

Ecological Art: A Call for Visionary Intervention in a Time of Crisis

Ruth Wallen

The ice is melting while fires are raging. Frogs, bats and bees are disappearing, coral reefs bleaching and vast forests being felled by beetles. Renowned environmental analyst Lester Brown argues that it is imperative that we immediately take actions to lower greenhouse gases; stabilize world population; eradicate poverty; and restore earth's natural systems, including "soils, aquifers, forests, grasslands and fisheries" [1]. Although Brown offers a blunt assessment of the challenges we face, he is quick to add that we have the technological and economic resources to take the actions he advocates. His recent work, however, *Plan B 4.0: Mobilizing to Save Civilization*, concludes with a chapter titled "Can We Mobilize Fast Enough?" [2]. While Brown, like many other sustainability advocates, focuses on sociopolitical, economic and technological factors, culture—and particularly ecological art, or ecoart for short—can play a major role in activating and inspiring change.

TOWARD A DEFINITION OF ECOART

Drawing on broad interdisciplinary knowledge and appealing to both heart and mind, ecological art is grounded in an ecological ethic and systems theory, addressing the web of interrelationships between the physical, biological, cultural, political and historical aspects of ecosystems. Asking probing questions, fashioning potent metaphors, identifying patterns, weaving stories, offering restoration and remediation, inventively using renewable materials and re-envisioning systems, ecological artists inspire, advocate and innovate, revealing and/or enhancing ecological relationships while modeling ecological values. Ecological art inspires caring and respect for the world in which we live, stimulates dialogue, sparks imagination and contributes to the socio-cultural transformations whereby the diversity of life forms found on earth may flourish [3].

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Article Frontispiece. Susan Leibovitz Steinman, *Mandela Art-scape*, aerial overview, temporary community-based ecoart installation (native plants and salvaged materials), 2 acres, execution 1998–1999; the installation was in existence from 1998–2003. (© Susan Leibovitz Steinman) <www.steinmanstudio.com/public art/mandela/index.html>.

CONTEMPORARY APPROACHES

In the following pages I survey the recent development of ecological art practice, followed by a brief interrogation of the most significant concepts—*ecology*, *ecosystem*, *biodiversity* and *sustainability*—that inform the practice. I close with a discussion of examples that illustrate the potential of ecoart to advance ecological consciousness and offer fresh visions.

The contemporary practice of ecological art had its genesis in the late 1960s through mid-1970s with the work of such innovators as Hans Haacke, Helen and Newton Harrison, Patricia Johanson, Alan Sonfist, Joseph Beuys, Nancy Holt, Mierle Ukeles, Bonnie Sherk (Fig. 1) and Agnes Denes. At that time, there was a tension between what Allan Kaprow later described as "art-like art," art that was self-referential and separate, and "life-like art," which emphasized "connectedness and wide-angle awareness" [4]. While environmental art, including early earthworks, employed natural materials and placed work in remote landscapes, these forms were generally more concerned with challenging the conception of "art" than with engaging ecological principles [5]. In contrast, practitioners of life-like ecological art conceived of themselves as engaged citizens or public intellectuals responding to the call of the activist movements of the day.

Writing about ecoart is still distressingly scant. Suzi Gablik and Lucy Lippard are among the most noteworthy English-language writers envisioning socio-cultural change inspired by ecological systems theory. In Europe, using a somewhat different framework, two anthologies edited by Heike Strelow and collaborators amplify these ideas [6]. For Gablik, an ecological perspective emphasizes the wide context, "the web of relationships in which art exists" [7]. In a later article, she calls this a "connective aesthetic," one that eschews individualist anthropocentrism, instead seeking connections between culture and nature, or between art, science, religion and politics, ruptured by modernity [8]. Gablik advocates the development of an art that goes beyond critique, one that will engender healing and renewal. Significantly, this aesthetic is participatory as opposed to spectatorial. Just as art is situated in broader systems, so too the audience or viewer is regarded not as distanced observer but as participant in the experience.

