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Our Relationships to Nature and Loss through Art

Justine Goldblatt

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Primary Advisor:

Julian Barnett

Defense Panel:

Alison Brody

Steve Buddington

“He begins to see how it might work, how a few black marks on a blank white field might change what’s in the world.”

Richard Powers, *The Overstory*, 2018

“The natural world demands a response beyond scientific insight. The natural world demands a response that rises from the wild unconscious depths of the human soul.”

Thomas Berry, *The Great Work*, 1999

Abstract

Societal forces that push ideas of productivity, individual gains, and material wealth have distorted humankind's relationship with the natural world. The sooner more of us acknowledge that nature is composed of living entities whose fates are interlaced with our own, the sooner we can alter our lives to focus on a relationship of respect and reciprocity with the natural world. Art is a medium that can communicate threatened aspects of nature due to climate change, while also provoking viewers to become more aware of their connections with nature. Drawing and painting are contemplative processes that can tell a story of times past, loss, and hope for the future. My project consisted of drawings signifying the effects of climate change on local Vermont species to distill such a vast issue into a comprehensible and personal form. These drawings were incorporated into a website allowing for clear explanation beyond the artistic interpretation of the viewer. Finally, my project invited the public to experience the artistic process for themselves by painting with water on "magic" canvases that turn black when wet and fade as the water evaporates. The public's encounters with these canvases invited people to break from the hustle of everyday life. The outdoor setting and adjoining online graphics encouraged people to reflect on their relationships with nature. As the water evaporated, the fading of people's paintings represented the metaphorical loss of biodiversity we face worldwide. People responded to this experience in notable ways, including recognizing the importance of nature in their lives and what we stand to lose. Unlike existing forms of climate change art that instill fear in viewers as a call to action, my project allowed people to recognize their appreciation for nature and as a result find more ways to enjoy and protect it. The poignancy of this experience will carry with people and inspire us all to strengthen our relationships with the Earth and consequently safeguard it.

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Introduction

Personal Statement

In my freshman year at the University of Vermont, my dad drove me up from New York to move in. We were about an hour from campus, driving through Vergennes when he looked at me, smiled, and said, “You’re going to have a lot of fun here.” As I looked out the window at the green fields passing with Lake Champlain and the Adirondacks looming in the back I knew exactly what he meant. My dad knew that this place, with its beautiful scenery and endless opportunities to enjoy the outdoors, would be perfect for me. That image is one I return to often, especially now. My dad suddenly passed away about a year ago. In the time since I have found that nature’s effect on me is the one constant in my life. Any time I look down from campus onto the lake, I am reminded to take a breath. When the overwhelming feeling that life is random and directionless takes over, I look at the trees around me that slowly and patiently take in sunlight and nutrients to keep growing bit by bit every day and the crease in my forehead relaxes just a bit.

Unfortunately, due to climate change, the constancy of the presence of nature in our lives is threatened. The goal of my project was to utilize art in various ways to illuminate people’s current relationship with nature. I hope to communicate the positive ways nature impacts us and the negative ways we have been contributing to nature’s decline. I did so by illustrating various scenarios of how certain species in Vermont are threatened. I will also create large canvases of paper that turn black when wet and then back to white as the water evaporates. The public will be able to interact with these canvases. In doing so, they may take time to reflect on their relationships with nature and see the fading of their art as a metaphor for the loss of nature we are facing due to climate change. There are numerous discussions on the climate crisis and how

individual action will not be enough to cause real change. My project is not attempting to say that changing our daily lives can have enough of an impact to drastically slow climate change. Rather, my project intends to increase our awareness of our relationships with nature. Specifically, how nature benefits us, how we are impacted by its loss, and how changing our actions to be kinder to nature will benefit the planet as a whole.

Our Relationship with the Earth

The beauty and serenity that nature brings to the world is not the only reason why humanity needs to preserve it, but it is a strong one. I can't imagine a world in which my surroundings are barren of life. Yet, this is a reality we are slowly coming to face as global change continues to worsen. By now, people are familiar with the rhetoric that carbon emissions are on the rise, causing impacts like biodiversity to decrease and freshwater resources to dwindle, but still reform isn't happening quickly enough (Ripple, et. al., 2017).¹ When we view a freak hurricane in the news, it still feels unnatural. We don't realize that these natural disasters are becoming our new normal. The micro effects of climate change on the planet are even less noticeable on a day to day basis. I strive to draw attention to these small and local impacts of climate change in thought-provoking ways to spark conversation. Instead of staying at the surface of climate change with its huge, devastating, and scary statistics, I broke down these pieces of climate change into more digestible forms. We often don't notice the small changes caused by climate change until they compound over long periods. Such as how the pile of snow at the end of my driveway I sledded down with my brother got smaller every year until all that

¹ The *World Scientists' Warning to Humanity: A Second Notice* summarizes many trends in relation to climate change from 1960 to 2016. These include a continued decrease in freshwater resources, forests, vertebrate abundance, as well an increase in carbon dioxide emissions, temperatures, and the human population. 7

was left was mud and slush. By drawing attention to these changes, people may reflect on how losses in nature affects them.

In addition to highlighting our meaningful relationships with nature, I hoped to encourage a shift in our consumerist and materialistic culture. As Gosh says, “for let us make no mistake: the climate crisis is also a crisis of culture, and thus of imagination” (Gosh, p.9, 2016). Our culture creates a desire for us to constantly purchase the newest technology, clothes, and furnishings. When someone goes to the store, the limiting factor in their purchases is how much money they have, not what this purchase means in terms of its impact on the planet. The tie between the resources used to produce and transport goods is hidden behind shiny and bright packaging. As a result, it is natural for us to think of resources as merely objects to possess and utilize, rather than living, complex organisms and ecosystems. We have grown to believe that anything we want and can afford is therefore our right to have. We no longer think of the things we acquire from this Earth as gifts. Kimmerer writes in *Braiding Sweetgrass* about how in the English language, we refer to everything in nature as an “it.” In doing so, we fail to recognize that nature is alive. As Kimmerer points out, if we refer to a tree as he, she, or they, we may think twice before cutting the tree down (Kimmerer, 2013, pp. 56-58). Due to the way our society views and speaks of nature, it is no wonder how little respect we give it.

A final limitation in humanity’s perspective of the natural world is due to the reductionist epistemology of Western science. For years, scientists have studied the world by breaking complex systems down to their most basic parts. For instance, understanding the function of macromolecules is critical to understanding how a cell works. Such as how plant cells take in sunlight and carbon dioxide to produce sugar and oxygen in their chloroplasts. However, merely looking from a part-to-whole viewpoint fails to take into account a variety of other factors

including context-dependent conditions (Brigandt, et. al., 2023). The process of photosynthesis in a plant cell is vital to the organism, however, if we fail to zoom out, we lose track of the importance of this process in the rest of the ecosystem. Such as how this process of making sugar is what sustains the rest of the animals that consume these plants and break them down into energy. A reductionist view is especially limiting in the context of ecology in which all organisms interact in complex ways that cannot be understood by looking at the characteristics of a single organism. Through reductionism, we reduce a beautiful symphony down to its parts to understand it. Yet, in the process, we lose track of the vibrant life contained. We no longer see nature as a whole living and breathing being, but a collection of molecules. We also lose track of our role in this huge web.

