

MEDIATED EARTHWORKS: NEW MEDIA GOES WILD

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The artistic use of emerging sensor technologies in remote locations is resulting in artworks inextricably linked to dynamic forces in the natural landscape. Like Earthworks, these projects are shaped by nature, connected interactively with their environments but using technology instead of bulldozers to mediate. New media is introducing new types of environmental impact in sculptural, visual, cinematic, and narrative construction.



Fig. 1. Sustainable Cinema No. 1: The Image Mill, 2009, Scott Hessels, steel kinetic sculpture, installed at the Ford Presidential Museum, Michigan. Copyright Scott Hessels.



Fig. 2. Mulholland Drive, 2004, Scott Hessels, Michael Chu, Martin Bonadeo, light and sound installation, installed at UCLA, Los Angeles. Copyright Scott Hessels.

Throughout history, artists have taken the materials and forces of nature and used them in the creation of works. The sculpting of clay, the mixing of pigments both represent the use of natural or organic materials as servants to artistic inspiration. However, a subset of art has allowed that relationship to be reversed. Using a wide range of tools – wind, entropy, erosion, mapping – some artworks allow nature to be a physical, determining influence in their realization. These artists have shared their vision with the natural environment and transferred the power to shape its form to the forces of nature.

Recently, new media artists have joined this tradition and begun using data from the natural world as a driver for visual, temporal, narrative or dimensional components of their work. Taking advantage of the increasingly portability of computational sensors, these artists are 'reading' the natural environment and then using the data to shape artworks that exist in a mediated but symbiotic relationship with the natural world.

Easily understood as a type of data visualization, the projects often focus on the computational and can be associated with other information arts. Alternatively, they can be viewed as ecological art, tapping into the contemporary zeitgeist surrounding sustainable design. However, if one considers the interactivity of the works – nature as a collaborator – they fall rather interestingly into a history of Land Art sculpture. Perhaps by viewing these projects as Mediated Earthworks, we broaden both the depth of these artworks and our understanding of our complex relationship with nature.

The moving image is usually considered a mediated art form since it is difficult to separate kinesis from the machines that power it. However, kinetic sculpture is also time-based, often narrative, and its changes in shape, color, and even materiality share many qualities with cinema. Making this leap, one can consider the evolving form of Calder's mobiles and the rambling wind-powered sculptures of Theo Jansen as non-mediated moving images. In a sense, kinetic artworks are screenless cinema.

The Earthworks sculptures that began emerging in the 1960's were often sets of instructions that foreshadowed programming as well as made to change over time. Their innate ephemeral qualities – artworks that embraced entropy and change instead of battling it – made them temporal forms whose changing 'image' was part of the artists' creative strategies. As sculptor Robert Morris explained, "What art now has in its hands is mutable stuff which need not arrive at a point of being finalized with respect to time or space. The notion that work is an irreversible process ending in a static icon-object no longer has much relevance." [1] The sculptures had cycles, changing stages, life spans. Earthworks were images that moved.

Like the moving image, interactivity is also strongly associated with computation and media. However, interactivity can be purely relational, with no mediation required. Paul Willemen puts it almost bitterly, "To refer to interactivity as a new feature characteristic of 'new tech' discursive forms is, again, nonsense. Indeed, in many respects, the digitalization of information has rendered interaction between reader/viewer and text-production more restricted in that the protocols governing interactivity have become tighter, narrower, more inflexible, and more policed. The expansion of opportunities for interaction has become accompanied by reductions in the scope for action." [2] Part of that scope of action is limited by a view that interactivity must occur with machines.

However, interactivity may not be limited to Willemen's reader/viewer either. The emphasis on process and temporality of Land Art was directly tied to forces in the environment. It was a unique and radical form of interactivity, where context was given influence and power, forming a triangle to the reader/viewer relationship. The artist interacted with the natural environment, viewers interacted with the spaces and systems that were created, and nature would interact with the sculpture by reshaping it. Artist, viewer and nature were in a messy mix of interactivity...which wonderfully increased the unpredictability of each of the interactions.

