

**PLACING THE GOLDEN SPIKE**  
**Landscapes of the Anthropocene**

*Placing the Golden Spike: Landscapes of the Anthropocene*

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INOVA supports the advancement of contemporary art by facilitating the creation of new works  
across disciplines and placing artistic research into broader dialogues of social, cultural, and  
academic importance.

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**Sara KRAJEWSKI**

Sara Krajewski is the Director of INOVA (Institute of Visual Arts) at the University of Wisconsin-Milwaukee.

Over the last decade, scientists and humanists have considered renaming our current geological era the “Anthropocene” in recognition of the profound impact that human activities have had upon the Earth’s crust and atmosphere. The argument equates humanity with forces like glaciers, volcanoes, and meteors that physically alter layers of rock. If we accept the concept of the Anthropocene, then one major question must be answered: when and where did human activity begin to leave its indelible mark upon the surface of Earth? Did the Anthropocene begin with intercontinental trade, the industrial revolution, fossil fuel extraction, nuclear testing, or with the advent of agriculture over 40,000 years ago?

For each geological epoch the International Union of Geological Sciences identifies an exemplary site and marks it by driving a golden spike into the rock layers. This exhibition brings together nine contemporary artists to explore some locations where we might consider driving the “golden spike” that would mark the beginning of the Anthropocene era, such as the surreal landscapes of oil fields (Marina Zurkow), areas affected by petrochemical production (Steve Rowell), nuclear testing and waste disposal sites (Eve Andrée Laramée), and waterways changed by industry, human population, and storms brought about by climate change (Roderick Coover and Scott Rettberg). Other sites reflect more dispersed entities like the polluted atmosphere (Amy Balkin), rising sea levels (Eric Corriel’s nighttime projection), plastic refuse (Yevgeniya Kaganovich) and even digital space (Xavier Cha’s performance). Through work exploring and responding to specific sites, the artists offer us a starting point for speculating on the ethics of representing this transformative, aesthetically charged moment in the Earth’s history.

The exhibition has a dynamic and shifting presence. Over the spring, Natalie Jeremijenko is developing an urban greening project that takes the exhibition out of the gallery and into INOVA’s neighborhood. Jeremijenko’s *Signs of (Intelligent) Life* offers a small-scale, high-impact solution to creating more biodiversity in mono-cultural urban environments and forms an adaptive step in remediating ecological change. Publication Studio, from Portland, Oregon, comes in residency to produce the exhibition catalogue on site, uncovering and adding layers from the exhibition and the artists’ materials in the special edition book. Workshops with Yevgeniya Kaganovich (April 24) and Marina Zurkow (May 1-2) offer opportunities for participants to think about the life and evolution of plastic as a landform that will persist through geological time.

To talk about the Anthropocene is to displace the immediacy of climate change and register environmental transformation beyond human scale. This position might make some of us uncomfortable. We hope the debate that arises enables us to contemplate how the manipulation of local ecologies and the global exploitation of natural resources will require new ways of living in the 21st century. The exhibition and accompanying programs challenge us to recognize the omnipresence of human impact on contemporary landscapes—suggesting that the closer and more carefully we look at both local environments and remote sites, the more places we may find to place the golden spike of the Anthropocene.

INOVA is an ideal venue for this exploration. As the contemporary art gallery of the University of Wisconsin–Milwaukee, INOVA supports the advancement of contemporary art by facilitating the creation of new works across disciplines and placing artistic research into broader dialogues of social, cultural, and academic importance. *Placing the Golden Spike: Landscapes of the Anthropocene* fits this mission by highlighting the intersection of art and science and striving to explore a difficult subject through the fresh perspectives that artists adopt in their work and research practices. The exhibition includes collaboration with UWM partners and community organizations, providing opportunities for exchange between exhibiting artists, university scholars and scientists, local artists, and the larger community of Milwaukee. These partnerships give us the opportunity to work with an informed audience and bring high-level specialists into dialogue with members of our general public, all through compelling programs.

The exhibition began through the work of Dehlia Hannah, the 2013–14 postdoctoral fellow at UWM’s Center for Twenty-first Century Studies. Dehlia’s scholarly work on climate change aesthetics and modeling scientific inquiry through artistic practices led her to propose an exhibition to INOVA. Dehlia sought to track how certain artists’ site-specific projects go beyond environmentalism and eco-arts. Using such artistic endeavors as a lens, we decided to investigate the debates surrounding the designation of the “Anthropocene” to our current era. Dehlia’s curiosity and intellect served as the bedrock for the exhibition, workshops, and university programming. Thank you to Richard Grusin, Director and Emily Clark, Associate Director, the Center for 21st Century Studies, for their ongoing support of connecting the Center’s activities to INOVA and encouraging this collaboration. We are grateful to

colleagues at the UWM for their engagement with the exhibition during its development and its realizations: Mark D. Schwartz, Distinguished Professor, Geography; Arijit Sen, Associate Professor, School of Architecture and Urban Planning; Nicolas Lampert, Senior Lecturer, Art & Design, Peck School of the Arts; and Maria Gillespie, Assistant Professor, Dance, Peck School of the Arts. The UWM’s Year of the Humanities provided funding for scholar Heather Davis to participate in our exhibition programming.

Natalie Jeremijenko’s *Signs of Intelligent Life* is made possible through the efforts of an outstanding team including designer Jake Richardson, consultant Bethany Wall, UWM Student Undergraduate Researchers Quinn Stout and Erin Rademacher, and horticulturalist Kristin Kakatsch. Laura Blereau of bitforms gallery provided technical assistance for Marina Zurkow. Natascha Boojar of the Austrian Cultural Institute in New York City facilitated the inclusion of Amy Balkin’s *A People’s Archive of Sinking and Melting*. Great appreciation goes to Ben Balcom of Microlights Cinema in Milwaukee for an inspired film program that complements the exhibition with a series of short films. We are pleased to work with Publication Studio on the design, printing, and electronic distribution of this volume. Their approach to the social life of the book lead us to propose yet another “golden spike” in the printed page. Dehlia Hannah collaborated closely with the writers and artists on the content of the catalogue—thank you to Heather Davis and Heather Anne Swanson, and Arijit Sen for their thoughtful essays. The exhibition would not be possibly without INOVA’s team: Associate Director Bruce Knackert and Gallery Assistant Monica Miller who facilitated the details of prepping and installing the works; and UWM Art History graduate student intern Kara Hendrickson who provided research support.

*Placing the Golden Spike: Landscapes of the Anthropocene* is supported by the Mary L. Nohl Fund of the Greater Milwaukee Foundation and funded in part by a grant from the Andy Warhol Foundation for the Visual Arts.

Finally, a great thank you to all of the artists in the exhibition. Your work inspired us to create an exhibition with poignancy, humor, beauty, and strangeness, which we hope befits our speculation about this unfolding moment of the Anthropocene.

# Placing the GOLDEN SPIKE

Landscapes of the Anthropocene

Text on the right wall, likely an informational panel or brochure, containing several columns of small text.







Previous: Yevgeniya Kaganovich, Marina Zurkow, Eve Andrée Laramée  
Left: Amy Balkin, Yevgeniya Kaganovich, Eve Andrée Laramée  
Right: Natalie Jeremijenko and INOVA student research





Above and Right: Steve Rowell







Above: Roderick Coover and Scott Rettberg  
Right: Eric Corriel  
Next: Eve Andrée Laramée









## WHAT PEOPLE SHOULD KNOW

“One of the reasons I study the atmosphere is because it’s critical to life. But it’s a very, very thin veneer on the surface of the planet. You can go anywhere in the world and take an air sample in what you think is the cleanest place on earth, and it’s full of human-produced compounds. We can see all these things that were never there before in the history of the planet. And we can measure it. And so the stuff that people dump into the atmosphere doesn’t disappear, doesn’t escape to space. And this is relevant for the greenhouse effect, it’s relevant for stratospheric ozone depletion, it’s relevant for just air pollution in general.”

– Robert Rhew, geochemist, UC Berkeley



...the site is now structured (inter)textually rather than spatially, and its model is not a map but an itinerary, a fragmentary sequence of events and actions through spaces, that is, a nomadic narrative....

Miwon Kwon

**Dehlia HANNAH**

Dehlia is the Research Curator of the Synthesis Center and Assistant Research Professor of Arts, Media and Engineering at Arizona State University. At Synthesis she leads the *Atmosphere and Place* research network and the Experiential Climate Modeling project. Dehlia received her Doctorate in Philosophy from Columbia University in May, 2013. Her dissertation and current book project, entitled *Performative Experiments*, articulates the philosophical implications of an emerging genre of contemporary artwork that takes the form of scientific experiments and deploy scientific methods and materials as new media. Dehlia began working with Sara Krajewski on *Placing the Golden Spike: Landscapes of the Anthropocene* as a Postdoctoral Fellow at the University of Wisconsin-Milwaukee's Center for 21st Century Studies while co-organizing a conference on *Anthropocene Feminism* with Richard Grusin and Emily Clark. Prior to discovering the Anthropocene, Dehlia was a fellow of the Chemical Heritage Foundation's Center for Contemporary History and Policy, where she conducted research on the CHF Museum's art exhibition *Sensing Change*. Her new project *A Year Without a Winter* (2016-2018) explores creative and practical responses to emerging climate futures at multiple locations worldwide. She lives in Copenhagen.

*Placing the Golden Spike: Landscapes of the Anthropocene* began with an arcane question currently under consideration by the International Commission on Stratigraphy, the body of the International Union of Geological Sciences responsible for demarcating the units of measurement of the geological time scale. If, as naturalists have urged since the late eighteenth century, humans have become the dominant geological force on Earth, then when and where did this new epoch begin? The onset of each period, epoch, and age of the Earth's history is marked with a Global Boundary Stratotype Section and Point (GSSP)—a "golden spike" or plaque situated at a unique geographical location. Scientific proposals have linked the golden spike of the Anthropocene to moments ranging from the use of fire and the development of agriculture in deep human history, to the rise in fossil fuel use since the Industrial Revolution, atomic weapons tests in the mid-twentieth century, the chemical industry's production of fertilizers and plastics, and, more recently, to European colonization and consequent depopulation of the Americas, political events with profound ecological consequences.

In their efforts to establish the stratigraphic status of the Anthropocene, geologists find themselves embroiled in a debate about what counts as a site. Works of art were initially selected for this exhibition with the expectation that site-specific artistic practices could deepen and transform our comprehension of places like the Trinity site in New Mexico where the first atomic tests were conducted in 1945, the subject of Eve Andrée Laramée's installation *Inverse Alchemy: Shadows in Reverse*. With the inclusion of Steve Rowell's *Uncanny Sensing, Remote Valleys (TX Prototype)* and Marina Zurkow's *Mesocsom (Wink, Texas)* the exhibition expanded to address present and long-range impacts of fossil fuel extraction at two locations in Texas. Roderick Coover and Scott Rettberg's detailed investigations of industrial pollution along the Delaware River form the basis of *Toxi-City* and *Chemical Map*, which together document human vulnerability to flooding and chemical exposure in a time of increasingly turbulent weather. Yevgeniya Kaganovich's weed-like plastic sculpture *grow* and Zurkow's *Landfill Club* address the relentless accumulation of plastic on the Earth's surface and in the oceans over the last

century. As we attended to the circulation of chemicals, plastics and people, our notion of site began to expand beyond rock strata to other domains in which the profound impact of human activity will be legible for eons to come.

*As members of the Anthropocene Working Group, we contend that the proposed new geological epoch should reflect a unique stratigraphic unit that is characterized by unambiguous, widespread, and essentially permanent anthropogenic signatures in rock, glacial ice, or marine sediments.*

Jan Zalasiewicz

Air and water constitute diffuse and distributed sites suffused with petrochemicals, radioactive dust, and plastic fragments, such that any small sample exemplifies a panoply of anthropogenic changes to the global environment. *A People's Archive of Sinking and Melting* by Amy Balkin and Eric Corriel's *Water Will Be Here (Milwaukee)* point towards melting glaciers and rising oceans as crucial parts of the Anthropocene's legacy. These consequences of sharply elevated atmospheric carbon dioxide levels will remain detectable to future geologists in the form of air bubbles trapped in ice cores. The air itself, represented by Balkin's poster essay *The Atmosphere: A Guide* then emerged as a conceptually plausible place at which to drive the golden spike of the Anthropocene.

The context of an art exhibition invites us to bring a playful and critical eye to the formidable task of situating the Anthropocene at a discrete geographical location and temporal moment. Stratigraphy admits a degree of arbitrariness in assigning GSSPs. The geological time scale, after all, is, like any time scale, a classificatory convention and an artifact itself. *Placing the Golden Spike* offered us an opportunity to explore how the very idea of the Anthropocene might call into question the scientific conventions upon which it is grounded. Specifically, our attempt to pay closer attention to its exemplary sites suggests that the Anthropocene exceeds what will be left written in stone. Indeed it may be in domains often construed as immaterial that our legacy will be the most significant.

*Our encounters with art... enable us to see things differently. They call into question complacent assumptions, introduce new ways of ordering a domain and*

*provide evidence of the value of new world orders. They provide conceptual and perceptual resources that allow us to recognize features and patterns we would otherwise overlook.*

Catherine Z. Elgin

Miwon Kwon traces three tendencies in the site-specific art practices of the 1960s to the 1990s: an imperative to engage the constraints and affordance of physical location (exemplified by Land Art), a concern with social and institutional context as a condition of cultural production (for example, Institutional Critique), and finally, the identification of discursive spaces—"a field of knowledge, intellectual exchange, or cultural debate"—as "sites" for critical intervention. The requirements for GSSPs fall squarely into the first category of site as physical location. The scientific discussion of the golden spike of the Anthropocene, however, slips between discrete and distributed locations, types of materials, socio-historical episodes, and descriptions of the forms of historical agency exercised by the mysterious figure of Anthropos.

A careful inspection of the Balkin's *Guide* calls attention to an atmosphere permeated at every layer by technologies of communication, transportation and scientific research, a politically contested and heavily militarized domain crisscrossed by treaties, commercial and national air space rights. Returning to Rowell's *Uncanny Sensing (TX Prototype)*, we realize that his drone-shot video footage suggests a tiny fraction of the vantage points afforded by the myriad surveillance drones and satellites that clutter the lower and upper atmosphere. At once a discursive, institutional and physical space, the atmosphere hosts the infrastructure and material residues of the digital space in which we spend an ever increasing amount of time.

Xavier Cha's dance performance *Surveil* nicely exemplifies Kwon's description of the site a nomadic itinerary or "a fragmentary sequence of events and actions through spaces." Based on recorded patterns of Internet traffic (including that of the curators), *Surveil* transfigures durable inscriptions of our repetitive, compulsive, and circular modes of inhabiting digital space into choreographed movements. The work raises the possibility of placing the golden spike in a virtual world, or more disturbing, in the anxious minds of the alleged agents of the Anthropocene. The on-site production of this catalogue by Publication Studio (Antonia Pinter and Patricia No) during a one-week residency at the gallery plays with Kwon's notion of site as an (inter)textually structured

space. More importantly, it foregrounds the role of text and its material substrates in the formation of public space. If we are to take seriously the idea that geology may have to embrace the social domain in order to locate the beginning of the Anthropocene, then we ought to also consider the invention of the printing press, the radio and the Internet and other critical moments in media history as candidates for the golden spike.

*We are a geological force of nature, but that power is unlike any other force of nature in that it is reflexive, and can be used, withdrawn or modified.*

Simon Lewis and Mark Maslin

Each evening as the sun sets, Corriel's video projection floods the gallery's front windows with water, a reminder to passersby that their environment could be otherwise. Natalie Jeremijenko's *Signs of (Intelligent) Life* and *Phenological Clock*, mounted on INOVA's façade, suggest that the time for environmental change is now. Doubling as planters for local flowering plants and pit stops for pollinators, the signs advertise the gallery and carry messages introducing the Milwaukee community to the principles of mutualistic systems design which are at the heart of Jeremijenko's Environmental Health Clinic. While referring to agriculture as an early candidate for the golden spike of the Anthropocene, the project also looks forward to new, alternative sites. Jeremijenko's work suggests that we place the golden spike not in the past but rather in the present—at just that moment when we take the wheel and assume responsibility as drivers of the Anthropocene.

I would like to express deep thanks to Sara Krajewski for making it possible to realize *Placing the Golden Spike: Landscapes of the Anthropocene*. For their extraordinary work and many thoughtful conversations I thank the artists, Amy Balkin, Xavier Cha, Roderick Coover, Eric Corriel, Eve Andr ee Laram e, Natalie Jeremijenko, Scott Rettberg, Steve Rowell, Marina Zurkow and Publication Studio team Patricia No and Antonia Pinter. I would also like to thank Heather Davis, Heather Anne Swanson and Arijit Sen for their contributions to the catalogue. Thanks to Richard Grusin for inspiring me to work on the Anthropocene and for his ongoing support also to Arijit, Jennifer Johung and Emily Clark for their friendship and encouragement to pursue this project while I was a postdoc in Milwaukee.

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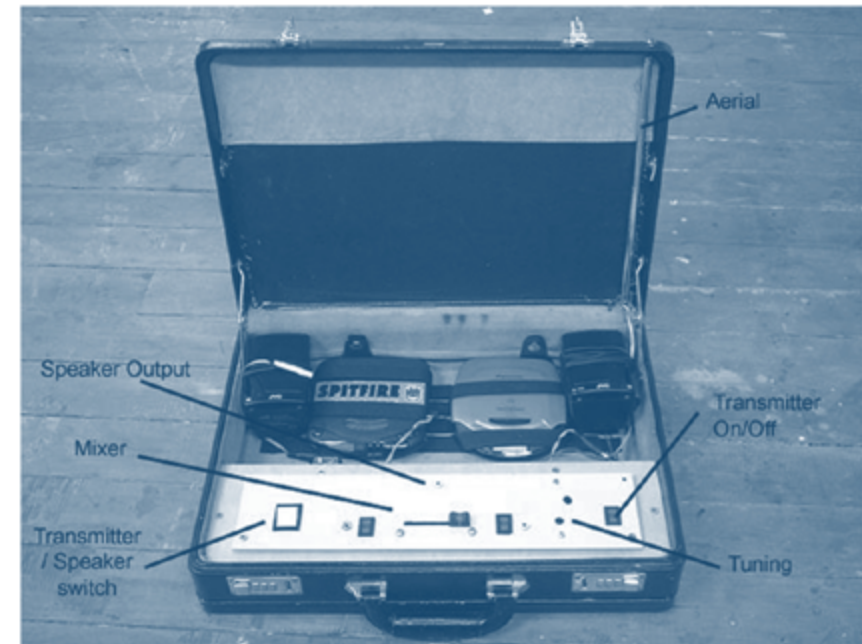
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## PUBLIC RADIO

Size: Briefcase

Frequency: 100-108 FM

Output: Minijack for headphones or to amplifier

Input: Twin CD and Mixer or Mike

Aerial: 1-1.5 Extendable

Power: 9-14V

Above, the *Pirate Radio Briefcase* by British anarchists the Space Hijackers is "a complete pirate radio station in a case. Hold parties wherever you want." This mobile radio transmitter contains "a fully operational pirate radio station complete with twin CD players, mixer, amplifier, speakers, transmitter, and aerial." Also available from Space Hijackers, the *Pirate Radio Jacket*—"dapper dress for pirate radio mischief making rude boys."

**Eve Andrée LARAMÉE**

Eve Andrée Laramée is Professor and Chair of the Department of Art at Pace University in New York City. Laramée is an ecological artist working at the confluence of art and science. She has exhibited throughout the United States, Europe, Asia, and the Middle East, including (amongst other institutions), the Venice Biennale, Mass MOCA, Massachusetts Institute of Technology (MIT), and the New Museum of Contemporary Art, New York. Her work is included in the collections of the MacArthur Foundation, the Museum of Modern Art, New York, and Harvard University Art Museum. Laramée's research investigates the impact of nuclear power and fossil fuels on ecosystems, climate, and human health. Current projects focus on the problem of radioactive waste which persists throughout geological time. Sources are uranium mining, nuclear weapons and energy production/decommissioning, and nuclear accidents. She has collaborated with physicists, hydrologists, geologists, biogeographers, and ecologists. Her art-and-science projects catalyze positive social change by promoting an awareness of environmental health issues and by directly involving communities. The outcomes share innovative thinking, extending the ways in which cultures imagine, create, and understand.