Background

This project required me to research a diverse range of topics to integrate science and art into an impactful form of communication. Firstly, I focused on the history of environmental, performance, and interactive art. I also investigated the psychology behind how art is a useful tool for communication. This includes the way that emotionally impactful art is more memorable and leads people to collective action. Finally, I researched key species in Vermont that are being impacted by climate change. This would allow my drawings to be based on real threats to local species.

Environmental art

Environmental art has been around since the 1960s but is recently becoming more popular with the increasing threat of climate change. Artists who create environmental art seek to investigate the relationship between people and the environment by embedding their practice

within it. This may mean that they work collaboratively with the Earth outside, bring pieces of nature inside to create with, or make art that inspires us to live more sustainably (The Art Story, 2024a). The overall goal of environmental art is to create works that reflect the beauty of the Earth in ways that minimize their impact on the planet.

Andy Goldsworthy is a compelling example of an environmental artist. For Goldsworthy, the land is his canvas. He utilizes the changes in nature across time and space as the primary method of creating his art. Goldsworthy can be found in the early hours of the day arranging rocks before the tide sweeps them away, or deftly placing icicles before the sun rises and showers them in golden rays that slowly melt the ice. He then photographs his work before it disappears forever (Libow, 2005). Goldsworthy's art paves its way into a new vein of art, different from the historical purposes of art. The role of art has been in constant evolution since the dawn of humanity, from prehistoric art serving as a means to tell stories, to Egyptian art signifying class and hierarchy, and Renaissance art signifying skill and wealth (Gardner, 1975). In more recent years, art has become more about the intent of what the artist aims to convey. Goldsworthy is the architect behind his work, but he lets the Earth tell the story. His art is not about his skill or craftsmanship, but instead about drawing attention to the beautiful processes at work in our world.

Performance art

Performance art was developed to challenge the traditional forms of visual arts. It had a role in the Avant Garde movements of the 20th century and rose in the '60s to express various cultural upheavals including responses to politics and feminism. Performance art is usually carried out live, however, its form can span from the utilization of the body, objects, or media. Examples include public body painting, public involvement in the creation of art, and public

sculpture installations (The Art Story, 2024b). Primarily, performance art is grounded in a dependence on “social intercourse as a factor of its existence” (Helgeura, 2011, p.2). As long as the piece has an impact on the viewer, whether it is through experience, collaboration, or stimulation of ideas, it can fall under the category of performance art.

Interactive art is another genre of art that intersects with performance art. The style began in the late 1950s as a means for artists to move art to more inclusive venues and involve public participation. Through public engagement, people may collaborate, generate a sense of community, and gain new perspectives. Interactive art creates an immersive experience that is more individualized and creates deeper connections with the viewer (Cultivate, 2023). Just as environmental and performance art pushed the boundaries of what constitutes art, interactive art expands the role that art can play for the viewer.

An example of both performance and interactive art is a piece called *Tiza*, also known as *Chalk*, by the artists Jennifer Allora and Guillermo Calzadilla. Their work consisted of giant pieces of chalk left out in primarily urban spaces for the public to write with. The project was first introduced in Lima, Peru in 2002 and was later brought to other cities including Zapopan, Mexico and Sydney, Australia. In Lima, the artists placed the chalk in front of government buildings. Years of military dictatorship in Peru led people to use the chalk to express their personal frustrations with the state (Thompson, 2012). Allora and Calzadilla had no say over what was written or what the product looked like, but that was the beauty of the piece. Giving the public agency to express their thoughts in a country under strict military control made this piece extremely powerful. The artist’s behind *Tiza* stated that the chalk was the trace that “links presence and absence, inscription and erasure, preservation and destruction, and appearance and

disappearance.” Something as delicate as chalk drawings were able to portray strong messages due to their placement in a context of complex “social and political exchange” (Sung, 2019).

Context plays a large role in the message of a piece of art. Every site has a history, a set of laws or policies, memories, or connotations that affect not only the art, but the way the audience views it. For *Tiza*, its location outside of government buildings in Lima, Peru led people to draw primarily political sentiments. Ultimately, a peaceful protest formed and military officers came to wash away the chalk (Thompson, 2012). Similarly, context plays an important role in where I chose to carry out my project. The University of Vermont offered a location that would invite a certain group of people, college students and professors, to participate. The way *Tiza* was eventually shut down in Peru highlights the fact that involving public participation carries risks. For my project, since the main message is slowing down and reflecting, I wanted to do so in a place that didn’t require extensive permission and was with a community of people I was confident would be responsive.

In addition to location, whether the canvases were placed out inside or outside played a role in the experience of the public. Weather was an unpredictable consideration that would have impacted the functionality of the canvases. However, I felt the benefit of being in fresh air while interacting with the canvases was most important. Goldsworthy’s work is an excellent example of the part nature may play in a piece of art. For instance, he has no control over the temperature outside as he arranges icicles into masterful structures (Libow, 2005). He carefully and patiently works, and whether he finishes before the ice melts is partly what makes Goldsworthy’s work so amazing. In choosing to carry out my public piece of the project outside, I trusted that regardless of the weather that day, it would add meaning to the overall experience.

A final aspect of context that I considered in my project was the personal experiences every person carries in association with a location. This personal history may give people preconceived notions about the types of activities and thoughts they engage with at a location. Some people may only focus on schoolwork when spending time on campus, while others may frequently spend time doing activities in the green spaces. These aspects may have led some people to be more inclined to participate, while others needed to shift their mindsets to stop and interact with the canvases.

Climate Change Art

Examples of climate change art that integrate the genres of ecological, performance, and interactive art exist in various forms. For instance, *333Hz* by Antoine Bertin is an immersive piece exhibited at the Centre Wallonie Bruxelles, Paris in 2021 that invites viewers to listen to the tempo of deforestation. Bertin used data from the Global Forest Watch stating that an average 20,000 trees per minute were cut down since 2001. Bertin translated this rate into beats per minute (BPM) and set metronomes to strike against logs in a pile. The human ear cannot detect individual beats in a tempo of 20,000 BPM and instead hears the frequency 333 Hz, giving the piece its name (Bertin, 2021). Another piece titled *H. O. R. I. Z. O. N. (Habitat One: Regenerative Interactive Zone of Nurture)* was created in a collaboration between the Institute of Queer Ecology and the Guggenheim museum. It is a “digital, immersive social simulation exploring a world in which capitalism, greed and colonialism has destroyed the planet and disease is rampant” (Bååth, 2024). These art pieces address different aspects of climate change in innovative mediums that are more immersive for the viewer than traditional art. However, the message throughout these pieces is largely the same. They are serving as a warning. This is a theme I see across past and current climate change art. Pieces often impart narrow, one-note

messages that instill a sense of dread in the viewer. In addition, although the pieces are interactive, they fail to give the viewer any agency in their experience. Public responses to *333Hz and H. O. R. I. Z. O. N.* are difficult to find. A survey of social media posts about these pieces show little to no comments (Bertin [@ant1bert1], 2021)(The Institute of Queer Ecology [@queerecology], 2021). This possibly suggests that the impersonality of the art failed to impart their messages effectively.

