge contains information vital to military interests.

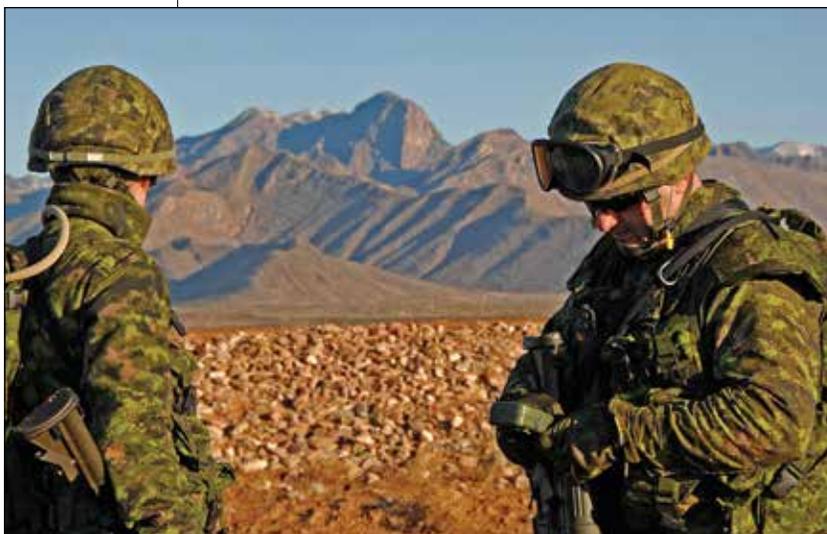
Enter Google Earth

Developed privately by Keyhole Inc., and purchased by *Google* in 2004, *Google Earth* is a virtual globe, map, and geographical program available for free, on the internet.¹⁰ Simply put, *Google Earth* gives users access to the world at their fingertips, and by utilizing satellite photos at an average resolution of 15m per pixel, almost any part of the planet can be ‘zoomed in’ upon, providing information on buildings, roads, topography, and so on. When combined with another *Google* product, known as ‘*Google Street View*,’ users are able to view a digital image of the street correlated to the location they are viewing on *Google Earth*.¹¹ Thus, *Google Earth* provides citizens free imagery and cartographic knowledge which was once under the sole purview of the state. Roger Stahl, in his essay, *Becoming Bombs: 3D Animated Satellite Imagery and the Weaponization of the Civic Eye*, discusses the impact and power of *Google Earth*:

Since its public unveiling in 2005, *Google Earth* has been unable to shed its martial aura. Because the view from the sky has so long been a lever of military power, the new “regimes of visibility” precipitated by *Google Earth* have become sites of contest both in terms of domestic national security and international geopolitics. To many in the West, its unveiling recalled Cold War rumours of spy satellites that could read a license plate from space and a hundred Hollywood scenes of five-star generals doing so from high-tech dungeons deep in the earth. As the fabled technology settled into everyday civilian life, it seemed to recruit a nation of desktop generals who scanned the contours of the globe with bombsight

eyes. Throngs of amateur *Google Earth* “spies” began the task of seeking out and testing the technology against the planet’s secret spaces, pooling their findings in online communities. Perhaps the most famous of these “finds” was an enormous Chinese military training area, a mock-up of a section of the Chinese-Indian mountain border, discovered by a Californian living in Germany. The intrigue of this discovery propelled the story around the world with the momentum of the newest espionage blockbuster.¹²

With the introduction of *Google Earth*, the general public is gaining access to cartographic knowledge once highly restricted and controlled, often with controversial results. The conflict between public the private rights, and state security in the age of *Google Earth* will be in focus for the remainder of this short article.



Canadian soldiers synchronizing their global positioning system with the Defence Advanced GPS Receiver (DAGR) satellite, 28 January 2007.

