
The Environmental and Human Costs of DH

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Introduction

In her DH 2014 keynote address, Bethany Nowviskie encouraged digital humanists to “attend to the environmental and human costs of DH” (2015). These costs are sometimes accrued through acts of inaccessibility, such as through building websites that are not practical for screen readers or mobile devices. But they may also be accrued through acts of accessibility like exposing communities to unwanted surveillance through digital publications. (See, for example, the recent controversy around the digitization and open access publication of the lesbian erotic magazine *On Our Backs* raised by Tara Robertson in “[Digitization: Just Because You Can, Doesn’t Mean You Should](#)”, as well as Reveal Digital’s [response](#). Projects like [Mukurtu](#) are seeking to temper the open access movement by providing a platform that keeps the power of distribu-

tion and access within the hands of community members). These costs are accrued whether the intentions are deliberate or not.

In the environmental humanities, like in the digital humanities, “access” is not always a desirable goal. The actions of thousands of First Nations and Native American people, who continue to protest corporate and state access to tribal lands for the purpose of building pipelines, attest that access is both a human and environmental issue. In late October 2016, a viral Facebook campaign launched in the U.S. in response to unsubstantiated reports that the FBI was targeting Standing Rock, North Dakota protesters’ locations via Facebook. Regardless of the veracity of the reports, the mass responses on social media—where individuals “checked in” *en masse* to Standing Rock—attest to a perceived privacy violation where personal data is accessed to enact environmental injustices. Access, especially human access, may well put endangered ecosystems at risk, expediting the “climate of extinction” in which, Nowviskie asserts, digital humanists work.

The papers in this session confront this “climate of extinction” both directly and obliquely.

Drawn from a diverse range of disciplinary fields and locales—including literature, media studies & archaeology, information science, and environmental science—this session interweaves examinations of *the lived ecologies of the digital* with analyses of *digital representations of lived ecologies*. Collectively, they address both the material and immaterial repercussions of digital humanities within the Anthropocene.

In the contact between humans, non-humans, and the more-than-human, this session asks us to consider the ways in which digital humanists and digital humanities projects are complicit in environmental degradation. How are digital tools leveraged to enact environmental injustices and destruction? How are they used to redress environmental injustice? How might we, in the words of The Dark Mountain Project manifesto “face this reality honestly and learn how to live with it” (“[The Manifesto](#),” n.p)?

(Un)natural Disasters: The United States’ Racialized Response to Disaster Relief

Christina Boyles

Hurricane Matthew wreaked incalculable damage in the United States and Caribbean. According to the Weather Channel, “The eyewall may deliver the strongest, most destructive winds anyone in parts of the northeast and east-central Florida coast has seen

in their lifetime. The last, and only, Category 4 hurricane to make landfall anywhere in northeast Florida or the Georgia coast was an 1898 hurricane south of St. Simons Island, Georgia" ("Hurricane Matthew a Potentially Catastrophic Category 4 or 5 Strike Ahead on Florida's East Coast; Strongest in Decades").

In fact, the severe impacts from this hurricane have led to some locations being uninhabitable for weeks or months. Governor Rick Scott encouraged residents of Florida's southeastern shore to evacuate. Other residents, like those farther north in Jacksonville or farther West near Orlando, were put on high alert. Over 1.5 million residents of these areas fled their homes ("Hurricane Matthew Strengthens as Florida Governor Urges Evacuations").

Not all residents of Florida had the means to escape the onslaught of Matthew. Many residents, particularly those living in rural and inland communities, did not have access to the resources needed to flee the coming storm. In fact, if history has anything to tell us, those without resources will suffer the most. In 1928, Florida was hit by a category 4 hurricane now referred to as the Lake Okechobee hurricane. Although the loss of life was catastrophic—the Galveston hurricane of 1900 is the only natural disaster to have caused more American deaths—the legacy of the storm has largely been lost to history. Nicole Sterghos Brochu asserts that this is "because the vast majority of those who died were black migrant workers, segregated in life and abandoned in death" ("Florida's Forgotten Storm").

The fallout of the storm, however, has left a lasting cultural legacy in central Florida. Notably, anger has simmered for decades in West Palm Beach's African-American community over disparate memorials for black and white storm victims. Sixty-nine white victims in a segregated mass grave received personalized burial markers. In a nearby pauper's cemetery, a mass grave of 674 black victims was forgotten and left unmarked, later sharing space with a dump, a sewage plant, and a street extension ("Storm's Path Remains Scarred after 75 Years").

Government documents reveal that the racialized response to the 1928 storm was intentional. Seeking to protect Florida's burgeoning tourist industry, federal officials minimized the damages caused by the storm, even going so far as to dramatically underestimate the death toll. Since many individuals who lost their lives were transient—meaning their names and residences did not appear in census data—the government could easily downplay and even negate their existence.