*Fukushima Psychopomp: Slouching Towards Yucca Mountain, 2012*

The premise of *Inverse Alchemy: Shadows in Reverse*, is that the detonation of *The Gadget*, the first atomic weapon to be tested at the Trinity site in the Jornada del Muerto Desert Basin in New Mexico, on July 16, 1945, triggered the Anthropocene era. Nuclear weapons deploy a dark *inverse alchemy*. Radioactive Uranium-238 decays through its half-life “daughters” into stable Lead-206, over 4.47 billion years of geological time. The gold-leafed detonator core of *The Gadget*, insured “correct” implosion, creating the guiding metaphor of the transmutation of gold into lead rather than lead to gold.

At the moment this event occurred, the world was irreversibly altered. The effects of subsequent bombing can be geologically traced in Earth's strata, starting with Japan, and then compounded by thousands of nuclear weapons tests during the Cold War. Radioactive isotopes from these activities can be detected in ice core samples from Antarctica. Those are the radioactive fingerprints of the Anthropocene era. Research, development, testing, use, and decommissioning of these weapons of mass destruction have created an invisible map across the globe—a dark, shadowy realm of environmental and ecological degradation, marked by glowing light that indicates radioactive impacts. This installation tracks three-fold post-Trinity nuclear activities: 1. Science Fact, 2. Science Fiction, and 3. Fiction Science. As we are learning post-Fukushima, when climate change occurs and vulnerability spectrums shift, nuclear sites and the ecosystems surrounding them are at increased risk.



Radioactive waste is never disposed of; it is dispositioned—placed out of sight and out of mind. *Disposition* is the word used by the military and industry rather than the word disposal. The dictionary definition is very telling:

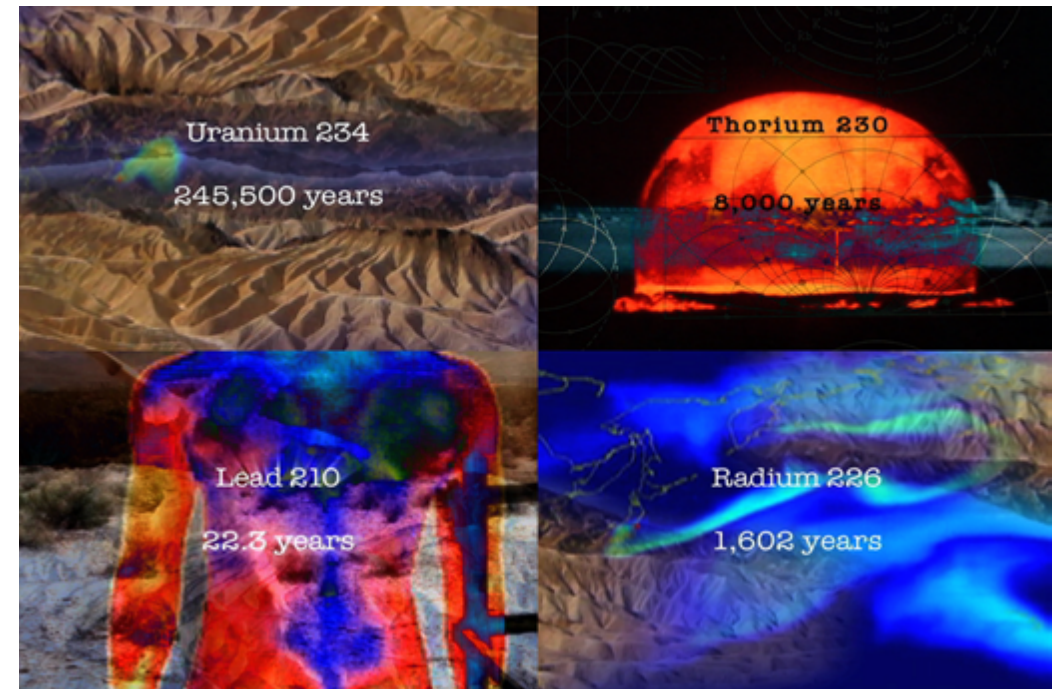
DISPOSITION |,dispə'ziʃən|

- A person's inherent qualities of mind and character
- An inclination or tendency
- The action of arranging or ordering people or things in a particular way
- Military preparations, in particular the stationing of troops ready for attack or defense
- The action of distributing or transferring property or money to another
- The power to deal with something as one pleases

Disposition is a fluid situation. It is not a fixed or final resting place. It is an approximate proximity of traces, a distribution of particles weaving together fields of radiotoxic matter through geological time and space. Dispositions are temporary locations at multiple sites and confluences of flows. They represent and embody temporary clumps of matter, environmental attitudes and values. Suspended in this turbulence we find millions of particles, some colliding, others softly slipping past one another, slipping through holes in the system. Millions of tons of contaminated earth and billions of gallons of radioactive fluids comprise these complex fields of toxicity. Isotopes moving through strata and time, result in cancer clusters and birth defects throughout the world. Dispositioned traces of radiation slips into our cells, into the spaces between our bodies, into our selves.



*Time Traveler from the Future: Slouching Towards Yucca Mountain, 2012*



*Uranium Daughters, 2012*



*Danger Ranger: Slouching Toward Yucca Mountain, 2012*

*The Uranium Daughters* video is a visual metaphor for the half-life of Uranium-238, responding to the problem of radioactive waste storage and the ongoing Fukushima meltdowns. The split screen connotes splitting of atoms, transmutation of elements, and cell division. Over geological time, uranium undergoes exponential decay into “uranium daughters” that cascade into other elements and finally to stable Lead-206. This video calls attention to legacy radioactive waste produced by the military during the Cold War. The build-up of nuclear weapons created the parallel “peaceful” nuclear energy industry. Thermographs and spectrographic maps of the Fukushima Daiichi nuclear reactor meltdowns and radioactive hotspots are overlaid onto the landscape of Mojave Desert ghost towns, Death Valley, and the Nevada Test Site (N2S2).

*Teratology* sheds light on the study of abnormalities in the physiological development and congenital disorders of fetuses caused by prenatal exposure to radiation. During organogenesis and early fetal development stages, structural and functional defects are at higher risk, causing mutations and malformations, such as microencephaly and chromosomal displacement.



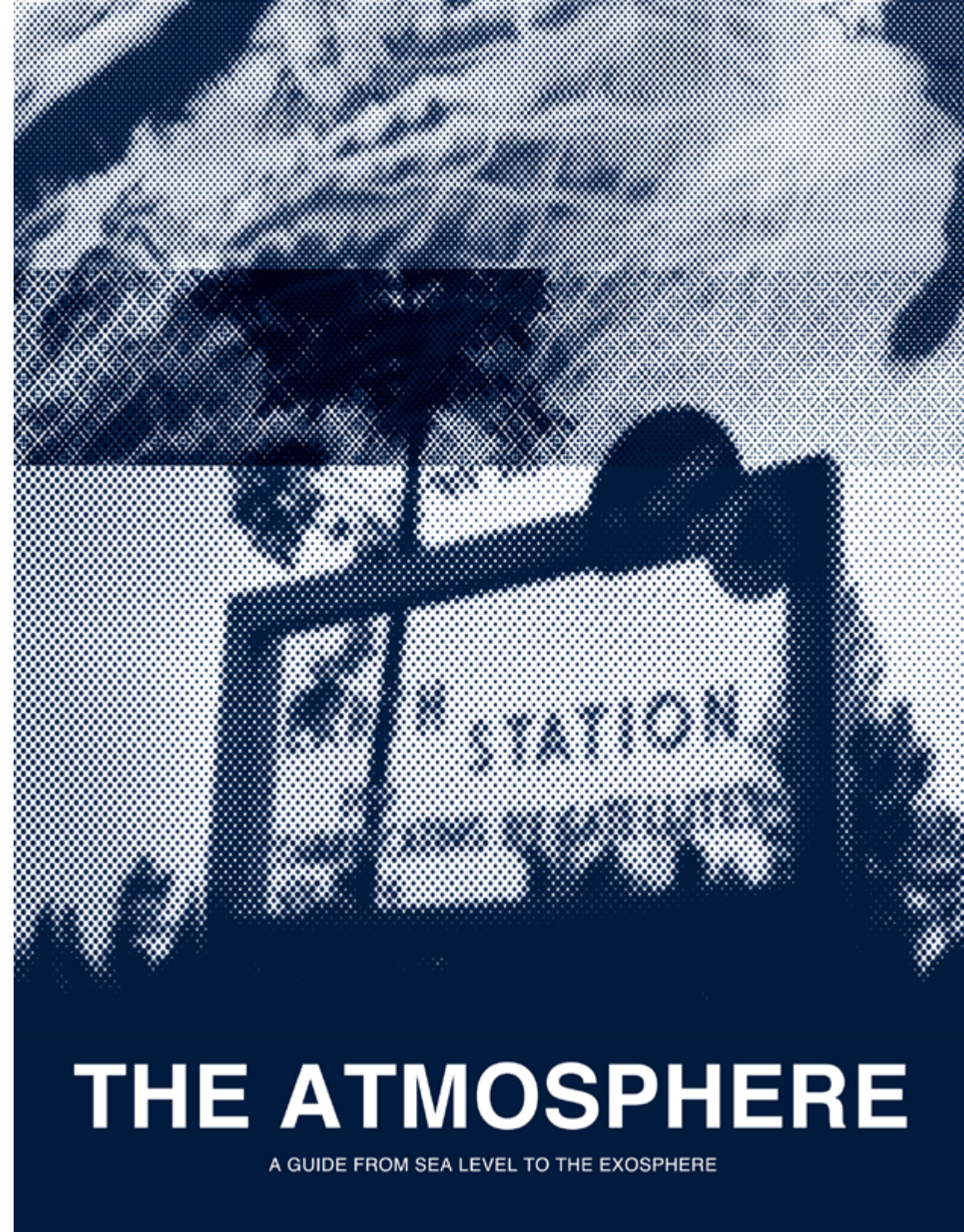
Radiation is a potent teratogen that can cause involution, the shrinking of organs, including the brain, and other developmental abnormalities.

*Slouching Towards Yucca Mountain* is an installation featuring twelve fictional time traveler characters who explore the landscape of the post-atomic West. The project uses humor and beauty to address the serious problem of radioactive waste. After 60+ years of military and industrial nuclear waste production, there is no viable plan for long term deep geological storage. Excerpts of several characters are included in the exhibition. *Danger Ranger the Toxic Avenger*, is a time-traveling whistle-blower. She bears witness to the environmental degradation of land and water, *Time Travellers in Black* come from the future. *Time Travelers in Brown* come from the past. *Reptile Woman* lives in the abandoned tunnels beneath the decommissioned Yucca Mountain Nuclear Waste Repository. Last *Fukushima Psychopomp* guides souls to the underworld. She is a spectral entity ushering souls from the world of the living to the world of the dead.



*Reptile Woman Emerging from the Tunnel: Slouching Towards Yucca Mountain, 2012*





# THE ATMOSPHERE

A GUIDE FROM SEA LEVEL TO THE EXOSPHERE



# THE ATMOSPHERE

**As plotted from sea level to the exosphere.** The atmosphere is defined by the extent of the atmosphere and the surface of the Earth's atmosphere. The atmosphere is a fluid mixture of gases and vapors that surrounds the Earth, whether chemical, nuclear, or biological. Read the story to visualize more than 100 years of human history and the 1957 Space Climate Year. The University of Colorado Boulder and the 1957 Space Climate Year. The University of Colorado Boulder and the 1957 Space Climate Year. The University of Colorado Boulder and the 1957 Space Climate Year. The University of Colorado Boulder and the 1957 Space Climate Year.

## Amy BALKIN

Amy Balkin's projects address legal borders and systems, environmental justice, and the allocation of common-pool resources. They include *A People's Archive of Sinking and Melting* (Balkin et al.), atmospheric "clean-air" park *Public Smog*, and *This is the Public Domain*, an effort to create a permanent international commons. She was a collaborator on *Invisible-5*, an environmental justice audio tour of California's I-5 freeway corridor. Recent exhibitions include *Rights of Nature-Art and Ecology in the Americas* at Nottingham Contemporary, *Lenin: Icebreaker Revisited* at the Austrian Cultural Forum New York, and *Anthropocène Monument* at les Abattoirs, FRAC Midi-Pyrénées, Toulouse. Her work was included in *DOCUMENTA (13)*, and will be in forthcoming books *Art in the Anthropocene* (Heather Davis and Etienne Turpin), *Decolonizing Nature: Contemporary Art and the Politics of Ecology* (T.J. Demos), and *Critical Landscapes* (Emily Eliza Scott and Kirsten J. Swenson).

LAYERS OF THE ATMOSPHERE	YOU ARE HERE	POLLUTION	SPATIAL POLITICS	REMOTE SENSING	CLIMATE CHANGE	AIRSPACE	ELECTROMAGNETIC SPECTRUM
<b>EXOSPHERE</b> <b>EXOBASE</b> 600-80,000 KM/374-50,000 MI	<b>WHAT PEOPLE SHOULD KNOW</b>	<b>SPACE JUNK - CO2</b>	<b>SATELLITES</b>	<b>SATELLITE REMOTE SENSING</b>	<b>THE SPECULATIVE</b>	<b>OUTER SPACE TREATY OF 1967</b>	<b>THE SOUND OF SPACE WEATHER</b>
<b>THERMOPAUSE</b> <b>THERMOSPHERE</b> 90-600 KM / 56-375 MI	<b>ENMOD</b>	<b>SHINING SKY</b>	<b>WEAPON GRIDS</b>	<b>LIMBOPHERE-THERMOSPHERE PROXIES</b>	<b>GENEENGINEERING</b>	<b>KARMAN LINE (100 KM / 62 MI)</b>	<b>AURORA</b>
<b>MESOPAUSE</b> <b>MESOSPHERE</b> 50-90 KM / 31-56 MI	<b>NOCTILUCENT CLOUDS</b>	<b>GENEVA CONVENTION ON AIR POLLUTION</b>	<b>SCIENCEWASH</b>	<b>ARIDITY OF ICE IN THE MESOSPHERE</b>	<b>ATMOSPHERIC &amp; CLIMATE JUSTICE</b>	<b>CLIMATE MODEL</b>	<b>SKYWAY (IONOSPHERIC REFRACTION)</b>
<b>STRATOPAUSE</b> <b>STRATOSPHERE</b> 20-50 KM / 12-31 MI	<b>JOSEPH KITTINGER (1931-2014)</b>	<b>ARCTIC AIR POLLUTION TRANSPORT</b>	<b>WAR IN THE LOWER ATMOSPHERE</b>	<b>DRIFTSOUND</b>	<b>OZONE (O<sub>3</sub>)</b>	<b>DIVERSIONS</b>	<b>SPECTRUM</b>
<b>TROPOPAUSE</b> <b>TROPOSPHERE</b> 0-20 KM / 0-12 MI	<b>ARCTIC BALLOON EXPEDITION OF 1987</b>	<b>TRANSBOUNDARY AIR POLLUTION</b>	<b>ATOMIC TESTS IN THE ATMOSPHERE</b>	<b>RADIOSOON</b>	<b>ATMOSPHERIC BROWN CLOUDS</b>	<b>VERTICAL EXTENT OF SOVEREIGNTY</b>	<b>TROPOSCATTER</b>
<b>SEA LEVEL</b> 0 KM / 0 MI	<b>SF-BAY AREA AIR BASIN</b>	<b>THE DONORA SMOG</b>	<b>HAARP</b>	<b>LIDAR (LIGHT DETECTION &amp; RANGING)</b>	<b>SHIP TRACKS</b>	<b>AIR RIGHTS</b>	<b>PUBLIC RADIO</b>
<b>CHARTING THE SKY</b>	<b>SOURCES &amp; CREDITS</b>	<b>ACKNOWLEDGEMENTS</b>	<b>INDEX</b>	<b>ABOUT THE GUIDE</b>	<b>CONTACT</b>	<b>NOTES</b>	<b>CONTRIBUTORS</b>

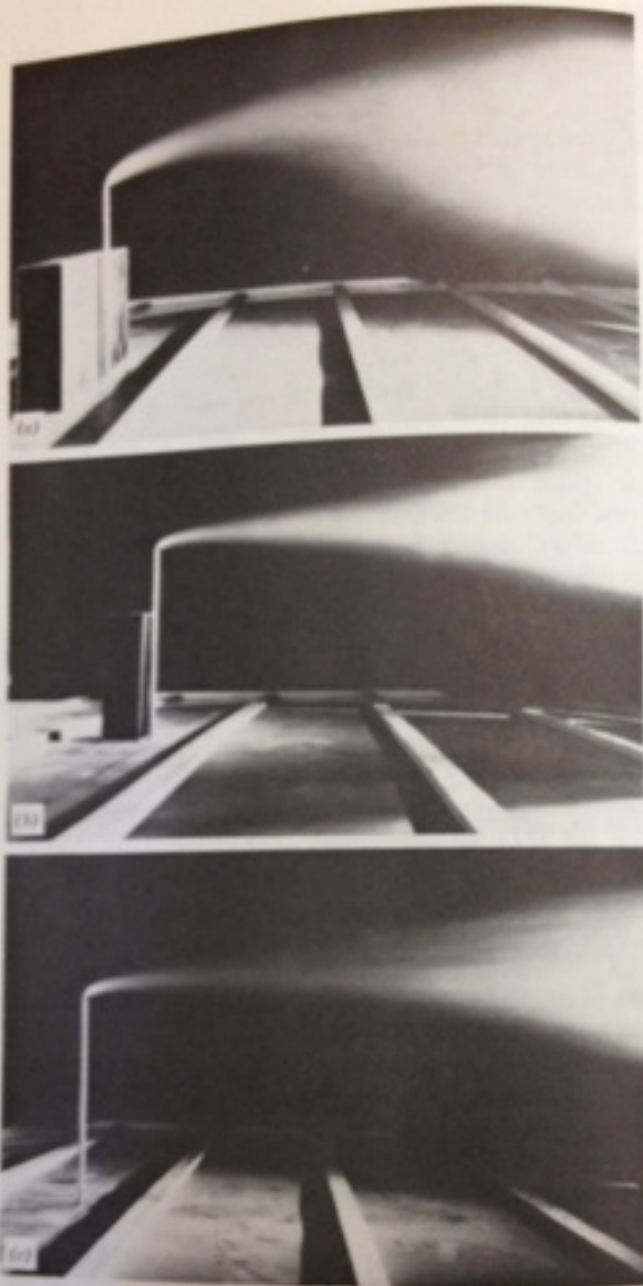


FIGURE 7.3 EPA model studies of air pollutant dispersion. Reprinted with permission from *Atmospheric Environment*, Vol. 10, W. H. Snyder and R. E. Lawson, Jr., "Determination of a Necessary Height for a Stack Close to a Building—A Wind Tunnel Study," Pergamon Press, New York. (Photos supplied courtesy of the Fluid Mechanics Facility, Environmental Protection Agency, Research Triangle Park, North Carolina.) (a) Building width twice its height. (b) Building width one third its height. (c) Stack without building.

