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Ecological Art: Art with a Purpose

“Ecological art,” including environmental art and art about ecological or environmental issues, is often envisioned as a means to an end: improving our relationship with the natural world (Bower 2). The means may include communication or visualization of scientific data about acute or ongoing environmental changes; provocative illustrations of human excess (e.g., large piles of trash) or environmental decline; or startling performances such as die-ins to represent species extinctions and loss of biological diversity. The end most commonly hoped for is immediate action or long-term environmental activism informed by cultural attitudes and practices. Examples of hoped-for actions that may be taken by individuals, NGOs, corporations, or governments include (among many others) riding a bicycle or stopping a gas pipeline so less fossil fuels are used and global warming is slowed; reusing objects and recycling waste; or conserving more land so other species may continue to thrive.

Thus, ecological art is purposeful and often prescriptive: the intended actions and directions for activists are clear. Yet, ecological art has been no more successful than, for example, targeted scientific research, deposits on returnable bottles, or campaigns to slow global warming, reduce the amount of waste we generate every day, or halt the ongoing sixth mass extinction in the history of the earth. Here, we consider the idea that prescriptive ecological art provides insufficient mental space for creative reflection about future scenarios of, and responses to, environmental change. Simultaneously, ecological art may be targeting problems that are too large, abstract, or far-removed from particular actions that individuals can identify or see themselves doing. We use this framing to ask whether, by presenting a limited range of possibilities in ecological art, we limit the range of options that viewers consider in deciding on possible actions that they could take to slow or halt environmental decline. We also ask how individuals can identify opportunities for personal action or activism in ecological art focused on global-scale problems such as effects of invasive species or global warming. We conclude by asking how we ourselves—a collaborative team consisting of an artist and a scientist interested in encouraging ecological awareness and environmental activism—can best engage diverse audiences in critically thinking about, and taking action to mitigate, environmental change. We

address these questions through a discussion of two of our recent ecological art installations: *Hemlock Hospice*¹ and *Warming Warning*.²

Hemlock Hospice

Hemlock Hospice was an installation of eighteen large mixed-media sculptures emplaced (from October 2017-November 2018) along a mile-long interpretive trail at the Harvard Forest in Petersham, Massachusetts, USA. It presented a visual and interactive narrative about the introduction in the 1950s of a nonnative insect (the hemlock woolly adelgid [*Adelges tsugae*], Figure 1), the associated decline of a dominant forest tree (eastern hemlock [*Tsuga canadensis*]), and a glimpse of eastern North American forests of the near future. *Hemlock Hospice* was contextualized locally, regionally, and globally. Research scientists and support staff who work at the Harvard Forest daily witness the inexorable decline of the particular forest in which *Hemlock Hospice* was located. Visitors who come to Harvard Forest from throughout New England or elsewhere see the decline of hemlock at Harvard Forest mirrored in ongoing forest declines around the world caused by insects, pathogens, and their interaction with human-caused climate change (Figure 2).

Eastern hemlock is an evergreen tree in the same family as pines, cedars, larches, firs, and spruces that dominates eastern North American forests from the Appalachian Mountains of Georgia in the southern USA to Nova Scotia, New Brunswick, Québec, and Ontario in eastern and central Canada. Its dense canopy, shaded understory, and quiet, soft soil built up from centuries of shed needles is ecologically unique (Ellison) and has inspired lasting poetry (e.g., “I think the Hemlock likes to stand” [Dickinson F400] and “Dust of Snow” [Frost 82]). The tiny, mealy-bug-like hemlock woolly adelgid feeds on and kills eastern hemlocks of all ages and sizes. It has spread throughout the range of eastern hemlock on the wind, the wings of birds, and the shoes, clothes, firewood, and cars of people.

There are myriad responses to the ongoing decline and disappearance of hemlock. Scientists study how the adelgid, climate change, and shifting patterns of land use are affecting rates of hemlock decline, the different trees and forests that may replace it, and methods to control the adelgid (Foster). Geneticists looking to identify trees resistant to the adelgid are racing against foresters who are “preemptively” salvaging hemlock trees so landowners can realize economic value from them (Foster and Orwig). Adelgid infestations on one or a few trees are controllable with regular applications of insecticides, but chemical control is impossible for treating large numbers of trees in dense forest stands without killing thousands of species of beneficial insects. Applied forest entomologists have introduced predatory beetles from the home range

¹ <https://harvardforest.fas.harvard.edu/hemlock-hospice>

² <https://harvardforest.fas.harvard.edu/warming-warning>

of the adelgid but these biological control measures have not yet proven effective in controlling the adelgid (Sumpter et al.).