To bring the stories of the storm's underrepresented victims back into our cultural memory, I created a Neatline exhibit demonstrating the loss of life the 1928 hurricane caused in both the United States and the Caribbean. To do so, I am also conducting interviews with family members of survivors and embedding their stories into the exhibit.

As Florida and the Caribbean start to recover from Hurricane Matthew, it is important to note that those living in economically disadvantaged communities will suffer the greatest from the storm's damage. Heavily populated by black residents, these towns risk facing the same mistreatment of these residents both during the storm and in the recovery process, even recent storms—Katrina and Sandy are two prominent examples—reveal that discriminatory practices are common to disaster practices and clean-up processes.

In order to prevent a similar injustice it is crucial to point out the United States' racialized responses to natural disasters and to focus aid efforts on the locations most impacted by the storm, many of which will be communities of color. By failing to do so, we risk contributing to a troublesome legacy of disaster relief discrimination.

No, Drones: Institutional Critique of UAS Data Accessibility and implications for Environmental Humanities

Nicholas Weber

Lindsay Barbieri

In name, pastiche isn't a method familiar to most earth scientists. But in practice, monitoring and observing environmental phenomena is a recombinatory process not that different from pastiche of the art world; it requires collecting data via a network of remote sensing instruments, normalizing this information so that it can meaningfully interoperate, and combining different stores of data in order to reliably produce knowledge about the natural world. The process of knowledge production in the earth sciences is both techno-scientific (Haraway, 1997), in the sense that sources of data are historically and locally situated, but also highly contingent on evidential cultures (Collins, 1998; Baker, 2011) in that collecting, finding and using data is mediated by the background practices of an academic department, scientific discipline, or research program.

Compare our generic description of knowledge production in environmental monitoring to Louise Lawler's recent series titled 'No Drones' – a critique of

contemporary art institutions. Lawler created the series through a pastiche process of photographing private art collections, commissioning drawings of her photographs, and then digitizing the illustrations as vector-based images that are magnified and printed on adhesive vinyl (see Image 1 below). For an unassuming viewer, the result is a powerful reflexive image that is both full of layers of symbols and yet stripped down to a single black-and-white outline of complex ideas. For an audience that can unpack the provenance of Lawler's images this work also creates a self-reflexive form of institutional critique of how highly priced and commoditized artworks serve as cultural markers of wealth, privilege, and accessibility (Nixon, 2014).

This paper attempts to use the same form of institutional critique as Lawler (Fraser, 2005) in discussing the emergence of Unmanned Aerial Systems (UAS) in environmental monitoring. Our goal is to demonstrate that with reflexivity the process of producing knowledge about environmental phenomena with UAS data can shed considerable light on markers of wealth, privilege and accessibility at play in contemporary informatics-driven science. Further, we argue that by creating 'legible' provenance information, UAS data can have a dramatic impact on the burgeoning practices of environmental humanities (Castree, 2014).



Figure 1: Louise Lawler's installation 'No Drones' at Sprüth Magers, Berlin 2015. Pictured left is 'Dots and Traces' - A drawing by Jon Buller that has been digitized and printed on a vinyl adhesive. Buller's sketch is a direct copy of photo taken by Lawler, which is itself a sculpture by Damien Hirst. (Image via Sprüth Magers)

The use of unmanned aerial systems (UAS) as tools for collecting innovative remote sensing data and geospatial imaging is increasing. Recent technological advances present communities with an opportunity to use UAS to push boundaries in data collection. The recent drop in costs combined with the advancement in lightweight technology mean UAS could become a

ubiquitous means of collecting scientific data (Dunbabin and Marques, 2012). UAS are predominantly used for imagery, however, given their advantages over traditional data capture methods (higher temporal and spatial resolution, new area access, etc.) novel sensors are being explored and UAS use has opened doors for both researchers and communities interested in monitoring environment, landscapes, community vulnerability and disaster response.

We present on three important topics in UAS-based collection of environmental data (1) the results of a survey of UAS use in the earth sciences (flight platforms, data and metadata standards, and data sharing practices) and how this may shape the ability of communities to access these technologies (2) a discussion of the experience of unwanted surveillance and how drones as tools could shift the equity of surveillance (self surveillance / community surveillance) and power dynamics. (3) a discussion of how drone data collection, with unprecedented ability to capture data on environment and landscape, may shift responses of organic beings to their physiographic surroundings – a topic of growing importance for the field of environmental humanities.