Two anthologies that arose from the *Between Nature* conference, held at Lancaster University in 2000, provide a more

ABSTRACT

At a time when the world is beset by ecological crises, ecological art offers inspiration, insight and innovation. This essay provides an overview of the artistic and scientific roots of the practice and illustrates the significant role that ecoart can play in the formulation, development and promulgation of a culture of sustainability.



Fig. 1. Bonnie Ora Sherk, *Crossroads Community/The Farm*, 1974–1980. (© Bonnie Ora Sherk) Envisioned as a “life frame,” this project transformed land adjacent to a freeway into a farm and community center; <www.alivinglibrary.org>.

rigorous critical perspective while broadening the field [9]. Focusing on the performative, these anthologies include dance and theater, genres largely ignored in other sources cited here. The *Between Nature* essays are reminders of the importance of art as a process, one through which “the very relationships between human beings and nature are being questioned, critiqued and even reinvented” [10].

The few major exhibitions devoted to ecoart have recognized the urgency of the ecological crisis and have tended to frame ecoart in instrumental terms. *Fragile Ecologies: Contemporary Artists’ Interpretations and Solutions*, curated by Barbara Matilsky for the Queens (NY) Museum of Art in 1992, focused on “ecological artworks that provide solutions to the problems facing natural and urban ecosystems” [11]. *Ecovention: Current Art to Transform Ecologies*, curated by Amy Lipton and Sue Spaid, proposed a new term, “ecovention,” a combination of the words ecology and intervention, to describe “an artist-initiated project that employs an inventive strategy to physically transform a local ecology” [12]. Spaid groups projects into five categories, four of which describe specific ways in which ecoartists tangibly contribute to enhancing environmental quality: restoring brownfields, enhancing biodiversity, improving urban infrastructure, and reclamation and restoration.

Other recent exhibitions have offered examples of the broad reach of the field. *Weather Report*, curated by Lippard, and *The Trouble with the Weather: A Southern*

Response, provided an extensive range of artistic responses to climate change [13]. Other examples include *Groundworks*, which focused on community-based collaborative projects; *Ecomedia*, which highlighted the contributions of new media; and *Beyond Green*, which focused on sustainable design [14].

However, the full title of the latter exhibition, *Beyond Green: Towards an Art of Sustainability*, suggests, in my view, unnecessary dichotomies. It appears to ref-

erence arguments, such as in the widely circulated essay “The Death of Environmentalism,” that criticize the limitations of traditional “green” environmental movements [15]. To clarify, the ecological art championed here takes the ethical, activist approach that curator Stephanie Smith espouses, perceiving human considerations as integral to the ecological. In contrast, I take issue with another very recent exhibition, *Radical Nature*, which, while appropriating the term “radical,” dismisses the thrust of the exhibitions described above as “pragmatic and humanitarian,” retreating instead to an object-oriented “ironic and subversive artistic neo-conceptualism” [16].

Although these exhibitions offer a snapshot of the codification of ecoart, they are but one locus of a practice that primarily engages a broader public, beyond gallery walls. We can also understand ecoart in the context of public art—specifically, what Suzanne Lacy calls “new genre public art,” a characterization describing projects that are not simply placed in public spaces but are meant to interact with both site and public. Additionally, Beuys’s term “social sculpture” is very useful, reminding us of the potential of art to transform society [17].

In light of the above, I suggest broadening the delineations offered by the *Ecovention* catalogue, which privileges tangible physical interventions and isolates “activism” as one of five categories

Fig. 2. Mel Chin, *The Fundred Dollar Bill Project*, 2007–present. (© Mel Chin. Photo courtesy Fundred Dollar Bill Project.) The Fundred Armored Truck picks up bills at a school in New Orleans, LA; <www.fundred.org>.



of ecoart. While some ecoart works emphasize physical innovation, transformation and restoration, others inspire sociopolitical activism and still others function conceptually, promulgating ecological values and perceptions. Works with the most impact often function on several registers simultaneously.