APPROACHES TO F

volume unit within wastewater discharge there is no change component needed bacteria are transferred in the number of mathematically. Normally the real bacteria formulation, and assumes that the reaction as the shorthand way of number of bacteria

Figure 7.4 summarizes volume unit located selected. Since this also be described "Travel time" is r

A mass balance of typical volume unit transformation prior to the differential

where

$t$  = time  
 $N(t)$  = conc  
 $N_0$  = conc  
 $(t =$   
 $k$  = bacte

"The term first order differential equation."  
 "This formulation provides average motion of the dispersion. The differ

subject to the initial to this equation with

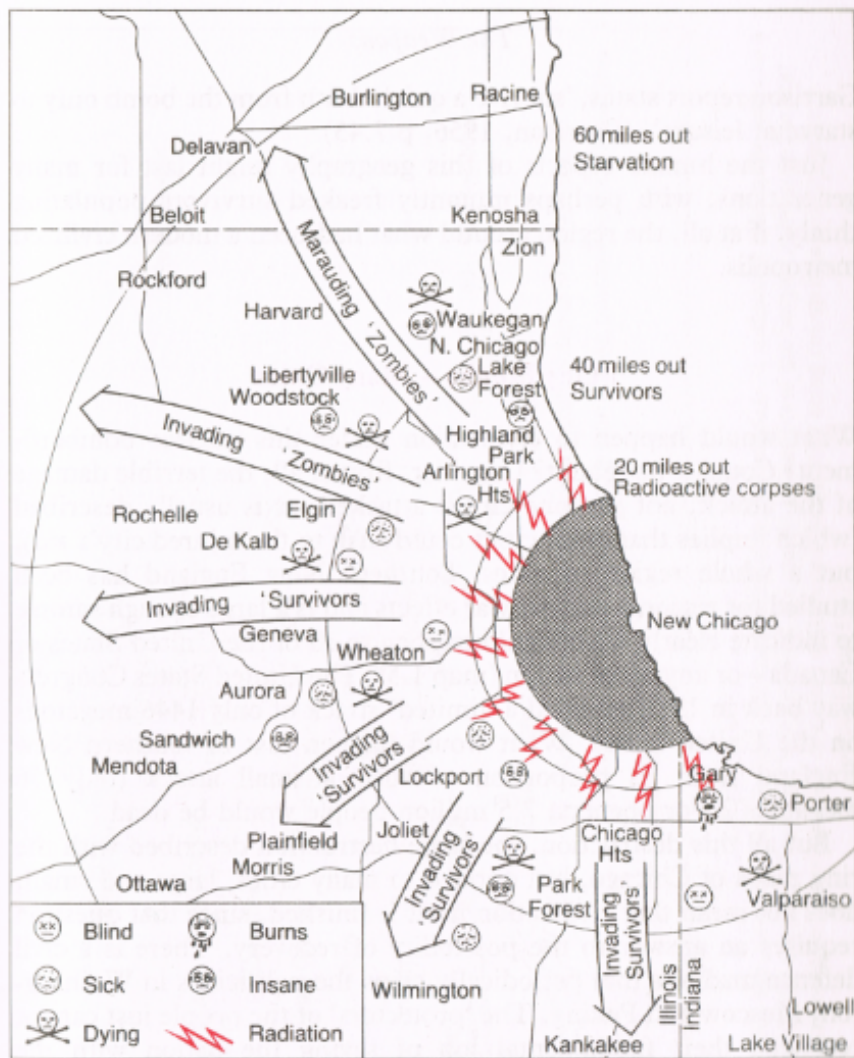
*The Atmosphere: A Guide* is a poster-essay depicting various human influences on the sky and their accumulated traces, whether chemical, narrative, spatial, or political. Visually referencing the Cloud Code Chart, another interpretive aid for looking up, the Guide visualizes some ways humans occupy present, past, and future atmospheres, from sea level to the exosphere.

*A People's Archive of Sinking and Melting* is a growing collection of items contributed from places that may disappear owing to the combined physical, political, and economic impacts of climate change, including glacial melting, sea level rise, coastal erosion, and desertification. Through common but differentiated collections, contributed materials form an archive of the future anterior; what will have been. The materials in the archive mark the asymmetry of present or anticipated loss, standing in as proxies for the contributors' recognition of the geopolitical production (or spatial politics) of precarity and slow-onset dispossession. Together, the contributions form one material record among many, a collection of community-gathered evidence, a public record, and a midden.

The archive operates from the principle that any thing is equally valuable as a record of present or projected future disappearance of a place, as chosen by someone there. A contribution doesn't have to originate from that location—it can be anything that happens to be there, including detritus, flotsam or jetsam. As of 2013, the archive contains contributions from Anvers Island (Antarctica), Cape Verde, Greenland, Kivalina (Alaska), Nepal, New Orleans, New York City, Panama, Peru, Senegal, and Tuvalu.

Left: Image courtesy of the artist

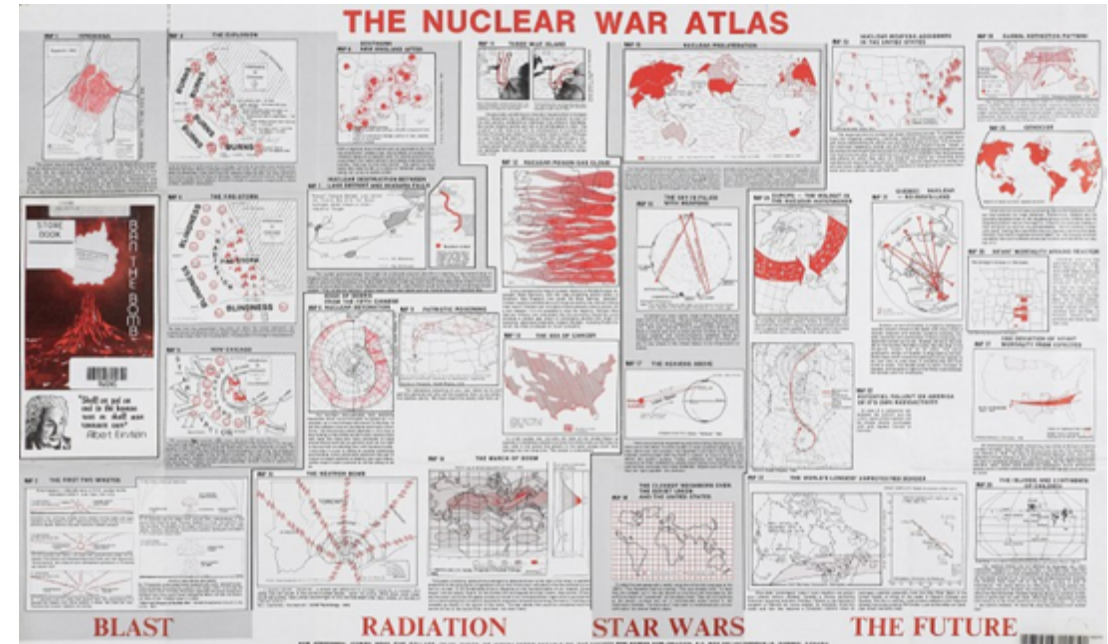




**Map 1.4 New Chicago**

The third ring map is apparent the minute the firestorm has burned out. It is the geography of New Chicago, which gradually fades away only after thousands of years. The new Port of Chicago, the Bay of Chicago, is surrounded by a 'hot' ring. The corpses do not begin to be evident until the edges of the firestorm are passed.

The survivors, however, are the ultimate blight of all. The rings of the dead, blinded, crazed, dying-of-radiation-sickness finally give way to the largest ring, the ring of the starving. Even distant farmers, without pesticides, fertilizer, horses or gasoline for farm machinery, might starve.



The visual rhetoric of NASA's Skywatcher's Chart and earlier cloud atlases is echoed in William Bunge's poster essay Nuclear War Atlas, which became the basis of his later book *Nuclear War Atlas*. 2nd edition. Oxford, UK; New York, NY, USA: Blackwell Publishers, 1988.



A People's Archive of Sinking and Melting, 2012–present  
 Top: Nepal Collection Bottom: New York Collection

1. Choose an item

Any item is equally valuable as a record of a sinking or melting place, as contributed by someone who lives there. Your contribution can be something natural, manufactured, found, made, or discarded, including trash. It doesn't have to originate from that place—it can be anything that is there. Your contribution will be archived with the information you send about it and the location's UNFCCC Party Grouping (provided).

2. Fill out the contribution form below and email it to: registrar@sinkingandmelting.org

Item name:

Material:

Contributed by:

Location:

Latitude/Longitude (if available):

Location is Sinking / Melting (choose one):

Date found/contributed:

Notes/further information:

Images (optional/attach any 7MB .jpg or smaller images):

3. Deliver your contribution to INOVA

4. Add an interview (optional)

Please answer the below if you'd like to provide an interview to accompany the online archive and for possible publication:

Do you live where the object came from? If not, what is your relationship to that place?

What have you seen disappear, or expect to disappear, environmentally or otherwise?

What do those disappearances mean?

What's your relationship to the object(s) you contributed?

Why did you contribute to the archive? What do you hope for your contribution, and the archive generally, to change or draw attention to?





A People's Archive of Sinking and Melting, 2012 - present  
Above: Kivalina Collection  
Right top: New Orleans Collection  
Right bottom: Antarctica Collection



**Eric CORRIEL**

After growing up on Long Island, Eric Corriel graduated from Cornell University where he received a Bachelors of Arts in Philosophy while also studying Fine Art and Computer Science. He later received a Diplôme National d'Arts Plastiques (National Diploma of Fine Art), the equivalent of an MFA, focusing on Digital Art, from the École Régionale Supérieure d'Expression Plastique in Lille, France. Currently living in Brooklyn, Eric takes the urban landscape as a medium in which to create site-specific video installations in the public realm. He teaches interactive design at the School of Visual Arts in New York City, where he is also Lead Web Designer and Developer.

For his artwork, Eric has been awarded by the New York Foundation of the Arts, New York Council for the Arts, and the Public Art Network. As a web designer and developer he has received awards from the Webbys, Davey Awards, and W3.



*Water Will Be Here, 2010*  
Top: Brooklyn, NY  
Bottom: Atlanta, GA



My work revolves around transforming the urban landscape through site-specific installations. The urban landscape, as unique as it is, generally recedes into the background of our daily lives, almost to the point of failing to be noticed at all. Paradoxically, this is precisely what makes it such a powerful medium. The fact that it is an elemental component of our daily lives grants it exceptional reach into our consciousness. My work aims to leverage this medium's inherent power to pull other levers. By hacking a digital camera I intervene on the thin layer between reality and its representation. Effectively, I perform acts of "wire crossing" to alter how the camera perceives reality.





## **Roderick COOVER**

Roderick Coover is the creator or co-creator of works of digital, interactive, and emergent cinema and media arts, including *Toxi•City*, *Hearts and Minds: The Interrogations Project*, and *The Theory of Time Here*. His documentary films and interactive, documentary research projects include works such as *The Unknown Territories Project*, *From Verite to Virtual: Conversations On The Frontiers Of Anthropology And Documentary Film*, and *Cultures In Webs: Working In Hypermedia with the Documentary Image*. Coover is the recipient of Fulbright, Whiting and Mellon awards among others. His works are internationally exhibited and anthologized, and they are distributed by Video Data Bank, Documentary Educational Resources, Eastgate Systems, University of Chicago, and CRchange, which is a production company he co-owns with Scott Rettberg. Coover is Director of the Graduate Program in Film and Media Arts at Temple University and Founding Director of the Graduate Certificate Program in Documentary Arts and Ethnographic Practices. He lives in Philadelphia.

## **Scott RETTBERG**

Scott Rettberg is Professor of Digital Culture in the department of linguistic, literary, and aesthetic studies at the University of Bergen, Norway. Rettberg was the project leader of ELMCIP (Electronic Literature as a Model of Creativity and Innovation in Practice), a HERA-funded collaborative research project that ran from June 2010-June 2013. Rettberg is the leader of the Bergen Electronic Literature Research Group. Rettberg is the author or co-author of novel-length works of electronic literature, films, and new media art projects including *The Unknown*, *Kind of Blue*, *Implementation*, *Toxi•City*, *Hearts and Minds: The Interrogations Project* and others. His creative work has been exhibited both online and at international art venues, including the Beall Center, the Slought Foundation, and others. Rettberg is the co-founder and served as the first executive director of the nonprofit Electronic Literature Organization, where he directed major projects funded by the Ford Foundation and the Rockefeller Foundation. He is the conference chair of the 2015 End(s) of Electronic Literature Conference and Festival.



Images and texts from *Toxi-city*, 2015





Mudiwa and Kenya in Newark died of carbon monoxide poisoning from a diesel generator that was placed too close to the open window of their apartment. The open window created a vacuum effect that pulled the smoke in as they slept in the cold room. They died in their sleep and were found cuddled together in Kenya's bed.

Created by filmmaker Roderick Coover and writer Scott Rettberg, *Toxi•City* is a combinatory climate change narrative that generates a new film each time it is shown. Six people struggle to survive after hurricanes and toxic events have devastated Philadelphia and New Jersey. These speculative stories of life in a post-industrial wasteland are set against the true stories of deaths from Hurricane Sandy in an algorithmic symphony of contemporary despair.

The film interweaves fact and fiction. Over a two-year period, Roderick kayaked and walked Delaware River estuary and coastal regions filming locations threatened by sea-level rise. He researched industrial and environmental histories. He filmed fragile marshlands at Prime Hook Wildlife Refuge transformed by tidal change, structures in Lewes and Fortescue that were caving into the water, decaying petro-chemical industries at Paulson and Philadelphia, and the brownfields of Rohm Haas in Frankfort and Roebing Steel industries in Florence. His travels took him further afield as he compared the Delaware estuary with other flood-prone, post-industrial shorelines, like the Thames in England. Roderick's work speculates upon consequences of rising tides washing over highly populated, chemical landscapes.

The visual explorations provided a foundation for Scott, who developed the narrative accounts of six characters living in communities of the Delaware River estuary in a near future age of sea-level rise. Hurricane Sandy hit the East Coast just as he began work on the script; and it devastated an area of New Jersey where Scott used to live and he researched the stories of many people who died in that actual disaster. These obituaries are interwoven with the speculative narrative segments. Running continuously, the film's recombinatory system never generates the same narrative sequence twice, but nevertheless produces a coherent holistic story of each character's search for meaning in the face of environmental catastrophe.





Margaret and Lawrence died in a fire in their one-story home in Middlesex, apparently caused by a candle they were using during the power outage. Lawrence, who collected old vinyl LP records, was found dead of smoke inhalation in the basement. His mother Margaret was pulled from the blaze but died in the hospital ten days later. Margaret used to sing, not only in church, but with the Sweet Adelines all-ladies barbershop quartet.







## SHRINKING SKY

Although CO<sub>2</sub> emissions cause warming in the lower atmosphere, they can cause the thermosphere to cool. Cooling is already reducing the density of the thermosphere, causing an overall contraction.

Since the 1940s, the thermosphere, which warms and expands significantly by day and cools and shrinks at night, has shrunk by five miles.

**Heather Davis**

Heather Davis is currently a postdoctoral fellow at the Institute for the Arts and Humanities at Pennsylvania State University. Her work traces the ethology of plastic and its links to petrocapi-talism. She completed her Ph.D. in the joint program in Communication at Concordia University in 2011 on the intersection of community-based art, relational subjectivity, and ecology. She has been a postdoctoral fellow in Women's Studies at Duke University and a visiting scholar in the Experimental Critical Theory Program at UCLA, the Aesthetics and Politics Program at the California Institute of the Arts, the Hemispheric Institute of Performance and Politics at NYU, and the Department of Women's and Gender Studies at Rutgers University. She is the editor of *Art in the Anthropocene: Encounters Among Aesthetics, Politics, Environment and Epistemology* (Open Humanities Press, forthcoming 2015) and *Desire/Change: Contemporary Feminist Art in Canada* (McGill-Queen's UP, forthcoming 2016). Her writing can be found at [heathermdavis.com](http://heathermdavis.com).

The plants appear in unlikely places. They grow up in cracks, in abandoned hallways. They grow slowly, almost imperceptibly. Their appearance is organic, but their touch uncanny. Yevgeniya Kaganovich's *grow* was conceived of as durational installations: the small plant-like sculptures grow over time. They are composed of plastic bags, and visitors are encouraged to leave their plastic bags in a receptacle to be added to the growth of the "plants." The mindless accumulation of plastic, pictured through the plastic bag, is here transformed into a kind of weed, spreading in a logic that evokes and mimics metabolization but heralds in a new kind of order. For unlike regular plastic plants, the plants of *grow* do not merely imitate. These are not the plants found in offices and homes that give the appearance of life, mimicking biology but without responsibility. Instead, *grow* plants embrace their own artificial materiality, creating a form of pseudo-life that operates within its own cycles rather than those determined by carbon, oxygen, water. These plants instead occupy the life cycles of the converted waste of the oil industry, and the corresponding difficult labor of recycling. This life-cycle is displayed through other works in the show. Steve Rowell documents the ecological transformation of the landscape of Texas in *Uncanny Sensing (TX Prototype)* by way of oil extraction, its bright flares emerging as the beacons of a solipsistic and near-sighted modernity. The birth of oil here illuminates plastic's origins while Marina Zurkow's *Landfill Club* creates a midden that carefully archives its disposal. Zurkow invites visitors to collect, sort and tag their own plastic debris, and to fill out a questionnaire that asks after the life-cycles of these eminently disposable goods. But in her performance, discarding plastic becomes at once intimate and archaeological: the life-worlds of the personal objects becoming figures for the future geologic records of humanity.

Plastic, and its accumulation, is one material that scientists are currently considering as a "golden spike" for the Anthropocene.<sup>1</sup> Plastic is a useful indicator, as all the plastic that has ever been created since its first appearance in 1907 (the date the first



synthetic polymer, Bakelite, was invented) is still somewhere on the planet. There is a clear division, in the geologic record, between the dates before plastic and after plastic. For plastic easily disperses, breaks apart, and we spend a huge amount of energy to contain plastic “elsewhere,” but plastic does not go away. It does not biodegrade. That is, it does not turn into something else. So all the plastic that has ever been made, from take-out containers to nylons to IV bags, is rapidly composing a new kind of geologic layer on the earth. Chemical engineer Anthony Andrady, a world expert on plastics, puts the lifespan of plastic at about one hundred thousand years—but no one really knows how long this new material will persist.<sup>2</sup> What is particularly interesting about this date is that it indicates an evolutionary movement, rather than something innate to the polymers themselves. In other words, the figure of ten or one hundred thousand years, what we sometimes name as the length of time it would take for plastic to biodegrade, is rather the projected evolutionary timespan for an organism to appear that can successfully metabolize plastic. There is some speculation that certain forms of bacteria can do this presently, under particular circumstances, but these organisms are not widespread and the results debated.<sup>3</sup> So, we wait for evolutionary time to catch up to the petrochemical industry.

In the meantime, plastic is recoating the surface of the earth, and as the earth is mainly composed of ocean, a significant amount of plastic waste finds its ways to the oceans.<sup>4</sup> Ocean plastic is found at every ocean depth, from the surface to the floor, where it is eaten by all kinds of organisms, from bacteria to whales to corals, even if it cannot be digested.<sup>5</sup> In these watery conditions, especially those beyond the reach of light, how long might it take for organisms to be able to unlock the vast sources of energy contained in plastic, metabolize them, and return the carbon dioxide and water back to the surrounding environment? We have no idea; although Andrady says that the plastic at the bottom of the ocean might exist “in perpetuity.” Regardless, the time scales of plastic are geologic, evolutionary. Plastic forces a kind of geologic thinking. Plastic’s geology is also expressed as a new form of rock. The Geological Society of America has approved the name *plastiglomerate* to describe a “hybrid” material resulting from the fusion of plastic debris with natural materials such as lava, wood, metal, sand, and marine corals. The “plastiglomerate” refers to an “indurated, multi-composite material made hard by agglutination of rock and molten plastic. This material is subdivided into an in situ type, in which plastic is adhered to rock outcrops, and a

clastic type, in which combinations of basalt, coral, shells, and local woody debris are cemented with grains of sand in a plastic matrix.”<sup>6</sup> Plastic becomes rock when it melts and then either attaches itself to other existing rock formations, or mixes with debris. Once hardened, the plastic will endure, literalizing its geologic status. Plastic, here, is literally becoming rock.

But there is a fundamental difference between rock—rock that is the foundation of the Earth—and plastic. When we point out the synthetic or “artificial” nature of something, what we are pointing to is the way in which it develops, emerges or is created irrespective of its surrounding environment. Plastic is not *of* this earth in the sense that the earth itself, particular sites, carry memories of the creatures and activities that have taken place on them. There is an infolding of geology, atmosphere and organism, one that mutually co-evolves and that carries with it certain memories and patterns of behavior, holding not only the memories of the *human* creatures that occupy or pass through a particular place, but also the memories of the other animals, plants, and geologies that also mutually (in)form that place. There is an infolding of knowledge through the circulation of matter and energy that passes through a place. A world develops with a particular organism, and the organism with the world. They mutually compose and become co-constitutive of each other. This is a kind of radical reciprocity from which an ethics of land emerges, as Jeanette Armstrong argues,<sup>7</sup> or in a similar vein what Dwayne Donald calls an “ethical relationality.”<sup>8</sup> These understandings of ethics articulate the ways in which the land demands of us a reciprocal engagement, one where we are forced to acknowledge our enmeshed and interdependent relations. The land itself calls us to develop an ethics of radical and reciprocal relationality.