The English Lake District and 'World Ecology'

Margaret Linley

In his *Guide to the Lakes* (1835), William Wordsworth famously condemns changes occurring in the Lake District since the late eighteenth century, changes accelerating ironically because visitors were flocking there from all parts of England to see the landscapes Wordsworth celebrated in his nature poetry. Wordsworth is induced to speak out "at length" by a "wish to preserve the native beauty" of the district against the transformations that seem so rapidly to be taking place. The new mobility and accessibility enabled by improved transportation and communication, however, are only part of the problem. The "invention and universal application of machinery" are, for Wordsworth, equally to blame. Rather than simply argue for isolation, Wordsworth's solution to this conundrum of access and preservation is to use the mass print genre of the travel guide as an educational platform for cultivating environmental consciousness toward a reconstitution of the Lakeland as public space: "a sort of national property, in which every man has a right and interest who has an eye to perceive and a heart to enjoy" (*Guide*).

Early in the *Guide* Wordsworth describes the process by which "nature is indebted to the hand of man," its state and appearance the outcome of historical and

social processes. In so doing, he complicates a strain of environmental writing, interestingly often attributed to the Romantic legacy, which differentiates human activity from “the natural,” a habit of thought that, according to ecocritics such as Jason W. Moore (*Capitalism in the Web of Life*), ultimately mystifies the role of capitalism in resource exploitation and climate change. Yet perhaps even more provocative is the way Wordsworth analyses the history of travel in the Lake District as essentially a form of colonization and insists, additionally, that the operations of such modernized forces of power on nature demand that readers think ecologically.

This paper will explore how the problem of access Wordsworth identified dovetails with concerns raised by scholars about the environmental and human costs of digital humanities (such as Nowviskie, Parikka, and Haraway, among many others) through the specific example of *Lake District Online*, a digital research project based on Simon Fraser University’s collection of 260 illustrated rare books about the English Lake District, including many maps and historical specimens of ornate book bindings, illustrations, and photography, spanning 300 years (1709-2000) with a concentration in the nineteenth century. As Elizabeth DeLoughrey and George B. Handley argue, historicization has been a primary tool of postcolonial studies and it is central to our understanding of land and, by extension, the earth. In order to continue to engage a historical model of ecology and an epistemology of space in time, we must carry these concepts, not least of all the spatial imaginary made possible by the experience of place, into the dialogue around access to emerging digital environments.

Guided by this premise, *Lake District Online* has produced several freely accessible research, educational, and public engagement resources: 1) an extensible bibliographic research database for linking with other open databases (such as Wikipedia), comprising a metadata framework for searching and indexing bibliographical, biographical, and critical information about the books as well as their contents; 2) an experimental prototype of a teaching and learning platform, *Reading Up Close and At a Distance*, designed to enable students to interpret literature interactively on different scales; 3) a co-curated public exhibition with the Wordsworth Trust, *Wordsworth Country: From the English Lake District to the Pacific Northwest*, launched simultaneously at the Wordsworth Museum (UK), SFU Library and Special Collections (BC), and online; and 4) a corpus of high-resolution digital images and text

files based on the SFU Lake District rare book collection. To approach these resources through the paradigm of colonial violence that Wordsworth identifies at work in the regional landscapes of Cumbria is also to engage empire building and environmental histories as highly mobile, flexible, and mutually constitutive. Moreover, as Wordsworth implies, access - and the related concept of openness - is a question of spatiality and especially of boundaries, exclusions, and limitations entailed in the politics and ethics of place making. Focusing especially on the significance of the present location of the Lake District collection in Vancouver, British Columbia, this paper will reflect on colonial legacies of organizing, producing, and accessing nature in the context of the digital humanities.

Decaying Plastic Play: *Flappy Bird’s* Hacked Afterlife as Media Archaeological Praxis

Jeffrey Moro

On March 28th, 2016, prolific YouTube streamer SethBling posted a [video](#) demonstrating how, using only timed button presses and graphical glitches present in the console original, he injected three hundred and thirty-one new bytes into the seminal 1990 Super Nintendo Entertainment System (SNES) platforming game Super Mario World—bytes corresponding to the source code of the 2013 viral iPhone game phenomenon Flappy Bird. The hack allows users to play a fully functional port of Flappy Bird within Super Mario World, grafting the former’s computational logic into the latter’s graphics. The choice of games here is striking; while Super Mario World has been re-released across a variety of hardware platforms—to say nothing of Mario’s cultural ubiquity—Flappy Bird remains a touchstone for its inaccessibility, both in its frustratingly difficult design and the fact that in February 2014, its creator pulled it from all platforms, citing concerns that its addictiveness ruined people’s lives (Nguyen). SethBling’s hack then produces a chimeric object; a hybrid of plastic, logic, and time; the ghost of one game haunting the shell of another. This haunting constitutes, as this short paper argues, a regenerative practice: a “circuit bending,” to draw on a theoretical and practical challenge from Garnet Hertz and Jussi Parikka, that engages the “archive” of dead (whether by accident or design) computational media not only within artistic traditions of remix, tinkering, and collage, but also with a media archaeological eye towards circulations of technological waste, supply chains, and resource extractions (“Zombie Media”).