A large and ongoing interactive climate change art project, titled *The Tempestry Project*, was started in 2017 by Emily McNeil, Asy Connelly and Marissa Connelly. This is a globally collaborative project that sells tapestry kits to communities so that they may visualize the daily temperatures they experience in their area in a year. Colors of yarn correspond to temperatures, with blue signifying colder days and reds showing increasingly hotter days. An article by Erika Zambello from the National Parks Conservation Association highlights positive responses to this project. Zambello describes how people all over are volunteering to participate and create tapestries, such as in National Parks across the United States. As of last year, the company is reported to sell over 500 “tempestry” kits a year. Zambello states how, “the tempestries provided a visible and tangible entry point for friends, family members and even strangers into a conversation about climate change” (Zambello, 2023). The collaborative nature of this project brings together groups of people to create meaningful pieces of tapestry that communicate impacts of climate change on the daily temperatures of an area. This project is similar to other pieces of climate change art in that it is inspired by highlighting a negative impact of climate change, however its medium makes the message less daunting. The time-consuming act of weaving each tapestry allows the maker to slow down and create a tactile connection with their work.

While I based my project on observable phenomena occurring as a result of climate change, the aim is not to merely supply the viewer with scientific data in an artistic form. My project aims to facilitate the examination of one's reflection of their relationship with nature by encouraging self expression on blank, regenerative spaces of canvas. My project was originally inspired out of fear for what we stand to lose as climate change continues. However, unlike previous examples of climate change art, it is about taking time to appreciate our relationships with nature and letting this encourage us to strengthen these relationships. My project also brings this moment of reflection to people unexpectedly. Unlike *The Tapestry Project*, which requires participants to not only seek out their involvement but also pay for the materials and know how to kit, there were no barriers to people interacting with my project as they walked across the University of Vermont Green. Similar to the importance of context for *Tiza*, the location of my project contributed to its impact by serving as a disruption in a student's busy day to reach people that may not have been seeking such an experience.

Communication through Art

Part of the reason my project spans a variety of artistic genres and mediums is that I want to convey ideas effectively. In addition to the art I created, I supplied guiding information to make clear some of my points on climate change. A study on the effectiveness of art in communicating climate change information suggested that the best way for art to have a clear message is with accompanying text or legends (Hahn and Berkers, 2020). People have unique backgrounds that affect how they view and interpret art. As a result, providing an informative website along with my project will help guide people to see the intent of my art.

I also researched the psychology behind why art can be an impactful tool for communication. There are several psychological and neurological phenomena that can occur

when a person views art. When someone is emotionally impacted by art, the brain produces hormones that make the experience more salient in their memories. For instance, the brain produces oxytocin, a “hormone that is strongly associated with empathy” during the art-making process (Skolczylas, 2020). An experience as simple as making or viewing art can cause people to share common emotions. This in turn inspires collective action. In addition, according to the National Institute of Health, emotion plays a role in learning, attention, memory, and problem-solving (Tyng et. al., 2017). Art offers a way to evoke emotion in a viewer by presenting them with beautiful, deep, or thought-provoking imagery. When a viewer has an emotional connection to art, they are more likely to remember the experience, change their perspectives, and discuss the message.

Speakers at the IETM Galway Satellite Meeting titled “Climate Change and the Performing Arts” discussed some other potential impacts of art on the brain. Skolczylas compiled a report summarizing a variety of these discussion points. One speaker, Ganga Shreedhar, spoke about the role art has in communicating the urgency of climate change action. She states that “the human brain has two different ways of processing information: one is ‘analytical, rational, deliberate’ and the other one is ‘emotional, impulsive automatic.’” As people go about their daily lives, they are often operating under the second option. They have short attention spans and react to information emotionally. This is where art can have an impact. In addition, Shreedhar discusses how portraying narratives is more effective at changing the mind of the viewer. If the viewer sees that other people are exhibiting strong connections to nature, they will be more convinced to do so as well (Skolczylas, 2020). Art has the potential to provoke positive emotions regarding nature that may inspire people to pursue more sustainable lifestyles.

In a paper titled, “Seeing Global Warming, Contemporary Art and the Fate of the Planet,” Finis Dunaway discusses numerous pieces in an art installation called *Weather Report*. Many of the installations directly call attention to the ways that people’s lifestyles are adding to climate change. For instance, a piece titled *Running the Numbers: An American Self-Portrait* uses statistics on American consumption to inform art pieces. From far away, the image appears to be one of a famous work of art, but up close the viewer is astonished to see it is made up of tons of plastic bottles or sheets of paper (Dunaway, 2009). Works like this confront the viewer with the consequences of their quick and thoughtless consumption of disposable goods. The mass of plastic bottles makes it clear how humans could use less single-use plastic to live more sustainably.

Dunaway also discusses how artistic communication is a means of digesting the distant and daunting wall that is climate change. Climate change discussions usually evoke a sense of environmental despair. In her paper “Working Through Environmental Despair,” Macy states, “As a society we are caught between a sense of impending apocalypse and the fear of acknowledging it” (Macy, 1995). The scary statistics and tragic stories make climate change feel overwhelming to the point that it takes away our desire to act. In addition, much of the imagery surrounding climate change that we see feels detached from us. Dunaway mentions the iconic image of the polar bear on a shrinking ice cap that many of us likely picture when we think about the impacts of climate change. The problem with this imagery is that it does not show people the concrete impacts that climate change has on their lives. The abstract idea of a polar bear out there struggling to survive surely makes people remorseful, however, it is not tangible enough to change the way that people act (Dunaway, 2009).

Another piece titled, *Connect the dots: Mapping the High Water, Hazards, and History of Boulder Creek* consisted of blue circles placed around the town of Boulder, Colorado. These circles were at the theoretical water level of a recurrent flood in the area that would increase in frequency as a result of climate change (Dunaway, 2009). Suddenly the distant threat of climate change impacts was made real through the placement of these blue dots. If water levels were to rise as high as the dots showed, people would face real challenges in their lives. The parks and trails they walk would be covered. The buildings they rely on for shelter, goods, and services would be destroyed. A blue dot on its own is a harmless shape, yet the message behind it is distressing. By connecting the local area to the vast threat of climate change, the threat is made much more real.

To combat the distance people usually feel between themselves and climate change, my artwork focuses on species that are native to Vermont. This way, people can see the actual impacts that are surrounding them as climate change takes its toll. Day-to-day changes may be so small they are imperceptible to people. However, artwork allows me to condense time and show the larger impact that gradual climate change causes. Similar to the aim of Dunaway's art exhibit, *Weather Report*, I will "forge perceptual links between local and global environmental change" (Dunaway, 2009). In this way, my work shows people the more personal and immediate impacts of climate change in ways that inspire hope and action instead of despair.

Vermont Species Impacted by Climate Change

The Vermont Department of Fish and Wildlife has a list multiple pages long of all of the native species threatened by climate change. Three of these species, the sugar maple, bumblebee, and moose are iconographic, ecologically, and economically important to the state (Agency of

Natural Resources, 2024). Various studies have been tracking the impact on these species by a multitude of factors, including climate change.