For instance, Mel Chin, whose celebrated ecoart work *Revival Field* demonstrates that plants can function as hyperaccumulators, absorbing heavy metals from the soil, was invited to New Orleans in the wake of Hurricane Katrina. In response to extremely high levels of lead in local soils, his recent work *Operation Paydirt/The Fundred Dollar Bill Project* (2007–) (Fig. 2) proposes to use phosphate-induced metal stabilization, a method developed by the U.S. military and not yet tested in urban areas, to neutralize lead *in situ*. To raise the \$300 million necessary, he is organizing groups of children across the county to draw “fundred” dollar bills, which he is collecting in an armored truck to present to Congress. This novel project provides the prospect of effective remediation, potentially applicable in many contexts, promulgated through lively, participatory events that model political agency while generating support for healthy urban environments.

Graphic, alarmist documentation of environmental devastation is one approach to heightening disquiet about ecological malaise. However, this strategy alone may simply re-inscribe trauma and paralysis. In contrast, ecoart works such as Chin’s offer hopeful visions, providing novel solutions while raising awareness through collaborative, playful action.

KEY PRINCIPLES

Although the science at the core of ecoart practice is given little attention in the scant literature, it is essential for both practitioners and critics of ecoart to understand its implications. Ernst Haeckel’s substantive definition of ecology, written in 1870, reads in part: “By ecology we mean the body of knowledge concerning the economy of nature—the investigation of the total relations of the animal both to its inorganic and to its organic environment” [18]. Contemporary textbooks often cite multiple definitions of ecology, but the concept of *relationships* appears in every one.

Relationships can be conceived of in three principal ways: in terms of cycles of matter (water or nutrients), flows of energy or nested systems, with smaller

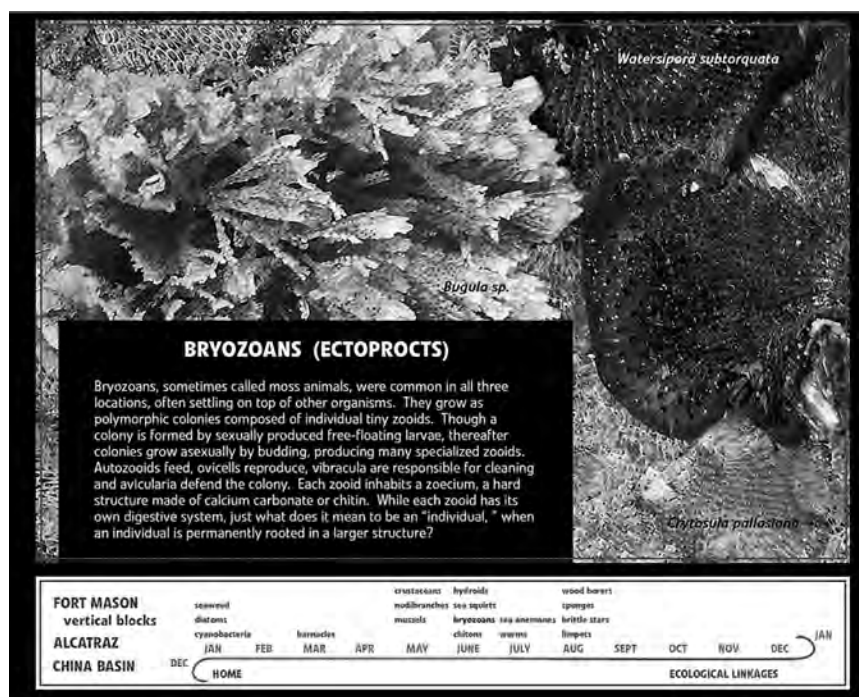


Fig. 3. Ruth Wallen, *The Sea as Sculptress*, 1980, 2010. (© Ruth Wallen) <www.exploratorium.edu/outdoor/sea-as-sculptress>.

networks such as a population or community integrated into larger ones such as an ecosystem or landscape. (In contrast, as Annie Leonard points out in her playful Internet video *The Story of Stuff*, modern patterns of consumption turn continuous resource cycles into linear ones, with everything ending up festering in a dump [19]). Furthermore, ecologists recognize that these relationships change over time. Feedback loops ensure that changes in one part of the system affect others. Whole systems evolve as organisms adapt in relationship to one another.