In characterizing this haunting as “regenerative,” I engage interdisciplinary work in the environmental humanities and media archaeology alongside tactics from games and software studies. In a post-400ppm world, questions of digital media’s emergence from and contribution to the feedback loops of climate crisis within industrial capitalism loom large. In the digital humanities, Bethany Nowviskie’s oft-cited keynote at DH2014 in Lausanne provides a *cri de coeur*, alongside emerging conversations from the GO::DH working group on minimal computing from the same conference, for thinking through the ecological circulations and impacts of DH technologies and practices—what Nowviskie, drawing from Steven Jackson, calls the challenge of “broken world thinking” (5). Media studies as a field has also begun to take up broader questions of climate, geology, infrastructure, and the Anthropocene in theoretical and material studies of digital technologies, whether under the rubric of the “non-human turn” (ex. Grusin, Richard, ed. *The Nonhuman Turn*. U of Minnesota P, 2015); geological and elemental media histories (ex. Parikka, Jussi. *A Geology of Media*. U of Minnesota P, 2015; Peters, John Durham. *The Marvelous Clouds: Toward a Philosophy of Elemental Media*. U of Chicago P, 2015); computational infrastructure (ex. Bratton, Benjamin. *The Stack: On Software and Sovereignty*. MIT P, 2015; Starosielski, Nicole. *The Undersea Network*. Duke UP, 2015; Blum, Andrew. *Tubes: A Journey to the Center of the Internet*. Ecco, 2013); or sustainability and waste (ex. Gabrys, Jennifer. *Digital Rubbish: A Natural History of Electronics*. U of Michigan P, 2011; Acland, Charles, ed. *Residual Media*. U of Minnesota P, 2007; Scanlan, John. *On Garbage*. Reaktion Books, 2005). These diverse approaches, only a small fraction of such work, share a common reading of computational technologies both relying on and contributing to a material reorientation of human/Earth relations, whether through open-pit mining, ozone depletion, or undersea cable networking—to say nothing of new social relations made possible by the connective potentiality of such technologies.

It is no coincidence that SethBling’s hack emerges at the same time as academic and environmentalist communities’ explorations of technological obsolescence, material production, and sustainability/waste grow more prominent. Nor is he working in isolation: his hack is only one within of a subculture of videos exploring different ways to hack, deform, and manipulate “classic” (almost always a euphemism for “obsolete”) video games. Part of these players’ engagement with obsolete video games and platforms is practical:

the relative (to contemporary platforms) simplicity of the hardware and coding allows for more granular engagement with the technologies themselves. But the choice of Flappy Bird and Super Mario World reveals multiple valences of computational obsolescence and decay: a game forcibly disappeared emerges within one that, through the cooperative/coercive machinations of nostalgia and capitalism, endures. Moreover, the hack itself is a kind of deliberate decay, one that deforms the digital object until it becomes pliable, manipulable, and inscribable. Much like the acrylonitrile butadiene styrene (ABS) that comprises its cartridge shell, the game becomes plastic: transformable, recyclable, and pliable under the right (industrial) conditions.

At its root, this hack plays (in multiple senses of the word) with the roots, tendrils, and growths of computational memory. It reveals “memory” as a function of physical hardware, the encoded rhetoric of software, and the transmission of shared culture. Wendy Hui Kyong Chun, in her 2008 book *Programmed Visions*, offers the idea of software’s “enduring ephemerality,” computational media’s capacity to “remember” through material regeneration—continual acts of writing and rewriting across electrical charge and silicon (148). Through this frame, SethBling’s hack is rewriting, and its ingenious incarnating and recycling of Flappy Bird’s three hundred and thirty-one bytes embodies Chun’s claim that “what is not constantly upgraded or ‘migrated’ or both becomes unreadable. . . . The experiences of using—the exact paths of execution—are ephemeral. Information is ‘undead’: neither alive or dead, neither quite present or absent.” (148). Hertz and Parikka deploy “zombie” as a metaphor for reinvigorated dead media to similar ends, observing that the materials constituting software—the plastic, the rare earth metals—are also subject to regimes of ephemerality (150–53). ABS, in its petroleum-based non-biodegradability, may be effectively immortal, but the systems through which humans articulate its use are subject to entropic decay. Only the ephemerality endures.

This paper closes by offering SethBling’s hack and the broader gaming subcultures of glitch play to which it belongs as artistic responses to computational obsolescence and decay. Chun’s “enduring ephemerality” becomes artistic praxis much as Hertz and Parikka offer circuit bending as a media archaeological arts method. It extends the material concerns of media studies’ Anthropocenic turn to code and its cultures, and offers these deforming/reforming modes of play

as potential sites of resistance for an ecologically-engaged digital humanities practice.

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