A study from 1988 to 2012 on sugar maples in Vermont sought to identify and quantify climate-driven stresses on this species. Sugar maples are extremely important to the identity and economy of Vermont. Sugar maples are the state tree, provide the sap used for famous Vermont maple syrup, and attract tourists yearly to view their vibrant, colorful foliage. This study adjusted for stresses that are unrelated to climate change to focus on the specific impact of climate change on sugar maples. They focused on measuring factors of the crown canopy as an indicator of sugar maple health. They found that the most significant impact of climate change on sugar maple crown condition is earlier warm temperatures in the spring and later cold temperatures in the fall. In the spring, this means trees bud earlier than usual and increase their risk of spring frost injury. In the fall, higher temperatures correspond to higher levels of respiration in leaves, despite decreasing levels of photosynthesis as leaves change color. This means that more carbohydrates are used up, instead of being allocated to shoots and leaf growth in the following spring. The study used their data to make projections about the future of sugar maple trees in Vermont. Under a low emission scenario, they projected that 55% of maples will experience moderate to severe climate stress by 2071. Under a high emissions scenario, this increases to 84% of maples (Oswald, 2018).

Bumblebees are another group of species being negatively impacted by climate change, as shown in a ten-year study ending in 2014. Not only do bees pollinate 90% of flowering plants, but they are also critical pollinators of 75% of crops that humans depend on. Richardson et. al. (2019) examined population changes in native Vermont bumble bee species. The study assembled a data set of 12,319 bumble bee records. Over ten years, four species of bumblebee

could no longer be found and four species saw significant declines in species richness, abundance, and diversity. Several factors cause these changes in different bee species populations including pathogens, pesticides, land use, and climate change (Richardson et. al., 2019).

Bees are indirectly affected by the changes in precipitation patterns due to climate change. Altered precipitation patterns cause the blooming cycles of flowers to shift. If the timing of flower blooms and bee activity do not align, neither the flower nor the bee can benefit from this interaction. Not only are bees lacking the nutrients they need from flower pollen to feed their queen and grow, but flowers are unable to spread their pollen and reproduce (Faccio et. al., 2021).

Finally, I chose to focus on moose, an iconographic species in Vermont. While their population is currently stable, they are by no means healthy. The primary factor harming moose is the increasing numbers of ticks. Climate change is leading to shorter winters in which the tick populations are not killed off. This leads to an overwhelming number of ticks that attach to moose and suck their blood (VT Fish and Wildlife, 2024).

In addition to population losses due to winter ticks, moose must also navigate balancing the energetic cost of finding shelter to thermoregulate (Haase, 2010). One study highlights the effects of a lack of thermal shelters on terrestrial species, including moose. If shade areas from shrubbery and tall trees are too spaced out, this may impact a species' gene flow, reproduction, and survival. Conservation efforts can focus on limiting habitat fragmentation and deforestation so species like moose aren't forced to search far and wide for shelter (Elmore, 2017). This is crucial because diseases and parasites, like the winter tick, are becoming more prevalent and reducing the fitness of species.

The Process

Drawings

I chose to use ink pens to create drawings to represent the impacts of climate change on nature. I mainly used the technique of stippling to create images from an accumulation of tiny dots. Stippling is inherently time-consuming. You cannot rush because you can only move your pen up and down so fast. Too fast and you'll break the tip of the pen and create misshapen dots. Thus, whenever I sat down to draw I knew I had to be patient and accepting of however long the drawing would take.

The methodical creation of art, such as pen and ink drawings, is reflective of processes in nature. The slow emergence of an image from a sea of black dots reminds me of the complex interweaving of cells to create plants and animals. At the microscopic cellular level, all you see is little jelly sacks full of dots. Yet, from far away there is a whole living organism. The list of microscopic to macroscopic beauty stretches on. For instance, all of the tiny radiant feathers that together make a hummingbird's coat gleam. Or the multitude of raindrops refracting light at once to create a rainbow. One tiny cell, feather, or raindrop on its own is quite unremarkable, but together they make a thing of beauty. Collections of tedious, minuscule particles form the beauty that is nature as well as a piece of art.

Stippling also highlights the risks inherent in a reductionist view of the world. While reductionism is useful in figuring out how processes work, only looking at something from a zoomed-in viewpoint loses the greater image. Zooming in on a drawing created from stippling will show formless dots. You may be able to ascertain certain information such as what the dots are made of and how they were formed, but you fail to see the image that the dots make together

as a whole. In the scientific world, reductionism allows us to comprehend how mysterious microscopic systems work, however, the separation between scientific understanding and the rest of the world leads to the separation of “knowledge from responsibility” (Kimmerer, 2013, p.346). Scientific understanding allows us to exert a large amount of control over our world, inevitably for materialistic and political agendas. We can develop vast amounts of technology, yet through our microscopes we fail to see the far-reaching effects our tinkering has.

I started my first drawing looking out the window, up at the canopy of a maple tree. The damage to sugar maples predicted by the study in Vermont from 1988 to 2012 made me think about how our lives would change as maple trees disappear (Oswald et. al., 2018). I found myself imagining what our skies might look like as more and more trees are stressed by climate change. I pictured the expansion of negative space concurrent with a reduction in leaves. I was inspired to create a drawing in which I only colored in the negative space around a crown of leaves (Figure 1). As damage to maple trees continues, theoretically more and more black would add until there is no more white space.

Similarly, as maple canopies thin there will be less and less leaves covering the Earth in autumn as they fall. Jumping into leaf piles is something I did as a kid, and it still evokes a feeling of nostalgia. I chose to draw two girls jumping into a non-existent pile to show the impact on our daily lives that a reduction in maple tree leaves will have. By putting the impact of climate change on a species into a form we know and love, the beauty and fun of leaves, the drawing brings the viewer closer to the issue (Figure 2). I was also inspired by Skolczykylas’ description of how viewing someone else interacting with nature causes people to be more inclined to do so as well (Skolczykylas, 2020). This drawing will hopefully cause people to reflect on how times spent in nature like these are in danger of being lost. In addition, it may propel

them to find more time to enjoy nature, like jumping in leaf piles, or whatever the adult version may be.

The next species I focused on was the bumble bee. I focused on the growing disconnect between flowering and pollination (Facio et. al., 2021). Two species that have coevolved over time to offer nutrients and reproduction to each other are suddenly being thrown out of balance because of the changing climate. I chose to portray the growing disconnect between bees and flowers with an image of a bee flying above a wilting flower (Figure 3). At first, this is a familiar image to us. Yet, at second glance the black spots in the flower indicate something is wrong. As Walton Ford says, “The big thing I’m always looking for in my work is a sort of attraction-repulsion, where the stuff is beautiful to begin with until you notice that some sort of horrible violence is about to happen or is in the middle of happening” (Art21, 2003). To further the unsettling image, I created a similarly composed image of a hand reaching for a rotting apple (Figure 4). This drawing puts the interaction in terms of what it would be like if the timing between people and their food was disconnected. The hand is too late and the apple has become moldy and rotten. The wrinkles and spots in the apple highlight the passage of time. The wrinkles in the apple are reflected in the fine lines of the hand above it. It is disturbing to imagine our hands wrinkling and shriveling up like the apple below.

The drawing of the hand over the apple also calls into question the relationship between the two (Figure 4). Is the hand reaching for the apple or moving away? Or perhaps, has the hand caused the apple to rot? The possibilities of this relationship highlight our reciprocal relationship with the Earth. We rely on fruits like apples to sustain us. However, what are we doing to sustain the fruit in return? The ways humans are contributing to climate change, through carbon

emissions, agriculture, and deforestation, are putting the survivability of fruits like the apple at risk (Ripple et. al., 2017).