For ecoartists, like many activists, ecological relationships are often invoked as a way to understand and fortify relationships to place. For example, my project *The Sea as Sculptress* (1980, 2010) involves an intimate year-long macro-photographic exploration of the succession of marine life growing on wooden sculptures placed in three locations in the San Francisco Bay (Fig. 3). Sumptuous visuals heighten curiosity and sensual aesthetic appreciation, while a conflation of time and scale communicates ecological processes. Following Aldo Leopold’s reminder that “we can only be ethical in relation to something we can see, feel, understand, love or otherwise have faith in” [20], the work encourages viewers to function as stewards of the bay, cognizant of the full scale and consequences of their actions.

Ecosystem is the term used to define the

constellations of relationships in places such as the San Francisco Bay. The concept of an ecosystem was first posed by Tansey, who in 1935 described it as “the whole system (in the sense of physics) including not only the organism-complex, but also the whole complex of physical factors forming what we call the environment of the biome—the habitat factors in the widest sense” [21].

Although ecosystems are a central concept in the popular understanding of ecology, what constitutes an ecosystem is subject to debate. Clements’s theory, popular before the mid-20th century, of successional botanical communities that reach a stable climax, was refuted not only because systems are not static but because the ranges of individual species tend to be random, instead of cohering into neat communities. Contemporary theories emphasizing patchiness present further challenges to conceptualizing neatly bounded ecosystems.

Where defining systems perimeters is desirable, many ecoartists have followed the lead of ecologists Bormann and Likens, who recognize watersheds as useful, definable systems. Ecoartists including AMD & ART, Ala Plastica, Helen and Newton Harrison, Basia Irland, Dominique Mazeaud, and Collins and Goto work with restoring and remediating watersheds, the circulatory systems of the earth, which carry both nutrients and wastes in the most essential resource for life.

Tim Collins and Reiko Goto's *3 Rivers 2nd Nature* (2005) was a 5-year project that enlisted collaborators from many disciplines to address the vitality of the watersheds of Allegheny County, PA (Fig. 4). As artists, they were able to pose questions, animate dialogue and motivate and creatively synthesize research, offering alternatives to an entrenched system of power dominated by economic, legislative and legal agendas.

Another central concept of ecology, which has become more problematic to define, is the idea of equilibrium or balance within systems. In the contemporary view, balance is understood as a dynamic equilibrium, with multiple stable points. Severe perturbations that overstress the limits of a system may upset balance, creating tipping points whereby the system is reconfigured in a very different, and perhaps less complex, environmentally degraded state.

Ecosystems are often described as chaotic or complex. However, the randomness of chaos can be perceived as organized patterns, known as strange attractors. Ecoartists can play significant roles in identifying and exploring the implications of these patterns. Helen and Newton Harrison, for instance, work by identifying large-scale patterns, which they describe in terms of potent metaphors, such as *Peninsula Europe*, *Serpentine Lattice* or *Green Heart of Holland*. Then, responding to the questions invoked by these metaphors, the Harrisons create larger narratives that recommend actions to foster ecological well-being [22].

Because homeostatic ecosystems are difficult to identify and quantify as discrete units, biologists have increasingly advocated biodiversity as a measure of the health of ecosystems. The preservation of biodiversity was introduced as the central principle of the new field of conservation biology in 1978 and rapidly became a widely championed cause [23]. The year of this writing, 2010, has been deemed the International Year of Biodiversity by the United Nations. Biodiversity offers a striking measure of human impact. Biologists posit that humans are causing the sixth and greatest planetary extinction event, a rate of extinction 100,000 times higher than the natural rate, prompting Soule to call conservation biology a "crisis discipline" (Fig. 5) [24].