The rapid proliferation of materials that have no relation to any particular place defies the logic of the earth itself, and the reciprocal and relational ethics that we are called upon to listen to. Even in geology, rocks bear traces, or an inscription, of their history, determining and being determined by the activities of the creatures that reside, pass through, live and die within particular environments. This sense of ecology, tied to a notion of place-making, is defied by a material such as plastic. There is no ‘local’ for plastic. Instead, plastic exists everywhere and anywhere. “Plastic,” as Amanda Boetzkes and Andrew Pendakis write in their provocative account of plastic’s relation to oil and art, “is always a ‘some’ or an ‘any,’ never a ‘this or a ‘that.’ It feels infinite because it sheds every trace of particularity, every index of a located space and time.”<sup>9</sup> It has no

birthplace, no evolutionary home, no relations to its surrounds. It has no *Umwelt*, or world that is made in a co-evolutionary fashion, in the sense that Jakob von Uexküll articulates.<sup>10</sup>

This is the reason that we are attracted to plastic. Aside from its practical applications, which are myriad, plastic rids us from our obligations to the earth, to place. Plastic emerges free of historical weight, seemingly light and endlessly transformable because of the fundamentally alienated quality of its being. In the 1950s, when plastic was first becoming integrated within, and in many ways, defining, commodity capitalism, “Plastic...was marketed as a substance that was not degraded by history or nature.”<sup>11</sup> Plastic represented a shiny new world free of the demands of the earth, of death, and decay. Ridding ourselves of these demands seemed to promise a world of prosperity, through scientific control. Plastic has always been a thoroughly profit-driven material. Even when the category of what we now think of as plastics was still in formation, its nature was more “commercial than scientific,” as Jeffrey Meikle argues in his illuminating and far-reaching cultural history, *American Plastic*.<sup>12</sup> And in order for plastic to be a commercial success, we needed to create a use for it, or as many uses as possible, and, for it to be infinitely disposable.

Plastic became synonymous with ephemerality, seeming to offer a substance without ontology precisely because of this manufactured disposability. This ontological problem is what is alluded to in its name: the ability to morph, be molded, or transform. Roland Barthes made this argument in 1957 in an essay entitled “Plastic” where he wrote, “more than a substance, plastic is the very idea of its infinite transformation; as its everyday name indicates, it is ubiquity made visible...it is less a thing than a trace of its movement.”<sup>13</sup> Boetzkes and Pendakis echo this sentiment, they write that plastic defies ontological categories: “Indeed, plastic is less a substance than its antithesis, a paradigm in which substance is transformed into a way of being unmoored from the coordinates that stabilize presence and meaning.”<sup>14</sup> The process of mooring oneself to the coordinates of presence and meaning, I would argue, is what it means to be earth-bound, to form and to be informed by enmeshed relations to mineral, animals, water, air, to processes of change, transformation, and metabolization. Plastic instead is a surface, that which, despite insinuating itself into the geologic layer, remains separated from the earth. Plastic is designed to be all surface, all the way through, with no variation, no history. We use it so widely because it can become anything, infinitely transformable

and manipulable to the wills and whims of human invention. Plastic removes itself from a standard ontological category because it, by design and of necessity, is universal. It becomes universal as it is abstracted from the earth. As Esther Leslie writes in a brilliant book on artifice, nature, and the chemical industry, “Time’s dominion was to be cracked...through the accelerating power of chemical reaction—modern magic consists in the short-circuiting of natural process... In time, technology remakes times itself, removing it from natural rhythms to an abstract universal.”<sup>15</sup> Plastic’s materialization of the universal can also be seen as the perfect extension of the logic of petrocapi-talism. Michael Hardt, linking the relations of capital to plastic, says, “Accumulation is always against metabolism and against use. I mean the dream of the permanence of money, of an infinite ability to accumulate value without its degrading... The end point of accumulation, and specifically the accumulation of plastic, is the death of metabolism.”<sup>16</sup> Plastic can be seen as a perfected materialization of this desire for *accumulation without metabolism*: it endlessly accumulates, spreading itself over the entire surface of the earth, throughout the oceans and embedded in the geologic strata while creating a sealant or barrier for breath, metabolism, chemical exchange.

Plastic cracks time. Compressed and recomposed, it exists outside of the cycles of life and death, an undead time that has an existence only akin to the geologic. Rather than assuming the slippage of an ontological category through the figure of plastic, perhaps it would be more productive to think of plastic as possessing a kind of geontology. This is the trick of plastic, appearing in its universalized materiality, it represents a stiff ontology, an ontological formation that seems to take itself too seriously, a stubborn being that refuses to go away. If we follow the life-cycle of plastic, it leads not to an ephemeral non-ontological force, but to an all too material and materialized set of implications for multiple beings, humans and nonhumans alike, in the world. As historian of science Bernadette Bensaude Vincent writes,

Our Plastic Age confronts the issue of duration. The ephemeral present of plastics is not just an instant detached from the past and the future. It is the tip of a heap of memory, the upper layer of many layers of the past that have resulted in crude oil stored in the depths of the soil and the sea. Plastics really belong to Bergson’s (1946) duration; they cannot be abstracted from the heterogeneous and irreversible flux of becoming. The present is conditioned by the accumulated traces of the past, and the future

of the earth will bear the marks of our present. While the manufacture of plastics destroys the archives of life on the earth, its waste will constitute the archives of the twentieth century and beyond.<sup>17</sup>

The artists in this exhibition understand the dual logic of the archive expressed by Vincent: the archive as at once the past and future of our present age figured through the golden spike. By placing the spike, we are demarcating a break with the past, while heralding in a new kind of future, one whose geologic and biologic qualities will be radically different. The question remains how we might begin to compose an ethical relation to this future that increasingly refuses metabolization.

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1. Andrew Revkin, "Researchers Propose Earth's 'Anthropocene' Age of Humans Began With Fallout and Plastics" *New York Times* (January 15, 2015) [http://dotearth.blogs.nytimes.com/2015/01/15/researchers-propose-earths-anthropocene-age-of-humans-began-with-fallout-and-plastics/?\\_r=0](http://dotearth.blogs.nytimes.com/2015/01/15/researchers-propose-earths-anthropocene-age-of-humans-began-with-fallout-and-plastics/?_r=0)

2. See Alan Weisman, "Polymers Are Forever." *Orion* 26, no. 3 (May-June 2007a): 16, [www.orionmagazine.org/index.php/articles/article/270/](http://www.orionmagazine.org/index.php/articles/article/270/).

3. Jun Yang, Yu Yang, Wei-Min Wu, Jiao Zhao, and Lei Jiang, "Evidence of Polyethylene Biodegradation by Bacterial Strains from the Guts of Plastic-Eating Waxworms." *Environmental Science and Technology* 48 (November 10, 2014): 13776-13784.

4. For a recent study on ocean plastics see Jenna R. Jambeck, Roland Geyer, Chris Wilcox, et. al. "Plastic waste inputs from land into the ocean" *Science* Vol. 347 Is. 6223 (13 February, 2015): 768-771.

5. For bacterial consumption of plastic see Zettler, Erik R., Tracy J. Mincer, and Linda A. Amaral-Zettler, "Life in the 'Plastisphere': Microbial Communities on Plastic Marine Debris" *Environmental Science and Technology* 47 (June 7, 2013): 7137-7146; for whale death linked to consuming plastic see Giles Tremlett, "Spanish sperm whale death linked to UK supermarket supplier's plastic" *The Guardian* (March 8, 2013) <http://www.theguardian.com/world/2013/mar/08/spain-sperm-whale-death-swallowed-plastic>; on a recent report of corals eating microplastics see Oliver Milman "Corals face 'slow starvation' from ingesting plastics pollution, experts find" *The Guardian* (24 February 2015) [http://www.theguardian.com/environment/2015/feb/25/corals-face-slow-starvation-from-ingesting-plastics-pollution-experts-find?CMP=share\\_btn\\_tw](http://www.theguardian.com/environment/2015/feb/25/corals-face-slow-starvation-from-ingesting-plastics-pollution-experts-find?CMP=share_btn_tw).

6. Corocan, Patricia, Charles J. Moore, and Kelly Jazvac, "An anthropogenic marker horizon in the future rock record" *GSA Today* (June 2014): 6.

7. Keynote Address, Association for Literature, Environment and Culture in Canada Conference (August 7, 2014).

8. Dwayne Donald, "Forts, Curriculum, and Ethical Relationality" in *Reconsidering Canadian Curriculum Studies: Provoking Historical, Present and Future Perspectives*, edited by Nicholas Ng-A-Fook and Jennifer Rottman, 39-46. New York: Palgrave Macmillan, 2012.

9. Amanda Boetzkes and Andrew Pendakis, "Visions of Eternity: Plastic and the Ontology of Oil" *e-flux journal* 47 (September 2013), 2.

10. See Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans*, Minneapolis: University of Minnesota Press, 2010.

11. Esther Leslie, *Synthetic Worlds: Nature, Art and the Chemical Industry*, London: Reaktion Books, 2005. 14.

12. Jeffrey Meikle, *American Plastic: A Cultural History*, New Brunswick, NJ: Rutgers University Press, 1995. 7.

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**Yevgeniya Kaganovich**

Yevgeniya Kaganovich is a Belarus-born, Milwaukee, Wisconsin based artist, whose hybrid practice encompasses jewelry and metalsmithing, sculpture and installation. Yevgeniya has received a Masters of Fine Arts from the State University of New York at New Paltz and a Bachelors of Fine Arts in Metal/Jewelry from the University of Illinois at Urbana-Champaign. Yevgeniya has been an active art practitioner since 1992, exhibiting her work nationally and internationally. Her work has received a number of awards and has been published widely. Yevgeniya has worked as a Designer/Goldsmith at Peggie Robinson Designs, Studio of Handcrafted Jewelry in Evanston, Illinois and has taught Metalsmithing at Chicago State University, Chicago, Illinois, and Lill Street Studios, Chicago Illinois. Currently, Yevgeniya is a Professor and Chair of the Department of Art and Design at the University of Wisconsin-Milwaukee, teaching a thriving Jewelry and Metalsmithing program with graduate and undergraduate students.

*grow* is series of durational installations in a number of public buildings throughout the city of Milwaukee. At each location, a system of interconnected plant-like forms, simulating a self-propagating organism in multiple stages of development, grows over time, utilizing reused plastic bags as base material. The layers of plastic are fused together to create a surface similar to leather or skin, molded into plant-like volumes, connected with plastic bag “thread” and stuffed with plastic bags, creating a system made out of a singular material, reused plastic. At each location there is a plastic recycling bin. The bags are periodically collected, processed, and used to add on to each organism. Like weeds, these organisms grow into unused and overlooked spaces: niches, stairwells, and other peripheral and forgotten architectural elements.

The project launched at the Milwaukee’s Lynden Sculpture Garden in October 2012, with subsequent “plantings” at multiple public locations



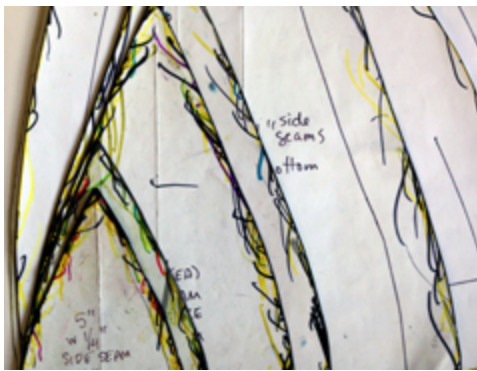
Images from *grow*, 2012 – present

throughout the city of Milwaukee, such as malls, libraries, and civic building. Public involvement ranges from contributing plastic bags for specific locations to participating in workshops on manipulating plastic bags as a raw material. As a culmination of the project, all forms will be transplanted back to the Lynden Sculpture Garden for a final exhibition, and subsequently recycled.

*grow* transforms an artificial, manipulated material into a seemingly unchecked, feral, opportunistic growth. It visualizes and punctuates reuse by juxtaposing it with slow, methodical, labor-intensive making that plays with control, “craftiness,” and precision. It attempts to contemplate care and speculate on sustaining artificial lifecycles.







### Collecting and Prepping Plastic Bags:

- Empty plastic bag recycling bins at all locations
- Sort and store bags according to color
- Cut off handles, seams, and printed parts of the bags
- Save the cut offs to use for stuffing
- Stack the remaining large white sheets

### Making String:

- Notch sheet at  $\frac{1}{2}$ " intervals, tear into strips—or
- Cut sheet into  $\frac{1}{2}$ " wide strips
- Stretch the strip as far as possible by hand, making a section of string
- There is a significant difference in how the strips will stretch based on the kind, thickness, and age of the original bag
- Tie the ends of the strings together
- Wind the string onto a spool

### Making Sheets:

- Place 4 prepared plastic bag sheets between two pieces of brown paper
- Iron until all 4 sheets are fused together
- The top of the fused sheet will have a more dimensional leather-like texture
- Be sure to use proper ventilation and a respirator for all plastic fusing operations

### Making Bulbs:

- Trace bulb templates onto the smoother side of the 4 ply sheet using a thin Sharpie marker
- Cut out 6 traced shapes, cutting with scissors just on the inside of the outline so that no color outline appears on the shape
- Sew edges together with a  $\frac{1}{2}$ " margin for 5", 6", 8", and 9" bulbs, and 1" margin for 12", 15", and 18" bulbs, leaving the more dimensional leather-like side of the 4 ply sheet on the outside of the forms
- Tape with sections of reinforced packing tape over the seams on the inside of the forms, preserving the curvature of the seam
- Perforate the edges of the tips and crochet them together with prepared string
- Stuff bulbs with stuffing (cut off handles, seams, printed sheets, and other bags)



- Mount the bulb onto a prepared Plexiglas circle of the appropriate size with sections of reinforced packing tape
- Add additional stuffing into the top of the bulb as needed

**Making Stalks:**

- Make tubing/speculum: cut trapezoidal shapes out of 4 ply plastic sheet, wrap around a steel mandrel, overlapping the seams, iron the seam shut using brown paper as barrier
- Be sure to use proper ventilation and a respirator for all plastic fusing operations
- Perforate the edge of the tube/speculum and crochet a flexible section that is at least 2" long
- Crochet a tip onto the smallest tube/speculum
- Stuff the sections individually
- Sew the sections together to create one stalk
- Stuff and iron shot the bottom of the stalk
- Make small bulbs or pods using prepared templates by fusing edges together on the surface of the iron, stuffing the pods, and fusing a circle onto the bottom of the pod with a soldering iron
- Sew small bulbs or pods onto the ends of selected stalks

**Putting Forms and Groups Together:**

- Select a grouping of bulbs of different sizes
- Place a connector stalk into each bulb to connect to the next bulb
- Place additional stalks with small pods on ends into bulbs
- Sew stalks together at the bottom
- Sew the group of stalks into each bulb, at least 3 stalks per bulb
- Crochet the membrane/neck around the stalks to make the bulb opening tighter around the stalks
- Place groups into peripheral architectural spaces
- Connect all forms with connector stalks

**Supplies and Materials for Making *grow***

- plastic bags
- scissors
- clothing iron
- brown paper
- iron board or other surface we can iron on, plywood would work
- masking or painter's tape
- thin sharpies
- patterns/templates
- plastic bag 4 ply sheet
- plastic bag strips
- cardboard spools
- stalks
- crochet hooks
- soldering iron



**Marina ZURKOW**

Marina Zurkow is a media artist focused on near impossible nature and culture intersections. She uses life science, materials, and technologies—including food, software, clay, animation, mycelium, and petrochemicals (when necessary)—to foster intimate connections between people and non-human agents. Crossing multiple disciplines with her practice, Zurkow builds animations and participatory environments that are centered on humans and their relationship to animals, plants, and the weather. Engaging audiences using film and video, sculpture, print graphics, and public interventions, Zurkow’s work is by turns humorous and contemplative. Through the experience of her projects it is clear that nature has long been a stage upon which we project ourselves, making ourselves other.

Recent solo exhibitions of her work include bitforms gallery in New York; the Montclair Art Museum, New Jersey; and DiverseWorks, Houston; her work has also been featured in numerous venues internationally. Her recent public art engagements have been supported by Creative Time, New York; LACE, Los Angeles; Baruch College, New York and several other institutions. Zurkow is the recipient of a 2011 John Simon Guggenheim Memorial Fellowship and has been granted awards from the New York Foundation for the Arts, New York State Council for the Arts, the Rockefeller Foundation, and Creative Capital. She is on faculty at the Interactive Technology Program (ITP), New York University.

*Necrocracy* is a meditation on geology, time, nature, and petrochemical production, featuring works of video animation, drawing, and sculpture. Questioning the inherited, Romantic-era division between the natural and the human, the works navigate between human manufacturing of petroleum-based products, ecology, and the geological chronology of oil.

First exhibited at DiverseWorks in Houston, Texas, this body of work marked the debut of seven animated works and included a labyrinth of fifty 10-foot high drawing-banners depicting a wide variety of things made from petroleum plastic: IV bags, flip flops, rubber chickens, artificial flowers, nylon umbrellas, gas masks, police riot shields, cell phones, car parts, condoms, diapers, and more. The animations (some video, some software driven) look at the petroleum-rich landscape of West Texas through a series of lenses: geological time, the larger ecosystem, and the interdependence of resources like water and oil.



Wink Sink 2

In January 2011, I researched the Permian Basin during a residency hosted by DiverseWorks. From Marfa to Midland, I met with geologists, naturalists, cattlemen, oilmen, and activists. I traversed the high southern plains of the Llano Estacado—the ecosystem stretching from Lubbock to the Edwards Plateau—a landscape so subtle



Left and next page: Stills from *Mesocosm (Wink, Texas)*, 2012

most people call it “The Big Empty.” We, all of us who live on the grid of the US, are soaking in petroleum and wouldn’t know how to live, feed, shelter, clothe, or express ourselves without oil-based products.

In the Permian Period 250 million years ago, the geological riches of the area were formed, as marine microorganisms accumulated in sediments on the floor of a vast saline sea. Over millions of years, the seas dried out, the landmass itself moved to its present location, and the marine creatures transmuted into hydrocarbons. In the past century, we have pumped over one hundred billion barrels of oil and one hundred trillion cubic feet of gas from these Texas hydrocarbon reservoirs. The exhibition asks us to think about how we disturb, worship, and are dominated by these long-dead beings: Necrocracy, or the rule of the dead.

*Mesocosm (Wink, Texas)* is part of an ongoing series of animated landscapes that develop and change over time in response to software-driven data inputs. The title is drawn from the field of environmental science and refers to experimental, simulated ecosystems, which allow for manipulation of the physical environment and are used

for biological, community, and ecological research. The animated elements are drawn by hand, frame-by-frame, yet their choreographies are dynamic—not predetermined or canned—dictated by constraints in real-time. Each of the works in the Mesocosm series is long in duration and recombines perpetually as inputs determine order, density, and interrelationships. They are looped and have no beginning or end. Because change happens slowly, but can be radical over time, the works are intended to be seen in public places where people gather or pass through frequently, or lived with like a painting—in living rooms and meeting spaces.

Wink, Texas is the most recent landscape to be animated as part of this Mesocosm series. In the animation, a large sinkhole—the “Wink Sink 2” located on located on private oil company property in the small Texas town of Wink—boils, gushes, flows and expels objects: plastic bags, oil and dark clouds that whirl out of the sinkhole’s vortex in ghostly choreography. Oil refineries burn off gases in plumes in the background as an occasional train or coyote lumbers past. This sinkhole has been widening steadily since it emerged in 2002; here, it appears as a natural geological event, complete with picnic rest stop furnishings. By day, the landscape is inhabited by a diversity of bird life, prairie dogs, insects, pronghorn antelope, HazMat workers, and, depending on the season, by migrating monarch butterflies, snakes, and sandhill cranes.

Dupont’s patented Tychem hazardous materials clean-up suits are used in petroleum industry disaster response to mitigate ecological disasters. *Haz-mat Suits for Children* have been downscaled to a smaller size. These suits are sealed to prevent humans from entering them, thus assuring that no children are harmed in the process.





**LANDFILL CLUB  
RECORD OF INQUIRY**

NAME: \_\_\_\_\_

ITEM: \_\_\_\_\_

PHYSICAL DESCRIPTION: \_\_\_\_\_

MATERIAL:

- PET     HDPE     PMMA  
 PVC     LDPE     OTHER  
 PP     PS    SPECIFY: \_\_\_\_\_  
 PU     PIB

CHEMICAL DIAGRAM (draw below):

I TYPICALLY KEEP THIS ITEM FOR:

- YEARS     HOURS     OTHER  
 DAYS     MINUTES    SPECIFY: \_\_\_\_\_

I TYPICALLY DISCARD THIS ITEM VIA:

- TRASH     RECYCLING     OTHER  
 GIFT     STORAGE    SPECIFY: \_\_\_\_\_

IN ITS NEXT LIFE, THIS ITEM COULD BECOME:

A NEW \_\_\_\_\_

FOOD FOR \_\_\_\_\_

A BODY BURDEN TO \_\_\_\_\_

SHELTER/HABITAT FOR \_\_\_\_\_

CURRENCY FOR \_\_\_\_\_

OTHER \_\_\_\_\_

IN 50,000 YEARS THIS ITEM WILL BE: \_\_\_\_\_

NOTES, COMMENTS & ANECDOTES? (please use reverse side)

*Landfill Club* is a social sculpture that encourages participants to become intimately familiar with a single piece of petrochemical plastic, untangling its history and considering its long future. Participants will adopt one item of plastic and get to know it chemically, culturally, and geologically, before recording their findings on a custom tag, which will be attached and displayed with the object. Each object will also be documented and featured in the Landfill Club Archive.