DND photo VL2007-1004-01 by Corporal Bruno Turcotte

Information Wars

When the state was the traditional bastion for cartographic knowledge, access to information could be highly regulated and controlled. In the case of war and conflict, the axiom of “what you don’t know, can’t hurt you” could not be further from the truth. Warfare *has always been*, and *will continue to be* driven by information, meaning, what you don’t know can *kill* you. Thus, the state took issues of surveillance and imagery seriously, both to safeguard secrets, and to preserve strategy. *Google Earth*, in essence, provides the general public the power of the ever-seeing satellite eye, removing state supremacy in the realm of geographically situated knowledge. The corporate interests of *Google* are directly challenging state secrets, and suddenly, governments are no longer ‘in the driver’s seat.’ Journalist Roger Stahl reported the laconic view of Lieutenant General Leonid Sazhin, an analyst for the Russian Federal Security Service, who claimed: “Terrorists don’t need to reconnoitre the target. Now an American company is working for them.”¹³ The institutionalized state control of geographic knowledge is under threat, as Harley states: “[O]fficial

VIEWS AND OPINIONS

map-making agencies, usually under the cloak of 'national security,' have been traditionally reticent about publishing details about what rules govern the information they exclude especially where this involves military installations or other politically sensitive sites.¹⁴ *Google Earth* has upset government hegemony over satellite imagery, and significant concern has been raised internationally over state secrets and security infrastructure shown within the plain sight of the public eye. Furthermore, *Google Earth* is being used by individuals and organizations in *active*, not *passive* methods, to challenge long-established state domination over space and military intelligence. The first case study that will be examined with be the use of *Google Earth* by Palestinian militants to strike targets within Israel.

Take 3rd World Ideology, Add 2nd World Weaponry, Plus 1st World Technology, Equals...

Within the tragic tale of the long-established Israeli-Palestinian conflict, it is clear that Israel has held the dominating position of military supremacy via technology and surveillance for several decades. This balance of power is slowly starting to shift, and one element in this ever-changing equation is the introduction and utilization of *Google Earth* by Palestinian militants to more accurately strike Israel with rockets.¹⁵ Striking distant targets with indirect fire (munitions fired beyond line-of-sight) is extremely difficult, as numerous variables are required to predict the necessary point of aim. Imagery from *Google Earth* allows the collection of distance, altitude, and target identification, allowing militants the ability to both fixate (figure out where they are) and orient (what way they need to point) rocket positions, to strike Israeli positions using firing tables. In layman's terms, *Google Earth* allows Palestinian militant groups, such as the al-Aqsa Martyrs Brigade, to more accurately strike specific locations within Israel, by giving them a better picture of real-world intelligence on the ground.¹⁶ This cartographic knowledge was once almost exclusively held by the Israelis, and *Google Earth* is, in essence, 'levelling the playing field' between the two combatants. Khaled Jaabari, a commander for the al-Aqsa Martyrs Brigade, stated: "We [al-Aqsa Martyrs Brigade] obtain the details from *Google Earth* and check them against our maps of the city centre and sensitive areas."¹⁷ Thus, *Google Earth* is narrowing the technical divide between two historically mismatched opponents. Ten years ago, militants such as Khaled Jaabari simply could not match the surveillance and cartographic capabilities of the Israelis, who spent millions, if not billions of dollars to maintain such superiority. Now, groups like the al-Aqsa Martyrs Brigade are receiving high quality geographic information, for free. While this cost is easy for them to bear, it is certainly the opposite for the Israelis, and efforts have been undertaken to have imagery purposely censored or lowered in resolution to make targeting more difficult. Following the next case study of *Google Earth* and the 'War on Terror,' further discussion will deal with state responses and security issues regarding *Google Earth*.



Reuters photo RTT1Q101 by Oleg Popov

Palestinian militants from the al-Aqsa Martyrs Brigades parade in Ramallah, 15 June 2007.