Figure 1: *Insect Landing* (2017). Installation at Harvard Forest, 4 × 6 × 6 feet; recycled wood, acrylic paint, and hardware. Collaborators: David Buckley Borden, Jack Byers, Aaron M. Ellison, Salvador Jiménez-Flores, C. C. McGregor, Patrick Moore, Salua Rivero, and Lisa Ward. Photograph: Aaron M. Ellison.

Insect Landing was seen variously as an abstract insect or a landed spaceship, among others. The colonization of North America by the hemlock woolly adelgid and other nonnative species is strongly linked to transboundary shipping and the global economy (Bradley et al.). Their subsequent spread is linked not only to economic activities and transportation networks but also to the prevalence of hospitable climates and suitable host plants. The clarion call of the first Earth Day (1970) to “think globally, act locally” still applies today, nearly fifty years later: local actions to manage ecological systems must simultaneously account for regional, national, and international actors and activities.



Figure 2: *Double Assault* (2017). Installation at Harvard Forest, variable dimensions; acrylic paint, wood, vintage sawmill saw blades, and assorted hardware. Collaborators: David Buckley Borden, Jack Byers, Aaron M. Ellison, and Salua Rivero. Photographs: David Buckley Borden and Aaron M. Ellison.

Interactions between global warming (left) and the hemlock woolly adelgid (right) have led to a “double assault” on eastern hemlock trees. In lockstep with global industrialization and unsustainable fossil fuel consumption, average temperatures in northeast North America have increased nearly 1.5 °C (> 2.5 °F) since 1880. Eastern hemlock favours cooler climates and is stressed by warmer temperatures. Winter minimum temperatures ≤ -25 °C (-13 °F) kill at least 50% of the adelgids (Costa et al.). Because winters generally are colder further north where hemlock is more common, winter low temperatures historically have prevented the adelgid from spreading quickly. As winter low temperatures colder than -25 °C have become increasingly rare in our warming climate, the hemlock woolly adelgid has inexorably spread northward (Fitzpatrick et al.).

Our response with *Hemlock Hospice* was to extend the concept of hospice—palliative treatment providing physical and spiritual care for terminally ill individuals, their families, and loved ones (Kane et al.)—to a species of tree that, despite our best efforts, is disappearing before our eyes. We wanted to provide an expression of care for these dying trees in a declining forest and to open a space for thoughtful and constructive conversations about our relationships with nonhuman organisms such as trees and insects (Figures 3 and 4). Our intention was that visitors to *Hemlock Hospice* would take with them a newfound empathy for trees and species like the adelgid that interact with them, and an acceptance of the ongoing, dynamic changes in forests and other ecological systems. We also hoped that they would think more deeply about their own roles in moving species across borders, inadvertently promoting new interactions among species, and creating novel ecosystems.



Figure 3: *Exchange Tree* (2017). Installation at Harvard Forest, 8 × 10 × 12.5 feet, wood and acrylic paint. Collaborators: David Buckley Borden, Aaron Ellison, Salvador Jiménez-Flores, and Salua Rivero. Photograph: David Buckley Borden.

The form of *Exchange Tree* (left side of photograph) was inspired by the iconic and unforgettable form of the fallen tops of dead eastern hemlock trees that have snapped off and remain perched on the ground atop their slowly disintegrating limbs (right-center in photograph). We invited visitors to *Hemlock Hospice* to reflect on their experience by writing messages on field flagging and tying them onto the branches of the sculpture (Figure 4).