*Landfill Club* frames scientific study within the larger context of art, sustainability, and social sciences, offering that transformation requires hands-on creative acts to foster personal and social change.

*Uncanny Sensing (Texas Prototype)* is an experimental, regional prototyping of a larger, national project, *Uncanny Sensing, Remote Valleys* (a project of Creative Capital) set to premiere in 2016.

**Steve ROWELL**

Steve Rowell is an artist, curator, and researcher currently based in Los Angeles. Rowell's transdisciplinary practice examines the overlapping aspects of technology, perception, and culture as they relate to landscape. Rowell contextualizes natural, postnatural, and built environments, appropriating the methods and tools of the geographer. In addition to being Program Manager at The Center for Land Use Interpretation (Los Angeles) since 2001, he has collaborated with SIMPARCH (Chicago) and The Office of Experiments (London). His work, both collaborative and solo, has been exhibited internationally at a range of galleries and museums, including: the 2006 Whitney Biennial and PS1, New York; Yerba Buena Center for The Arts, San Francisco; The Smithsonian American Art Museum, Washington, DC; Temporäre Kunsthalle and NGBK, Berlin; The Barbican Art Centre and the Frieze Art Fair, London; The John Hansard Gallery, Southampton; Ballroom Marfa; The Center for PostNatural History, Pittsburgh; INOVA (Institute for Visual Arts), Milwaukee; and the Museum of Contemporary Art, Chicago. In 2013 he received awards from Creative Capital and the Graham Foundation for Advanced Studies in the Fine Arts.

*Uncanny Sensing, Remote Valleys* is aimed at investigating ecology, post-natural landscapes, and the philosophical dilemma of the anthropic principle. It's about the rise of machines in the age of the Anthropocene, and how we perceive the environment using technology—giving us a view of the world around us that some say is incomplete, synthetic, uncanny. The title of the project is a reconfiguration of the terms “remote sensing” (a method of data collection from the physical world via sensors and other remote technology) and “uncanny valley” (the cognitive dissonance caused by lifelike replicas of living things). Through the use of autonomous aerial cameras, camouflaged sensors, and remote audio monitors, I present raw media gathered in the field, documenting animal behavior, industrial processes, erosional effects, and other elements of the landscape and environment. By relying on unmediated data, I intentionally reduce my role as an artist

in the conventional sense and expand my role as interpreter, editor, and curator of the landscape. Beneath the technological elements of the project are evocations of animism, activism, and indeterminacy.

This is a project about reconciling the natural world with the un-natural or post-natural world; it's about coming to terms with the human altered environment. In this iteration, this prototype, I present an investigation of the Houston region as a distillation of three elemental planes of existence: water, land, and air. Through the use of aerial footage captured by a remote control drone, paired with other remote sensing systems, including data from air monitoring stations throughout the city, this installation presents a landscape both familiar and alien, as seen and heard through the eyes autonomous devices. Devices like this will someday interact with the natural world, no longer reliant on their human



designers. A new, cybernetic ecology might evolve.

Will this symbiosis be a threat?

To what extent should we rely on technology to mitigate anthropogenic climate change?

As we experience this installation, we inherently apply meaning to what we see and hear, imposing anthropomorphism of the surveyed landscape, the animals' reaction, the drones reflection and shadow. In order to better comprehend our landscape and our collective creation—in particular the petrochemical industry of the Gulf Coast region and its contribution to global climate change—a new perspective is sometimes needed. Remote (uncanny) sensing can provide this perspective and give us a new phenomenology of place.



The dim light of a pre-dawn sky, filtered through chemically saturated steam plumes from the ExxonMobil plant at Baytown, illuminates the flooded, sunken former subdivision of Brownwood.



The interior of the Mobile Ambient Air Monitoring Laboratory (MAAML), the most advanced mobile lab of its kind. The Bureau of Pollution Control and Prevention for the City of Houston deploys the MAAML to locations of known air pollution events in order to monitor the industry but also to deter known offenders from repeatedly exceeding federal limits. Despite efforts like this, toxic atmospheric events occur all the time, but accurate source detection is difficult.



Teflon tubes and glass sampling funnels inhale the atmosphere to collect samples of toxins and particulate matter at the City of Houston's Clinton Drive air monitoring site.

A note on the sound for the central, 22-minute video: The synthesized tones are generated using acquired data from the Bureau of Pollution Control and Prevention's air monitoring network. Six primary toxins—carbon monoxide, carbon dioxide, sulfur dioxide, ozone, nitric oxide, nitrogen dioxide—present in our atmosphere have been extrapolated as audible frequencies. These are then fed into a digital harmonium, or drone generator used in classical Indian music. The variable concentrations of these pollutants, from February 10, 2014 are audible as increased timbre, pitch, and volume. Harmony and dissonance ebb and flow. This 22-minute composition is paired with the aerial drone footage, which has been edited to the sound.



At the Houston Museum of Natural Science, multihued neon tubes educate future oil workers by illustrating the various working complexities of a petrochemical refinery with audio narration and synthesizer music reminiscent of a 1970s dystopian science fiction film. Sponsors of the Wiess Energy Hall at the HMNS is a who's who of the industry and include: Saudi Aramco, Halliburton, Shell, ChevronTexaco, ExxonMobil, American Petroleum Institute, Enron (now dissolved), ConocoPhillips, and British Petroleum.



Petrochemical plants are notoriously dangerous, explosive places and many pride themselves on their safety ratings, which must be posted along the perimeter of each site. Here, FMC Corp - Peroxygen Chemicals Division in Pasadena, TX announces that the rest of the world is more hazardous than their facility.





Various air sampling sensors in a neighborhood downwind from the dense network of petrochemical refineries that dominates the landscape between Houston and the Texas Gulf Coast.

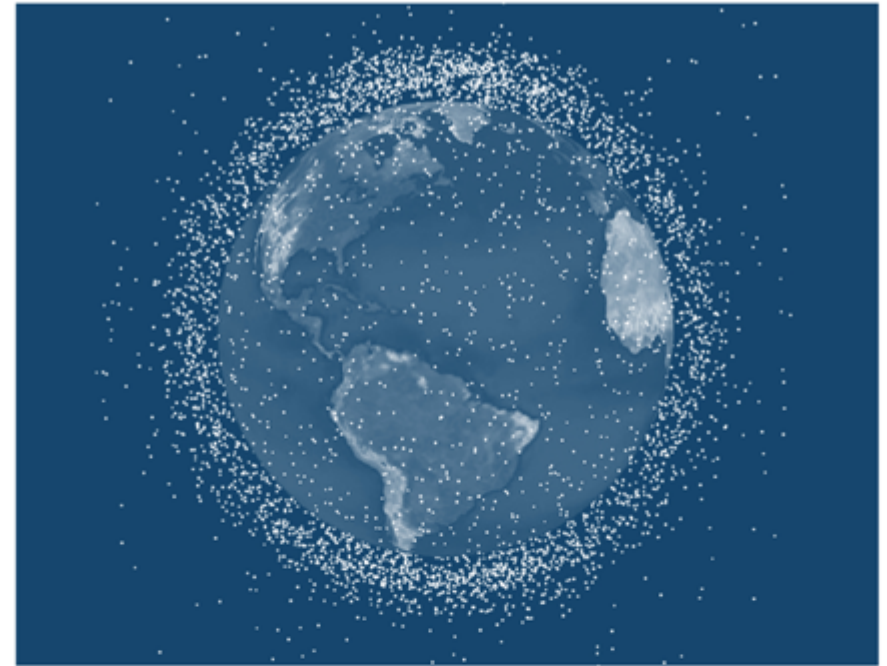


Drone's eye view of the sinking landscape around the San Jacinto Monument marking where the decisive battle between Mexico and Texas occurred in 1836. Some seven decades later, oil exploded from this same soil and the global petroleum-based economy had begun. Water extraction for this industry and the ever-spreading cities on this coastal plain has resulted in extreme subsidence of the land, endangering natural ecosystems and anthropic places such as this alike.





A ragged Texas State flag marks the golden spike of the petroleum age. It was here in 1901 where the Spindletop oil gusher erupted, ushering in the global oil industry. Subsidence from oil, gas, and sulfur extraction has caused this natural salt dome to collapse into a flooded waste-scape of debris. The toxic slurry here is contained and monitored for seepage into the surrounding wetlands and coastline where Vietnamese-American fishermen gather shrimp, oysters, and crawfish for countless seafood restaurants from New Orleans to Houston.



## SPACE JUNK + CO<sub>2</sub>

In 2012, the Swiss Space Center announced plans to launch CleanSpace One, a robot spacecraft that will grab inactive satellite parts and bring them back to Earth.

"Research since the early 1990s has led to the suggestion that increasing carbon-dioxide emissions, from power stations and other terrestrial sources, are increasing the orbital lifetimes of defunct satellites and debris in the lower-altitude orbits. Observations and modeling support the theory that CO<sub>2</sub> emissions have led to a cooling of the thermosphere (at altitudes between 85 and 600 km) and a consequent reduction in density, which reduces the frictional effect on orbiting objects. The hypothesis is that thermospheric cooling could continue for the next hundred years, despite CO<sub>2</sub> emission controls, by which time the effect would be comparable with that of solar variability."

– Mark Williamson, *Space: The Fragile Frontier*

**Heather Anne SWANSON**

Heather Anne Swanson is an assistant professor in the Department of Anthropology at Aarhus University (Denmark). She is also a post-doctoral fellow with Aarhus University Research on the Anthropocene (<http://anthropocene.au.dk>), an interdisciplinary group that explores the futures that are possible for both humans and nonhumans on our damaged planet. Her transdisciplinary practice brings together attention to multispecies interactions and the globe-spanning connections of political economy to ask questions about how culture and politics get inside the bodies of animals and plants, and how other species shape what it means to be human. Her current research, which finds inspiration in diverse fields across the natural sciences, social sciences, and the humanities, moves outwards from the salmon worlds of Hokkaido, Japan, to engage questions of consumption, cultivation, and conservation. Methodologically, Swanson draws on the sensibilities of ethnographic observation and natural history to ask how we might better notice the more-than-human relations and trajectories that make up our worlds. She is a co-editor of the forthcoming collection *Arts of Living on a Damaged Planet: Stories from the Anthropocene* (with Nils Bubandt, Elaine Gan, and Anna Tsing), as well as *To See Once More the Stars: Living in a Post-Fukushima World* (2014, with Daisuke Naito, Ryan Sayre, and Satsuki Takahashi).



Andrew J. Russell, *Golden Spike Ceremony at Promontory, Utah, 1869*

**Dateline: Promontory Summit, Utah, 1869**

*On a fair day in May, crowds pushed close as railway baron Leland Stanford picked up a silver maul. Two steam engines, one from the east and one from the west, had been drawn nose-to-nose, and a laurel rail tie with pre-drilled holes had been set into the soil. The ceremony, to mark the completion of the world's first trans-continental railroad, had been delayed for two days due to bad weather and a labor dispute, but all that was to be forgotten in a flurry of handshakes, rousing speeches, and popping champagne corks. At the center of it all was a gleaming railroad spike made of 17.6-karat copper-alloyed gold, specially designed for the event, and engraved with the words *May God continue the unity of our Country, as this Railroad unites the two great Oceans of the world*. Although historical records are a bit fuzzy, legend has it that Stanford and other dignitaries tapped the ceremonial spike into place as cheers rose from the crowd. The sounds of the hammer were transmitted via telegraph around the nation, ringing in a new age of transportation, communication, and commerce.*



Today, stratigraphers use the term “golden spike” to refer to a physical exemplar of a boundary in geological time, a moment when the world changed. Stratigraphers search the world for reference locales—places where global transitions can be seen particularly clearly. Sometimes the mark is a distinct chemical signature, other times a significant shift in the fossil record. For example, a section of rock in El Kef, Tunisia with an iridium-rich layer from the meteorite impact implicated in the death of the dinosaurs has been selected as the “golden spike” for the Cretaceous-Tertiary boundary. Once stratigraphers agree that a site should serve as a sedimented archetype, they drive a spike or place a small plaque, marking the area’s significance.

At the moment, stratigraphers are struggling over where to place the official golden spike for the Anthropocene—the ur-marker for an epoch of human destruction. Hiroshima, Japan, 1945, and the worldwide distribution of isotopes from nuclear bombs? A 1950s industrial American farm, with its soils forever changed by synthetic nitrogen fertilizers and repeated mechanical ploughing? A layer in a Greenlandic ice core from sometime after 2013, when atmospheric CO<sub>2</sub> levels exceeded 400 parts per million for the first time in at least 800,000 years?

For scholars and artists not bound by the search for a singular stratum, there are even more time-spaces where one might drive a golden spike to mark the Anthropocene’s “ground zero”: British factory furnaces circa 1800. The 1862 World’s Fair, where Parkesine, the first man-made plastic, won a bronze prize. December 2, 1942 at precisely 3:25 p.m. on the University of Chicago squash court, where physicists generated the world’s first self-sustaining nuclear chain-reaction. In the midst of the almost-infinite possibilities, I want to propose that we consider driving a golden spike at the site of the first golden spike itself.

Railroads, like those joined together on the Utah bluff, put the world, quite literally, on a new track. Trains both emerged from and contributed to dreams of empire and desires for capitalist accumulation. Although coal-burning steam ships already ruled the seas, trains linked fossil fuels and overland shipping for the first time. Trains not only used vast amount of coal themselves; they also transported it in even greater quantities. Trains made it easier to move massive amounts of fossilized carbon from mine to factory. With cheap coal, one could keep fires under industrial boilers burning day and night, powering automated looms, iron smelters, and assembly lines that stamped out standardized machine parts.

The new mobile economic worlds that trains made possible, however, far exceeded the walls of factories. Consider the American West. In the wake of the Civil War, railroads symbolized the reunification of America and her new path to continental dominance. They linked resource-rich hinterlands with populous Eastern markets, making possible new economies of scale. Trade was no longer stuck in the mud, limited by seasonally impassible roads. By hauling their products to the local rail station, even remote producers could sell their goods onward to central markets. Large-scale agriculture became viable as never before. Only 30 years after the first transcontinental train tooted its whistle, the area of farmland under cultivation had more than doubled (Bruchey 1990: 296). By the second half of the 19th century, markets in timber, wheat, and beef became integrated across the nation.

Perhaps it is not a stretch to call industrial capitalism the handmaiden of the railroads. As historian William Cronon has shown, futures trading and the speculative economy as we know it emerged from Chicago’s rail yards, where financiers began swapping receipts for the grain in trackside elevators, betting on the rising and falling prices of standardized wheat grades (Cronon 1991). Indeed, the city of Chicago rose to mercantile power predominately as a result of its status as a railroad hub. The railroads did not merely *foster* industrialization, speculation, and big business; they embodied all of those things themselves. In the late 19th century U.S., railways employed more people than by any other industry (Murrin et al. 2012: 514). But railroads were not a populous project: they were mostly financed by private firms whose investors reaped the profits. For example, the Chinese laborers who built much of the Central Pacific Line that stretched from Sacramento to the site of the golden spike earned only about \$24-\$35 per month, working longer hours for less compensation than workers of European descent (Chinese Railroad Workers in North America Project 2015). As historian Richard White reminds us, railway tycoons typically got rich by strategically siphoning off once-public resources, even when they constructed and ran their lines at a loss (White 2011). Many of the so-called “robber barons,” industrial capitalists like the Vanderbilts and J.P. Morgan, were tied to the tracks in one way or another.

Despite their role in the making of vast inequality, railroads were nonetheless woven with visions of Jeffersonian agrarianism and the creation of a paradise for small-holder farmers. The movement of trains symbolized the young nation’s surge into history, chugging and steaming through its dreams of Manifest Destiny. In John Gast’s



George A. Crofutt, *American Progress (Westward the Course of Destiny)*, c. 1873

famous 1872 painting, “American Progress,” Columbia – the angelic personification of the spirit of the U.S.A.—strings a telegraph line in front of one of three trains traveling across the image from right to left, full-steam ahead into the West’s future. In the process, one of the most common Anthropocene scenes unfurls as virgin lands bow to hoof and plow, once they are connected to growing cities.

As Gast’s painting makes clear, railroads sparked vast ecological conversions. American bison were a keystone species for tall grass prairie ecosystems, but not for the mosaics of ranches and farms that the new maze of railroad tracks created. The bison’s grazing helped maintain plant diversity, and their wallows filled with rainwater, producing pools and muddy areas that were a boon for insects and small animals. Unfortunately for the bison, however, they were marked as an enemy of Progress. They supported strong but supposedly “primitive” human communities—Plains Indian tribes—whom the U.S. government sought to “pacify” and replace with white settlers and domestic livestock. For the government officials who wanted American Indians contained and bison dead, the railroads were their most reliable accomplice. Kansas Pacific Railroad, for example, contracted “Buffalo Bill” Cody, later famous for his Wild West shows, to kill twelve bison per day to feed its laborers, paying Cody an alleged \$500 a month for his services (Sandoz 2008 [1954]: 30). Then, in 1867, when the transcontinental tracks through the heart of bison country were completed, they disrupted the remaining animals’ movements and split them into two smaller herds. Once trains began

to lumber across the landscape, travelers would often shoot bison out car windows for sport. The railroad companies—no fans of bison, who sometimes stood on tracks, delaying trains and damaging those that failed to stop in time—encouraged such practices. Buffalo hides that were not left to rot were shipped to market in the freight cars (Cronon 1991: 216).

Nineteenth century trains were power incarnate—the ability to extract resources, craft political influence, and displace others. They were a tool of both empire-building and the making of private dynasties. The jointly symbolic and material strength of trains was not lost on anyone. When Commodore Matthew Perry sailed into Yokohama Bay in 1854 to “open” Japan to the West, he found space in his warships for a one-fourth scale steam train along with 370 feet of circular track, a gift to Japanese officials thought to epitomize the prowess, promise, and power of the modern world. The Japanese officials did not miss the message: in their frantic efforts to develop fast enough to avoid Western colonization, Japanese officials completed the first rail line of their own in 1872 (See Ericson 1996). One had to scramble to catch the train of modernity lest one get left standing behind at the station.

As railroads rapidly became one of the most important forms of global infrastructure, a mainline arms-race ensued. Between 1850 and 1900, the number of miles of track worldwide increased from 23,500 to a half a million (Buzan and Lawson 2014: 628). This growth transformed North America and Europe, but was not limited to them. While Germany laid rails that would help it become a unified nation-state, the Brits built tracks across India, Africa, and Australia. As in the American West, such proliferation often led to environmental degradation. Railways changed patterns of species, along with patterns of wealth. Nearly everywhere they reached, trains spawned new extractive industries at the ends of their trunk lines: mining, logging, industrial farming and ranching. As they fanned out across the world, they linked together the sites we now see as characteristic of the Anthropocene, making accumulation and ruination possible on a scale never seen before.

Siberia was one place so affected. For the tsarist autocracy, the Russian East was its American West. The Trans-Siberian Railway, begun in 1890 and completed in 1916, produced much the same outcomes as the North American transcontinental tracks. For Russia, Siberian resources were a gold mine. While part of the region’s riches were actual gold, the area also contained approximately 80 percent of Russia’s oil, 80 percent

of its coal, 80 percent of its minerals, and 40 percent of its timber resources—all made accessible by metal rails (Hill 2004: 324). As in the U.S., the construction of the tracks not only helped raw materials to move out, it also enabled settlers to move in. Like cars following behind a great engine, millions of settlers were pulled into the Siberian steppe to join the new communities that clustered around the railroads. These Siberian farmers adopted mechanized methods similar to those in use in the American West, buying 25 percent of all the agricultural machinery sold in Russia (Naumov 2006: 137). Production soared: between the mid-19th century and the early 20th century Siberian grain production quintupled, reaching over 7 million tons (Naumov 2006: 137). This triumph of modernity was, of course, a multispecies disaster, one that damaged delicate permafrost ecologies instead of prairie grasses. Although the species were different from those of the American West, the pattern was the same: Instead of the bison, it was the Mongolian gazelle, now on the IUCN Red List, as well as other ungulates, whose migrations were disrupted by the railway.