Finally, I created drawings focusing on the moose. I was inspired by the study on the danger of the decreasing availability of thermal refuges (Elmore, 2017). I see the moose as a large and well-known animal that can serve as a representative for all organisms needing thermal refuge. I chose to depict a tiny-sized moose frolicking through a garden looming above (Figure 5). His tiny size alludes to all of the other small creatures that would benefit from more vegetation. Fighting deforestation and habitat fragmentation is a major way to have an impact, however, cultivating personal gardens is useful as well. Growing a garden would not only benefit the critters in our yards but also be another valuable way to reconnect with the Earth that would benefit us as well.

I wanted to reinforce the idea of the moose as an umbrella species for the many smaller but similarly affected species of Vermont. I pictured the antlers of a moose as a shelter. My next drawing depicted the top of a moose's head as a haven for a multitude of creatures like insects, birds, and chipmunks (Figure 6). Just as moose need refuge, his antlers represent the habitats that will exist for other animals if people take action to help conserve moose populations. By helping the moose, people will inadvertently be helping many other lesser-known species as well. This highlights the complex interweaving of all life on our planet.

Canvases

The series of drawings I completed represent how I was inspired to portray species that are being threatened due to climate change in Vermont. I wanted to find a way to invite the public to view these works, but also experience the artistic process themselves. To accomplish this, I created eleven large canvases covered with a “magic” type of paper to distribute around

the Green on the University of Vermont campus for a couple of days. This “magic paper” appears to turn black when it becomes wet and then back to white again as the water evaporates. Placing the canvases out with paintbrushes and recycled glass jars filled with water will allow the public to engage with my project in a stimulating way. I will accompany the canvases with a QR code that brings the viewer to the website I have created. The website features my drawings, guiding descriptive statements, and links to scientific papers that provide evidence for the impacts of climate change on each species.

Constructing the magic paper canvases required quite a bit of patience as well as trial and error. I had to think through several avenues to figure out how to build large canvases to support the paper. I began with thinking I could just build wood frames from scratch, as this was a path I was familiar with. However, a few problems soon arose. The wood was too expensive for my budget and didn't follow the sustainability themes of my project. In addition, transporting the large heavy frames would pose a challenge.

After considering countless possibilities from roll-up banners, to old movie screens, to poster boards, I came across eleven large framed posters in a local thrift shop. Reusing these frames for my project was following my mission of sustainability. In addition, their portability meant that I could spread them out across the Green on campus and lean them up against trees. This would make the experience more integrated with the scenery and relaxing for the people who interact with them.

Putting the magic paper into these frames turned out to be its own beast. I cut the paper backings off the frames and exposed the poster and glass being held in with large staples. I developed a technique of inserting a screwdriver into the staples to bend them up enough to fit the poster and glass out. Once the glass was out, I used double-sided carpet tape to adhere the

magic paper tight across the glass. I then reversed all my steps to place the paper-covered glass and poster backing back into the frame and secured them in place.

Results and Observations

Through anecdotal evidence and responses to an online survey, I was able to view the results of this project. For the two days my canvases were out in public, I spent most of the day sitting and watching or strolling in circles to see what people were painting and talking about. Almost continuously throughout the day, someone was at a canvas painting. I witnessed groups of friends taking turns and pairs sitting down together. I watched as one girl painted and then ran back to redo it as her painting faded. I saw some friends splitting up to go to different canvases and then rejoin to display their work. People painted a variety of things including hearts, smiley faces, stars, moons, plants, and animals. Paintings ranged from silly to serious, such as the word “poo” to a striking Renaissance-esk painting of a person. Many wished positive statements for all, such as “You are loved,” “You matter,” and “You’re beautiful.” A few others showed feminist and queer statements (Images 7-18). The range of time people spent at a canvas varied from a few seconds as they walked by to several minutes in which they sat down and made themselves comfortable as they painted. Two little boys of a family passing through spent a good deal of time perfecting their paintings and then diverged into swinging the paintbrushes around on their strings.

I watched quite a lot of people scanning my QR code and viewing my website. I overheard many reading the title out loud to their friends and saying things like, “That’s so cool.” I also overheard many people explaining the canvases to their friends and encouraging them to try them. People also took pictures with their paintings and posted them to social media.

The responses to my online survey overall were supportive of the project and thoughtful. There were two multiple-choice questions with a fill-in-yourself option followed by two short response questions about their experiences. Responses to the multiple choice questions overall expressed a positive and reflective experience. The responses also indicated that the website was impactful in terms of conveying a sense of nostalgia, joy, and loss.

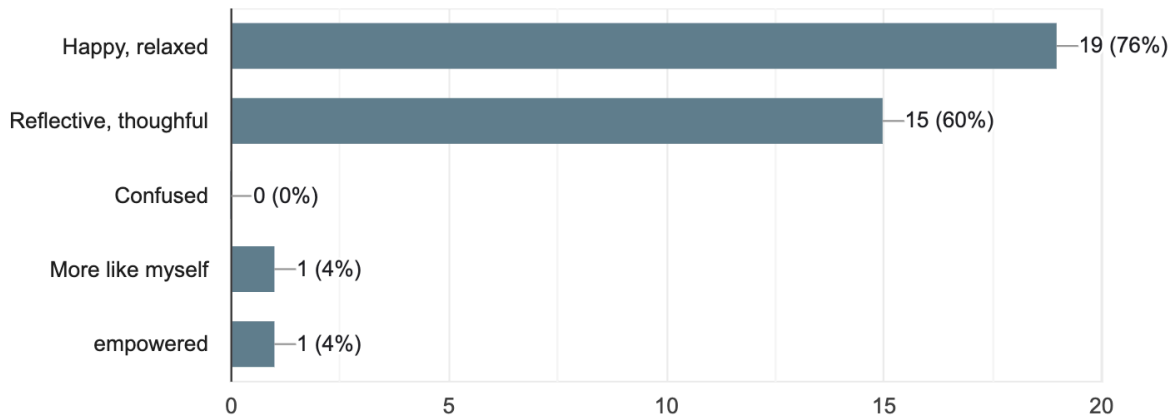


Figure 1 Responses to “How did painting on the canvases make you feel?” presented to the public via a QR code on large interactive canvases distributed around the University of Vermont

Green.

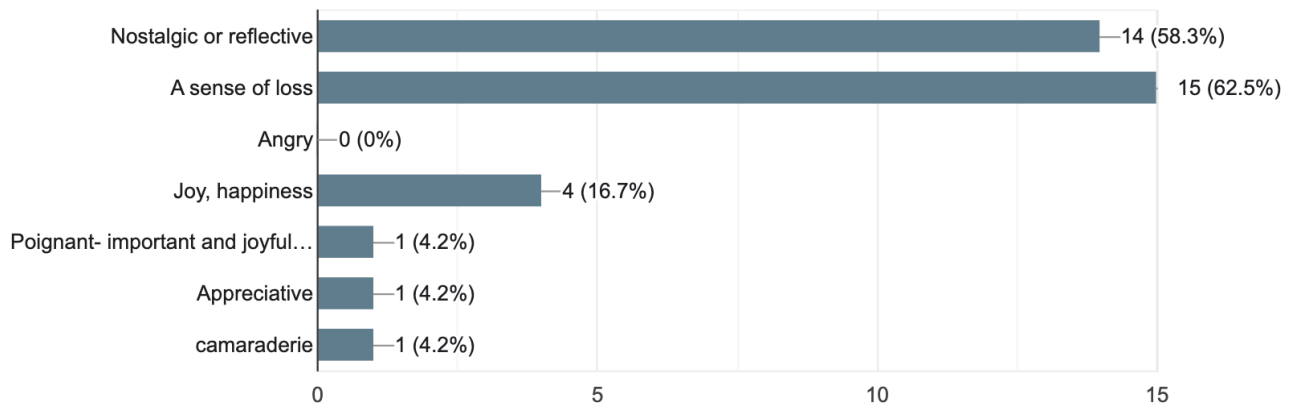


Figure 2 Responses to “How did the drawings and information on the website make you feel?” presented to the public via a QR code on large interactive canvases distributed around the University of Vermont green.