In my view, however, the implications of shifting from holistic, systemic thinking, prompted by the ecosystem concept, to a focus on individual species, suggested by biodiversity, deserves further consideration. Calculating biodiversity is appealing because it provides a seemingly

simple quantitative measure, mirroring our materialist culture. For those acting in the quantitative arena, measuring biodiversity is the strongest tool available for estimation of the deleterious ecological impacts of potential projects. However, I caution those championing charismatic species. If one returns the emphasis to single parts or objects, the concept of biodiversity is potentially less robust than that of an ecosystem understood in terms of relationships and patterns.

Fortunately, although biodiversity is sometimes understood as replacing the older terms *species diversity* or *species richness*, *diversity* can also be a measure of many other variables, including genetic, molecular, morphological, habitat, or ecosystemic diversity as well as human attributes such as cultural and linguistic diversity. If biodiversity is understood as the sum of these interrelated variables, it not only affirms the importance of each individual species or attribute, but also, through the back door, by establishing the value of diversity within each of the various components that make up a system, reaffirms the importance of ecosystemic complexity.

The concept of sustainability potentially offers a robust perspective. It takes the crucial step of placing humans within ecosystems, instead of conceiving of "natural environments" as outside of human domains, and therefore not intrinsically of human concern. The popularity and openness of this term, however, may overshadow the need for precise specification

of what it is desirable to "sustain." The Brundtland Commission of the United Nations on 20 March 1987 simply declared: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [25]. This definition can easily be interpreted as echoing the managerial ethos of "multiple use" informing many governmental agencies. It initially gives non-human creatures no standing other than a utilitarian one—as "resources," although, as pharmaceuticals illustrate, we may not yet know which species may prove useful.

In practice, sustainability promulgates relational, systemic thinking, integrating not only the hard sciences, but also political and economic realities, into ecological frameworks. The 2005 World Summit deemed ecological, social and economic demands the "three pillars" of sustainability [26]. Most significantly, this understanding inexorably links sustainability to social justice, placing human suffering—poverty, malnutrition, disease and lack of education—in an ecological context.

Ecoartists recognize the need to address both socioeconomic and biological needs. For instance, after the 1989 Loma Prieta earthquake in the San Francisco Bay Area, Susan Leibovitz Steinman constructed a temporary park using native plants and repurposed highway materials on the site of the collapse of the Nimitz Freeway in Oakland, California (Article

Fig. 4. Tim Collins and Reiko Goto, *3 Rivers 2nd Nature*, 2005 (© Tim Collins and Reiko Goto, Studio for Creative Inquiry, Carnegie Mellon University); <<http://collinsandgoto.com/category/water>>.



A River Dialogue about Rivers as Public Places in the context of a post-industrial waterfront.



Fig. 5. Lynne Hull, *Lightning Raptor Roost* with ferruginous hawk, wood, metal, 20 in tall, 1990. (© Lynne Hull) These sculptures provide alternative nesting sites for threatened and endangered raptors attracted by large transmission lines; <<http://eco-art.org>>.

Frontispiece). Recognizing the totality of community desires, she also teamed with a community college to provide training, and ultimately jobs, in horticulture, building and maintaining the park.

The current economic crisis highlights the challenge of addressing social and economic pillars while promoting ecological sustainability. Calls for alternatives to existing economic systems that foster mindless, inequitable consumption can be heard in many corners, from the recent World People's Conference on Climate Change and the Rights of Mother Earth, to Lester Brown to James

Speth, Dean of the School of Forestry and Environmental Studies at Yale [27]. Wochenklausur, a collaborative group based in Vienna, exemplifies the contribution of the arts to re-envisioning economic systems. "Social Economy—A Discourse in Progress," a project centered in Worgl, Austria (which in 1932 launched its own currency to stimulate the local economy), involves a dialogue among international experts on alternative exchange systems and reshaping financial markets [28].