Although we intended *Hemlock Hospice* literally to be hospice for hemlocks and to prompt reflection, not action, the most common question we were asked by visitors to *Hemlock Hospice* or by audiences to whom we presented the project was “how can I save the hemlock tree in my backyard” (or the hemlock forest)? That is, visitors and viewers wanted to take immediate, personal action to stop perceived negative environmental change, and wanted us to provide guidelines for action or activism through the installation. Despite months of “user-testing” before *Hemlock Hospice* opened (Ellison and Borden, “Hemlock Hospice”), we did not anticipate this desire and thus failed to provide an opportunity for environmental action. Our own reflection about this, however, created new opportunities.



Figure 4: Close-up of *Exchange Tree* festooned with messages from visitors. Photograph: David Buckley Borden.

Warming Warning

Our second collaborative installation, *Warming Warning*, was a single large sculpture emplaced on Harvard University's Science Center Plaza (October-December 2018) that used design themes and iconography derived from *Hemlock Hospice*. In contrast to our intentions with *Hemlock Hospice*, we deliberately set out with *Warming Warning* to provoke viewers to take actions to reduce carbon emissions and decelerate global warming (Figure 5).



Figure 5: *Warming Warning* (2018). Installation at Harvard University, 29.5 × 10.3 × 9 feet; hemlock timbers, acrylic paint, and miscellaneous hardware. Collaborators: David Buckley Borden, Jack Byers, Aaron M. Ellison, and Dan Pedersen. Photograph: David Buckley Borden.

Visually, *Warming Warning* has a number of tropes and pointers to prompt viewers to think about climate change and warming. The triangles represent both caution (a common road sign) and change (a Greek capital delta). The colour gradient from white and light yellow to deep red represents the temperature change since 1880 (*cf.* Figure 2, left panel). The reflection bench (foreground) provided viewers a way to consider their personal role in creating a carbon-free, sustainable future.

On one side of *Warming Warning*, we painted a black line illustrating the average global temperature from 1880-2017 (Figure 6).³ On the other side, we illustrated for scenarios (through the year 2100) of carbon dioxide emissions, from a “business-as-usual” scenario paralleling the global temperature trace, through two decarbonization scenarios envisioned by the 2014 Paris Climate Accord, to the most rapid decarbonization scenario needed by 2030 to keep the planet from warming beyond 1.5 °C (Figure 7).⁴ The point where the four scenarios diverge matches the date of the installation—October 2018. The choice is pressing and the time for action is right now.

³ Data from <https://www.ncdc.noaa.gov/cdo-web/>.

⁴ <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>



Figure 6: North side of *Warming Warning*, with black line showing average global temperature from 1880-2017. Photograph: David Buckley Borden.

At the far end of *Warming Warning* we deliberately placed a pile of white-primed timbers (Figure 5). This “reflection bench” provided a place for viewers to sit and consider the carbon-emission scenarios and decide whether and how to be an active agent in determining our collective future. The large triangles of *Warming Warning* are held together at the top by a series of metal flanges; at the end of the piece one flange extends out into space (Figure 8). The idea was that the pieces of the reflection bench could be assembled into new triangles by the viewer, painted in a colour that would reflect actions we take now to lead us towards a cooler, more sustainable future, and added to the piece as the future unfolds.



Figure 7: South side of *Warming Warning* showing four carbon-emission scenarios (1900-2100) that diverge in October 2018 from business-as-usual (top black line) to that needed to keep warming at or below 1.5 °C (lower white line). Photograph: David Buckley Borden.



Figure 8: Detail of *Warming Warning* showing flange at the top of its west end.
Photograph: David Buckley Borden.

Abstraction and Aesthetics: Communication, Provocation, or Action

Can ecological art aesthetically represent large-scale or abstract environmental issues? Should it simultaneously communicate scientific data that inform individual or collective actions? Can it also provoke emotional responses that inspire immediate action or long-term activism? And should any of these be the *raison d'être* of ecological art?

Although we would answer all four of these questions affirmatively, Susan Sontag famously denigrated art that is interpretable or meant to be of use: “Interpretation, based on the highly dubious theory that a work of art is composed of items of content, *violates art. It makes art into an article for use*, for arrangement into a mental scheme of categories” (10, *emphasis added*). Yet it seems to us that art—especially ecological art—not only can be aesthetically beautiful and abstract [Sontag’s “*how it is what it is, even that it is what it is*” (14, *emphasis in original*)] but also can be interpreted at different times by different viewers [Sontag’s derided “*what it means*” (14, *emphasis in original*)].