Google Earth and the 'War on Terror'

In Western society, a key indicator that individuals/governments/corporations take reservation with an issue is demonstrated in their willingness to take legal action against a perceived slight or injustice. Take the seemingly-unprecedented example of British troops stationed in Basra, Iraq, where members of the Royal Green Jackets, an infantry unit, have threatened to sue *Google* if soldiers were wounded by an attack facilitated by *Google Earth Images*.¹⁸ In an article describing a historical 'first,' journalist Elinor Mills detailed how British soldiers had reacted to the knowledge that "... documents seized in raids on insurgents' homes were printouts from photos taken from *Google Earth* that show the location of buildings, tents, latrines and lightly armoured vehicles."¹⁹ When confronted with evidence that insurgents had pinpointed the precise latitude and longitude of soldiers' quarters, a British intelligence officer surmised the situation by stating: "This is evidence, as far as we are concerned, for planning terrorist attacks... We believe they use *Google Earth* to identify the most vulnerable areas, such as tents."²⁰ Reports of similar incidents have occurred throughout Iraq, and the discovery of instructional videos located online briefing insurgents on how to use *Google Earth* to attack Coalition forces has made such news mainstream.²¹ *Google Earth* is becoming more than just an interesting application – it is becoming a weapon. Weapons do not have to consist of rifles, helicopter gunships, or grenades, as Captain (ret'd) Nathan Fick recalled in his memoirs *One Bullet Away*: "In the Marines, anything can be a weapon; it's a whole new way of thinking. My plastic MRE (Meal, Ready-to-Eat) spoon was a weapon if I used it as an insulator on a radio antenna so that I could talk to jets and call in air strikes."²² Concerns of the nefarious capabilities unintentionally laden within *Google Earth* have prompted controversy regarding the safety of soldiers deployed overseas during the 'War on Terror,' as well as within domestic security circles. China, Iran, Turkey, Morocco, Bahrain, Sudan, Jordan, Sweden, and the United States have all undertaken efforts to block or ban *Google Earth* from photographing certain facilities, including the White House, and *Google Street View* has been banned from photographing military bases in the United

States, as well as around sensitive facilities in Great Britain.²³ Despite the efforts of many states in limiting the impact of sensitive cartographic knowledge to outsiders, access to *Google Earth* is widely available internationally, and on several occasions, *Google* has accidentally revealed areas blurred out at the request of governments.²⁴ While Chris Perkins and Martin Dodge assert that "...the most effective mapping...has been, and often still is, the exclusive preserve of the military," they miss the point that insurgents do not need extraordinary complex or detailed maps to strike targets.²⁵ Simply put, *Google Earth* provides, for free, a static, 'bird's-eye view' of the battlefields of the 21st Century, a capability unavailable to all but a select group of states ten years ago. *Google Earth can be, and has been used, to assist in successful insurgent operations that would have been unimaginable without the cartographic power of the state. This decentralization of knowledge is unprecedented, and this trend will likely increase, not decrease over time. Prior to concluding, this article will look at the response of Google Earth to claims that it threatens national security.*

Responses from Google Earth

Google Earth has been both praised and pilloried for its responses to requests based upon national security concerns. While *Google Earth* director John Hanke has pointed out that terrorists *have, and will continue* to attack targets with or without *Google Earth*, on several occasions, *Google* has acquiesced to demands to reduce resolution on locations deemed sensitive, including complexes in India, Great Britain, and the United States.²⁶ Furthermore, as *Google Earth* is based out of the United States, they are prohibited in exporting *Google Earth* to Iran, due to U.S. regulations.²⁷ Despite the downscaling of resolutions in some sensitive areas, what is clear is that *Google Earth* is here to stay, and that it will be continued to be used for both peaceful and nefarious applications.