This emphasis on time and process allowed viewers to look at the dynamics of the elements in the environment. One had to experience different stages of the system to experience the whole work. The physical forces of the landscape became an interactive driver for the realization of the visual artwork. It was

“a programmatic approach to the work and advocates sculpture which experiences, reacts to its environment, changes, is non-stable... art is gradually entering into a more significant relationship with the viewer and the component parts of his environment.” [3]

Changes in time led to changes in form and the Earthworks movement viewed sculpture as malleable, changing, entropic, and participatory. Earthworks connected physically with their environments and were designed to react to the forces found there. Nature was the hammer that pounded the sculptures, the brush that changed their colors. “During the period, many artists worked with natural materials, often fascinated by their evolution and their organic decomposition. To better observe this process, the artist became almost a laboratory assistant, engaging in artistic experiences.” [4]

Many of the Earthworks artists would probably contend that they were fighting the creeping technology and mediation of the 1960's and took to the desert for its innate isolation and primitivism. It is ironic that many of the works were actually very complex systems and, when connected with the programmatic strategies evolving in Conceptualism and Fluxus, became keystones in the computational arts of today.

These artistic systems are celebrated as early ecological art but could easily be equally lauded as early programming art. Hans Haacke creating artificial ecosystems (“Rhine Water Purification Plant” 1972), Agnes Denes harvesting wheat in downtown Manhattan (“Wheatfield: A Confrontation” 1982), and Robert Smithson pouring tar down an eroded hillside (“Asphalt Rundown” 1969) all leaned on nature to do the heavy lifting and provide the meaning. The sculptures could not exist without the input of nature itself. The direct use of forces and processes in nature to create sculpture continues today. John Grade’s “Host” (2007) is partly sculpted by the local birds pecking away at the form of his work.

Today culture has shifted towards an emphasis on sustainability – how those ecological systems can continue on. It is an approach that empowers natural systems, giving them the capacity to endure. Sustainable design often incorporates a direct agency with environmental power – wind, currents, sunlight, etc. The highlighting of systems in nature has been replaced by a closer look at the forces of nature.

Tapping those forces means that artistic gestures can be shared with nature itself. Kinetic art has often recognized this possibility and used natural force as a method to change the form of a sculpture. Alexander Calder’s mobiles opened up sculpture to the dynamics of outside influences, for example. Two recent exhibitions of kinetic works have emphasized the forces of nature as a collaborator in the creation of an artwork. Guy Brett, curator of the Force Fields: Phases of the Kinetic show in Barcelona, explained that “we begin to see that ‘natural phenomenon’ and ‘aesthetic decision’ were at this time in a shifting and reciprocal relationship to one another. The working-out of natural processes was allowed to change the conception of the beautiful; artists ceded their ‘will to form’ to certain degrees and in certain ways, and allowed natural events to prevail, which was seen as an emancipatory process, and to offer deeper insight into reality.” [5]

The Drip, Blow, Burn: Forces of Nature in Contemporary Art exhibition at the Hudson River Museum presented artworks that used wind, water, and fire to shape the materials of the art. Curator Thomas Weaver observed that “the natural here is not just a subject, and certainly not just a material...moving natural elements are *primal* elements that, by rupturing the boundaries that govern the significations of visual art, embody the power of art to wrestle with the world.” [6]

Although wind, water and fire are dynamic forces to use as creative influences, they are just the beginning of the possibilities. Computer technologies have not increased the distance between man and nature, new sensors have actually introduced new types of environmental agency. Many natural forces are not directly tangible and now the invisible energy fields, patterns, rhythms and dynamics of nature are possible artistic 'shared gestures'.

Today, indiscernible changes in motion, light, sound, temperature, depth, and a host of other variables can be detected. Our newfound computational detail is spreading and giving us unique information about the natural environment. One of the largest initiatives, Hewlett-Packard's "Central Nervous System for the Earth," plans to release a trillion sensors into the natural and built environments. [7] Tiny wireless contraptions will swarm the planet giving real-time information on ecological systems, geological activity, energy waste, *etc.* We can now discover new types of kinesis in our environment.