The current inequitable use of the world's resources is even more untenable

in light of estimates that we are already consuming the resources of future generations, exceeding the sustainable capacity of the planet by nearly 30 percent [29]. As segments of increasing human populations clamor for a more equitable share, ethical questions abound. Returning to the initial definition of sustainability, meeting the needs of the present without compromising the ability of future generations, what "needs" are legitimate ones? Should certain "needs" be prioritized? Might "generations" apply to more than human species?

Significantly, ecology can be understood not only in terms of scientific principles but also as the basis for ethical action. Ecologist Frank Golley, in his book about the ecosystem concept, describes its usefulness in broad terms:

It emphasized interconnection and integration of systems at a variety of scales, cooperation, synergisms and symbioses rather than dialectical opposition, competition and conflict. . . . Thus the ecosystem perspective can lead towards an ecological philosophy, and from philosophy it can lead to an environmental value system, environmental law and a political agenda [30].

Ecoart can play a significant role by encouraging dialogue and offering visions of desirable sustainable futures, both informed by and informing an "environmental value system," or "ecological ethic," as well as the concept of ecological justice. Hildegard Kurt, in her contribution to Prigann, Strelow and David's *Ecological Aesthetics*, offers a provocative vision of an aesthetic of sustainability. She imagines sustainability as nothing less than the "humanization of industrial modernism," linking "global justice" and "ecological responsibility." However, she bemoans the "cultural deficit" in current models of sustainability, arguing that in order to make this broad vision attractive, sustainability needs to be seen as a "cultural challenge" [31].

POWERFUL EXAMPLES

Discussion of a few of the innumerable ecoart works will help elucidate how ecoartists can meet this cultural challenge. Eschewing the status of the distanced observer championed by Cartesian science, the arts encourage us to get dirty, combining scientific understanding with sensual awareness to reawaken embodied relationship and innovative response.

Consider *Prima Lingua* by Jackie Brookner (1996), a sculpture in the shape of a huge human tongue, colo-



Fig. 6. Wetland constructed by the Chengdu Urban Rivers Associations to purify greywater proximate to an elementary school in Ping Yi County, Sichuan, China. (Photo © Betsy Damon) Inspired by Betsy Damon's *Living Water Garden*, 2010; <www.keepersofthewaters.org>.

nized by ferns, mosses and liverworts that serve to filter the contaminated water pumped through it (Color Plate C No. 3). Imagine purifying water by actually licking, tasting and touching the contamination. While the tongue appeals to our base senses and reminds us of our sexuality and connection to the earth itself, it also references language, the intellect by which we cognize the current ecological plight. Dualities reified by positivist science are blurred, as it is the direct sensual relationship of the tongue tasting water that purifies the water. The title, translated as "First Language/First Tongue," reinforces the primacy of this relationship.

Furthermore, *Prima Lingua* illustrates the insight of cognitive scientists that reason itself is literally embodied, formed from the bodies we inhabit. According to Lakoff and Johnson, "Our conceptual systems draw largely upon the commonalities of our bodies and the environments we live in" [32]. These commonalities, expressed not literally but metaphorically, form the basis for abstract thought. *Prima Lingua* provides an ecological function while proposing a powerful metaphor that reestablishes

the relationship between corporality and rationality.

Prima Lingua also evokes other linkages. The sculpture exemplifies Donna Haraway's fascination with species entanglements, the tongue serving as an "attachment site," for the unexpected "copresence" of species. As Haraway argues throughout her recent work *When Species Meet*, this "becoming with" is a practice of "becoming worldly," of recognizing all the ramifications of our ecological embeddedness [33].

Interweaving sense, emotion and reason, the tongue also comments on the limitations of what feminist theorist Val Plumwood deems "dispassionate science." Plumwood asks why, if science is granted standing through the concept of rational legal authority, do resulting policies, such as the quotas set for fisheries, still result in degradation, or collapse, of the resource. Her cogent, embodied critique argues that it is the "value-free" nature of contemporary, disengaged science that is so easily trumped by a politics privileging economic gain [34].