People’s reflections on their relationships with nature and ways they could change had similar themes throughout. The first question asked, “How would you describe your relationship with nature?” Most of the responses could be categorized into expressing strength, importance, desire, appreciation, protectiveness, and a sense of loss. In response to the question, “Are there ways you want to alter your relationship with nature?” people conveyed that they were aware of the urgency of needing to protect nature and wished they had more time to spend enjoying it.

Themes in Responses to the Question "How would you describe your relationship with nature?"

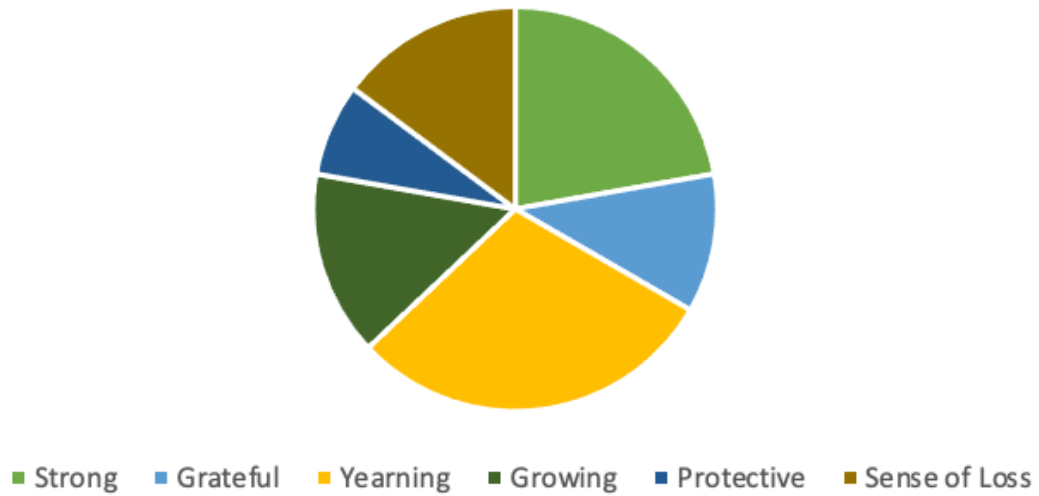


Figure 3 General themes in written responses to the question “How would you describe your relationship with nature?” Presented to the public via a QR code on large interactive canvases distributed around the University of Vermont Green.

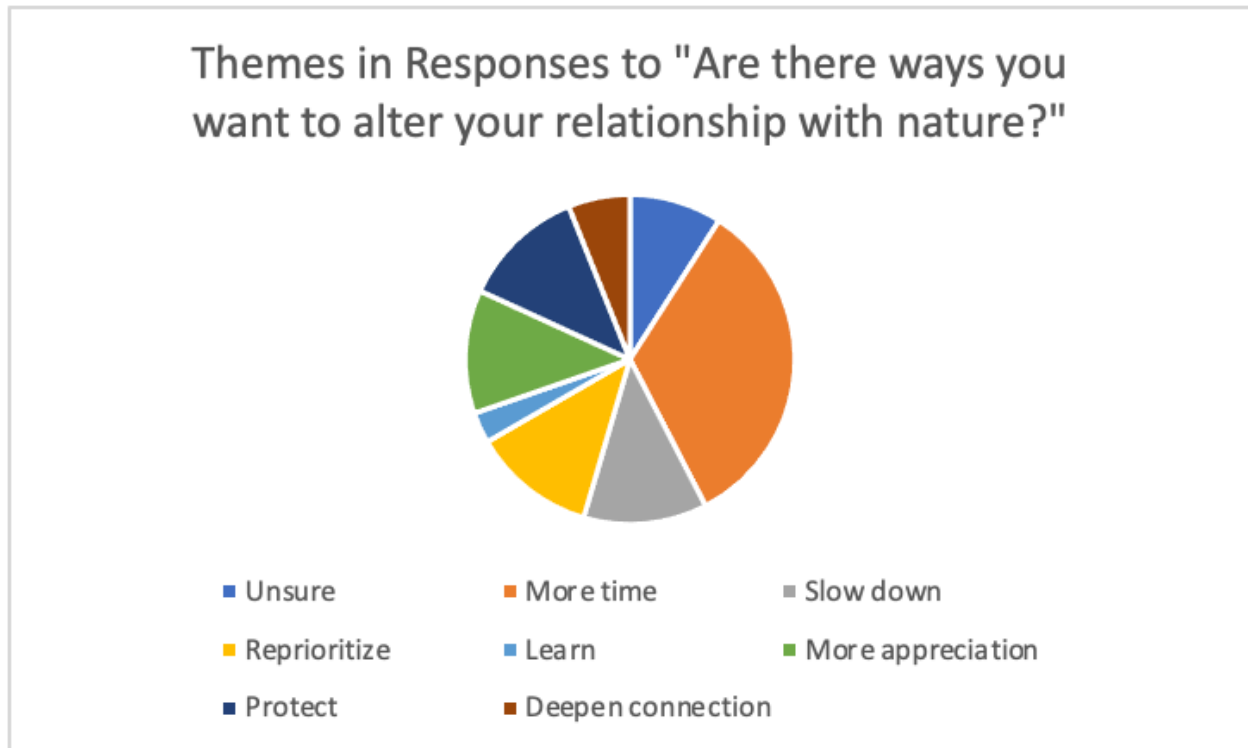


Figure 4 General themes in written responses to the question “Are there ways you want to alter your relationship with nature?” Presented to the public via a QR code on large interactive canvases distributed around the University of Vermont Green.

Discussion

A major aim of my project was to impact people emotionally through a medium that can convey more than just words or statistics. Science looks at the world through a rational and investigative lens. This lens enables us to find explanations for how the world works but disconnects us from the large picture. Highly specific regulations for procedure and writing make scientific papers difficult to understand. Art is one way to incorporate the knowledge science has unraveled into a more holistic and impactful medium. As artist Morton states, “Art’s vague qualities ... help us think things that are difficult to put into words” (Morton, 2010, p. 60). The

responses indicate that the art on my website and experiences with the canvases affected people in ways that cannot be contained in words. For instance, one person stated that the experience made them feel “more like myself” (Figure 1). This is a statement that doesn’t outright name any particular adjectives to describe how they felt, yet it is quite moving. In this way, art transmits ideas and emotions deeper than words.