Increasingly, artists are co-opting these stunning data streams for artworks. When the sensors are matched with timespans, data over time, we see the increased possibilities of nature itself affecting an artwork. Similar conceptually to Earthworks, these new computational versions have a key difference. Mediation is not limited to the photographic or video documentation of the artwork but now includes the actual collection and input of artistic materials. Media is no longer just presentational.

With sensor and datastream as a type of mediation, emerging technologies make it possible to create new media artworks in remote, wilderness locations. The miniaturization, portability, and cheapness of sensors, computers, projectors, *etc.* is leading to a body of work where the landscape is inextricably linked to the artwork. The list of sensing technologies is growing at a phenomenal rate; this includes commonly used sensors like GPS, DNA, motion, altitude, tilt, speed, light, sound, SONAR as well as emerging technologies in 3D/stereoscopy, 360 degree cameras among others. When matched with artistic strategies, we're seeing GPS Drawing, light and sound installations, projections, and a host of other technologies all using captured datasets that transform the artwork in real time as the data from nature is incorporated.

The narrative possibilities are also being explored when nature is used as a driver for story construction. The natural environment can now become a protagonist, not metaphorically but literally, in the evolution of a story. Sensed changes in nature can be used to select and present from databases of a wide range of media, creating real-time stories in text, moving image, sound, *etc.* One of the lures of exploring environmental agency is the hidden interactivity of the process. The narrative still allows for interactivity's flexibility, but is not controlled by direct human interface. Tomorrow's auteurs may be dynamic spaces.

The direct agency of the natural environment has been investigated by several artists. Mary Lucier's "Dawn Burn" (1975) used a video camera to record the rising sun until its rays left a scar on the image and eventually destroyed the camera's tubes – the power of sunlight directly shaped the visuals on screen. The Center for Land Use Interpretation (1994, ongoing) has initiated several projects that merge database arts with a proactive nature and have made advances in the art of mapping. Paula Poole and Brett Stalbaum have mixed painting technologies with GPS systems, and Haruki Nishijima has designed systems that capture ambient sound and translate it into light and motion. Sheldon Brown's "Video Wind Chimes" (1994) used wind sensors housed in streetlights that had been converted into projectors. Changes in wind changed the television channels being projected down onto the sidewalk.

In my own practice, I have also been working with the forces of nature. The “Sustainable Cinema” series (2009, ongoing) are kinetic public sculptures that use natural energy – wind, water – to generate the moving image [Fig. 1]. The artworks combine references to both the optical illusion toys that led to the invention of movies and early natural energy sources. By referencing the histories of both film and industrialization, these sculptures are simple illusions created with simple energy to make us reflect on how removed we are from the original magic of the moving image. It is a primal media experience, which due to the rapid development of cinema technologies, is no longer an oxymoron.

I had explored this direct agency of nature years earlier when I created a light installation based on the topography of Los Angeles’ famous Mulholland Drive. Together with programming by Michael Chu and sound design by Martin Bonadeo, we collected the tilt, altitude, location, direction, speed and sound of the drive and created an exact duplicate of the experience of traveling along the road in a 3D computer program. That virtual path was then used to control two robotic lights in a dark room filled with fog. Like cinema, direct data is captured, then edited and presented. However, here the environment directly defines the experience, the precise geography is used computationally. “Mulholland Drive” [Fig. 2] demonstrates how the rhythms, patterns, and random chance of the environment can be sensed through new media technologies and used to create new forms of visual experience.

Computational sensing, database aesthetics, real-time processing and visualization systems all can give new perspective on the natural environment. Working with science, media artists can now use the same materials that shaped the Earthworks movement like water, air, soil, stone, temperature, light, acoustics, topology, geography. However, with sensing, shared creative input can be given to natural forces and phenomena in those materials – flow, echo, wind, currents, reflection, decay, animal migration and behavior, topology, projection, and so on.

Once again, artists are reflecting society’s views on the environment but now with an emphasis on shared input – natural energy paired with creative energy. With emerging sensing technologies, hidden natural forces can also be used in artistic strategies. For centuries, nature has been celebrated as an inspiration for the arts. Finally, nature can do more than inspire, it can pick up the brush itself.

References and Notes:

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