Prima Lingua offers an alternative ethical vision, a multispecies system that purifies water through embodied engage-

ment. More recent projects by Brookner as well as those of others, including Betsy Damon, Barbara Johanson, Viet Ngo and Buster Simpson, scale this concept up to public water sculptures and parks.

Betsy Damon's *Living Water Garden*, designed and constructed with local collaborators in Chengdu, China, diverts polluted water from the Fu Nan River and purifies it employing a seven-stage biological system including settling ponds, aerating flow forms and reconstructed wetlands. Although the project only cleans 200 cubic meters of water a day, it changes the relationship of a city to its river, offering an urban park while demonstrating the power of natural ecological processes to purify water. While children play safely in the symbolic flow forms, the revitalized habitat beckons a diversity of fauna.

Within China, the influence of this relatively small (5.9-acre) park has been quite significant. Replicated throughout the country, most notably for the Olympic Forest Park in Beijing, a part of the 2008 Olympic revitalization efforts, the park provides a visionary model that combines parkland, biological water treatment, habitat restoration and environmental



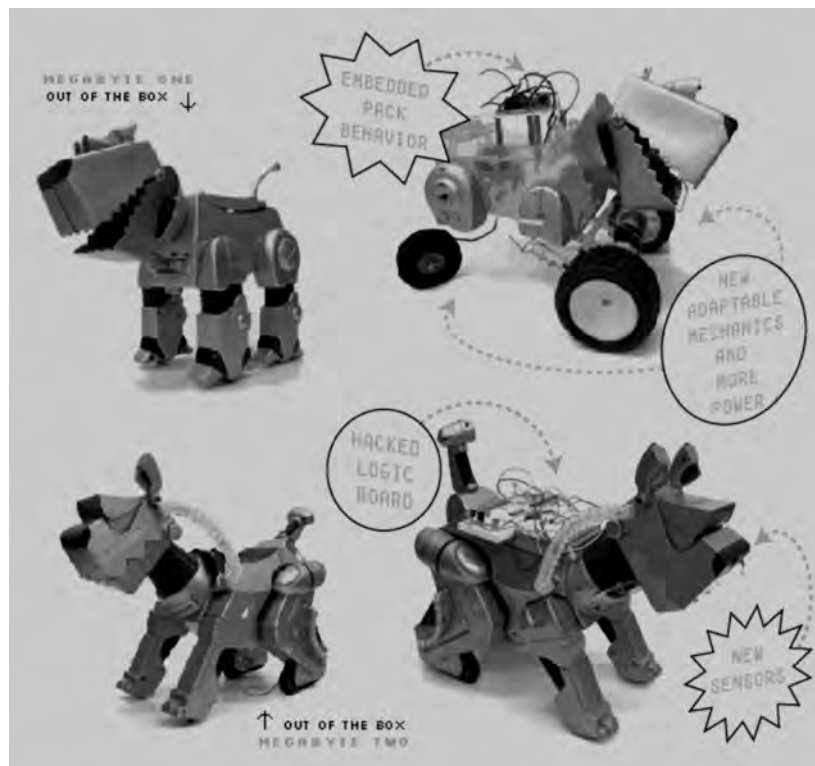
Fig. 7. Helen and Newton Harrison, *Greenhouse Britain: Losing Ground Gaining Wisdom*, installation (scale model, projections, digital imagery, photography, text), Ronald Feldman Fine Arts, 2009. (© Helen and Newton Harrison. Photo courtesy Ronald Feldman Fine Arts.) <<http://greenhousebritain.greenmuseum.org>>

education. *Living Water Garden* has also inspired the Chengdu Urban Rivers Association, an NGO that, recognizing the need to address pollution at its source, is working with a number of villages in the watershed to implement complete re-use of wastewater, converting solid waste into methane (used to produce electricity), liquid waste into fertilizer and discarded greywater into fertile wetlands (Fig. 6).