Implications and Conclusions

Google Earth represents more than a dual use (civilian/military) technology – it marks the movement of cartographic information, once jealously guarded and vetted by the state, into the public domain under private control. Maps possess enormous power, and the aforementioned transition is not without growing pains, as seen in case studies of Israel, and the 'War on Terror.' While the unintended capabilities of *Google Earth* represent a threat to the control of cartographic knowledge by the state, there is hope that the decentralization of geographic information will result in a more harmonious world. While this short article was intended to inform the reader about a developing cartographic story, the conclusion has not yet been written, as *Google Earth* remains in its infancy. Ultimately, like most things in this world, *Google Earth* will become what we, as humanity, make of it.

Lieutenant Nicholas Kaempffer, an artillery officer, has a Bachelor of Arts (Honours) degree in Geography from Queen's University. He is a Troop Commander at the Royal Regiment of Canadian Artillery School (RCAS).



German Chancellor Angela Merkel and *Google* north and central Europe head Philipp Schindler look at a *Google Earth* application during a media night in Berlin, 24 May 2011.

Reuters photo RTRZMULV by Thomas Peter

NOTES

1. David Turnbull, "Cartography and science in early modern Europe: Mapping the construction of knowledge spaces," in *Imago Mundi*, Vol. 48, No.1, p. 7.
2. *Ibid.*
3. *Ibid.*, p. 14.
4. *Ibid.*, p. 16.
5. Chris Perkins and Martin Dodge, "Satellite imagery and the spectacle of secret spaces," in *Geoforum*, 2009, p. 2.
6. Lord Baden-Powell, founder of the Boy Scouts, was an English officer during the 19th -20th Centuries, famous for his intelligence work, whereby he would disguise himself as a butterfly collector and sketch sensitive enemy military installations, hiding the outlines within the wings of his drawings.
7. A case in point was President Kennedy's publication of Russian nuclear missile installations in Cuba during the Cuban Missile Crisis. Surveillance photos from American U2 spy planes was used to garner both political support at home, and within the United Nations for a blockade of Cuba – a prime example of military cartography at work.
8. Perkins and Dodge, p. 1.
9. *Ibid.*
10. *Google Earth* (2010), at <http://www.google.com/earth/index.html>.
11. *Google Street View* (2010), at < http://www.google.com/intl/en_us/help/maps/streetview/>.
12. Roger Stahl, "Becoming Bombs: 3D Animated Satellite Imagery and the Weaponization of the Civic Eye," in *MediaTropes*, 2010, Vol. 2, No. 2, 2:2, p. 65.
13. *Ibid.*, p. 66.
14. J.B. Harley, "Maps, knowledge and power," in D. Cosgrove and S. Daniels, (Eds.), *The Iconography of Landscape* (Cambridge, PA: Cambridge University Press, 1988), p. 301.
15. Clancy Chassay and Bobby Johnson, "Google Earth Used to Target Israel," 2007, in *Guardian*, at < <http://www.guardian.co.uk/technology/2007/oct/25/google.israel.>>
16. *Ibid.*
17. *Ibid.*
18. Elinor Mills, "Google, British Military Discuss *Google Earth* Use in Attacks," at CNET, 2007, at https://moodle.queensu.ca/file.php/868/Google_Maps_Military_Uses_001.pdf
19. *Ibid.*
20. *Ibid.*
21. Stahl.
22. Nathan Fick, *One Bullet Away* (New York, First Mariner Books, 2005), p. 28.
23. 1. Stahl. 2. Federal Aviation Administration. "Every US Military Base Identified on *Google Maps*," at < Seeandavoid.org> 3. Mike Ferro, "Google Earth Uncovers Secret UK Nuke Base – Is Technology Out of Hand?" 2009, at https://moodle.queensu.ca/file.php/868/Google_Maps_Military_Uses_003.pdf.
24. Ferro.
25. Perkins and Dodge, p. 2.
26. Ferro.
27. *Google Earth* Support Forums, 2010, at <http://www.google.com/support/forum/p/earth/thread?tid=403a43f2bf5def3b&hl=en>.