The interplay between nature’s constant presence and its simultaneous decline is a key theme in my project. Responses to my project showed that people rely on nature in similar ways for emotional healing which originally inspired me. People stated that nature is integral to their well-being and serves as a source of energy. Words describing people’s connections and love for the wonders of nature allude to my belief that nature is valuable in supporting our mental well-being because its presence is often the only constant we can count on. Alan Lightman in *Searching for Stars on an Island in Maine* elucidates many of the laws that humans have constructed to govern our world. Lightman explains how even the theories from some of the biggest names in science, like Newton and Einstein, that seem to crack the code on how our world works, may be disproved or revised. In a world where there is no complete set of laws to explain the phenomena at work, how can we expect to fully understand our role in it? At the end of many of his chapters, Lightman transports the reader back to his island in Maine where he meditates in a tiny boat in the ocean, gazing at the stars (Lightman, 2018). His repeated return to nature reflects the fact that in a world that even the most impressive scientists struggle to make sense of, nature is still there. The fluctuating state of our lives, in terms of careers, relationships, health, and more makes the presence of nature ever more valuable. However, as climate change takes its toll, this may be yet another mental refuge we can no longer rely on. And on the contrary, it may be the source of our biggest problems.

Many responses indicated people's awareness that nature is being threatened. Someone said, "[nature] will not provide the same resources and joy forever." Others described how they feel a sense of loss for nature and anxiety about climate change. These responses are following the concern I wanted to convey. The magic canvases emulated the disappearance of nature in our world. The way that the public's paintings evaporated made them ephemeral. The word "ephemerality" has Greek origins from the word εφήμερος – ephemeros, meaning "living but a day or short-lived" (Oxford Reference, 2024). Therefore, something that is ephemeral derives much of its beauty from its short existence. There are countless examples of ephemerality in nature. Like the first snow, that is just enough to stick but soon melts away. Or the golden light of a sunset, that lasts less than an hour before the sun hides beneath the horizon. These instances are beautiful by themselves, but the fact that they are fleeting makes them even more valuable. The beauty of nature as a whole is becoming fleeting due to climate change. This concept of ephemerality was communicated through the canvases. As peoples' paintings started to fade, it served as a metaphor for the loss of nature we are facing due to climate change.

A few people attempted to stop the fading of their paintings by going back and repainting lines they had just painted. Regardless of their efforts, in the end, their painting always vanished. As I witnessed this, I found myself thinking of humanity attempting to combat climate change with some of the same futile tactics. While innovation, like renewable energy, is beneficial in the fight against climate change, we can't continue to place such "band-aids" on such a large wound.² Innovation is expensive, high in resource requirements, and takes time to implement. We need a radical shift in our approach that starts at the beginning. If people and businesses

² The release of greenhouse gasses, like carbon dioxide, takes decades to millennia to disappear. In this case, despite any conversion to alternate sources of energy in the future, whatever is currently released into the atmosphere will be around for a long time. Fossil fuel combustion, deforestation, and semiconductor manufacturing are just three of the largest contributors to greenhouse gasses that could be reduced through a shift in human consumption (Rubin, 2011).

continue to operate at the same level of resource use, “future global emissions of greenhouse gasses will grow significantly in the coming decades in response to growth in world population, economic development, and other factors...” (Rubin, 2011, p. 335). In summary, no amount of innovation will be able to keep up without continued damage to the planet if human activity continues with its current trends. To put it in terms of the canvases, if people wanted their paintings to stay, they would need to start from a completely different set of materials. Once again I return to the idea of shifting our mindsets. Developing relationships of reciprocity with nature is essential. We need to stop thinking in terms of what we get from nature, but instead what we can give to each other.

The disappearance of the canvases alternatively represents the unending desire of people to have more. The vanishing of one’s painting represents the instance we lose satisfaction in what we have. We want more clothes, more technology, more money, more time. As Kimmerer puts it, this represents the “deadly road of materialism.” While shifting economic practices and regulations is necessary, “scarcity and plenty are as much qualities of the mind and spirit as they are of economy” (Kimmerer, 2013, p. 371). Raising people’s awareness for their love of nature through their experience with the canvases hopefully sows seeds of gratitude for what nature gives us. If we stop allowing the market to tell us what to value, we may realize we need material goods much less than we thought. From all of the responses to my survey, it is clear people value nature, yet our culture still dominantly forces materialism on us. Increasing awareness of our appreciation for nature’s gifts will inspire us to consume more mindfully.

People’s responses detailing how important nature is to them and the fear they have of losing it indicate their experiences with the canvases will carry with them. Although something ephemeral is short-lived, its impact on the viewer can endure. People were emotionally impacted

by the experience, using words such as “happy,” “nostalgic,” and “relaxed” to describe the way it made them feel (Figures 1 and 2). As previously discussed, an event that triggers an emotional response, especially one that is positive or empathetic, is much more likely to stay in someone’s head and have an impact on them (Skolczylas, 2020). The emotions that this experience triggered for people highlighted their positive relationships with nature. As a result, they may be more likely to remember how they felt and act when they have the chance to be kinder to nature in the future.

In addition to people recognizing their meaningful relationships with nature, many expressed a desire to spend more time in it. One response mentioned getting “caught up in the hustle of everyday” and failing to “stop and smell the roses.” These reflections made it clear that people are aware of the benefits of being in nature, but they often forget to make time to do so. My canvases successfully gave people a moment to relax. One person expressed how their relationship with nature is becoming more meaningful by stopping and seeing what catches their eye. They described how “making time to look at the minutia is powerful.” We are only able to fully grasp the wonders of nature if we go outside and look around. Doing so will not only allow us to connect more with nature but will hopefully lead to a lifestyle less led by consumption.

My project did not focus on supplying viewers with information to directly combat climate change but instead was aimed at inspiring people to reflect on ways specific to their lives that they might have an impact. The unique activities we go about in our lives can be made as sustainable as possible. For instance, one viewer was inspired to find ways they can increase their care for nature by looking into ways to have less of an impact while rock climbing outside. Another expressed pride in their relationship with their garden and was motivated to deepen this connection. Not only will this person cultivate a stronger relationship with the Earth, but they

will also benefit the creatures needing thermal refuges which inspired my drawing of moose antlers protecting little critters (Image 6).

People were inspired to make changes in their lives that felt feasible to them. One person even responded that my project made them feel “empowered” (Figure 1). I find it hugely successful that people felt uplifted by my project instead of the frequent feelings of environmental despair we feel when confronted with climate change. As E. O. Wilson says, “There can be no purpose more inspiring than to begin the age of restoration, reweaving the wondrous diversity of life that still surrounds us” (Wilson, 1992, p. 351). This excitement around the possibility of the life we can nurture, instead of fear and guilt over what we have lost is key to restoring our relationships with nature.

Limitations and Future Directions

The public interactiveness of my project led to limitations in my message. I could not control what people painted or how much they engaged. As a result, a multitude of people’s paintings did not have to do with climate change. Some people had other personal agendas including political, feminist, and self-promotional statements. Other people just wanted to put out positive affirmations. Finally, a handful of people merely wrote or painted silly doodles (Images 7-18). While these people likely did not grasp the intent of my project, they were still able to have the experience of painting on the canvases. From my experience and others’ responses, I believe that simply the act of painting on the canvas is fun and relaxing. People love the way the canvas seems to magically change color beneath their brush. Those who painted on the canvases without reflecting on their relationship with nature still accomplished the secondary goal of my project, to create a positive disruption in people’s busy days.