Helen and Newton Harrison's work addresses an even larger scale. *Greenhouse Britain: Losing Ground, Gaining Wisdom* (2007–2009) (Fig. 7) invokes the metaphor of a greenhouse, understood both in terms of greenhouse gas emissions and as a creative response—ecologically sustainable greenhouses. On the floor of the installation a large topographical model of Britain graphically shows, via overhead projection, the encroachment of seawater onto the land that would result from a 5- to 15-meter rise in sea level. Accompanying wall panels, synthesizing images, maps and text, offer ways to think about impending changes.

Particularly striking is the Harrisons' use of language. Poetic text defines key

Fig. 8. Natalie Jeremijenko, Will Kavesh and Jesse Arnold, feral robotic dogs, 2005–present. (© Natalie Jeremijenko, Will Kavesh and Jesse Arnold) Industrial playthings, altered to sniff for toxic chemicals, are enlisted in the service of sustainability; <www.nyu.edu/projects/xdesign/feralrobots/>.



concepts that are woven into provocative narratives. The rising ocean is termed a “form determinant,” the driving force determining the forms that other elements of civilization, from culture to industry, will take. In addition to responding defensively, the Harrisons suggest that we might “withdraw gracefully.” This graceful withdrawal is framed as an opportunity for visionary planning and design. Resultant proposals focus not on “development” but on “settlement,” a word carefully chosen to indicate conscious planning of habitats for human beings and other living creatures. For instance, a series of compact villages are imagined in the Pennines as part of a forest/meadow ecosystem designed to provide for biodiversity, food and carbon sequestration. In collaboration with ATOPIA, the Harrisons have proposed a “Vertical Promenade” of solar-powered high rises with hanging gardens as a form of “ecocivility” for the Lea Valley (*Editor’s Note*: See front cover of *Leonardo*, Vol. 45, No. 1, 2012).

Unlike public-service sound bites designed to convince people of the dangers of global warming, the Harrisons provocatively begin with the assumption that the tipping point has already passed. However, they use this harrowing assumption to offer visions of collective responses that will help diminish greenhouse gas emissions by engendering creative, sustainable settlement. Their work is a prime example of the potential of ecoart to create knowledge that promotes cultural change.

A century ago, as industrial might was employed in the service of military slaughter, artists moved to the margins of society to critique a world gone mad. Now many artists embrace a public presence and the need for active collaboration with scientists, professionals and government officials. Ecological art is a call to acknowledge both the gravity of the current ecological crisis and the necessity of visionary responses that change behaviors, policies and values. Ecoart draws attention to the wonder of the myriad of existent life forms and the heartbreak of their disappearance. However, instead of ignoring or denying present challenges, through fearless questioning artists free imagination to spawn creative responses. As robotic dogs become feral (Fig. 8), and flora to purify water sprout

from our very tongues, circles of connections and possibilities widen. New metaphors and artistically generated dialogues question reified relationships while sparking new ones. Fresh narratives inspire further change and innovation. Values and perceptions may shift as new knowledge emerges. Ecological art is a growing force in the shaping of values, visions and innovations so that we may ensure the well-being of future generations of the diversity of life forms inhabiting the planet.

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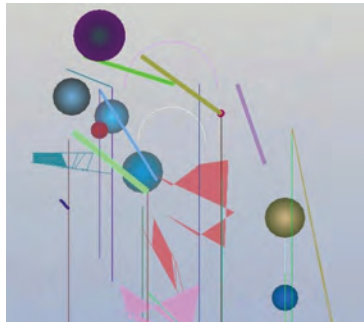
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Manuscript received 22 September 2010.

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COLOR PLATE C



No. 1. Kang Zhang (above): Circles, lines and polygons in Kandinsky's style. (© Kang Zhang) Kang Zhang (right, top and bottom): Rule-based automatic generation of Kandinsky-style abstract paintings. (© Kang Zhang)



No. 2. Jackie Brookner, *Prima Lingua*, volcanic rock, concrete, moss, wetland plants, water, fish, snails, rubber, stainless steel, 64 × 101 × 80 in, 1996. (© Jackie Brookner) <www.jackiebrookner.net/prima_lingua.htm>. (See article by Ruth Wallen in this issue.)