Rail lines also created their own corridors of contamination. Train cars spread the seeds of invasive plants from warmer climes, which often gained footholds in the sunny and disturbed right-of-ways alongside tracks. Railroads not only redistributed species; they also remade soils. Grading and bank cutting created erosion in some places, while compacting the ground in others. Pollution was also part of the mix: creosote-coated ties leached hydrocarbons into the soil, while dripping and aerosolizing lubricants, oils, and fluids, along with heavy metal dust from constantly abrading metal train parts blanketed near-track areas. Herbicides, used to prevent plant growth between the rails, only added to the toxic brew.

Yet at the same time, railroads also created unique ecological patches where a handful of species were able to flourish. The tall grass ecologies of the American West were fire-adapted and fire-maintained. They were dependent on both native burning practices and lightning storms to remain lush. The new owners of agricultural and ranch lands, however, had different orientations toward fire: it was a wild enemy, a killer not a life-bringer. By suppressing fire, white settlers suffocated the tall grasses. Ironically, by the time trains had finished slicing across the American prairie, the only remaining patches of American grasslands were alongside their tracks, where sparks from the locomotives recreated the effects of lost grazing and firing practices (Cronon 1991: 213).

### Time for a new train of thought

Even though railroads are no longer as central to shipping as they once were, the economic, political, environmental—and, perhaps most importantly, imaginary—patterns that their 19th century expansion fostered remain firmly in place. Beautiful wildflowers may occasionally take over an abandoned line, but this is not cause for celebration. The steel rails—the overall infrastructures of industrial capitalism—remain solidly staked to the ground, and they are not going to simply rot away. Whether we like it or not, we are going to have to address these phenomena of our own making. The narratives of Progress inscribed in Gast's 1872 painting—a pictorial version of what Weber (1958) later called the Protestant ethic and the spirit of capitalism—remain all too potent. Gast's image of a Garden of Paradise on earth—a heaven for capitalists, but not for American Indians, bison, or native grasses—continues to serve as an animating backdrop for ongoing calls for “growth.”

Even as species die all too quickly, the lure of progress signified by the golden railroad spike does not. In the 1970s and 1980s, the Soviet Union constructed a new railway, the Baikal-Amur Mainline (BAM), as a more secure alternative to a part of the Trans-Siberian railway close to the Chinese border. While environmentalists raised alarms about the project from the get-go, due to its route along the edge of Lake Baikal, the government paid little heed. Under industrial communism, as under industrial capitalism, nationalistic military posturing and desires for additional mining development trumped ecological concerns. Ironically, train symbolism, too, traveled remarkably unchanged across both time and Cold War chasms. In 1984, the Soviets held a “golden spike” ceremony to mark the meeting of the BAM's eastern and western sections that clearly echoed the one held in Utah more than a century earlier. Unfortunately, however, the ecological consequences of the new tracks also resonated with those of their predecessors: silt has snuffed out the spawning grounds of some Baikal fish species, while train-related oil products and other chemicals have poisoned birds and nerpa seals, the only pinniped species that lives exclusively in freshwater (Saiko 2001: 84).

When it was pounded into the Utah clay in 1869, the golden spike clearly marked a moment that transformed life on earth profoundly and unevenly for humans and other species. The sound of the maul against the metal continues to reverberate, as the economic formations and landscape changes triggered by train networks torque the world



toward ever-increasing degradation. Yet as depressing as this story is, it also contains a glimmer of modest hope: rapid global transformation is indeed possible. Locomotives were able to pull the world into the Anthropocene in a mere half-century; perhaps some other driver can help us to move quickly off these tracks and sideways into other non-progress futures.

The artists and scholars whose work is collected in this exhibition catalogue have been tasked with placing the golden spike of the Anthropocene—with describing the landscapes that Gast’s angel of Progress has left in its wake. Placing a spike—marking a moment of transition—is a powerful first step in bringing new worlds into being. As we have seen, the pounding of the first golden spike undoubtedly ushered in a new era, albeit one of environmental destruction. To pound a spike is to create a narrative that weaves together pasts, presents, and futures. When it was ceremoniously hammered into the ground, the first golden spike celebrated the *start* of a new mode of movement rather than the *end* of track construction. The act of placing a golden spike for the Anthropocene is a similarly bold beginning, an attempt to stake out a new direction. Just maybe, the new trains of thought embodied in this work can generate the momentum that might help move us toward more livable worlds.

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## Publication STUDIO

Publication Studio, founded in 2009 in Portland, Oregon, makes and publishes original books on-demand, creating a public out of publication by engaging the social life of the book for pleasure alone. Co-founded by Patricia No, a writer, editor and publisher from New York and Antonia Pinter, an artist and publisher from Washington, Publication Studio collaborates to make and distribute books with numerous artists, writers, publishers, and institutions of all kinds.

When I was a kid, my neighbor had a lot of books. A lot of weird, old, non-fun books. He had a two-story barn filled with books. One day, he called me over and he had dug out a hole the size of a small swimming pool in his backyard. We wheelbarrowed piles of books from the barn and I stacked them into this hole, which we then covered over with dirt.

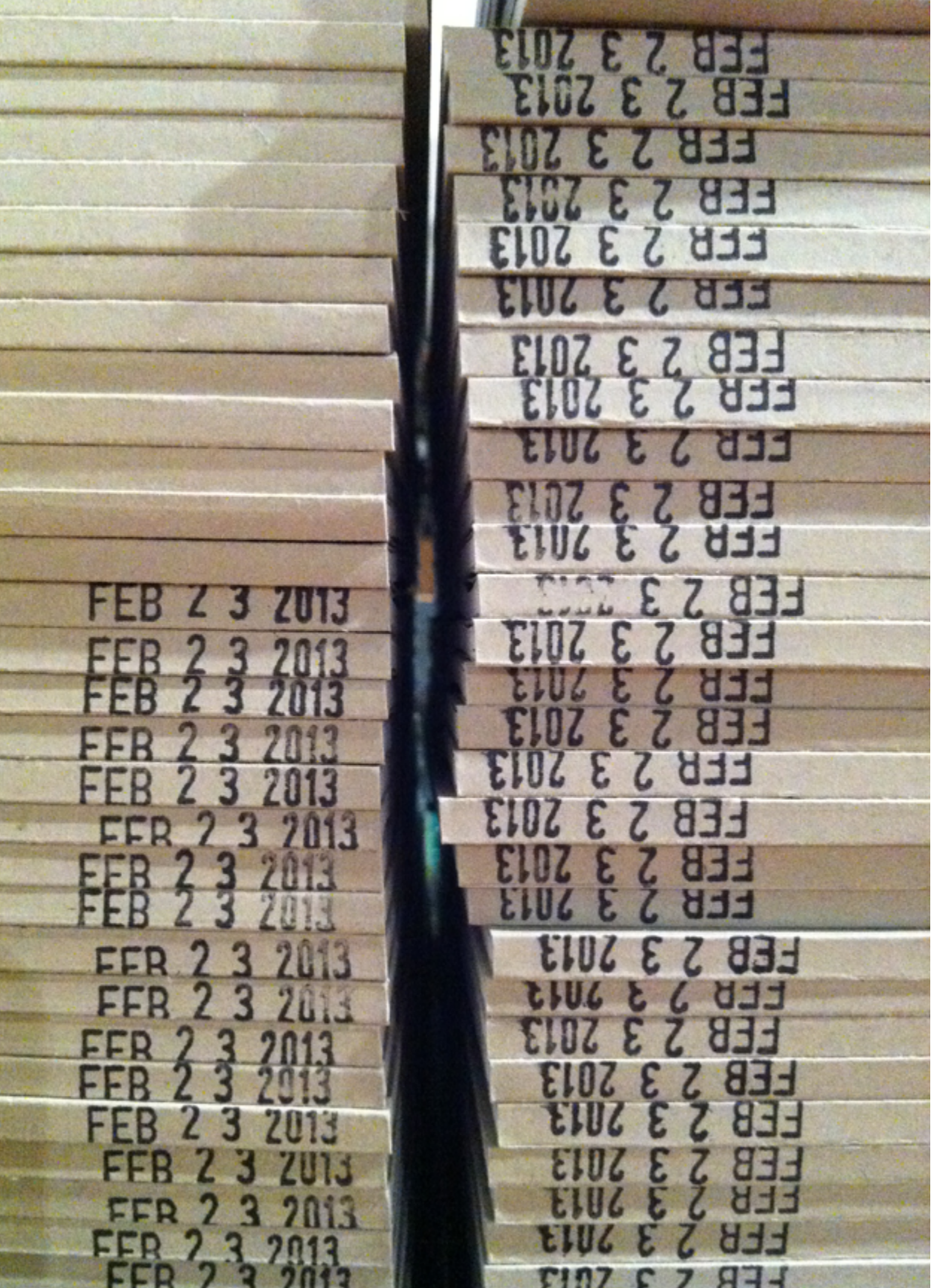
I was about eight years old and I had so many questions. I asked him why, and I knew it was incredibly wrong to be burying hundreds of books, even though I didn't want to read any of them. There was no explanation that assuaged my discomfort, and it's still a personal experience that I think about today. I think about Amazon.com warehouses as huge holes in the ground filled with lost books. I think about how there is just too much to read in this world for one person, and I picture that gap as a huge hole in the ground filled with all the unread books of a lifetime—all those Reader's Digest back issues—"where are *they*?"

For a publisher today, it is a legitimate position of concern and inquiry to think about or investigate what kind of impact printing has

on the world, and to wonder if it needs to continue. Of course, this is a moot question as it will, of course, continue. The question, then, should be rather a frame of consciousness, of elastic economics, of implementing change in book making and buying behavior. We don't need warehouses filled with books that no one will read. We don't need to dig swimming-pool-sized holes to bury our books.

What happens to ink when it sits in the ground? What happens to paper when we put it back into the earth? What happens to knowledge when we literally bury it? Does it seep through the dirt and disappear underfoot or are we actually causing some major shift in our environment? It's interesting to think about in two ways: one as a metaphysical phenomenon and one as an geographical actuality. The impact of publishing has been huge, both economically, culturally, and environmentally. Where would we drive publishing's golden spike?

I know we all believe that it would have been a huge shame if we didn't have Sappho's fragments,



the works by Thucydides and Ovid, the Bhagavad Gita or even the Bible, but is that impetus enough for all the saving we're doing? Well, yes, to an extent.

However, when you think of Amazon.com's warehouses filled with books, I'm pretty sure that we didn't need to produce all those books, we don't need to store them, and it's ridiculous that over 50% of those books will end up pulped. Who is responsible for that waste? Is it irresponsible to produce books en masse when we all collectively love books so much yet consume so few of them?

Piles of paper, books, can be formed as a geological site (buried books, Amazon.com warehouses, lumber yards, paper mills), They have a physical presence that we could drive a golden spike through. We can somehow measure the history and weight of their effect on our environment and economy in a visible way—I don't know how to measure the impact of digital materials, but I think artists have come the closest to comment and critique on these issues (Xavier Cha deals with the emotional weight of digital culture in a bodily form).

So, we can think of printing/ books as an Anthropocene phenomena. Old books, like Syrian books carved into stone in the 2nd and 3rd centuries to Jikji, the oldest movable metal type (100 years prior to Gutenberg) are still here with us today and are physical markers of human's desire to create and to disseminate in ways that would outlast even language itself. As we become more aware of the impact we have on earth, we're simultaneously creating more information than we ever have before—and we need to propose a discourse of action. The technologies we use determine the lifespan of our *meaning*, and the technologies we use mark our impact in a physically palpable way even after our meaning is lost.

The act of saving paper is different to me than saving digital materials. I'm constantly throwing away PDFs, usually because I know I can find it on the internet again, or that it's saved in an email that someone sent me. All these digital files leave mote fingerprints tracking their movements, and I wonder, if I collected all the digital materials I've used in my



lifetime what space would it fill? Would it fill a swimming-pool-sized hole in the ground? Would I be upset to bury it or would I not care at all? What would it look like, how can we measure its value or its impact?

Publication Studio only prints and binds a book if it has been sold. Our model can only exist if someone wants and pays for a book we've published. It's a *desire* based economy, not a consumer driven one, and we foster and create it by engaging the social life of the book, to make a public out of publication, so that we can all actively influence the industry in a real, political, and direct way and not rely on industry-driven marketplace rules.

Our storefront studio space is not just retail or making space, it's a social space where we read, sell, and talk about books every day. This social aspect around books is a deliberate method to reduce the wastefulness of overproduction and mindless consumption of information—it's about connection and collaboration, a democratic system of circulation, about reading. Ultimately, we can think of ourselves not as changing the *publishing* industry, but as advocates

for changing to a *publication* industry, literally one book at a time. This is why we continue to print and bind books.

It is to reach the world beyond its small letters. To provide cultural collective histories through time, technologies, and language, and to make public our ideas in an incredibly efficient technology using really beautiful forms of dissemination: namely, the book.



## Xavier CHA

Xavier Cha's performance-based work revolves around modes of accessibility, exchange, and hierarchies of space and perception. Collaboration is often at play in her performances. Cha has invited actors, dancers, musicians, programmers, cults, and clowns, among many other non-artist performers, to not only participate in her projects, but also to become protagonists in the work. Through these events, Cha formalizes subjectivity within contemporary culture, isolating elements of production, perception, and communication into bare, abstract, and often illogical experience. In stripping away extraneous content, Cha reveals phantasmic qualities of consumption, trends, and cultural engagement. Her work has been exhibited at the Whitney Museum of American Art, the New Museum, Kunsthalle Düsseldorf, the Institute of Contemporary Art, Philadelphia, de la Cruz Collection Contemporary Art Space, The Kitchen, Museum of Contemporary Art North Miami, Contemporary Art Museum St. Louis, Northern Gallery for Contemporary Art (UK), the Sculpture Center, Asia Society Museum, and the Hammer Museum, among other galleries and museums throughout the United States and Europe. In 2014, Cha was awarded a John Simon Guggenheim Memorial Fellowship.



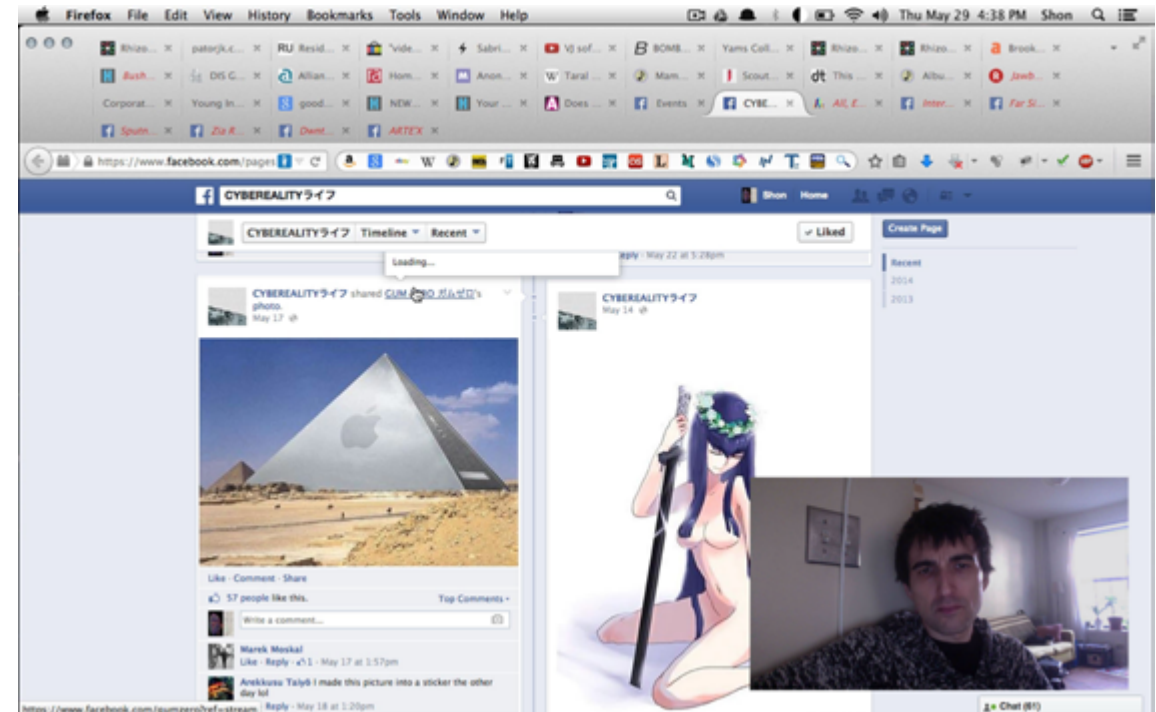
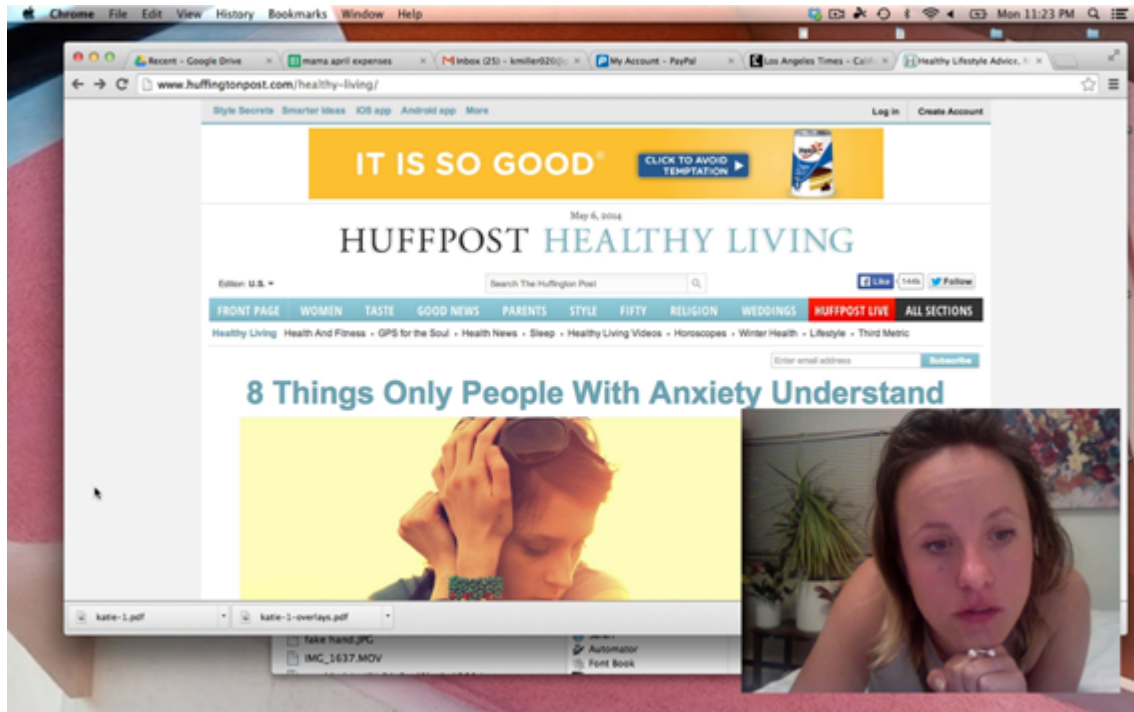
All images from *Surveil*, 2014 at Kunsthalle Düsseldorf  
performers Rashaun Mitchell and Silas Riener





*Surveil* is a movement piece using the surveillance of online traffic patterns of consenting individuals as the algorithmic map for the choreography of dancers in real time and space. The monitoring of this often neurotic, compulsively repetitive behavior online (checking email, facebook, email, twitter, facebook, email, instagram... in a repetitive compulsive loop, almost tic-like) is transcribed into transcendent movement by contemporary dancers. Every movement online is monitored, purchased, sold, and used to silently inform and guide our future navigation as consumers of digital information and services. We exist in an illusory veneer of autonomy or agency as navigators or “users” while being coerced along pre-determined paths, and deeper and deeper we plummet into these grooves of mass programming. In this performance, the odd, virtuosic movements trigger a strong uncanny, yet empathetic response—like that of watching a majestic animal pace in circles when kept in captivity, sharing and projecting this state of psychosis, this loss of control which persuades involuntary mental and physical patterns. As far as the Anthropocene goes, we experience an ever increasing disconnect and alienation from our physical bodies’ true imprint on our environment; our environment is our headspace molded and expanded by our virtual and technological presence.





**[3/5/15, 12:44:54 PM] Dehlia Hannah:** So what happens (to you, your audiences, dancers) by embodying and spatializing this frenetic/static condition of being online?