One possible avenue to make the message of my project more direct to the public would be using a similar product to the one that coats the “magic” paper. A few companies sell sprayable hydrochromic ink. This ink is opaque white when dry but becomes translucent when wet to reveal the image beneath (SFXC, 2022). I could use this ink to cover up my artwork and texts. This way, when people paint with water, instead of just black being revealed, it would show art and information related specifically to climate change. This would make the message clearer, however, I see great value in the way that people were able to paint anything they wished on the canvases. I wanted people to experience the art-making process for themselves because it is through this process that I often feel the most in tune with my thoughts. I was able to fully appreciate my love of nature by taking the time to apply each dot to paper to create my drawings of each species.

Final Reflection

This project has been an evolutionary process to finding the most meaningful ways we can evaluate our relationships with nature and alter our lives in response. My drawings allowed me to dive into the ways I view humanity’s relationships with nature including our consumerist culture and reductionist scientific point of view. These mentalities place us at risk of devaluing nature and obscuring ways we are linked to nature’s destruction. I was also able to learn and portray the way specific species in Vermont are being impacted by climate change. This illuminated concrete evidence of what might be lost soon and possible ways we can help.

Nature is something I and others turn to when we feel lost. Nature holds beauty, energy, and wisdom. My project made people aware of their gratitude for nature. People expressed recognition of the importance of nature in their lives, the desire to spend more time in it, and the hopes to protect it. The act of painting on the canvases was a relaxing break from their busy

days. People realize how much they get caught up in the hustle of life and need to slow down from time to time to go outside. Living a life more in tune with nature will strengthen our connections to the Earth while causing us to take less and give more. People are aware of the need for change. They are aware of the tactics and reforms necessary to change it, but these thoughts are scary and discouraging. Unlike previous examples of interactive climate change art, my project simply asked people to reflect on why nature is important to them and let their connection guide them to living a life kinder to nature in whatever ways they can. To take a step back from the need to consume and produce endlessly, and instead take a deep breath and smell the flowers.

Appendix

Drawings:

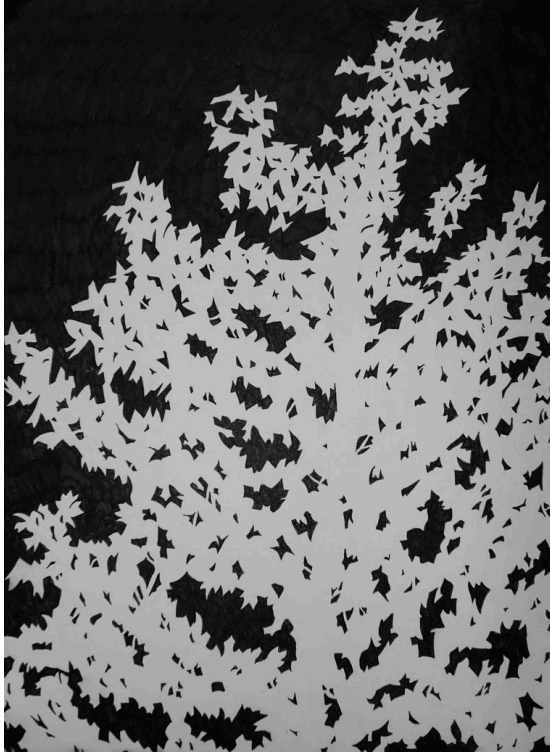


Image 1 Ink drawing filling in the negative space around the crown of a sugar maple tree to highlight the yearly loss of leaves due to climate change impacts.



Image 2 Ink drawing of two girls jumping in a nonexistent pile of leaves with watercolor autumn foliage in the background, highlighting the potential loss of interactions with nature as climate change impacts sugar maple trees.

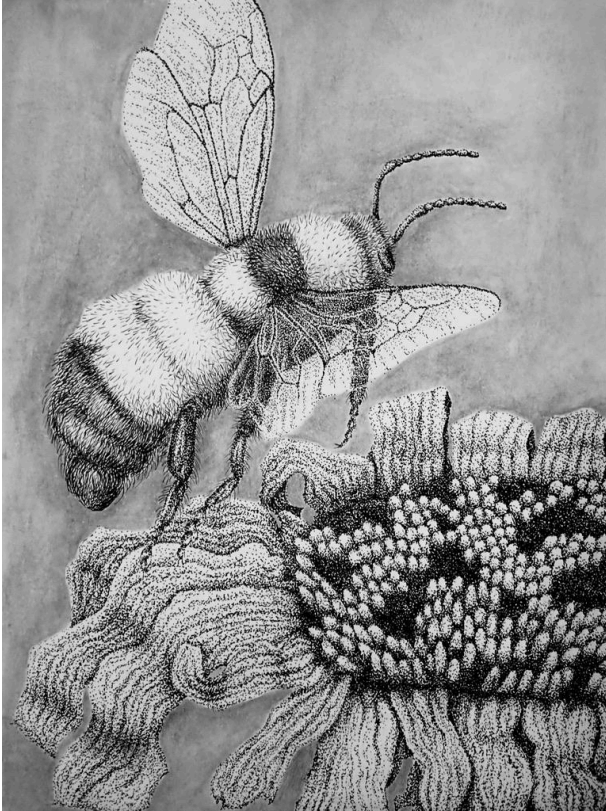


Image 3 Ink drawing of a bumble bee flying over a wilting flower to illustrate the disconnect in the timing of bee pollination with flower blooming and the resulting harm on each of their survivability as a result of climate change.



Image 4 Ink drawing of a hand reaching for a rotting apple, illustrating the relationship between humans and the Earth, specifically our reliance on the Earth for sustenance despite our negative impacts on the health of the Earth.



Image 5 Ink drawing of a miniature moose running through flowers to illustrate the importance of vegetation as a thermal refuge for animals, especially during times of increasing impacts of climate change.

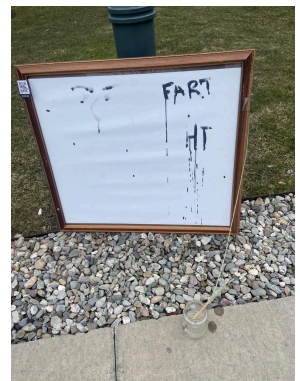
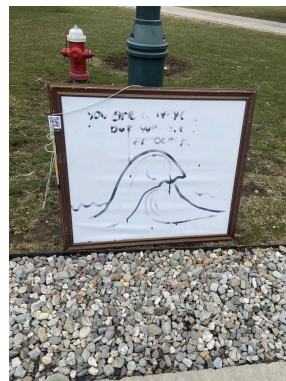


Image 6 Ink drawing of moose antlers as a home for many animals including birds, snakes, spiders, chipmunks, and butterflies to represent the way that efforts to help the health of moose help many other species as well.

Website:

<https://www.figma.com/proto/QNYxH8hDFTEVxLrHSCvw2n/Thesis-narrow?type=design&t=4eTwOnoLbTLRMI7B-1&scaling=min-zoom&page-id=0:1&node-id=1-2&mode=design>

Canvases:



Images 7 - 18 Water paintings by the public on evaporative canvases placed around the University of Vermont Green. Paintings consisted of figures, animals, plants, hearts, and statements.

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