Both *Hemlock Hospice* and *Warming Warning* foregrounded bold designs to prompt critical thought and reflection by the viewer. Nonetheless, more than 30% of individuals who tied messages to *Exchange Tree* (Figure 4) simply wrote their names on the ribbons tied to the *Exchange Tree* (Ellison and Borden, “Learning from Art”). Similarly, the majority of viewers of *Warming Warning* whom we observed took “selfies” in front of it. The sculptures in both exhibitions used varying degrees of abstraction to encourage viewers to think about environmental changes. At the same time, our intention with both installations was to communicate what ecologists actually know about the causes and pace of environmental and climatic changes using creative visualizations of data—artistic infographics, as it were. *Hemlock Hospice* asked for reflection, but *Warming Warning* was meant not only to inspire reflection but

also to provoke and prompt a particular course of action. Both installations were accompanied by opening events with speakers, presentations, forums, and discussions featuring scientists and artists who discussed the intentions of the installations. For the opening of *Warming Warning*, we added educators and activists to the mix, and all participants discussed the immediate needs for, and methods of, individual and collective action. Whether these discussions lead to immediate action and long-term commitments to sustainable lives is inconclusive, but there is some evidence that when ideas and concepts are framed expansively (or, in the case of art, abstractly), viewers, participants, and students are more likely to take action on broad themes in the future, in other places or contexts, and with broader communities (Engle).

Our concern is not that ecological art cannot be both aesthetically pleasing and informative (or interpreted). Rather, by communicating information that simultaneously defines one or more courses of action (as in the four illustrated scenarios of future carbon emissions on *Warming Warning*; Figure 7), we do not want to discourage wide-ranging discussion of alternative futures by not illustrating routes of action that we either think are “incorrect” or haven’t even considered. Prescribing particular courses of action while proscribing others also could narrow the audience for the work. For example, individuals who don’t “believe” in climate change would be unlikely to view or consider *Warming Warning* in its current form but might approach and think about it if it lacked the data visualization and was called, say, Untitled #2.

Discussions with colleagues at the Harvard Graduate School of Education and teachers in the local Cambridge, Massachusetts public schools suggested alternative interpretations. For many of these researchers and educators, there was no connection between the aesthetics of *Warming Warning* and the data visualized or the actions intended. The teachers saw *Warming Warning* as aesthetically pleasing and noted that the colour scheme might prompt discussion about temperature change and global warming (especially given its title). But they had their own methods already in place for teaching science, the science of climate change, and the range of possible actions. Researchers didn’t see the carbon-emission scenarios portrayed on *Warming Warning* as empowering, or as leading to actions that they themselves could take on an individual level. There is a wide chasm between deciding that reduction in carbon emissions is a necessary societal goal and what can be done today by each person (e.g., only walking, bicycling, or using public transportation to move around, curtailing meat consumption, etc.). Perhaps the most we can or should expect from ecological art is that it raises awareness as a “rallying flag” for environmental action and activism.

Based on our experiences conceptualizing, designing, and realizing *Hemlock Hospice* and *Warming Warning*, we recognize the important roles that the aesthetics and deliberate mission-driven design of ecological art can play in drawing in and engaging diverse audiences in thinking about contemporary environmental issues. Deliberate design decisions can be used to lead viewers through a conceptual narrative and prompt viewers to think or interpret creative work in particular, often non-restrictive, directions. Both artists and scientists make a series of culturally informed and creative decisions in designing their artistic work or their scientific experiments (Hacking). Although these don’t have to be spelled out explicitly in the pieces (or

technical papers) themselves, it remains important to acknowledge their role in ecological art, science, and art/science collaborations.

If collaborating artists and ecologists want to push visual arts beyond generating awareness for environmental issues and create projects with measurable direct action goals, arts-science collaborators must expand their interdisciplinary community. Social scientists, educators, activists, and policy makers could work together to exponentially expand the impact of ecological art. Instead of considering ecological art as being exclusively aesthetic, communicative, provocative, or a call to action, we should create pieces in which each of these elements builds on one another to create ecological art that is aesthetic, communicative, provocative, and (with concerted interdisciplinary effort) action-oriented.

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