**[3/5/15, 12:46:18 PM] Xavier Cha:** hmmm—silly answer but, it’s art. what happens to the artist/viewer when someone puts a sculpture or painting in a show

**[3/5/15, 12:48:09 PM] Xavier Cha:** it’s an experience that i hope people may relate to, but i don’t mean to be pedantic with the work

**[3/5/15, 12:48:17 PM] Dehlia Hannah:** ok, but what happens to you through this process? For me, (just starting to find out) there’s a kind of attention to my patterns of thought, bodily activity, social interactions, that comes to light in a new way when i think about what’s legible to the surveillance program...

**[3/5/15, 12:48:33 PM] Xavier Cha:** i get trapped in these repetitive cycles all the time everyday, checking instagram, email, Facebook on loop

**[3/5/15, 12:50:24 PM] Dehlia Hannah:** A question that comes up all the time about the anthropocene is, who is this “anthropos?” and depending on where, when, how you interpret the anthropocene, that question gets different answers, with different politics, responsibility, etc.

**[3/5/15, 12:51:01 PM] Xavier Cha:** it’s interesting to realize that this extremely powerful tool and space can become so prescribed and banal through our use of it—revealing our mental patterns through our navigation of this space

**[3/5/15, 12:51:39 PM] Xavier Cha:** hmmm, ya, who is the “anthropos?”

**[3/5/15, 12:51:42 PM] Dehlia Hannah:** railroad tracks on the internet—not a wilderness

**[3/5/15, 12:51:57 PM] Xavier Cha:** exactly

**[3/5/15, 12:52:15 PM] Dehlia Hannah:** well, what if its this deranged critter with arthritis in her thumbs?

**[3/5/15, 12:52:30 PM] Xavier Cha:** ha

Volunteer Release and Confidentiality Agreement Form

Talent  
Name: \_\_\_\_\_

Project : Xavier Cha's Surveil for Placing the Golden Spike exhibition at INOVA

By signing this Release and Agreement of Confidentiality,  
I, \_\_\_\_\_, hereby consent without further consideration or compensation  
to the use, full or in part, of all recordings made by the installed software, Screenflow,  
including all websites visited, all material on the user's desktop and screen includ-  
ing audio, all recordings of my face, surroundings, and voice and/or written or visual  
extraction, in whole or in part, of such recordings for the purposes of visual art, illustra-  
tion, broadcast, or distribution in any manner, online, via social media, or in print.

By signing this Release and Agreement of Confidentiality,  
I, \_\_\_\_\_, the contracted volunteer agrees that I or anyone on my behalf  
will not disclose or use in any manner any information or material concerning the pro-  
cedure or operations of the participated project, or any related matters concerning the  
artist Xavier Cha or her work.

Volunteer's Signature \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_

Country \_\_\_\_\_ Postal Code \_\_\_\_\_ Phone \_\_\_\_\_

Email \_\_\_\_\_

**Natalie JEREMIJENKO**

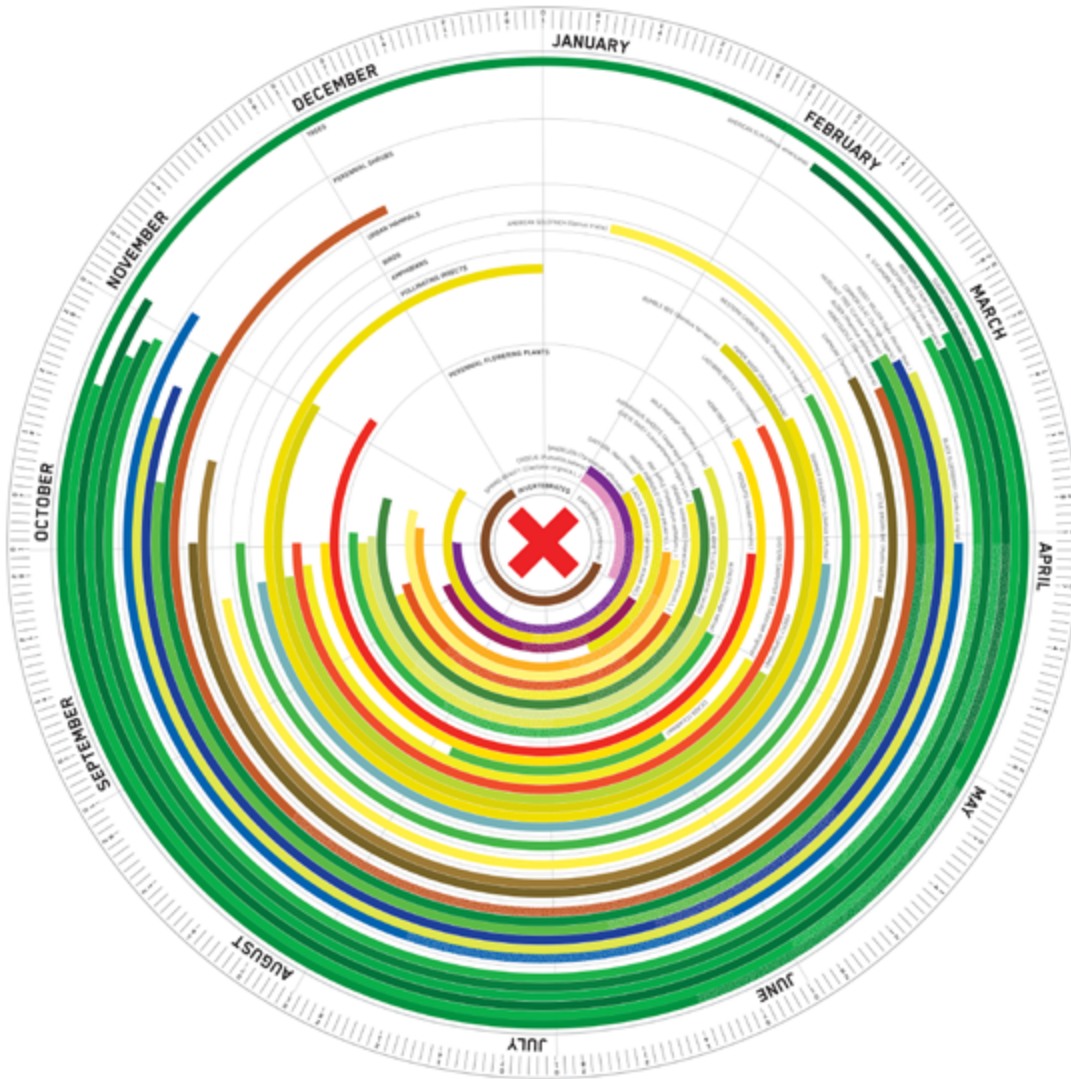
Natalie Jeremijenko is an artist and associate professor of Visual Art at New York University's Steinhardt School of Culture, Education, and Human Development where she directs the Environmental Health Clinic (xClinic), and affiliated with the Computer Science Department and Environmental Studies program. Holding degrees in fine arts, neuroscience, biochemistry, history, and philosophy of science, and a Ph.D. in Computer Science and Engineering from the University of Queensland, she has taught at the intersections of visual arts and engineering at Yale University, University of California San Diego, the San Francisco Art Institute, and the Royal Melbourne Institute of Technology and exhibited her work in locales ranging from museums such as New York's Museum of Modern Art to web platforms, rock music festivals, urban parks, highways, and polluted riverbeds. Jeremijenko's practice develops the emerging field of socio-ecological systems design (or xDesign) crucial in the Anthropocene, using attractions and ongoing participatory research spectacles that address the contemporary challenge to reimagine our collective relationship to natural systems. This integrates diverse strategies to redesign energy, food and transportation systems that can contribute to the common good, increase soil, aquatic and terrestrial biodiversity and improve human and environmental health.



*Signs of (Intelligent) Life, New York, 2014*



*Signs of (Intelligent) Life: Cross Dressing Bikes and Buildings for Pollinators, People and Possibilities*



MKE Phenological Clock, 2015

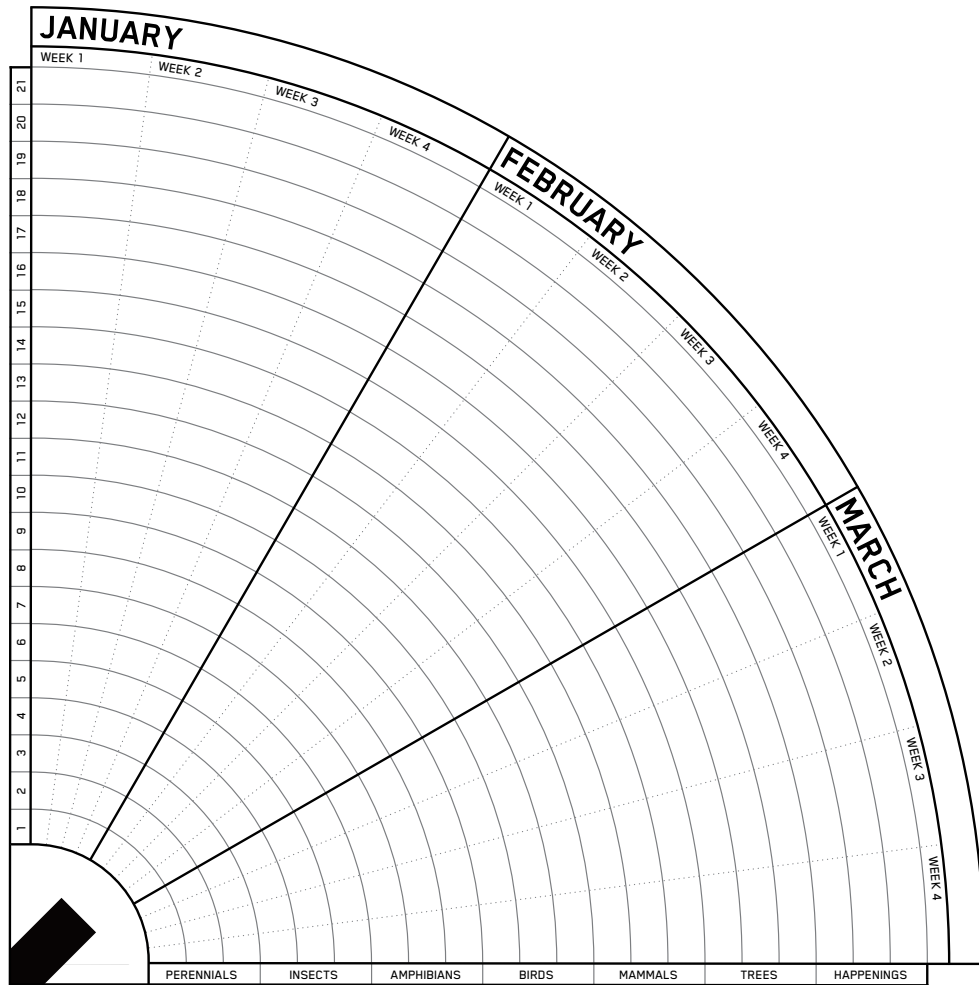
Natalie Jeremijenko's installation of *Signs of (Intelligent) Life*, *LifexCycle*, and *MKE Phenological Clock* are the seeds of a larger project: to open a Milwaukee satellite of Jeremijenko's Environmental Health Project (xCLINIC). A public experiment of Jeremijenko's creative approach to environmental health, this trio of projects introduces the concept of mutualism, a little understood concept that describes the vital interdependent relationships on which most of the biomass of the earth relies and thrives.

During the exhibition, the project acts as a platform for xCLINIC to become better acquainted with the specific environmental health concerns of the city and to establish relationships with community and civic partners. Afterwards, INOVA will join a growing network of xCLINICs internationally that facilitate the aggregation of localized knowledge and participation in developing creative strategies to mitigate and adapt to the ecological consequences of the Anthropocene. The xCLINIC takes the gallery as a platform for communal activity that identifies particular environmental health concerns. Through this engagement, the xCLINIC develops prescriptions for actions based on local data collection and facilitates specific art, design, and participatory projects in partnership with local environmental organizations, government agencies, or civil society groups, using the data and prescribed actions to instigate change. Over time, this strategy shifts social behavior, transforms physical circumstances, and directly empowers communities to take responsibility for environmental health, leading to informed demands for local public policy changes.

Initially installed at INOVA (signs will be later made available to local businesses), *Signs of (Intelligent) Life* adapts the materials and design of outdoor commercial signs to host

growing systems for native flowering plants that support pollinator health, improve air quality, and promote diverse ecosystems. The project supplements existing signage with a large sign-planter made of lightweight, breathable Tyvek, printed with striking designs that communicate messages about mutualism and exhibits the interdependency of species at the site. A graphic of the *MKE Phenological Clock*, mounted to the gallery exterior, visualizes the relationships and seasonal rhythms of selected local insects, plants, birds, and trees. Visitors can take a blank poster version to do their own phenological tracking, elaborating and contributing to the field research gathered through amateur observers of the Wisconsin Phenological Society. Flowering native plants growing out of the sign add visual vibrancy and form habitats for pollinating insects. *LifeXCycle* offers participants an opportunity to cross-dress their bicycles with signs designed to enable the messages of the xCLINIC to circulate throughout the city.





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| <input type="radio"/> 7 _____ | <input type="radio"/> 14 _____ | <input type="radio"/> 21 _____ |

The phenological clock displays when local organisms bud, bloom, emerge, or migrate on a January through December clock face. These observable seasonal events are arranged in concentric annual circles, one for each species: perennial flowering plants in the innermost circles; the insects, butterflies, bees and moths that are dependent on these are in the next surrounding set of circles; the birds, dependent on insectivorous resources are next; and then local trees and their large biomass and habitat provisions are positioned as the outmost annual rings. For instance, when a flowering perennial plant buds, leafs out and flowers, these events appear in the same circle, the color of which is characteristic of the organism.

This clock re-presents time as the dynamic coordination of diverse and interdependent organisms rather than as the mechanical movement of gears, pendulums or quartz in conventional time pieces. These are the actual material biogeochemical processes that define time, create micro-climates and produce the vivid natural systems on which we depend not only for food, and nutrients, but also air quality, water quality, and health. Phenology is our most sensitive indicator of climate destabilization and understanding this will inform the creative collective work of reimagining and redesigning our collective relationship to natural systems. In the Anthropocene, and our current pollinator crisis, threatened ecosystem collapse and climate destabilization, the temporal structure of the ecosystem is a valuable way to represent organisms and coordinate our collective attention toward the workings of natural systems.

**Instructions**

Select your favorite flowering perennials, a couple of insects that delight you, a bird who's appearance you have noticed or song you'd like to hear, and a handful of trees you walk past, are out your window or that you see often. Make your own legend with a color for each species and then mark in any hopeful budding, blooming, sighting or seasonal hijinx you notice in that species. You can send us an image of your observations to contribute to the next edition of the Milwaukee phenological clock, or not, just keep it for your very own gratification.





## ATOMIC TESTS IN THE ATMOSPHERE

Above: Dominic Truckee Blast, June 6, 1962  
Christmas Island Area, 210 kilotons at 6,970 ft.

Atmospheric nuclear bomb tests from 1954 to 1963 produced a persistent cloud of carbon-14 (a radioactive isotope of carbon) that traveled the Earth. Beside doubling the amount of carbon-14 in the atmosphere, atomic weapons testing left markers of atmospheric militarism around the world. As a result of eating fruit from trees with increased carbon-14 uptake, people born in the 1950s carry more carbon-14 in their brain cells than people born after the 1963 Partial Nuclear Test Ban Treaty.

**Arijit SEN**

Arijit Sen, Associate Professor of Architecture, teaches architectural design, urbanism, and cultural landscapes at the University of Wisconsin-Milwaukee. He is the co-coordinator of the Buildings Cultures Landscapes doctoral program initiative between the University of Wisconsin-Madison and UWM. His research interests include physical and cultural landscapes of immigration in the United States. He is currently completing his book “Creative Dissonance: The Politics of Immigrant World Making” and a co-edited monograph “Devon Street, Chicago: Interpreting Landscapes of Transnationalism.” Sen received his PhD from the University of California, Berkeley and served as a Center for 21st Century Studies fellow at the University of Wisconsin-Milwaukee and a Quadrant Fellow at the Institute of Advanced Study at the University of Minnesota, Minneapolis.

**Architects Approaching the Anthropocene**

In organizing *Placing the Golden Spike: Landscapes of the Anthropocene*, the exhibition curators Dehlia Hannah and Sara Krajewski ask, “If the Anthropocene is accepted, then one major question must be answered: when and where did human activity begin to leave its indelible mark upon the surface of Earth?” Most references to the Anthropocene point towards major disasters resulting from climate change, industrial resource extraction processes, and other large global, financial, and environmental crises produced by human actions. Scholars of architecture and the built environment are primarily interested, however, in the everyday acts of human beings and the politically charged nature of the mundane.

In her groundbreaking work on the *Power of Place*, Dolores Hayden (1995) writes “exploring... issues in terms of landscape history means framing questions of power around the politics of land use.” This line of thinking suggests that one such “golden spike” moment was when humans colonized the Earth’s crust, indelibly marking it with political boundaries delineating agricultural and human settlements.<sup>1</sup> Erle C. Ellis argues that “the critical challenge... is in maintaining, enhancing, and restoring the ecological functions of the remnant, recovering and managed novel ecosystems formed by land use and its legacies...”<sup>2</sup> This practice of reclaiming geography that fundamentally altered our ecosystem prompted Ellis and Navin Ramankutty to coin the term “anthropogenic biomes” or “anthromes” to describe such environs.<sup>3</sup> An anthrome redefines land as property. It reconfigures geology and topography into nation states, urban regions, metropolitan jurisdictions, and local neighborhoods. These ontologically inscriptive processes are historical in nature and they influence the way we understand and value anthromes as a world made by intricately intertwined human and non-human systems.

*Placing the Golden Spike* offers an invitation to explore how anthromes are socially constructed, represented, and maintained in everyday life and to consider how art and architecture might intervene in their formation. In order to understand how myriad anthromes are locally reproduced, an undergraduate architecture class of 117 students studied 15 public main streets in the city of Milwaukee as case studies of complex ecological and political systems. As part of a class assignment, students enrolled in Arch 302 (Architecture and Human Behavior) engaged with or responded to INOVA’s work with Natalie Jeremijenko’s Environmental Health Clinic (xCLINIC).<sup>4</sup>

xCLINIC proposes an approach to social and ecological problems of the Anthropocene by introducing creative, participatory models designed to engage with specific concerns at the local level. As INOVA Director Sara Krajewski describes it, Jeremijenko's work proposes that a successful strategy to mitigate and adapt to the local effects of the Anthropocene demands the aggregation of localized knowledge and increased local participation. Over time, shifting social behavior and transforming physical circumstances directly at local sites empower communities to take responsibility for environmental health and make informed demands for public policy changes.

The students in Arch 302 applied a method of spatial ethnography to study selected urban retail streets across Milwaukee. Spatial ethnography is a strategy that merges analyses of place as material culture with a thick description of human stories.<sup>5</sup> It is an improvised interpretive method of restless storytelling that combines analysis of artifacts with ethnographic, historical, and observational accounts of how people use and give meaning to place. This methodology explores the reflexive relationships that happen between people, culture, everyday processes, non-human agents such as flora, fauna, and climate, and material settings on multiple scales in the urban setting.

The city of Milwaukee is made of smaller neighborhoods, each with its own main street—a public thoroughfare with retail establishments and public life. By choosing to study and analyze different main streets, the students produced a comparative body of knowledge and information about the various human and non-human agents and activities within these streetscapes. After completing a series of assignments focusing on how to collect, analyze, and represent data, students were challenged to suggest a targeted and place-specific catalytic design that generated resilience, capacity, and improved environmental health of these main streets. Ultimately the class exercise repositions an understanding of architecture in the Anthropocene by testing if local neighborhoods were indeed unique anthromes or place-specific ecologies that necessitated exclusive design responses.

Urban anthromes are ecologically, environmentally, and politically fraught as various urban inhabitants (both human and non-human) contest their place within this complex ecosystem. Until recently, much of urban life has been seen from an anthropocentric lens, as if humans are the only habitants of the city. Take the concept of the right to the city first proposed by Henri Lefebvre. According to David Harvey, “The right to the city is far more than the individual liberty to access urban resources: it is a

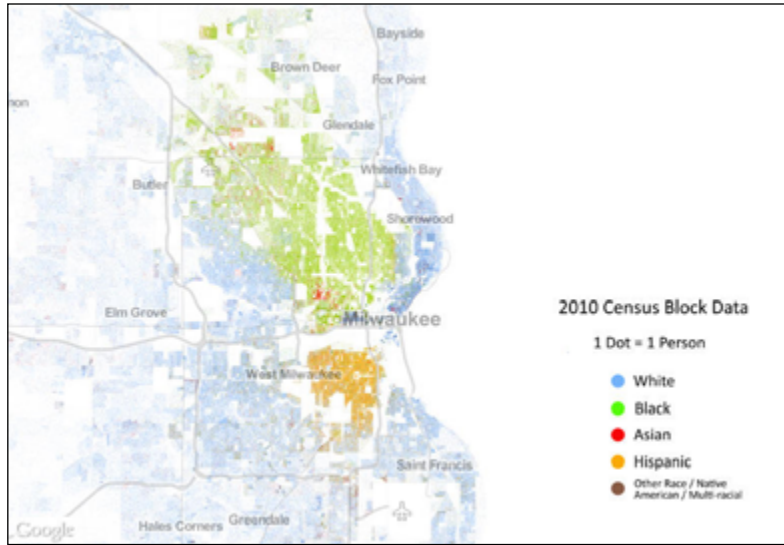
right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization.”<sup>6</sup> Yet discussions focusing on the freedom to make and remake our cities, and, by extension, redefine ourselves as citizens, often leaves out the role of animals, birds, plants, seeds, and the material and nonhuman environment.

Discussions of rights to the city within the context of industrial and postindustrial metropolises have often centered on arguments around the social construction of urban publics and contested public space. This way of thinking emerges from Georg Simmel's discussion of the transformative role of cities and Louis Wirth's *Urbanism as a Way of Life*. In current scholarship, a range of scholars such as Jane Jacobs, Sharon Zukin and Saskia Sassen have continued these debates over the meaning of public space to the twentieth and twenty-first century, showcasing the multiple forms of contesting publics and interested social constituencies.<sup>7</sup> Questions such as “whose space?” interrogate the nature of ownership and authorship in public spaces. Who is admitted into such spaces and how public is constituted and legitimized have been the center of much debate.<sup>8</sup> Public spaces (and public identities), scholars agree, are neither neutral nor uniform or innocent. What is unique to the student assignment and Jeremijenko's work is shifting this discussion of the “right to the city” to include the role of non-human agents and environmental factors.

### **Contested Urban Anthromes in Milwaukee: An Example**

In the city of Milwaukee, the politics of public space is palpable—some public sites are celebrated and emulated while others are demonized and segregated. Some locales are ignored while others are declared culturally and historically significant. The politics of public space is further implicated in chorographic acts of governmental and planning agencies that designate boundaries of historic and cultural districts, neighborhoods and tracts, and various forms of vested economic territories. Refocusing our comparisons of public space using the Anthropocene lens opens up ways to see the interconnected environmental, ecological, political, economic and cultural systems in the making of urban space in this city. Interlinked issues such as climate change, infrastructure, social networks, environmental racism, food justice, and human rights come to the forefront.





<http://demographics.coopercenter.org/DotMap/index.html>



<http://www.visitmilwaukee.org/visitors/interactive-map>

Milwaukee likes to boast of its communities and neighborhoods, many designated by the City government and planning agencies in order to improve tourism and economy.<sup>9</sup> At an urban scale these designated territories, or what Dennis R. Judd and Susan S. Fainstein call tourist bubbles,<sup>10</sup> define a checkered public realm. Visitors arriving in Milwaukee often receive a colorful map along with an official visitor’s guide produced by Visit Milwaukee convention & visitor’s bureau.<sup>11</sup> To a visitor this map reconfigures a large swath of continuous bedrock abutting Lake Michigan into a kaleidoscope of colorful shapes representing neighborhoods and historic districts that Ellis calls “an anthrome mosaic.” A light blue swatch demarcates the historic East Side neighborhood and a dark blue band depicts the old immigrant neighborhood of Brady Street. Both these locales sit on top of a green patch titled East Town, a “downtown neighborhood filled with a mix of high rises, restaurants, boutique shops, hotels, condos, and apartments.” Lake Michigan borders the right edge of this image. The map legend describes all these marked neighborhoods as places worth visiting. Descriptions of museums, parks, art galleries, and restaurants invest these neighborhoods with cultural and historical assets. Each neighborhood is unique because they have a designated retail district or a main street, creating an appearance of a decentered mosaic of smaller boroughs. In reality it is not so, since census tract boundaries, sewage and water parcels, and aldermanic districts have conflicting boundaries. Nevertheless, these historic districts are powerful public imaginaries and residential neighborhoods, public fairs, main street business organizations, and grassroots groups cohere around these territorial monikers.

At the top left hand corner of the map, outside the tourist bubble, lays a gray zone with no names, no neighborhoods, and no historical references. A freeway cuts across this geographical twilight zone like a bridge. What makes this gray non-space even more distinct is a red inset marking Wauwatosa a neighborhood “10 minutes west of Downtown Milwaukee,” too far away to be included in this map, but apparently worthy of a visit. This large gray zone is not a black hole. Indeed the unnamed gray space holds a complex ecosystem, diverse neighborhoods, and historical and cultural assets. This area also experiences economic disinvestment, major loss of housing as a result of the 2010 foreclosure crisis and environmental degradation in the form of post-industrial brownfield sites. It is home to a vast majority of poor and minority residents. The racial dot map shows that the gray zone is racially segregated, mostly African American with smatterings of new low-income immigrant communities. EPA and environmental

justice maps show us that a large number of industrial brownfields and polluted sites are located in this area. This unnamed gray space is important because its existence is more than a mere act of innocent omission. This large gray zone brings forth the contradictions inherent in the way humans have colonized land and unevenly invested places with meanings and histories. It speaks of environmental racism and associated economic and ecological devastations. Returning to the Visit Milwaukee map we see a more complex environmental process by which we humans tend to differentiate our physical landscape into networks of interrelated geographies.<sup>12</sup>

Erasure of stories plague racially and economically marked neighborhoods. Places that are neglected, devastated, disinvested, and depopulated also lose their stories when their storytellers die or move, when their heritage is ignored or forgotten, and when singularly negative stories of crime, depopulation and poverty take center stage. These purposeful erasures are not merely social disasters. They are environmental disasters that systematically damage our anthromes.

By comparing the anthromes of urban main streets across the spectrum of neighborhoods, the student projects throw a spotlight on the interconnected, structural, and systemic environmental inequities of our times. Their projects provide an opportunity to rethink and redefine the urban cultural landscapes of Milwaukee as a product of profound—and unequal—ecological, environmental and political processes. Neighborhood main streets are social constructions and they are reproduced within a complex web of social, economic, cultural and environmental politics. Inner city neighborhoods such as Washington Park and Mitchell Street are produced by years of uneven development, environmental racism, persistent disinvestment, and biased planning strategies. In contrast streets such as Downer Avenue in the wealthy Historic Water Tower neighborhood next to Lake Michigan display a different kind of ecosystem and relationship to its ecology. These neighborhoods are connected and related to each other. The working class neighborhoods hugging the banks of Milwaukee River or the 30th Street industrial corridor and the rich neighborhoods of industry captains located along Lake Michigan are related to each other. They are part of the same nineteenth and twentieth century industrial economy that collapsed in recent decades. The complex and intricate webs of social, environmental, material, services, and ecological systems of these neighborhoods point towards interconnected forms of inequity that seem

to be characteristic of the evolving Anthropocene. The student projects show how new catalytic interventions and restructuring in one neighborhood's main street have palpable impacts across the city and at many levels within it. Architecture in the age of the Anthropocene is part of a complex web of mutually interconnected landscapes where we have a chance to reexamine and rethink the social, ecological and the political discussions of urbanity using an encompassing environmental lens.

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1. Ellis suggests that the emergence of agricultural systems and economies began such transformations. See, Erle C. Ellis, "A Taxonomy of Human Biosphere," Chris Reed and Nina-Marie Lister (Eds.), *Projective Ecologies*, Cambridge: Actar, Harvard University Graduate School of Design, 2104), 168-183.

2. Ellis, "Taxonomy," 179

3. Erle C. Ellis and Navin Ramankutty, "Putting People in the Map: Anthropogenic Biomes of the World," *Frontiers in Ecology and the Environment* 6:8 (October 2008): 439-447.

4. NYU's Environmental Health Clinic (xCLINIC), under the direction of Professor Natalie Jeremijenko, is a design lab focused on accessible, community-driven innovation that improves the air, water, and nutritional quality of urban neighborhoods, especially low-income urban neighborhoods that face high levels of pollution and constrained access to quality nutrition. By fostering an open-source network of community organizations with local roots, xCLINIC operates on three continents with sustainable impact and high financial efficiency.

5. Arijit Sen and Lisa Silverman, *Making Place: Space and Embodiment in the City* (Indiana University Press, 2014), p. 8–13.

6. David Harvey, "The Right to the City," *New Left Review* 53 (2008), 23–40.  
Henri Lefebvre, *Writings on Cities*, trans. and editors, Eleonore Kofman and Elizabeth Lebas, (New York: Blackwell Pub., 1996), 158.

7. Louis Wirth, "Urbanism as a Way of Life," *American Journal of Sociology* 44 (July 1938): 1–24.  
Sharon Zukin, *Landscapes of Power: From Detroit to Disney World*, (Berkeley: University of California Press, 1991).  
David Harvey, *The Urban Experience* (Baltimore: Johns Hopkins University Press, 1989).  
David Harvey, *The Condition of Postmodernity* (Malden: Blackwell, 1990).  
Georg Simmel, "The Metropolis and Mental Life," *The Sociology of Georg Simmel*, trans., Kurt Wolff (New York: Free Press, 1950), 409–24.  
Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961).  
Lewis Mumford, *The Culture of Cities* (1938; New York: Harcourt Brace, 1996).  
Lewis Mumford, *The City in History: Its Origins, Its Transformations, and Its Prospects* (1961; New York: Harcourt, 1989).  
Saskia Sassen, *The Global City: New York, London, Tokyo* (Princeton: Princeton University Press, 2001).

8. Jeffrey Hou, *Insurgent Public Space: Guerrilla Urbanism and the Remaking of Contemporary Cities* (New York: Routledge, 2010).  
Setha Low, *On the Plaza: The Politics of Public Space and Culture* (Austin: University of Texas, 2000).

9. The making of urban public space has a contested history in the city of Milwaukee. In the last two years, local business interests, political fat cats, and ideologically vested interests have pushed creative placemaking as a way to make profit and turn public places into economic commodities. The term placemaking has been wrested from its use in the past, to represent investments and development that primarily produce profit for a few, often at the cost of social, political and cultural interests of low-income and minority residents.

10. This is a term used by Dennis Judd and Susan Fainstein. Dennis R. Judd, and Susan S. Fainstein, *The Tourist City* (New Haven: Yale University Press, 1999), 36.

11. Now a non-profit corporation, the organization website explains that "[f]ormerly a department of the Metropolitan Milwaukee Association of Commerce, the "Convention & Visitors Bureau of Milwaukee" was incorporated in the State of Wisconsin on January 6, 1967. ... The bureau officially changed its name to the "Greater Milwaukee Convention & Visitors Bureau, Inc." in 1977. In 2005 the addition of "VISIT Milwaukee," was added to our name as part of a re-branding and re-imaging process." See more at: [http://www.visitmilwaukee.org/about-](http://www.visitmilwaukee.org/about-us#sthash.64gpGEAG.dpuf)

[http://www.visitmilwaukee.org/about-](http://www.visitmilwaukee.org/about-us#sthash.64gpGEAG.dpuf)

12. Environmental geographers have shown that maps of cities and inhabited regions, seen during night, are made up of clusters of brightly lit nodes connected by highways and transportation infrastructure. Interspersed between the brightly lit nodes are dark spaces that may seem to be uninhabited, virginal land, untouched and unexplored. However these dark spots are often sites of resource extraction—forests, pipelines, mines and rich mineral deposits, that produce the energy and resources to keep the urbanized areas lit at night. Both the NASA map and the Milwaukee tourist map produce such hyper visible places, locales invested with meaningful stories, rich histories, and cultural interest. The invisible worlds, or dark spaces, are spaces of exploitation and inequity. These two spaces are intertwined because one supports the existence of the other. The territories marked in both maps are political in nature because they valorize some places, some histories, and some ideologies while rendering invisible the unaccounted for narratives of the dark places and gray zones next to them.

See NASA map at [http://apod.nasa.gov/apod/image/0011/earthlights2\\_dmisp\\_big.jpg](http://apod.nasa.gov/apod/image/0011/earthlights2_dmisp_big.jpg)  
<http://apod.nasa.gov/apod/ap001127.html>





## THE SPECULATIVE

Scenarios are images of the future, or alternative futures. Used to explore possible ways the climate may change in the future in a range of time scales, climate scenarios predict how “temperature, precipitation, sea level, and other climatic variables may change” over time as a result of human and natural climate drivers. Climate scenarios also factor in human beliefs about the climate and how attitudes towards the future impact the future climate and atmosphere.

While it would be difficult to sum up the total impact of human worldviews on the atmosphere, anthropogenic greenhouse gas concentration might be a crude metric. In January 2011, the atmospheric concentration of carbon dioxide was 391 parts per million (ppm). What will the climate be like in 100 years? In 1,000 years? Uncertainty is high.

*Placing the Golden Spike: Landscapes of the Anthropocene*  
Institution of Visual Arts  
March 26 – June 13, 2015

**Amy Balkin, et. al**

*A People's Archive of Sinking and Melting*, 2012–  
Mixed media  
Dimensions variable  
Courtesy of the artist

**Amy Balkin**

*The Atmosphere: A Guide*, 2013  
Poster essay, inkjet print  
Dimensions variable  
Courtesy of the artist

**Xavier Cha**

*Surveil*, 2014  
Performance  
Presented on May 13, 2015; performers Isaac Robertson and Miranda Zielinski

**Roderick Coover and Scott Rettberg**

*Toxi-City*, 2015  
HD Video  
3:00:00  
Courtesy of the artists

**Eric Corriel**

*Water Will Be Here*, 2010  
Site-specific video installation  
53:00 loop  
Courtesy of the artist

**Natalie Jeremijenko**

*MKE Phenological Clock*, 2015

Vinyl window installation

63 x 70"

Courtesy of the artist

**Natalie Jeremijenko**

*Signs of (Intelligent) Life*, 2015

Tyvek, viola tricolor, soil, compost,

36 x 192"

Courtesy of the artist

**Natalie Jeremijenko**

*LifeXCycle*, 2015

Tyvek, bicycle

Dimensions variable

Courtesy of the artist

**Yevgeniya Kaganovich**

*grow*, 2012-present

Durational installation project, recycled plastic bags

Dimensions variable

Courtesy of the artist

**Eve Andrée Laramée**

*Inverse Alchemy: Shadows in Reverse*

Site-specific installation, mixed medium

Courtesy of the artist

*Alien #1: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Time Traveler in RadWaste Tunnel: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Hands in the Fire #1: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

Diptych, each 9 x 12 inches

*Skeleton Hands in Reactor #1: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

Diptych, each 9 x 12 inches

*The Dark Character #2: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*The Dark Character #3: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Time Traveler in Time Tunnel: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Time Traveler in RadWaste Tunnel: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Time Traveler in Nuclear Reactor: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Hands in the Fire #3: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*Fur Trapper Gold Dust #1: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

9 x 12 inches

*The Dark Character and The Gadget: Slouching Towards Yucca Mountain*, 2012

Video still, archival inkjet print on acid free paper

20 x 28 inches



*Time Travelers in Reactor Core: Slouching Towards Yucca Mountain, 2012*

Video still, archival inkjet print on acid free paper  
20 x 28 inches

*Danger Ranger: Slouching Towards Yucca Mountain, 2012*

Video still, archival inkjet print on acid free paper  
20 x 28 inches

*Reptile Woman Emerging from the Tunnel: Slouching Towards Yucca Mountain, 2012*

Video still, archival inkjet print on acid free paper  
20 x 28 inches

*Fukushima Psychopomp: Slouching Towards Yucca Mountain, 2012*

Video still, archival inkjet print on acid free paper  
20 x 28 inches

*Time Traveler from the Future: Slouching Towards Yucca Mountain, 2012*

Video still, archival inkjet print on acid free paper  
20 x 28 inches

*Uranium Daughters, 2012*

Video

*Teratology, 2012*

Video

*Slouching Toward Yucca Mountain, 2012*

Video

### **Steve Rowell**

*Uncanny Sensing (TX Prototype), 2014*

Three screen video installation with four-channel sound

Videos: 8:00, 10:00, 22:00

Courtesy of the artist

### **Marina Zurkow**

*Mesocosm (Wink, Texas), 2012*

Custom software-driven, hand-drawn animation  
146-hour cycle (24-minute day, 146-hour year)  
Courtesy of the artist and bitforms gallery

### **Marina Zurkow**

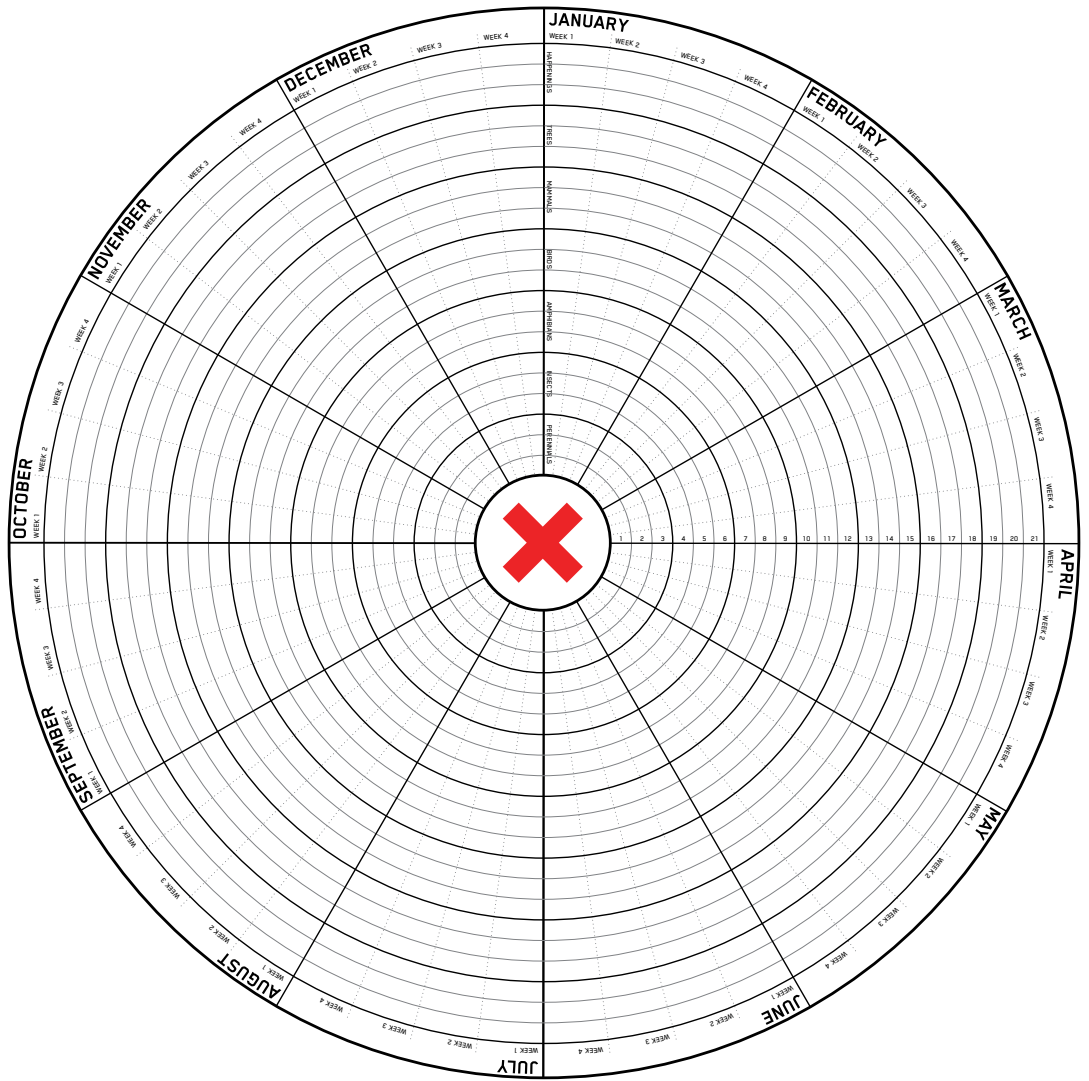
*HazMat Suits for Children, 2012*

Tychem TK fabric, acrylic, Velcro, rubber, mannequin  
Each 48 x 15 inches  
Courtesy of the artist and bitforms gallery

### **Marina Zurkow and Ben Kauffman**

*Landfill Club, Milwaukee, 2015*

Social sculpture  
Dimensions variable  
Courtesy of the artists



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